THE CITY RECORD.

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THE CITY RECORD.

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BOARD OF ALDERMEN.

Public Hearing by the Committee on Buildings.

PUBLIC NOTICE IS HEREBY GIVEN that the Committee on Buildings will hold a public hearing in the Aldermanic Chamber on FRIDAY, JULY 13, 1917, at 2 p. m., on the following matter:

No. 1518—Ord. No. 268. "An Ordinance to amend section 562 of article 27 of chapter 5 of the Code of Ordinances, relating to elevators."

This ordinance may be found in the minutes of the Board of Aldermen published in the CITY RECORD of July 5, 1917.

All persons interested are invited to be present.

jy11,13 P. J. SCULLY, City Clerk and Clerk of the Board of Aldermen.

PUBLIC SERVICE COMMISSION, FIRST DISTRICT.

No. 120 BROADWAY, NEW YORK CITY.

Calendar for the Week Commencing July 11, 1917.

Friday, July 13, 1917—10.30 a. m.—Room 2562—Case No. 2209—Long Island Railroad Company—"New tariff schedules containing changes in passenger rates"—Whole Commission.

Regular Meeting of the Commission held on Wednesday at 11 a. m.

STATE INDUSTRIAL COMMISSION—DEPARTMENT OF LABOR.

INDUSTRIAL CODE.

Rules Relating to the Construction, Installation, Inspection and Maintenance of Steam Boilers in Factories, Mines, Tunnels and Quarries.

(The rules contained in this Bulletin were adopted by the State Industrial Commission in accordance with the requirements of Section 51-a and 52 of the Labor Law, and became effective July 1, 1917.)

BOILER CODE.

Rules for the construction, installation, inspection and maintenance of steam boilers as provided in sections 91 and 124 of the Labor Law.

Section 91. Boiler inspection. The commissioner of labor shall cause to be inspected all boilers used for generating steam or heat for factory purposes which carry a steam pressure of ten pounds or more to the square inch, except where a certificate is filed with such commissioner, or shall have been heretofore filed with the state fire marshal under the provisions of former section three hundred and fifty-seven of the insurance law, by a duly authorized insurance company, in conformity with the rules or regulations of the officer with whom such certificate shall have been filed, and certifying that upon such inspection such boilers have been found to be in a safe condition. Every such insurance company shall report to the commissioner all boilers insured by them coming within the provisions of this section including those rejected, together with the reason therefor. A fee of five dollars shall be charged the owner or lessee of each boiler inspected by the inspector of the department of labor, but not more than the sum of ten dollars shall be collected for the inspection of any one boiler for any year. Such fee shall be payable within thirty days from the date of such inspection. If a certificate of inspection, heretofore filed in the office of the state fire marshal, or hereafter filed in the office of the commissioner of labor shows a boiler to be in need of repairs or in an unsafe or dangerous condition, the commissioner of labor shall order such repairs to be made to such boiler as in his judgment may be necessary and he shall order the use of such boiler discontinued until such repairs are made or such dangerous and unsafe conditions remedied. Such order shall be served upon the owner or lessee of the boiler, personally or by mail, and any owner or lessee failing to comply with such order within a time to be specified therein, which shall be not less than ten days from the service of the order if served personally and not less than fifteen days from the mailing thereof if served by mail, shall be liable to a penalty of fifty dollars for each day's neglect thereafter. Every owner or lessee of any such boiler who shall use or allow a boiler to be used by any one in his employ after receiving notice that such boiler is in an unsafe or dangerous condition shall be subject to a penalty of not to exceed five dollars for each day on which such boiler is used after the receipt of such notice. Owners and lessees of boilers shall attach to such boilers the numbers assigned by the commissioner of labor, under a penalty of five dollars for each day's failure so to do after such numbers have been assigned.

The provisions of this section shall not apply to cities in which boilers are regularly inspected by competent inspectors acting under the authority of local laws or ordinances.

§ 124. Inspection of steam boilers and apparatus; steam, air and water gauges. All boilers used in generating steam for mining or tunneling purposes shall be kept in good order, and the owner, agent, manager or lessee of such mine or tunnel shall have such boilers inspected by a competent person, approved by the commissioner of labor, once in six months, and shall file a certificate showing the result thereof in the mine or tunnel office and a duplicate thereof in the office of the commissioner of labor. * * * Each boiler or battery of boilers used in mining or tunneling for generating steam, shall be provided with a proper safety valve and with steam and water gauges, to show respectively, the pressure of steam and the height of water in the boilers. Every boiler-house in which a boiler or nest of boilers is placed, shall be provided with steam gauge properly connected with the boilers, and another steam gauge shall be attached to the steam pipe in the engine-house, and so placed that the engineer or fireman can readily ascertain the pressure carried.

INSPECTION OF BOILERS.

Rule 800. All boilers used for generating steam or heat for factory purposes, shall be subject to a regular internal and external inspection each year, and all boilers used for generating steam or heat for mining, tunneling and quarrying purposes, shall be inspected externally at least once in six months and subject to a regular internal inspection each year.

Rule 801. Whoever owns, uses or causes to be used a portable boiler subject to inspection, as provided in sections 91 and 124 of the Labor Law, shall report the location of such boilers to the Industrial Commission on January first, or within thirty days thereafter, of each year.

Rule 802. The owner or user of a boiler or boilers herein required to be inspected shall, after fifteen days' notice, prepare the boiler for internal inspection, or hydrostatic pressure test, if necessary. To prepare a boiler for internal inspection, the water shall be drawn off and the boiler thoroughly washed. All manhole and handhole covers, and washout plugs in boilers and water column connection shall be removed, and the furnace and combustion chambers thoroughly cooled and cleaned. Enough of the brick work shall be removed to determine the condition of the boiler, furnace or other parts, at each annual inspection, if necessary. The steam gauge shall be removed for testing.

Rule 803. If it is found that steam or hot water is leaking into the boiler, the source of such leakage shall be disconnected and so drained as to cut out such steam or hot water from the boiler to be inspected.

Rule 804. If the boiler is jacketed so that the longitudinal seams of shells, drums or domes, cannot be seen, and if it cannot otherwise be determined, enough of the jacketing, setting wall or other covering shall be removed so that the size and pitch of the rivets and such other data as may be necessary can be determined at first data inspection.

Rule 805. In preparing a boiler for hydrastatic test, the boiler shall be filled to the stop valve. If boiler to be tested is connected with other boilers, that are under steam pressure, such connections shall be blanked off unless there be double stop valves on all connecting pipes, with an open drain between.

INSPECTION BY INSURANCE COMPANY.

Rule 806. All boilers subject to periodic inspection by duly authorized insurance companies shall be exempt from regular annual inspection by the Industrial Commission on the following conditions:

a. The insurance companies' regulations shall conform with these Rules.

b. The insurance companies' inspectors who inspect boilers operated in this state shall hold certificates of competency issued by the Industrial Commission, as hereinafter provided.

c. Reports of all inspections shall conform to the requirements, and shall be made upon forms approved by the Commission.

d. A copy of all internal and external inspection reports shall be filed with the Commission within twenty-one days after the inspection is made.

e. Insurance companies, whose inspectors hold certificates of competency, shall immediately report to this Commission the name of the owner or user, and the location of every boiler on which insurance has been refused, cancelled or discontinued because of existing dangerous defects and shall within a reasonable time report all other refusals, cancellations or discontinuances.

CERTIFICATE OF COMPETENCY.

Rule 807. Certificates of competency and commissions as inspectors of steam boilers shall be issued to persons in the employ of duly authorized boiler insurance companies who pass a written examination as to their knowledge of the construction, installation, maintenance and repair of steam boilers and their appurtenances.

Provided, however, that a person holding a certificate of competency as an inspector of steam boilers for a state that has a standard of examination equal to the standard set by the Industrial Commission of the State of New York, shall, upon written request of a duly authorized boiler insurance company, by whom such person is employed, be granted a certificate of competency and a commission as an inspector of steam boilers for the State of New York without further examination. The commission shall be retained by the insurance company and shall be immediately returned to the Industrial Commission when the inspector ceases to be employed by the said company. Inspectors' certificate shall be issued by the Industrial Commission upon recommendation of an examining board appointed by the Industrial Commission, composed of one representative of each of the following interests: a representative of boiler manufacturers, the duly authorized boiler insurance companies, the operating engineers, the Boiler Inspection Division of the Industrial Commission, and such others as the Industrial Commission may designate.

Rule 808. An applicant who fails to pass an examination shall not be granted a new examination until after the expiration of ninety days.

GENERAL.

Rule 809. A certificate of inspection upon the form approved by the Industrial Commission shall be issued and shall be conspicuously posted under glass in the engine or boiler room.

Rule 810. In case a defect affecting the safety of a steam boiler is discovered, the owner or user of the boiler shall immediately discontinue the boiler from service and notify the Industrial Commission. An inspection shall be made and a certificate of inspection issued before the boiler is again placed in service.

Rule 811. Any boiler in this state at the time these rules take effect, if hereafter installed, may be operated after a thorough internal and external inspection and a hydrostatic pressure test and a certificate issued. The maximum allowable working pressure on such boiler shall be determined as provided in Par. 378, Rule 850.

Rule 812. No boiler shall be operated at a pressure in excess of the safe

working pressure allowed by the annual inspection certificate, which pressure is to be ascertained by means of these rules.

Rule 813. No person shall remove or tamper with any safety appliance prescribed by these rules, and no person shall in any manner load the safety valve to greater pressure than that allowed by the certificate of inspection.

Rule 814. If there are valves in the connections between water column and boiler, at least one steam gage shall be connected directly to steam space of boiler, with but one cock between said gage and boiler.

Rule 815. The discharge of safety valves, blow-off pipes, or other outlets, shall be so located that there will be no danger from scalding.

Rule 816. Safety valves, try cocks, water column and water blow-offs on boilers operated at a pressure of more than fifteen (15) pounds to the square inch shall be tested daily when the boiler is in operation.

Rule 817. All patches on a boiler shell or drum, which exceed twenty-four inches in length, measured on a line parallel to the longitudinal seam, and between the center lines of the extreme rivet holes, shall be calculated for safe working pressure from said patch seam, the efficiency of which shall be determined in the usual manner. The afficiency of the patch seam may then be increased by multiplying said efficiency by a factor which is determined by the angularity of the inclined patch seam to the girth seam, according to the following table:

Angle.	Factor.	Angle.	Factor.
30 degrees	1.51	50 degrees	1.20
35 degrees	1.42	55 degrees	1.15
40 degrees	1.34	60 degrees	1.11
45 degrees	1.27	65 degrees	1.08

Rule 818. A table of areas of grate surfaces, in square feet for other than direct spring-loaded safety valves, follows:

Maximum Pressure Allowed Per Square Inch on the Boiler.		Zero to 25 Lbs.	Over 25 to 50 Lbs.	Over 50 to 100 Lbs.
Diameter of Valve, in Inches.	Area of Valve, in Square Inches.	Area of Grate, in Square Feet.		
1	.7854	1.50	1.75	2.00
1¼	1.2272	2.25	2.50	3.00
1½	1.7671	3.00	3.75	4.00
2	3.1416	5.50	6.50	7.25
2½	4.9087	8.25	10.00	11.00
3	7.0686	11.75	14.25	16.00
3½	9.6211	16.00	19.50	21.75
4	12.5660	21.00	25.50	28.25
4½	15.9040	26.75	32.50	36.00
5	19.6350	32.75	40.00	44.00

Rule 819. A table of areas of grate surfaces, in square feet, for direct spring-loaded safety valves, follows:

Maximum Pressure Allowed Per Square Inch on the Boiler.		75 W=——. 3600 P=40. A=.401.	100 W=——. 3600 P=65. A=.329.	160 W=——. 3600 P=115. A=.297.	160 W=——. 3600 P=140. A=.244.	200 W=——. 3600 P=190. A=.224.	240 W=——. 3600 P=240. A=.213.
Diameter of Valve, in Inches.	Area of Valve, in Square Inches.	Zero to 25 Pounds.	Over 25 to 50 Pounds.	Over 50 to 100 Pounds.	Over 100 to 150 Pounds.	Over 150 to 200 Pounds.	Over 200 Pounds.
		Area of Grate, in Square Feet.					
1	.7854	2.00	2.50	2.75	3.25	3.5	3.75
1¼	1.2272	3.25	4.00	4.25	5.00	5.5	5.75
1½	1.7671	4.50	5.50	6.00	7.25	8.0	8.50
2	3.1416	8.00	9.75	10.75	13.00	14.0	15.00
2½	4.9087	12.50	15.00	16.50	20.00	22.0	23.00
3	7.0686	17.75	21.50	24.00	29.00	31.5	33.25
3½	9.6211	24.00	29.50	32.50	39.50	43.0	45.25
4	12.5660	31.50	38.25	42.50	51.50	56.0	59.00
4½	15.9040	40.00	48.50	53.50	65.00	71.0	74.25
5	19.6350	49.00	60.00	66.00	80.00	88.0	92.25

Rule 820. When the conditions exceed those on which the table (Rule 819) is based, the following formula shall be used:

$$A = \frac{W70}{P} \times 11.$$

A = Area of direct spring-loaded safety-valve in square inches per square foot of grate surface.

W = Weight of water in pounds evaporated per square foot of grate surface per second.

P = Pressure (absolute) at which the safety valve is set to blow.

If more than one safety valve is used, the minimum combined area shall be in accordance with the table.

Rule 821. All boilers condemned after an inspection by the Chief Engineer in Charge of Boiler Inspection shall be discontinued from service. Such boilers shall have distinctly stamped thereon, "Condemned, N. Y. State I. C.," in a location as specified in par. 333 of Rule 850.

NEW INSTALLATIONS—PART 1, SECTION 1.

POWER BOILERS.

(Paragraphs 1 to 377 inclusive and paragraphs 410 to 430 inclusive shall become effective January 1, 1918.)

RULE 850.

SELECTION OF MATERIALS.

1 Specifications are given in these Rules for the important materials used in the construction of boilers, and where given, the materials shall conform thereto.

2 Steel plates for any part of a boiler when exposed to the fire or products of combustion, and under pressure, shall be of firebox quality as designated in the Specifications for Boiler Plate Steel.

3 Steel plates for any part of a boiler, where firebox quality is not specified, when under pressure, shall be of firebox or flange quality as designated in the Specifications for Boiler Plate Steel.

4 Braces when welded, shall be of wrought-iron of the quality designated in the Specifications for Refined Wrought-Iron Bars.

5 Manhole and handhole covers and other parts subjected to pressure and braces and lugs, when made of steel plate, shall be of firebox or flange quality as designated in the Specifications for Boiler Plate Steel.

6 Steel bars for braces and for other boiler parts, except as otherwise specified herein, shall be of the quality designated in the Specifications for Steel Bars.

7 Staybolts shall be of iron or steel of the quality designated in the Specifications for Staybolt Iron or in the Specifications for Staybolt Steel.

8 Rivets shall be of steel or iron of the quality designated in the Specifications for Boiler Rivet Steel or in the Specifications for Boiler Rivet Iron.

9 Cross pipes connecting the steam and water drums of water-tube boilers, headers and cross boxes and all pressure parts of the boiler proper over 2-in. pipe size, or equivalent cross-sectional area, shall be of wrought steel, or cast steel of Class B grade, as designated in the Specifications for Steel Castings, when the maximum allowable working pressure exceeds 160 lb. per sq. in.

10 Mud drums of boilers used for other than heating purposes shall be of wrought steel, or cast steel of Class B grade, as designated in the Specifications for Steel Castings.

11 Pressure parts of superheaters, separately fired or attached to stationary boilers, unless of the locomotive type, shall be of wrought steel, or cast steel of Class B grade, as designated in the Specifications for Steel Castings.

12 Cast iron shall not be used for nozzles or flanges attached directly to the boiler at any pressure or temperature. Cast iron shall not be used for boiler and superheater mountings such as connecting pipes, fittings, valves and their bonnets, for steam temperatures of over 450 deg. fahr.

13 Water-leg and door-frame rings of vertical fire-tube boilers, and of locomotive and other type boilers, shall be of wrought iron or steel, or cast steel of Class A or Class B grade, as designated in the Specifications for Steel Castings. The OG or other flanged construction may be used as a substitute in any case.

ULTIMATE STRENGTH OF MATERIAL USED IN COMPUTING JOINTS.

14 *Tensile Strength of Steel Plate.* The tensile strength used in the computations for steel plates shall be that stamped on the plates as herein provided, which is the minimum of the stipulated range, or 55,000 lbs. per sq. in. for all steel plates, except for special grades having a lower tensile strength.

15 *Crushing Strength of Steel Plate.* The resistance to crushing of steel plate shall be taken at 95,000 lb. per sq. in. of cross-sectional area.

16 *Strength of Rivets in Shear.* In computing the ultimate strength of rivets in shear, the following values in pounds per square inch of the cross-sectional area of the rivet shank shall be used:

Iron rivets in single shear	38,000
Iron rivets in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

The cross-sectional area used in the computations shall be that of the rivet shank after driving.

MINIMUM THICKNESSES OF PLATES AND TUBES.

17 *Thickness of Plates.* The minimum thickness of any boiler plate under pressure shall be ¼ in.

18 The minimum thicknesses of shell plates, and dome plates after flanging, shall be as follows:

When the Diameter of Shell Is

36 In. or Under.	Over 36 In. to 54 In.	Over 54 In. to 72 In.	Over 72 In.
¼ in.	5/16 in.	⅜ in.	½ in.

19 The minimum thickness of butt straps shall be given as in Table 1. Intermediate values shall be determined by interpolation. For plate thicknesses exceeding 1¼ in., the thickness of the butt straps shall be not less than three-quarters of the thickness of the plate.

Table 1 Minimum Thicknesses of Butt Straps.

Thickness of Shell Plates, In.	Minimum Thickness of Butt Straps, In.	Thickness of Shell Plates, In.	Minimum Thickness of Butt Straps, In.
1/4	1/4	17/32	7/16
9/32	1/4	9/16	7/16
5/16	1/4	5/8	1/2
11/32	1/4	3/4	1/2
3/8	5/16	7/8	5/8
13/32	5/16	1	3/4
7/16	3/8	1 1/8	3/4
15/32	3/8	1 1/4	7/8
1/2	7/16		

20 The minimum thickness of tube sheets for horizontal return tubular boilers shall be as follows:

When the Diameter of Tube Sheet Is

42 In. or Under.	Over 42 In. to 54 In.	Over 54 In. to 72 In.	Over 72 In.
3/8 in.	7/16 in.	1/2 in.	9/16 in.

21 *Tubes for Water-Tube Boilers.* The minimum thicknesses of tubes used in water-tube boilers, measured by Birmingham wire gage, for maximum allowable working pressures not exceeding 165 lbs. per square inch., shall be as follows:

Diameters less than 3 in.	No. 12 B.W.G.
Diameter 3 in. or over, but less than 4 in.	No. 11 B.W.G.
Diameter 4 in or over, but less than 5 in.	No. 10 B.W.G.
Diameter 5 in.	No. 9 B.W.G.

The above thicknesses shall be increased for maximum allowable working pressures higher than 165 lb. per sq. in. as follows:

Over 165 lb. but not exceeding 235 lb.	1 gage
Over 235 lb. but not exceeding 285 lb.	2 gages
Over 285 lb. but not exceeding 400 lb.	3 gages

Tubes over 4-in. diameter shall not be used for maximum allowable working pressures above 285 lb. per sq. in.

22 *Tubes for Fire-Tube Boilers.* The minimum thicknesses of tubes used in fire tube boilers measured by Birmingham wire gage, for maximum allowable working pressures not exceeding 175 lb. per sq. in., shall be as follows:

Diameters less than 2½ in.	No. 13 B.W.G.
Diameter 2½ in. or over, but less than 3¼ in.	No. 12 B.W.G.
Diameter 3¼ in. or over, but less than 4 in.	No. 11 B.W.G.
Diameter 4 in. or over, but less than 5 in.	No. 10 B.W.G.
Diameter 5 in.	No. 9 B.W.G.

For higher maximum allowable working pressures than given above the thicknesses shall be increased one gage.

Specifications for Boiler Plate Steel.

These specifications* are similar to those of the American Society for Testing Materials, Serial Designation A 30-14.

23 *Grades.* These specifications cover two grades of steel for boilers, namely, flange and firebox.

I MANUFACTURE.

24 *Process.* The steel shall be made by the open-hearth process.

II CHEMICAL PROPERTIES AND TESTS.

25 *Chemical Composition.* The steel shall conform to the following requirements as to chemical composition:

Flange—
- Manganese, 0.30—0.60 per cent.
- Phosphorus, acid, not over 0.05 per cent.
- Phosphorus, basic, not over 0.04 per cent.
- Sulphur, not over 0.05 per cent.

Firebox—
- Carbon—
  - Plates ¾ in. thick and under, 0.12—0.25 per cent.
  - Plates over ¾ in. thick, 0.12—0.30 per cent.
- Manganese, 0.30—0.50 per cent.
- Phosphorus, acid, not over 0.04 per cent.
- Phosphorus, basic, not over 0.035 per cent.
- Sulphur, not over 0.04 per cent.

26 *Ladle Analyses.* An analysis shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Par. 25.

27 *Check Analyses.* Analyses may be made by the purchaser from a broken tension test specimen representing each plate as rollode, which shall conform to the requirements specified in Par. 25.

III PHYSICAL PROPERTIES AND TESTS.

28 *Tension Tests. a* The material shall conform to the following requirements as to tensile properties:

*Approved and recommended in its modified form, October 9, 1914, by the Association of American Steel Manufacturers, the American Boiler Manufacturers' Association, the National Tubular Boiler Manufacturers' Association, the National Association of Thresher Manufacturers and the representatives present of leading water tube boiler manufacturers, with whom the Boiler Code Committee was in conference on September 16, 1914, and by whom further modifications were afterwards offered.

	Flange.	Firebox.
Tensile strength, lb. per sq. in.	55,000—65,000	55,000—63,000
Yield point, min., lb. per sq. in.	0.5 tens. str.	0.5 tens. str.
Elongation in 8-in., min., per cent. (see Par. 29)	1,500,000 Tens. str.	1,500,000 Tens. str.

b If desired steel of lower tensile strength than the above may be used in an entire boiler, or part thereof, the desired tensile limits to be specified, having a range of 10,000 lb. per sq. in. for flange or 8,000 lb. per sq. in. for firebox, the steel to conform in all respects to the other corresponding requirements herein specified, and to be stamped with the minimum tensile strength of the stipulated range.

c The yield point shall be determined by the drop of the beam of the testing machine.

29 *Modifications in Elongation. a* For material over ¾ in. in thickness, a deduction of 0.5 from the percentages of elongation specified in Par. 28*a* shall be made for each increase of ⅛ in. in thickness above ¾ in., to a minimum of 20 per cent.

b For material ¼ in. or under in thickness, the elongation shall be measured on a gage length of 24 times the thickness of the specimen.

30 *Bend Tests. a Cold-bend Tests*—The test specimen shall bend cold through 180 deg. without cracking on the outside of the bent portion, as follows: For material 1 in. or under in thickness, flat on itself, and for material over 1 in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen.

b Quench-bend Tests—The test specimen, when heated to a light cherry red as seen in the dark (not less than 1,200 deg. fahr.), and quenched at once in water the temperature of which is between 80 deg. and 90 deg. fahr., shall bend through 180 deg. without cracking on the outside of the bent portion, as follows: For material 1 in. or under in thickness, flat on itself, and for material over 1 in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen.

31 *Homogeneity Tests.* For firebox steel, a sample taken from a broken tension test specimen shall not show any single seam or cavity more than ¼ in. long, in either of the three fractures obtained in the test for homogeneity, which shall be made as follows:

The specimen shall be either nicked with a chisel or grooved on a machine, transversely, about 1/16 in. deep, in three places about 2 in. apart. The first groove shall be made 2 in. from the square end; each succeeding groove shall be made on the opposite side from the preceding one. The specimen shall then be firmly held in a vise, with the first groove about ¼ in. above the jaws, and the projecting end broken off by light blows of a hammer, the bending being away from the groove. The specimen shall be broken at the other two grooves in the same manner. The object of this test is to open and render visible to the eye any seams due to failure to weld or to interposed foreign matter, or any cavities due to gas bubbles in the ingot. One side of each fracture shall be examined and the length of the seams and cavities determined, a pocket lens being used if necessary.

32 *Test Specimens.* Tension and bend test specimens shall be taken from the finished rolled material. They shall be of the full thickness of material as rolled, and shall be machined to the form and dimensions shown in Fig. 1; except that bend test specimens may be machined with both edges parallel.

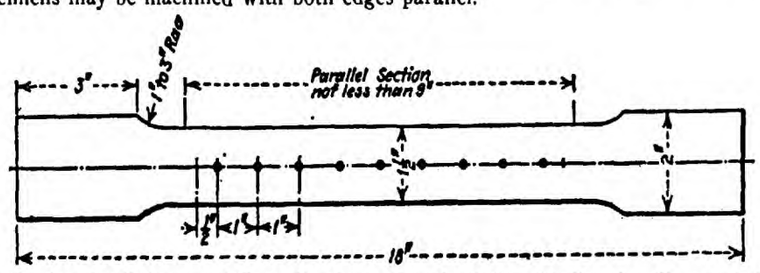

Fig. 1 Standard Form of Test Specimen Required for All Tension Tests of Plate Material.

33 *Number of Tests. a* One tension, one cold-bend, and one quench-bend test shall be made from each plate as rolled.

b If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

c If the percentage of elongation of any tension test specimen is less than that specified in Pars. 28 and 29, and any part of the fracture is outside the middle third of the gaged length, as indicated by the scribe scratches marked on the specimen before testing, a retest shall be allowed.

IV Permissible Variation in Gage.

34 *Permissible Variation.* The thickness of each plate shall not vary under the gage specified more than 0.01 in. The overweight limits are considered a matter of contract between the steel manufacturer and the boiler builder.

V Finish.

35 *Finish.* The finished material shall be free from injurious defects and shall have a workmanlike finish.

VI Marking.

36 *Marking. a* Each shell plate shall be legibly stamped by the manufacturer with the melt or slab number, name of manufacturer, grade and the minimum tensile strength of the stipulated range as specified in Par. 28, in three places, two of which shall be located at diagonal corners about 12 in. from the edge and one about the center of the plate, or at a point selected and designated by the purchaser so that the stamp shall be plainly visible when the boiler is completed.

b Each head shall be legibly stamped by the manufacturer in two places, about 12 in. from the edge, with the melt or slab number, name of manufacturer, grade, and the minimum tensile strength of the stipulated range as specified in Par. 28, in such manner that the stamp is plainly visible when the boiler is completed.

c Each butt strap shall be legibly stamped by the manufacturer in two places on the center line about 12 in. from the ends with the melt or slab number, name of manufacturer, grade, and the minimum tensile strength of the stipulated range as specified in Par. 28.

d The melt or slab number shall be legibly stamped on each test specimen.

VII Inspection and Rejection.

37 *Inspection.* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

38 *Rejection. a* Unless otherwise specified, any rejection based on tests made in accordance with Par. 27 shall be reported within five working days from the receipt of samples.

b Material which shows injurious defects subsequent to its acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

39 *Rehearing.* Samples tested in accordance with Par. 27, which represent rejected material, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

Specifications for Boiler Rivet Steel.

These specifications are substantially the same as those of the American Society for Testing Materials, serial designation 31-14.

A Requirements for Rolled Bars.

I Manufacture.

40 *Process.* The steel shall be made by the open-hearth process.

II Chemical Properties and Tests.

41 *Chemical Composition.* The steel shall conform to the following requirements as to chemical composition:

Manganese	0.30-0.50 per cent.
Phosphorus	not over 0.04 per cent.
Sulphur	not over 0.045 per cent.

42 *Ladle Analyses.* An analysis to determine the percentages of carbon, manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Par. 41.

43 *Check Analyses.* Analyses may be made by the purchaser from finished bars, representing each melt, which shall conform to the requirements specified in Par. 41.

III Physical Properties and Tests.

44 *Tension Tests. a* The bars shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.	45,000-55,000
Yield point, min., lb. per sq. in.	0.5 tens. str.
Elongation in 8 in., min., per cent, but need not exceed 30 pent.	1,500,000 Tens. str.

b The yield point shall be determined by the drop of the beam of the testing machine.

45 *Bend Tests. a Cold-bend Tests*—The test specimen shall bend cold through 180 deg. flat on itself without cracking on the outside of the bent portion.

b Quench-bend Tests—The test specimen, when heated to a light cherry red as seen in the dark (not less than 1200 deg. fahr.), and quenched at once in water the temperature of which is between 80 deg. and 90 deg. fahr., shall bend through 180 deg. flat on itself without cracking on the outside of the bent portion.

46 *Test Specimens.* Tension and bend test specimens shall be of the full-size section of bars as rolled.

47 *Number of Tests. a* Two tension, two cold-bend, and two quench-bend tests shall be made from each melt, each of which shall conform to the requirements specified.

b If any test specimen develops flaws, it may be discarded and another specimen substituted.

c If the percentage of elongation of any tension test specimen is less than that specified in Par. 44 and any part of the fracture is outside the middle third of the gaged length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

48 *Permissible Variations in Gage.* The gage of each bar shall not vary more than 0.01 in. from that specified.

V Workmanship and Finish.

49 *Workmanship.* The finished bars shall be circular within 0.01 in.

50 *Finish.* The finished bars shall be free from injurious defects and shall have a workmanlike finish.

VI Marking.

51 *Marking.* Rivet bars shall, when loaded for shipment, be properly separated and marked with the name or brand of the manufacturer and the melt number for identification. The melt number shall be legibly marked on each test specimen.

V Inspection and Rejection.

52 *Inspection.* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the bars ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the bars are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

53 *Rejection. a* Unless otherwise specified, any rejection based on tests made in accordance with Par. 43 shall be reported within five working days from the receipt of samples.

b Bars which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

54 *Rehearing.* Samples tested in accordance with Par. 43, which represent rejected bars, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

B Requirements for Rivets.

I Physical Properties and Tests.

55 *Tension Tests.* The rivets, when tested, shall conform to the requirements as to tensile properties specified in Par. 44, except that the elongation shall be measured on a gaged length not less than four times the diameter of the rivet.

56 *Bend Tests.* The rivet shank shall bend cold through 180 deg. flat on itself, as shown in Fig. 2, without cracking on the outside of the bent portion.

57 *Flattening Tests.* The rivet head shall flatten, while hot, to a diameter 2½ times the diameter of the shank, as shown in Fig. 3, without cracking at the edges.

58 *Number of Tests. a* When specified, one tension test shall be made from each size in each lot of rivets offered for inspection.

b Three bend and three flattening tests shall be made from each size in each lot of rivets offered for inspection, each of which shall conform to the requirements specified.

II Workmanship and Finish.

59 *Workmanship.* The rivets shall be made true to form, concentric, and shall be made in a workmanlike manner.

60. *Finish.* The finished rivets shall be free from injurious defects.

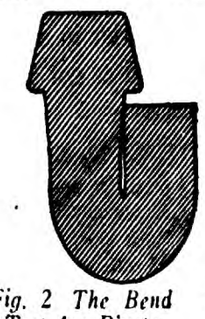

Fig. 2 The Bend Test for Rivets

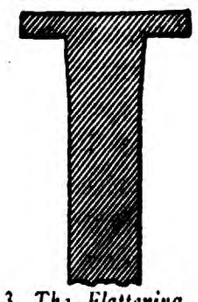

Fig. 3 The Flattening Test for Rivets

III Inspection and Rejection.

61. *Inspection.* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the rivets ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the rivets are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

62 *Rejection.* Rivets which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

Specifications for Staybolt Steel.

Requirements for Rolled Bars.

63 Steel for staybolts shall conform to the requirements for Boiler Rivet Steel specified in Pars. 40 to 62, except that the tensile properties shall be as follows:

Tensile strength, lb. per sq. in.	50,000—60,000
Yield point, min., lb. per sq. in.	0.5 tens. str.
Elongation in 8 in., min., per cent	1,500,000 Tens. str.

Also with the exception that the permissible variations in gage shall be as follows:

Permissible Variations in Gage. The bars shall be truly round within 0.01 in. and shall not vary more than 0.005 in. above, or more than 0.01 in. below the specified size.

Specifications for Steel Bars.

These specifications are abstracted from those for steel for bridges of the American Society for Testing Materials, Serial Designation A 7-14.

I Manufacture.

64 *Process.* The steel shall be made by the open-hearth process.

II Chemical Properties and Tests.

65 *Chemical Composition.* The steel shall conform to the following requirements as to chemical composition:

Phosphorus, Acid	not over 0.06 per cent.
Phosphorus, Basic	not over 0.04 per cent.
Sulphur	not over 0.05 per cent.

66 *Ladle Analysis.* An analysis to determine the percentages of carbon, manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Par. 65.

III Physical Properties and Tests.

67 *Tension Tests. a* The material shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.	55,000—65,000
Yield point, min., per sq. in.	0.5 tens. str. 1,500,000
Elongation in 8 in., min., per cent.*	Tens. str.
Elongation in 2 in., min., per cent.	22

b The yield point shall be determined by the drop of the beam of the testing machine.

68 *Modifications in Elongation. a* For bars over ¾ in. in thickness or diameter a deduction of 1 from the percentage of elongation in 8 in. specified in Par. 67, shall be made for each increase of ⅛ in. in thickness or diameter above ¾ in., to a minimum of 18 per cent.

b For bars under 5/16 in. in thickness or diameter a deduction of 2.5 from the percentage of elongation in 8 in. specified in Par. 67, shall be made for each decrease of 1/16 in. in thickness or diameter below 5/16 in.

69 *Bend Tests. a* The test specimen shall bend cold through 180 deg. without cracking on the outside of the bent portion, as follows: For material ¾ in. or under in thickness or diameter flat on itself; for material over ¾ in. to and including 1¼ in. in thickness or diameter around a pin the diameter of which is equal to the thickness or diameter of the specimen; and for material over 1¼ in. in thickness or diameter around a pin the diameter of which is equal to twice the thickness or diameter of the specimen.

b The test specimen for bars over 1½ in. in thickness or diameter when prepared as specified in Par. 70, shall bend cold through 180 deg. arount a 1-in. pin without cracking on the outside of the bent portion.

70 *Test Specimens. a* Tension and bend test specimens except as specified in *b*, shall be of the full thickness of material as rolled. They may be machined to the form and dimensions shown in Fig. 1, or may have both edges parallel.

b Tension test specimens for bars over 1½ in. in thickness or diameter may be of the form and dimensions shown in Fig. 4. Bend test specimens may be 1 by ½ in. in section. The axis of the specimen shall be located at any point midway between the center and surface and shall be parallel to the axis of the bar.

71 *Number of Tests. a* One tension and one bend test shall be made from each melt; except that if material from one melt differs ⅛ in. or more in thickness, one tension and one bend test shall be made from both the thickest and thinnest material rolled.

b If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

c If the percentage of elongation of any tension test specimen is less than that specified in Par. 67, and any part of the fracture is more than ¾ in. from the center of the gage length of a 2-in. specimen or is outside the middle third of the gage length of an 8-in. specimen, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

IV Permissible Variations in Gage.

72 *Permissible Variation.* The thickness or cross-section of each piece of steel shall not vary under that specified more than 2.5 per cent. (Note: Overweight variation is a matter of contract between the steel manufacturer and boiler builder.)

V. Finish

73 *Finish* The finished material shall be free from injurious defects and shall have a workmanlike finish.

VI Marking.

74 *Marking.* Bars shall, when loaded for shipment, be properly separated and marked with the name or brand of the manufacturer and melt number for identification. The melt number shall be legibly marked on each test specimen.

VII Inspection and Rejection.

75 *Inspection.* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

76 *Rejection.* Material which shows injurious defects subsequent to its acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

Specifications for Steel Castings.

These specifications are abstracted from those for steel castings of the American Society for Testing Materials, Serial Designation A 27-14.

77 *Classes.* These specifications cover two classes of castings, namely:

Class A, ordinary castings for which no physical requirements are specified.

Class B, castings for which physical requirements are specified. These are of three grades: hard, medium and soft.

78 *Patterns. a* Patterns shall be made so that sufficient finish is allowed to provide for all variations in shrinkage.

b Patterns shall be painted three colors to represent metal, cores and finished surfaces. It is recommended that core prints shall be painted black and finished surfaces red.

79 *Basis of Purchase.* The purchaser shall indicate his intention to substitute the test to destruction specified in Par. 87, for the tension and bend tests, and shall designate the patterns from which castings for this test shall be made.

I Manufacture.

80 *Process.* The steel may be made by the open-hearth, crucible, or any other process approved by the purchaser.

81 *Heat Treatment. a* Class *A* castings need not be annealed unless so specified.

b Class *B* castings shall be allowed to become cold. They shall then be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as an "annealing charge"), and allowed to cool uniformly and slowly. If, in the opinion of the purchaser or his representative, a casting is not properly annealed, he may at his option require the casting to be re-annealed.

II Chemical Properties and Tests.

82 *Chemical Composition.* The castings shall conform to the following requirements as to chemical composition:

	Class A.	Class B.
Carbon	not over 0.30 per cent	.....
Phosphorus	not over 0.06 per cent	not over 0.05 per cent
Sulphur	.....	not over 0.05 per cent

83 *Ladle Analyses.* An analysis to determine the percentages of carbon, manganese, phosphorus and sulphur shall be made by the manufacturer from a test ingot taken during the pouring of each melt, a copy of which shall be given to the purchaser or his representative. This analysis shall conform to the requirements specified in Par. 82. Drillings for analysis shall be taken not less than ¼ in. beneath the surface of the test ingot.

84 *Check Analyses. a* Analyses of Class *A* castings may be made by the purchaser, in which case an excess of 20 per cent above the requirement as to phosphorus specified in Par. 82, shall be allowed. Drillings for analysis shall be taken not less than ¼ in. beneath the surface.

b Analyses of Class *B* castings may be made by the purchaser from a broken tension or bend test specimen, in which case an excess of 20 per cent above the requirements as to phosphorus and sulphur specified in Par. 82, shall be allowed. Drillings for analysis shall be taken not less than ¼ in. beneath the surface.

*See Par. 68.

III Physical Properties and Tests.
(For Class *B* Castings only.)

85 *Tension Tests. a* The castings shall conform to the following minimum requirements as to tensile properties:

	Hard.	Medium.	Soft.
Tensile strength, lb. per sq. in.	80,000	70,000	60,000
Yield point, lb. per sq. in.	36,000	31,500	27,000
Elongation in 2 in., per cent.	15	18	22
Reduction of area, per cent.	20	25	30

b The yield point shall be determined by the drop of the beam of the testing machine.

86 *Bend Tests. a* The test specimen for soft castings shall bend cold through 120 deg., and for medium castings through 90 deg., around a 1-in. pin, without cracking on the outside of the bent portion.

b Hard castings shall not be subject to bend test requirements.

87 *Alternative Tests to Destruction.* In the case of small or unimportant castings, a test to destruction on three castings from a lot may be substituted for the tension and bend tests. This test shall show the material to be ductile, free from injurious defects, and suitable for the purpose intended. A lot shall consist of all castings from one melt, in the same annealing charge.

88 *Test Specimens. a* Sufficient test bars, from which the test specimens required in Par. 89, may be selected, shall be attached to castings weighing 500 lb. or over, when the design of the castings will permit. If the castings weigh less than 500 lb., or are of such design that test bars cannot be attached, two test bars shall be cast to represent each melt; or the quality of the castings shall be determined by tests to destruction, as specified in Par. 87. All test bars shall be annealed with the castings they represent.

b The manufacturer and purchaser shall agree whether test bars can be attached to castings, on the location of the bars on the castings, on the castings to which bars are to be attached, and on the method of casting unattached bars.

c Tension test specimens shall be of the form and dimensions shown in Fig. 4. Bend test specimens shall be machined to 1 by ½ in. in section with corners rounded to a radius not over 1/16 in.

89 *Number of Tests. a* One tension and one bend test shall be made from each annealing charge. If more than one melt is represented in an annealing charge, one tension and one bend test shall be made from each melt.

b If any test specimen shows defective machining or develops flaws, it may be discarded; in which case the manufacturer and the purchaser or his representative shall agree upon the selection of another specimen in its stead.

c If the percentage of elongation of any tension test specimen is less than that specified in Par. 85, and any part of the fracture is more than ¾ in. from the centre of the gaged length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

IV Workmanship and Finish.

90 *Workmanship.* The castings shall substantially conform to the sizes and shapes of the patterns, and shall be made in a workmanlike manner.

91 *Finish. a* The castings shall be free from injurious defects.

b Minor defects which do not impair the strength of the castings may, with the approval of the purchaser or his representative, be welded by an approved process.

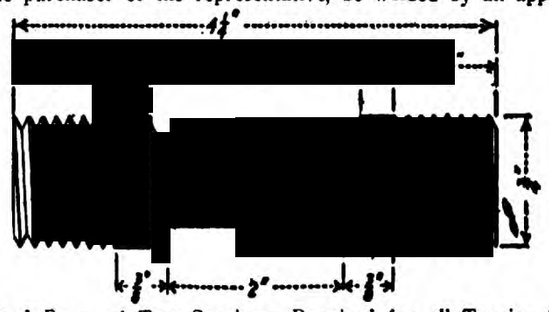

Fig. 4. Standard Form of Test Specimen Required for all Tension Tests of Steel Casting Material.

The defects shall first be cleaned out to solid metal; and after welding, the castings shall be annealed, if specified by the purchaser or his representative.

c The castings offered for inspection shall not be painted or covered with any substance that will hide defects, nor rusted to such an extent as to hide defects.

V Inspection and Rejection.

92. *Inspection.* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the castings ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the castings are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

93. *Rejection. a* Unless otherwise specified, any rejection based on tests made in accordance with Par. 84, shall be reported within five working days from the receipt of samples.

b Castings which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected, and the manufacturer shall be notified.

94. *Rehearing.* Samples tested in accordance with Par. 84, which represent rejected castings, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

Specifications for Gray Iron Castings.

These specifications are identical with those of the American Society for Testing Materials, serial designation A 48-05.

95 *Process of Manufacture.* Unless furnace iron is specified, all gray castings are understood to be made by the cupola process.

96 *Chemical Properties.* The sulphur contents to be as follows:

Light castings	not over 0.08 per cent
Medium castings	not over 0.10 per cent
Heavy castings	not over 0.12 per cent

97 *Classification.* In dividing castings into light, medium and heavy classes, the following standards have been adopted:

98 Castings having any section less than ½ in. thick shall be known as *light castings.*

99 Castings in which no section is less than 2 in. thick shall be known as *heavy castings.*

100 *Medium castings* are those not included in the above classification.

Physical Properties and Tests.

101 *Transverse Test.* The minimum breaking strength of the "Arbitration Bar" under transverse load shall not be under:

Light castings	2,500 lbs.
Medium castings	2,900 lbs.
Heavy castings	3,300 lbs.

In no case shall the deflection be under 0.10 in.

102 *Tensile Test.* Where specified, this shall not run less than:

Light castings	18,000 lb. per sq. in.
Medium castings	21,000 lb. per sq. in.
Heavy castings	24,000 lb. per sq. in.

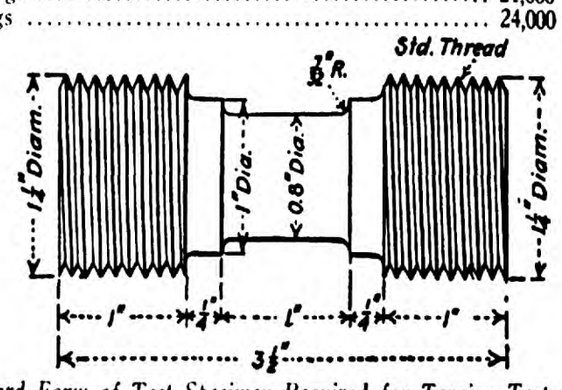

Fig. 5. Standard Form of Test Specimen Required for Tension Tests of Gray-Iron Casting Material.

103 *Arbitration Bar.* The quality of the iron going into castings under specifications shall be determined by means of the "Arbitration Bar." This is a bar 1¼ in. in diameter and 15 in. long. It shall be prepared as stated further on and tested transversely. The tensile test is not recommended, but in case it is called for, the bar as shown in Fig. 5, and turned up from any of the broken pieces of the transverse test shall be used. The expense of the tensile test shall fall on the purchaser.

104 *Number of Test Bars.* Two sets of two bars shall be cast from each heat, one set from the first and the other set from the last iron going into the castings. Where the heat exceeds twenty tons, an additional set of two bars shall be cast for each twenty tons or fraction thereof above this amount. In case of a change of mixture during the heat, one set of two bars shall also be cast for every mixture other than the regular one. Each set of two bars is to go into a single mold. The bars shall not be rumbled or otherwise treated, being simply brushed off before testing.

105 *Method of Testing.* The transverse test shall be made on all the bars cast, with supports 12 in. apart, load applied at the middle and the deflection at rupture noted. One bar of every two of each set made must fulfill the requirements to permit acceptance of the castings represented.

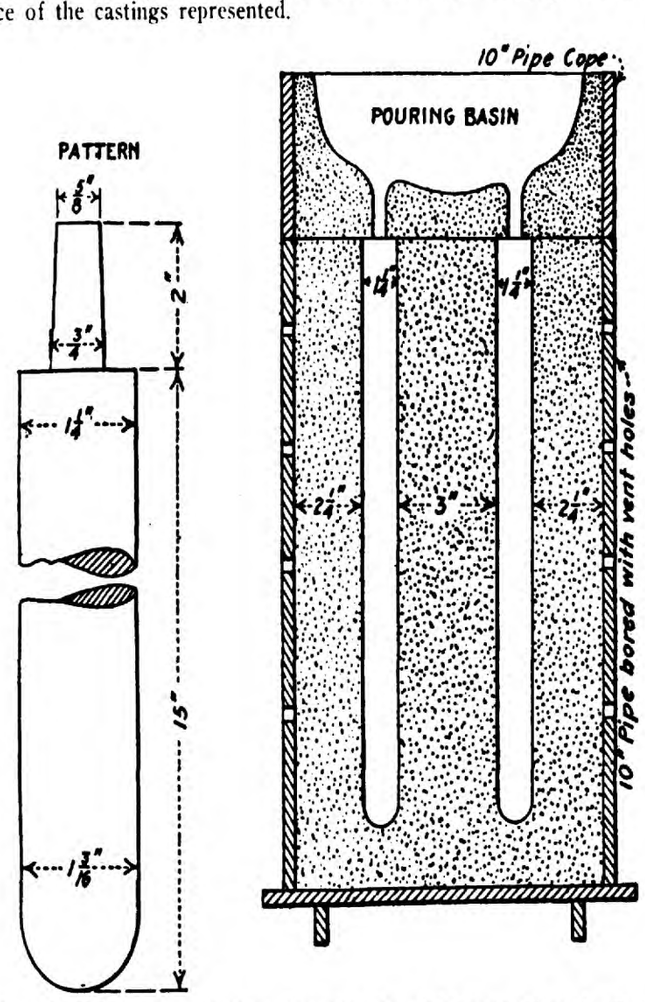

Fig. 6 Details of Pattern and Mold Required for Arbitration Bars in Testing Gray-Iron Casting Material.

106 *Mold for Test Bar.* The mold for the bars is shown in Fig. 6. The bottom of the bar is 1/16 in. smaller in diameter than the top, to allow for draft and for the strain of pouring. The pattern shall not be rapped before withdrawing. The flask is to be rammed up with green molding sand, a little damper than usual, well mixed and put through a No. 8 sieve, with a mixture of one to twelve bituminous facing. The mold shall be rammed evenly and fairly hard, thoroughly dried and not cast until it is cold. The test bar shall not be removed from the mold until cold enough to be handled.

107 *Speed of Testing.* The rate of application of the load shall be from 20 to 40 seconds for a deflection of 0.10 in.

108 *Samples for Analysis.* Borings from the broken pieces of the "Arbitration Bar" shall be used for the sulphur determinations. One determination for each mold made shall be required. In case of dispute, the standards of the American Fonudrymen's Association shall be used for comparison.

109 *Finish.* Castings shall be true to pattern, free from cracks, flaws and excessive shrinkage. In other respects they shall conform to whatever points may be specially agreed upon.

110 *Inspection.* The inspector shall have reasonable facilities afforded him by the manufacturer to satisfy him that the finished material is furnished in accordance with these specifications. All tests and inspections shall, as far as possible, be made at the place of manufacture prior to shipment.

Specifications for Malleable Castings.

These specifications are identical with those of the American Society for Testing Materials, Serial Designation A 47-04.

111 *Process of Manufacture.* Malleable iron castings may be made by the open-hearth, air furnace, or cupola process. Cupola iron, however, is not recommended for heavy nor for important castings.

112 *Chemical Properties.* Castings for which physical requirements are specified shall not contain over 0.06 sulphur nor over 0.225 phosphorus.

PHYSICAL PROPERTIES AND TESTS.

113 *Standard Test Bar.* This bar shall be 1 in. sq. and 14 in. long, without chills and with ends left perfectly free in the mold. Three shall be cast in one mold, heavy risers insuring sound bars. Where the full heat goes into castings which are subject to specification, one mold shall be poured two minutes after tapping into the first ladle, and another mold from the last iron of the heat. Molds shall be suitably stamped to insure identification of the bars, the bars being annealed with the castings. Where only a partial heat is required for the work in hand, one mold should be cast from the first ladle used and another after the required iron has been tapped.

a Of the three test bars from the two molds required for each heat, one shall be tested for tensile strength and elongation, the other for transverse strength and deflection. The other remaining bar is reserved for either the transverse or tensile test, in case of the failure of the two other bars to come up to requirements. The halves of the bars broken transversely may also be used for the tensile test.

b Failure to reach the required limit for the tensile strength with elongation, as also the transverse strength with deflection, on the part of at least one test, shall reject the castings from that heat.

114 *Tensile Test.* The tensile strength of a standard test bar for castings under specification shall not be less than 40,000 lb. per sq. in. The elongation measured in 2 in. shall not be less than 2½ per cent.

115 *Transverse Test.* The transverse strength of a standard test bar, on supports 12 in. apart, pressure being applied at the center, shall not be less than 3,000 lb., deflection being at least ½ in.

116 *Test Lugs.* Castings of special design or of special importance may be provided with suitable test lugs at the option of the inspector. At least one of these lugs shall be left on the casting for his inspection upon his request therefor.

117 *Annealing.* Malleable castings shall neither be "over" nor "under" annealed. They must have received their full heat in the oven at least sixty hours after reaching that temperature.

118 The "saggers" shall not be dumped until the contents shall at least be "black hot."

119 *Finish.* Castings shall be true to pattern, free from blemishes, scale or shrinkage cracks. A variation of 1/16 in. per foot shall be permissible. Founders shall not be held responsible for defects due to irregular cross sections and unevenly distributed metal.

120 *Inspection.* The inspector representing the purchaser shall have all reasonable facilities given him by the founder to satisfy him that the finished material is furnished in accordance with these specifications. All tests and inspections shall be made prior to shipment.

Specifications for Boiler Rivet Iron.

These requirements are an adaptation, with slight modifications in the physical properties and tests, of the specifications for engine bolt iron of the American Society for Testing Materials.

A REQUIREMENTS FOR ROLLED BARS.

I MANUFACTURE.

121 *Process.* The iron shall be made wholly from puddled iron or knobbled charcoal iron, and shall be free from any admixture of iron scrap or steel.

122 *Iron Scrap.* This term applies only to foreign or bought scrap and does not include local mill products free from foreign or bought scrap.

II PHYSICAL PROPERTIES AND TESTS.

122 *Tension Tests. a* The iron shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.	48,000-52,000
Yield point, min., lb. per sq. in.	0.5 tens. str.
Elongation in 8 in., min., per cent	28
Reduction of area, min., per cent	45

b The yield point shall be determined by the drop of the beam of the testing machine. The speed of the cross-head of the machine shall not exceed 1½ in. per minute.

124 *Bend Tests. a Cold-Bend Tests*—The test specimen shall bend cold through 180 deg. flat on itself without cracking on the outside of the bent portion.

b Hot-bend Tests—The test specimen, when heated to a bright cherry red, shall bend through 180 deg. flat on itself, without fracture on the outside of the bent portion.

c Nick-bend Tests—The test specimen, when nicked 25 per cent around with a tool having a 60-deg. cutting edge, to a depth of not less than 8 nor more than 16 per cent of the diameter of the specimen, and broken, shall show a wholly fibrous fracture.

d Bend tests may be made by pressure or by blows.

125 *Etch Tests.** The cross-section of the test specimen shall be ground or polished, and etched for a sufficient period to develop the structure. This test shall show the material to be free from steel.

126 *Test Specimens.* All test specimens shall be of the full section of material as rolled.

127 *Number of Tests. a* Bars of one size shall be sorted into lots of 100 each. Two bars shall be selected at random from each lot, or fraction thereof, and tested as specified in Pars. 123 and 124; but only one of these bars shall be tested as specified in Par. 125.

b If any test specimen from either of the bars originally selected to represent a lot of material, contains surface defects not visible before testing but visible after testing, or if a tension test specimen breaks outside the middle third of the gage length, one retest from a different bar will be allowed.

III PERMISSIBLE VARIATIONS IN GAGE.

128 *Permissible Variations.* The gage of each bar shall not vary more than 0.01 in. from that specified.

IV FINISH.

129 *Finish.* The bars shall be smoothly rolled and free from slivers, depressions, seams, crop ends and evidences of being burnt.

V MARKING.

130. *Marking.* The bars shall be stamped or marked as designated by the purchaser.

VI INSPECTION AND REJECTION.

131 *Inspection. a* The inspector representing the purchaser shall have free entry at all times, while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. Tests and inspection at the place of manufacture shall be made prior to shipment.

b The purchaser may make the tests to govern the acceptance or rejection of material in his own laboratory or elsewhere. Such tests, however, shall be made at the expense of the purchaser.

132 *Rejection.* If either of the test bars selected to represent a lot does not conform to the requirements specified in Pars. 123, 124 and 125, the lot will be rejected.

B REQUIREMENTS FOR RIVETS.

I PHYSICAL PROPERTIES AND TESTS.

133 *Number of Tests.* When Specified, three rivets of each diameter shall be taken at random from each lot offered for inspection, and if they fail to stand the following tests the lot will be rejected:

134 *Bend Tests. a* The rivet shank shall bend cold through 180 deg. flat on itself, as shown in Fig. 2, without cracking on the outside of the bent portion.

b The heads must stand bending back, showing that they are firmly joined.

c When nicked and broken gradually the fracture must show a clean, long and fibrous iron.

II WORKMANSHIP AND FINISH.

135 *Workmanship.* The rivets shall be true to form, concentric, and shall be made in a workmanlike manner.

136 *Finish.* The finished rivets shall be free from injurious defects.

III INSPECTION AND REJECTION.

137 *Inspection.* The inspector representing the purchaser shall have free entry at all times, while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the rivets ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the rivets are being furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

138 *Rejection.* Rivets which show injurious defects subsequent to their acceptance at the manufacturer's works will be rejected and the manufacturer shall be notified.

Specifications for Staybolt Iron.

These specifications are identical with those of the American Society for Testing Materials, serial designation A 39-14.

I MANUFACTURE.

139 *Process.* The iron shall be rolled from a bloom or boxpile, made wholly from puddled iron or knobbled charcoal iron. The puddle mixture and the component parts of the bloom or boxpile shall be free from any admixture of iron scrap or steel.

140 *Definition of Terms. a Bloom*—A bloom is a solid mass of iron that has been hammered into a convenient size for rolling.

b Boxpile—A boxpile is a pile, the sides, top and bottom of which are formed by four flat bars and the interior of which consists of a number of small bars the full length of the pile.

c Iron Scrap—This term applies only to foreign or purchased scrap and does not include local mill products free from foreign or purchased scrap.

II PHYSICAL PROPERTIES AND TESTS.

141 *Tension Tests. a* The iron shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.	49,000-53,000
Yield point, min., lb. per sq. in.	0.5 tens, str.
Elongation in 8 in., min., per cent	30
Reduction of area, min., per cent	48

b The yield point shall be determined by the drop of the beam of the testing machine. The speed of the cross-head of the machine shall not exceed 1½ in. per minute.

142 *Bend Tests. a Cold-bend Tests*—The test specimen shall bend cold through 180 degrees flat on itself in both directions without fracture on the outside of the bent portion.

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*A solution of two parts water, one part concentrated hydrochloric acid, and one part concentrated sulphuric acid, is recommended for the etch test.

b Quench-bend Tests—The test specimen, when heated to a yellow heat and quenched at once in water the temperature of which is between 80 deg. and 90 deg. fahr., shall bend through 180 deg. flat on itself without fracture on the outside of the bent portion.

c Nick-bend Tests—The test specimen, when nicked 25 per cent. around with a tool having a 60-deg. cutting edge, to a depth of not less than 8 nor more than 16 per cent. of the diameter of the specimen, and broken, shall show a clean fibre entirely free from crystallization.

d Bend tests may be made by pressure or by blows.

143 *Etch Tests.** The cross-section of the test specimen shall be ground or polished, and etched for a sufficient period to develop the structure. This test shall show the material to have been rolled from a bloom or a boxpile, and to be free from steel.

144 *Test Specimens.* All test specimens shall be of the full section of material as rolled.

145 *Number of Tests. a* Bars of one size shall be sorted into lots of 100 each. Two bars shall be selected at random from each lot or fraction thereof, and tested as specified in Pars. 141 and 142; but only one of these bars shall be tested as specified in Par. 143.

b If any test specimen from either of the bars originally selected to represent a lot of material, contains surface defects not visible before testing but visible after testing, or if a tension test specimen breaks outside the middle third of the gage length, one retest from a different bar will be allowed.

c When retests are specified in *b* are not permitted, a reduction of 2 per cent. in elongation and 3 per cent. in reduction of area from that specified in Par. 141, shall be allowed.

III Permissible Variations in Gage.

146 *Permissible Variations.* The bars shall be truly round within 0.01 in., and shall not vary more than 0.005 in. above or more than 0.01 in. below the specified size.

IV. Finish.

147 *Finish.* The bars shall be smoothly rolled and free from slivers, depressions, seams, crop ends and evidences of being burnt.

V. Marking.

148 *Marking.* The bars shall be stamped or marked as designated by the purchaser.

VI Inspection and Rejection.

149 *Inspection. a* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. Tests and inspection at the place of manufacture shall be made prior to shipment.

b The purchaser may make the tests to govern the acceptance or rejection of material in his own laboratory or elsewhere. Such tests, however, shall be made at the expense of the purchaser.

150 *Rejection. a* If either of the test bars selected to represent a lot does not conform to the requirements specified in Pars. 141, 142 and 143, the lot will be rejected.

b Bars which will not take a clean, sharp thread with dies in fair condition, or which develop defects in forging or machining, will be rejected, and the manufacturer shall be notified.

Specifications for Refined Wrought-Iron Bars.

These specifications are similar to those of the American Society for Testing Materials, Serial Designation A 41-13.

I Manufacture.

151 *Process.* Refined wrought-iron bars shall be made wholly from puddled iron, and may consist either of new muck-bar iron or a mixture of muck-bar iron and scrap, but shall be free from any admixture of steel.

II Physical Properties and Tests.

152 *Tension Tests. a* The iron shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.	48,000
(See Pars. 153 and 154.)	
Yield point, lb. per sq. in.	25,000
Elongation in 8 in., per cent	22
(See Par. 155.)	

b The yield point shall be determined by the drop of the beam of the testing machine. The speed of the cross-head of the machine shall not exceed 1½ in. per minute.

153 *Permissible Variations.* Twenty per cent. of the test specimens representing one size may show tensile strengths 1,000 lb. per sq. in. under, or 5,000 lb. per sq. in. over that specified in Par. 152; but no specimen shall show a tensile strength under 45,000 lb. per sq. in.

154 *Modifications in Tensile Strength.* For flat bars which have to be reduced in width, a deduction of 1,000 lb. per sq. in. from the tensile strength specified in Pars. 152 and 153, shall be made.

155 *Permissible Variations in Elongation.* Twenty per cent. of the test specimens representing one size may show the following percentages of elongation in 8 in.:

Round Bars.

½ in. or over, tested as rolled	20 per cent.
Under ½ in., tested as rolled	20 per cent.
Under ½ in., tested as rolled	16 per cent.
Reduced by machining	18 per cent.

Flat Bars.

⅜ in. or over, tested as rolled	18 per cent.
Under ⅜ in., tested as rolled	16 per cent.
Reduced by machining	16 per cent.

156 *Bend Tests. a Cold-bend Tests*—Cold bend tests will be made only on bars having a nominal area of 4 sq. in. or under, in which case the test specimen shall bend cold through 180 deg. without fracture on the outside of the bent portion, around a pin the diameted of which is equal to twice the diameter or thickness of the specimen.

b Hot-bend Tests—The test specimen, when heated to a temperature between 1,700 deg. and 1,800 deg. fahr., shall bend through 180 deg. without fracture on the outside of the bent portion, as follows: for round bars under 2 sq. in. in section, flat on itself; for round bars 2 sq. in. or over in section and for all flat bars, around a pin the diameter of which is equal to the diameter or thickness of the specimen.

c Nick-bend Tests—The test specimen, when nicked 25 per cent. around for round bars, and along one side for flat bars, with a tool having a 60-deg. cutting edge, to a depth of not less than 8 nor more than 16 per cent. of the diameter or thickness of the specimen, and broken, shall not show more than 10 per cent. of the fracture surface to be crystalline.

d Bend tests may be made by pressure or by blows.

157. *Etch Test.** The cross-section of the test specimen shall be ground or polished, and etched for a sufficient period to develop the structure. This test shall show the material to be free from steel.

158 *Test Specimens. a* Tension and bend test specimens shall be of the full section of material as rolled, if possible; otherwise the specimens shall be machined from the material as rolled. The axis of the specimen shall be located at any point one-half the distance from the center to the surface of round bars, or from the center to the edge of flat bars, and shall be parallel to the axis of the bar.

b Etch test specimens shall be of the full section of material as rolled.

159 *Number of Tests. a* All bars of one size shall be piled separately. One bar from each 100 or fraction thereof will be selected at random and tested as specified.

b If any test specimen from the bar originally selected to represent a lot of material contains surface defects not visible before testing but visible after testing, or if a tension test specimen breaks outside the middle third of the gage length, one retest from a different bar will be allowed.

*A solution of two parts water, one part concentrated hydrochloric acid and one part concentrated sulphuric acid is recommended for the etch test.

III Permissible Variations in Gage.

160 *Permissible Variations. a* Round bars shall conform to the standard limit gages adopted by the Master Car Builders' Association given in Table 2.

Table 2. Permissible Variations in Gage for Round Wrought-Iron Bars.

Nominal Diameter, Inches	Maximum Diameter, Inches.	Minimum Diameter, Inches.	Total Variation, Inches.
1/4	0.2550	0.2450	0.010
5/16	0.3180	0.3070	0.011
3/8	4.3810	0.3690	0.012
7/16	0.4440	0.4310	0.013
1/2	0.5070	0.4930	0.014
9/16	0.5700	0.5550	0.015
5/8	0.6330	0.6170	0.016
3/4	0.7585	0.7415	0.017
7/8	0.8840	0.8660	0.018
1	1.0095	0.9905	0.019
1 1/8	1.1350	1.1150	0.020
1 1/4	1.2605	1.2395	0.021

b The widths or thicknesses of flat bars shall not very more than 2 per cent. from that specified.

IV Finish.

161 *Finish.* The bars shall be smoothly rolled and free from slivers, depressions, seams, crop ends and evidences of being burnt.

V Inspection and Rejection.

162 *Inspection. a* The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the material is being furnished in accordance with these specifications. Tests and inspection at the place of manufacture shall be made prior to shipment.

b The purchaser may make the tests to govern the acceptance or rejection of material in his own laboratory or elsewhere. Such tests, however, shall be made at the expense of the purchaser.

163 *Rejection.* All bars of one size will be rejected if the test specimens representing that size do not conform to the requirements specified.

Specifications for Lapwelded and Seamless Boiler Tubes.

Approved by the Boiler Tube Manufacturers of America September 25, 1914.

I Manufacture.

164 *Process. a* Lapwelded tubes shall be made of open-hearth steel or knobbled, hammered charcoal iron.

b Seamless tubes shall be made of open-hearth steel.

II Chemical Properties and Tests.

165 *Chemical Composition. a* The steel shall conform to the following requirements as to chemical composition:

Carbon	0.08–0.18 per cent
Manganese	0.30–0.50 per cent
Phosphorus	not over 0.04 per cent
Sulphur	not over 0.045 per cent

b Chemical analyses will not be required for charcoal iron tubes.

166 *Check Analyses. a* Analyses of two tubes in each lot of 250 (or on total order if less than 250) may be made by the purchaser which shall conform to the requirements specified in Par. 165. Drillings for analyses shall be taken from several points around each tube.

b If the analysis of only one tube does not conform to the requirements specified, analyses of two additional tubes from the same lot shall be made, each of which shall conform to the requirements specified.

III Physical Properties and Tests.

167 *Flange Test. a* For tubes not more than 6 in. diameter a test specimen not less than 4 in. in length shall have a flange turned over at right angles to the body of the tube without showing cracks or flaws. This flange as measured from the outside of the tube shall have a width of from ⅛ in. to ½ in. The width between these limits to be not less than 10 per cent of the outside diameter of the tube. For tubes more than 6 in. diameter the flange test is not required.

b In making the flange test, the flaring tool and die block as shown in Fig. 7, may be used.

168 *Flattening Tests.* A test specimen 3 in. in length shall stand hammering flat until the inside walls are brought parallel and separated by a distance equal to three (3) times the wall thickness, without showing cracks or flaws. In the case lapwelded tubes, the test shall be made with the weld at the point of maximum bend.

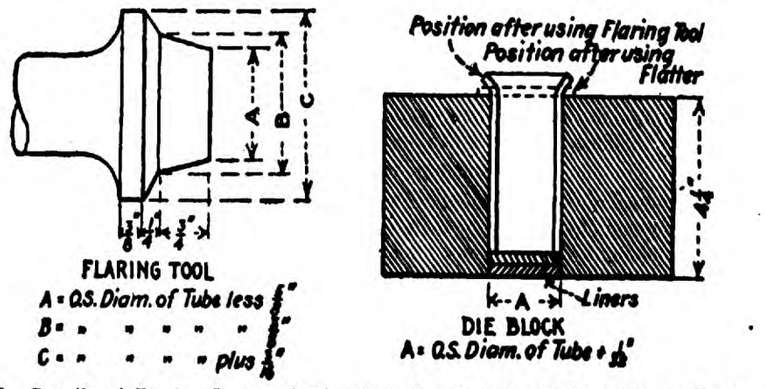


Fig. 7. Details of Flaring Tool and Die Block Required for Making Flange Tests of Boiler Tubes.

169 *Hydrostatic Tests.* Tubes under 5 in. in diameter shall stand an internal hydrostatic pressure of 1,000 lb. per sq. in. and tubes 5 in. in diameter or over, an internal hydrostatic pressure of 800 lb. per sq. in., provided that the fibre stress does not exceed 16,000 lb. per sq. in. in which case the test pressure shall be determined by the following formula:

$$P = \frac{32{,}000}{D} \times t$$

where t is the wall thickness in inches; D is the inside diameter in inches. Lapwelded tubes shall be struck near both ends, while under the test pressure, with a 2 lb. steel hand hammer, the blow to be equivalent to 2 lb. falling 2 ft.

170 *Test Specimens. a* All test specimens shall be taken from tubes before being cut to finished lengths and shall be smooth on the ends and free from burrs.

b All tests shall be made cold.

171 *Number of Tests.* One flange and one flattening test shall be made from each of two tubes in each lot of 250 or less. Each tube shall be subjected to the hydrostatic test.

172 *Retests.* If the result of the physical tests of only one tube from any lot do not conform to the requirements specified in Pars. 167 and 168, retests of two additional tubes from the same lot shall be made, each of which shall conform to the requirements specified.

Etch Tests for Charcoal Iron.

173 *Etch Tests.*[1] A cross section of tube may be turned or ground to a perfectly true surface polished free from dirt or cracks, and etched until the soft parts are sufficiently dissolved for the iron tube to show a decided ridged surface with the weld very distinct, while a steel tube would show a homogeneous surface.

IV Workmanship and Finish.

174 *Workmanship.* Finished tubes 3½ in. or under in outside diameter shall be circular within 0.02 in. and the mean outside diameter shall not vary more than 0.015 in. from the size ordered. For tubes over 3½ in. in outside diameter, these variations

[1]A solution of two parts water, one part concentrated hydrochloric acid and one part concentrated sulphuric acid is recommended for the etch test.

shall not exceed 0.5 per cent of the outside diameter. All tubes shall be carefully gaged with a B.W.G. gage and shall not be less than the gage specified. Tubes on which the standard slot gage, specified, will go on tightly at the thinnest point, will be accepted. The length shall not be less, but may be 0.125 in. more than that ordered.

175 *Finish.* The finished tubes shall be free from injurious defects and shall have a workmanlike finish and shall be practically free from kinks, bends and buckles.

V MARKING

176 *Marking.* The name or brand of the manufacturer, the material from which it is made, whether steel or charcoal iron, and "Tested at 1,000 lb." for tubes under 5 in. in diameter, or "Tested at 800 lb." for tubes 5 in. in diameter or over, shall be legibly stenciled on each tube.

VI INSPECTION AND REJECTION.

177 *Inspection.* All tests and inspection shall be made at the place of manufacture. The manufacturer of boiler tubes shall furnish the purchaser of each lot of tubes a statement of the kind of material of which the tubes are made, and that the tubes have been tested and have met all the requirements of these rules. This statement shall be furnished to the manufacturer using the tubes.

178 *Rejection.* Tubes when inserted in the boiler shall stand expanding and beading without showing cracks or flaws, or opening at the weld. Tubes which fail in this manner will be rejected and the manufacturer shall be notified.

CONSTRUCTION AND MAXIMUM ALLOWABLE WORKING PRESSURES FOR POWER BOILERS.

179 *Maximum Allowable Working Pressure.* The maximum allowable working pressure is that at which a boiler may be operated as determined by employing the factors of safety, stresses, and dimensions designated in these Rules.

No boiler shall be operated at a higher pressure than the maximum allowable working pressure except when the safety-valve or valves are blowing, at which time the maximum allowable working pressure shall not be exceeded by more than six per cent.

Wherever the term maximum allowable working pressure is used herein, it refers to gage pressure, or the pressure above the atmosphere, in pounds per square inch.

180 The maximum allowable working pressure on the shell of a boiler or drum shall be determined by the strength of the weakest course, computed from the thickness of the plate, the tensile strength stamped thereon, as provided for in Par. 36, the efficiency of the longitudinal joint, or of the ligament between the tube holes in shell or drum, (whichever is the least), the inside diameter of the course, and the factor of the safety.

$$\frac{TS \times t \times E}{R \times FS} = \text{maximum allowable working pressure, lb. per sq. in.}$$

where

TS = ultimate tensile strength stamped on shell plates, as provided for in Par. 36, lb. per sq. in.

t = minimum thickness of shell plates in weakest course, in.

E = efficiency of longitudinal joint or of ligaments between tube holes (whichever is the least).

R = inside radius of the weakest course of the shell or drum, in.

FS = factor of safety, or the ratio of the ultimate strength of the material to the allowable stress. For new constructions covered in Part I, FS in the above formula = 5.

BOILER JOINTS.

181 *Efficiency of a Joint.* The efficiency of a joint is the ratio which the strength of the joint bears to the strength of the solid plate. In the case of a riveted joint this is determined by calculating the breaking strength of a unit section of the joint, considering each possible mode of failure separately, and dividing the lowest result by the breaking strength of the solid plate of a length equal to that of the section considered. (See Appendix, Par. 410 to 416, for detailed methods and examples.)

182 The distance between the center lines of any two adjacent rows of rivets, or the "back pitch" measured at right angles to the direction of the joint, shall be at least twice the diameter of the rivets and shall also meet the following requirements:

a Where each rivet in the inner row comes midway between two rivets in the outer row, the sum of the two diagonal sections of the plate between the inner rivet and the two outer rivets shall be at least 20 per cent greater than the section of the plate between the two rivets in the outer row.

b Where two rivets in the inner row come between two rivets in the outer row, the sum of the two diagonal sections of the plate between the two inner rivets and the two rivets in the outer row shall be at least 20 per cent greater than the difference in the section of the plate between the two rivets in the outer row and the two rivets in the inner row.

183 On longitudinal joints, the distance from the centers of rivet holes to the edges of the plates, except rivet holes in the ends of butt straps, shall be not less than one and one-half times the diameter of the rivet holes.

184 *Circumferential Joints.* *a* The strength of circumferential joints of boilers, the heads of which are not stayed by tubes or through braces, shall be at least 50 per cent of that required for the longitudinal joints of the same structure. *b* When 50 per cent or more of the load which would act on an unstayed solid head of the same diameter as the shell, is relieved by the effect of tubes or through stays, in consequence of the reduction of the area acted on by the pressure and the holding power of the tubes and stays, the strength of the circumferential joints in the shell shall be at least 35 per cent of that required for the longitudinal joints. *c* In circumferential joints of horizontal return tubular boilers the shearing strength of the rivets shall be not less than 50 per cent of the full strength of the plate corresponding to the thickness at the joint.

185 When shell plates exceed 9/16 in. in thickness in horizontal return tubular boilers, the portion of the plates forming the laps of the circumferential joints, where exposed to the fire or products of combustion, shall be planed or milled down as shown in Fig. 8, to ½ in. in thickness, provided the requirement in Par. 184 is complied with.

186 *Welded Joints.* The ultimate strength of a joint which has been properly welded by the forging process, shall be taken as 28,500 lb. per sq. in., with steel plates having a range in tensile strength of 47,000 to 55,000 lb. per sq. in. Autogenous welding may be used in boilers in cases where the strain is carried by other construction which conforms to the requirements of the Code and where the safety of the structure is not dependent upon the strength of the weld. Autogenous welding shall not be used in place of caulking or girth joints.

187 *Riveted Longitudinal Joints.* The riveted longitudinal joints of a shell or drum which exceeds 36 in. in diameter, shall be of butt and double-strap construction. This rule does not apply to the portion of a boiler shell which is staybolted to the firebox sheet.

188. The longitudinal joints of a shell or drum which does not exceed 36 in. in

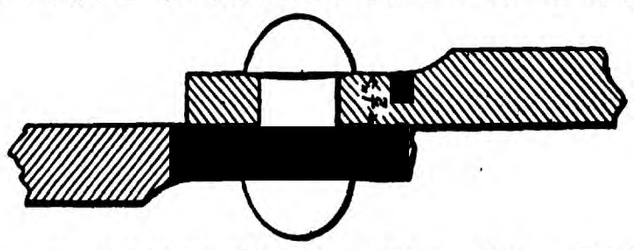


Fig. 8. Circumferential Joint for Thick Plates of Horizontal Return Tubular Boilers.

diameter may be of lap-riveted construction; but the maximum allowable working pressure shall not exceed 100 lb. per sq. in.

189 The longitudinal joints of horizontal return tubular boilers shall be located above the fire-line of the setting.

190 In horizontal return tubular boilers with lap joints no course shall be over 12 ft. long. With butt and double strap construction longitudinal joints of any length may be used provided the tension test specimens are so cut from the plate that their lengthwise direction is parallel with circumferential seams of the boiler and the tests meet the standards prescribed in the specifications for boiler plate steel.

191 Butt straps and the ends of shell plates forming the longitudinal joints shall be rolled or formed by pressure, not blows, to the proper curvature.

192 *Efficiency of Ligament.* When a shell or drum is drilled for tubes in a line parallel to the axis of the shell or drum, the efficiency of the ligament between the tube holes shall be determined as follows:

a When the pitch of the tube holes on every row is equal (Fig. 9), the formula is:

$$\frac{p-d}{p} = \text{efficiency of ligament.}$$

where

p = pitch of tube holes, in.

d = diameter of tube holes, in.

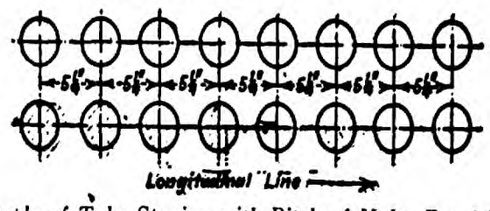


Fig. 9. Example of Tube Spacing with Pitch of Holes Equal in Every Row.

Example: Pitch of tube holes in the drum as shown in Fig 9 = 5¼ in. Diameter of tubes = 3¼ in. Diameter of tube holes = 3 9/32 in.

$$\frac{p-d}{p} = \frac{5.25-3.281}{5.25} = 0.375, \text{ efficiency of ligament}$$

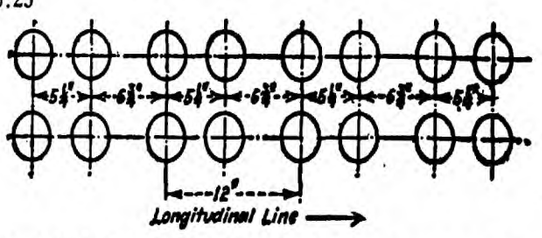


Fig. 10. Example of Tube Spacing with Pitch of Holes Unequal in Every Second Row.

b When the pitch of tube holes on any one row is unequal (as in Figs. 10 and 11), the formula is:

$$\frac{p-n\,d}{p} = \text{efficiency of ligament}$$

where

p = unit of length of ligament, in.

n = number of tube holes in length, p.

d = diameter of tube holes, in.

Example—Spacing shown in Fig. 10. Diameter of tube holes = 3 9/32 in.

$$\frac{p-n\,d}{p} = \frac{12-2\times 3.281}{12} = 0.453, \text{ efficiency of ligament.}$$

Example—Spacing shown in Fig. 11. Diameter of tube holes = 3 9/32 in.

$$\frac{p-n\,d}{p} = \frac{29.25-5\times 3.281}{29.25} = 0.439, \text{ efficiency of ligament.}$$

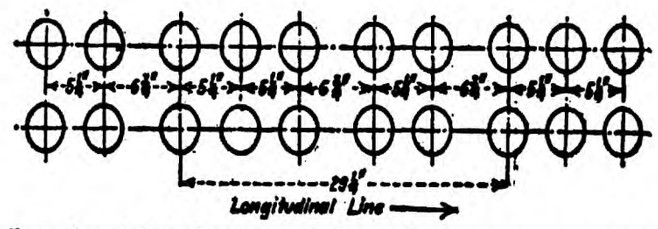


Fig. 11 Example of Tube Spacing with Pitch of Holes Varying in Every Second and Third Row.

193 When a shell or drum is drilled for tube holes in a line diagonal with the axis of the shell or drum, as shown in Fig. 12, the efficiency of the ligament between the tube holes shall be determined by the following methods and the lowest value used.

a $\dfrac{0.95(p_1-d)}{p_1}$ = efficiency of ligament.

b $\dfrac{p-d}{p}$ = efficiency of ligament.

where

p_1 = diagonal pitch of tube holes, in.

d = diameter of tube holes, in.

p = longitudinal pitch of tube holes or distance between centers of tubes in a longitudinal row, in.

The constant 0.95 in formula *a* applies provided $\dfrac{p_1}{d}$ is 1.5 or over.

Example—Diagonal pitch of tube holes in drum, as shown in Fig. 12 = 6.42 in. Diameter of tube holes = 4 1/32 in.

Longitudinal pitch of tube holes = 11½ in.

a $\dfrac{0.95(6.42-4.031)}{6.42} = 0.353$, efficiency of ligament.

b $\dfrac{11.5-4.031}{11.5} = 0.649$, efficiency of ligament.

The value determined by formula *a* is the least and is the one that shall be used in this case.

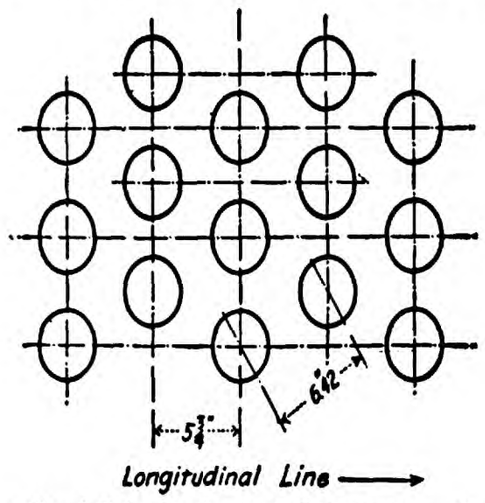


Fig. 12 Example of Tube Spacing with Tube Holes on Diagonal Lines.

194 *Domes.* The longitudinal joint of a dome 24 in. or over in diameter shall be of butt and double-strap construction, irrespective of pressure. When the maximum allowable working pressure exceeds 100 lb. per sq. in., the flange of a dome 24 in. or over in diameter shall be double riveted to the boiler shell.

The longitudinal joint of a dome less than 24 in. in diameter may be of the lap type, and its flange may be single riveted to the boiler shell provided the maximum allowable working pressure on such a dome is computed with a factor of safety of not less than 8.

The dome may be located on the barrel or over the fire-box on traction, portable or stationary boilers of the locomotive type up to and including 48 in. barrel diameter. For larger barrel diameters, the dome shall be placed on the barrel.

DISHED HEADS.

195 *Convex Heads.* The thickness required in an unstayed dished head with

the pressure on the concave side, when it is a segment of a sphere, shall be calculated by the following formula:

$$t = \frac{5.5 \times P \times L}{2 \times TS} + \frac{1}{8}$$

where

t = thickness of plate, in.
P = maximum allowable working pressure, lb. per sq. in.
TS = tensile strength, lb. per sq. in.
L = radius to which the head is dished, in.

Where two radii are used, the longer shall be taken as the value of L in the formula.

Where the radius is less than 80 per cent of the diameter of the shell or drum to which the head is attached, the thickness shall be at least that found by the formula by making L equal to 80 per cent of the diameter of the shell or drum.

Concave Heads. Dished heads with the pressure on the convex side shall have a maximum allowable working pressure equal to 60 per cent of that for heads of the same dimensions with the pressure on the concave side.

When a dished head has a manhole opening, the thickness as found by these Rules shall be increased by not less than ⅛ in. over that called for by the formula.

196 When dished heads are of a less thickness than called for by Par. 195, they shall be stayed as flat surfaces, no allowance being made in such staying for the holding power due to the spherical form.

197 The corner radius of an unstayed dished head measured on the concave side of the head shall not be less than 1½ in. or more than 4 in. and within these limits shall be not less than 3 per cent of L in Par. 195.

198 A manhole opening in a dished head shall be flanged to a depth of not less than three times the thickness of the head measured from the outside.

Braced and Stayed Surfaces.

199 The maximum allowable working pressure for various thicknesses of braced and stayed flat plates and those which by these Rules require staying as flat surfaces with braces or staybolts of uniform diameter, symmetrically spaced, shall be calculated by the formula:

$$P = C \times \frac{t^2}{p^2}$$

where

P = maximum allowable working pressure, lb. per sq. in.
t = thickness of plate in *sixteenths* of an inch.
P = maximum pitch measured between straight lines passing through the centers of the staybolts in the different rows, which lines may be horizontal, vertical or inclined, in.
C = 112 for stays screwed through plates not over 7/16 in. thick with ends riveted over.
C = 120 for stays screwed through plates over 7/16 in. thick with ends riveted over.
C = 135 for stays screwed through plates and fitted with single nuts outside of plate.
C = 150 for stays screwed through plates or made a taper fit and having the heads formed on the stays before installing them and not riveted over, said heads being made to have a true bearing on the plate and the diameter of the heads being not less than 1.4 times the diameter of the stays.
C = 175 for stays fitted with inside and outside nuts and outside washers where the diameter of washers is not less than 0.4p and thickness not less than t.

If flat boiler plates not less than ⅜ in. thick are strengthened with doubling plates securely riveted thereto and having a thickness of not less than 2/3 t, then the value of t in the formula shall be three-quarters of the combined thickness of the boiler plate and doubling plates but not more than one and one-half times the thickness of the boiler plates, and the values of C given above may also be increased 15 per cent.

When two sheets are connected by stays and but one of these sheets require staying, the value of C is governed by the thickness of the sheet requiring staying.

200 *Staybolts.* The ends of screwed staybolts shall be riveted over or upset by equivalent process. Staybolts must be hollow or the outside ends of solid staybolts shall be drilled with a hole at least 3/16 in. diameter to a depth extending at least ½ in. beyond the pressure side of the plates, except on boilers having a grate area not exceeding 15 sq. ft., or the equivalent in gas or oil fired boilers, where the drilling of the staybolts is optional. Flexible staybolts of either the jointed or ball and socket type need not be drilled.

201 When channel irons or other members are securely riveted to the boiler heads for attaching through stays, the transverse stress on such members shall not exceed 12,500 lb. per sq. in. In computing the stress, the section modulus of the member shall be used without addition for the strength of the plate. The spacing of the rivets over the supported surface shall be in conformity with that specified for staybolts.

If the outstanding legs of the two members are fastened together so that they may act as one member in resisting the bending action produced by the load on the rivets attaching the members to the head of the boiler, and provided that the spacing of these rivets attaching the members to the head is approximately uniform, the members may be figured as a single beam uniformly loaded and supported at the points where the through braces are attached.

202 The ends of stays fitted with nuts shall not be exposed to the direct radiant heat of the fire.

203 *a* The maximum spacing between centers of rivets or between the edges of tube holes and the centers of rivets attaching the crowfeet of braces to the braced surface, shall be determined by the formula in Par. 199, using 135 for the value of C.

b The maximum distance between the edges of tube holes and the centers of other types of stayes shall be determined by the formula in Par. 199 using the value of C given in Par. 199 which applies to the thickness of plate and type of stay used.

c The maximum spacing between the inner surface of the shell and lines parallel to the surface of the shell passing through the centers of the rivets attaching the crowfeet of braces to the head shall be determined by the formula in Par. 199, using 175 for the value of C.

d The maximum distance between the inner surface of the shell and the centers of braces of other types shall be determined by the formula in Par. 199, using a value of C equal to 1.3 times that value of C in Par. 199 which applies to the thickness of plate and type of stay as therein specified.

e In applying these rules and those in Par. 199 to a head or plate having a manhole or reinforced opening, the spacing applies only to the plate around the opening and not across the opening.

Table 3 Maximum Allowable Pitch, in Inches, of Screwed Staybolts, Ends Riveted Over.

Pressure, Lb. Per Sq. In.	Thickness of Plate, In. 5/16	3/8	7/16	1/2	9/16	5/8	11/16
	Maximum Pitch of Staybolts, In.						
100	5¼	6⅜	7⅜				
110	5	6	7	8⅛			
120	4¾	5¾	6¾	8			
125	4¾	5⅝	6⅝	7¾			
130	4⅝	5½	6½	7⅝			
140	4½	5⅜	6¼	7⅜	8⅜		
150	4¼	5⅛	6	7⅛	8		
160	4⅛	5	5⅞	6⅞	7¾		
170	4	4⅞	5⅝	6¾	7½	8⅜	
180		4¾	5½	6½	7⅜	8⅛	
190		4⅝	5⅜	6⅜	7⅛	7⅞	
200		4½	5¼	6⅛	7	7¾	8½
225		4¼	4⅞	5⅞	6½	7¼	8
250		4	4⅝	5½	6¼	6⅞	7⅝
300			4¼	5	5⅝	6¼	7

204 The formula in Par. 199 was used in computing Table 3. Where values for screwed stays with ends riveted over are required for conditions not given in Table 3, they may be computed from the formula and used, provided the pitch does not exceed 8½ in.

205 The distance from the edge of a staybolt hole to a straight line tangent to the edges of the rivet holes may be substituted for p for staybolts adjacent to the riveted edges bounding a stayed surface. When the edge of a stayed plate is flanged, p shall be measured from the inner surface of the flange, at about the line of rivets to the edge of the staybolts or to the projected edge of the staybolts.

206 The distance between the edges of the staybolt holes may be substituted for p for staybolts adjacent to a furnace door or other boiler fitting, tube hole, hand hole or other opening.

207 In water leg boilers, the staybolts may be spaced at greater distances between the rows than indicated in Table 3, provided the portions of the sheet which come between the rows of staybolts have the proper transverse strength to give a factor of safety of at least 5 at the maximum allowable working pressure.

208 The diameter of a screw stay shall be taken at the bottom of the thread, provided this is the least diameter.

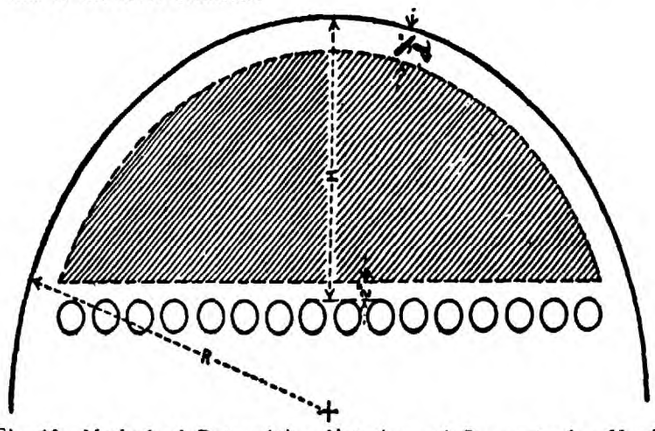


Fig. 13 Method of Determining Net Area of Segment of a Head.

209 The lease cross-sectional area of a stay shall be taken in calculating the allowable stress, except that when the stays are welded and have a larger cross-sectional area at the weld than at some other point, in which case the strength at the weld shall be computed as well as in the solid part and the lower value used.

210 Holes for screw stays shall be drilled full size or punched not to exceed ¼ in. less than full diameter of the hole for plates over 5/16 in. in thickness, and ⅛ in. less than the full diameter of the hole for plates not exceeding 5/16 in. in thickness, and then drilled or reamed to the full diameter. The holes shall be tapped fair and true, with a full thread.

211 The ends of steel stays upset for threading shall be thoroughly annealed.

212 An internal cylindrical furnace which requires staying shall be stayed as a flat surface as indicated in Table 3.

213 *Staying Segments of Heads.* A segment of a head shall be stayed by head to head, through, diagonal, crowfoot or gusset stays, except that a horizontal return tubular boiler may be stayed as provided in Pars. 225 to 229.

214 *Areas of Segments of Heads to be Stayed.* The area of a segment of a head to be stayed shall be the area enclosed by lines drawn 2 in. from the tubes and a distance d from the shell as shown in Figs. 13 and 14. The value of d shall be the larger of the following values but not less than 3 in.

(Note:—Dimensions marked 3″ in Figs. 13 and 14 to be changed to d.)

(1) d = the outer radius of the flange not exceeding eight times the thickness of the head

(2) $$d = \frac{5 \times t}{\sqrt{P}}$$

Where

d = distance in inches
t = thickness of head in sixteenths of an inch
P = maximum allowable working pressure in lb. per sq. in.

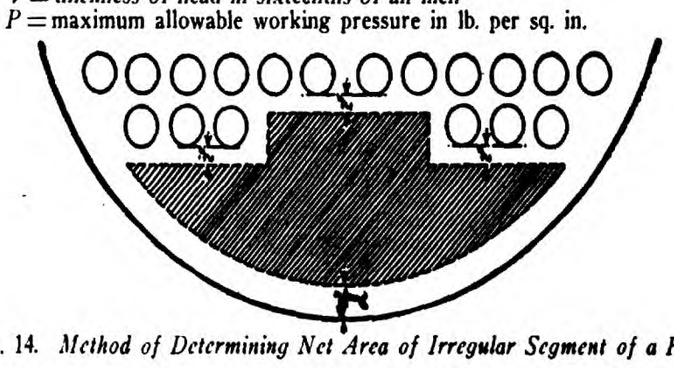


Fig. 14. Method of Determining Net Area of Irregular Segment of a Head.

215 When drum heads of water tube boilers are 30 in. or less in diameter and the tube plate is stiffened by flanged ribs or gussets, no stays need be used if a hydrostatic test to destruction of a boiler or unit section built in accordance with the construction, shows that the factor of safety is at least 5.

216 Stays shall be used in the tube sheets of a fire tube boiler if the distance between the edges of the tube holes exceeds the maximum pitch of staybolts for the corresponding plate thickness and pressure given in Table 3. That part of the tube sheet which comes between the tubes and the shell need not be stayed if the nearest tangent common to two tube holes when measured on any radius of the tube sheet that intersects the tangent between the holes does not exceed this maximum pitch by more than 3 in. The tube holes to which a common tangent may be drawn in applying this rule shall not be at a greater distance from edge to edge than the maximum pitch referred to.

217 The net area to be stayed in a segment of a head may be determined by the following formula:

$$\frac{4\,(H-5)^2}{3}\sqrt{\frac{2\,(R-3)}{(H-5)}} - 0.608 = \text{area to be stayed, sq. in.}$$

where

H = distance from tubes to shell, in.
R = radius of boiler head, in.

218 When the portion of the head below the tubes in a horizontal return tubular boiler is provided with a manhole opening, the flange of which is formed from the solid plate and turned inward to a depth of not less than three times the thickness of the head, measured from the outside, the area to be stayed as indicated in Fig. 14, may be reduced by 100 sq. in. The surface around the manhole shall be supported by through stays with nuts inside and outside at the front head. The distance in the clear between the bodies of the braces, or of the inside braces where more than two are used, shall not be less than 10 in. at any point.

Table 4. Maximum Allowable Stresses for Stays and Staybolts.

Description of Stays.	Stresses, Lb. Per Sq. In. For Lengths Between Supports Not Exceeding 120 Diameters.	For Lengths Between Supports Exceeding 120 Diameters.
a Unwelded stays less than twenty diameters long screwed through plates with ends riveted over	7,500	....
b Unwelded stays and unwelded portions of welded stays, except as specified in line *a*	9,500	8,500
c Steel through stays exceeding 1½ in. diameter	10,400	9,000

219 When stay rods are screwed through the sheets and riveted over, they shall be supported at intervals not exceeding 6 ft. In boilers without manholes, stay rods over 6 ft. in length may be screwed through the sheets and fitted with nuts and washers on the outside.

220*a* The full pitch dimensions of the stays shall be employed in determining the area to be supported by a stay and the area occupied by the stay shall be deducted therefrom to obtain the net area. The product of the net area in square inches by the maximum allowable working pressure in lb. per sq. in. gives the load to be supported by the stay.

b Where stays come near bounding surfaces and special allowances are made for the spacing, the load to be carried by such stays shall be determined by neglecting the added area provided for by these special allowances. For example, if the minimum pitch by Table 3 would make a staybolt come 6 in. from the edge of the plate and a special allowance would make it come 7 in., the distance of 6 in. should be used in computing the load to be carried.

c The maximum allowable stress per square inch net cross sectional area of stays and staybolts shall be as given in Table 4.

d The length of the stay between supports shall be measured from the inner faces of the stayed plates. The stresses are based on tension only. For computing stresses in diagonal stays, see Pars. 221 and 222.

221 *Stresses in Diagonal and Gusset Stays.* Multiply the area of a direct stay required to support the surface by the slant or diagonal length of the stay. Divide this product by the length of a line drawn at right angles to surface supported to center of palm of diagonal stay. The quotient will be the required area of the diagonal stay.

$$A = \frac{a \times L}{l}$$

where

A = sectional area of diagonal stay, sq. in.
a = sectional area of direct stay, sq. in.
L = length of diagonal stay, as indicated in Fig. 15, in.
l = length of line drawn at right angles to boiler head or surface supported to center of palm of diagonal stay, as indicated in Fig. 15, in.

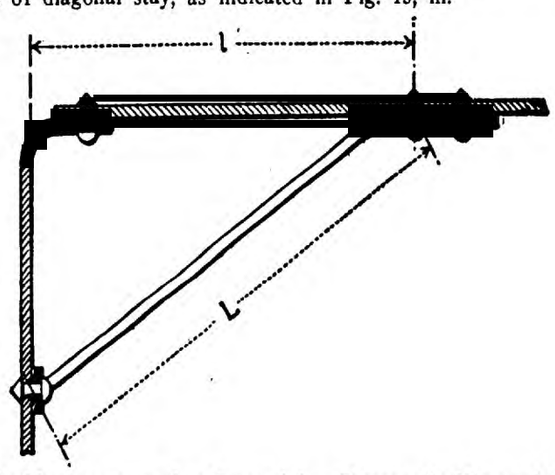


Fig. 15 Measurements for Determining Stresses in Diagonal Stays.

Given diameter of direct stay = 1 in., $a = 0.7854$, $L = 60$ in., $l = 48$ in., substituting and solving:

$$A = \frac{0.7854 \times 60}{48} = 0.981 \text{ sectional area, sq. in.}$$

Diameter = 1.11 in. = 1⅛ in.

222 For staying segments of tube sheets, such as in horizontal return tubular boilers, where L is not more than 1.15 times l for any brace, the stays may be calculated as direct stays, allowing 90 per cent of the stress given in Table 4.

223 *Diameter of Pins and Area of Rivets in Brace.* All rivet and pin holes shall conform with the requirements in Par. 253 and the pins shall be made a neat fit. To determine the sizes that shall be used proceed as follows:

1. Determine the "required cross-sectional area of the brace" by first computing the total load to be carried by the brace, and dividing the total load by the values of stresses for unwelded stays given in Table 4.
2. Design the body of the brace so that the cross-sectional area shall be at least equal to the "required cross-sectional area of the brace" for unwelded braces. Where the braces are welded, the cross-sectional area at the weld shall be at least as great as that computed for a stress of 6,000 lb. per sq. in. (see Table 4).
3. Make the area of pins to resist double shear at least three-quarters of the "required cross-sectional area of the brace."
4. Make the combined cross-section of the eye at the side of the pin (in crowfoot braces) of at least 25 per cent greater than the "required cross-sectional area of the brace."
5. Make the combined cross-sectional area of the rivets at each end of the brace at least 1¼ times the "required cross-sectional area of the brace."
6. Design each branch of a crowfoot to carry two-thirds the total load on the brace.
7. Make the net sectional areas through the sides of the crowfoot, tee irons, or similar fastenings at the rivet holes at least equal to the required rivet section, that is, at least equal to one and one-quarter times the "required cross-sectional area of the brace."
8. Make the cross-sectional areas through the blades of diagonal braces where attached to the shell of the boiler at least equal to the required rivet section, that is, at least equal to one and one-quarter times the "required cross-sectional area of the brace."

Table 5 Sizes of Angles Required for Staying Segments of Heads.

With the Short Legs of the Angles Attached to the Head of the Boiler.

Height of Segment, Dimension B in Fig. 16.	30" Boiler. Angle 3"x2½" Thickness, Inches.	Angle 3½"x3" Thickness, Inches.	Angle 4"x3" Thickness, Inches.	34" Boiler. Angle 3½"x3" Thickness, Inches.	Angle 4"x3" Thickness, Inches.	Angle 5"x3" Thickness, Inches.	36" Boiler. Angle 4"x3" Thickness, Inches.	Angle 5"x3" Thickness, Inches.	Angle 6"x3½" Thickness, Inches.	Dimension A in Fig. 16.
10	3/8	5/16	5/16	....	....	....	....	....	....	6 1/2
11	7/16	3/8	5/16	7/16	5/16	5/16	....	....	....	7
12	9/16	7/16	3/8	1/2	7/16	5/16	7/16	5/16	....	7 1/2
13	....	9/16	7/16	11/16	1/2	5/16	9/16	3/8	....	8
14	....	....	1/2	....	5/8	3/8	5/8	7/16	3/8	8 1/2
15	....	....	....	....	....	1/2	3/4	1/2	3/8	9
16	....	....	....	....	....	....	....	5/8	7/16	9 1/2

224 Gusset stays when constructed of triangular right-angled web plates secured to single or double angle bars along the two sides at right angles shall have a cross-sectional area (in a plane at right angles to the longest side and passing through the intersection of the two shorter sides) not less than 10 per cent greater than would be required for a diagonal stay to support the same surface, figured by the formula in Par. 221, assuming the diagonal stay is at the same angle as the longest side of the gusset plate.

225 *Staying of Upper Segments of Tube Heads by Steel Angles.* When the shell of a boiler does not exceed 36 in. in diameter and is designed for a maximum allowable working pressure not exceeding 100 lb. per sq. in., the segment of heads above the tubes *may* be stayed by steel angles as specified in Table 5 and Fig. 16, except that angles of equal thickness and greater depth of outstanding leg, or of greater thickness and the same depth of outstanding leg, may be substituted for those specified. The legs attached to the heads may vary in depth ½ in. above or below the dimensions specified in Table 5.

226 When this form of bracing is to be placed on a boiler, the diameter of which is intermediate to or below the diameters given in Table 5, the tabular values for the next higher diameter shall govern. Rivets of the same diameter as used in the longitudinal seams of the boiler shall be used to attach the angles to the head and to connect the outstanding legs.

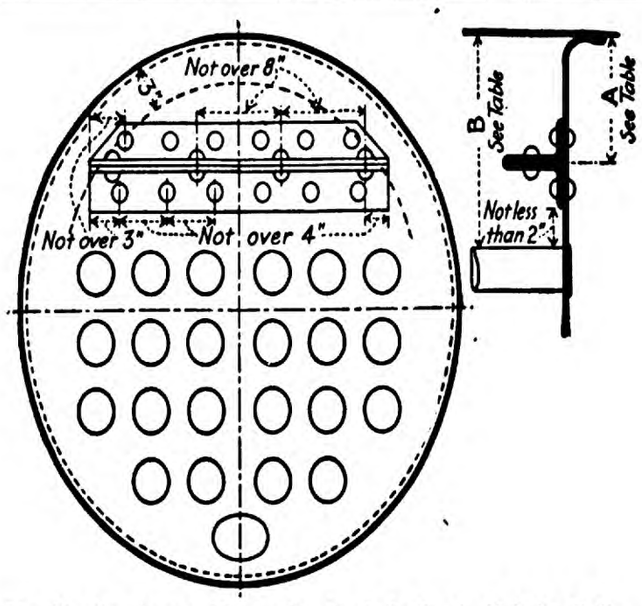


Fig. 16. Staying or Head with Steel Angles in Tubular Boiler.

227 The rivets attaching angles to heads shall be spaced not over 4 in. apart. The centres of the end rivets shall not be over 3 in. from the ends of the angle. The rivets through the outstanding legs shall be spaced not over 8 in. apart; the centres of the end rivets shall be not more than 4 in. from the ends of the angles. The ends of the angles shall be considered those of the outstanding legs and the lengths shall be such that their ends overlap a circle 3 in. inside the inner surface of the shell, as shown in Fig. 16.

228 The distance from the centre of the angles to the shell of the boiler, marked A in Fig. 16, shall not exceed the values given in Table 5, but in no case shall the leg attached to the head on the lower angle come closer than 2 in. to the top of the tubes.

229 When segments are beyond the range specified in Table 5, the heads shall be braced or stayed in accordance with the requirements in these Rules.

230 *Crown Bars and Girder Stays.* Crown bars and girder stays for tops of combustion chambers and back connections, or wherever used, shall be proportioned to conform to the following formula:

$$\text{Maximum allowable working pressure} = \frac{C \times d^2 \times T}{(W - P) \times D \times W}$$

where

W = extreme distance between supports, in.
P = pitch of supporting bolts, in.
D = distance between girders from centre to centre, in.
d = depth of girder, in.
T = thickness of girder, in.
C = 7,000 when the girder is fitted with one supporting bolt.
C = 10,000 when the girder is fitted with two or three supporting bolts.
C = 11,000 when the girder is fitted with four or five supporting bolts.
C = 11,500 when the girder is fitted with six or seven supporting bolts.
C = 12,000 when the girder is fitted with eight or more supporting bolts.

Example: Given $W = 34$ in., $P = 7.5$ in., $D = 7.75$ in., $d = 7.5$ in., $T = 2$ in.; three stays per girder, $C = 10{,}000$; then substituting in formula:

Maximum allowable working pressure =

$$\frac{10{,}000 \times 7.5 \times 7.5 \times 2}{(34 - 7.5 \times 7.75 \times 34} = 161.1 \text{ lb. per sq. in.}$$

231 *Maximum Allowable Working Pressure on Truncated Cones. a.* Upper combustion chambers of vertical submerged tubular boilers made in the shape of a frustum of a cone when not over 38 in. diameter at the large end, may be used without stays if figured by the rule for plain cylindrical furnaces (Par. 239), making D in the formula equal to the diameter at the large end.

b When over 38 in. in diameter at the large end, that portion which is over 30 in. in diameter shall be fully supported by staybolts or gussets to conform to the provisions for staying flat surfaces. In this case the top row of staybolts shall be at a point where the cone top is 30 in. or less in diameter.

In calculating the pressure permissible on the unstayed portion of the cone, the vertical distance between the horizontal planes passing through the centres of the rivets at the cone top, and through the centre of the top row of staybolts shall be used as L in Par. 239, and D in that paragraph shall be the inside diameter at the centre of the top row of staybolts.

232 *Stay Tubes.* When stay tubes are used in multitubular boilers to give support to the tube plates, the sectional area of such stay tubes may be determined as follows:

$$\text{Total section of stay tubes, sq. in.} = \frac{(A - a)\ P}{T}$$

where

A = area of that portion of the tube plate containing the tubes, sq. in.
a = aggregate area of holes in the tube plate, sq. in.
P = maximum allowable working pressure, lb. per sq. in.
T = working tensile stress allowed in the tubes, not to exceed 7,000 lb. per sq. in.

233 The pitch of stay tubes shall conform to the formula given in Par. 199, using the values of C as given in Table 6.

Table 6. Values of C for Determining Pitch of Stay Tubes.

Pitch of Stay Tubes in the Bounding Rows.	When Tubes Have no Nuts Outside of Plates.	When Tubes are Fitted with Nuts Outside of Plates.
Where there are two plain tubes between each stay tube	120	130
Where there is one plain tube between each stay tube	140	150
Where every tube in the bounding rows is a stay tube and each alternate tube has a nut	....	170

When the ends of tubes are not shielded from the action of flame or radiant heat, the values of C shall be reduced 20 per cent. The tubes shall project about ¼ in. at each end and be slightly flared. Stay tubes when threaded shall not be less than 3/16 in. thick at bottom of thread; nuts on stay tubes are not advised. For a nest of tubes C shall be taken as 140 and S as the mean pitch of stay tubes. For spaces between nests of tubes S shall be taken as the horizontal distance from center to center of the bounding rows of tubes and C as given in Table 6.

Tube Sheets of Combustion Chambers.

234 The maximum allowable working pressure on a tube sheet of a combustion chamber, where the crown sheet is not suspended from the shell of the boiler, shall be determined by the following formula:

$$P = \frac{(D - d)\ T \times 27{,}000}{W - D}$$

where

P = maximum allowable working pressure, lb. sq. in.
D = least horizontal distance between tube centers, in.
d = inside diameter of tubes, in.
T = thickness of tube plate, in.
W = distance from tube sheet to opposite combustion chamber sheet, in.

Example: Required the working pressure of a tube sheet supporting a crown sheet braced by crown bars. Horizontal distance between centers, 4⅛ in.; inside diameter of tubes, 2.782 in.; thickness of tube sheets, 11/16 in.; distance from tube sheet

to opposite combustion chamber sheet, 34¼ in., measured from outside of tube plate to outside of back plate; material, steel. Substituting and solving:

$$P=\frac{(4.125-2.782)\times 0.6875\times 27{,}000}{34.25\times 4.125}=176 \text{ lb. per sq. in.}$$

235 Sling stays may be used in place of girders in all cases covered in Par. 234, provided, however, that when such sling stays are used, girders or screw stays of

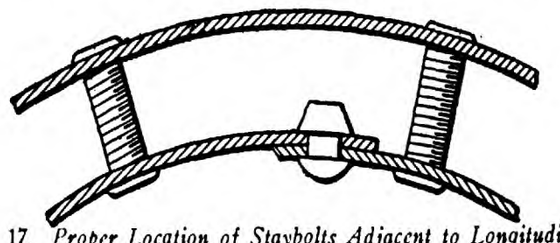


Fig. 17. Proper Location of Staybolts Adjacent to Longitudinal Joint in Furnace Sheet.

the same sectional area shall be used for securing the bottom of the combustion chamber to the boiler shell.

236 When girders are dispensed with and the top and bottom of combustion chambers are secured by sling stays or braces, the sectional area of such stays shall conform with the requirements of rules for stays and stayed surfaces.

237 *Furnaces of Vertical Boilers.* In a vertical fire-tube boiler the furnace length, for the purpose of calculating its strength and spacing staybolts over its surface, shall be measured from the center of rivets in the bottom of the water-leg to the center of rivets in the flange of the lower tube sheet.

238 When the longitudinal joint of the furnace sheet of a vertical fire-tube boiler is of lap-riveted construction and staybolted, a staybolt in each circular row shall be located near the longitudinal joint, as shown in Fig. 17.

239 *Plain Circular Furnaces.* Unstayed furnaces *more than* 18 *in. diameter,* when diveted or of seamless construction or such furnaces when lapwelded by the forging process shall have walls not less than 5/16 in. thick. The maximum allowable working pressure for such furnaces shall be determined by one or the other of the following formulæ:

a Where the length does not exceed 120 times the thickness of the plate

$$P=\frac{51.5}{D}\left\{(18.75\times T)-(1.03\times L)\right\}$$

b Where the length exceeds 120 times the thickness of the plate

$$P=\frac{4250\times T^2}{L\times D}$$

where

P=maximum allowable working pressure, lb. per sq. in.
D=outside diameter of furnace, in.
L={total length of furnace between centers of head rivet seams (not length of a section), in.
T=thickness of furnace walls, in sixteenths of an inch.

Where the furnace has a riveted longitudinal joint, it may be of the lap type for inside diameters not exceeding 30 in. but shall be of butt and strap construction for inside diameters exceeding 30 in. The efficiency of the joint shall be greater than:

$$\frac{P\times D}{1250\times T}$$

Example. Given a furnace 26 in. in diameter, 94 in. long and ½ in. thick. The length exceeds 120 times the thickness of the plate, hence the formula (*b*) should *be* used. Substituting the values in this formula:

$$P=\frac{4250\times 8\times 8}{94\times 26}=111 \text{ lb. per sq. in.}$$

240 A plain cylindrical furnace exceeding 38 in. in diameter shall be stayed in accordance with the rules governing flat surfaces.

241 *Circular Flues.* The maximum allowable working pressure for seamless or welded flues more than 5 in. in diameter and up to and including 18 in. in diameter shall be determined by one or the other of the following formulæ:

a Where the thickness of the wall is less than 0.023 times the diameter

$$P=\frac{10{,}000{,}000\times T^2}{D^2}$$

b Where the thickness of the wall is greater than 0.023 times the diameter

$$P=\frac{17{,}300\times T}{D}-275$$

where

P=maximum allowable working pressure, lb. per sq. in.
D=outside diameter of flue, in.
T=thickness of wall of flue, in.

c The above formulæ may be applied to riveted flues of the sizes specified, provided the sections are not over 3 ft. in length and provided the efficiency of the joint is greater than $P\times D$ divided by $20{,}000\times T$.

Example. Given a flue 14 in. in diameter and 5/16 in. thick. The thickness of the wall is less than 0.023 times the diameter; hence the formula (*a*) should be used. Substituting the values in this formula:

$$P=\frac{10{,}000{,}000\times 5/16\times 5/16\times 5/16}{14\times 14\times 14}=110 \text{ lb. per sq. in.}$$

242 *Adamson Type.* When plain horizontal flues are made in sections not less than 18. in. in length, and not less than 5/16 in. thick:

a They shall be flanged with a radius measured on the fire side, of not less than three times the thickness of the plate, and the flat portion of the flange outside of the radius shall be at least three times the diameter of the rivet holes.

b The distance from the edge of the rivet holes to the edge of the flange shall be not less than the diameter of the rivet holes, and the diameter of the rivets before driving shall be at least ¼ in. larger than the thickness of the plate.

c The depth of the Adamson ring between the flanges shall be not less than three times the diameter of the rivet holes, and the ring shall be substantially riveted to the flanges. The fire edge of the ring shall terminate at or about the point of tangency to the curve of the flange, and the thickness of the ring shall be not less than ½ in.

The maximum allowable working pressure shall be determined by the following formula:

$$P=\frac{57.6}{D}\left\{(18.75\times T)-(1.03\times L)\right\}$$

where

P=maximum allowable working pressure, lb. per sq. in.
D=outside diameter of furnace, in.
L=length of furnace section, in.
T=thickness of plate, in sixteenths of an inch.

Example. Given a furnace 44 in. in diameter, 48 in. in length, and ½ in. thick. Substituting values in formula:

$$P=\frac{57.6}{44}\left\{(18.75\times 8)-(1.03\times 48)\right\}$$
$$=1.309\ (150-49.44)=131 \text{ lb. per sq. in.}$$

243 The maximum allowable working pressure on corrugated furnaces, such as the Leeds suspension bulb, Morison, Fox, Purves, or Brown, having plain portions at the ends not exceeding 9 in. in length (except flues especially provided for) when new and practically circular, shall be computed as follows:

$$P=\frac{C\times T}{D}$$

where

P=maximum allowable working pressure, lb. per sq. in.
T=thickness, in.—not less than 5/16 in. for Leeds, Morison, Fox and Brown, and not less than 7/16 in. for Purves and other furnaces corrugated by sections not over 18 in. long.
D=mean diameter, in.
C=17,300, a constant for *Leeds furnaces,* when corrugations are not more than 8 in. from center to center and not less than 2¼ in. deep.
C=15,600, a constant for *Morison furnaces,* when corrugations are not less than 8 in. from center to center and the radius of the outer corrugations is not more than one half that of the suspension curve.
C=14,000, a constant for *Fox furnaces,* when corrugations are not more than 8 in. from center to center and not less than 1½ in. deep.
C=14,000, a constant for *Purves furnaces* when rib projections are not more than 9 in. from center to center and not less than 1⅜ in. deep.
C=14,000, a constant for *Brown furnaces,* when corrguations are not more than 9 in. from center to center and not less than 1⅝ in. deep.
C=10,000, a constant for furnaces corrugated by sections not more than 18 in. from center to center and not less than 2½ in. deep, measured from the least inside to the greatest outside diameter of the corrugations, and having the ends fitted one into the other and substantially riveted together, provided that the plain parts at the ends do not exceed 12 in. in length.

In caculating the mean diameter of the Morison furnace, the least inside diameter plus 2 in., may be taken as the mean diameter.

244 The thickness of a corrugated or ribbed furnace shall be ascertained by actual measurement. The furnace shall be drilled for a ¼-in. pipe tap and fitted with a screw plug that can be removed for the purpose of measurement. For the Brown and Purves furnaces, the holes shall be in the center of the second flat; for the Morison, Fox and other similar types, in the center of the top corrugation, at least as far in as the fourth corrugation from the end of the furnace.

245 *Cast Iron Headers.* The pressure allowed on a water-tube boiler, the tubes of which are secured to cast-iron or malleable-iron headers, shall not exceed 160 lb. per sq. in. The form and size of the internal cross section of a cast-iron or malleable-iron header at any point shall be such that it will fall within a 6 in. by 7 in. rectangle.

246a The cast-iron used for the headers of water-tube boilers shall conform with the Specifications for Gray-iron Castings given in Pars. 95 to 110, the header to be arbitrarily classified as a "medium casting" as to physical properties and tests, and as a "light casting" as to chemical properties.

246b A cast-iron header when tested to destruction shall withstand a hydrostatic pressure of at least 1,200 lb. per sq. in. A hydrostatic test at 400 lb. per sq. in. gage pressure shall be made on all new headers with tubes attached.

247 Where it is impossible to calculate with a reasonable degree of safety the strength of a boiler structure or any part thereof, a full sized sample shall be built by the manufacturer and tested to destruction in the presence of the Boiler Code Committee or a representative of the Boiler Code Committee appointed to witness such test.

Tubes.

248 *Tube Holes and Ends.* Tube holes shall be drilled full size from the solid plate, or they may be punched at least ½ in. smaller in diameter than full size, and then drilled, reamed or finished full size with a rotating cutter.

249 The sharp edges of tube holes shall be taken off on both sides of the plate with a file or other tool.

250 A fire-tube boiler shall have the ends of the tubes substantially rolled and beaded, or rolled and welded, at the firebox or combustion chamber end.

251 The ends of all tubes, suspension tubes and nipples shall be flared not less than ⅛ in. over the diameter of the tube hole on all water-tube boilers and superheaters, or they may be beaded.

252 The ends of all tubes, suspension tubes and nipples of water-tube boilers and superheaters shall project through the tube sheets or headers not less than ¼ in. nor more than ½ in. before flaring.

Riveting.

253 *Riveting.* Rivet holes shall be drilled full size or they may be punhced not to exceed ¼ in. less than full diameter for material over 5/16 in. in thickness, and ⅛ in. less than full diameter for material not exceeding 5/16 in. in thickness, and then drilled or reamed to full diameter.

254 After drilling rivet holes, the plates and butt straps shall be separated and the burrs removed.

255 *Rivets.* Rivets shall be of sufficient length to completely fill the rivet holes and form heads at least equal in strength to the bodies of the rivets. Forms of rivet heads that will be acceptable are shown in Fig. 17*a*.

256 Rivets shall be machine driven wherever possible, with sufficient pressure to fill the rivet holes, and shall be allowed to cool and shrink under pressure.

Calking.

257 *Calking.* The calking edges of plates, butt straps and head shall be beveled. Every portion of the sheared surfaces of the calking edges of plates, butt straps and heads shall be planed, milled or chipped to a depth of not less than ⅛ in. Calking shall be done with a round-nosed tool.

Manholes.

258 *Manholes.* An elliptical manhole opening shall be not less than 11 × 15 in. or 10 × 16 in. in size. A circular manhole opening shall be not less than 15 in. in diameter.

259 A manhole reinforcing ring when used, shall be of steel or wrought-iron, and shall be at least as thick as the shell plate.

260 Manhole frames on shells or drums when used, shall have the proper curvature, and on boilers over 48 in. in diameter shall be riveted to the shell or drum with two rows of rivets, which may be pitched as shown in Fig. 18. The strength of the rivets in shear on manhole frames and reinforcing rings shall be at least equal to the tensile strength of that part of the shell plate removed, on a line parallel to the axis of the shell, through the center of the manhole, or other opening.

261 The proportions of manhole frames and other reinforcing rings to conform to the above specifications may be determined by the use of the following formulae, which are based on the assumption that the rings shall have the same tensile strength per square inch of section as, and be of not less thickness than, the shell plate removed.

For a single-riveted ring: $W=\frac{l\times t_1}{2\times t}+d$

For a double-riveted ring: $W=\frac{l\times t_1}{2\times t}+2d$

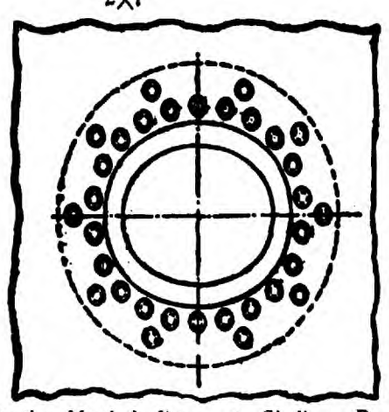


Fig. 18. Method of Riveting Manhole Frames to Shells or Drums with Two Rows of Rivets.

For two single-riveted rings: $W=\frac{l\times t_1}{4\times t}+d$

For two double-riveted rings: $W=\frac{l\times t_1}{4\times t}+2d$

Where

W=least width of reinforcing ring, in.

t_1 = thickness of shell plate, in.
d = diameter of rivet when driven, in.
t = thickness of reinforcing ring—not less than thickness of the shell plate, in.
T = tensile strength of the ring, lb. per sq. in. of section
a = net section of one side of the ring or rings, sq. in.
S = shearing strength of rivet, lb. per sq. in. of section (see Par. 16)
l = length of opening in shell in direction parallel to axis of shell, in.
N = number of rivets

To find the number of rivets for a single or double reinforcing ring:

$$N = \frac{5.1 \times T \times a}{S \times d^2}$$

262 Manhole plates shall be of wrought steel or shall be steel castings.

263 The minimum width of bearing surface, for a gasket on a manhole opening shall be ½ in. No gasket for use on a manhole or handhole of any boiler shall have a thickness greater than ¼ in.

264 A manhole shall be located in the front head, below the tubes, of a horizontal return tubular boiler 48 in. or over in diameter. Smaller boilers shall have either a manhole or a handhole below the tubes. There shall be a manhole in the upper part of the shell or head of a fire-tube boiler over 40 in. in diameter, except a vertical fire-tube boiler, or except on internally fired boilers not over 48 in. in diameter. The manhole may be placed in the head of the dome. Smaller boilers shall have either a manhole or a handhole above the tubes.

Washout Holes.

265 A traction ,portable or stationary boiler of the locomotive type shall have not less than six handholes, or washout plugs, located as follows: one in the rear head below the tubes; one in the front head at or about the line of the crown sheet; four in the lower part of the waterleg; also, where possible, one near the throat sheet.

266 A vertical fire-tube boiler, except boilers of steam fire-engines, or boilers 24 in. or less in diameter shall have not less than seven handholes, located as follows: Three in the shell at or about the line of the crown sheet; one in the shell at or about the water-line or opposite the fusible plug when used; three in the shell at the lower part of the waterleg. A vertical firetube boiler, submerged tube type, shall have two or more handholes in the shell, in line with the upper tube sheet. All boilers 24 in. or less in diameter, shall have at least one opening for inspection and one opening in addition to the blow-off, for washing out the boiler, these openings to be fitted with brass plugs.

267 A vertical fire-tube boiler of a steam fire-engine shall have at least three brass washout plugs of not less than 1-in. iron pipe size, screwed into the shell and located as follows: one at or about the line of the crown sheet; two at the lower part of the waterleg.

Threaded Openings.

268. *Threaded Openings.* An opening in a boiler for a threaded pipe connection 1 in. in diameter or over shall have not less than the number of threads given in Table 7.

Table 7. Minimum Number of Pipe Threads for Connections to Boilers.

Size of pipe connection, in.....	1 and 1¼	1½ and 2	2½ to 4 inclusive.	4½ to 6 inclusive.	7 and 8	9 and 10	12
Number of threads per in.....	11½	11½	8	8	8	8	8
Minimum number of threads required in opening	4	5	7	8	10	12	13
Minimum thickness of material required to give above number of threads, in.....	0.348	0.435	0.875	1	1.25	1.5	1.625

If the thickness of the material in the boiler is not sufficient to give such number of threads, there shall be a pressed steel flange, bronze composition flange, steel-cast flange or steel plate, so as to give the required number of threads.

Safety Valves.

269 *Safety Valve Requirements.* Each boiler shall have two or more safety valves, except a boiler for which one safety valve 2 in. size or smaller is required by these Rules; in which case one or more may be used.

270 The safety valve capacity for each boiler shall be such that the safety valve or valves will discharge all the steam that can be generated by the boiler without allowing the pressure to rise more than six per cent. above the maximum allowable working pressure, or more than six per cent. above the highest pressure to which any valve is set.

271 One or more safety valves on every boiler shall be set at or below the maximum allowable working pressure. The remaining valves may be set within a range of three per cent. above the maximum allowable working pressure, but the range of setting of all of the valves on a boiler shall not exceed ten per cent. of the highest pressure to which any valve is set.

272 Safety valves shall be of the direct spring loaded pop type with seat and bearing surface of the disc either inclined at an angle of about 45 deg. or flat at an angle of about 90 deg. to the center line of the spindle. The vertical lift of the valve disc measured immediately after the sudden lift due to the pop may be made any amount desired up to a maximum of 0.15 in. irrespective of the size of the valve. The nominal diameter measured at the inner edge of the valve seat shall be not less than 1 in. or more than 4½ in.

273 Each safety valve shall be plainly marked by the manufacturer. The markings may be stamped on the body, cast on the body or stamped or cast on a plate or plates riveted to the body and shall contain the following:

a The name or identifying trademark of the manufacturer.
b The nominal diameter with the words "Bevel Seat" or "Flat Seat."
c The steam pressure at which it is set to blow.
d The lift in inches of the valve disc from its seat, measured at a pressure 3 per cent. higher than that at which the valve is set to blow.
e The weight of steam discharged in pounds per hour at a pressure 3 per cent. higher than that for which valve is set to blow.

274 The minimum capacity of a safety valve or valves to be placed on a boiler shall be determined on the basis of 6 lb. of steam per hour per sq. ft. of boiler heating surface for water tube boilers, and 5 lb. for all other types of power boilers, and upon the relieving capacity marked on the valves by the manufacturer, provided such marked relieving capacity does not exceed that given in Table 8. In case the relieving capacity marked on the valve or valves exceeds the maximum given in Table 8, the minimum safety valve capacity shall be determined on the basis of the maximum relieving capacity given in Table 8 for the particular size of valve and working pressure for which it was constructed. The heating surface shall be computed for that side of the boiler surface exposed to the products of combustion, exclusive of the superheating surface. In computing the heating surface for this purpose only the tubes, shells, tube sheets and the projected area of headers need be considered.

275 Safety valve capacity may be checked in any one of three different ways, and if found sufficient, additional capacity need not be provided:

a By making an accumulation test, that is, by shutting off all other steam discharge outlets from the boiler and forcing the fires to the maximum. The safety valve equipment shall be sufficient to prevent an excess pressure beyond that specified in Par. 270.

b By measuring the maximum amount of fuel that can be burned and computing the corresponding evaporative capacity upon the basis of the heating value of the fuel. See Appendix, Pars. 421 to 427.

c By determining the maximum evaporative capacity by measuring the feed water. The sum of the safety valve capacities marked on the valves, shall be equal to or greater than the maximum evaporative capacity of the boiler.

276 When two or more safety valves are used on a boiler, they may be either separate or twin valves made by mounting individual valves on Y-bases, or duplex, triplex or multiplex valves having two or more valves in the same body casing.

277 The safety valve or valves shall be connected to the boiler independent of any other steam connection, and attached as close as possible to the boiler, without any unnecessary intervening pipe or fitting. Every safety valve shall be connected so as to stand in an upright position, with spindle vertical, when possible.

278 Each safety valve shall have full sized direct connection to the boiler. No valve of any description shall be placed between the safety valve and the boiler, nor on the discharge pipe between the safety valve and the atmosphere. When a discharge pipe is used, it shall be not less than the full size of the valve, and shall be fitted with an open drain to prevent water from lodging in the upper part of the safety valve or in the pipe.

279 If a muffler is used on a safety valve it shall have sufficient outlet area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve. The muffler plates or other devices shall be so constructed as to avoid any possibility of restriction of the steam passages due to deposit. When an elbow is placed on a safety valve discharge pipe, it shall be located close to the safety valve outlet or the pipe shall be securely anchored and supported. All safety valve dicharges shall be so located or piped as to be carried clear from running boards or working platforms used in controlling the main stop valves of boilers or steam headers.

Where discharge pipes are used ample drainage shall be provided at or near the safety valve.

280 When a boiler is fitted with two or more safety valves on one connection, this connection to the boiler shall have a cross-sectional area not less than the combined area of all of the safety valves with which it connects.

281 Safety valves shall operate without chattering and shall be set and adjusted as follows: To close after blowing down not more than 4 lb. on boilers carrying an allowed pressure less than 100 lbs. per sq. in. gage. To close after blowing down not more than 6 lb. on boilers carrying pressures between 100 and 200 lb. per sq. in. gage inclusive. To close after blowing down not more than 8 lb. on boilers carrying over 200 lb. per sq. in. gage.

282 For purposes of inspection and to insure the valve being free, each safety valve used on a boiler shall have a substantial lifting device by which the valves may be raised by an amount equal to one-twentieth of the nominal diameter of the valve up to the maximum limit of 1-16 in. when there is no pressure on the boiler.

283 The seats and discs of safety valves shall be of non-ferrous material. The seat of a safety valve shall be fastened to the body of the valve in such a way that there is no possibility for the seat to lift.

284 Springs used in safety valves shall not show a permanent set exceeding 1-32 in. ten minutes after being released from a cold compression test closing the spring solid.

Springs used in safety valves shall not show a permanent set exceeding 1-32 in. ten minutes after being released from a cold compression test closing the spring solid. And the spring shall be so constructed that the valve can lift from its seat one-tenth the diameter of the seat before the coils are closed or before there is other interference.

285 The spring in a safety valve shall not be used for any pressure more than 10 pen cent above or below that for which it was designed.

286 All dimensions shall conform to the American Standard given in Tables 15 and 16 of the Appendix for the pressure therein specified, except that the face of the safety valve flange and the nozzle to which it is attached shall be flat and without the raised face for pressure up to and including 250 lb. per sq. in. For higher pressure, the raised face shall be used.

287 When the letters *A S M E Std* are plainly stamped or cast on the valve body this shall be a guarantee by the manufacturer that the valve conforms with the details of construction herein specified.

288 Every superheater shall have one or more safety valves near the outlet. The discharge capacity of the safety valve or valves on an attached superheater may be included in determining the number and sizes of the safety valves for the boiler, provided there are no intervening valves between the superheater safety valve and the boiler.

289 Every safety valve used on a superheater, discharging superheated steam, shall have a steel body with a flanged inlet connection, and shall have the seat and disc of nickel composition or equivalent material, and the spring fully exposed outside of the valve casing so that it shall be protected from contact with the escaping steam.

290 Every boiler shall have proper outlet connections for the required safety valve or valves, independent of any other steam outlet connection or of any internal pipe in the steam space of the boiler, the area of opening to be at least equal to the aggregate area of all of the safety valves to be attached thereto.

Water and Steam Gages.

291 *Water Glasses and Gage Cocks.* Each boiler shall have at least one water glass, the lowest visible part of which shall be not less than 2 in. above the lowest permissible water level.

The lowest permissible water level for various classes of boilers is given in Par. 430 of the Appendix.

292 No water glass connection shall be fitted with an automatic shut-off valve, except when the automatic shut-off valves are so constructed that the two connections to the water glass can be blown through separately and the steam connection cannot be entirely closed thereby.

293 When shut-offs are used on the connections to a water column, they shall be either outside screw and yoke type gate valves or stop cocks with levers permanently fastened thereto, and such valves or cocks shall be locked or sealed *open*.

294 Each boiler shall have three or more gage cocks, located within the range of the visible length of the water glass, except when such boiler has two water glasses with independent connections to the boiler and located on the same horizontal line and not less than 2 ft. apart.

295 No outlet connections, except for damper regulator, feed-water regulator, drains or steam gages, shall be placed on the pipes connecting a water column, to a boiler.

296 *Steam Gages.* Each boiler shall have a steam gage connected to the steam space or to the water column or its steam connection. The steam gage shall be connected to a syphon or equivalent device of sufficient capacity to keep the gage tube filled with water and so arranged that the gage cannot be shut off from the boiler except by a cock placed near the gage and provided with a tee or lever handle arranged to be parallel to the pipe in which it is located when the cock is open. Connections to gages shall be of brass, copper or bronze composition.

Where the use of a long pipe becomes necessary a shut-off valve or cock arranged so that it can be locked or sealed open may be used near the boiler. Such a pipe shall be of ample size and arranged so that it may be cleared by blowing out.

297 The dial of the steam gage shall be graduated to not less than 1½ times the maximum allowable working pressure on the boiler.

298 Each boiler shall be provided with a ¼-in. pipe size valved connection for attaching a test gage when the boiler is in service, so that the accuracy of the boiler steam gage can be ascertained.

299 *Nozzles and Fittings.* Flanged cast iron pipe fittings used for boiler parts, for pressures up to and including 160 lb. per sq. in. shall conform to the American Standards given in Tables 15 and 16 of the Appendix, except that the face of the flange of a safety valve as well as that of a safety valve nozzle, shall be flat and without the raised face. For pressures above 160 lb. per sq. in., steel cast and wrought steel fittings shall be used for boiler parts with exceptions specified in Pars. 9 and 12. An allowable variation of 20 per cent from the flange thickness required by Tables 15 and 16 may be made for steel cast and forged steel fittings, leaving the drilling of bolt holes unchanged. For pressures above 250 lb. per sq. in., the flange thickness and the thickness of the bodies shall be increased to keep within the same deflection limits and to give at least the same factor of safety as the fittings specified in Tables 15 and 16. The face of the flange of a safety valve, as well as that of a safety valve nozzle, shall have a flat face for pressures up to and including 250 lb. per sq. in. and shall have raised face at higher pressures. Tables 15 and 16 do not apply to flanges on the boiler side of steam nozzles or to flanges left by the manufacturer as part of the boiler, and do not apply to fittings designed as part of the boiler.

300 The minimum number of threads that a pipe or fittings shall screw into a tapped hole shall correspond to the numerical values given for number of threads in Table 7.

301 *Stop Valves.* Each steam discharge outlet over 2 in. in diameter, except safety valve and superheater connections, shall be fitted with a stop valve or valves of the outside screw and yoke type, located as near the boiler as practicable.

302 The main stop valves of boilers shall be extra heavy when the maximum allowable working pressure exceeds 125 lb. per sq. in. The fittings between the

boiler and such valve or valves shall be extra heavy, as specified in Table 16 of the Appendix.

303 When two or more boilers are connected to a common steam main, two stop valves, with an ample free blow drain between them, shall be placed in the steam connection between each boiler and the steam main. The discharge of this drain valve must be visible to the operator while manipulating the valve. The stop valve shall consist preferably of one automatic non-return valve (set next the boiler) and a second valve of the outside screw and yoke type; or, two valves of the outside screw and yoke type may be used.

304 When a stop valve is so located that water can accumulate, ample drains shall be provided.

305 *Steam Mains.* Provisions shall be made for the expansion and contraction of steam mains connected to boilers, by providing substantial anchorage at suitable points, so that there shall be no undue strain transmitted to the boiler. Steam reservoirs shall be used on steam mains when heavy pulsations of the steam currents cause vibration of the boiler shell plates.

306 Each superheater shall be fitted with a drain.

307 *Blow-off Piping.* A surface blow-off pipe shall not exceed 1½ in. pipe size and shall form a continuous passage with the blow-off pipe external to the boiler. The internal and external pipes shall be separate with clearance between their ends and arranged so that the removal of either will not disturb the other. A brass or steel bushing as shown in Fig. 19, or flanged connection shall be used.

308 Each boiler shall have a bottom blow-off pipe, fitted with a valve or cock, in direct connection with the lowest water space practicable; the minimum size of pipe and fittings shall be 1 in. and the maximum size shall be 2½ in. Globe valves shall not be used on such connections.

309 A bottom blow-off cock shall have the plug held in place by a guard or gland. The end of the plug shall be distinctly marked in line with the passage.

310 The blow-off pipe or pipes shall be extra heavy from boiler to valve or valves, and shall run full size without reducers or bushings. All fittings between the boiler and valves shall be of steel.

311*a* When the maximum allowable working pressure exceeds 125 lb. per sq. in., on all boilers except those used for traction and portable purposes, each bottom blow-off pipe shall have two valves, or a valve and a cock, and such valves, or valve and cock, shall be extra heavy, except that on a boiler having multiple blow-off pipes, a single master valve may be placed on the common blow-off pipe from the boiler, in which case only one valve on each individual blow-off is required.

b On all traction and portable boilers when the maximum allowable working pressure exceeds 125 lbs. per sq. in., each bottom blow-off pipe shall have one extra heavy valve.

312 A bottom blow-off pipe when exposed to direct furnace heat shall be protected by fire-brick, a substantial cast-iron removable sleeve or a covering of non-conducting material.

313 An opening in the boiler setting for a blow-off pipe shall be arranged to provide for free expansion and contraction.

314 *Feed Piping.* The feed pipe of a boiler shall have an open end or ends. Wherever globe valves are used on feed piping, the inlet shall be under the disc of the valve.

315 The feedwater shall discharge at about three-fifths the length of a horizontal return tubular boiler from the front head (except a horizontal return tubular boiler equipped with an auxiliary feedwater heating and circulating device), above the central rows of tubes, when the diameter of the boiler exceeds 36 in. The feed pipe shall be carried through the head or shell near the front end in the way specified for a surface blow-off in Par. 307 and be securely fastened inside the shell above the tubes.

316 Feedwater shall not discharge in a boiler close to riveted joints in the shell or to furnace sheets.

317 The feed pipe shall be provided with a check valve near the boiler and a valve or cock between the check valve and the boiler, and when two or more boilers are fed from a common source, there shall also be a globe valve on the branch to each boiler, between the check valve and the source of supply.

318 When a pump, inspirator or injector is required to supply feedwater to a boiler plant of over 50 h. p., more than one such appliance shall be provided.

319 *Lamphrey Fronts.* Each boiler fitted with a Lamphrey boiler furnace mouth protector, or similar appliance, having valves on the pipes connecting them to the boiler, shall have these valves locked or sealed *open*. Such valves when used, shall be of the straightway type.

320 *Water Column Pipes.* The minimum size of pipes connecting the water column to a boiler shall be 1 in. Water-glass fittings or gage cocks may be connected direct to the boiler.

321 The water connections to the water column of a boiler shall be of brass and shall be provided with a cross to facilitate cleaning. Either the water column or this connection shall be fitted with a drain cock or drain valve with a suitable connection to the ashpit, or other safe point of waste. The water column blow-off pipe shall be at least ¾ in.

322 The steam connection to the water column of a horizontal return tubular boiler shall be taken from the top of the shell or the upper part of the head; the water connection shall be taken from a point not less than 6 in. below the center line of the shell.

Setting.

323 *Methods of Support.* A horizontal return tubular boiler over 78-in. in diameter shall be supported from steel lugs by the outside suspension type of setting, independent of the boiler side walls. The lugs shall be so designed that the load is properly distributed between the rivets attaching them to the shell and so that not more than two of these rivets come in the same longitudinal line on each lug. The distance girthwise of the boiler from the centers of the bottom rivets to the centers of the top rivets attaching the lugs shall not be less than 12 in. The other rivets used shall be spaced evenly between these points. If more than four lugs are used they shall be set in four pairs.

324 A horizontal return tubular boiler over 54 in., and up to and including 78 in. in diameter, shall be supported by the outside suspension type of setting, or at four points by not less than eight steel or cast-iron brackets set in pairs. A horizontal return tubular boiler up to and including 54 in. in diameter shall be supported by the outside suspension type of setting, or by not less than two steel or cast-iron brackets on each side.

325 Lugs or brackets, when used to support boilers of all types shall be properly fitted to the surfaces to which they are attached. The shearing and crushing stresses on the rivets used for attaching the lugs or brackets shall not exceed 8 per cent. of the strength given in Pars. 15 and 16.

326. Wet-bottom stationary boilers shall have a space of not less than 12 in. between the bottom of the boiler and the floor line, with access for inspection.

327. *Access and Firing Doors.* The minimum size of an access door to be placed in a boiler setting shall be 12 × 16 in. or equivalent area, 11 in. to be the least dimension in any case.

328 A water tube boiler which is fired by hand shall have the firing door or doors of the inward opening type unless such doors are provided with substantial and effective latching devices to prevent them from being blown open by pressure on the furnace side.

Hydrostatic Tests.

329 *Hydrostatic Pressue Tests.* After a boiler has been completed, it shall be subjected to a hydrostatic test of one and one-half times the maximum allowable working pressure. The pressure shall be under proper control so that in no case shall the required test pressure be exceeded by more than 6 per cent.

330 During a hydrostatic test, the safety valve or valves shall be removed or each valve disc shall be held to its seat by means of a testing clamp and not by screwing down the compression screw upon the spring.

Stamping.

331. *Stamping of Boilers.* In laying out shell plates, furnace sheets and heads in the boiler stop, care shall be taken to leave at least one of the stamps, specified in Par. 36 of these Rules, so located as to be plainly visible when the boiler is completed; except that the tube sheets of a vertical fire-tube boiler and butt straps shall have at least a portion of such stamps visible sufficient for identification when the boiler is completed.

332 Each boiler shall conform in every detail to these Rules and shall be distinctly stamped by the builder with the New York State standard stamp as shown in Fig. 20, denoting that the boiler was constructed in accordance therewith. The height of the letters and figures used in stamping shall be not less than ¼ in. and this stamp shall be located as specified in par. 333.

New York Std.
Number of boiler.
Working pressure when built.
Year put in service.
Name of builder.

Fig. 20. Form of Stamp Proposed for the Boiler Manufacturer.

333 *Location of Stamps.* The location of stamps shall be as follows:

a On horizontal return tubular boilers—on the front head, above the central rows of tubes.

b On horizontal flue boilers—on the front head, above the flues.

c On traction, portable or stationary boilers of the locomotive type or Star water-tube boilers—on the furnace end, above the handhole.

d On vertical fire tube and vertical submerged tube boilers—on the shell above the fire door.

e On water-tube boilers, Babcock & Wilcox, Stirling, Heine and Robb-Mumford standard types—on a head above the manhole opening, preferably on the flanging of the manhole opening.

f On vertical boilers, Climax or Hazelton type—on the top head.

g On Cahall or Wickes vertical water tube boilers—on the upper drum, above the manhole opening.

h On Scotch marine boilers—on the front head, above the center or right-hand furnace.

i On Economic boilers—on the front head, above the central row of tubes.

j For other types and new designs—in a conspicuous location.

334 The New York State standard stamp shall not be covered by insulating or other material.

New Installations.

PART I—SECTION II.

Boilers Used Exclusively for Low Pressure Steam and Hot Water Heating and Hot Water Supply.

(This does not apply to economizers or feed water heaters.)

Boiler Materials.

335 The Rules for power boilers shall apply:

a To all steel plate *hot-water* boilers over 60 in. in diameter.

b To all steel plate *hot-water* boilers where the grate area exceeds 10 sq. ft. and the maximum allowable working pressure exceeds 50 lbs. per sq. in.

c Under other conditions, the following rules (Pars. 336 and 337) shall apply.

336 Specifications are given in these rules, Pars. 23 to 178, for the important materials used in the construction of boilers, and where given, the materials shall conform thereto.

337 Flange steel may be used entirely for the construction of steam heating boilers covered in this section, but in no case shall steel of less than ¼ in. thickness, nor tube sheets or heads of less than 5/16 in. in thickness be used.

Maximum Allowable Working Pressure.

338 The maximum allowable working pressure shall not exceed 15 lbs. per sq. in. on a boiler built under these rules to be used exclusively for low pressure steam heating.

339 A boiler to be used exclusively for low pressure steam heating may be constructed either of cast iron, steel cast, or wrought iron or steel or any combination of these, but in all cases the connecting rods and bolts shall be wrought iron or steel.

340 All steel plate, *hot-water* and *steam-heating* boilers shall have a factor of safety not less than 5.

Boiler Joints.

341 Longitudinal lap joints will be allowed on boilers to be used exclusively for low pressure *steam* heating, when the maximum allowable working pressure does not exceed 15 lbs. per sq. in., and the diameter of the boiler shell does not exceed 60 in.

342 The longitudinal joints of a horizontal return tubular boiler, if of the lap tape, shall be not over 12 ft. in length.

343 In a hot-water boiler to be used exclusively for heating buildings or hot water supply, when the diameter does not exceed 60 in. and the grate area does not exceed 10 sq. ft., or equivalent, as defined in Pars. 359 and 360, longitudinal lap joints will be allowed.

When the grate area exceeds 10 sq. ft., or equivalent, as defined in Par. 360, and the diameter of the boiler does not exceed 60 in. longitudinal, lap joints will be allowed, providing the maximum allowable working pressure does not exceed 50 lb. per sq. in.

344 *Protection of Joints.* When a boiler is built wholly or partially of steel and is used exclusively for low pressure *steam* heating, or when a *hot-water* boiler is used exclusively for heating buildings or for hot-water supply, it shall not be necessary to water jacket the rivets in the fire-box where one end of each rivet is exposed to the fire or direct radiant heat from the fire, provided any one of the following conditions is fulfilled:

a Where the ends of the rivets away from the fire are protected by means of natural drafts of cold air induced in the regular operation of the boiler;

b Where the ends of the rivets away from the fire are in the open air;

c Where the rivets are protected by the usual charges of fresh fuel, which is not burned in contact with the rivets.

Washout Holes.

345 A boiler used for hot-water supply shall have washout holes or other provision made for the removal of any sediment that may accumulate therein.

Boiler Openings.

346 *Flanged Connections.* Openings in boilers having flanged connections shall have the flanges conform to the American Standard given in Tables 15 or 16 of the Appendix, for the corresponding pipe size, and shall have the corresponding drilling for bolts or studs.

Safety Valves.

347 *Outlet Connections for Safety and Water Relief Valves.* Every boiler shall have proper outlet connections for the required safety, or water relief valve or valves, independent of any other connection outside of the boiler or any internal pipe in the boiler, the area of the opening to be at least equal to the aggregate area of all of the safety valves with which it connects. A screwed connection may be used for attaching a safety valve to a heating boiler. This rule applies to all sizes of safety valves.

348 *Safety Valves.* Each *steam* boiler shall be provided with one or more safety valves of the spring-pop type which cannot be adjusted to a higher pressure than 15 lbs. per sq. in.

349 *Water-Relief Valves.* Each *hot-water* boiler shall be provided with one or more water relief valves with open discharges having outlets in plain sight.

350 A boiler used for heating buildings by hot water, or for hot water supply, shall be provided with a water relief valve or valves, which cannot be adjusted for a pressure in excess of the maximum pressure allowed on the boiler. All water relief valves must be fitted with a device for lifting the disc of the valve from its seat so that the working condition can be ascertained.

351 No water relief valve shall be smaller than one inch. Water relief valves to be of the following sizes:

When the grate area does not exceed 8 sq. ft., a water relief valve not less than 1 in. size shall be used.

When the grate area exceeds 8 square feet, but does not exceed 13 sq. ft., a water relief valve not less than 1¼-in. size shall be used.

When the grate area exceeds 13 sq. ft., but does not exceed 18 sq. ft., a water relief valve not less than 1½-in. size shall be used.

When the grate area exceeds 18 sq. ft., a water relief valve not less than 2-in. size shall be used.

352 When two or more safety or water relief valves are used on a boiler, they may be single or twin valves.

353 Safety or water relief valves shall be connected to boilers independent of other connections and be attached directly or as close as possible to the boiler,

without any intervening pipe or fittings, except the Y-base forming a part of the twin valve or the shortest possible connection. A safety or water relief valve shall not be connected to an internal pipe in the boiler. Safety valves shall be connected so as to stand upright, with the spindle vertical, when possible.

354 No shut-off of any description shall be placed between the safety or water relief valve and boilers, nor on discharge pipes between them and the atmosphere.

355 When a discharge pipe is used, its area shall be not less than the area of the valve or aggregate area of the valves with which it connects, and the discharge pipe shall be fitted with an open drain to prevent water from lodging in the upper part of the valve or in the pipe. When an elbow is placed on a safety or water relief valve discharge pipe, it shall be located close to the valve outlet or the pipe shall be securely anchored and supported. The safety or water relief valves shall be located as provided in Par. 353, and the discharge outlet so arranged that there will be no danger from scalding.

356 Each safety valve used on a *steam* heating boiler shall have a substantial lifting device which shall be so connected to the disc that the latter can be lifted from its seat a distance of not less than one-tenth of the nominal diameter of the seat when there is no pressure on the boiler.

Table 9. Allowable Sizes of Safety Valves for Steam Heating Boilers, of Water Relief Valves for Water Heating Boilers, and of Hot Water Supply Boilers.

Diameter of Valve, Inches.	Area of Valve, Square Inches.	Water Evaporated Per Square Foot of Grate Surface Per Hour, Lbs. 75	100	160	160	200	240
		Maximum Allowable Working Pressure, Lbs. Per Square Inch.					
		Zero to 25 Lbs.	Over 25 to 50 Lbs.	Over 50 to 100 Lbs.	Over 100 to 150 Lbs.	Over 150 to 200 Lbs.	Over 200 Lbs.
		Area of Grate, Square Feet.					
1	0.7854	2.00	2.50	2.75	3.25	3.5	3.75
1¼	1.2272	3.25	4.00	4.25	5.00	5.5	5.75
1½	1.7671	4.50	5.50	6.00	7.25	8.0	8.50
2	3.1416	8.00	9.75	10.75	13.00	14.0	15.00
2½	4.9087	12.50	15.00	16.50	20.00	22.0	23.00
3	7.0686	17.75	21.50	24.00	29.00	31.5	33.25
3½	9.6211	24.00	29.50	32.50	39.50	43.0	45.25
4	12.5660	31.50	38.25	42.50	51.50	56.0	39.00
4½	15.9040	40.00	48.50	53.50	65.00	71.0	74.25

357 Every safety valve or water relief valve shall have plainly stamped on the body or cast thereon the manufacturer's name or trade mark and the pressure at which it is set to blow. The seats and discs of safety or water relief valves shall be made of non-ferrous material.

358 The minimum size of a safety valve for a steam boiler shall be one inch, and the maximum size shall be 4½ inches. The size of safety valve required for a steam boiler shall be governed by the grate area of the boiler as shown in Table number 9 and the pressure allowed.

When the conditions exceed those on which Table 9 is based, the following formula for bevel and flat seated valves shall be used:

$$A = \frac{W\,70}{P} \times 11$$

in which

A = area of direct spring-loaded safety valve per square foot of grate surface, sq. in.

W = weight of water evaporated per square foot of grate surface per second, lb.

P = pressure (absolute) at which the safety valve is set to blow, lbs. per sq. in.

GRATE AREA.

359 *Double Grate Down Draft Boilers.* In boilers of this type the grate area shall be taken as one and one-quarter times the area of the lower grate.

360 *Boilers Fired with Oil or Gas.* In determining the number and size of safety or water relief valve or valves for a boiler using gas or liquid fuel, 15 sq. ft. of heating surface shall be equivalent to one square foot of grate area. If the size of grate for use of coal is evident from the boiler design, such size may be the basis for the determination of the safety valve capacity.

STEAM AND WATER GAGES.

361 *Steam Gages.* Each *steam* boiler shall have a steam gage connected to the steam space or to the water column or its steam connection, by means of a syphon or equivalent device of sufficient capacity to keep the gage tube filled with water and so arranged that the gage cannot be shut off from the boiler except by a cock placed near the gage an dprovided with a tee or lever handle arranged to be parallel with the pipe in which it is located when the cock is open. Connections to gages shall be of brass, copper or bronze composition. The dial of a steam gage for a *steam* heating boiler shall be graduated to not less than 30 lb.

362 *Pressure r Altitude Gages.* Each *hot-water* boiler shall have a gage connected in such a manner that it cannot be shut off from the boiler except by a cock with tee or lever handle, placed on the pipe near the gage. The handle of the cock shall be parallel to the pipe in which it is located when the cock is open. Connections to gages shall be made of brass, copper or bronze composition. The dial of the pressure or altitude gage shall be graduated to not less than 1½ times the maximum allowable working pressure.

363 *Thermometers.* Each *hot-water* boiler shall have a thermometer so located and connected that it shall be easily readable when observing the water pressure or altitude. The thermometer shall be so located that it shall at all times indicate the temperature in deg. Fahr. of the water in the boiler.

FITTINGS AND APPLIANCES.

364 *Bottom Blow-Off Pipes.* Each boiler shall have a blow-off pipe, fitted with a valve or cock, in direct connection with the lowest water space practicable.

365 *Damper Regulators.* When a pressure damper regulator is used, it shall be connected to the steam space of the boiler.

366 *Water Glasses.* Each *steam* boiler shall have one or more water glasses.

367 *Gage Cocks.* Each *steam* boiler shall have two or more gage cocks located within the range of visible length of the water glass.

368 *Water Column Pipes.* The minimum size of pipes connecting the water column of a boiler shall be 1 in. Water-glass fittings or gage cocks may be connected direct to the boiler. The steam connection to the water column of a horizontal return tubular boiler shall be taken from the top of shell or the upper part of the head; the water connection shall be taken from a point not less than 6 in. below the center line of the shell. No connections, except for damper regulator, oil burner regulator, feed water regulator, drain or steam gages, shall be placed on the pipes connecting a water column to a boiler.

METHODS OF SETTING.

369 Wet-bottom steel plate boilers shall have a space of not less than 12 in. between the bottom of the boiler and the floor line with access for inspection.

370 *Access Doors.* The minimum size of access door used in boiler settings shall be 12 x 16 in. or equivalent area, the least dimension being 11 in.

371 The longitudinal joints of a horizontal return tubular boiler shall be located above the fire-line.

HYDROSTATIC TESTS.

372 A shop test of 60 lbs. per sq. in. hydrostatic pressure shall be applied to steel or cast-iron boilers or to the sections of cast-iron boilers which are used exclusively for low pressure *steam* heating.

373 *Hot-water* boilers for a maximum allowable working pressure not exceeding 30 lb. per sq. in. used exclusively for heating buildings or for hot-water supply, when constructed of cast iron, steel cast, or wrought iron or plate steel, or any combination of these, shall be subjected to a shop test of 60 lb. per sq. in. hydrostatic pressure applied to the boiler or the section thereof.

374 A maximum allowable working pressure in excess of 30 lb. per sq. in. will be allowed on a hot-water boiler constructed of cast iron, steel cast, or wrought iron or plate steel, or any combination of these, used exclusively for heating buildings or for hot-water supply, provided such boilers or their sections have been subjected to a shop hydrostatic test of two and one-half times the actual working pressure.

375 Individual shop inspection shall be required only for boilers which come under the rules for power boilers.

STAMPING.

376 Each plate of a completed boiler shall show a sufficient portion of the plate maker's stamp for identification.

377. *Name.* All boilers referred to in this section shall be plainly and permanently marked with the manufacturer's name and the maximum allowable working pressure.

All heating boilers built according to these rules may be marked A.S.M.E. standard.

Existing Installations.

PART II.

MAXIMUM ALLOWABLE WORKING PRESSURE.

378 The maximum allowable working pressure on the shell of a boiler or drum shall be determined by the strength of the weakest course, computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint, the inside diameter of the course and the factor of safety allowed by these ruls.

$$\frac{TS \times t \times E}{R \times FS} = \text{maximum allowable working pressure, lb. per sq. in. where}$$

TS = ultimate tensile strength of shell plates, lb. per sq. in.

t = thickness of shell plate, in weakest course, in.

E = efficiency of longitudinal joint, method of determining which is given in Par. 181, of these Rules

R = inside radius of the weakest course of the shell or drum, in.

FS = factor of safety allowed by these Rules.

379 One year after these rules become effective, boilers of butt and double strap construction shall not be operated without a factor of safety of at least four by the formula, Par. 378. Five years after these rules become effective, the factor of safety shall be at least four and five-tenths. In no case shall the maximum allowable working pressure on old boilers be increasd, unless they are being operated at a lesser pressure than would be allowable for new boilers, in which case the changed pressure shall not exceed that allowable for new boilers of the same construction.

380 The lowest factor of safety used for boilers, the shells or drums of which are exposed to the products of combustion, and the longitudinal joints of which are of lap riveted construction, shall be not less than the following:

4¼ for boilers not over five years old,
4½ for boilers over five and not over ten years old,
4¾ for boilers over ten and not over fifteen years old,
5 for boilers over fifteen and not over twenty years old.

For each five years thereafter the factor of safety shall be increased by not less than five-tenths; provided, however, that after a thorough internal and external inspection and a hydrostatic pressure test of one and one-half times the pressure allowed, during which no distress or leakage develops, the pressure allowed may be continued at a factor of safety of five.

The owner or user of such boiler shall prepare the boiler for hydrostatic pressure test by uncovering all riveted joints.

380-a The lowest factor of safety for boilers, the shells or drums of which are not exposed to the products of combustion, and the longitudinal joints of which are of lap riveted construction, shall be not less than the following:

4 for boilers not over ten years old,
4¼ for boilers over ten and not over fifteen years old,
4½ for boilers over fifteen and not over twenty years old,
5 for boilers over twenty years old.

For each five years thereafter the factor of safety shall be increased by not less than five-tenths; provided, however, that after a thorough internal and external inspection and a hydrostatic pressure test of one and one-half times the pressure allowed, during which no distress or leakage develops, the pressure allowed may be continued at a factor of safety of five.

The owner or user of such boiler shall prepare the boiler for hydrostatic pressure test by uncovering all riveted joints.

381 Second-hand stationary boilers, by which are meant boilers where both the ownership and location are changed, and which are not less than ten years old and which have longitudinal joints of lap riveted construction, shall have a factor of safety of at least 5½, by the formula of Par. 378, one year after these rules become effective, unless constructed in acccordance with the rules contained in Part I, when the factor of safety shall be at least five.

382 *Cast-iron Headers and Mud Drums.* The maximum allowable working pressure on a water tube boiler, the tubes of which are secured to cast-iron or malleable iron headers, or which have cast-iron mud drums, shall not exceed 160 lbs. per sq. in.

383 *Steam Heating Boilers.* The maximum allowable working pressure shall not exceed 15 lbs. per sq. in. on a boiler used exclusively for low pressure *steam* heating.

384 No pressure shall be allowed on a boiler on which a crack is discovered along the longitudinal riveted joint.

STRENGTH OF MATERIALS.

385 *Tensile Strength.* When the tensile strength of steel or wrought-iron shell plates is not known, it shall be taken at 55,000 lbs. per sq. in. for steel, and 45,000 lbs. per sq. in. for wrought-iron. When the tensile strength of cast-iron is not known, it shall be taken as 18,000 lbs. per sq. in.

386 *Strength of Rivets in Shear.* In computing the ultimate strength of rivets in shear the following values in lbs. per sq. in. of the cross-sectional area of the rivet shank shall be used:

Iron rivets in single shear	38,000
Iron rivets in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

The cross-sectional area shall be that of the rivet shank after driving.

387 *Crushing Strength of Mild Steel.* The resistance to crushing of mild steel shall be taken at 95,000 lbs. per sq. in. of cross-sectional area.

Table 10. Sizes of Rivets Based on Plate Thickness.

Thickness of plate	1/4"	9/32"	5/16"	11/32"	3/8"	13/32"
Diameter of rivet after driving	11/16"	11/16"	3/4"	3/4"	13/16"	13/16"
Thickness of plate	7/16"	15/32"	1/2"	9/16"	5/8"	....
Diameter of rivet after driving	15/16"	15/16"	15/16"	1 1/16"	1 1/16"	....

388 *Rivets.* When the diameter of the rivet holes in the longitudinal joints of a boiler is not known, the diameter and cross-sectional area of rivets, after driving may be ascertained from Table 10, or by cutting out one or more rivets in the body of the joint.

SAFETY VALVES FOR POWER BOILERS.

389 The safety valve capacity of each boiler shall be such that the safety valve or valves will discharge all the steam that can be generated by the boiler without allowing the pressure to rise more than 6 per cent above the maximum allowable working pressure, or more than 6 per cent above the highest pressure to which any valve is set.

390 One or more safety valves on every boiler shall be set at or below the maximum allowable working pressure. The remaining valves may be set within a range of 3 per cent above the maximum allowable working pressure, but the range of setting of all of the valves on a boiler shall not exceed 10 per cent of the highest pressure to which any valve is set.

391 Safety valve capacity may be checked in any one of three different ways, and if found sufficient, additional capacity need not be provided;

a By making an accumulation test, that is, by shutting off all other steam discharge outlets from the boiler and forcing the fires to the maximum. The safety valve equipment shall be sufficient to prevent an excess pressure beyond that specified in Par. 270.

b By measuring the maximum amount of fuel that can be burned and computing the corresponding evaporative capacity upon the basis of the heating value of the fuel. See Appendix, Pars. 421 to 427.

c By determining the maximum evaporative capacity by measuring the feedwater. The sum of the safety valve capacities shall be equal to or greater than the maximum evaporative capacity of the boiler.

392 In case either of the methods outlined in sections *b* or *c* of Par. 391 is em-

ployed, the safety valve capacities shall be taken at the maximum values given in Table 8 for spring loaded pop safety valves, or 0.66 times the maximum values given in Table 8, for lever safety valves.

393 When additional valve capacity is required, any valves added shall conform to the requirements in Part I of these rules.

394 No valve of any description shall be placed between the safety valve and the boiler, nor on the discharge pipe between the safety valve and the atmosphere. When a discharge pipe is used, it shall be not less than the full size of the valve, and the discharge pipe shall be fitted with an open drain to prevent water lodging in the upper part of the safety valve or in the pipe. If a muffler is used on a safety valve it shall have sufficient outlet area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve. The muffler plates or other devices shall be so constructed as to avoid any possibility of restriction of the steam passages due to deposit. When an elbow is placed on a safety valve discharge pipe, it shall be located close to the safety valve outlet or the pipe shall be securely anchored and supported. All safety valve discharges shall be so located or piped as to be carried clear from running boards or working platforms used in controlling the main stop valves of boilers or steam headers.

Fittings and Appliances.

395 *Water Glasses and Gage Cocks.* Each steam boiler shall have at least one water glass, the lowest visible part of which shall be not less than 2 in. above the lowest permissible water level.

396 Each boiler shall have three or more gage cocks, located within the range of the visible length of the water glass, when the maximum allowable working pressure exceeds 15 lbs. per sq. in., except when such boiler has two water glasses with independent connections to the boiler, located on the same horizontal line and not less than 2 ft. apart.

Exception should be made where the height of the segment above the tubes on the boiler does not exceed 12 in.; in which case, at least two gage cocks located within the visible range of the water glass must be used.

397 No connections except for damper regulator, oil burner regulator, feed water regulator, drains, or steam gages, shall be placed on the pipes connecting a water column to a boiler.

398 *Steam Gages.* Each steam boiler shall have a steam gage connected to the steam space or to the water column or to its steam connection. The steam gage shall be connected to a syphon or equivalent device of sufficient capacity to keep the gage tube filled with water and so arranged that the gage cannot be shut off from the boiler except by a cock placed near the gage and provided with a tee or lever handle arranged to be parallel to the pipe in which it is located when the cock is open. Connections to gages shall be of brass, copper or bronze composition.

Each boiler shall be provided with a ¼-in. size valved connection for attaching a test gage when the boiler is in service, so that the accuracy of the boiler steam gage can be ascertained.

399 *Stop Valves.* Each steam outlet from a power boiler (except safety valve connections) shall be fitted with a stop valve located as close as practicable to the boiler.

It is recommended that when two or more boilers are connected to a common steam main, two stop valves, with an ample free blow drain between them be placed in the steam connection between each boiler and the steam main. Also that the discharge of this drain valve be visible to the operator while manipulating the valve and further that the stop valves consist of one automatic non-return valve (set next the boiler) and a second valve of the outside screw and yoke type; or two valves of the outside screw and yoke type may be used.

400 When a stop valve is so located that water can accumulate, ample drains shall be provided.

401 *Bottom Blow-off Pipes.* Each boiler shall have a blow-off pipe fitted with a valve or cock, in direct connection with the lowest water space practicable.

402 When the maximum allowable working pressure exceeds 125 lbs. per sq. in., the blow-off pipe shall be extra heavy from boiler to valve or valves, and shall run full size without reducers or bushings. All fittings between the boiler and valve shall be steel or extra heavy fittings of bronze, brass, malleable iron or cast-iron.

403 When the maximum allowable working pressure exceeds 125 lbs. per sq. in., each bottom blow-off pipe shall be fitted with an extra heavy valve or cock. Preferably two (2) valves, or a valve and a cock should be used on each blow-off in which case such valves, or valve and cock, shall be extra heavy.

404 A bottom blow-off pipe when exposed to direct furnace heat, shall be protected from the products of combustion by firebrick, a substantial cast-iron removable sleeve, or a covering of non-conducting material.

405 An opening in the boiler setting for a blow-off pipe shall be arranged to provide for free expansion and contraction.

406 *Feed-Piping.* The feed pipe of a steam boiler shall be provided with a check valve near the boiler and a valve or cock between the check valve and the boiler, and when two or more boilers are fed from a common source, there shall also be a valve on the branch to each boiler, between the check valve and the source of supply. When a globe valve is used on a feed pipe, the inlet shall be under the disc of the valve.

The main feed in boilers shall not enter the boiler through the blow-off unless clearly impracticable to introduce it elsewhere.

When a pump, inspirator, or injector is required to supply feedwater to a boiler of over 50 horse power, more than one such mechanical appliance shall be provided.

It is recommended that wherever possible the feed water entering boilers shall be not less than one hundred twenty degrees Fahrenheit.

407 *Lamphrey Fronts.* Each boiler fitted with a Lamphrey boiler furnace mouth protector, or similar appliance, having valves on the pipes connecting them to the boiler, shall have these valves locked or sealed *open*. Such valves, when used, shall be of the straightaway type.

Hydrostatic Pressure Tests.

408. *Test Pressure.* When a hydrostatic test is applied the required test pressure shall be one and one-half times the maximum allowable working pressure. The pressure shall be under proper control so that in no case shall the required test pressure be exceeded by more than 2 per cent.

409 During a hydrostatic test of a boiler, the safety valve or valves shall be removed or each valve disc shall be held to its seat by means of a testing clamp and not by screwing down the compression screw upon the spring.

APPENDIX.

Efficiency of Joints.

410 *Efficiency of Riveted Joints.* The ratio which the strength of a unit length of a riveted joint has to the same unit length of the solid plate is known as the efficiency of the joint and shall be calculated by the general method illustrated in the following examples:

TS = tensile strength stamped on plate, lb. per sq. in.
t = thickness of plate, in.
b = thickness of butt strap, in.
P = pitch of rivets, in., on row having greatest pitch.
d = diameter of rivet after driving, in. = diameter of rivet hole.

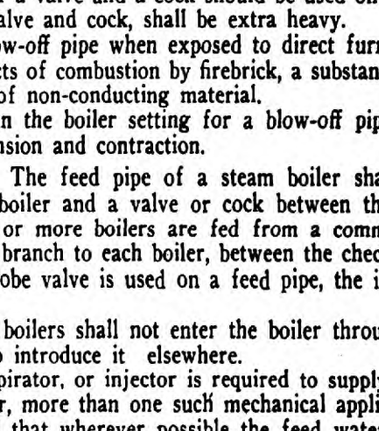


Fig. 21 Example of Lap Joint, Longitudinal or Circumferential, Single-Riveted.

a = cross-sectional area of rivet after driving, sq. in.
s = shearing strength of rivet in single shear, lb. per sq. in., as given in Par. 16.
S = shearing strength of rivet in double shear, lb. per sq. in., as given in Par. 16.
c = crushing strength of mild steel, lb. per sq. in., as given in Par. 15.
n = number of rivets in single shear in a unity length of joint.
N = number of rivets in double shear in a unit length of joint.

411 *Example:* Lap joint, longitudinal or circumferential, single-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes = $(P-d)t \times TS$
C = shearing strength of one rivet in single shear = $n \times s \times a$
D = crushing strength of a plate in front of one rivet = $d \times t \times c$

Divide B, C, or D (whichever is the least) by A, and the quotient will be the efficiency of a single-riveted lap joint as shown in Fig. 21.

TS = 55,000 lb. per sq. in.
t = ¼ in. = 0.25 in.
P = 1⅝ in. = 1.625 in.
d = 11/16 in. = 0.6875 in.
a = 0.3712 sq. in.
s = 44,000 lb. per sq. in.
c = 95,000 lb. per sq. in.
A = 1.625×0.25×55,000 = 22,343
B = (1.625−0.6875) 0.25×55,000 = 12,890
C = 1×44,000×0.3712 = 16,332
D = 0.6875×0.25×95,000 = 16,328

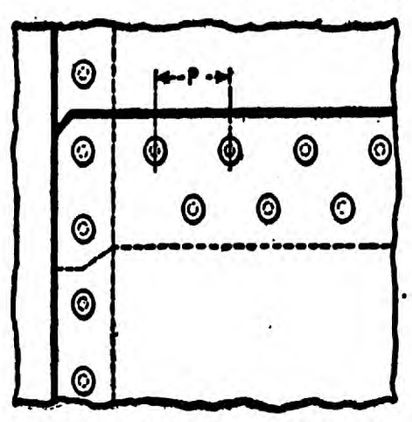


Fig. 22 Example of Lap Joint, Longitudinal or Circumferential, Double-Riveted.

$$\frac{12{,}890(B)}{22{,}343(A)} = 0.576 = \text{efficiency of joint}$$

412 *Example:* Lap joint, longitudinal or circumferential, dougle-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes = $(P-d)t \times TS$
C = shearing strength of two rivets in single shear = $n \times s \times a$
D = crushing strength of plate in front of two rivets = $n \times d \times t \times c$

Divide B, C, or D (whichever is the least) by A, and the quotient will be the efficiency of a double-riveted lap joint, as shown in Fig. 22.

TS = 55,000 lb. per sq. in.
t = 5/16 in. = 0.3125 in.
P = 2⅞ in. = 2.875 in.
d = ¾ in. = 0.75 in.
a = 0.4418 sq. in.
s = 44,000 lb. per sq. in.
c = 95,000 lb, per sq. in.
A = 2.875×0.3125×55,000 = 49,414
B = (2.875−0.75) 0.3125×55,000 = 36,523
C = 2×44,000×0.4418 = 38,878
D = 2×0.75×0.3125×95,000 = 44,531

$$\frac{36{,}523\ (B)}{49{,}414\ (A)} = 0.739 = \text{efficiency of point}$$

413 *Example:* Butt and double strap joint, double-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes in the outer row = $(P-d)\ t \times TS$
C = shearing strength of two rivets in double shear, plus the shearing strength of one rivet in single shear = $N \times S \times a + n \times s \times a$
D = strength of plate between rivet holes in the second row, plus the shearing strength of one rivet in single shear in the outer row = $(P-2d)\ t \times TS + n \times s \times a$

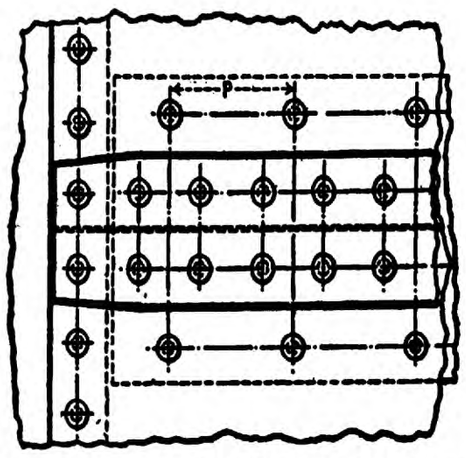


Fig. 23. Example of Butt and Double Strap Joint, Double-Riveted.

E = strength of plate between rivet holes in the second row, plus the crushing strength of butt strap in front of one rivet in the outer row = $(P-2d)\ t \times TS + d \times b \times c$
F = crushing strength of plate in front of two rivets, plus the crushing strength of butt strap in front of one rivet = $N \times d \times t \times c + n \times d \times b \times c$
G = crushing strength of plate in front of two rivets, plus the shearing strength of one rivet in single shear = $N \times d \times t \times c + n \times s \times a$
H = strength of butt straps between rivet holes in the inner row = $(P-2d)\ 2b \times TS$. This method of failure is not possible for thicknesses of butt straps required by these Rules and the computation need only be made for old boilers in which thin butt straps have been used. For this reason this method of failure will not be considered in other joints.

Divide B, C, D, E, F, G or H (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, double-riveted, as shown in Fig. 23.

TS = 55,000 lb. per sq. in.
t = ⅜ in. = 0.375 in
b = 5/16 in. = 0.3125 in.
P = 4⅞ in. = 4.875 in.
d = ⅞ in. = 0.875 in.
a = 0.6013 sq. in.
s = 44,000 lb. per sq. in.
S = 88,000 lb. per sq. in.
c = 95,000 lb. per sq. in.

Number of rivets in single shear in a unit length of joint = 1.
Number of rivets in double shear in a unit length of joint = 2.

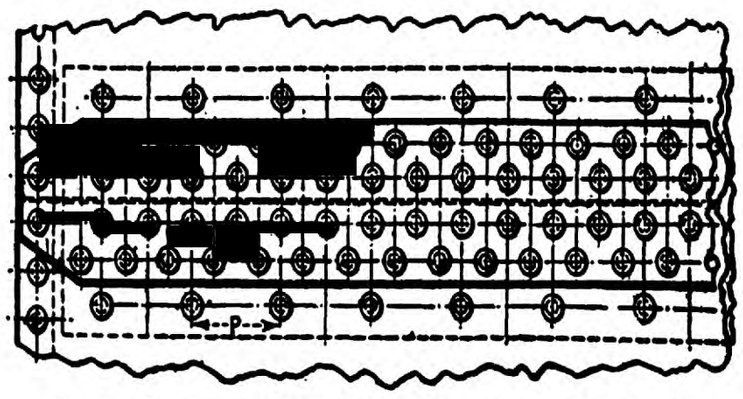


Fig. 24. Example of Butt and Double Strap Joint, Triple-Riveted.

$A = 4.875 \times 0.375 \times 55{,}000 = 100{,}547$
$B = (4.875 - 0.875)\ 0.375 \times 55{,}000 = 82{,}500$
$C = 2 \times 88{,}000 \times 0.6013 + 1 \times 44{,}000 \times 0.6013 = 132{,}286$
$D = (4.875 - 2 \times 0.875)\ 0.375 \times 55{,}000 + 1 \times 44{,}000 \times 0.6013 = 90{,}910$
$E = (4.875 - 2 \times 0.875)\ 0.375 \times 55{,}000 + 0.875 \times 0.3125 \times 95{,}000 = 90{,}429$
$F = 2 \times 0.875 \times 0.375 \times 95{,}000 + 0.875 \times 0.3125 \times 95{,}000 = 88{,}320$
$G = 2 \times 0.875 \times 0.375 \times 95{,}000 + 1 \times 44{,}000 \times 0.6013 = 88{,}800$

$$\frac{82{,}500\ (B)}{100{,}547\ (A)} = 0.820 = \text{efficiency of joint}$$

414 *Example:* Butt and double strap joint, triple-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes in the outer row = $(P-d)\ t \times TS$
C = shearing strength of four rivets in double shear, plus the shearing strength of one rivet in single shear = $N \times S \times a + n \times s \times a$
D = strength of plate between rivet holes in the second row, plus the shearing strength of one rivet in single shear in the outer row = $(P-2d)\ t \times TS + n \times s \times a$
E = strength of plate between rivet holes in the second row, plus the crushing strength of butt strap in front of one rivet in the outer row = $(P-2d)\ t \times TS + d \times b \times c$
F = crushing strength of plate in front of four rivets, plus the crushing strength of butt strap in front of one rivet = $N \times d \times t \times c + n \times d \times b \times c$
G = crushing strength of plate in front of four rivets, plus the shearing strength of one rivet in single shear = $N \times d \times t \times c + n \times s \times a$

Divide B, C, D, E, F or G (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, triple-riveted, as shown in Fig. 24.

TS = 55,000 lb. per sq. in.
t = ⅜ in. = 0.375 in.
b = 5/16 in. = 0.3125 in.
P = 6½ in. = 6.5 in.
d = 13/16 in. = 0.8125 in.
a = 0.5185 sq. in.
s = 44,000 lb. per sq. in.
S = 88,000 lb. per sq. in.
c = 95,000 lb. per sq. in.

Number of rivets in single shear in a unit length of joint = 1.
Number of rivets in double shear in a unit length of joint = 4.

$A = 6.5 \times 0.375 \times 55{,}000 = 134{,}062$
$B = (6.5 - 0.8125)\ 0.375 \times 55{,}000 = 117{,}304$
$C = 4 \times 88{,}000 \times 0.5185 + 1 \times 44{,}000 \times 0.5185 = 205{,}326$
$D = (6.5 - 2 \times 0.8125)\ 0.375 \times 55{,}000 + 1 \times 44{,}000 \times 0.5185 = 123{,}360$
$E = (6.5 - 2 \times 0.8125)\ 0.375 \times 55{,}000 + 0.8125 \times 0.3125 \times 95{,}000 = 124{,}667$
$F = 4 \times 0.8125 \times 0.375 \times 95{,}000 + 1 \times 0.8125 \times 0.3125 \times 95{,}000 = 139{,}902$
$G = 4 \times 0.8125 \times 0.375 \times 95{,}000 + 1 \times 44{,}000 \times 0.5185 = 138{,}595$

$$\frac{117{,}304\ (B)}{134{,}062\ (A)} = 0.875 = \text{efficiency of joint}$$

415 *Example:* Butt and double strap joint, quadruple-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes in the outer row = $(P-d)\ t \times TS$
C = shearing strength of eight rivets in double shear, plus the shearing strength of three rivets in single shear = $N \times S \times a + n \times s \times a$
D = strength of plate between rivet holes in the second row, plus the shearing strength of one rivet in single shear in the outer row = $(P-2d)\ t \times TS + 1 \times s \times a$
E = strength of plate between rivet holes in the third row, plus the shearing strength of two rivets in the second row in single shear and one rivet in single shear in the outer row = $(P-4d)\ t \times TS + n \times s \times a$
F = strength of plate between rivet holes in the second row, plus the crushing strength of butt strap in front of one rivet in the outer row = $(P-2d)\ t \times TS + d \times b \times c$
G = strength of plate between rivet holes in the third row, plus the crushing strength of butt strap in front of two rivets in the second row and one rivet in the outer row = $(P-4d)\ t \times TS + n \times d \times b \times c$
H = crushing strength of plate in front of eight rivets, plus the crushing strength of butt strap in front of three rivets = $N \times d \times t \times c + n \times d \times b \times c$
I = crushing strength of plate in front of eight rivets, plus the shearing strength of two rivets in the second row and one rivet in the outer row, in single shear = $N \times d \times t \times c + n \times s \times a$

Divide B, C, D, E, F, G, H or I (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint quadruple-riveted, as shown in Fig. 25.

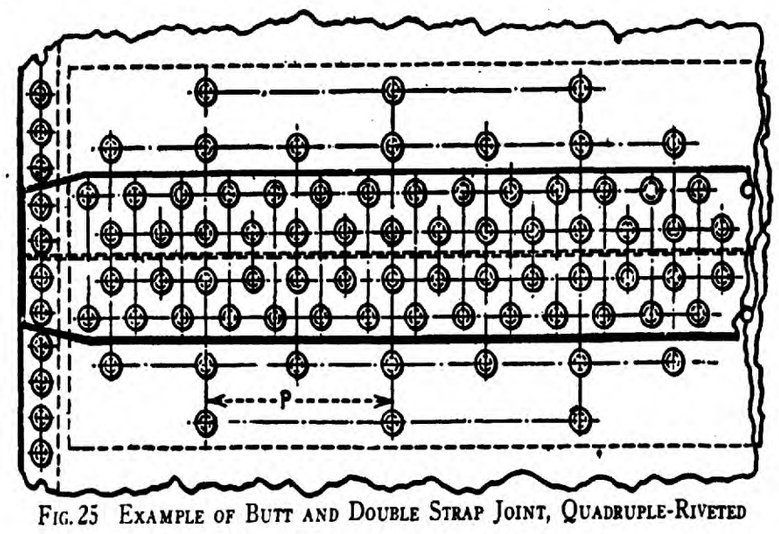


FIG. 25 EXAMPLE OF BUTT AND DOUBLE STRAP JOINT, QUADRUPLE-RIVETED

TS = 55,000 lb. per sq. in.
t = ½ in. = 0.5 in.
b = 7/16 in. = 0.4375 in.
P = 15 in.
d = 15/16 in. = 0.9375 in.
a = 0.6903 sq. in.
s = 44,000 lb. per sq. in.
S = 88,000 lb. per sq. in.
c = 95,000 lb. per sq. in.

Number of rivets in single shear in a unit length of joint = 3.
Number of rivets in double shear in a unit length of joint = 8.

$A = 15 \times 0.5 \times 55{,}000 = 412{,}500$
$B = (15 - 0.9375)\ 0.5 \times 55{,}000 = 386{,}718$
$C = 8 \times 88{,}000 \times 0.6903 + 3 \times 44{,}000 \times 0.6903 = 577{,}090$
$D = (15 - 2 \times 0.9375)\ 0.5 \times 55{,}000 + 1 \times 44{,}000 \times 0.6903 = 391{,}310$
$E = (15 - 4 \times 0.9375)\ 0.5 \times 55{,}000 + 3 \times 44{,}000 \times 0.6903 = 400{,}494$
$F = (15 - 2 \times 0.9375)\ 0.5 \times 55{,}000 + 0.9375 \times 0.4375 \times 95{,}000 = 399{,}902$
$G = (15 - 4 \times 0.9375)\ 0.5 \times 55{,}000 + 3 \times 0.9375 \times 0.4375 \times 95{,}000 = 426{,}269$
$H = 8 \times 0.9375 \times 0.5 \times 95{,}000 + 3 \times 0.9375 \times 0.4375 \times 95{,}000 = 473{,}145$
$I = 8 \times 0.9375 \times 0.5 \times 95{,}000 + 3 \times 44{,}000 \times 0.6903 = 447{,}369$

$$\frac{386{,}718\ (B)}{412{,}500\ (A)} = 0.937 = \text{efficiency of joint}$$

416 *Example:* Butt and double strap joint, quintuple-riveted.

A = strength of solid plate = $P \times t \times TS$
B = strength of plate between rivet holes in the outer row = $(P-d)\ t \times TS$
C = shearing strength of 16 rivets in double shear, plus the shearing strength of seven rivets in single shear = $N \times S \times a + n \times s \times a$
D = strength of plate between rivet holes in the second row, plus the shearing strength of one rivet in single shear in the outer row = $(P-2d)\ t \times TS + 1 \times s \times a$
E = strength of plate between rivet holes in the third row, plus the shearing strength of two rivets in the second row in single shear and one rivet in single shear in the outer row = $(P-4d)\ t \times TS + 3 \times s \times a$

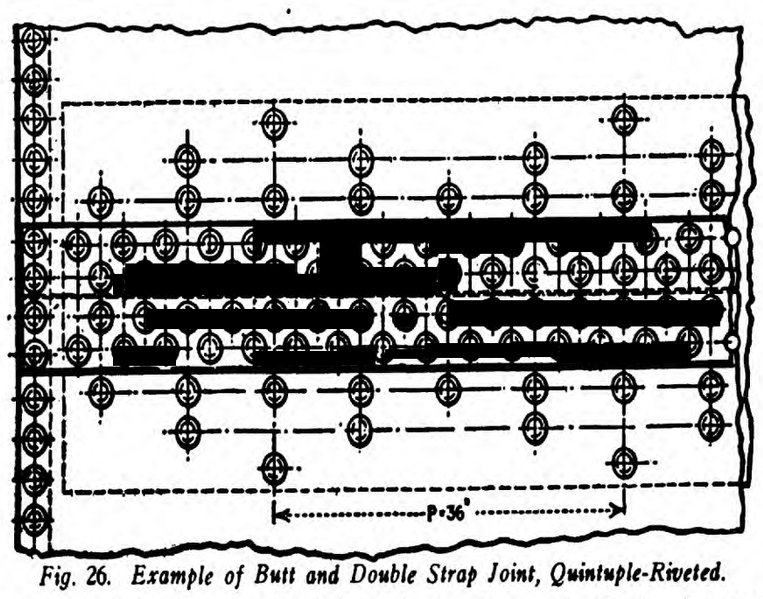


Fig. 26. Example of Butt and Double Strap Joint, Quintuple-Riveted.

F = strength of plate between rivet holes in the fourth row, plus the shearing strength of four rivets in the third row, two rivets in the second row and one rivet in the outer row in single shear = $(P-8d)\ t \times TS + n \times s \times a$
G = strength of plate between rivet holes in the second row, plus the crushing strength of butt strap in front of one rivet in the outer row = $(P-2d)\ t \times TS + d \times b \times c$
H = strength of plate between rivet holes in the third row, plus the crushing strength of butt strap in front of two rivets in the second row and one rivet in the outer row = $(P-4d)\ t \times TS + 3 \times d \times b \times c$
I = strength of plate between rivet holes in the fourth row, plus the crushing strength of butt strap in front of four rivets in the third row, two rivets in the second row and one rivet in the outer row = $(P-8d)\ t \times TS + n \times d \times b \times c$
J = crushing strength of plate in front of 16 rivets, plus the crushing strength of butt strap in front of seven rivets = $N \times d \times t \times c + n \times d \times b \times c$
K = crushing strength of plate in front of 16 rivets, plus the shearing strength of four rivets in the third row, two rivets in the second row and one rivet in the outer row in single shear = $N \times d \times t \times c + n \times s \times a$

Divide B, C, D, E, F, G, H, I, J or K (whichever is the least) by A, and the quotient will be the efficiency of a butt and double strap joint, quintuple-riveted, as shown in Fig. 26 or Fig. 27.

TS = 55,000 lb. per sq. in.
t = ¾ in. = 0.75 in.
b = ½ in. = 0.5 in.
P = 36 in.
d = 1 5/16 in. = 1.3125 in.
a = 1.3529 sq. in.
s = 44,000 lb. per sq. in.
S = 88,000 lb. per sq. in.
c = 95,000 lb. per sq. in.

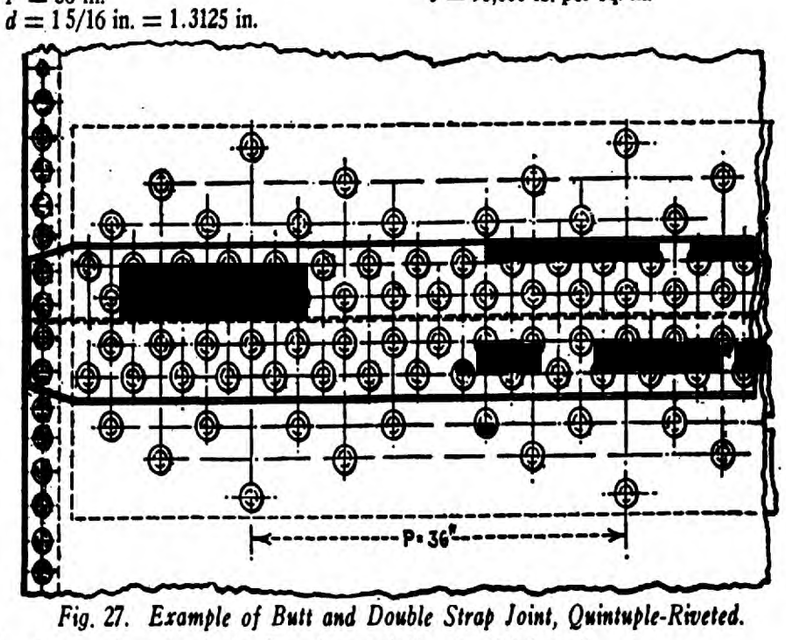


Fig. 27. Example of Butt and Double Strap Joint, Quintuple-Riveted.

Number of rivets in single shear in a unit length of joint = 7.
Number of rivets in double shear in a unit length of joint = 16.

$A = 36 \times 0.75 \times 55{,}000 = 1{,}485{,}000$
$B = (36 - 1{,}3125)\ 0.75 \times 55{,}000 = 1{,}430{,}860$
$C = 16 \times 88{,}000 \times 1.3529 + 7 \times 44{,}000 \times 1.3529 = 2{,}321{,}576$
$D = (36 - 2 \times 1.3125)\ 0.75 \times 55{,}000 + 1 \times 44{,}000 \times 1.3529 = 1{,}436{,}246$
$E = (36 - 4 \times 1.3125)\ 0.75 \times 55{,}000 + 3 \times 44{,}000 \times 1.3529 = 1{,}447{,}020$
$F = (36 - 8 \times 1.3125)\ 0.75 \times 55{,}000 + 7 \times 44{,}000 \times 1.3529 = 1{,}468{,}568$
$G = (36 - 2 \times 1.3125)\ 0.75 \times 55{,}000 + 1.3125 \times 0.5 \times 95{,}000 = 1{,}439{,}064$
$H = (36 - 4 \times 1.3125)\ 0.75 \times 55{,}000 + 3 \times 1.3125 \times 0.5 \times 95{,}000 = 1{,}455{,}472$
$I = (36 - 8 \times 1.3125)\ 0.75 \times 55{,}000 + 7 \times 1.3125 \times 0.5 \times 95{,}000 = 1{,}488{,}141$
$J = 16 \times 1.3125 \times 0.75 \times 95{,}000 + 7 \times 1.3125 \times 0.5 \times 95{,}000 = 1{,}932{,}266$
$K = 16 \times 1.3125 \times 0.75 \times 95{,}000 + 7 \times 44{,}000 \times 1.3529 = 1{,}912{,}943$

$$\frac{1{,}430{,}860\ (B)}{1{,}485{,}000\ (A)} = 0.963 = \text{efficiency of joint}$$

417 Figs. 28 and 29 illustrate other joints that may be used. The butt and double strap joint with straps of equal width shown in Fig. 28 may be so designed that it will have an efficiency of from 82 to 84 per cent. and the saw-tooth joint shown in Fig. 29 so that it will have an efficiency of from 92 to 94 per cent.

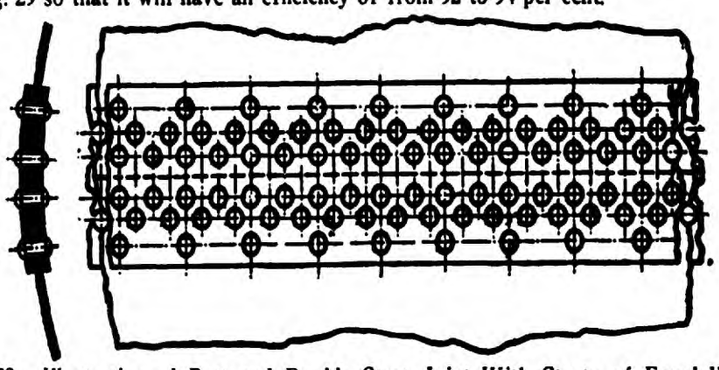


Fig. 28. Illustration of Butt and Double Strap Joint With Straps of Equal Width.

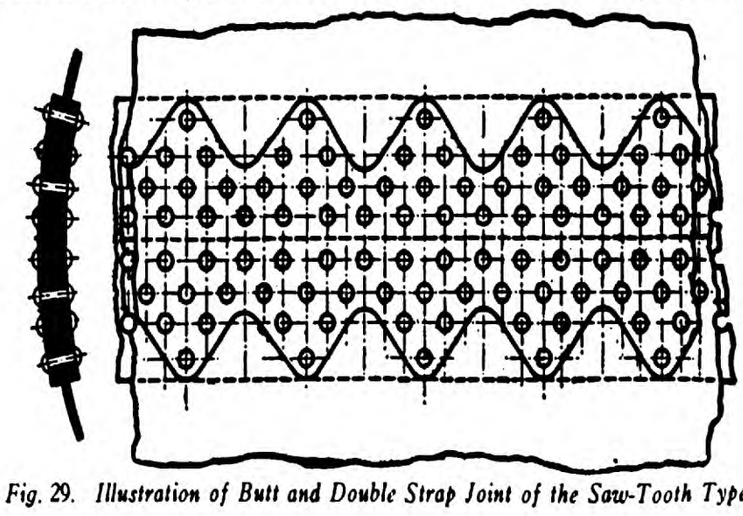


Fig. 29. Illustration of Butt and Double Strap Joint of the Saw-Tooth Type.

BRACED AND STAYED SURFACES.

418 The allowable loads based on the net cross-sectional areas of staybolts with V-threads, are computed from the following formulae. The use of Whitworth threads with other pitches is permissible.

The formula for the diameter of a staybolt at the bottom of a V-thread is:

$$D-(P\times 1.732)=d$$

D = diameter of staybolt over the threads, in.
P = pitch of threads, in.
d = diameter of staybolt at bottom of threads, in.
1.732 = a constant

When U. S. threads are used, the formula becomes

$$D-(P\times 1.732\times 0.75)=d$$

Tables 11 and 12 give the allowable loads on net cross-sectional areas for staybolts with V-threads, having 12 and 10 threads per inch.

Table 11. *Allowable Loads on Staybolts With V-Threads,* 12 *Threads Per Inch.*

Outside Diameter of Staybolts, In.	Diameter at Bottom of Thread, In.	Net Cross-Sectional Area (at Bottom of Thread), Sq. In.	Allowable Load at 7500 Lb. Stress Per Sq. In.
3/4	0.7500	0.6057	0.288	2160
13/16	0.8125	0.6682	0.351	2632
7/8	0.8750	0.7307	0.419	3142
15/16	0.9375	0.7932	0.494	3705
1	1.0000	0.8557	0.575	4312
1 1/16	1.0625	0.9182	0.662	4965
1 1/8	1.1250	0.9807	0.755	5662
1 3/16	1.1875	1.0432	0.855	6412
1 1/4	1.2500	1.1057	0.960	7200
1 5/16	1.3125	1.1682	1.072	8040
1 3/8	1.3750	1.2307	1.190	8925
1 7/16	1.4375	1.2932	1.313	9849
1 1/2	1.5000	1.3557	1.444	10830

Table 12. *Allowable Loads on Staybolts With V-Threads,* 10 *Threads Per Inch.*

Outside Diameter of Staybolts, In.	Diameter at Bottom of Thread, In.	Net Cross-Sectional Area (at Bottom of Thread), Sq. In.	Allowable Load at 7500 Lb. Stress Per Sq. In.
1 1/4	1.2500	1.0768	0.911	6832
1 5/16	1.3125	1.1393	1.019	7642
1 3/8	1.3750	1.2018	1.134	8505
1 7/16	1.4375	1.2643	1.255	9412
1 1/2	1.5000	1.3268	1.382	10365
1 9/16	1.5625	1.3893	1.515	11362
1 5/8	1.6250	1.4518	1.655	12412

419 Table 13 shows the alowable loads on net cross-sectional areas of round stays or braces.

Table 13. *Allowable Loads on Round Braces or Stay Rods.*

Minimum Diameter of Circular Stay, In.	Net Cross-Sectional Area of Stay, in Sq. In.	Allowable Stress, in Lb. Per Sq. In., Net Cross-Sectional Area. 6000	8500	9500
		Allowable Load, in Lb., on Net Cross-Sectional Area.		
1	1.0000	0.7854	4712	6676	7462
1 1/16	1.0625	0.8866	5320	7536	8423
1 1/8	1.1250	0.9940	5964	8449	9443
1 3/16	1.1875	1.1075	6645	9414	10521
1 1/4	1.2500	1.2272	7363	10431	11658
1 5/16	1.3125	1.3530	8118	11501	12854
1 3/8	1.3750	1.4849	8909	12622	14107
1 7/16	1.4375	1.6230	9738	13796	15419
1 1/2	1.5000	1.7671	10603	15020	16787
1 9/16	1.5625	1.9175	11505	16298	18216
1 5/8	1.6250	2.0739	12443	17628	19702
1 11/16	1.6875	2.2365	13419	19010	21247
1 3/4	1.7500	2.4053	14432	20445	22852
1 13/16	1.8125	2.5802	15481	21932	24512
1 7/8	1.8750	2.7612	16567	23470	26231
1 15/16	1.9375	2.9483	17690	25061	28009
2	2.0000	3.1416	18850	26704	29845
2 1/8	2.1250	3.5466	21280	30147	33693
2 1/4	2.2500	3.9761	23857	33797	37773
2 3/8	2.3750	4.4301	26580	37656	42086
2 1/2	2.5000	4.9087	29452	41724	46632
2 5/8	2.6250	5.4119	32471	46001	51413
2 3/4	2.7500	5.9396	35638	50487	56426
2 7/8	2.8750	6.4918	38951	55181	61673
3	3.0000	7.0686	42412	60083	67152

420 Table 14 gives the net areas of segments of heads for use in computing stays.

Table 14. *Net Areas of Segments of Heads.*

Height from Tubes to Shell, In.	Diameter of Boiler, In. 24	30	36	42	48	54	60	66	72	78	84	90	96
	Area to Be Stayed, Sq. In.												
8	28	33	37	40	43	47	51	53	55	58	60	63	65
8½	35	41	46	51	55	59	63	66	70	74	76	80	82
9	42	49	56	62	67	72	76	82	86	90	92	95	98
9½	50	58	66	70	80	86	91	96	101	105	111	116	119
10	57	68	77	85	93	99	106	112	117	123	129	132	137
10½	66	78	89	98	107	114	123	131	135	142	147	153	160
11	74	88	100	111	121	130	138	147	155	161	169	174	183
11½	83	99	112	124	137	146	156	165	173	181	189	196	204
12	91	109	125	139	151	163	174	184	194	203	213	219	230
12½	..	120	138	153	167	180	193	204	216	224	234	243	252
13	..	132	151	168	183	197	211	224	235	247	256	267	279
13½	..	143	164	183	200	216	230	246	258	270	282	293	302
14	..	155	178	199	217	234	250	266	280	294	305	319	331
14½	..	167	192	215	235	254	271	287	303	318	333	345	360
15	..	178	206	231	252	273	291	309	326	343	357	372	386
15½	..	..	220	247	271	291	312	332	350	368	382	400	417
16	..	..	235	263	289	312	334	355	374	394	411	423	443
16½	..	..	249	281	308	332	357	380	399	420	436	457	475
17	..	..	264	297	326	353	378	402	425	447	467	486	502
17½	..	..	..	314	345	374	400	426	449	471	494	516	536
18	..	..	..	331	365	396	424	450	476	500	520	543	564
18½	..	..	..	349	384	417	448	476	501	526	552	577	598

Height from Tubes to Shell, In.	Diameter of Boiler, In. 24	30	36	42	48	54	60	66	72	78	84	90	96
	Area to Be Stayed, Sq. In.												
19	..	..	..	366	404	439	470	500	529	555	580	604	631
19½	..	..	..	384	424	461	496	528	558	584	613	641	663
20	..	..	..	401	444	483	519	552	583	613	642	667	699
20½	..	..	..	..	464	505	543	578	613	643	675	706	729
21	..	..	..	..	485	528	568	604	640	673	705	733	766
21½	..	..	..	..	505	551	594	632	669	703	739	766	797
22	..	..	..	..	526	574	618	658	697	734	769	800	835
22½	..	..	..	..	..	597	643	687	726	765	800	835	867
23	..	..	..	..	..	620	668	713	754	796	830	869	906
23½	..	..	..	..	..	642	695	740	784	827	866	904	945
24	..	..	..	..	..	667	719	768	814	859	897	939	978
24½	..	..	..	..	..	689	745	797	843	892	934	975	1018
25	..	..	..	..	..	714	771	825	875	922	966	1010	1051
25½	..	..	..	..	..	737	798	855	907	956	1003	1047	1092
26	..	..	..	..	..	761	824	882	936	987	1035	1083	1126
26½	..	..	..	..	..	..	850	909	968	1024	1073	1120	1167
27	..	..	..	..	..	..	877	939	998	1053	1106	1157	1202
27½	..	..	..	..	..	..	904	968	1030	1089	1145	1195	1243
28	..	..	..	..	..	..	930	997	1060	1120	1177	1232	1279
28½	..	..	..	..	..	..	..	1028	1092	1157	1211	1270	1321
29	..	..	..	..	..	..	..	1056	1123	1187	1248	1305	1360
29½	..	..	..	..	..	..	..	1084	1155	1221	1284	1347	1400
30	..	..	..	..	..	..	..	1115	1187	1255	1321	1382	1442
30½	..	..	..	..	..	..	..	..	1218	1290	1358	1424	1480
31	..	..	..	..	..	..	..	..	1252	1324	1394	1459	1523
31½	..	..	..	..	..	..	..	..	1286	1359	1433	1496	1561
32	..	..	..	..	..	..	..	..	1317	1394	1467	1538	1605
32½	..	..	..	..	..	..	..	..	..	1430	1508	1575	1650
33	..	..	..	..	..	..	..	..	..	1465	1542	1617	1687
33½	..	..	..	..	..	..	..	..	..	1500	1578	1655	1733
34	..	..	..	..	..	..	..	..	..	1536	1617	1695	1770
34½	..	..	..	..	..	..	..	..	..	..	1654	1735	1816
35	..	..	..	..	..	..	..	..	..	..	1692	1775	1856
35½	..	..	..	..	..	..	..	..	..	..	..	1810	1900
36	..	..	..	..	..	..	..	..	..	..	..	1857	1941
36½	..	..	..	..	..	..	..	..	..	..	..	..	1984
37	..	..	..	..	..	..	..	..	..	..	..	..	2026

SAFETY VALVES.

421 *Method of Computing Discharge Capacity.* The required discharge capacity of a safety valve or valves for a boiler may be based either on the heat units in the fuel consumed or on the amount of steam generated.

The number of heat units that each safety valve will handle, for valves of the ordinary types in which the discharge capacity is proportioned to the lift, may be obtained as follows:

$U=161{,}000\times P\times D\times L$ for Bevel Seats at 45 deg.
$U=227{,}500\times P\times D\times L$ for Flat Seats.

The amount of steam that a valve will discharge may be found as follows:

$W=110\times P\times D\times L$ for Bevel Seats at 45 deg.
$W=155\times P\times D\times L$ for Flat Seats.

Where

U = Number of heat units per hour that a safety valve will handle B.T.U.
W = Quantity of steam that a safety valve will handle per hour, lb.
P = Absolute boiler pressure or gage pressure plus 14.7 lb. per sq. in.
D = Inside diameter of valve seat, in.
L = Vertical lift of valve disc, measured with 3 per cent. excess pressure, in.

METHOD OF CHECKING THE SAFETY VALVE CAPACITY BY MEASURING THE MAXIMUM AMOUNT OF FUEL THAT CAN BE BURNED.

422 The maximum quantity of fuel C than can be burned per hour at the time of maximum forcing is determined by a test. The maximum number of heat units per hour, or $C\times H$ is then determined, using the values of H given in Par. 427. The weight of steam generated per hour is found by the formula:

$$W=\frac{C\times H\times 0.75}{1{,}100}$$

The sum of the safety valve capacities marked on the valves shall be equal to or greater than W.

423 *Example* 1: A boiler at the time of maximum forcing uses 2,150 lb. of Illinois coal per hour of 12,100 B.t.u. per lb. Boiler pressure, 225 lb. per sq. in. gage.

$$C\times H=2{,}150\times 12{,}100=26{,}015{,}000$$
$$W=C\times H\times 0.75\div 1{,}100=17{,}740$$

A 3½ in. bevel seated valve with 0.11 in. lift would discharge in heat units

$U=161{,}000\times 239.7\times 3\frac{1}{2}\times 0.11$
$=14{,}858{,}000$

and in weight of steam

$W=110\times 239.7\times 3\frac{1}{2}\times 0.11$
$=10{,}150$

From which it can be seen that either method indicates that two such valves will give the proper relieving capacity.

424 *Example* 2: Wood shavings of heat of combustion of 6,400 B.t.u. per lb. are burned under a boiler at the maximum rate of 2,000 lb. per hour. Boiler pressure, 100 lb. per. sq. in. gage.

$$C\times H=2{,}000\times 6{,}400=12{,}800{,}000$$
$$W=C\times H\times 0.75\div 1{,}100=8{,}730$$

A bevel seated 3½ in. valve is marked by the manufacturer 0.11 in. lift and discharge capacity for 100 lb. pressure = 4,840 lb.; hence two such valves would be required.

425 *Example* 3: An oil-fired boiler at maximum forcing uses 1,000 lb. of crude oil (Texas) per hour. Boiler pressure, 275 lb. per sq. in. gage.

$$C\times H=1{,}000\times 18{,}500=18{,}500{,}000$$
$$W=C\times H\times 0.75\div 1{,}100=12{,}620$$

A bevel seated 2½ in. valve is marked by the manufacturer 0.08 in. lift and discharge capacity for 275 lb. pressure = 6,350 lb.; hence two such valves would be required.

426 *Example* 4: A boiler fired with natural gas consumes 3,000 cu. ft. per hour. The working pressure is 150 lb. per sq. in gage.

$$C\times H=3{,}000\times 960=2{,}880{,}000$$
$$W=C\times H\times 0.75\div 1{,}100=1{,}960$$

A bevel seated 2 in. valve is marked by the manufacturer 0.07 in. lift and discharge capacity for 150 lb. pressure = 2,500 lb.; hence one such valve would be required.

427 For the purpose of checking the safety valve capacity as described in Par. 422, the following values of heats of combustion of various fuels may be used.

	$H=$ B. t. u. per lb.
Semi-bituminous coal	14,500
Anthracite	13,700
Screenings	12,500
Coke	13,500
Wood, hard or soft, kiln dried	7,700
Wood, hard or soft, air dried	6,200
Wood shavings	6,400

	H = B. t. u. per lb.
Peat, air dried, 25 per cent moisture	7,500
Lignite	10,000
Kerosene	20,000
Petroleum, crude oil, Penn	20,700
Petroleum, crude oil, Texas	18,500

	H = B. t. u. per cu. ft.
Natural gas	960
Blast furnace gas	100
Producer gas	150
Water gas, uncarburetted	290

TABLE 15.

American Standard 125-Lb. Working Pressure Per Sq. In. Standard Flange Fittings. Straight Sizes (See Fig. 30).

	Size.	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15
A-A	Face to face	7	7 1/2	8	9	10	11	12	13	14	15	16	17	18	20	22	24	28	29
A	Center to face	3 1/2	3 3/4	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	11	12	14	14 1/2
B	Center to face of long radius ells	5	5 1/2	6	6 1/2	7	7 3/4	8 1/2	9	9 1/2	10 1/4	11 1/2	12 3/4	14	15 1/4	16 1/2	19	21 1/2	22 3/4
C	Center to face of 45-deg. ells	1 3/4	2	2 1/4	2 1/2	3	3	3 1/2	4	4	4 1/2	5	5 1/2	5 1/2	6	6 1/2	7 1/2	7 1/2	8
D	Face to face laterals	7 1/2	8	9	10 1/2	12	13	14 1/2	15	15 1/2	17	18	20 1/2	22	24	25 1/2	30	33	34 1/2
E	Center to face	5 3/4	6 1/4	7	8	9 1/2	10	11 1/2	12	12 1/2	13 1/2	14 1/2	16 1/2	17 1/2	19 1/2	20 1/2	24 1/2	27	28 1/2
F	Center to face	1 3/4	1 3/4	2	2 1/2	2 1/2	3	3	3	3	3 1/2	4 1/2	4 1/2	4 1/2	5	5	5 1/2	6	6
G	Face to face reducer	..	..	..	..	..	6	6 1/2	7	7 1/2	8	9	10	11	11 1/2	12	14	16	17
	Diameter of flange	4	4 1/2	5	6	7	7 1/2	8 1/2	9	9 1/4	10	11	12 1/2	13 1/2	15	16	19	21	22 1/4
	Thickness of flange	7/16	1/2	9/16	5/8	11/16	3/4	13/16	15/16	15/16	15/16	1	1 1/16	1 1/8	1 1/8	1 3/16	1 1/4	1 3/8	1 3/8
	Diameter of bolt circle	3	3 3/8	3 7/8	4 3/4	5 1/2	6	7	7 1/2	7 3/4	8 1/2	9 1/2	10 3/4	11 3/4	13 1/4	14 1/4	17	18 3/4	20
	No. of bolts	4	4	4	4	4	4	4	8	8	8	8	8	8	8	12	12	12	16
	Diameter of bolts	7/16	7/16	1/2	5/8	5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	1	1
	Minimum metal thickness of body	7/16	7/16	7/16	7/16	7/16	7/16	7/16	1/2	1/2	1/2	9/16	5/8	5/8	11/16	3/4	13/16	7/8	7/8

	Size.	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
A-A	Face to face	30	33	36	40	44	46	48	50	52	54	56	58	60	62	64	66	68
A	Center to face	15	16 1/2	18	20	22	23	24	25	26	27	28	29	30	31	32	33	34
B	Center to face of long radius ells	24	26 1/2	29	31 1/2	34	36 1/2	39	41 1/2	44	46 1/2	49	51 1/2	54	56 1/2	59	61 1/2	64
C	Center to face of 45-deg. ells	8	8 1/2	9 1/2	10	11	13	14	15	16	17	18	19	20	21	22	23	24
D	Face to face, laterals	36 1/2	39	43	46	49 1/2	53	56	59	..	..	..	..	..	..	..	..	..
E	Center to face	30	32	35	37 1/2	40 1/2	44	46 1/2	49	..	..	..	..	..	..	..	..	..
F	Center to face	6 1/2	7	8	8 1/2	9	9	9 1/2	10	..	..	..	..	..	..	..	..	..
G	Face to face, reducer	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	Diameter of flange	23 1/2	25	27 1/2	29 1/2	32	34 1/4	36 1/2	38 3/4	41 3/4	43 3/4	46	48 3/4	50 3/4	53	55 1/4	57 1/4	49 1/2
	Thickness of flange	1 7/16	1 9/16	1 11/16	1 13/16	1 7/8	2	2 1/16	2 1/8	2 1/4	2 5/16	2 3/8	2 3/8	2 1/2	2 5/8	2 5/8	2 11/16	2 3/4
	Diameter of bolt circle	21 1/4	22 3/4	25	27 1/4	29 1/2	31 3/4	34	36	38 1/2	40 1/2	42 3/4	45 1/4	47 1/4	49 1/2	51 3/4	53 3/4	56
	Number of bolts	16	16	20	20	20	24	28	28	28	32	32	32	36	36	40	40	44
	Diameter of bolts	1	1 1/8	1 1/8	1 1/4	1 1/4	1 1/4	1 1/4	1 3/8	1 1/2	1 1/2	1 1/2	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8	1 5/8
	Minimum metal thickness of body	1	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2	1 9/16	1 5/8	1 11/16	1 3/4	1 13/16	1 7/8	1 15/16	2

Notes—Figures given are for center to face and for face to face finished dimensions. Where necessary manufacturers will make suitable allowances in patterns before casting.

Laterals do not extend beyond the 30-in. size at the present time. Box wrench to be used on bolting for large sizes.

Square head bolts with hexagonal nuts are recommended; 1 5/8 in. diameter and larger stud with a nut at each end is satisfactory.

Hexagonal nuts for pipe sizes 1 in. to 46 in. can be conveniently pulled up with open wrenches of minimum design of heads. Hexagonal nuts for pipe sizes 48 in. to 100 in. can be conveniently pulled up with socket wrenches.

Flanges to be spot bored for nuts for sizes 32 in. to 100 in., inclusive.

Table 16. American Standard, 250-lb. Working Pressure Per Square Inch., Extra Heavy Flange Fittings, Straight Sizes (See Fig. 30).

	Size.	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10	12	14	15
A-A	Face to face	8	8 1/2	9	10	11	12	13	14	15	16	17	18	20	21	23	26	30	31
A	Center to face	4	4 1/4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	10	10 1/2	11 1/2	13	15	15 1/2
B	Center to face of long radius ells	5	5 1/2	6	6 1/2	7	7 3/4	8 1/2	9	9 1/2	10 1/4	11 1/2	12 3/4	14	15 1/4	16 1/2	19	21 1/2	22 3/4
C	Center to face of 45-deg. ells	2	2 1/2	2 3/4	3	3 1/2	3 1/2	4	4 1/2	4 1/2	5	5 1/2	6	6	6 1/2	7	8	8 1/2	9
D	Face to face, laterals	8 1/2	9 1/2	11	11 1/2	13	14	15 1/2	16 1/2	18	18 1/2	21 1/2	23 1/2	25 1/2	27 1/2	29 1/2	33 1/2	37 1/2	39 1/2
E	Center to face, laterals	6 1/2	7 1/4	8 1/2	9	10 1/2	11	12 1/2	13 1/2	14 1/2	15	17 1/2	19	20 1/2	22 1/2	24	27 1/2	31	33
F	Center to face, laterals	2	2 1/4	2 1/2	2 1/2	2 1/2	3	3	3	3 1/2	3 1/2	4	4 1/2	5	5	5 1/2	6	6 1/2	6 1/2
G	Face to face, reducer	..	..	..	..	..	6	6 1/2	7	7 1/2	8	9	10	11	11 1/2	12	14	16	17
	Diameter of flange	4 1/2	5	6	6 1/2	7 1/2	8 1/4	9	10	10 1/2	11	12 1/2	14	15	16 1/4	17 1/2	20 1/2	23	24 1/2
	Thickness of flange	11/16	3/4	13/16	7/8	1	1 1/16	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/16
	Diameter of bolt circle	3 1/4	3 3/4	4 1/2	5	5 7/8	6 5/8	7 1/4	7 7/8	8 1/2	9 1/4	10 5/8	11 7/8	13	14	15 1/4	17 3/4	20 1/4	21 1/2
	Number of bolts	4	4	4	4	4	8	8	8	8	8	12	12	12	12	16	16	20	20
	Diameter of bolts	1/2	1/2	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	1	1	1 1/8	1 1/8	1 1/4
	Minimum metal thickness of body	1/2	1/2	1/2	1/2	9/16	9/16	9/16	5/8	5/8	11/16	3/4	13/16	13/16	7/8	15/16	1	1 1/8	1 3/16

	Size.	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
A-A	Face to face	33	36	39	41	45	48	52	55	58	61	65	68	71	74	78	81	84
A	Center to face	16 1/2	18	19 1/2	20 1/2	22 1/2	24	26	27 1/2	29	30 1/2	32 1/2	34	35 1/2	37	39	40 1/2	42
B	Center to face of long radius ells	24	26 1/2	29	31 1/2	34	36 1/2	39	41 1/2	44	46 1/2	49	51 1/2	54	56 1/2	59	61 1/2	64
C	Center to face of 45-deg. ells	9 1/2	10	10 1/2	11	12	13	14	15	16	17	18	19	20	21	22	23	24
D	Face to face, laterals	42	45 1/2	49	53	57 1/2	..	..	..	..	..	..	..	..	..	..	..	..
E	Center to face, laterals	34 1/2	37 1/2	40 1/2	43 1/2	47 1/2	..	..	..	..	..	..	..	..	..	..	..	..
F	Center to face, laterals	7 1/2	8	8 1/2	9 1/2	10	..	..	..	..	..	..	..	..	..	..	..	..
G	Face to face, reducer	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
	Diameter of flange	25 1/2	28	30 1/3	33	36	38 1/4	40 3/4	43	45 1/4	47 1/2	50	52 1/4	54 1/2	57	59 1/4	61 1/2	65
	Thickness of flange	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 13/16	2 15/16	3	3 1/8	3 1/4	3 3/8	3 7/16	3 9/16	3 11/16	3 3/4	3 7/8	4
	Diameter of bolt circle	22 1/2	24 3/4	27	29 1/4	32	34 1/2	37	39 1/4	41 1/2	43 1/2	46	48	50 1/4	52 3/4	55	57 1/4	60 3/4
	Number of bolts	20	24	24	24	24	28	28	28	28	28	32	32	36	36	36	40	40
	Diameter of bolts	1 1/4	1 1/4	1 3/8	1 1/2	1 5/8	1 5/8	1 5/8	1 3/4	1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	1 7/8	2	2	2
	Minimum metal thickness of body	1 1/4	1 3/8	1 1/2	1 9/16	1 5/8	1 13/16	1 7/8	2	2 1/8	2 1/4	2 3/8	2 7/16	2 9/16	2 11/16	2 13/16	2 7/8	3

Notes—Figures given are for center to face and for face to face finished dimensions. Where necessary manufacturers will make suitable allowances in patterns before casting.

Laterals do not extend beyond the 24 in. size at the present time. Box wrench to be used on bolting for large sizes.

Square head bolts with hexagonal nuts are recommended; 1 5/8 in. diameter and larger stud with a nut at each end is satisfactory.

Hexagonal nuts for pipe sizes 1 in. to 16 in. can be conveniently pulled up with wrenches of minimum design of heads. Hexagonal nuts for pipe sizes 18 in. to 48 in. can be conveniently pulled up with socket wrenches.

Distance between inside edges of bolt holes and raised face to be 1/32 in.

Flanges to be spot bored for nuts.

Thickness of flanges given in table includes raised face.

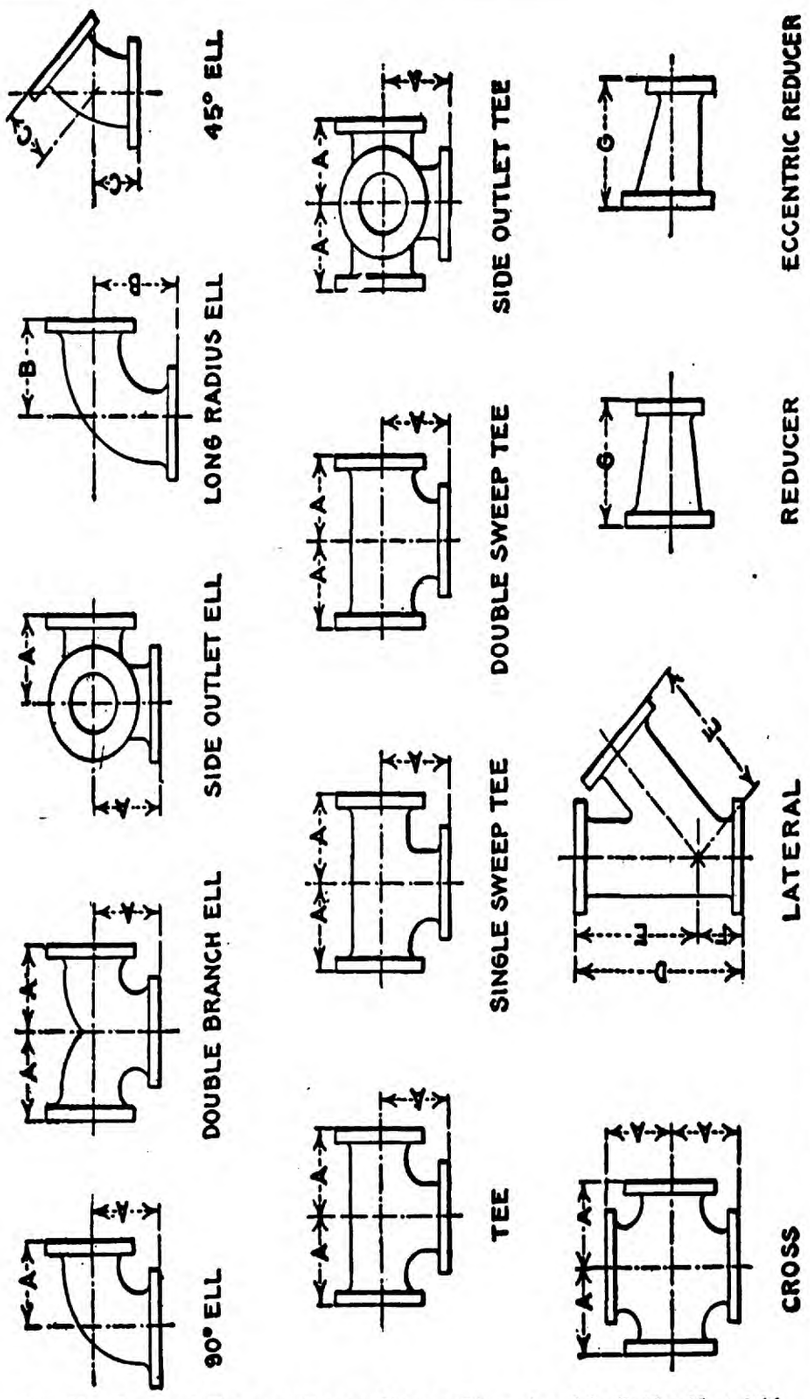


Fig. 30. Standard Types of Flange Fittings Dimensioned in Tables 15 and 16.

FUSIBLE PLUGS.

428 Fusible plugs, if used, shall be filled with tin with a melting point between 400 and 500 deg. fahr.

429 The least diameter of fusible metal shall be not less than ½ in., except for maximum allowable working pressures of over 175 lb. per sq. in., or when it is necessary to place a fusible plug in a tube, in which case the least diameter of fusible metal shall be not less than ⅜ in.

430 Each boiler may have one or more fusible plugs located at the lowest permissible water level as follows:

a In Horizontal Return Tubular Boilers—in the rear head, not less than 2 in. above the upper row of tubes, the measurement to be taken from the line of the upper surface of tubes to the center of the plug, and projecting through the sheet not less than 1 in.

b In Horizontal Flue Boilers—in the rear head, on a line with the highest part of the boiler exposed to the products of combustion, and projecting through the sheet not less than 1 in.

c In Traction, Portable or Stationary Boilers of the Locomotive Type or Star Water Tube Boilers—in the highest part of the crown sheet, and projecting through the sheet not less than 1 in.

d In Vertical Fire-tube Boilers—in an outside tube, not less than one-third the length of the tube above the lower tube sheet.

e In Vertical Fire-tube Boilers, Corliss Type—in a tube, not less than one-third the length of the tube above the lower tube sheet.

f In Vertical Submerged Tube Boilers—in the upper tube sheet, and projecting through the sheet not less than 1 in.

g In Water-tube Boilers, Horizontal Drums, Babcock & Wilcox Type—in the upper drum, not less than 6 in. above the bottom of the drum, over the first pass of the products of combustion, and projecting through the sheet not less than 1 in.

h In Stirling Boilers, Standard Type—in the front side of the middle drum, not less than 4 in. above the bottom of the drum, and projecting through the sheet not less than 1 in.

i In Stirling Boilers, Superheated Type—in the front drum, not less than 6 in. above the bottom of the drum, exposed to the products of combustion, and projecting through the sheet not less than 1 in.

j In Water-tube Boilers, Heine Type—in the front course of the drum, not less than 6 in. above the bottom of the drum, and projecting through the sheet not less than 1 in.

k In Robb-Mumford Boilers, Standard Type—in the bottom of the steam and water drum, 24 in. from the center of the rear neck, and projecting through the sheet not less than 1 in.

l In Water-tube Boilers, Almy Type—in a tube or fitting exposed to the products of combustion.

m In Vertical Boilers, Climax or Hazleton Type—in a tube or center drum not less than one-half the height of the shell, measuring from the lowest circumferential seam.

n In Cahall Vertical Water-tube Boilers—in the inner sheet of the top drum, not less than 6 in. above the upper tube sheet, and projecting through the sheet not less than 1 in.

o In Wickes Vertical Water-tube Boilers—in the shell of the top drum and not less than 6 in. above the upper tube sheet, and projecting through the sheet not less than 1 in.; so located as to be at the front of the boiler and exposed to the first pass of the products of combustion.

p In Scotch Marine Type Boilers—in the combustion chamber top, and projecting through the sheet not less than 1 in.

q In Dry Rack Scotch Type Boilers—in the rear head, not less than 2 in. above the upper row of tubes, and projecting through the sheet not less than 1 in.

r In Economic Type Boilers—in the rear head, above the upper row of tubes.

s In Cast-Iron Sectional Heating Boilers—in a section over and in direct contact with the products of combustion in the primary combustion chamber.

t In Water-tube Boilers, Worthington Type—in the front side of the steam and water drum, not less than 4 in. above the bottom of the drum, and projecting through the sheet not less than 1 in.

u For other types and new designs, fusible plugs shall be placed at the lowest permissible water level, in the direct path of the products of combustion, as near the primary combustion chamber as possible.

v Fire Engine Boilers are not usually supplied with fusible plugs. Unless special provision is made to keep the water above the firebox crown sheet other than by the natural water level, the lowest permissible water level shall be at least 3 in. above the top of the firebox crown sheet.

DEPARTMENT OF FINANCE.

WARRANTS MADE READY FOR PAYMENT IN DEPARTMENT OF FINANCE THURSDAY, JULY 12, 1917.

Below is a statement of warrants made ready for payment on the above date, showing therein the Department of Finance voucher number, the dates of the invoices or the registered number of the contract, the date the voucher was filed in the Department of Finance, the name of the payee and the amount of the warrant.

Where two or more bills are embraced in the warrant, the dates of the earliest and latest are given, excepting that, when such payments are made under a contract, the registered number of the contract is shown in the place of the second invoice date.

Where the word "final" is shown after the name of the payee, payment will not be made until thirty days after the completion and acceptance of the work, but all of the other warrants mentioned will be forwarded through the mail unless some reason exists why payment is to be made in person, in which event written notice will be promptly given to the claimant.

In making a written or verbal inquiry at this office for any of the above mentioned warrants, it is requested that reference be made by the Department of Finance voucher number.

WILLIAM A. PRENDERGAST, Comptroller.

Finance Voucher No.	Invoice Dates or Contract Number.		Received in Department of Finance.	Name of Payee.	Amount.
				Armory Board.	
89791	5-24-17		6-21-17	John P. Kane Co	$67 10
78710	4-30-17		5-24-17	T. E. Quinn	93 00
				Bellevue and Allied Hospitals.	
93851	4- 5-17		7- 5-17	Keystone Grinder and Mfg. Co	$4 37
93798	6-13-17		7- 5-17	National Syringe Co.	5 00
93385	11-25-16		7- 3-17	Kieley & Mueller, Inc	18 20
93883	6-12-17		7- 5-17	Wm. Langbein & Bros	16 90
93875	6- 5-17		7- 5-17	F. Eckenroth & Son, Inc	20 00
93384	11-29-16		7- 3-17	The Fairbanks Company	2 28
93387	12-31-16.	5-31-17	7- 3-17	The New York World	6 24
93386	5-10-17		7- 3-17	Deutsches Journal	1 70
93826	6- 2-17		7- 5-17	T. H. Adie	15 60
93825	5-18-17		7- 5-17	Crane & Downing, Inc	3 24
93820	5-17-17		7- 5-17	Herman Kornahrens, Inc	1 90
93880	5-31-17		7- 5-17	General Naval Stores Company	21 78
93879	5-25-17		7- 5-17	The Peck Brothers & Co	27 00
93874	6-13-17		7- 5-17	The Kny-Scheerer Corporation	31 20
93821	6- 5-17		7- 5-17	The Hamilton-Low Co	2 40
93843	5-31-17		7- 5-17	E. F. Keating Company	15 67
93794	5-28-17		7- 5-17	Armstrong Cork & Insulating Co	12 50
93824	3- 6-17		7- 5-17	General Speedometer Repair Co	2 00
				Department of Plant and Structures.	
94154	6- 2-17		7- 5-17	Geo. Pool & Son, Inc	$9 14
94155	6-21-17		7- 5-17	O. H. Perry & Son, Inc	36 00
94156	6-16-17		7- 5-17	K. G. Welding & Cutting Co., Inc	45 00
92428	5-19-17		6-29-17	Oriental Rubber and Supply Company, Inc	119 93
				County Court, Kings County.	
95318			7- 9-17	Marie Mahon	$3 95
95317			7- 9-17	John A. Higgins	4 05
95745			7-10-17	John L. Gray	5 00
				Municipal Court of the City of New York.	
94164	7- 1-17		7- 5-17	The Star Towel Supply Co	$2 40
94163	6-30-17		7- 5-17	Tony LoSquadro	2 00
94165	4- 2-17		7- 5-17	John H. Nuhn	1 25
94166	6- 2-17		7- 5-17	Eagle Spring Water Co	4 20
				Court of General Sessions.	
93550	6-20-17		7- 3-17	Individual Drinking Cup Co., Inc	$8 20
				City Court of The City of New York.	
94013	6- 6-17		7- 5-17	A. Pearson's Sons	$47 50
				Supreme Courts.	
93018	6-30-17		7- 2-17	I. & S. Glick	$62 85
				Board of City Record.	
92636		46376	6-29-17	The Brooklyn Daily Eagle	$1,256 49
92635		46379	6-29-17	Clarence S. Nathan, Inc	504 99
92631		46377	6-29-17	M. B. Brown Printing & Binding Co	4,334 35
92625		46382	6-29-17	M. B. Brown Printing & Binding Co	14,684 74
92632		46377	6-29-17	M. B. Brown Printing & Binding Co	132 75
92626		46382	6-29-17	M. B. Brown Printing & Binding Co	640 67
92627		46382	6-29-17	M. B. Brown Printing & Binding Co	477 82
				Department of Correction.	
88432	3-23-17		6-19-17	The O. M. Edwards Company, Inc	$165 00
93113	6-25-17		7- 2-17	DeGrauw, Aymar & Co	4 80
92496	4-30-17.	5-30-17	6-29-17	R. F. Stevens Company	794 53
92501	6- 7-17.	6-14-17	6-29-17	Benjamin S. Alder Co	255 43
92500	5-31-17.	6- 9-17	6-29-17	Bloomingdale Bros.	333 32
92498	6- 8-17		6-29-17	Bramhall Deane Co	158 00
92497	5-28-17		6-29-17	Swan & Finch Company	232 50
92493	6- 5-17		6-29-17	Francis H. Leggett & Co	890 00
				District Attorney, New York County.	
95045			7- 9-17	William Harman Black	$26 95
				Department of Docks and Ferries.	
95618			7-10-17	Department of Docks and Ferries	$213 67
91690			6-27-17	Chamberlain of the City of New York	319 29
				Board of Elections.	
96049			7-11-17	Harry W. Taylor, Clerk	$261 75
92124	5-29-17		6-28-17	E. Faulkner	7 74
				Board of Estimate and Apportionment.	
93427	6-25-17		7- 3-17	Charles Pickler	$96 00
				Department of Education.	
94929	5-19-17		7- 9-17	John T. Stanley Co., Inc	$4 50
94539	4- 9-17		7- 6-17	Tower Mfg. & Novelty Co	12 00
94538	4-25-17		7- 6-17	The Arabol Mfg. Co.	4 50
94537	4-13-17		7- 6-17	F. N. Dubois & Co	4 50
93589	5- 9-17		7- 3-17	Flushing Auto Garage, Inc	28 12
94935	6- 8-17		7- 9-17	Remington Typewriter Co.	75
94928	3- 9-17		7- 9-17	The American Multigraph Sales Co	5 00
94540	4-13-17		7- 6-17	Schoverling, Daly & Gales	9 75
94544	3-13-17		7- 6-17	S. Ziskind	3 50
94543	4-19-17		7- 6-17	Rockland & Rockport Lime Co	5 50
94542	4-26-17		7- 6-17	F. A. Pierce Co.	3 70
94541	4-17-17		7- 6-17	Hall, Gardner & Co	2 52
94545	4-24-17		7- 6-17	A. P. W. Paper Co	6 00
93438	3-29-17		7- 3-17	Hall & Boyle	27 00
94337		41660	7- 5-17	A. J. Nystrom & Co	26 98
94238		42629	7- 5-17	American Book Co.	1 12
94284		47371		American Book Co.	2 50
94346		41629	7- 5-17	American Book Co.	2 24
94939			7- 9-17	John J. Egan	7 40
94936			7- 9-17	Trimble Foster	60 10
94924			7- 9-17	Dorothy Brown	70
94933			7- 9-17	Michael H. Lucey	21 26
94927	6- 6-17		7- 9-17	Hugh D. McGrane	90 00
94931			7- 9-17	Frank G. Trapp	24 00
94338		41665	7- 5-17	Newson & Co.	45 00
94304		41656	7- 5-17	Syndicate Trading Co	25 60
94311		41670	7- 5-17	Rand, McNally & Co.	56 00
94254		47230	7- 5-17	D. C. Heath & Co	8 20
94397		46510	7- 5-17	Kalt Lumber Co.	35 41
94296		46510	7- 5-17	Kalt Lumber Co.	98 65

Finance Voucher No.	Invoice Dates or Contract Number.	Received in Department of Finance.	Name of Payee.	Amount.
84249	41629	7- 5-17	American Book Co.	11 1
94310	41668	7- 5-17	C. S. Hammond & Co	15 00
93627	44132	7- 3-17	Geo. T. Montgomery	86 35
94330	44170	7- 5-17	Kalt Lumber Co.	21 16
94246	46538	7- 5-17	F. S. Banks & Co	35 68
94266	41715	7- 5-17	E. Steiger & Co	21 50
94333	44568	7- 5-17	Neostyle Envelope Co.	14 98
94336	44131	7- 5-17	Tower Mfg. & Novelty Co	80
94364	41672	7- 5-17	Charles Scribners Sons	16 92
94341	41672	7- 5-17	Charles Scribner's Sons	2 82
81313	45363	5-31-17	The E. L. Grover Co	583 60
94937		7- 9-17	John L. Tildsley	18 25
94925		7- 9-17	Percy Bridges	6 10
94926		7- 9-17	Benjamin B. Chappell	6 60
94934		7- 9-17	Harry W. Willspaugh	10 06
94938		7- 9-17	Morris E. Siegel	110 31
94281	41639	7- 5-17	Ginn & Company	94
94345	41639	7- 5-17	Ginn & Company	1 13
93442	44707	7- 3-17	New York Telephone Company	54 97
92379	6- 4-17, 6- 5-17	6-29-17	Title Guarantee & Trust Company	315 69
92383	45934	6-29-17	Milliken Bros., Inc.	17,337 60
92384	46004	6-29-17	Thomas Dwyer	20,499 48
94348	41649	7- 5-17	Hinds, Noble & Eldredge	28 92
94353	41639	7- 5-17	Ginn & Company	3 90
94360	47052	7- 5-17	Gold Rose Printing Co	22 25
			Department of Health.	
92385	47298	6-29-17	Armour & Company	$129 41
92387	47645	6-29-17	Conron Bros. Company	541 12
92546	6- 1-17	6-29-17	Penn Metal Company	212 71
92388	47645	6-29-17	Conron Bros. Company	147 81
92390	47645	6-29-17	Conron Bros. Company	363 84
92386	47164	6-29-17	Armour & Company	530 06
92393	47301	6-29-17	Morris & Company	462 20
92391	47547	6-29-17	Oscar Frommel & Bro	262 55
			Board of Inebriety.	
88404	6- 4-17	6-19-17	F. C. Raynor	$64 07
88405	5-31-17	6-19-17	Shults Bread Company	113 00
88410	5-18-17	6-19-17	S. D. Woodruff & Sons	96 55
			Commissioner of Jurors, Queens County.	
94858	6-30-17	7- 7-17	New York Telephone Co	$2 92
			Law Department.	
92491	6-15-17	6-29-17	C. N. Cronyn	$73 66
			Miscellaneous.	
96118		7-11-17	Standard Scale & Supply Co. or John C. Wait, Atty.	$25 67
95807		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	805 00
95808		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	1,922 50
95809		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	1,060 00
95810		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	5,500 00
95813		7-10-17	Dime Savings Bank of Brooklyn	6,000 00
95814		7-10-17	Dime Savings Bank of Brooklyn	1,000 00
95815		7-10-17	Germania Savings Bank, Kings County	1,000 00
95816		7-10-17	Newburgh Savings Bank	1,000 00
95817		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	6,000 00
95811		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	25,000 00
95812		7-10-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	4,500 00
96119		7-11-17	Charlotte Stern or Alexander Coblitz, Attorney	20 00
95971		7-11-17	Home Savings Bank, City of Albany	500 00
95972		7-11-17	William A. Prendergast as Comptroller and Milo R. Maltbie as Chamberlain	45 00
95020		7- 9-17	Salvatore Gentile	32 60
95021		7- 9-17	C. B. Richards & Company	550 55
95725		7-10-17	Home Hospital	4,108 50
95724		7-10-17	The Lakeview Home	493 79
95723		7-10-17	The Babies' Hospital of The City of New York	458 82
95722		7-10-17	St. Germain's Home for Juvenile Delinquents, Branch of House of the Good Shepherd	2,049 59
95721		7-10-17	St. Michael's Home	4,441 36
95720		7-10-17	St. Joseph's Hospital, New York City	7,087 80
95719		7-10-17	New York Eye and Ear Infirmary	952 00
95718		7-10-17	Hebrew Sheltering Guardian Society	55 00
95717		7-10-17	Catholic Guardian Society of the Diocese of Brooklyn	140 00
95716		7-10-17	American Female Guardian Society and Home for the Friendless	872 28
95030		7- 9-17	Gustav Gaertner	14 00
95019		7- 9-17	Aetna Accident and Liability Co	87 50
95014		7- 9-17	Royal Indemnity Co.	125 00
95010		7- 9-17	American Surety Co. of New York	80 00
95011		7- 9-17	American Surety Co. of New York	80 00
95018		7- 9-17	United States Fidelity & Guaranty Co.	10 41
95013		7- 9-17	United States Fidelity & Guaranty Co.	15 00
95016		7- 9-17	Abraham Adisky	7 50
95012		7- 9-17	Fidelity and Deposity Co. of Maryland	71 25
95017		7- 9-17	National Surety Co.	15 97
95015		7- 9-17	Globe Indemnity Co., New York	91 78
95037		7- 9-17	Max S. Levine and Louis Jacobson	500 00
95655		7-10-17	Warren C. Fielding	99 70
95026		7- 9-17	John Joseph Kindred	50 00
95027		7- 9-17	H. Valentine Wildman	50 00
95029		7- 9-17	Samuel Beskin	2,500 00
95025		7- 9-17	Chamberlain of the City of New York	04
95024		7- 9-17	B. Parelhoff	5 00
95023		7- 9-17	Richard D. Fitzgerald	18 12
95022		7- 9-17	City Pay Account	9 38
			National Guard and Naval Militia.	
93691		7- 3-17	New York, Ontario & Western Railway Co.	$1 68
			Bronx Parkway Commission.	
93640	4-17-17	7- 3-17	Westchester Lighting Co.	$76 80
93645	5-14-17	7- 3-17	William E. Williams	3 44
93650	5-23-17	7- 3-17	J. S. Woodhouse Co	6 26
93641	6-15-17	7- 3-17	Tarrytown News	3 75
93658	5-16-17	7- 3-17	Conlin & Co.	35 00
92455		6-29-17	Mount Vernon Trust Co., assignee of Edwin W. Fiske	640 00
92440	5-31-17	6-29-17	Herman W. Merkel	381 70
92443	4-30-17	6-29-17	New York Telephone Co	139 40
93656	5-31-17	7- 3-17	American Blue Print Co	12 60
93657	6- 1-17	7- 3-17	Cornell Bros.	11 31
93647	4-23-17	7- 3-17	Carroll M. Guest	5 06
93642	6- 4-17	7- 3-17	Evans & Morford	36 00
93649	5-29-17	7- 3-17	L. C. Smith & Bros. Typewriter Co.	1 50
			Department of Parks.	
91857	8-11-16	6-28-17	Department of Docks and Ferries	$311 12
95198		7- 9-17	New York Aquarium	2,637 14
95202		7- 9-17	The American Museum of Natural History	14,580 30
95203		7- 9-17	American Museum of Natural History	828 21
92397	5- 4-17	6-29-17	M. Ewing Fox Co., Inc.	115 20
92406	6-15-17	6-29-17	Edward Wright	150 00
			Police Department.	
92296	6-15-17	6-28-17	Colt-Stratton Co., Inc.	$77 78
94190	6-26-17	7-15-17	Rutherford Rubber Co.	72 00
94196	4-14-17	7- 5-17	The K. & L. Bindery	4 00
94193	6- 9-17	7- 5-17	J. C. Hoose	9 75
94192	6-21-17	7- 5-17	American Auto Press Co., Inc.	4 95
94191	6-14-17	7- 5-17	Theo. Moss & Co.	9 00
94183	6-25-17	7- 5-17	Garford Motor Truck Co., Inc.	16 88
94186	6-18-17	7- 5-17	Baker, Murray & Imbrie, Inc.	37 20
94185	6-18-17	7- 5-17	John Simmons Co.	1 66
84184	4-27-17, 6-15-17	7- 5-17	Stanley & Patterson	69 33
94182	6-13-17	7- 5-17	Topping Bros.	15 60
94427	6-15-17	7- 6-17	Nelson Bros.	22 21
94197	6-22-17	7- 5-17	Hodgman Rubber Company	3 75
88254	5-31-17	6-19-17	Berry Brothers	302 50
			President of the Borough of Manhattan.	
91498	5-11-17	6-27-17	The Sicilian Asphalt Paving Company	$72 00
93468		7- 3-17	William A. Prendergast, Comptroller of The City of New York, Trustee for Account of Street Opening Fund	3,486 62
93522	5-31-17	7- 3-17	The Asphalt Construction Co	24 50
93519	6-19-17	7- 3-17	The Sicilian Asphalt Paving Company	5 25
93524	5-31-17	7- 3-17	The Asphalt Construction Co	51 60
93520	5-31-17	7- 3-17	The Aztec Asphalt Company, Inc.	5 80
93521	6-12-17	7- 3-17	The Sicilian Asphalt Paving Company	7 88
93523	5-31-17	7- 3-17	The Aztec Asphalt Company, Inc.	18 00
93407	5-23-17	7- 3-17	Department of Correction	35 40
93495	6- 8-17	7- 3-17	C. M. Kinney Co	3 84
93486	5-22-17	7- 3-17	White, Washburne Co.	36 25
93490		7- 3-17	Sibley-Pitman Electric Corporation	13 28
93489	5-11-17	7- 3-17	Keystone Lubricating Company	40 80
93485	6- 7-17	7- 3-17	Standard Oil Co. of New York	4 50
93487	5-22-17	7- 3-17	Uehling Instrument Company	9 60
93478	5-24-17	7- 3-17	Samuel Lewis	30 00
93508	6-12-17	7- 3-17	Jenkins Bros.	10 88
93504	5-23-17	7- 3-17	Froment & Co	4 80
93499	5- 5-17	7- 3-17	Annin & Co	7 70
93484	5-22-17	7- 2-17	The Bristol Co.	2 81
93476	5-22-17	7- 3-17	Arthur McConnell	17 50
93506	5- 9-17	7- 3-17	Otis Elevator Co	8 45
			President of the Borough of The Bronx.	
90857	6- 9-17	6-25-17	Limbacher Paint & Color Works	$400 00
93732	6-30-17	7- 3-17	F. V. Morrison, Jr	75 00
93730	6-26-17	7- 3-17	L. Fusfeld	7 00
93724	5-31-17	7- 3-17	Brick Lime & Cement Co., Inc.	13 55
93721	6-14-17	7- 3-17	Church E. Gates & Company	24 96
93716	6- 8-17	7- 3-17	Contractors' Trading Company, Inc.	12 00
93712	6-22-17	7- 3-17	The C. G. Braxmar Co	5 00
93713	6-25-17	7- 3-17	A. P. Dienst Co., Inc.	2 14
93714	6-11-17	7- 3-17	Pittsburgh Plate Glass Co	11 05
93715	6-14-17	7- 3-17	Agent and Warden, Auburn Prison	26 55
93720	3- 8-17, 6-30-17	7- 3-17	A. P. Dienst Co., Inc.	34 09
93719	4-24-17, 6-20-17	7- 3-17	Vought & Williams	63 11
93731	6-28-17	7- 3-17	E. Belcher Hyde	12 00
92565	46909	6-29-17	Thomas J. Harte	235 00
92566	46893	6-29-17	New York Trap Rock Co	1,047 54
			President of the Borough of Brooklyn.	
88517		6-19-17	George Haiss Mfg. Co	$950 00
92666	6-14-17	6-29-17	Sweeney & Gray	370 00
91398	5-31-17	6-26-17	Abraham & Straus	154 00
93747	6-16-17	7- 3-17	Newman & Carey Company	75 00
92686	6-12-17, 6-19-17	6-29-17	Paul Ayres Co., Inc.	17 47
92695	5- 2-17	6-29-17	Joseph J. Bloeth	25 75
92657	6-26-17	6-29-17	Andrew B. Smith	65 50
92715	6-15-17	6-29-17	Andrew B. Smith	41 00
93742	6-16-17	7- 3-17	Thomas Martin	73 92
93743	6-15-17	7- 3-17	Sam'l W. Cornell	9 35
93746	5-29-17	7- 3-17	The Danzer Wagon Works	15 00
93741	6- 5-17	7- 3-17	Arthur H. McGrath	3 36
92706	4-16-17	6-29-17	Watson Manufacturing Co.	250 00
92694	6-19-17	6-29-17	R. A. Lewis	305 00
92684	5-28-17	6-29-17	The Neptune Manufacturing Co.	112 50
92702	5-16-17	6-29-17	Stevenson & Marsters	197 33
92701	6-16-17	6-29-17	Theo. Gaus' Sons	133 65
92664	6-18-17	6 29-17	Third St. Dumping Company, Inc.	175 00
92665	6-19-17	6-29-17	Brooklyn Ash Removal Co., Inc.	350 00
92679	6-12-17	6-29-17	Bacon Coal Company	1,670 00
92710	6-22-17	6-29-17	New York Clay Product Company	119 48
92704	5-26 17	6-29-17	Theo. Gaus' Sons	111 32
			President of the Borough of Queens.	
90890	46832	6-25-17	Marshall Contracting Co., Inc.	2,057 70
94091	5-31-17	7- 5-17	Strang Auto Garage Co., Inc.	7 75
94089	5 31-17	7- 5-17	Strang Auto Garage Co., Inc.	3 05
94087	6-13-17	7- 5-17	Harry Raiten	11 00
94085	6-13-17	7- 5-17	Chilton Paint Company	58 00
94084	6- 8-17	7- 5-17	The Long Island Hardware Company.	16 28
94082	5-31-17	7- 5-17	The Long Island Hardware Company.	90 00
94081	5-31-17	7- 5-17	The Long Island Hardware Company.	80 12
94080	6- 2-17	7- 5-17	The Long Island Hardware Company.	4 50
94079	5-29-17	7- 5-17	Boston Woven Hose and Rubber Company	59 00
94111		7- 5-17	The Barber Asphalt Paving Company.	17 00
			President of the Borough of Richmond.	
92312		5-10-17	Castleton Motor Car Co	363 50
92585	47546	6-29-17	Fiss, Doerr & Carroll Horse Co	1,340 00
92586	41501	6-29 17	Carrere & Hastings	1,362 96
91854	45428	6-29-17	John F. Koop	1,800 00
92584	46448	6-29-17	M. McQuade & Co	704 75
92575	4-30-17	6-29-17	Gregg Brothers	188 50
92573	6- 1-17	6-29-17	Staten Island Supply Co	255 00
			Public Service Commission.	
95301		7- 9-17	Law Department of the City of New York	1,149 72
95295		7 9-17	William L. Ransom, Counsel	14 70
95296		7- 9-17	A. I. Raisman, Engineer of Designs	12 61
95302		7- 9-17	John H. Myers, Division Engineer	81 66
95294		7- 9-17	Cornelius V. V. Powers, Division Engineer	7 75
95292		7- 9-17	Robert H. Jacobs, Division Engineer.	121 92
95316		7- 9-17	F. W. Carpenter, Division Engineer	21 45
95297		7- 9-17	J. O. Shipman, Division Engineer	32 79

Finance Voucher No.	Invoice Dates or Contract Number.	Received in Department of Finance.	Name of Payee.	Amount.
			Department of Public Charities.	
93943	12-30-16	7- 5-17	Edison Lamp Works of General Electric Company	15 60
93915	6- 1-17	7- 5-17	Flushing Automobile Garage, Inc	1 25
93925	4-26-17	7- 5-17	Stanley & Patterson	44 40
93995	6- 4-17	7- 5-17	Clinton Wire Cloth Company	19 31
93985	4-27-17	7- 5-17	New Amsterdam Gas Company	30 20
93991	5-29-17	7- 5-17	Tascarella Bros.	13 00
93904	6- 2-17	7- 5-17	Hudson Auto Lamp Works, Inc	3 50
93896	5-19-17	7- 5-17	The Sterling Piano Company	10 00
93895	4-25-17	7- 5-17	Singer Sewing Machine Company	10 00
93893	5-17-17	7- 5-17	Eugene Prager	42 50
93900	5-23-17	7- 5-17	Wm. Romaine	4 00
93901	5-17-17	7- 5-17	Eugene Prager	6 40
93902	5-21-17	7- 5-17	Naylor & Newton, Inc	42 00
93903	6- 8-17	7- 5-17	Wm. J. Murray	80 00
93899	6-13-17	7- 5-17	Sanitary Mechanical Specialty Co	27 65
93237	2-28-17. 5-28-17	7- 2-17	E. T. Joyce	46 85
93236	5-22-17. 5-23-17	7- 2-17	E. F. Keating Co	52 20
94446	3-16-17	7- 6-17	Olney & Warrin, Inc	5 90
93973	5- 9-17	7- 5-17	Hull, Grippen & Co	3 75
93936	5-19-17. 5-29-17	7- 5-17	John Simmons Co.	65 58
93922	11-15-16. 4- 4-17	7- 5-17	The Kny-Scheerer Corp.	34 75
93906	4-30-17	7- 5-17	Mrs. Patrick Sheehan	2 50
93913	10-16-16. 3- 9-17	7- 5-17	General Motors Truck Co	13 75
93992	5-18-17	7- 5-17	U. T. Hungerford Brass & Copper Co.	53 71
93993	6- 4-17	7- 5-17	Frank A. Hall & Sons	14 90
93182	5-23-17	7- 2-17	Nason Mfg. Co.	21 26
93186	4- 3-17	7- 2-17	Kitts Mfg. Co.	22 00
93155	4-25-17	7- 2-17	Thomas C. Dunham	94 00
94003	6- 9-17	7- 5-17	Charles Beseler Co.	2 25
93271	4- 3-17. 4-30-17	7- 2-17	Joseph D. Duffy, Inc	35 53
93907	5-25-17	7- 5-17	Enos Johnson	43 00
93949	5-17-17. 5-29-17	7- 5-17	Stanley & Patterson	58 99
93994	5-10-17	7- 5-17	Chas. H. Heinsohn	36 75
93912	6- 1-17	7- 5-17	Gough & Horn	7 40
93458	5-23-17. 5-25-17	7- 3-17	L. Strauss & Sons	67 51
93461	5-18-17	7- 3-17	William J. Love, Inc	2 80
93460	3-27-17	7- 3-17	Theo. Moss & Co.	1 64
93459	4-25-17	7- 3-17	John Wanamaker, New York	24 00
93454	6-15-17	7- 3-17	Stumpp & Walter Co	45 50
93453	6- 7-17	7- 3-17	Vaughan's Seed Store	28 00
93450	5-21-17. 6- 2-17	7- 3-17	Richman & Samuels	40 52
93909	6-30-17	7- 5-17	J. M. Horton Ice Cream Co	90 80
93449	5-10-17	7- 3-17	R. F. Stevens Co.	22 39
93946	11-23-16. 6- 5-17	7- 5-17	John Simmons Co.	5 80
76517		5-21-17	Neptune B. Smyth, Inc	560 00
76516		5-21-17	Neptune B. Smyth, Inc	365 00
87782	46269	6-18-17	Edward F. Stevens and Renwick, Aspinwall & Tucker	712 99
95713		7-10-17	Frank Doyle, Bookkeeper	156 75
93939	4- 3-17	7- 5-17	Milton Bradley Co.	14 00
93931	4- 5-17	7- 5-17	Multiplex Display Fixture Co	41 00
93926	5-10-17	7- 5-17	Yawman & Erbe Mfg. Co	46 00
93930	4-21-17	7- 5-17	Frederick A. Hemmings	95 00
94000	5-31-17	7- 5-17	Bramhall, Deane Co.	13 30
93997	5- 6-17	7- 5-17	Edw. E. Buhler Co	17 33
93998	5-21-17	7- 5-17	Blog Shoe Finding Co., Inc	15 00
93999	5-24-17	7- 5-17	Bosch Magneto Co.	3 20
94004	6-14-17	7- 5-17	James S. Barron & Co	98 00
94005	5-24-17	7- 5-17	Alberger Pump & Condenser Co	35 00
94002	5-31-17	7- 5-17	The Burnet Co.	1 44
93977	6- 6-17	7- 5-17	R. H. Forschner Co	4 00
93971	6- 7-17	7- 5-17	The Gutta Percha & Rubber Mfg. Co.	11 75
93982	5-24-17	7- 5-17	Library Bureau	75 60
93983	5-21-17	7- 5-17	Benjamin S. Adler Co	6 59
93984	5-25-17	7- 5-17	New York Belting & Packing Co	6 94
93989	3-20-17	7- 5-17	Samuel Lewis	18 75
93986	5-29-17	7- 5-17	National Casket Company	67 00
93990	5-29-17	7- 5-17	Wolf, Sayer & Heller, Inc	26 00
93956	3-28-17. 5- 9-17	7- 5-17	Oriental Rubber & Supply Co., Inc	44 80
93954	1-29-17. 6- 8-17	7- 5-17	E. T. Joyce	23 10
93988	4-26-17	7- 5-17	Library Bureau	76 30
			Sheriff, Richmond County.	
93043	4-30-17. 5-31-17	7- 2-17	James Lucey	$38 00
93042	4-30-17. 5-31-17	7- 2-17	James Lucey	19 81
			Sheriff, New York County.	
94393	6- 2-17	7- 5-17	Eagle Spring Water Co	$6 60
94391	7- 2-17	7- 5-17	Wm. Cleary & Son	11 00
94396	6- 2-17. 6-30-17	7- 5-17	The Banks Law Publishing Co	17 10
94395	6-30-17	7- 5-17	Union Towel Supply Company	10 34
94394	6-30-17	7- 5-17	Burns Bros. Ice Corporation	10 83
			Department of Street Cleaning.	
94042	4-21-17	7- 5-17	Irving Underhill	$10 00
94041	5-16-17	7- 5-17	Underwood Typewriter Co., Inc	50
94036	6-19-17	7- 5-17	S. Glucksman	4 00
94034	6-14-17	7- 5-17	Henry Frank, Jr.	31 35
92606	5-31-17	6-29-17	C. F. Harms Company	210 00
92617	47561	6-29-17	Geo. N. Reinhardt & Co	3,468 40
92620	47425	6-29-17	Standard Oil Co. of New York	550 16
			Tenement House Department.	
92559	4-28-17. 6-23-17	6-29-17	Evans Products Corporation	$133 00
92560	6-11-17	6-29-17	Roneo Company	129 90
			Board of Water Supply.	
94864		7- 7-17	Michael J. Shanahan	$87 50
			Department of Water Supply, Gas and Electricity.	
94955		7- 9-17	William F. Laase, Borough Engineer	$37 32
94956		7- 9-17	William A. Shaw, Clerk	4 10
92481	3- 6-17	6-29-17	Autocar Sales Company	356 00
94957		7- 9-17	William Flannery	8 41
94568		7- 6-17	Town of Mount Pleasant, John J. Hughes, Receiver of Taxes	393 77
94922		7- 7-17	Village of Lynbrook, Charles E. Schweitzer, Collector	1,062 49
92611	47078	6-29-17	Electro Bleaching Gas Co	3,205 98
92612	47099	6-29-17	R. D. Wood Co	2,740 51

VOUCHERS RECEIVED IN DEPARTMENT OF FINANCE THURSDAY, JULY 12, 1917.

A statement is herewith submitted of all vouchers filed in the Department of Finance on this date, in which is shown the Department of Finance voucher number, the date of the invoices or the registered number of the contract, the name of the payee and the amount of the claim. Where two or more bills are embraced in one voucher the date of the earliest is given, excepting that when such vouchers are submitted under a contract the registered number of the contract is shown instead.

WILLIAM A. PRENDERGAST, Comptroller.

Finance Voucher No.	Invoice Date or Contract Number.	Name of Payee.	Amount.
		Board of Assessors.	
96852		New York Telephone Co	$31 24
		Art Commission.	
96426		J. J. Adams	$100 00
96427		New York Telephone Co	4 20
		Bellevue and Allied Hospitals.	
96865	12- 1-16	Meeker & Co.	$1,215 89
		Municipal Civil Service Commission.	
96867	6-30-17	United Electric Service Co.	$16 25
96868		Geo. H. Eberle	12 80
96869		Geo. H. Eberle	6 75
96870		May B. Upshaw	32 65
96871		Thomas C. Murray	32 75
96866	6-20-17	A. Pearson's Sons	188 00
		Coroner, Borough of Richmond.	
96783	7- 7-17	O'Maras' Garage	$32 45
		Department of Correction.	
96829	4-30-17	Standard Oil Co. of N. Y.	$450 00
96830	6-19-17	John T. Stanley Co	1 25
96831	6- 8-17	Edw. E. Buhler Co	4 48
96832	4-16-17	Topping Brothers	1 62
96833	6-25-17	Greenlie, Halliday Co	10 00
96834	6-15-17	Hammacher, Schlemmer & Co.	42 00
96835	11-24-16	Nason Mfg. Co.	73
96836	4-30-17	S. H. Creedon	29 00
96837	5-31-17	N. Y. Central R. R. Co	10 59
96838	9- 6-16	The Sherwin-Williams Co	24 50
96839		Burdette G. Lewis	7 70
		Department of Education.	
96442	3-20-17	Paul Euell, Inc	$7 66
96443	6-24-17	Wm. B. Taylor	78 34
96444	3-28-17	Jas. J. Fay	47 22
96445	8- 1-16	The New York Association for the Blind	11 25
96446	4- 9-17	B. P. Eldridge	14 27
96447	3- 6-17	Geo. Rabe	34 67
96448	3-16-17	Thos. J. Tuomey Co	18 06
96449	3-29-17	Jos. F. Egan	6 94
96450	4- 9-17	John F. Koop	7 88
96451	4- 4-17	E. P. Gleason Mfg. Co	4 70
96452	4- 7-17	John A. O'Brien	8 77
96453	4-28-17	Kramer, Mezger, Inc.	20 01
96454	3- 8-17	D. L. Delaney	49 37
96455	3-31-17	Kroepke Plumbing & Heating Co.	37 59
96456	4- 9-17	Louis Guerr	23 22
96457	4- 6-17	Fred A. Buser	59 80
96458	4- 4-17	A. D. Evertsen Co	28 06
96459	4-12-17	F. J. McCaragher	62 53
96460		Garbutt & Co.	39 83
96461	4-11-17	F. J. McCaragher	16 88
96462	4-15-17	Jas. I. Kelly	25 47
96463	4-17-17	Thos. F. McEnaney	14 62
96464	4-10-17	Whitestone Scavenger Co	64 00
96465	4- 9-17	Geo. Gross & Son	6 10
96466	4- 3-17	Jas. H. Draper	24 36
96577		R. M. Bingham	312 75
96441	8-10-16	Neostyle Envelope Co	43 70
96840	6-19-17	John Smith	212 00
96841		Chas. Herr	63 75
96842		Wm. T. Blunt	133 50
		Fire Department.	
96550	46737	American-La Francee Fire Engine Co.	14,578 00
96876	47086	Francis M. A. Leach	896 92
96877	46637	East River Mill & Lumber Co.	68 87
96878	47385	E. B. Latham & Co., Inc	36 66
96879	46739	United States Tire Co	500 86
		Department of Health.	
96854	47251	Thos. F. Tuohy & Co., Inc.	4,500 00
96855	45919	C. J. Tagliabue Mfg. Co	945 00
96853		Howard B. Elliott	3,498 57
		Howard B. Elliott	1 43
		Miscellaneous.	
96505		Frank A. McGuire	75 00
96437		Hebrew Sheltering Guardian Society	14,362 70
96438		Howard Orphanage and Industrial School	2,863 55
96439		St. Anthony's Hospital	7,711 20
96440		The New York Society for the Relief of the Ruptured and Crippled	1,,168 21
96429		American Female Guardian Society and Home for the Friendless	2,723 80
96430		Beth Israel Hospital	2,119 40
96431		Beth Israel Hospital	2,280 19
96432		Brooklyn Nursery and Infants' Hospital	402 56
96433		The Ozanam Home for Friendless Women	259 48
96434		Catholic Institute for the Blind	617 83
96435		Dominican Convent of Our Lady of the Rosary	11,892 00
96436		Good Counsel Training School for Young Girls	1,369 92
96773		David Brandt	6 00
96774		Wm. Schuetz	4 50
96775		Wm. Schuetz	4 50
96776		Wm. Schuetz	4 50
96777		Wm. J. Hotz	1 00
96778		John J. McDermott	7 00
96779		Jacob Levinson	4 50
96780		Jas. A. Stengle	4 50
96781		George Schmidt	4 50
96782		Dominick Palazzo	4 50
96746	6-16-17	The Brooklyn Citizen	85 00
96747		A. Federhart & Sons, Inc	75 00
96748	7- 5-17	Chesebro, Whitman Co	440 00
96749		Jos. J. F. Bopp	205 00
96750	7- 6-17	Henry L. Ennis Co	300 00
96751		Eric H. Palmer	13 60
96752	7- 9-17	Edward J. Flanagan	85 00
96753		Fred Geib	85 00
96754	7- 9-17	Jos. Slavin	85 00
96755		Benj. F. Shackelton	85 00
96756		Geo. Bullenkamp	85 00
96757		Eric H. Palmer	27 15
96758	7- 6-17	R. B. Martin, Inc	8 00
96759	7- 5-17	Jos. Kelly	425 00
96760		Harry A. Siegeel and W. C. Michel	20 00
96761	6-22-17	Whitehead & Hoag Co	32 64
96762		John J. Juliano	85 00
96763		Wm. F. Connelly	85 00
96764		Frederic Watson	210 00
96765		Wm. E. J. Keating	130 00
96766		Max Ellenson	85 00
96767	7- 7-17	Peter F. Grupe	85 00
96768	7- 6-17	Wm. Bayne	85 00
96769	7- 8-17	Rev. Peter Schroeder	75 00
96770	7- 7-17	Thos. P. Ward	80 00
96771	7- 7-17	Thos. P. Ward	85 00
96772	7- 7-17	Chas. Dammemyer	85 00
96784		Ole Erickson	24 03
96785		Jacob Plant	1 00
96786		Title Guaranteee and Trust Co.	4 20
96787		Kate Crosby	2 07
96788		Phillipp Haag	190 69
96789		Sarah E. Hansen	25 85
96790		Sebastian Bazuro	72 80
96791		Henry Pfister	14 49
96792		Florence Barbieri et al	18 40
96793		Carl E. Elstrom	8 05
96794		Elizabeth H. Hannahs	1 15
96795		The Whitney Co	973 50
96796		Joseph Friedmann	88 50
96797		B. E. Winham	67 50
96798		Antonio Casella & Raffaela Casella	75 00
96799		Mrs. Caroline Kessler	75 00
96800		John W. Lawlor, as assignee of Julia Fruin	90 00
96801		Manderkin Building Co	133 50
96802		August Hahn	87 00
96803		Edward W. Thompson and Arthur W. Thompson	75 00
96804		Samuel Yutkowitz	105 00
96706		Mrs. S. Heischover	54 00

Finance Voucher No.	Invoice Date or Contract Number.	Name of Payee.	Amount.
96806		D. Kidansky & L. J. Levy..	120 00
96807		M. Goldberg	53 50
96888		Edgerton L. Winthrop, Jr., et al.	118 50
96809		David Mickelbark	88 50
96810		Eugenio Gentile	90 00
96811		Miss Amelia Schaefer	78 00
96812		Sarah E. Thomson, as Exec. of Estate, John R. Thompson, deceased	75 00
96813		Carmela Di Piazza	75 00
96814		Christian Tymann	90 00
96815		Wm. Messer Co.....	165 00
96816		Magdalen O'Connor, as Exec. of the Estate of Thos. J. O'Connor, deceased	57 00
96817		Moritz Gruenstein et al....	90 00
96818		Mrs. Mary J. Green.....	45 00
96819		Reuben Mirsky et al., as guardian, Louis Greenstin..	81 00
96820		The G. X. Mathews Co.....	255 00
96821		Vincenzo Di Muria.....	54 00
96822	7-10-17	Israels Empire Stables.....	192 00
96823		Bedford Riding Academy...	188 33
		The Mayoralty.	
96568		Burns Bros.	$6 50
96569	6-30-17	New York & Brooklyn Supply Co.	4 20
96570		John Butera	11 68
96571	6-29-17	Yawman & Erbe Mfg. Co..	3 75
96572		E. W. Bullinger	7 00
96573	6- 1-17	Diebold Safe & Lock Co....	185 00
96574		United Electric Service Co..	2 75
96575		John J. Glennon	17 50
96576		John J. Glennon	16 05
96567	46488	New York Telephone Co...	172 52
		Brooklyn Public Library.	
96745		Brooklyn Public Library...	$13,824 42
		Department of Parks, Borough of Queens.	
96500		G. Casabona	$90 00
96501	7- 5-17	Robt. G. Lake	3 00
96502	6-30-17	Western Chair Co.....	40 00
96489	6-22-17	Doering Bros.	15 80
96490	6-22-17	Tisdale Lumber Co.....	14 64
96491	6-23-17	Martin A. Meyer, Jr., Co...	9 50
96492	6-14-17	Fred Adee Co.....	2 05
96493	7- 3-17	Grochola & Kuskowski.....	2 00
96494	7- 2-17	G. Terdeman	12 00
96495	6- 1-17	Jas. Mulligan	43 25
96496	7- 4-17	Louis Borges	90 00
96497	7- 5-17	Chas. Feths	90 00
96498	7- 5-17	Adam Albert	90 00
96499	7- 5-17	John Mand	90 00
96475	6- 8-17	General Carbonic Co, Braunstier Bros.	150 00
96476	6-18-17	J. M. Thorburn & Co.....	5 50
96477	6-26-17	Nungesser, Dickinson Seed Co.	30 00
96478	6-13-17	Stumpp & Walter Co.....	2 50
96479	6-28-17	J. Newton Van Ness Co....	9 25
96480	4-26-17	The Smith-Worthington Co.	6 25
96481	6- 2-17	Electric Hose & Rubber Co.	193 80
96482	5-28-17	Chas. A. Myers Cont. Co., Inc.	258 60
96483		South Brooklyn Railway Co.	771 51
96484	6- 1-17	Calvin Tomkins	622 15
96485	6-21-17	Henry E. Kordes Co., Inc..	131 25
96486	5-24-17	Goodwin-Gallagher Sand & Gravel Corp.	254 65
96487	6- 6-17	Thos. F. Tuohy & Co., Inc.	265 76
96488	5-17-17	Coldwell Lawn Mower Co..	35 77
96504	47353	J. & T. Adikes.....	403 23
96503	5-31-17	New York Telephone Co...	80 82
96533	47388	Thos. M. Blake	2,722 72
96534	47520	Wm. Zinsser & Co., Inc....	733 50
		Police Department.	
96508	6-28-17	Standard Oil Co. of N. Y..	$427 92
96509	6-26-17	The Prest-o-lite Co., Inc....	28 50
96510	6- 6-17	Geo. J. Miller & Sons.....	3,600 00
96511	6-30-17	Alexander Bauman, Inc....	29 00
96512	7- 3-17	Fisk Rubber Co. of N. Y...	261 00
96513	6-29-17	Fisher, Mitchell Co.....	5 34
96514	6-28-17	Hanlon & Goodman Co.....	8 52
96515	6-30-17	New York Brass & Wire Works Co.	8 50
96516	6-30-17	Louis J. Kahn	35 00
96517	5-31-17	Jaamica Auto & Supply Co.	10 88
96518	7- 2-17	Michael Paulini	25
96519		Houpert Machine Co.....	36 00
96520	6-25-17	American Whitewashing Co.	15 00
96521	6-28-17	Thos. F. Burke	51 50
96522	6-28-17	Wm. R. Pitt Composite Iron Works	35 00
96523	6-29-17	Arnold Levien Iron Works.	6 40
96524	6- 9-17	Chas. Glasser	4 05
96525		Geo. J. Stier, Inc.....	94 35
96526	6-28-17	Sterling Top & Equipment Co., Inc.	20 00
96527	6-30-17	Gus Hallen	92 50
96528	7- 2-17	Gustave C. Stelle.....	99 16
96529	6-30-17	W. M. Fleischman.....	529 08
96530	7- 1-17	M. Byers	874 14
96531	7- 2-17	Wm. J. McClusky.....	602 10
96532	6-30-17	Bedford Riding Academy...	331 00
96507		Dr. John A. Hartwell.....	100 00
96506	42189	Geo. N. Reinhardt & Co....	257 84
		Department of Plant and Structures.	
96565		Jos. R. Geoghan.....	$7 45
96566		Adrian La Forge.....	9 80
96551	7- 2-17	Henry Romeike, Inc.....	15 00
96552	6-30-17	The Mutual Towel Supply Co.	16 38
96553	6-25-17	Obrig Camera Co.....	18 78
96554	6-22-17	Otis Elevator Co.....	12 36
96555	6-22-17	The Linde Air Products Co.	24 00
96556	7- 5-17	Library Bureau	1 75
96557	6-21-17	American Mason Safety Tread Co.	127 60
96558	6-25-17	Froment & Co.....	50 00
96559	6-29-17	The East River Mill & Lumber Co.	513 57
96560	6-26-17	East River Mill & Lumber Co.	585 00
96561	6-30-17	J. M. Kohlmeier	32 21
96562	6-27-17	The John C. Orr Co.....	127 88
96563		The Western Union Tel. Co.	7 50
96564	6- 8-17	American Steel & Wire Co.	138 20
96627	5-26-17	Oldsmobile Co. of N. Y....	525 00
96824	6-29-17	John Wanamaker	232 00
96825	7-11-17	G. W. Bromley & Co.....	169 00
		President of the Borough of Manhattan.	
96578	47542	Jas. I. Newman.....	1,170 00
96579	47163	Chicago Bridge & Iron Works	6,502 50
96580	43780	Wm. J. Fitzgerald.....	261 54
96581	35765	Cleveland Trinidad Pav. Co.	173 97
96582	45522	W. J. Fitzgerald	17,478 45
96583	47416	Gasparrini & De Blasio....	4,027 50
96584	47258	W. J. Fitzgerald	2,020 34
96585	47502	Melrose Const. Co.....	1,755 95
96586	37337	Harlem Cont. Co.....	173 19
96587	43767	Wm. J. Fitzgerald.....	102 54
96589		G. B. Raymond & Co.....	151 00
96590	10-31-16	The Aztec Asphalt Co., Inc.	8 10
96591		John O'Rourke and James M. Vincent	142 99
96592		E. J. Scully and James M. Vincent	143 19
96593		Estate of Louis H. Stroh and James M. Vincent.....	363 41
96594		J. A. Sharp and James M. Vincent	162 79
96595		E. P. Sands and James M. Vincent	168 00
96596		Hugh Patterson and James M. Vincent	2 57
96597		William H. Spelman and James M. Vincent	645 65
96598		Herbert Smith and James M. Vincent	30 83
96599		William A. Prendergast, Comptroller	6,466 00
		President of the Borough of The Bronx.	
96856	46908	The Barrett Co.....	140 11
96857	46912	John A. McCarthy	420 03
96858	45461	Anita Const. Co.....	2,677 84
96859	43201	Rodgers & Hagerty, Inc...	7,004 42
96860	47056	Geo. V. Slack & Co., Inc...	10,132 85
96861	45639	New York & New Jersey Const. Co.	23,333 37
96862	45499	The Asphalt Const Co.....	10,352 41
96863	47090	Oscar Daniels Co.....	2,112 25
96864	44936	Marrone & Palladino.....	3,888 32
		President of the Borough of Brooklyn.	
96889	47212	John J. Towers.....	5,960 25
96890	46438	Borough Asphalt Co.....	4,561 53
96891	44843	Concrete Material Co., Inc.	10,380 54
		President of the Borough of Queens.	
96880	47545	Peace Bros.	4,220 46
96881	45820	Clancy & Van Alst.....	14,477 96
96882	47341	Jos. L. Sigretto & Co.....	2,805 64
95883	46836	John C. Scrade	1,967 50
96884	38685	Borough Asphalt Pav. Co..	71 73
96885	39202	Borough Asp. Co.....	75 43
96886	38684	Borough Asp. Co.....	10 57
96887	38686	Borough Asp. Pav. Co.....	61 39
96888	33603	Standard Bitulithic Co.....	1,785 31
		President of the Borough of Richmond.	
96467		Samuel W. Benedict.....	25 00
96468		Cornelius C. Jones.....	25 00
96469		Thaddeus Carlin	40 00
96470		Harry R. Denyse	40 00
96471	47208	John E. Donovan.....	230 94
96472	45902	John E. Donovan.....	7,553 25
96473	45904	Richard Lamb	5,530 50
96474	46001	Jos. Johnson's Sons.....	3,146 02
96843	5-28-17	Cornell Motor Car Co.....	14 96
96844	5-31-17	Castleton Motor Car Co....	24 44
96845	6- 6-17	Platt & Washburn Rfg. Co.	15 00
96846	6-18-17	Jas. Thompson & Sons.....	489 30
96847	6-19-17	Staten Island Shipbuilding Co.	226 68
96848	6-12-17	Hubbard R. Yetman.....	11 95
96849	6-20-17	Patrick White & Sons.....	120 00
96850	6-20-17	Andrew Jones	12 00
96851	3-30-17	Arthur J. De Berard.....	1 75
		Department of Public Charities.	
96826		Frank Doyle	$302 00
96827		Frank Doyle	25 56
96828		Frank Doyle	39 00
96708	6- 6-17	Eugene Dietzgen Co.....	3 00
96709	5-15-17	Hale Desk Co.....	222 50
96710	5-17-17	H. Kohnstamm & Co.....	47 70
96711	6-22-17	Acker, Merrall & Condit Co.	2 40
96712	6- 7-17	B. Ackermann Co.....	30 00
96713	6-15-17	Borden's Condensed Milk Sales Co., Inc.....	8 00
96714	6- 1-17	John Bellmann	126 45
96715	5-11-17	L. Crocco & Sons.....	7 25
96716	6-16-17	The Fleischmann Co.....	88 40
96717	6-20-17	Samuel E. Hunter.....	21 84
96718	6-20-17	John Campbell	300 00
96719	5-18-17	Armour & Co.....	35 00
96720	5- 5-17	The Baker Castor Oil Co...	470 00
96721	5- 5-17	Colgate & Co.....	1,710 00
96722	4-28-17	Du Pont Chemical Works..	285 00
96723	5- 9-17	Dennison Mfg. Co.....	1 00
96724	5- 3-17	Davis & Geck, Inc.....	3 46
96725	5-24-17	The Dentists' Supply Co....	16 58
96726	4-20-17	The Bug Products Co., Inc.	76 10
96727	3-30-17	The Deane Plaster Co.....	617 00
96728	5-19-17	Farbwerke, Hoechst Co.....	184 40
96729	4-13-17	Fritzsche Brothers	86 75
96730	5- 4-17	W. Feucht	19 50
96731	5-28-17	Franco-American Chemical Works	140 00
96732		Germania Pigeon Lofts.....	55 00
96733	4-10-17	Gimbel Brothers	57 50
96734	4-25-17	John Greig	138 00
96735	5-17-17	The Hoffman La Roche Chemical Works	531 75
96736	5- 9-17	Hollister Wilson Laboratories	353 00
96737	5-23-17	Kieley & Mueller, Inc.....	33 75
96614	4-16-17	Geo. W. Millar & Co.....	17 76
96615	5- 5-17	The Maltine Co.....	10 50
96616	5-22-17	John Morgan	5 00
96617	5-26-17	Murray Oxygen Co.	49 00
96618	5-17-17	The Norwich Pharmacal Co.	19 25
96619	4-18-17	Peek & Velsor.....	10 00
96620	5-22-17	Jas. Picker	483 47
96621	5- 7-17	Jas. Picker	523 78
96622	5- 1-17	Jas. Picker	839 24
96623	6-15-17	Powers, Weightman, Rosengarten Co.	999 11
96624	6-15-17	Powers, Weightman, Rosengarten Co.	373 65
96625	5- 5-17	Parke, Davis Co.	636 40
96626	4-16-17	Royal Petroleum Co., Inc...	28 25
96600	5-10-17	Johnson & Johnson.....	34 32
96601		H. T. Jarrett.....	76 31
96602	4- 3-17	The Jamison Semple Co....	25 25
96603	5-25-17	A. Klipstein & Co.....	97 50
96604	5- 5-17	Henry Livezey	29 25
96605	4-18-17	Lenz Apparatus Co., Inc....	3 75
96606	4-12-17	The Liquid Carbonic Co....	40 00
96607	5- 8-17	Magnus, Mabee & Reynard, Inc.	729 71
96608	5- 7-17	Merck & Co.....	827 07
96609		H. K. Mulford Co.....	6 41
96610	4- 6-17	E. Michaels	8 25
96611	4-10-17	Metropolitan Tobacco Co...	373 00
96612	4-16-17	McKesson & Robbins.....	14 60
96613	4-18-17	M. Mayer & Son.....	15 40
96628	5-11-17	Froment & Co.	25 07
96629	6- 4-17	Godfrey Keeler Co.....	48 00
96630	5-28-17	Jenkins Bros.	94 74
96631	5-11-17	H. W. Johns-Manville Co..	87 44
96632	6-18-17	The Geo. Josephite Co.....	24 05
96633	6-11-17	E. T. Joyce	64 50
96634	5-23-17	E. F. Keating Co.....	200 46
96635	3-22-17	Lawrence Belting Co.....	5 22
96636	4-19-17	Western Electric Co., Inc..	3 96
96637	3- 9-17	The Manhattan Supply Co..	7 47
96638	6-15-17	Manhattan Electrical Supply Co.	96
96639	5-31-17	Nason Manufacturing Co...	54
96640	6-13-17	Pratt & Cady Co., Inc.....	20 58
96641	5-29-17	Oriental Rubber & Supply Co., Inc.	12 50
96642	6- 7-17	Pittsburgh Plate Glass Co..	4 50
96643	5-17-17	Franklin Tuning Co.....	5 00
96644	6-11-17	The Fairbanks Co.....	231 00
96645		Bosch Magneto Co.....	10 80
96646	6- 2-17	The De Felice Studio.....	3 00
96647	6-16-17	Bloomingdale Bros.	414 53
96648	6-18-17	Gough & Horn.....	112 52
96649	2-24-17	Richman & Samuels.....	2 00
96650	3-28-17	Hodgman Rubber Co.....	214 12
96651	4-10-17	E. Lentz, Inc.....	637 14
96652	4- 1-17	The Miller Rubber Co.....	39 08
96653	4- 6-17	Meinecke & Co.....	2 70
96654	3-12-17	Geo. Poll & Co., Inc.....	90 00
96655	4-18-17	The Prometheus Electric Co.	65 30
96656	4- 6-17	Pittsburgh Electric Specialties Co.	7 38
96657	4- 4-17	F. Alfred Reichardt & Co., Inc.	299 33
96658	6-19-17	Paul B. Hoeber	14 50
96659	6- 4-17	Philip Braender	32 00
96660	6- 9-17	Bradley & Smith	19 32
96661	6-18-17	Hammacher, Schlemmer & Co.	5 47
96662		The MacLeod Co.	85 00
96663	6-15-17	Montgomery & Co., Inc.....	11 66
96664	6-13-17	New York Frame & Picture Co.	62 50
96665	5-31-17	The American Laundry Machinery Co.	66 25
96666	6- 4-17	Brooklyn Varnish Mfg. Co.	210 00
96667	5-25-17	Edw. E. Buhler Co.....	441 00
96668	5-31-17	Bramhall, Deane Co.....	1 50
96669	5-16-17	A. F. Brombacher & Co....	9 84
96670	5-23-17	Castleton Motor Car Co....	90
96671		Combination Rubber Mfg. Co.	7 45
96672	6- 1-17	Clinton Wire Cloth Co.....	150 00
96673	5-23-17	Cornell & Underhill.....	3 77
96674	5-21-17	Candee, Smith & Howland Co.	150 00
96675	6- 7-17	Crandall Packing Co.....	22 95
96676	6- 9-17	H. T. Dakin.....	13 20
96677	5-22-17	F. W. Devoe & C. T. Raynolds Co.	7 92
96678	6- 6-17	F. N. Du Bois & Co.....	26 82
96679	5-16-17	The East River Mill & Lumber Co.	53 00
96697	6-15-17	Richman & Samuels.....	389 14
96698	5-31-17	Mutual McDermott Dairy Corp.	22 52
96699		H. J. Heinz Co.....	14 00
96700	5- 1-17	Henry Allen	40 00
96701	4-28-17	Palo Co.	62 86
96702	4- 6-17	Geo. Murphy, Inc.	44 45
96703	5-26-17	E. Leitz, Inc.....	997 76
96604	5-10-17	Knickerbocker Supply Co..	309 69
96605	5-14-17	Hull, Grippen & Co.....	4 60
96706	5-10-17	Bausch & Lomb Optical Co.	215 48
96707	4-19-17	Eimer & Amend.....	618 46
96680	4- 3-17	Jas. T. Dougherty.....	424 51
96681	5-16-17	H. Fischer & Co.....	11 75
96682	5-25-17	J. E. Kennedy & Co.....	860 11
96683	5-10-17	The Kny-Scheerer Corp....	693 10
96684	6-19-17	Lehn & Fink.....	289 20
96685	3- 6-17	M. McGirr Sons Co.....	730 50
96686	6- 3-17	Munson Supply Co.....	9 45
96687	6-15-17	L. Barth & Son.....	226 02
96688	4-24-17	Cary Mfg. Co.....	13 20
96689	6-15-17	Empire Sales Co.....	3 92

Finance Voucher No.	Invoice Date or Contract Number.	Name of Payee.	Amount.
96690	6- 4-17	Jaburg Bros.	7 90
96691	6- 1-17	Wm. J. Love, Inc.	89 69
96692	5-22-17	The Hospital Supply Co.	16 95
96693	5-21-17	F. Madlener Mfg. Co.	191 10
96694	4-10-17	The Wm. M. Eisen Co.	122 17
96695	4- 2-17	Wm. Langbein & Bros.	37 50
96696	3-30-17	J. L. Lewis.	2 48
		Commissioner of Records, Kings County.	
96738	5-31-17	New York Tel. Co.	27 33
96739		David McQueen	14 35
96740	5-18-17	Samuel Weil & Son	4 50
96741	7- 2-17	Pat'k Dougherty	25 66
96742	7- 9-17	M. V. Benoit	58 50
96743	7-10-17	Walldorf, Hafner & Schultz.	73 00
96744	7-11-17	E. Belcher Hyde	35 00
		Sheriff, New York County.	
96537	46717	New York Tel. Co.	89 69
96538	6- 4-17	Bulkins Exterminating & Disinfecting Co.	2 50
96539	6- 8-17	Jacob Kaufman	4 00
96540	6- 6-17	Greenhut & Co.	53 80
96541		Franco American Baking Co.	26 10
96542	6-30-17	D. F. Croker	27 02
96543	6-30-17	Fred Luhring	13 50
96544	6- 1-17	Nauss Bros. Co.	77 17
96545		Knickerbocker Ice Co.	4 69
96546	6- 6-17	John T. Stanley Co.	1 00
96547		Knickerbocker Ice Co.	2 17
96548	7- 2-17	Eagle Spring Water Co.	5 10
96549	6-17-17	Greenhut & Co.	10 92
96535	7- 1-17	N. Bass & Co.	2 45
96536		Alfred E. Smith	29 90
		Department of Street Cleaning.	
96588	38795	Dailey & Ivins	39,910 63
		Department of Water Supply, Gas and Electricity.	
96872	46626	National Carbon Co.	81 00
96873	43920	The New York Edison Co.	12,432 77
96874	47195	New York Tel. Co.	606 03
96875	47193	New York Tel. Co.	1,115 59

Police Department.

Report for week ended June 23, 1917:

JUNE 18.

Granted—Application of Acting Detective Sergeant Thomas F. Donohue, Detective Bureau, for permission to accept reward of $50, less the usual deduction for the Pension Fund, from the Superintendent of Police of Detroit, Mich., for the arrest of one H. B. Jacobs. Application of Patrolman Christian Gonseth, 155th Precinct, to be reimbursed in the sum of $13.50 for uniform blouse damaged in the performance of duty. Application of Patrolman Raymond T. Reid, 14th Precinct, to be reimbursed in the sum of $6 for uniform blouse damaged in the performance of duty.

The following resignation was accepted: Patrolman Charles Hoffman, 164th Precinct, to take effect 12 p. m., June 16, 1917.

JUNE 19.

The compensation of Joseph A. Garvey, Clerk, was increased from $300 to $540 per annum, effective this date.

The following member of the Force was relieved and dismissed from the Police Force and Service and placed on the roll of the Police Pension Fund and was awarded the following pension: To take effect 12 p. m., June 18, 1917: Patrolman Charles Hand, Shield No. 4803, 173rd Precinct, on his own application, at $725 per annum; appointed Jan. 18, 1892.

JUNE 20.

The resignations of the following Special Patrolmen in the employ of the Police Department were accepted: David Morris, Shield No. 1014, 39 Precinct (5th Dist.), 12.01 a. m., June 9, 1917; James E. Donnelly, Shield No. 2388, Division of Bridge Defense, 8 a. m., June 12, 1917; Julius Gnos, Shield No. 1206, 1st Precinct (1st Dist.), 12 p. m., June 12, 1917; Stephen J. Carroll, Shield No. 1837, 43rd Precinct (5th dist.), 12 p. m., June 13, 1917; Salvatore A. Rotunno, Shield No. 1148, Division of Bridge Defense, noon, June 14, 1917; John S. Conway, Jr., Shield No. 2528 (under jurisdiction of Public Service Commission), 22nd Precinct (3rd Dist.), noon, June 11, 1917.

The following death was reported: Special Patrolman John Allen, Shield No. 2510, Division Bridge Defense 1, at 12.03 a. m., June 20, 1917.

JUNE 21.

Granted—Application of Acting Detective Sergeant James A. Knapp, Detective Bureau, for permission to accept reward of $25, less the usual deduction for the Pension Fund, from Howard Thurston for the arrest of person charged with stealing jewelry from his residence and for the recovery of the stolen jewels.

The employment of the following Special Patrolman in the Police Department was discontinued: Thomas J. Lennon, Shield No. 1868, Division of Bridge Defense, at 12 p. m., June 11, 1917.

The resignations of the following Special Patrolmen in the employ of the Police Department were accepted John H. Greiner, Shield No. 1149, Division of Bridge Defense, 12 p. m., May 30, 1917; Fred Feldmann, Shield No. 1036, 37th Precinct (6th Dist.), 12.01 a. m., June 12, 1917; Francis M. Campbell, Jr., Shield No. 2395, Division of Bridge Defense, 8 a. m., June 12, 1917; Joseph P. Conway, Shield No. 2608, 42nd Precinct (6th Dist.), 12 p. m., June 13, 1917; Ralph F. Hazelhurst, Shield No. 2249, 42nd Precinct (6th Dist.), 12 p. m., June 14, 1917; Frank W. Miller, Shield No. 1483, 163rd Precinct (10th Dist.), 12 p. m., June 13, 1917.

The following Special Patrolmen were dismised from employment in the Police Department: Arthur B. McShane, Shield No. 2176, 68th Precinct (14th Dist.), 12 p. m., June 17, 1917; William H. Speer, Shield No. 2519, and William P. Carver, Shield No. 2561, 31st Precinct (5th Dist.), under jurisdiction of Public Service Commission, 12 p. m., June 17, 1917.

JUNE 22.

Granted—Application of Patrolman Robert Graham, 26th Precinct, to be reimbursed in the sum of $10 for repairs to uniform blouse damaged in the performance of duty. Application of Acting Detective Sergeant Carl Buck, Detective Bureau, for permission to accept reward of $50, less the usual deduction for the Pension Fund, from the U. S. Government for the arrest of a deserter from the U. S. Navy.

Runner Licenses Granted—Cornelius De Jong, 441 W. 23rd st., from June 14, 1917, to June 13, 1918; fee, $12.50; bond, $300. Charles Osborne, 162 Eleventh ave., from June 22, 1917, to June 21, 1918; fee, $12.50; bond, $300. Benigno Rico, 107 W. 84th st., from June 20, 1917, to June 19, 1918; fee, $20; bond, $300.

John J. Devery was promoted from First to Second Grade Clerk with compensation at the rate of $600 per annum, to take effect as of June 16, 1917, his name appearing on eligible list dated June 19, 1917.

Accepted—Resignation of Jacob A. Taylor, Steward, Steamer Patrol, effective 8 a. m., June 18, 1917.

JUNE 23.

Michael A. Kelly, appointed Caretaker, on probation March 22, 1917, was appointed permanently as Caretaker; his services while on probation having been satisfactory.

Granted—Petition for pension of Catherine Sullivan, widow of Patrolman Daniel T. Sullivan; date of marriage Oct. 25, 1878; amount of pension awarded $300 per annum. Petition for pension of Ellen Baldwin, widow of Sumner Baldwin, pensioner; date of marriage Jan. 17, 1875; amount of pension awarded $180 per annum. Petition for pension of Elizabeth H. Beresford, widow of Patrolman Thomas H. Beresford; date of marriage June 19, 1915; amount of pension awarded $600 per annum from May 21, 1917.

Granted—Application of Patrolman Jacob Parmet, 165th Precinct, to be reimbursed in the sum of $5 for repairs to summer uniform trousers destroyed in the performance of duty. Application of Sergeant James M. Wilson, 6th Precinct, to be reimbursed in the sum of $2.50 for damage to uniform trousers in the performance of duty.

The following resignation was accepted: Patrolman Thomas J. Frizzell, Shield No. 2512, 172nd Precinct, to take effect 12 p. m., June 22, 1917.

ARTHUR WOODS, Police Commissioner.

Department of Plant and Structures.

Report for week ended June 30, 1917.

Vouchers Forwarded to the Comptroller—Open market orders, $2,352.38; miscellaneous, $25.41; payrolls, $22,478.27; total, $24 856.06.

Moneys Received—Brooklyn Bridge: Privileges, $1,319.13; material and labor, $25.11; total, $1,344.24. Williamsburg Bridge: Privileges, $73.83. Manhattan Bridge: Privileges, $43.33. Queensboro Bridge: Material and Labor, $5.30. Bridges over Harlem River and in The Bronx: Privileges, 69 cents. Grand total, $1,467.44.

F. J. H. KRACKE, Commissioner.

Park Board.

Stated meeting, 3 p. m., June 21, 1917.

Present—Commissioners Whittle, Ingersoll, Weier.

Reading of the minutes dispensed with.

Contracts Awarded—Repairs to six timber groynes at Dreamland Park, Coney Island, Brooklyn.

Contracts Executed—June 18, Altman Plumbing Co., plumbing, comfort station, Forest Park, Queens, $1,460; surety, Fidelity and Deposit Company of Maryland. June 19, Peter Cleary, comfort station, Forest Park, Queens, $7,920; surety, Massachusetts Bonding and Insurance Company.

LOUIS W. FEHR, Secretary.

Stated meeting, 3 p. m., June 28, 1917.

Present—Commissioners Ward (President), Whittle, Ingersoll, Weier.

Bids Received—Manhattan: For air washers for the blowers in Addition H of the Metropolitan Museum of Art, Central Park. The following was adopted:

In view of the verbal leave of absence accorded the Landscape Architect of the Park Broad previous to its meeting of May 28, when his services were unexpectedly requisitioned by the Federal Government for temporary use in preparing the plans in connection with the rapid building of cantonments for troops in the Western portions of this country, this Board herewith officially confirms by resolution said leave granted, which was for a period of approximately three weeks, as requested by the Federal Government. Meanwhile the Board designates the Assistant Landscape Architect, Joseph Gatringer, as Acting Landscape Architect during the absence of Mr. Pilat.

The matter of street railway transportation through Pelham Bay Park was referred to the Landscape Architect.

Commissioner Ward, seconded by Commissioner Ingersoll, moved that the Service Rating of Joseph Gatringer be approved as rated by Mr. Pilat, with the exception of quantity, this to be rated at 38 instead of 41.

Commissioner Ward, seconded by Commissioner Ingersoll, moved that the Service Rating of Herman Letweman be approved as rated by the Secretary of the Park Board, with the exception of quality, this to be rated at 38 instead of 41.

A communication from Albert E. Higginson, complaining of the condition of trees in the five boroughs, was received. It was resolved that a copy of this communication be forwarded to each Commissioner, and the Mayor advised of this action.

The sale of four lambs, valued at $12 each, from the Central Park sheepfold, to Frame, Leaycraft & Company, was approved.

All bids were rejected on proposals received by the Central Purchase Committee on June 25, 1917, on Items Nos. 4 and 5, for linseed oil, etc., for Manhattan and Richmond.

Contracts Awarded—For meats, Manhattan and Richmond. (Bids received by the Central Purchase Committee June 21, 1917). For gasolene and kerosene for Manhattan and Richmond. (Bids received by the Central Purchase Committee June 25, 1917). For gasolene and kerosene for Brooklyn. (Bids received by the Central Purchase Committee June 25, 1917).

Contract Executed—June 25, Joseph L. Brennan, 167th st. and Sedgwick ave: Repave cement walks, small parks, Manhattan; $4.165; surety, New Amsterdam Casualty Company.

LOUIS W. FEHR, Secretary.

Special Meeting, 3 p. m., June 29, 1917.

Present—Commissioners Ward (President), Ingersoll, Weier—3.

Resolution adopted:

Whereas, On May 17, 1917, this Board awarded to Frank Oliva & Co., contract for general construction of comfort station, Madison Square Park, Manhattan; and

Whereas, The said Frank Oliva & Co. has refused and neglected to execute the contract or to furnish the required bond as security within the time described in sections 419 and 420 of the Greater New York Charter,

Resolved, That the amount of the deposit made by Frank Oliva & Co., in connection with his bid for said contract, be and the same hereby is declared forfeited to the City of New York as liquidated damages for the neglect and refusal of Frank Oliva & Co. to furnish the required bond and to execute the contract—the amount of said deposit to be paid into the Sinking Fund of the City, as provided by section 420 of the Greater New York Charter; further

Resolved, That the Commissioner of Parks, Manhattan and Richmond, be and he hereby is authorized to readvertise for proposals for doing the work.

On motion, at 12.45 p. m., the Board adjourned.

LOUIS W. FEHR, Secretary.

Department of Education.

Contracts Awarded, July 11, 1917.

Wells & Newton Co., plumbing, etc., P. S. 4, Bronx; surety, U. S. Fidelity & Guaranty Co. James I. Newman, fire protection work, P. S. 1, 51, 68, 82 and Bryant H. S., Queens; surety, National Surety Co. Pittsburgh Plate Glass Co., glass to various schools; surety, Aetna Accident & Liability Co. Narragansett Machine Co., furniture, P. S. 66 and 109, Brooklyn; surety, Aetna Accident & Liability Co. Hammacher, Schlemmer & Co., material for Murray Hill Vocational School, Manhattan; surety, American Surety Co. American Book Co., textbooks, etc.; surety, Aetna Casualty & Surety Co. A. W. King, alterations, etc., P. S. 66, Brooklyn; surety, Royal Indemnity Co. Edward E. Stapleton, fire protection work at P. S. 4, 24 and 56, Queens; surety, Aetna Accident & Liability Co. Leslie & Tracy, Inc., heating and ventilating apparatus, P. S. 66, Brooklyn; surety, U. S. Fidelity & Guaranty Co. South Bend Lathe Works, equipment for Murray Hill Vocational School, Manhattan; surety, New Amsterdam Casualty Co. Hill, Clarke & Co., equipment for Murray Hill Vocational School, Manhattan; surety, New Amsterdam Casualty Co.

B. J. Schaefer, printed supplies; surety, certified check deposited with Comptroller. Charles Bellotti, for conveying pupils; surety, American Surety Co. Cavanagh Bros. & Co., gymnasium apparatus, etc., for vacation playgrounds; surety, U. S. Fidelity & Guaranty Co. Hyman Gordon, for gymnasium apparatus, etc., for vacation playgrounds; surety, New Amsterdam Casualty Co. J. T. Stanley, Inc., general supplies; surety, certified check deposited with Comptroller. Domestic Mills Paper Co., general supplies; surety, National Surety Co. Allyn & Bacon, textbooks; surety, National Surety Co. The Oliver Typewriter Co., general supplies; surety, American Surety Co. Fire protection work: J. M. Knopp, P. S. 18 and 64, Manhattan; surety, New Amsterdam Casualty Co. A. W. King, P. S. 20, Manhattan; surety, Royal Indemnity Co. John D. Gordon, P. S. 133, Brooklyn; surety, National Surety Co. Ohlhausen & Veit, P. S. 131 and 137, Brooklyn; surety, National Surety Co. James J. Fay, P. S. 75, Manhattan; surety, London & Lancashire Co. Nicholas A. Pietroniro, repairs to grand stand, Curtis Athletic Field, Richmond; surety, National Surety Co. T. Frederick Jackson, Inc., installing electric equipment in P. S. 66, Brooklyn; surety, New Amsterdam Casualty Co. Lazere & Kaplan, Inc., for fire protection work, P. S. 136, Brooklyn; surety, National Surety Co. M. D. Lundin, fire protection work, P. S. 109 and 134, Brooklyn; surety, National Surety Co. Eugene Frank, installing electric equipment, P. S. 16, Brooklyn; surety, U. S. Fidelity & Guaranty Co. Hammacher, Schlemmer & Co., tool equipments, P. S. 66, 109, 165, 173, 174 and 175, Brooklyn; surety, American Surety Co.

A. E. PALMER, Secretary.

Borough of The Bronx.

Report for week ended July 3, 1917, exclusive of Bureau of Buildings.

Permits Issued—Sewer connections and repairs, 6; water connections and repairs, 22; laying gas mains and repairs, 19; placing building material on public highway, 4; crossing sidewalk with team, 7; miscellaneous, 74; total, 132.

Money Received and Deposited with City Chamberlain—Permits: For sewer connections, $25; for restoring and repaving streets, $373.32; inspection, etc., on permits, $15.75; sales of waste paper, $9.08; maps, $3.95; total, $427.10.

Security deposits, received on account of permits, and transmitted to Comptroller, $890.

Laboring Force—Bureau of Sewers and Highways. Maintenance: Foremen, 42; Assistant Foremen, 2; teams, 68; carts, 22; Mechanics, 55; Laborers, 446; Drivers, 4; total, 639. Bureau of Construction: Foremen, 1; Laborers, 7; total, 8. Bureau of Public Buildings and Offices: Foremen, 1; Assistant Foremen, 1; Mechanics, 6; Laborers, 24; Cleaners, 40; Watchmen, 4; Attendants, 11; total, 87. Topographical Bureau: Laborers, 3; Driver, 1; total 4. Administration: Mechanics, 1; Laborers, 4; total, 5.

DOUGLAS MATHEWSON, President.

BUREAU OF BUILDINGS.

Report for week ended July 7, 1917.

Plans filed: For new buildings, 11; estimated cost, $175,200. For alterations, 8; estimated cost, $4,750. Unsafe cases filed,

5; violation cases filed, 55; unsafe notices issued, 7; violation notices issued, 72; complaints lodged with the Bureau, 31; pieces of iron and steel inspected, 369.

ROBERT J. MOOREHEAD, Superintendent.

Department of Water Supply, Gas and Electricity.

Report for week ended June 16, 1917.

Collections, Bureau of Water Register, all boroughs, $162,872.56.

Contracts Entered Into—For cast iron special castings, etc. (Section 3): June 12; Thomas J. Radley Company, Inc.; surety, National Surety Company; estimated cost, $17,085.

Increased—Manhattan Office: David G. O'Hara, Inspector of Light and Power, $1,200 to $1,500 per annum.

Services Ceased—Manhattan Office: Edward S. Murphy, Clerk. Brooklyn Office: Thomas F. Connery, Clerk.

Transferred—Manhattan Office: John W. Kennedy, Clerk, to City Court.

DELOS F. WILCOX, Deputy Commissioner.

Office of the Chamberlain.

AS PROVIDED IN CHAPTER 729 OF the Laws of 1905, as amended, there has this day been paid into the City Treasury of the City of New York the sum of $172,482.54, from the amount of mortgage tax and interest collected for the quarter ended June 30, 1917.

MILO R. MALTBIE, Chamberlain.

Borough of Richmond.

BUREAU OF BUILDINGS.

Report for week ended July 7, 1917.

Plans Filed—For new buildings (estimated cost, $7,375), 14; for alterations (estimated cost, $2,725), 10; for plumbing (estimated cost, $1,915), 10. Construction inspections made, 219; plumbing, and drainage inspections made, 161; motion picture inspections made, 1; amusement device inspections made, 1; elevator inspections made, 9; violations of law reported, 6; violation notices issued, 6.

WM. J. McDERMOTT, Superintendent.

Changes in Departments, Etc.

BOARD OF STANDARDS AND APPEALS.

Promoted—Edward F. Hammel, to Assistant Engineer, Grade E, at $2,500 per annum, July 1.

BOARD OF ESTIMATE AND APPORTIONMENT.

Services Ceased—George B. Ford, Consultant to the Committee on the City Plan, June 30.

BOARD OF EDUCATION.

Died—Edward J. Corbett, Janitor-Engineer, P. S. 36, Bronx, June 30.

BOARD OF INEBRIETY.

Appointed—Frank I. Harvey, Cook, $720 per annum, July 2.

Services Ceased—Daniel S. Libby, Senior Hospital Helper, $360; John Hannon, Cook, $600, and Thomas E. O'Brien, Stenographer, $780, June 30.

Salaries Decreased—Edward H. McEntee, James J. Hutchinson and William J. O'Brien, Senior Hospital Helpers, from $480 to $390, July 1.

BOROUGH OF MANHATTAN.

Appointed—Otto Hammer, Jr., 43 Dennington ave., Woodhaven, L. I., Clerk, $300 per annum, Bureau of Highways, June 30; John Hader, 48 Central ave., Tompkinsville, S. I., Transitman, $1,320 per annum, Bureau of Highways, July 5; Edward Corcoran, 68 Hyatt ave., Winfield, L. I., Stationary Engineer, $4.50 a day, Bureau of Public Buildings and Offices, for about three months, July 10; Daniel G. Melville, Sea View ave., Dongan Hills, S. I., and Frederick Muller, 425 Amsterdam ave., Manhattan, Inspectors of Sewer Construction, $1,200 per annum, Bureau of Sewers, July 5.

Promoted—John A. Godfrey, 65 Morningside ave., from Inspector of Public Works at $1,260 per annum, to Transitman at $1,320 per annum, July 5.

DEPARTMENT OF PARKS.

MANHATTAN AND RICHMOND.

Appointed—Lillian E. Glickner, 177 W. 95th st.; May W. Lantry, 335 E. 42nd st.; Sophia Levine, 836 Manida st., Bronx; Anna H. Price, 145 Second ave.; Ida Badish, 50 Lynch st., Brooklyn; Dorothy E. Wells, 99 Putnam ave., Brooklyn; Marie L. Read, 3411 Ft. Independence st.; Anna B. Reisman, 62 Seventh st.; Etta Leopold, 790 Dawson st., Bronx; Lillian Fromenson, 135 W. 116th st., and Alice V. Magovern, 259 Pacific st., Brooklyn, Playground Attendants, $3 a day, for not to exceed eighty days, June 29; William F. Murray, 13 Abingdon sq., and Walter T. Brandon, 174 W. 137th st., Attendants at $2.50 a day, for not to exceed seventy-five days, July 5.

Services Ceased—Thomas Driscoll, 1442 Vyse ave., Bronx, Gardener, at $2.75 a day, July 3.

OFFICIAL DIRECTORY.

Unless otherwise stated, the Public Offices of the City are open for business from 9 a. m. to 5 p. m.; Saturday, 9 a. m. to 12 noon.

CITY OFFICES.

MAYOR'S OFFICE.
City Hall. Telephone, 1000 Cortlandt.
John Purroy Mitchel, Mayor.
Theodore Rousseau, Secretary.
Samuel L. Martin, Executive Secretary.
Paul C. Wilson, Assistant Secretary.
Bureau of Weights and Measures.
Municipal Building, 3d floor. Telephone, 1498 Worth.
Joseph Hartigan, Commissioner.

COMMISSIONER OF ACCOUNTS.
Municipal Building, 12th floor. Telephone, 4315 Worth.
Leonard M. Wallstein, Commissioner of Accounts.

BOARD OF ALDERMEN.
Clerk's Office, Municipal Building, 2nd floor. Telephone, 4430 Worth.
P. J. Scully, Clerk.
President of the Board of Aldermen.
City Hall. Telephone, 6770 Cortlandt.
Frank L. Dowling, President.

BOARD OF AMBULANCE SERVICE.
Municipal Building, 10th floor. Ambulance Calls, 3100 Spring. Administration Offices, 748 Worth.

ARMORY BOARD.
Hall of Records. Telephone, 3900 Worth.
C. D. Rhinehart, Secretary.

ART COMMISSION.
City Hall. Telephone, 1197 Cortlandt.
John Quincy Adams, Assistant Secretary.

BOARD OF ASSESSORS.
Municipal Building, 8th floor. Telephone, 29 Worth.
William C. Ormond, Chairman.
St. George B. Tucker, Secretary.

BELLEVUE AND ALLIED HOSPITALS.
26th st. and 1st ave. Telephone, 4400 Madison Square.
Dr. John W. Brannan, President.
J. K. Paulding, Secretary.

CENTRAL PURCHASE COMMITTEE.
Municipal Building, 12th floor. Telephone, 4227 Worth.

BUREAU OF THE CHAMBERLAIN.
Municipal Building, 8th floor. Telephone, 4270 Worth.
Milo R. Maltbie, Chamberlain.

BOARD OF CHILD WELFARE.
City Hall. Telephone, 4127 Cortlandt.
Harry L. Hopkins, Secretary.

CITY CLERK AND CLERK OF THE BOARD OF ALDERMEN.
Municipal Building, 2nd floor. Telephone, 4430 Worth.
P. J. Scully, City Clerk.

BOARD OF CITY RECORD.
Supervisor's office, Municipal Building, 8th floor. Distributing Division, 96 Reade st. Telephone, 3490 Worth.
David Ferguson, Supervisor.

DEPARTMENT OF CORRECTION.
Municipal Building, 24th floor. Telephone, 1610 Worth.
Burdette G. Lewis, Commissioner.

DEPARTMENT OF DOCKS AND FERRIES.
Pier "A," North River. Telephone, 300 Rector.
R. A. C. Smith, Commissioner.

DEPARTMENT OF EDUCATION.
Board of Education.
Park ave. and 59th st. Telephone, 5580 Plaza.
Stated meetings of the Board are held at 4 p. m. on the first Monday in February, the second Wednesday in August and the second and fourth Wednesdays in every month, except August.
William G. Willcox, President.
A. Emerson Palmer, Secretary.

BOARD OF ELECTIONS.
General office and office of the Borough of Manhattan, Municipal Building, 18th floor. Telephone, 1307 Worth.
Edward F. Boyle, President.
Moses M. McKee, Secretary.
Other Borough Offices.
The Bronx.
368 E. 148th st. Telephone, 356 Melrose.
Brooklyn.
435-445 Fulton st. Telephone, 1932 Main.
Queens.
64 Jackson ave., L. I. City. Telephone, 3375 Hunters Point.
Richmond.
Borough Hall, New Brighton, S. I. Telephone, 1000 Tompkinsville.
All offices open from 9 a. m. to 4 p. m., Saturdays to 12 noon.

BOARD OF ESTIMATE AND APPORTIONMENT.
Municipal Building, 13th floor. Telephone, 4560 Worth.
Joseph Haag, Secretary.
Bureau of Records and Minutes.
Municipal Building, 13th floor. Telephone, 4560 Worth. Joseph Haag, Secretary.
Office of the Chief Engineer.
Municipal Building, 13th floor. Telephone, 4560 Worth. Nelson P. Lewis, Chief Engineer.
Bureau of Public Improvements.
Municipal Building, 13th floor. Telephone, 4560 Worth. Nelson P. Lewis, Chief Engineer.
Bureau of Franchises.
Municipal Building, 13th floor. Telephone, 4563 Worth. Harry P. Nichols, Engineer.
Bureau of Contract Supervision.
Municipal Building, 13th floor. Telephone, 4560 Worth. Central Testing Laboratory, 125 Worth st. Telephone, 3088 Franklin. Tilden Adamson, Director.
Bureau of Personal Service.
Municipal Building, 13th floor. Telephone, 4560 Worth. George L. Tirrell, Director.

DEPARTMENT OF FINANCE.
Municipal Building, 5th floor. Telephone, 1200 Worth.
William A. Prendergast, Comptroller.
Deputy Comptrollers, 7th floor. Edmund D. Fisher, Albert E. Hadlock, Shepard A. Morgan, Hubert L. Smith.
Receiver of Taxes.
Manhattan—Municipal Building, 2nd floor. Telephone, 1200 Worth.
Bronx—177th st. and Arthur ave. Telephone, 140 Tremont.
Brooklyn—236 Duffield st. Telephone, 7056 Main.
Queens—5 Court Square, L. I. City. Telephone, 3386 Hunters Point.
Richmond—Borough Hall, St. George. Telephone, 100 Tompkinsville.
William C. Hecht, Receiver of Taxes.
Collector of Assessments and Arrears.
Manhattan—Municipal Building, 3d floor. Telephone, 1200 Worth.
Bronx—177th st. and Arthur ave. Telephone, 47 Tremont.
Brooklyn—503 Fulton st. Telephone, 8340 Main.
Queens—Municipal Building, Court Square, L. I. City. Telephone, 1553 Hunters Point.
Richmond—Borough Hall, St. George. Telephone, 1000 Tompkinsville.
Daniel Moynahan, Collector.

FIRE DEPARTMENT.
Municipal Building, 11th floor. Telephone, 4100 Worth.
Brooklyn, 365 Jay st. Telephone, 7600 Main.
Robert Adamson, Commissioner.

DEPARTMENT OF HEALTH.
Centre and Walker sts., Manhattan. Telephone, 6280 Franklin.
Burial Permit and Contagious Disease offices always open.
Bronx, 3731 Third ave. Brooklyn, Flatbush ave., Willoughby and Fleet sts. Queens, 372 Fulton st., Jamaica. Richmond, 514 Bay st., Stapleton.
Haven Emerson, Commissioner.
Alfred E. Shipley, Secretary.

BOARD OF INEBRIETY.
300 Mulberry st. Telephone, 2990 Spring.
Board meets first Wednesday in each month at 4 p. m.
Charles Samson, Secretary.

LAW DEPARTMENT.
Office of Corporation Counsel.
Main office, Municipal Building, 16th floor. Telephone, 4600 Worth.
Lamar Hardy, Corporation Counsel.
Brooklyn office, 153 Pierrepont st. Telephone, 2948 Main.
Bureau of Street Openings.
Main office, Municipal Building, 15th floor. Telephone, 1380 Worth.
Brooklyn office, 166 Montague st. Telephone, 5916 Main.
Queens office, Municipal Building, L. I. City. Telephone, 3886 Hunters Point.
Bureau for the Recovery of Penalties.
Municipal Building, 15th floor. Telephone, 4560 Worth.
Bureau for the Collection of Arrears of Personal Taxes.
Municipal Building, 17th floor. Telephone, 4585 Worth.

DEPARTMENT OF LICENSES.
Main office, 49 Lafayette st. Telephone, 4490 Franklin.
George H. Bell, Commissioner.
Brooklyn—381 Fulton st. Telephone, 1497 Main.
Richmond — Borough Hall, New Brighton. Telephone, 1000 Tompkinsville.
Division of Licensed Vehicles—517-519 W. 57th st. Telephone, 6387 Columbus.
Public Employment Bureau—Men's departments, 128 Leonard st. Women's departments, 53 Lafayette st. Telephone, 6100 Franklin. Branch Offices, 157 E. 67th st., Manhattan; Telephone 2001 Plaza. 436 W. 27th st., Manhattan; Telephone 1937 Chelsea. 12 W. 11th st., Manhattan; Telephone, 8065 Chelsea. 85 Java st., Brooklyn; Telephone, 3274 Greenpoint.

MUNICIPAL CIVIL SERVICE COMMISSION.
Municipal Building, 14th floor. Telephone, 1580 Worth.
Henry Moskowitz, President.
Robert W. Belcher, Secretary.

MUNICIPAL REFERENCE LIBRARY.
Municipal Building, 5th floor. Telephone, 1072 Worth. 9 a. m. to 5 p. m.; Saturday, to 1 p. m.

DEPARTMENT OF PARKS.
Municipal Building, 10th floor. Telephone, 4850 Worth.
Cabot Ward, Commissioner, Manhattan and Richmond.
Borough of Brooklyn.
Litchfield Mansion, Prospect Park, Brooklyn. Telephone, 2300 South.
Raymond V. Ingersoll, Commissioner.
Borough of The Bronx.
Zbrowski Mansion, Claremont Park. Telephone, 2640 Tremont.
Thomas W. Whittle, Commissioner.
Borough of Queens.
The Overlook, Forest Park, Richmond Hill, L. I. Telephone, 2300 Richmond Hill.
John E. Weier, Commissioner.
PARK BOARD
Municipal Building, 10th floor. Telephone, 4850 Worth.
Cabot Ward, President; Louis W. Fehr, Secretary.

PAROLE COMMISSION.
Municipal Building, 24th floor. Telephone, 2254 Worth.
Thomas R. Minnick, Secretary.

DEPARTMENT OF PLANT AND STRUCTURES.
Municipal Building, 18th floor. Telephone, 380 Worth.
F. J. H. Kracke, Commissioner.

EXAMINING BOARD OF PLUMBERS.
Municipal Building, 9th floor. Telephone, 1800 Worth.
Janet A. G. Hahn, Clerk.

POLICE DEPARTMENT.
240 Centre st. Telephone, 3100 Spring.
Arthur Woods, Commissioner.

DEPARTMENT OF PUBLIC CHARITIES.
Principal office, Municipal Building, 10th floor. Telephone, 4440 Worth.
John A. Kingsbury, Commissioner.
Brooklyn and Queens, 327 Schermerhorn st., Brooklyn. Telephone, 2977 Main.
Bureau of Social Investigation. Pearl and Centre sts. Telephone, 4405 Worth.
Borough of Richmond, Borough Hall, St. George, S. I. Telephone 1000 Tompkinsville.

PUBLIC SERVICE COMMISSION.
120 Broadway, 8 a. m. to 11 p. m., every day, including holidays and Sundays. Telephone, 7500 Rector.
Oscar S. Straus, Chairman.
James B. Walker, Secretary.

BOARD OF REVISION OF ASSESSMENTS.
Municipal Building, 7th floor. Telephone, 1200 Worth.
John Korb, Jr., Chief Clerk.

COMMISSIONERS OF SINKING FUND.
Office of Secretary, Municipal Building, 7th floor. Telephone, 1200 Worth.
John Korb, Jr., Secretary.

BOARD OF STANDARDS AND APPEALS.
Municipal Building, 9th floor. Telephone, 184 Worth.
Rudolph P. Miller, Chairman.

DEPARTMENT OF TAXES AND ASSESSMENTS.
Municipal Building, 9th floor. Telephone, 1800 Worth.
Lawson Purdy, President.
C. Rockland Tyng, Secretary.

DEPARTMENT OF STREET CLEANING.
Municipal Building, 12th floor. Telephone, 4240 Worth.
John T. Fetherston, Commissioner.

TENEMENT HOUSE DEPARTMENT.
Manhattan and Richmond office, Municipal Building, 19th floor. Telephone, 1526 Worth.
Brooklyn and Queens office, 503 Fulton st., Brooklyn. Telephone, 3825 Main.
Bronx office, 391 E. 149th st. Telephone, 7107 Melrose.
John J. Murphy, Commissioner.

BOARD OF WATER SUPPLY.
Municipal Building, 22nd floor. Telephone, 3150 Worth.
Charles Strauss, President.
George Featherstone, Secretary.

DEPARTMENT OF WATER SUPPLY, GAS AND ELECTRICITY.
Municipal Building, 23d, 24th and 25th floors. Telephones: Manhattan, 4320 Worth; Brooklyn, 3980 Main; Queens, 3441 Hunters Point; Richmond, 840 Tompkinsville; Bronx, 3400 Tremont.
Brooklyn, 50 Court st. Bronx, Tremont and Arthur aves. Queens, Municipal Building, L. I. City. Richmond, Municipal Building, St. George.
William Williams, Commissioner.

BOROUGH OFFICES.

BOROUGH OF THE BRONX.
President's office, 3d and Tremont aves. Telephone, 2680 Tremont.
Douglas Mathewson, President.

BOROUGH OF BROOKLYN.
President's office, 2d floor, Borough Hall.
Commissioner of Public Works, 2d floor, Borough Hall.
Assistant Commissioner of Public Works, 2d floor, Borough Hall.
Bureau of Highways, 5th and 12th floors, 50 Court st.
Bureau of Public Buildings and Offices, 10th floor, 50 Court st.
Bureau of Sewers, 10th floor, 215 Montague st.
Bureau of Buildings, 4th floor, Borough Hall.
Topographical Bureau, 209 Montague st.
Bureau of Substructures, 11th floor, 50 Court st.
Telephone, 3960 Main.
Lewis H. Pounds, President.

BOROUGH OF MANHATTAN.
President's office, 20th floor, Municipal Building
Commissioner of Public Works, 21st floor, Municipal Building.
Assistant Commissioner of Public Works, 21st floor, Municipal Building.
Bureau of Highways, 21st floor, Municipal Building.
Bureau of Public Buildings and Offices, 20th floor, Municipal Building.
Bureau of Sewers, 21st floor, Municipal Building.
Bureau of Buildings, 20th floor, Municipal Building.
Telephone, 4227 Worth.
Marcus M. Marks, President.

BOROUGH OF QUEENS.
President's office, 68 Hunters Point ave., L. I. City.
Telephone, 5400 Hunters Point.
Maurice E. Connolly, President.

BOROUGH OF RICHMOND.
President's office, New Brighton. Telephone, 1000 Tompkinsville.
Calvin D. Van Name, President.

CORONERS.
Manhattan, Municipal Building, 2nd floor. Open at all hours of the day and night. Telephone, 3711 Worth.
Bronx—Arthur and Tremont aves. Telephone, 1250 Tremont. 8 a. m. to midnight, every day.
Brooklyn, 236 Duffield st. Telephone, 4004 Main. Open at all hours of the day and night.
Queens, Town Hall, Jamaica. 9 a. m. to 10 p. m.: Sundays and holidays, 9 a. m. to 12 noon.
Richmond, 175 Second st., New Brighton. Open at all hours of the day and night.

COUNTY OFFICES.

Unless otherwise stated, the County offices are open for business from 9 a. m. to 4 p. m.; Saturday, 9 a. m. to 12 noon.

NEW YORK COUNTY.

COUNTY CLERK.
County Court House. Telephone, 5388 Cortlandt.
9 a. m. to 2 p. m. during July and August.
Wm. F. Schneider, County Clerk.

DISTRICT ATTORNEY.
Criminal Courts Building, 9 a. m. to 5.15 p. m.; Saturdays to 12 noon. Telephone, 2304 Franklin.
Edward Swann, District Attorney.

COMMISSIONER OF JURORS.
280 Broadway. Telephone, 241 Worth.
Frederick O'Byrne, Commissioner.

PUBLIC ADMINISTRATOR.
Hall of Records. Telephone, 3406 Worth.
William M. Hoes, Public Administrator.

COMMISSIONER OF RECORDS.
Hall of Records. Telephone, 3900 Worth.
Charles K. Lexow, Commissioner.

REGISTER.
Hall of Records. Telephone, 3900 Worth.
9 a. m. to 2 p. m. during July and August.
John J. Hopper, Register.

SHERIFF.
51 Chambers st. Telephone, 4300 Worth.
New York County Jail, 70 Ludlow st.
Alfred E. Smith, Sheriff.

SURROGATES.
Hall of Records. Telephone, 3900 Worth.
John P. Cohalan, Robert Ludlow Fowler, Surrogates.
William Ray De Lano, Chief Clerk.
John F. Curry, Commissioner of Records.

KINGS COUNTY.

COUNTY CLERK.
Hall of Records. Telephone, 4930 Main.
William E. Kelly, County Clerk.

COUNTY COURT.
County Court House. Court opens at 10 a. m. daily and sits until business is completed. Part I, Room 23; Part II, Room 10; Part III, Room 14; Part IV, Room 1, Court House. Clerk's office, Rooms 17, 18, 19 and 22; open daily from 9 a. m. to 5 p. m.; Saturday to 12 noon. Telephone, 4154 Main.
John L. Gray, Chief Clerk.

DISTRICT ATTORNEY.
66 Court st., 9 a. m. to 5.30 p. m.; Saturday, to 1 p. m. Telephone, 2954 Main.
Harry E. Lewis, District Attorney.

COMMISSIONER OF JURORS.
381 Fulton st. Telephone, 330-331 Main.
Jacob Brenner, Commissioner.

PUBLIC ADMINISTRATOR.
44 Court st. Telephone, 2840 Main.
Frank V. Kelly, Public Administrator.

COMMISSIONER OF RECORDS.
Hall of Records. Telephone, 6988 Main.
Edmund O'Connor, Commissioner.

REGISTER.
Hall of Records. Telephone, 2830 Main.
Edward T. O'Loughlin, Register.

SHERIFF.
50 Court st. Telephone, 6845 Main.
Edward Riegelmann, Sheriff.

SURROGATE.
Hall of Records. Court opens at 10 a. m. Telephone, 3954 Main.
Herbert T. Ketcham, Surrogate.
John H. McCooey, Chief Clerk.

BRONX COUNTY.

COUNTY CLERK.

Civil Records—161st st. and 3d ave. Telephone, 9266 Melrose.

Criminal Branch, 1918 Arthur ave.

James Vincent Ganly, County Clerk.

COUNTY JUDGE.

Bergen Building Annex, Tremont and Arthur aves. Telephone, 3205 Tremont.

Louis D. Gibbs, County Judge.

DISTRICT ATTORNEY.

Tremont and Arthur aves. Telephone, 1100 Tremont.

Francis Martin, District Attorney.

COMMISSIONER OF JURORS.

1932 Arthur ave. Telephone, 3700 Tremont.

John A. Mason, Commissioner.

PUBLIC ADMINISTRATOR.

2808 3d ave. Telephone, 9816 Melrose, 9 a. m. to 5 p. m.; Saturday to 12 noon.

Ernest E. L. Hammer, Public Administrator.

REGISTER.

1932 Arthur ave. Telephone, 6694 Tremont.

Edward Polak, Register.

SHERIFF.

1932 Arthur ave. Telephone 6600 Tremont.

James F. O'Brien, Sheriff.

SURROGATE.

Bergen Building Annex, 1918 Arthur ave.

George M. S. Schulz, Surrogate.

QUEENS COUNTY.

COUNTY CLERK.

364 Fulton st., Jamaica. Telephone, 2608 Jamaica.

Alexander Dujat, County Clerk.

COUNTY COURT.

County Court House, L. I. City. Telephone, 596 Hunters Point.

Court opens at 10 a. m. Trial Term begins first Monday of each month, except July, August and September, and on Friday of each week.

Clerk's office open 9 a. m. to 5 p. m.; Saturdays to 12.30 p. m. Telephone, 551 Jamaica.

County Judge's office always open at 336 Fulton st., Jamaica. Telephone, 551 Jamaica.

Burt Jay Humphrey, County Judge.

DISTRICT ATTORNEY.

County Court House, L. I. City. Telephone, 3871 Hunters Point. 9 a. m. to 5 p. m.; Saturday to 12 noon.

Denis O'Leary, District Attorney.

COMMISSIONER OF JURORS.

County Court House, L. I. City. Telephone, 963 Hunters Point.

Thorndyke C. McKennee, Commissioner.

PUBLIC ADMINISTRATOR.

362 Fulton st., Jamaica. Telephone, 223 Jamaica.

Randolph White, Public Administrator.

SHERIFF.

County Court House, L. I. City. Telephone, 3766 Hunters Point.

Samuel J. Mitchell, Under Sheriff.

SURROGATE.

364 Fulton st., Jamaica. Telephone, 397 Jamaica.

Daniel Noble, Surrogate.

RICHMOND COUNTY.

COUNTY CLERK.

County Office Building, Richmond. Telephone, 28 New Dorp.

C. Livingston Bostwick, County Clerk.

COUNTY JUDGE AND SURROGATE.

Trial Terms, with Grand and Trial Jury, second Monday of March, first Monday of October.

Trial Terms, with Trial Jury only, first Monday of May, first Monday of December.

Special Terms, without Jury, Wednesday of each week, except the last week of July, the month of August and the first week of September.

Surrogate's Court.

Monday and Tuesday of each week at the Borough Hall, St. George, and on Wednesday at the Surrogate's Court at Richmond, except during the session of the County Court. There will be no Surrogate's Court during the month of August.

Surrogate's Court and Office, Richmond. Surrogate's Chambers, Borough Hall, St. George.

J. Harry Tiernan, County Judge and Surrogate.

DISTRICT ATTORNEY.

Borough Hall, St. George. Telephone, 50 Tompkinsville; 9 a. m. to 5 p. m.; Saturday to 12 noon.

Albert C. Fach, District Attorney.

COMMISSIONER OF JURORS.

Village Hall, Stapleton. Telephone, 81 Tompkinsville.

Edward J. Miller, Commissioner.

PUBLIC ADMINISTRATOR.

Port Richmond. Telephone, 704 West Brighton.

William T. Holt, Public Administrator.

SHERIFF.

County Court House, Richmond. Telephone, 120 New Dorp.

Spire Pitou, Jr., Sheriff.

THE COURTS.

CITY COURT OF THE CITY OF NEW YORK.

City Hall Park. Court opens at 10 a. m. Trial Term, Part I, opens at 9.45 a. m. Telephone, 122 Cortlandt.

Special Term Chambers held from 10 a. m. to 4 p. m.; Saturday, to 12 noon. Clerk's office open from 9 a. m. to 4 p. m.; Saturday, to 12 noon.

Frank J. Goodwin, Clerk.

CITY MAGISTRATES' COURTS.

Boroughs of Manhattan and Bronx.

William McAdoo, Chief City Magistrate, 300 Mulberry st. Telephone, 6213 Spring.

Municipal Term—Room 500, Municipal Building, Manhattan.

First District—Criminal Courts Building.

Second District—125 Sixth ave.

Third District—2d ave. and 1st st.

Fourth District—151 E. 57th st.

Fifth District—121st st. and Sylvan pl.

Sixth District—162d st. and Washington ave.

Seventh District—314 W. 54th st.

Eighth District—1014 E. 181st st., Bronx.

Ninth District (Night Court for Females)—125 Sixth ave.

Tenth District (Night Court for Males)—151 E. 57th st.

Eleventh District (Domestic Relations)—151 E. 57th st.

Twelfth District—1130 St. Nicholas ave.

Thirteenth District (Domestic Relations)—1014 E. 181st st., Bronx.

Office of the Chief Probation Officer, 300 Mulberry st. Telephone, 8713 Spring.

Borough of Brooklyn.

Office of Deputy Chief Clerk Wm. F. Delaney, 44 Court st. Telephone, 7411 Main.

First District—318 Adams st.

Second District—Court and Butler sts.

Fifth District—361 Bedford ave.

Sixth District—495 Gates ave.

Seventh District—31 Snider ave., Flatbush.

Eighth District—W. 8th st., Coney Island.

Ninth District—5th ave. and 23d st.

Tenth District—133 New Jersey ave.

Domestic Relations—Myrtle and Vanderbilt aves.

Borough of Queens.

First District—St. Mary's Lyceum, L. I. City.

Second District—Town Hall, Flushing.

Third District—Central ave., Far Rockaway.

Fourth District—Town Hall, Jamaica.

Borough of Richmond.

First District—Lafayette ave., New Brighton.

Second District—Village Hall, Stapleton.

All courts open daily from 9 a. m. to 4 p. m., except on Saturdays, Sundays and legal holidays, when only morning sessions are held.

COURT OF GENERAL SESSIONS.

Criminal Court Building. Court opens at 10.30 a. m. Clerk's office open from 9 a. m. to 4 p. m., and on Saturdays until 12 noon.

Edward R. Carroll, Clerk.

MUNICIPAL COURTS.

The Clerk's offices are open from 9 a. m. to 4 p. m.; Saturday, to 12 noon.

Board of Justices— ————, Secretary. 264 Madison st., Manhattan. Telephone, 2596 Orchard.

Borough of Manhattan.

First District—146 Grand st. Telephone, 9611 Spring. Additional part is held at the southwest corner of 6th ave. and 10th st. Telephone, 2513 Chelsea.

Second District—264-266 Madison st. Telephone, 4300 Orchard.

Third District—314 W. 54th st. Telephone, 5450 Columbus.

Fourth District—207 E. 32d st. Telephone, 4358 Murray Hill.

Fifth District—2565 Broadway. Telephone, 4006 Riverside.

Sixth District—155 E. 88th st. Telephone, 4343 Lenox.

Seventh District—70 Manhattan st. Telephone, 6334 Morningside.

Eighth District—121st st. and Sylvan pl. Telephone, 3950 Harlem.

Ninth District—Madison ave. and 59th st. Telephone, 3873 Plaza.

Borough of The Bronx.

First District—Town Hall, 1400 Williamsbridge rd., Westchester. Telephone, 457 Westchester.

Second District—Washington ave. and 162d st. Telephone, 3042 Melrose.

Borough of Brooklyn.

First District—State and Court sts. Telephone, 7091 Main.

Second District—495 Gates ave. Telephone, 504 Bedford.

Third District—6 Lee ave. Telephone, 556 Williamsburg.

Fourth District—14 Howard ave. Telephone, 4323 Bushwick.

Fifth District—5220 Third ave. Telephone, 3907 Sunset.

Sixth District—236 Duffield st. Telephone, 6166 Main.

Seventh District—31 Pennsylvania ave. Telephone, 904 East New York.

Borough of Queens.

First District, 115 Fifth st., L. I. City. Telephone, 1420 Hunters Point.

Second District—Broadway and Court st., Elmhurst. Telephone, 87 Newtown.

Third District—1908 Myrtle ave., Glendale Telephone, 2352 Bushwick.

Fourth District—Town Hall, Jamaica. Telephone, 86 Jamaica.

Borough of Richmond.

First District—Lafayette ave. and 2d st., New Brighton. Telephone, 503 Tompkinsville.

Second District—Village Hall, Stapleton. Telephone, 313 Tompkinsville.

COURT OF SPECIAL SESSIONS.

Court opens at 10 a. m.

Part I, Criminal Court Building, Manhattan. Telephone, 3983 Franklin.

Part II, 171 Atlantic ave., Brooklyn. Telephone, 4280 Main.

Part III, Town Hall, Jamaica. Held on Tuesday of each week. Telephone, 2620 Jamaica.

Part IV, Borough Hall, St. George. Held on Wednesday of each week. Telephone, 324 Tompkinsville.

Part V, Bergen Building, Tremont and Arthur aves., Bronx. Held on Thursday of each week. Telephone, 6056 Tremont.

Frank W. Smith, Chief Clerk.

CHILDREN'S COURT.

Adolphus Ragan, Chief Clerk, 137 E. 22nd st. Telephone, 3611 Gramercy.

Bernard J. Fagan, Chief Probation Officer, 137 E. 22nd st. Telephone, 3611 Gramercy.

Parts I and II (Manhattan), 137 E. 22nd st. Telephone, 3611 Gramercy. Dennis A. Lambert, Clerk.

Part III (Brooklyn), 102 Court st. Telephone, 8611 Main. Wm. C. McKee, Clerk.

Part IV (Bronx), 355 E. 137th st. Court held on Monday, Thursday and Saturday of each week. Telephone, 9092 Melrose. Michael Murray, Clerk.

Part V. (Queens), 19 Flushing ave., Jamaica. Court held on Tuesday and Friday of each week. Telephone, 2624 Jamaica. Sydney Ollendorff, Clerk.

Part VI (Richmond), 14 Richmond Terrace, St. George. Court held on Wednesday of each week. *Telephone, 2190 Tompkinsville.* Wm. J. Browne, Clerk.

SUPREME COURT—APPELLATE DIVISION.

First Judicial Department.

Madison ave., corner 25th st. Court open from 2 p. m. until 6 p. m. Friday, Motion Day, Court opens at 10.30 a. m. Motions called at 10 a. m. Orders called at 10.30 a. m. Telephone, 3840 Madison Square.

Alfred Wagstaff, Clerk.

Second Judicial Department.

Borough Hall, Brooklyn. Court meets from 2 p. m. to 5 p. m., excepting that on Fridays Court opens at 10 a. m. Clerk's office open 9 a. m. Telephone, 1392 Main.

John B. Byrne, Clerk.

SUPREME COURT—APPELLATE TERM.

503 Fulton st., Brooklyn. Court meets 10 a. m. Clerk's office opens 9 a. m. Telephone, 7452 Main.

Joseph H. De Bragga, Clerk.

SUPREME COURT—CRIMINAL DIVISION.

Criminal Court Building. Court opens at 10.30 a. m. Clerk's office open from 9 a. m. to 4 p. m.; Saturday, to 12 noon. Telephone, 6064 Franklin.

William F. Schneider, Clerk.

SUPREME COURT—FIRST DEPARTMENT.

County Court House. Court open from 10.15 a. m. to 4 p. m. Telephone, 4580 Cortlandt.

SUPREME COURT—SECOND DEPARTMENT.

Kings County.

Joralemon and Fulton sts. Clerk's office hours, 9 a. m. to 5 p. m. Seven jury trial parts. Special Term for trials. Special Term for motions. Special Term (ex-parte business). Court opens at 10 a. m. Naturalization Bureau, Hall of Records. Telephone, 5460 Main.

James F. McGee, General Clerk.

Queens County.

County Court House, L. I. City. Court opens at 10 a. m. Trial and Special Term for motions and ex-parte business each month, except July, August and the first two weeks in September, in Part 1. Trial Term, Part 2, February, April, June, last two weeks in September, and November. Special Term for Trials, January, April, June and October.

Clerk's office open 9 a. m. to 5 p. m. Saturdays until 12 noon from October to June. July, August and September until 2 p. m. Telephone, 3896 Hunters Point.

Thomas B. Seaman, Special Deputy Clerk in Charge.

Richmond County.

Trial Term held at County Court House, Richmond. Special Term for trials held at Court room, Borough Hall, St. George. Special Term for motions held at Court House, Borough Hall, St. George.

C. Livingston Bostwick, County Clerk.

BOARD MEETINGS.

Board of Aldermen.

The Board of Aldermen meets in the Aldermanic Chamber, City Hall, every Tuesday at 1.30 p. m.

P. J. SCULLY, City Clerk and Clerk to the Board of Aldermen.

Board of Estimate and Apportionment.

The Board of Estimate and Apportionment meets in Room 16, City Hall, Fridays at 10.30 a. m. JOSEPH HAAG, Secretary.

Commissioners of Sinking Fund.

The Commissioners of the Sinking Fund meet in Room 16, City Hall, on Thursdays at 11 a. m., at call of the Mayor.

JOHN KORB, Jr., Secretary.

Board of Revision of Assessments.

The Board of Revision of Assessments meets in Room 16, City Hall, upon notice of the Secretary. JOHN KORB, Jr., Secretary.

Board of Appeals.

The Board meets every Tuesday at 2 p. m. in the Municipal Building.

RUDOLPH P. MILLER, Chairman.

Board of Standards and Appeals.

The Board meets in Room 919, Municipal Building, every Thursday at 2 p. m.

RUDOLPH P. MILLER, Chairman.

Board of City Record.

The Board of City Record meets in the City Hall at call of the Mayor.

DAVID FERGUSON, Supervisor, Secretary.

POLICE DEPARTMENT.

Auction Sale of Unclaimed Property.

PUBLIC NOTICE IS HEREBY GIVEN THAT a Public Auction Sale consisting of Unclaimed Property, as follows—Watches, Chains, Fobs, Rings, Pins, Bracelets and Miscellaneous Jewelry, Silverware, Clocks, Cameras, Glassware, Optical Goods, Books, Knives, Razors, Surgical Instruments, Trunks, Dress Suit Cases, Satchels, Pocketbooks, Shoes, Clothing, Furs, Robes, Hats, Dry Goods, Musical Instruments, Household Goods, Umbrellas, Canes, Baby Carriages, Bicycles, Auto Tires, Lamps, Electrical Goods, Cloth Cutting Machine, Junk Iron, Lead, Copper, etc., and other miscellaneous articles—will be held at the Office of the Property Clerk, 240 Centre st., Manhattan, on

TUESDAY, JULY 17, 1917,

at 9 a. m.

ARTHUR WOODS, Police Commissioner.

jy5,17

Owners Wanted for Unclaimed Property.

OWNERS WANTED BY THE PROPERTY Clerk of the Police Department of The City of New York, 72 Poplar st., Brooklyn, for the following property now in custody, without claimants: Boats, rope, iron, lead, male and female clothing, boots, shoes, wine, blankets, diamonds, canned goods, liquors, etc.; also small amount of money taken from prisoners and found by Patrolmen of this Department.

ARTHUR WOODS, Police Commissioner.

OWNERS WANTED BY THE PROPERTY Clerk of the Police Department of the City of New York, 240 Centre st., Manhattan, for the following property now in custody without claimants: Automobiles, baby carriages, bags, bicycles, boats, cameras, clothing, furniture, jewelry, junk, machinery, merchandise, metals, optical goods, silverware, tools, trunks, typewriters, umbrellas, etc.; also sums of money feloniously obtained by prisoners or found abandoned by Patrolmen of this Department.

ARTHUR WOODS, Police Commissioner.

DEPARTMENT OF STREET CLEANING.

Proposals.

SEALED BIDS WILL BE RECEIVED BY THE Commissioner of Street Cleaning at Room 1244, Municipal Building, Manhattan, until 12 noon on

THURSDAY, JULY 19, 1917,

FOR FURNISHING AND DELIVERING 650 WHITE ASH TRUCK POLES.

The time allowed for the delivery of supplies and the performance of the contract is 45 consecutive calendar days, except that 25 per cent. of each size are to be delivered within 30 consecutive calendar days.

The amount of security required for the faithful performance of the contract is 30 per cent. of the contract price.

Bids must be submitted in duplicate in separate envelopes.

The bidder will state the price of each item contained in the schedules herein contained or hereto annexed, per pole, by which the bids will be tested. The extensions must be made and footed up, as the bids will be read from the total for each item, and awards made to the lowest bidder on each item.

Delivery will be required to be made at the time and in the manner and in such quantities as may be directed.

Blank forms and further information may be obtained at the office of the Department of Street Cleaning, Manhattan, Room 1244, Municipal Building, Manhattan.

J. T. FETHERSTON, Commissioner.

Dated, New York, July 5, 1917. jy9,19

☞See General Instructions to Bidders on last page, last column, of the "City Record."

DEPARTMENT OF PARKS.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Park Board, at the office of the Department of Parks, Municipal Building, Manhattan, until 3 p. m., on

THURSDAY, JULY 19, 1917,

Borough of Manhattan.

FOR ALL LABOR AND MATERIALS NECESSARY AND REQUIRED FOR REGULATING, DRAINAGE, SURFACING AND FENCING, AS AN ADDITION, THE GROUNDS ADJACENT TO THE CHERRY STREET PLAYGROUND UNDER THE MANHATTAN BRIDGE.

The time allowed for the completion of the work will be sixty consecutive working days.

The amount of security required is Fifteen Hundred Dollars.

Certified check or cash in the sum of Seventy-five Dollars must accompany bid.

Blank forms and other information may be obtained at the office of the Department of Parks, Room 1004, Municipal Building, Manhattan.

The bids will be compared and the contract awarded at a lump or aggregate sum.

CABOT WARD President; RAYMOND V. INGERSOLL, THOMAS W. WHITTLE, JOHN E. WEIER, Commissioners of Parks. jy7,19

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Park Board, at the office of the Department of Parks, Municipal Building, Manhattan, until 3 p. m., on

THURSDAY, JULY 19, 1917,

Borough of Brooklyn.

FOR FURNISHING ALL LABOR AND MATERIALS NECESSARY OR REQUIRED FOR THE IMPOVEMENT OF THE PROSPECT PARK PLAZA, BETWEEN THE MAN ENTRANCE TO PROSPECT PARK AND FLATBUSH AVE., BOROUGH OF BROOKLYN, COMPRISING, REGULATING AND GRADING, CONSTRUCTION OF ASPHALTIC CONCRETE PAVEMENT ON CONCRETE FOUNDATION, SETTING AND RESETTING OF BLUESTONE CURB, LAYING CEMENT SIDEWALKS AND FURNISHING AND PLACING OF TOPSOIL AND SOD, TOGETHER WITH ALL WORK INCIDENTAL THERETO.

The amount of security required is Eighteen Thousand Dollars ($18,000).

The time allowed to complete the work will be sixty (60) consecutive working days.

Certified check or cash in the sum of Nine Hundred Dollars ($900) must accompany bid.

Blank forms and other information may be obtained at the office of the Department of Parks, Brooklyn, Litchfield Mansion, Prospect Park West and 5th st., Prospect Park, Brooklyn.

The bids will be compared and the contract awarded at a lump or aggregate sum.

CABOT WARD, President; RAYMOND V. INGERSOLL, THOMAS W. WHITTLE, JOHN E. WEIER, Commissioners of Parks. jy7,19

☞See General Instructions to Bidders on last page, last column, of the "City Record."

BOROUGH OF MANHATTAN.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan, at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

TUESDAY, JULY 24, 1917,

FOR FURNISHING ALL OF THE LABOR AND MATERIALS REQUIRED FOR ALTERATIONS TO THE 3RD, 4TH, 6TH AND 7TH FLOORS OF THE HALL OF RECORDS BUILDING LOCATED AT CHAMBERS AND CENTRE STS., BOROUGH OF MANHATTAN.

The time allowed for the completion of the work will be fifty (50) consecutive working days.

The amount of security required will be Twenty-five Hundred Dollars ($2,500), and the amount of deposit accompanying the bid shall be five (5) per cent. of the amount of security.

The bidder will state one aggregate price for the whole work described and specified, as the contract is entire and for a complete job.

The bids will be compared and the contract awarded at a lump or aggregate sum to the lowest bidder.

Blank forms, specifications and plans may be obtained at the office of the Auditor, offices of the Commissioner of Public Works, Room 2141, Municipal Building, Manhattan.

MARCUS M. MARKS, President.

Dated, July 13, 1917. jy13,24

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 23, 1917,

TO REGULATE AND PAVE THE ROADWAY OF W. 172ND ST. FROM BROADWAY TO FORT WASHINGTON AVE. WITH SHEET ASPHALT PAVEMENT ON A CONCRETE FOUNDATION, AND THE ROADWAY OF W. 172ND ST. FROM FORT WASHINGTON AVE. TO HAVEN AVE. WITH BITUMINOUS CONCRETE PAVEMENT ON A CONCRETE FOUNDATION, AND DO ALL NECESSARY WORK INCIDENTAL THERETO.

The Engineer's estimate of the amount of work to be done is as follows:

Item 5—610 linear feet new 5-inch bluestone curb.

Item 7—80 linear feet new 6-inch granite corner curb.

Item 8—1,200 linear feet old curb redressed and reset.

Item 9—30 square feet concrete sidewalk, Class A.

Item 12—20 linear feet new granite header.

Item 13—20 linear feet temporary header.

Item 15—630 cubic yards concrete.

Item 17—1,700 square yards sheet asphalt pavement and keeping the pavement in repair for five years from date of completion.

Item 18—60 square yards sheet asphalt pavement in approaches.

Item 26—1,400 square yards bituminous concrete pavement and keeping the pavement in repair for five years from date of completion.

The time allowed for the full completion of the work will be thirty (30) consecutive working days.

The amount of security required will be $3,400, and the amount of deposit accompanying the bid shall be five per cent. (5%) of the amount of security.

The bidder must deposit with the Borough President, on or before the time of making his bid, samples and affidavit, or the letter in regard to samples and affidavit, as required by the specifications.

The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per foot, yard or other unit of measure or article by which the bid will be tested. The contract, if awarded, will be awarded for the whole work at a lump sum.

Blank forms may be had and the plans and drawings may be seen at the office of the Commissioner of Public Works, Bureau of Highways, Room 2124, Municipal Building, Manhattan.

MARCUS M. MARKS, President.

Dated, July 12, 1917. jy12,23

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 23, 1917,

TO REGULATE AND REPAVE THE ROADWAL OF HOUSTON ST., FROM THE BOWERY TO LAFAYETTE ST., WITH SHEET ASPHALT PAVEMENT ON A CONCRETE FOUNDATION, AND DO ALL NECESSARY WORK INCIDENTAL THERETO.

The Engineer's estimate of the amount of work to be done is as follows:

Item 1—4 new sewer manhole heads and covers, complete.

Item 2—1 new sewer manhole cover.

Item 3—1 new sewer manhole ring

Item 4—1 new water manhole head and cover, complete.

Item 5—960 linear feet new 5-inch bluestone curb.

Item 7—260 linear feet new granite corner curb.

Item 8—240 linear feet old curb redressed and reset.

Item 9—30 square feet concrete sidewalk, Class A.

Item 10—230 linear feet platform flag cut to line.

Item 12—10 linear feet new granite header.

Item 13—10 linear feet temporary header.

Item 14—3 cubic yards brick masonry.
Item 15—310 cubic yards concrete.
Item 16—50 cubic yards concrete in railroad area.
Item 17—1410 square yards sheet asphalt pavement outside of railroad area, and keeping the pavement in repair for five years from date of acceptance.
Item 18—80 square yards sheet asphalt pavement in approaches.
Item 19—310 square yards sheet asphalt pavement in railroad area.
The time allowed for the full completion of the work will be eighteen (18) consecutive working days.
The amount of security required will be $2.000, and the amount of deposit accompanying the bid shall be five per cent. (5%) of the amount of security.
The bidder must deposit with the Borough President, on or before the time of making his bid, samples and affidavit, or the letter in regard to samples and affidavit, as required by the specifications.
The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per foot, yard or other unit of measure or article, by which the bid will be tested. The contract, if awarded, will be awarded for the whole work at a lump sum.
Blank forms may be had and the plans and drawings may be seen at the office of the Commissioner of Public Works, Bureau of Highways, Room 2124, Municipal Building, Manhattan.
MARCUS M. MARKS, President.
Dated, July 11, 1917. jy11,23
☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 23, 1917.

FOR RESTORING WOOD BLOCK PAVEMENT OVER OPENINGS MADE BY THE DEPARTMENT OF WATER SUPPLY, GAS AND ELECTRICITY IN THE ROADWAY OF 2ND AVE., BETWEEN 78TH AND 79TH STS. WATER DEPARTMENT ORDER NO. 1285.
The Engineer's estimate of amount of work to be done is as follows:
Item 7—8 cubic yards concrete.
Item 8—50 square yards wood block pavement with foundation (no guarantee).
Item 9—800 square yards wood block pavement without foundation (no guarantee).
The time allowed for the full completion of the work will be fifteen (15) days.
The amount of security required will be $700, and the amount of deposit accompanying the bid shall be five per cent. (5%) of the amount of the security.
The bidder must deposit with the Borough President, at or before the time of making his bid, samples and affidavit, or the letter in regard to samples and affidavit, as required by the specifications.
The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per foot, yard or other unit of measure or article by which the bid will be tested. Each contract, if awarded, will be awarded for the whole work at a lump sum.
Blank forms may be had and the plans and drawings may be seen at the office of the Commissioner of Public Works, Bureau of Highways, Room 2124, Municipal Building, Manhattan.
MARCUS M. MARKS, President.
Dated, July 11, 1917. jy11,23
☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan, at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 23, 1917,

FOR THE FURNISHING AND DELIVERING OF 600 STANDARD CAST IRON MANHOLE COVERS FOR ROADWAY. TOTAL MAXIMUM WEIGHT 90,000 POUNDS.
The time allowed for the performance of the contract is on or before Dec. 31, 1917.
The amount of security required is thirty per cent. (30%) of the contract amount awarded.
No bid will be considered unless it is accompanied by a deposit. Such deposit shall be in an amount not less than one and one-half per cent. (1½%) of the total amount bid.
Bids must be submitted in duplicate, each copy in a separate envelope. No bid will be accepted unless this provision is complied with.
The required deliveries to be made are as follows: 60,000 pounds to the Corporation Yard under the Manhattan Bridge, Madison and Birmingham sts., and 30,000 pounds to the Corporation Yard, 90th st. and East River, Manhattan.
The bidder will state the price for each item contained in the specifications or schedules, per pound, by which the bids will be tested. The extensions must be made and footed up, as the bids will be read from the total.
Blank forms may be had and drawings may be seen at the office of the Commissioner of Public Works, Room 2103, Bureau of Sewers, Municipal Building, Manhattan.
MARCUS M. MARKS, President.
Dated, July 11, 1917. jy11,23
☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan, at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 23, 1917,

FOR THE ALTERATION TO RECEIVING BASINS, WITH INLETS, ON LENOX AVE. FROM 135TH ST. TO 145TH ST., TOGETHER WIH ALL WORK INCIDENTAL THERETO. (C. P. M.—37.)
The Engineer's estimate of the quantity and quality of the material and the nature and extent as near as possible of the work required, is as follows:
Item 1—1 receiving basin (Type "A" or "G"), complete.
Item 2—1 receiving basin altered (Method "A"), complete.
Item 3—9 inlets (Types "A," "B" or "C"), complete.
Item 4—38 linear feet of gutter drains, complete.
Item 5—278 linear feet of 12-inch basin connection, complete.
Item 6—36 linear feet of 6-inch cast iron basin connection (Class "A"), complete.
Item 7—106 linear feet of 8-inch cast iron basin connection (Class "A"), complete.
Item 8—2 cubic yards of rock (Class "A"), excavated and removed.
Item 9—2 cubic yards of rock (Class "B"), excavated and removed.
Item 10—3 cubic yards of concrete (Class "A").
Item 11—2 cubic yards of brick masonry.
Item 12—20 cubic yards of extra earth excavation.
Item 13—190 linear feet of 6-inch granite curb (Class "A"), set in concrete.
Item 14—217 linear feet of 6-inch granite curb (Class "B"), set in concrete.
Item 15—80 linear feet of curb reset in concrete.
Item 16—2,500 square feet of concrete sidewalk pavement laid.
Item 17—250 square feet of flagstone sidewalk pavement redressed and relaid.
Item 18—50 square feet of flagstone sidewalk pavement furnished and laid.
Item 19—46 square yards of restoration of permanent roadway pavement, all kinds.
Item 20—500 feet B. M. of timber and planking for bracing and sheeting.
The time allowed for constructing and completing the receiving basins and completing the alterations to receiving basins and appurtenances will be forty (40) consecutive working days.
The amount of security required will be Two Thousand Dollars ($2,000), and the amount of deposit accompanying the bid shall be five per cent. (5%) of the amount of security.
The bidder will state the price for each item or article contained in the specifications or schedules herein contained or hereto annexed, per foot, yard, or other unit of measure or article by which the bid will be tested. The contract, if awarded, will be awarded for the whole work at a lump sum.
Blank forms may be had and the drawings, form of specification and contract may be seen at the offices of the Commissioner of Public Works, Bureau of Sewers, Room 2103, Municipal Building, Manhattan.
MARCUS M. MARKS, President.
Dated, July 11, 1917. jy11,23
☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Manhattan at Room 2032, Municipal Building, Manhattan, until 2 p. m., on

MONDAY, JULY 30, 1917,

FOR THE CONSTRUCTION OF THE PARK AVENUE VIADUCT, WITH APPURTENANCES, PARK AVE., 40TH ST. TO THE GRAND CENTRAL STATION, TOGETHER WITH ALL WORK INCIDENTAL THERETO.
The Engineer's estimate of amount of work to be done is as follows:
Item 1. 1,300 cubic yards earth excavation.
Item 1-A. 600 cubic yards rock excavation.
Item 1-B. Removal of old masonry and foot bridge.
Item 2. 200 cubic yards concrete protection of waterproofing (1:2:4).
Item 2-A. 580 cubic yards concrete reinforced floor slab (1:2:4).
Item 2-B. 1,950 cubic yards concrete piers and walls (1:2:4).
Item 2-C. 50 cubic yards concrete (1:3:6).
Item 3. 40,000 square feet mortar covering.
Item 4. 2,400 square yards waterproofing (4-ply).
Item 5. 450 linear feet curb, 8-inch granite.
Item 6. 1,000 square feet concrete sidewalk.
Item 7. 13,400 cubic feet granite.
Item 8. 2,250 square yards sheet asphalt pavement.
Item 8-A. 350 square yards sheet asphalt pavement approaches.
Item 9. 5 cubic yards brick masonry.
Item 10. 2,380,000 pounds structural steel.
Item 11. 124,000 pounds reinforcing bars.
Item 12. 42,400 square feet reinforcing steel mesh
Item 13. 1,600 pounds steel castings.
Item 13-A. 19,000 pounds iron castings.
Item 14. Ornamental iron work.
Item 15. 20 linear feet wrought iron pipe, 2-inch diameter.
Item 15-A. 250 linear feet wrought iron pipe, 3-inch diameter.
Item 15-B. 400 linear feet wrought iron pipe, 4-inch diameter.
Item 15-C. 100 linear feet wrought iron pipe, 8-inch diameter.
Item 16. 300 linear feet vitrified tile pipe, 8-inch diameter.
Item 16-A. 20 linear feet vitrified tile pipe, 12-inch diameter.
Item 17. 700 square feet copper drains.
Item 18. Electrical work.
Item 19. Painting.
At the above place and time the bids will be publicly opened and read. The award of the contract, if awarded, will be made as soon thereafter as practicable. The President of the Borough of Manhattan reserves the right to reject any bids.
The time allowed for the full completion of the work will be 400 consecutive working days.
A bond in the sum of $125,000 will be required for the faithful performance of the work, and the amount of deposit accompanying the bid shall be five per cent. (5%) of the amount of the bond.
The bidder must deposit with the Borough President, at or before the time of making his bid, samples and affidavit, or the letter in regard to samples and affidavit, as required by the specifications.
The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per foot, yard or other unit of measure or article, by which the bid will be tested. The contract, if awarded, will be awarded for the whole work at a lump sum.
Pamphlets containing information for bidders, form of bid and contract, specifications, plans, etc., can be obtained at the office of the Commissioner of Public Works, Bureau of Highways, 21st floor, Municipal Building Manhattan, upon application by depositing Ten Dollars ($10) in cash or its equivalent for each set of specifications and plans. This deposit will be refunded upon the return of the pamphlets in acceptable condition within twenty days from the date on which the bids are to be opened.
MARCUS M. MARKS, President.
Dated, July 6, 1917. jy6,30
☞See General Instructions to Bidders on last page, last column, of the "City Record."

DEPARTMENT OF FINANCE.

Sales of Tax Liens.

Notice of Sale of Tax Liens of the City of New York, for Unpaid Taxes, Water Rents and Assessments for Local Improvements upon Lands and Tenements Within That Part of the City of New York Now Known and Described as the Borough of The Bronx, Embraced in Sections 9, 10, 11, 12 and 13, Formerly 23d and 24th Wards.

THE CITY OF NEW YORK, DEPARTMENT OF FINANCE, BUREAU FOR THE COLLECTION OF ASSESSMENTS AND ARREARS OF TAXES AND ASSESSMENTS, MUNICIPAL BUILDING, BOROUGH OF MANHATTAN, CITY OF NEW YORK.
Under the direction of Hon. William A. Prendergast, Comptroller of the City of New York, I, Daniel Moynahan, Collector of Assessments and Arrears, hereby give public notice, pursuant to the provisions of Chapter 17, Title 5, of the Greater New York Charter:
That the respective owners of the lands and tenements in the Borough of The Bronx, in The City of New York, embraced in Sections 9, 10, 11, 12 and 13 (formerly 23rd and 24th Wards), as said lands and tenements are shown upon the Tax Map of said City for said Borough, on which any taxes or any assessment for local improvements have been imposed and become a lien and have remained unpaid for three years since the same were due and payable, or on which any water rent has been imposed and become a lien and has remained due and unpaid for four years since the same was due and payable, are required to pay the amount of said taxes, assessments and water rents, *together with all unpaid taxes, water rents and assessments affecting such lands and tenements which became a lien and were due and payable prior to March fifteenth, nineteen hundred and seventeen* (the taxes, water rents and assessments for local improvements required to be paid, thus comprising all unpaid taxes and water rents affecting said properties contained in assessment rolls down to and including the assessment roll of the City of New York for the year nineteen hundred and sixteen, and all assessments for local improvements affecting said properties confirmed and entered up to March fourth, nineteen hundred and seventeen, inclusive), with all penalties thereon remaining unpaid, together with the interest thereon at the rate provided by law from the time the same became liens so as to be due and payable to the date of payment and the charges of this notice and advertisement to the Collector of Assessments and Arrears, at his office on the fourth floor of the Bergen Building, corner of Arthur and Tremont Avenues, Borough of The Bronx, City of New York.
AND NOTICE IS HEREBY GIVEN that if default be made in such payment the lien of the City of New York upon any of said lands and tenements for any tax, assessment or water rent which became a lien so as to be due and payable before March fifteenth, nineteen hundred and seventeen, will be sold at Public Auction at the Bureau for the Collection of Assessments and Arrears, fourth floor, Bergen Building, corner of Arthur and Tremont Avenues, Borough of The Bronx, in the City of New York, on

MONDAY, OCTOBER 15, 1917,

at two thirty o'clock in the afternoon of that day, for the lowest rate of interest, not exceeding twelve per centum per annum, at which any person or persons shall offer to take the same in consideration of advancing the said taxes, water rents and assessments and penalties, as the case may be, and interest thereon as aforesaid to the time of sale, the charges of notice and advertisement and all other costs and charges accrued thereon; and that such sale will be continued from time to time until all said liens for taxes, water rents and assessments for local improvements so advertised for sale affecting such lands and tenements shall be sold.
The transfer of tax lien to be executed and delivered to the purchaser thereof, pursuant to the terms of said sale, shall be subject to the lien for and the right of the City of New York to collect and receive all taxes, water rents and assessments for local improvements and penalties and interest thereon which accrued and became a lien, or which shall accrue and become a lien upon said premises so as to be due and payable on and after the date stated in the first advertisement of said sale as stated herein, namely, the fifteenth day of March, nineteen hundred and seventeen, i. e., the lien for and the right of the City of New York to collect and receive all taxes and water rents, included in the assessment rolls of the City of New York for the years subsequent to nineteen hundred and sixteen, and assessments for local improvements entered subsequent to March fourth, nineteen hundred and seventeen.
NOTICE IS HEREBY FURTHER GIVEN that a particular and detailed statement of the property affected showing section or ward, block and lot number thereof as the same may be on the Tax Map of the City of New York for the Borough of The Bronx and the tax liens thereon which are to be sold, is published in a pamphlet and that copies thereof are deposited in the offices of the Collector of Assessments and Arrears in the Boroughs of The Bronx and Manhattan and will be delivered to any person applying for the same.
Dated, New York, June 14, 1917.
This notice applies to arrears as of March 15, 1917.
DANIEL MOYNAHAN, Collector of Assessments and Arrears of The City of New York.
j15,22,29,jy6,13,20,27,a3,10,17,24,31,a7,14,21

Corporation Sale of the Lease of Certain City Real Estate.

UPON THE AUTHORIZATION OF THE Commissioners of the Sinking Fund, and pursuant to a resolution adopted by them at a meeting held June 28, 1917, the Comptroller of The City of New York will sell at public auction on

FRIDAY, JULY 27, 1917,

at 12 noon, in Room 368, Municipal Building, Manhattan, the lease of the following described property belonging to the City of New York, situate, lying and being in the First Ward, in the Borough and County of Queens, City and State of New York, bounded and described as follows:
Beginning at a point in the easterly line of Van Dam st., as now laid out, distant 100 feet southerly from the corner formed by the intersection of the southerly line of Nelson (Nott) ave. with the easterly line of Van Dam st., as now laid out; running thence southerly along the easterly line of Van Dam st., 145 feet; thence easterly at right angles to the last mentioned course 180 feet to the westerly line of Hill st.; thence northerly along the westerly line of Hill st. 145 feet; thence westerly parallel or nearly so with said southerly line of Nelson (Nott) ave. 180 feet to the point or place of beginning, be the said several dimensions more or less.
—with the buildings and appurtenances thereon, for a period of ten years from Sept. 1, 1917, with the privilege of renewal for an additional period of ten years, at an increase in rental of ten per cent. over the rental for the first ten years.
The minimum or upset rental at which said lease shall be sold is hereby fixed at the sum of Seven Hundred and Fifty Dollars ($750) per annum, payable quarterly in advance, and the said will be made upon the following
TERMS AND CONDITIONS:
The highest bidder will be required to pay twenty-five per cent. (25%) of the yearly rental at the time and place of sale; the amount so paid for one quarter's rent shall be forfeited if the successful bidder does not execute the lease when notified it is ready for execution.
No person will be received as lessee or surety who is delinquent on any former lease from the corporation, and no bid will be accepted from any person who is in arrears to the corporation upon debt or contract, or who is a defaulter as surety or otherwise upon any obligation to the City, as provided by law.
The lease to be in the usual form of leases of like property, and to contain in addition to other terms, covenants and conditions as follows:
First—A clause providing that the lessee shall not make any alterations or improvements upon the property except with the consent and approval of the Comptroller.
Second—A clause providing that during the term of the lease the lessee shall keep the fence present building and whatever buildings may be erected thereon in proper repair, both inside and outside, at his own cost and expense, and shall comply with all the laws and ordinances of the City of New York, and shall make all alterations and improvements thereto during the period of the lease.
Third—A clause providing that all repairs, alterations and improvements made on or to the property by the lessee during the period of the lease shall become the property of the City of New York at the expiration of the lease.
Fourth—A clause providing that the lessee shall pay the usual rates for water per meter measurements and comply with the rules and regulations of the Department of Water Supply, Gas and Electricity.
Fifth—A clause providing that the lessee shall have possession of the premises immediately upon the execution of the lease without the necessity of paying rent until the date of commencement of the lease, but he shall be liable for any damages which may occur in or to the premises to be demised from the date of possession.
The Comptroller shall have the right to reject any and all bids if deemed to be to the interest of the City of New York.
ALBERT E. HADLOCK, Deputy and Acting Comptroller.
Department of Finance, Comptroller's Office, July 11, 1917. jy11,27

Corporation Sale of Real Estate.

PUBLIC NOTICE IS HEREBY GIVEN THAT the Commissioners of the Sinking Fund of The City of New York, by virtue of the powers vested in them by law, will offer for sale at public auction, on

THURSDAY, JULY 26, 1917,

at 12 noon, in Room 368, Municipal Building, Manhattan, a strip of land in the rear of premises known as No. 16 Garfield pl., Brooklyn, bounded and described as follows:
All that certain piece or parcel of land situate, lying and being in the Borough of Brooklyn, City and State of New York, bounded and described as follows:
Beginning at a point distant 87 feet southwesterly from a point in the southwesterly line of Garfield pl., distant 150 feet southeasterly from the intersection of the southeasterly line of 4th ave. with the southwesterly line of Garfield pl.; running thence southeasterly along the northeasterly line of Old Freekes Mill rd. 25.8½ feet; running thence southwesterly 13.4½ feet to the center line of Old Freekes Mill rd.; running thence northwesterly and along said center line of Old Freekes Mill rd. 25.9 feet; running thence northeasterly 13.3½ feet to the point or place of beginning.
The minimum or upset price at which said property shall be sold is hereby fixed at the sum of Two Hundred and Fifty Dollars ($250). The sale to be made upon the following
TERMS AND CONDITIONS:
The highest bidder will be required to pay 10 per cent. of the amount of the bid, together with the auctioneer's fees, at the time of the sale, and 90 per cent. upon the delivery of the deed, which shall be within sixty days from the date of sale.
The premises to be conveyed free and clear of all taxes, assessments and water charges.
The deed so delivered shall be in the form of a bargain and sale deed without covenants.
The Comptroller may at his option resell the property if the successful bidder shall fail to comply with the terms of the sale and the person so failing to comply therewith will be held liable for any deficiency which may result from such resale.
The right is reserved to reject any and all bids.
Maps of said real estate may be seen on application at the Department of Finance (Division of Real Estate), Room 733, Municipal Building, Manhattan.
By order of the Commissioners of the Sinking Fund under resolution adopted at meeting of the Board held June 28, 1917.
ALBERT E. HADLOCK, Deputy and Acting Comptroller.
Department of Finance, Comptroller's Office, July 10, 1917. jy10,26

Corporation Sale of Buildings and Appurtenances Thereto on City Real Estate by Sealed Bids.

AT THE REQUEST OF THE PRESIDENT of the Borough of Queens, public notice is hereby given that the Commissioners of the Sinking Fund, by virtue of the powers vested in them by law, will offer for sale by sealed bids certain encroachments standing upon property owned by the City of New York, acquired by it for street opening purposes in the

Borough of Queens.

BEING THE BUILDINGS, PARTS OF buildings, etc., standing within the lines of 51st st., from Astoria ave. to Polk ave., in the Borough of Queens, which are more particularly described on a certain map on file in the office of the Collector of City Revenue, Department of Finance, Room 368, Municipal Building, Manhattan.
PURSUANT to a resolution of the Commissioners of the Sinking Fund, adopted at a meeting held June 28, 1917, the sale by sealed bids at the upset or minimum prices named in the description of each parcel of the above described buildings and appurtenances thereto will be held by direction of the Comptroller on

TUESDAY, JULY 24, 1917,

at 11 a. m., in lots and parcels, and in manner and form, and at upset prices as follows:
Parcel No. 43—Stoop and steps No. 97 Fifty-first st. Upset price, $2.
Parcel No. 44—Porch and steps No. 95 Fifth-first st. Upset price, $5.
Parcels Nos. 54-55—Part of two two-story frame houses Nos. 84 and 86 Fifty-first st. Cut 5.25 feet on north side by 5.54 feet on south side. Upset price, $50.
Parcel No. 56—Part of two-story brick house No. 82 Fifty-first st. Cut 5.54 feet on north side by 5.69 feet on south side. Upset price, $25.
Parcel No. 57—Part of two-story brick house No. 80 Fifty-first st. Cut 5.69 feet on north side by 5.83 feet on south side. Upset price, $25.
Parcel No. 59—Part of three-story frame building on northeast corner of Jackson ave. and 51st st. Cut 15.18 feet on front by 15.25 feet on rear. Part of stable in rear. Cut 15.08 feet on north side by 15.25 feet on south side. Upset price, $200.
Parcel No. 62—Part of one-story frame house No. 66 Fifty-first st. Cut 5.75 feet on north side by 5.31 feet on south side. Upset price, $5.
Parcel No. 67—Part of two-story frame house No. 56 Fifty-first st. Cut 5.25 feet on north side by 5.15 feet on south side. Upset price, $25.
Parcel No. 68—Part of two and one-half story frame house No. 54 Fifty-first st. Cut 4.35 feet on north side by 4.25 feet on south side. Upset price, $25.
Parcel No. 69—Part of two and one-half story frame house No. 50 Fifty-first st. Cut 4.18 feet on north side by 4.20 feet on south side. Upset price, $25.
Parcel No. 70—Part of two-story brick house No. 46 Fifty-first st. Cut 4.35 feet on north and south sides. Upset price, $30.
Parcel No. 72—Part of two-story brick house

No. 42 Fifty-first st. Cut 4.4 feet on north and south sides. Upset price, $25.

Parcel No. 73—Part of two-story brick building on the northeast corner of Hayes ave. and 51st st. Cut 14.97 feet on front by 15 feet on rear. Part of brick stable in rear. Cut 10.70 feet on north and south sides. Upset price, $200.

Parcel No. 76—Part of two-story brick building No. 87 Fifty-first st. Cut 15.15 feet on north side by 15.10 feet on south side. Upset price, $50.

Parcel No. 83—Part of two-story frame house No. 73 Fifty-first street. Cut 5.20 feet on north and south sides. Upset price, $25.

Parcel No. 87—Part of two-story frame house No. 65 Fifty-first st. Cut 4.45 feet on north side by 4.55 feet on south side. Upset price, $25.

Parcel No. 98—Steps of two and one-half story frame house on east side of 51st st. 20 feet south of Dyer pl. Upset price, $2.

Parcel No. 104—Porch and part of bay window of two-story frame house No. 18 Fifty-first st. Upset price, $5.

Parcel No. 105—Porch and part of two-story brick house No. 16 Fifty-first st. Cut 0.82 feet on north side by 0.86 feet on south side. Upset price, $5.

Parcel No. 110—Steps No. 6 Fifty-first st. Upset price, $2.

Parcels Nos. 111-112—Part of two three-story frame flats Nos. 2 and 4 Fifty-first st. Cut 11.10 feet on north side by 11.08 feet on south side. Upset price, $200.

Parcels Nos. 122-123—Part of porch and bay window of two and one-half story frame house No. 39 Fifty-first street. Upset price, $5.

Parcels Nos. 126-127. Porch and part of two-story double frame house No. 31 and No. 33 Fifty-first st. Cut 0.57 feet on north side by 1.10 feet on south side. Upset price, $5.

Parcel No. 130—Porch and steps No. 25 Fifty-first st. Upset price, $5.

Parcel No. 131—Porch and steps No. 23 Fifty-first st. Upset price, $5.

Parcel No. 132—Porch and steps No. 21 Fifty-first st. Upset price, $5.

Parcel No. 134—Part of two-story frame house No. 19 Fifty-first st. Cut 5.75 feet on north side by 5.70 feet on south side. Upset price, $25.

Parcel No. 137—Steps No. 13 Fifty-first st. Upset price, $2.

Parcel No. 140—Steps No. 5 Fifty-first st. Upset price, $2.

Sealed bids (blank forms of which may be obtained upon application) will be received by the Comptroller at the office of the Collector of City Revenue, Room 368, Municipal Building, Borough of Manhattan, until 11 a. m. on the 24th day of July, 1917, and then publicly opened for the sale for removal of the above-described buildings and appurtenances thereto, and the award will be made to the highest bidder within twenty-four hours, or as soon as possible thereafter.

Each parcel must be bid for separately and will be sold in its entirety, as described in above advertisement.

Each and every bid must be accompanied by a deposit of cash or certified check in a sum equal to 25 per cent. of the amount of the bid, except that a minimum deposit of $50 will be required with all bids, and that a deposit of $500 will be sufficient to entitle bidders to bid on any or all of the buildings.

Deposits of unsuccessful bidders will be returned within twenty-four hours after successful bidders have paid purchase price in full and given security, and those of successful bidders may be declared forfeited to The City of New York by the Comptroller upon the failure of the successful bidder to further comply with the requirements of the terms and conditions of the sale as set forth hereinafter.

Successful bidders will be required to pay the purchase money and deposit the required security within twenty-four hours of the receipt of notification of the acceptance of their bids.

The Comptroller reserves the right to reject any and all bids and to waive any defects or informalities in any bid should it be deemed in the interest of The City of New York to do so.

All bids must state clearly (1) the number or description of the building or buildings bid for, (2) the amount of the bid, (3) the full name and address of the bidder.

All bids must be inclosed in properly sealed envelopes, marked "Proposals to be opened July 24, 1917," and must be delivered, or mailed in time for their delivery, prior to 11 a. m. of that date to the "Collector of City Revenue, Room 368, Municipal Building, New York City," from whom any further particulars regarding the buildings to be disposed of may be obtained.

THE BUILDINGS WILL BE SOLD FOR IMMEDIATE REMOVAL ONLY, SUBJECT TO THE TERMS AND CONDITIONS PRINTED ON THE LAST PAGE OF THIS ISSUE OF THE "CITY RECORD."

ALBERT E. HADLOCK, Deputy and Acting Comptroller.

City of New York, Department of Finance, Comptroller's Office, July 3, 1917. jy9,24

AT THE REQUEST OF THE PRESIDENT of the Borough of Queens, public notice is hereby given that the Commissioners of the Sinking Fund by virtue of the powers vested in them by law, will offer for sale by sealed bids certain encroachments standing upon property owned by The City of New York, acquired by it for street opening purposes in the

Borough of Queens.

BEING certain buildings, parts of buildings, etc., standing within the lines of Damage Parcel No. 520 of the Queens Boulevard proceeding, in the Borough of Queens, which are more particularly described on a certain map on file in the office of the Collector of City Revenue, Department of Finance, Room 368, Municipal Building, Borough of Manhattan.

PURSUANT to a resolution of the Commissioners of the Sinking Fund adopted at a meeting held June 28, 1917, the sale by sealed bids at the upset or minimum prices named in the description of each parcel, of the above described buildings and appurtenances thereto will be held by direction of the Comptroller on

FRIDAY, JULY 20, 1917,

at 11 a. m., in lots and parcels, and in manner and form, and at upset prices as follows:

Parcel No. 520: Greenhouses and parts of greenhouses at No. 28 Thompson ave., Elmhurst, on Parcel No. 520, Queens Boulevard proceeding. Upset price, $50.

Sealed bids (blank forms of which may be obtained upon application) will be received by the Comptroller at the office of the Collector of City Revenue, Room 368, Municipal Building, Borough of Manhattan, until 11 a. m. on the 20th day of July, 1917, and then publicly opened for the sale for removal of the above-described buildings and appurtenances thereto, and the award will be made to the highest bidder within twenty-four hours, or as soon as possible thereafter.

Each parcel must be bid for separately and will be sold in its entirety, as described in above advertisement.

Each and every bid must be accompanied by a depost of cash or certified check in a sum equal to 25 per cent. of the amount of the bid, except that a minimum deposit of $50 will be required with all bids, and that a deposit of $500 will be sufficient to entitle bidders to bid on any or all of the buldings.

Deposits of unsuccessful bidders will be returned within twenty-four hours after successful bidders have paid purchase price in full and given security, and those of successful bidders may be declared forfeited to The City of New York by the Comptroller upon the failure of the successful bidder to further comply with the requirements of the terms and conditions of the sale as set forth hereinafter.

Successful bidders will be required to pay the purchase money and deposit the required security within twenty-four hours of the receipt of notification of the acceptance of their bids.

The Comptroller reserves the right to reject any and all bids and to waive any defects or informalities in any bid should it be deemed in the interest of The City of New York to do so.

All bids must state clearly (1) the number or description of the building or buildings bid for, (2) the amount of the bid, (3) the full name and address of the bidder.

All bids must be inclosed in properly sealed envelopes, marked "Proposals to be opened July 23, 1917," and must be delivered, or mailed in time for their delivery, prior to 11 a. m. of that date to the "Collector of City Revenue, Room 368, Municipal Building, New York City," from whom any further particulars regarding the buildings to be disposed of may be obtained.

THE BUILDINGS WILL BE SOLD FOR IMMEDIATE REMOVAL ONLY, SUBJECT TO THE TERMS AND CONDITIONS PRINTED ON THE LAST PAGE OF THIS ISSUE OF THE "CITY RECORD."

ALBERT E. HADLOCK, Deputy and Acting Comptroller.

City of New York, Department of Finance, Comptroller's Office, July 3, 1917. jy6,23

Confirmation of Assessments.

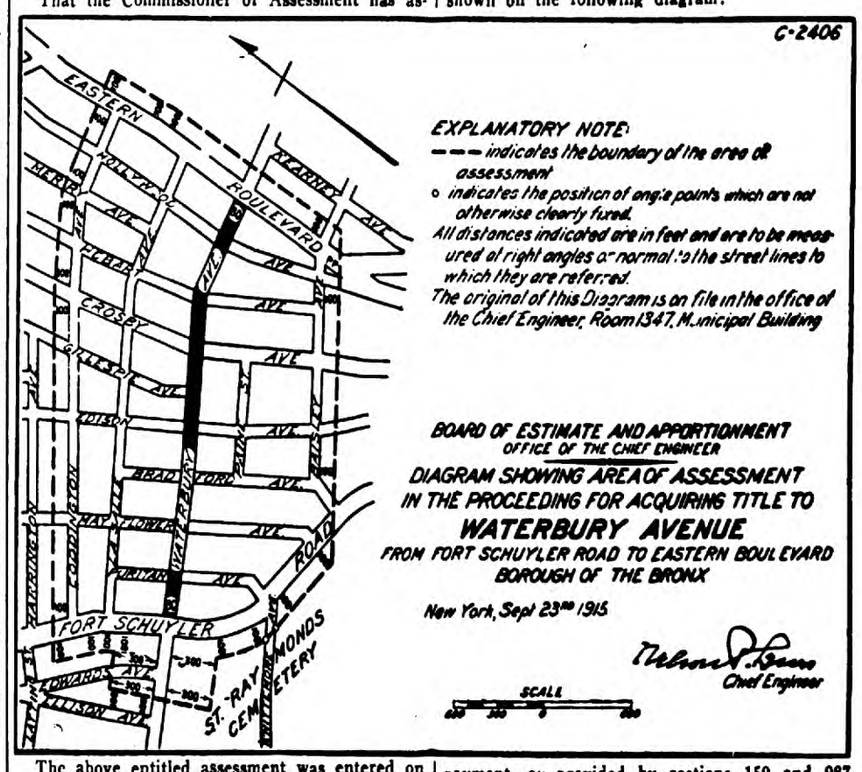
NOTICES TO PROPERTY OWNERS.

IN PURSUANCE OF SECTION 986 OF THE Greater New York Charter, the Comptroller of the City of New York hereby gives public notice of the confirmation by the Supreme Court and the entering in the Bureau for the Collection of Assessments and Arrears of assessment for OPENING AND ACQUIRING TITLE to the following named avenue in the BOROUGH OF THE BRONX:

SECTION 18.

WATERBURY AVE.—OPENING, from Fort Schuyler rd. to Eastern Boulevard. Confirmed June 16, 1917; entered, July 7, 1917.

That the Commissioner of Assessment has assessed any or all such lands, tenements and hereditaments and premises as are within the area of assessment fixed and prescribed as the area of assessment for benefit by the Board of Estimate and Apportionment on the 22nd day of October, 1915, and that the said area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of The Bronx, in The City of New York, which, taken together, are bounded as shown on the following diagram:



The above entitled assessment was entered on the day hereinbefore given in the Record of Titles of Assessments kept in the Bureau for the Collection of Assessments and Arrears of Taxes and Assessments and of Water Rents, and unless the amount assessed for benefit on any person or property shall be paid on or before Sept. 5, 1917, which is sixty days after the date of said entry of the assessment, interest will be collected thereon at the rate of seven per centum per annum, to be calculated from ten days after the date of said entry to the date of payment, as provided by sections 159 and 987 of the Greater New York Charter.

The above assessment is payable to the Collector of Assessments and Arrears at his office in the Bergen Building, 4th floor, southeast corner of Arthur and Tremont aves., Borough of The Bronx, between the hours of 9 a. m. and 5 p. m., and on Saturdays from 9 a. m. to 12 noon.

WILLIAM A. PRENDERGAST, Comptroller.
Dated, New York, July 7, 1917. jy12,23

IN PURSUANCE OF SECTION 986 OF THE Greater New York Charter, the Comptroller of the City of New York hereby gives public notice of the confirmation by the Supreme Court and the entering in the Bureau for the Collection of Assessments and Arrears of assessment for OPENING AND ACQUIRING TITLE TO THE FOLLOWING NAMED AVENUES IN THE BOROUGH OF THE BRONX:

SECTIONS 16 AND 17.

OPENING AND ACQUIRING TITLE TO ALLERTON AVE., from Bronx Park East to Hutchinson ave., and MACE AVE., from Bronx Park East to Baychester ave. Confirmed June 4, 1917; entered June 28, 1917. Area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of The Bronx, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Beginning at a point on the prolongation of a line midway between Adee ave. and Arnow ave. as these streets are laid out west of Wilson ave. distant 100 feet westerly from the westerly line of Bronx Park East, the said distance being measured at right angles to Bronx Park East; and running thence eastwardly along the said line midway between Adee ave. and Arnow ave. and along the prolongations of the said line to the intersection with a line distant 100 feet northwesterly from and parallel with the northwesterly line of Arnow ave. as this street is laid out east of Gun Hill rd., the said distance being measured at right angles to Arnow ave.; thence northeasterly along the said line parallel with Arnow ave. to the intersection with a line distant 100 feet northeasterly from and parallel with the northeasterly line of Gun Hill rd., the said distance being measured at right angles to Gun Hill rd.; thence southeastwardly along the said line parallel with Gun Hill rd. to the intersection with a line midway between Arnow ave. and Bartow ave.; thence northeastwardly along the said line midway between Arnow ave. and Bartow ave. to the intersection with a line midway between Gunther ave. and Lodovick ave.; thence southeastwardly along the said line midway between Gunther ave. and Lodovick ave. to the intersection with a line distant 100 feet northwesterly from and parallel with the northwesterly line of Bartow ave., the said distance being measured at right angles to Bartow ave.; thence northeastwardly along the said line parallel with Bartow ave. to the intersection with a line midway between Bruner ave. and Wickham ave.; thence southeastwardly along the said line midway between Bruner ave. and Wickham ave. to the intersection with a line midway between Allerton ave. and Bartow ave.; thence northeastwardly along the said line midway between Allerton ave. and Bartow ave., and along the prolongation of the said line to the intersection with the westerly pier and bulkhead line of Hutchinson River as indicated on Sections 45 and 52 of the final maps of the Borough; thence southeastwardly along the said pier and bulkhead line to the intersection with the prolongation of a line midway between Allerton ave. and Bushnell ave.; thence southwestwardly along the said line midway between Allerton ave. and Bushnell ave. and along the prolongation of the said line to the intersection with a line midway between Ely ave. and Bruner ave.; thence southeastwardly along the said line midway between Ely ave. and Bruner ave. to the intersection with a line distant 100 feet northeasterly from and parallel with the northeasterly line of Gun Hill rd., the said distance being measured at right angles to Gun Hill rd.; thence southeastwardly along the said line parallel with Gun Hill rd. to the intersection with a line midway between Bushnell ave. and Mace ave.; thence northeastwardly along the said line midway between Bushnell ave. and Mace. ave. to a point midway between Palmer ave. and De Reimer ave.; thence southeastwardly and always midway between Palmer ave. and De Reimer ave. to the intersection with a line midway between Mace ave. and Waring ave. as these streets are laid out east of Gun Hill rd.; thence southwestwardly along the said line midway between Mace ave. and Waring ave. and along the prolongation of the said line to the intersection with a line midway between Mace ave. and Waring ave. as these streets are laid out at Bruner ave.; thence westwardly along the said line midway between Mace ave. and Waring ave. and along the prolongation of the said line to a point distant 100 feet westerly from the westerly line of Bronx Park East, the said distance being measured at right angles to Bronx Park East; thence northwardly and always distant 100 feet westerly from and parallel with the westerly line of Bronx Park East to the point or place of beginning.

The above entitled assessment was entered on the day hereinbefore given in the Record of Titles of Assessments kept in the Bureau for the Collection of Assessments and Arrears of Taxes and Assessments and of Water Rents, and unless the amount assessed for benefit on any person or property shall be paid on or before August 27, 1917, which is sixty days after the date of said entry of the assessment, interest will be collected thereon at the rate of seven per centum per annum, to be calculated from ten days after the date of entry to the date of payment, as provided by Sections 159 and 987 of the Greater New York Charter.

The above assessment is payable to the Collector of Assessments and Arrears at his office in the Bergen Building, 4th floor, southeast corner of Arthur and Tremont aves., Borough of The Bronx, between the hours of 9 a. m. and 2 p. m., and on Saturdays from 9 a. m. to 12 noon.

WILLIAM A. PRENDERGAST, Comptroller.
Dated, New York, June 29, 1917. jy3,14

IN PURSUANCE OF SECTION 986 OF THE Greater New York Charter, the Comptroller of the City of New York hereby gives public notice of the confirmation by the Supreme Court and the entering in the Bureau for the Collection of Assessments and Arrears of assessment for OPENING AND ACQUIRING TITLE TO THE FOLLOWING NAMED STREET IN THE BOROUGH OF QUEENS:

FOURTH WARD.

HUNTINGTON ST.—OPENING, from Liberty ave. to Digby st. Confirmed June 7, 1917; entered June 29, 1917.

Area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of Queens, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Bounded on the north by a line midway between Huntington st. and Shoe and Leather st. and by the prolongation of the said line; on the east by a line distant 100 feet easterly from and parallel with the easterly line of Digby st., the said distance being measured at right angles to Digby st.; on the south by a line midway between Huntington st. and Kimball ave. and by the prolongation of the said line, and on the west by a line distant 100 feet westerly from and parallel with the westerly line of Halifax st., the said distance being measured at right angles to Halifax st., and by the prolongation of the said line.

The above entitled assessment was entered on the day hereinbefore given in the Record of Titles of Assessments kept in the Bureau for the Collection of Assessments and Arrears of Taxes and Assessments and of Water Rents, and unless the amount assessed for benefit on any person or property shall be paid on or before August 28, 1917, which is sixty days after the date of said entry of the assessment, interest will be collected thereon at the rate of seven per centum per annum, to be calculated from ten days after the date of entry to the date of payment, as provided by Sections 159 and 987 of the Greater New York Charter.

The above assessment is payable to the Collector of Assessments and Arrears at his office in the Municipal Building, Court House Square, L. I. City, Borough of Queens, between the hours of 9 a. m. and 2 p. m., and on Saturdays from 9 a. m. to 12 noon.

WILLIAM A. PRENDERGAST, Comptroller.
Dated, New York, June 29, 1917. jy3,14

Sureties on Contracts.

UNTIL FURTHER NOTICE SURETY COMpanies will be accepted as sufficient upon the following contracts to the amounts named:

Supplies of Any Description, Including Gas and Electricity.

One company on a bond up to $50,000.

When such company is authorized to write that amount as per letter of Comptroller to the surety companies, dated Jan. 1, 1914.

Construction.

One company on a bond up to $25,000.

Including regulating, grading, paving, sewers, maintenance, dredging, construction of parks, parkways, docks, buildings, bridges, tunnels, aqueducts, repairs, heating, ventilating, plumbing, etc.

When such company is authorized to write that amount as per letter of Comptroller to the surety companies, dated Jan. 1, 1914.

Asphalt, Asphalt Block and Wood Block Pavement.

Two companies will be required on any and every bond up to amount authorized by letter

of Comptroller to the surety companies, dated Jan. 1, 1914.

Jan. 1, 1914.

WILLIAM A. PRENDERGAST, Comptroller.

BOROUGH OF THE BRONX.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of The Bronx, at his office, Municipal Building, Crotona Park, Tremont and 3d aves., until 10.30 a. m., on

TUESDAY, JULY 24, 1917.

NO. 1. FOR FURNISHING AND DELIVERING FORAGE TO THE BUREAU OF SEWERS AND HIGHWAYS, MAINTENANCE.

The time allowed for the performance of the contract is as directed during the year 1917, after the endorsement of the certificate of the Comptroller upon the executed contract.

The amount of security required for the proper performance of the contract shall be thirty (30) per cent. of the total amount for which the contract is awarded.

The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per ton, gallon, piece, cubic yard or other unit of measure by which the bids will be tested. The bids will be compared and the contract awarded at a lump or aggregate sum for the contract.

Blank forms of bids or estimates upon which bids must be made can be obtained upon application therefor, the specifications may be seen and other information obtained at said office.

jy12,24 DOUGLAS MATHEWSON, President.

☞See General Instructions to Bidders on last page, last column, of the "City Record."

BOROUGH OF RICHMOND.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Richmond at Borough Hall, St. George, New Brighton, S. I., until 12 noon, on

MONDAY, JULY 23, 1917,
Borough of Richmond.

FOR ELECTRIC WORK OF AN ADDITIONAL COUNTY COURT HOUSE IN THE COUNTY OF RICHMOND, JAY ST., DEKALB ST. AND STUYVESANT PL., ST. GEORGE, BOROUGH OF RICHMOND, NEW YORK CITY.

The time for the completion of the work and the full performance of the contract is six (6) consecutive calendar months.

The amount of security required for the performance of the contract is Three Thousand Dollars ($3,000), and the amount of deposit accompanying the bid shall be five (5) per cent. of the amount of security.

The bids will be compared and the contract awarded at a lump or aggregate sum for the contract.

Bidders are requested to make their bids or estimates upon the blank form prepared by the President, a copy of which, with the proper envelope in which to enclose the bid, can be obtained upon application therefor at the office of the Engineer, Bureau of Engineering, Borough Hall, St. George, S. I., where plans and the contract, including the specifications, in the form approved by the Corporation Counsel, may be seen and other information obtained.

CALVIN D. VAN NAME, President.

Dated, July 5, 1917. jy12,23

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Richmond, at Borough Hall, St. George, New Brighton, S. I., until 12 noon, on

THURSDAY, JULY 19, 1917,
Borough of Richmond.

FOR THE REMOVAL OF THE STEAM PUMPING PLANT, AND FOR FURNISHING, INSTALLING AND CONNECTING COMPLETE TWO MOTOR-DRIVEN TURBINE PRESSURE PUMPS FOR OPERATING THE PLUNGER ELEVATORS IN BOROUGH HALL, BOROUGH OF RICHMOND, S. I., TOGETHER WITH ALL WORK INCIDENTAL THERETO.

The time for the completion of the work and the full performance of the contract is fifty (50) consecutive working days.

The amount of security required for the performance of the contract is Thirty-two Hundred Dollars ($3,200), and the amount of deposit accompanying the bid shall be five (5) per cent. of the amount of security.

The bids will be compared and the contract awarded at a lump or aggregate sum for the contract.

Bidders are requested to make their bids or estimates upon the blank form prepared by the President, a copy of which, with the proper envelope in which to enclose the bid, can be obtained upon application therefor at the office of the Engineer, Bureau of Engineering, Borough Hall, St. George, S. I., where plans and the contract, including the specifications, in the form approved by the Corporation Counsel may be seen and other information obtained.

CALVIN D. VAN NAME, President.

Dated, July 2, 1917. jy9,19

☞See General Instructions to Bidders on last page, last column, of the "City Record."

DEPARTMENT OF EDUCATION.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 23, 1917,
Borough of Manhattan.

FOR ADDITIONS, ALTERATIONS AND REPAIRS TO THE ELECTRIC LIGHT EQUIPMENTS IN PUBLIC SCHOOLS 109, 120 AND 160, BOROUGH OF MANHATTAN.

The time allowed to complete the whole work on each school will be eighty (80) consecutive working days, as provided in the contract.

The amount of security required is as follows: P. S. 109, $1,000; P. S. 120, $800; P. S. 160, $800.

The deposit accompanying bid on each school shall be five per cent. of the amount of security.

A separate bid shall be submitted for each school, and separate awards will be made thereon.

FOR SCRAPING, CLEANING AND PAINTING IRON HOUSE TANKS AND IRON WATER CLOSET CISTERNS IN VARIOUS SCHOOL BUILDINGS, BOROUGH OF MANHATTAN.

The time allowed to complete the whole work on all schools will be forty (40) consecutive working days, as provided in the contract.

The amount of security required is $2,600.

The bid to be submitted must include the entire work on all schools, and the award will be made thereon.

The deposit accompanying bid shall be five per cent. of the amount of security.

Borough of The Bronx.

FOR OPERA CHAIRS (DUPLICATE SCHOOL PLAN), AT PUBLIC SCHOOLS 10, 13, 20, 23, 25, 37, 39, 51 AND 52, BOROUGH OF THE BRONX.

The time allowed to complete the whole work on each itch will be 45 consecutive working days, as provided in the contract.

The amount of security required is as follows: Item 1, $3,600; Item 2, $1,600.

The deposit accompanying bid on each item shall be five per cent. of the amount of security.

A separate bid must be submitted for each item, and separate awards will be made thereon.

Blank forms, plans and specifications may be obtained or seen at the Office of the Superintendent, at Estimating Room, 9th floor, Hall of the Board of Education, Manhattan.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 11, 1917. jy11,23

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 23, 1917,
Borough of Brooklyn.

FOR ITEM 1, INSTALLING HEATING AND VENTILATING APPARATUS IN PUBLIC SCHOOL 16, ON THE NORTHERLY SIDE OF WILSON ST., 80 FEET EAST OF BEDFORD AVE., BOROUGH OF BROOKLYN.

The time allowed to complete the whole work will be 140 consecutive working days, as provided in the contract.

The amount of security required is $8,000.

The deposit accompanying bid shall be five per cent. of the amount of security.

FOR ALTERATIONS, REPAIRS, ETC., AT PUBLIC SCHOOLS 19, 24, 25, 26, 43, 64, 72, 123, 129, 148, 158, 162 AND ERASMUS HALL HIGH SCHOOL, BOROUGH OF BROOKLYN.

The time allowed to complete the whole work of each school will be as follows:

P. S. 19, 65 consecutive working days; P. S. 24, 60 consecutive working days; P. S. 25, 55 consecutive working days; P. S. 26, 60 consecutive working days; P. S. 43, 50 consecutive working days; P. S. 64, 45 consecutive working days; P. S. 72, 40 consecutive working days; P. S. 123, 60 consecutive working days; P. S. 129, 55 consecutive working days; P. S. 148, 60 consecutive working days; P. S. 158, 40 consecutive working days; P. S. 162, 60 consecutive working days; Erasmus Hall High School, 45 consecutive working days, as provided in the contract.

The amount of security required is as follows: P. S. 19, $600; P. S. 24, $500; P. S. 25, $400; P. S. 26, $600; P. S. 43, $600; P. S. 64, $2,000; P. S. 72, $400; P. S. 123, $600; P. S. 129, $500; P. S. 148, $600; P. S. 158, $400; P. S. 162, $700; Erasmus Hall High School, $600.

The deposit accompanying bid on each school shall be five per cent. of the amount of security.

A separate bid must be submitted for each school, and separate awards will be made thereon.

FOR FURNISHING AND DELIVERING GLASS TO VARIOUS SCHOOLS IN THE BOROUGH OF BROOKLYN.

The time allowed to complete the whole work on all schools will be 30 consecutive working days, as provided in the contract.

The amount of security is $600.

The bid to be submitted must include the entire work on all schools and award will be made thereon.

The deposit accompanying bid shall be five per cent. of the amount of security.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan, and also at branch office, 131 Livingston st., Brooklyn.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 11, 1917. jy11,23

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Superintendent of School Supplies at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

TUESDAY, JULY 17, 1917,

FOR FURNIHING AND DELIVERING COAL FOR USE IN THE SCHOOLS AND THE SEVERAL OFFICES AND DEPARTMENTS THEREOF, OF THE CITY OF NEW YORK.

The time for the delivery of the coal and supplies and the performance of the contract will be from July 26, 1917, to July 26, 1918, inclusive, as provided in the contract.

The amount of security required for the faithful performance of the contract is thirty per cent. (30%) of the amount of the contract.

No bid will be considered unless it is accompanied by a deposit. Such deposit shall be in an amount not less than one and one-half per cent. (1½%) of the total amount of the bid.

The bidder will state the price per gross ton, by which the bids will be tested.

Separate bids must be submitted for each Borough, alongside, or item by item.

Contracts, if awarded, will be awarded to the lowest bidder for each Borough, alongside, or item by item, if deemed for the best interest of the City.

The Board of Education reserves the right to award the contracts by Borough, alongside, or item by item, if deemed for the best interest of the City.

Delivery will be required to be made at the time and in the manner and in such quantities as may be directed.

Bids must be submitted in duplicate, each in a separate envelope.

Blank forms and further information may be obtained at the office of the Superintendent of School Supplies, Board of Education, Park ave. and 59th st., Manhattan.

PATRICK JONES, Superintendent of School Supplies.

Dated, July 5, 1917. jy5,17

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY THE Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 16, 1917,
Borough of Manhattan.

FOR AN AUTOMATIC SPRINKLER EQUIPMENT AT THE MANHATTAN TRADE SCHOOL FOR GIRLS, ON THE NORTHWESTERLY CORNER OF LEXINGTON AVE. AND E. 22ND ST., BOROUGH OF MANHATTAN.

The time allowed for installation of the risers will be sixty (60) consecutive working days, and to complete the whole work will be one hundred and seventy-five (175) consecutive working days, as provided in the Contract.

The amount of security required is Four Thousand Dollars ($4,000).

The deposit accompanying bid shall be five per cent. of the amount of security.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent, at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY THE Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 16, 1917,
Borough of The Bronx.

FOR NEW WINDOWS (DUPLICATE SCHOOL PLAN) AT PUBLIC SCHOOL 2, 3D AVE., NORTH OF 169TH ST., BOROUGH OF THE BRONX.

The time allowed to complete the whole work will be ninety (90) consecutive working days, as provided in the contract.

The amount of security required is $600.

The deposit accompanying bid shall be five per cent. of the amount of security.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY THE Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 16, 1917,
Borough of The Bronx.

FOR EXCAVATING, RETAINING WALLS, ETC., OF SITE FOR NEW PUBLIC SCHOOL 57, ON CROTONA AND BELMONT AVES., E. 180TH AND 181ST STS., BOROUGH OF THE BRONX.

The estimate of the Superintendent of School Buildings of the quantity and kind of materials required and the nature and extent of the work are herein stated and set forth, and the several bids will be tested by the quantities mentioned in said bids.

The following items of the estimate include both the material and the labor: Earth excavation, 1,530 cubic yards; rock excavation, 14,178 cubic yards; stone retaining walls, 4,600 cubic feet; sewer and water main.

The foregoing estimate of the Superintendent of School Buildings is approximate only, and the quantities given are not to be considered as a binding feature of the contract. Payment will be made upon the basis of quantities certified to by a City Surveyor, as hereinafter provided for.

Bidders are required to submit their bids upon the following express conditions, which apply to and become a part of every bid received.

Bidders must satisfy themselves by personal examination of the location of the proposed work, and by any other means, as to the accuracy of the foregoing estimate and of the plan and specifications, and they shall not at any time after the submission of their bids dispute or complain of such estimate or assert that there was any misunderstanding in regard to the nature or amount of the work to be done, or the materials or labor to be furnished.

The prices bid for the various items enumerated in paragraph 3 shall include and cover the cost of furnishing all the materials and labor necessary for the performance of all the work set forth, described and shown, in the proposal, in the form of agreement, in the specifications and on the plan for the work, together with any or all other work or expenses necessary or incidental thereto, such as surveyor's fees, shoring and sheet piling, the removal of present fences, walls, rubbish, and all other materials and work incidental to the work of this contract, the filling and leveling up with concrete of all holes or pockets which may have been excavated to a lower depth than required, back filling around pipes, and repairing pavements, sidewalks and streets where excavations have been made.

Any bid which fails to name a price per unit of measurement for each and every item where quantities are given, may be held to be informal and may be rejected, and in case of any discrepancy between price in words in the bid and that in figures, the price in words will be considered as the bid.

The contractor will be required to complete the entire work to the satisfaction of the Committee on Buildings and Sites and in accordance with the agreement, the specifications and the plan of the work.

No compensation beyond the amount payable for the several items of work and materials hereinbefore enumerated, which shall be actually performed and furnished at the price bid therefor by the bidder to whom the contract is awarded, shall be due or payable for the entire work and materials.

The time allowed to complete the whole work will be one hundred and twenty (120) consecutive working days, as provided in the contract.

The amount of security required is Twenty Thousand Dollars ($20,000).

The deposit accompanying bid shall be five per cent. of the amount of security.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent, at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY THE Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 16, 1917,
Borough of Brooklyn.

FOR FURNITURE, ETC., ITEM 2, DUPLICATE SCHOOL PLAN, AT PUBLIC SCHOOL 66, OSBORN AND WATKINS STS., NEAR SUTTER AVE., AND PUBLIC SCHOOL 109, DUMONT AVE., POWELL AND SACKMAN STS., BOROUGH OF BROOKLYN.

The time allowed to complete the whole work will be sixty (60) consecutive working days, as provided in the contract.

The amount of security required is Four Hundred Dollars ($400).

The deposit accompanying bid shall be five per cent. of the amount of security.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent, at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan, and also at Branch Office, 131 Livingston st., Brooklyn.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY THE Superintendent of School Buildings at the office of the Department of Education, Park ave. and 59th st., Manhattan, until 11 a. m., on

MONDAY, JULY 16, 1917,
Borough of Brooklyn.

FOR SANITARY ALTERATIONS, ETC., AT PUBLIC SCHOOLS 2, 5, 43, 87, 106, 116, 122, 137, 147 and COMMERCIAL HIGH SCHOOL, BOROUGH OF BROOKLYN.

The time allowed to complete the whole work on each item of P. S. 2, 106 and 116, and for each school will be fifty-five (55) consecutive working days, as provided in the contract.

The amount of security required is as follows: P. S. 2 (Item 1), $400; P. S. 2 (Item 2), $400; P. S. 5, $600; P. S. 43, $400; P. S. 87, $700; P. S. 106 (Item 1), $500; P. S. 106 (Item 2), $800; P. S. 116 (Item 1), $800; P. S. 116 (Item 2), $1,000; P. S. 122, $900; P. S. 137, $600; P. S. 147, $600; Commercial High School, $500.

The deposit accompanying bid on each item for each school shall be five per cent. of the amount of security.

A separate bid must be submitted for each item for each school and separate awards will be made thereon.

Blank forms, plans and specifications may be obtained or seen at the office of the Superintendent, at Estimating Room, 9th floor, Hall of the Board of Education, Park ave. and 59th st., Manhattan, and also at Branch Office, 131 Livingston st., Brooklyn.

C. B. J. SNYDER, Superintendent of School Buildings.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

PUBLIC SERVICE COMMISSION.

Invitation to Contractors.

For the Station Finish Work for Part of the Broadway-Fourth Avenue Rapid Transit Railroad.

SEALED BIDS OR PROPOSALS FOR THE construction of station finish for two (2) stations on the Broadway-Fourth Avenue Rapid Transit Railroad in the Borough of Manhattan will be received by the Public Service Commission for the First District (hereinafter called the "Commission") on behalf of The City of New York, at the office of the Commission at No. 120 Broadway, Borough of Manhattan, New York City, until the 18th day of July, 1917, at eleven thirty (11.30) o'clock a. m., at which time and place, or at a later date to be fixed by the Commission, the proposals will be publicly opened.

The stations for which said station finish is to be provided are two (2) stations on that part of the Broadway-Fourth Avenue Rapid Transit Railroad beginning under Broadway at the northerly approach to Twenty-eighth Street station and extending thence northerly under Broadway to the southerly wall of the Times Square station of the present Manhattan-Bronx Rapid Transit Railroad at Forty-second Street.

The work to be done will also include other finish work along the line of the Railroad.

The Contractor must complete all work within five (5) months from the delivery of the contract, except as otherwise provided in the form of contract.

A fuller description of the work and other requirements, provisions and specifications are given in the Information for Contractors and in the forms of contract, bond and Contractor's Proposal and in the contract drawings, which are to be deemed a part of this invitation and copies of which may be inspected and purchased at said office of the Commission.

The receipt of bids will be subject to the requirements specified in said Information for Contractors.

New York, June 29, 1917.

PUBLIC SERVICE COMMISSION FOR THE FIRST DISTRICT, by OSCAR S. STRAUS, Chairman.

JAMES B. WALKER, Secretary. j30,jy18

DEPARTMENT OF WATER SUPPLY, GAS AND ELECTRICITY.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Commissioner of Water Supply, Gas and Electricity, at Room 2351, Municipal Building, Manhattan, until 2 p. m., on

FRIDAY, JULY 20, 1917,
Borough of Brooklyn.

FOR PAINTING HYDRANTS.

The time allowed for doing and completing the entire work is before the expiration of seventy-five (75) consecutive working days.

The amount in which security is required for the performance of the contract is Twelve Hundred Dollars ($1,200).

The bidder will state the price per unit, as called for in the schedules of quantities and prices, by which the bids will be tested. Award, if made, will be made to the lowest formal bidder in aggregate for all items.

Blank forms of bid, proposal and contract, including specifications, approved as to form by the Corporation Counsel, can be obtained at Room 2351, Municipal Building, Manhattan.

WILLIAM WILLIAMS, Commissioner.

Dated, July 6, 1917. jy9,20

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Commissioner of Water Supply, Gas and Electricity at Room 2351, Municipal Building, Manhattan, until 2 p. m., on

TUESDAY, JULY 17, 1917,
Borough of Brooklyn.

FOR FURNISHING, DELIVERING, UNLOADING, STACKING AND STORING CAST IRON PIPE, SPECIAL AND VALVE BOX CASTINGS, VALVES AND DOUBLE NOZZLE FIRE HYDRANTS.

The time allowed for the delivery of the materials and supplies and the performance of the contract will be 125 consecutive calendar days on Section 1, 90 consecutive calendar days, on Section 2, 90 consecutive calandar days, on Section 3, 60 consecutive calendar days on Section 4.

The security required will be Eighteen Thousand Dollars ($18,000) on Section 1, Five Thousand Dollars ($5,000) on Section 2, Two Thousand Dollars $2,000) on Section 3, Twenty-five Hundred Dollars ($2,500) on Section 4.

Bids will be received for each section singly or for all sections, but in comparing the bids the bids for each section will be compared seperately and the contract awarded by sections to the lowest formal bidder.

Blank forms of bid, proposals and contract, including specifications, approved as to form by the Corporation Counsel, can be obtained at Room 2351, Municipal Building, Manhattan.

Dated, July 2, 1917.

jy5,17 WILLIAM WILLIAMS, Commissioner.

☞See General Instructions to Bidders on last page, last column, of the "City Record."

COMMISSIONERS OF THE SINKING FUND.

Notices of Public Hearing.

PUBLIC NOTICE IS HEREBY GIVEN THAT the Commissioners of the Sinking Fund, pursuant to the provisions of Chapter 372 of the Laws of 1907, will hold a public hearing at 11:15 o'clock in the forenoon on Thursday, July 26, 1917, in Room 16, City Hall, Borough of Manhattan, relative to the proposed new plan for improvement of the water-front and harbor of the City of New York, between East 140th Street and West 155th Street, Harlem River, Borough of Manhattan, made and adopted by the Commissioner of Docks, in accordance with law, June 28, 1917, and transmitted to the Commissioners of the Sinking Fund for approval.

The proposed amendment and alteration of the

plan consists in the abolishment of the New Plan between E. 140th and W. 155th sts., Harlem River, adopted by the Commissioner of Docks June 13, 1910, and approved by the Commissioners of the Sinking Fund September 15th, 1910, and establishing therefor a bulkhead line described as follows:

Beginning at a point in the pierhead line, along the westerly side of the Harlem River, Borough of Manhattan, established by the Secretary of War in 1890, where the centre line of the block between E. 140th and E. 141st sts. intersects same. Thence westerly and along said centre line to its intersection with the bulkhead line established in 1890; thence northwardly and coincident with said bulkhead line to its intersection with the southerly line of E. 141st st.; thence eastwardly and along the said southerly line of E. 141st st. to its intersection with the pierhead line established in 1890; thence northwardly and parallel with said pierhead line to its intersection with the centre line of the block between E. 141st and E. 142nd sts.; thence westwardly and along said centre line of the block to its intersection with the easterly line of 5th ave.; thence northwardly and along the easterly line of 5th ave. to its intersection with the southerly side of E. 142nd st.; thence eastwardly and along the southerly line of E. 142nd st. to its intersection with the pierhead line established in 1890; thence northwardly and coincident with the said pierhead line to its intersection with a line drawn 100 feet southerly from and parallel with the centre line of W. 143rd st.; thence westwardly and along the said parallel line to its intersection with the bulkhead line established in 1890; thence northwardly and coincident with the said bulkhead line to its intersection with the centre line of W. 143rd st.; thence eastwardly and along said centre line to its intersection with the pierhead line established in 1890; thence northwardly and coincident with said pierhead line to its intersection with the centre line of the block between W. 143rd and W. 144th sts.; thence westwardly and along said centre line to its intersection with the bulkhead line established in 1890; thence northwardly and coincident with the said bulkhead line to its intersection with the southerly line of W. 141st st.; thence eastwardly and along the southerly line of W. 144th st. to its intersection with the pierhead line established in 1890; thence northwardly and coincident with said pierhead line to its intersection with the northerly line of W. 146th st.; thence westwardly and along the northerly line of W. 146th st. to its intersection with the bulkhead line established in 1890; thence northwardly and coincident with the said bulkhead line to its intersection with the centre line of the block between W. 146th and W. 147th sts.; thence eastwardly and along said centre line to its intersection with the pierhead line established in 1890; thence northwardly and coincident with said pierhead line to its intersection with the southerly line of W. 147th st.; thence westwardly and along the southerly line of W. 147th st. to its intersection with a line drawn seventy (70) feet westerly from and parallel with the pierhead line established in 1890; thence northwardly and along said parallel line to its intersection with the northerly line of W. 148th st.; thence eastwardly and at right angles to that part of said parallel line which extends north of the southerly line of W. 148th st. to its intersection with the pierhead line established in 1890; thence northerly and coincident with the said pierhead line to its intersection with the northerly line of W. 150th st.; thence westerly and along the northerly line of W. 150th st. to its intersection with the bulkhead line established in 1890; thence northwardly and coincident with the said bulkhead line to its intersection with the centre line of the block between W. 150th st. and W. 151st st.; thence eastwardly and along said centre line of the block to its intersection with the pierhead line established in 1890; thence northwardly and coincident with said pierhead line to its intersection with the northerly line of W. 151st st.; thence westwardly and along said northerly line of W. 151st st. to the bulkhead line established in 1890; thence northwardly and coincident with said bulkhead line to its intersection with the easterly line of 7th ave.; thence northwardly and along said easterly line of 7th ave. to its intersection with the pierhead line established in 1890; thence northwardly and coincident with the said pierhead line to its intersection with the southerly line of W. 155th st.

Also the establishing of a marginal street, wharf, or place, extending from a line 100 feet south of and parallel with the centre line of W. 143rd st. to the centre line of the block between W. 142nd and W. 143rd sts., and from the pierhead line to the bulkhead line established by the Secretary of War in 1890.

JOHN PURROY MITCHEL, Mayor, and Chairman, Commissioners of the Sinking Fund.

Dated, June 28, 1917.

jy9,14

PUBLIC NOTICE IS HEREBY GIVEN THAT the Commissioners of the Sinking Fund, pursuant to the provisions of Chapter 372 of the Laws of 1907, will hold a public hearing at 11.10 o'clock in the forenoon on Thursday, July 26, 1917, in Room 16, City Hall, Borough of Manhattan, relative to the amended new plan for improvement of the waterfront and harbor of The City of New York, between Mill Basin and Paerdegat Basin, Jamaica Bay, Borough of Brooklyn, made and adopted by the Commissioner of Docks in accordance with law June 25, 1917, and transmitted to the Commissioners of the Sinking Fund for approval.

The proposed alteration and amendment to the new plan consists in:

1st—(a) Discontinuing the bulkhead line and the pierhead line between Mill Basin and the basin south of Bergen Beach; (b) the pierhead and bulkhead lines in the basin south of Bergen Beach; (c) the pierhead and bulkhead line between the easterly prolongation of the southerly side of Avenue U and the basin south of Bergen Beach; (d) that part of the exterior line of channel lying easterly of and within a line 1,000 feet east of the proposed pierhead and bulkhead lines hereinafter described, extending between the northerly side of Mill Basin and the southerly side of the basin south of Bergen Beach.

2nd—The establishment of a pierhead and bulkhead line described as follows: (a) Beginning at the point of intersection formed by the pierhead and bulkhead lines established by the Secretary of War January 13th, 1917, along the northerly side of Mill Basin and the westerly line of the main U. S. Government channel of Jamaica Bay; thence northwardly along a line running toward a point of intersection of a line distant 980.90 feet east of and parallel with the easterly side of that part of Bergen ave. lying between Avenues X and V and a line 495 feet south of and parallel with the southerly side of Avenue Y, to a point in same distant 200 feet south measured along said line, from a point of intersection of said line with a line distant 795 feet south of and parallel with the southerly side of Avenue Y; thence northwestwardly to a point distant 200 feet west of the point of intersection mentioned in last course, said distance being measured along the line distant 795 feet south of and parallel with the southerly side of Avenue Y; thence westward and along the last mentioned parallel line to a point of intersection of said line with a line distant 400 feet east of and parallel with a line which is parallel with that part of Mill ave. lying between Avenue X and National ave., and which line passes through point VIII south 3,452.51′ east 4,447.906′.

(b) Beginning at a point in the bulkhead and pierhead line along the westerly side of Paerdegat Basin, established by the Secretary of War, Jan. 13, 1917, where the same is intersected by the easterly prolongation of the southerly side of Avenue U; thence southwardly and in continuation of said established pierhead and bulkhead line to a point of intersection with a line distant 980.90 feet east of and parallel with the easterly side of that part of Bergen ave. lying between Avenue V and Avenue X; thence still southwardly along said parallel line to a point in same distant 200 feet north of the point of intersection of said parallel line, just mentioned, and a line distant 495 feet south of and parallel with the southerly side of Avenue Y; thence southwestwardly to a point in last mentioned parallel line distant 200 feet west of the point of intersection last referred to; thence westwardly and along the line 495 feet south of and parallel with the southerly side or Avenue Y to a point in same distant 45.35 feet east of the easterly side of E. 69th st.; thence northwestwardly to a point in the easterly side of E. 69th st. distant 430 feet south of the southerly side of Avenue Y.

3rd—The establishing of an exterior line of channel distant 1,000 feet east of and parallel with the pierhead and bulkhead line above described lying between the northerly side of Mill Basin and the southerly side of the basin south of Bergen Beach.

Coordinates of points VIII mentioned above are referenced to the intersection of the easterly side of Flatbush ave. and the southerly side of Avenue U, easterly from Flatbush ave.

JOHN PURROY MITCHEL, Mayor, and Chairman, Commissioners of the Sinking Fund.

Dated, July 28, 1917. jy9.14

PUBLIC NOTICE IS HEREBY GIVEN THAT the Commissioners of the Sinking Fund, pursuant to the provisions of Chapter 372 of the Laws of 1907, will hold a public hearing at 11.05 o'clock in the forenoon on Thursday, July 26, 1917, in Room 16, City Hall, Borough of Manhattan, relative to the amended new plan for improvement of the waterfront and harbor of The City of New York, in the vicinity of Mill Island, Jamaica Bay, Borough of Brooklyn, made and adopted by the Commissioner of Docks in accordance with law June 25, 1917, and transmitted to the Commissioners of the Sinking Fund for approval.

The proposed new plan consists in:

1st. The discontinuing of that part of Mill Basin and the marginal street, wharf, or place, south of and adjacent thereto, extending from Flatbush ave. to points "L" and XXIII, as shown on the attached map.

2nd. (a) The establishing of a pierhead and bulkhead line beginning at point "6" shown on map entitled "Pierhead and Bulkhead Lines for the southwest part of Jamaica Bay, New York, and for Mill and Gerritsen Basins, Rockaway Inlet and Sheepshead Bay, approved by the Secretary of War Jan. 13, 1917; thence westwardly along the northeryy side of Mill Basin to the first angle point shown on said map (Point XXIII on map herewith attached); thence (except for its connection with East Mill Basin further described herein) westwardly to point XI south 3,800.00′ and east 950.00′; thence northwestwardly to point XII south 3,200.00′ and east 500.00′; thence northwardly to point XIII south 1,613.08′ east 500.00′; thence northeastwardly to point XIV south 900.00′ east 1,484.85′; thence eastwardly to point XV south 900.00′ east 2.070.00′.

(b) Beginning at an angle point in the bulkhead line established by the Commissioner of Docks March 26, 1915, about 3,185 feet south of the southerly side of Avenue U and 100 feet east of the easterly side of Flatbush ave.; and running thence southwardly and eastwardly, parallel with that part of the pierhead and bulkhead line above described as passing through points XIII, XII, XI, XXIII and 6, referenced above, and distant 400 feet therefrom to point "L" on above mentioned War Department map, dated Jan. 13, 1917.

(c) The establishing of a pierhead and bulkhead line, beginning at point "V" shown on above mentioned War Department map, dated Jan. 13, 1917, which point is on the easterly side of E. 69th st. distant 430 feet south of the southerly side of Avenue Y; thence northwestwardly to point I south 2,872.51′ east 4,747.906′; thence northwardly to point II south 1,030.00′ east 4,747.906′; thence northwardly to point III south 980.00′ east 4,797.906′; thence northwardly to point IV south 400.00′ east 4,797.906′; thence westwardly to point V south 400.00′ east 4,297.906′; thence southwardly to point VI south 980.00′ east 4,297.906′; thence southeastwardly to point VII south 1,130.00′ east 4,447.906′; thence southwardly to point VIII south 3,452.51′ east 4,447.906′; thence along a line parallel with that part of Mill ave. lying between Avenue X and National ave. to point IX, which point is 400 feet measured at right angles from the line connecting points XXIII and XI; thence along a line deflecting 45 degrees to the right to point X in the line XXIII-XI.

(d) The establishing of a pierhead and bulkhead line beginning at point XXVI, which point is distant 795 feet south of the southerly side of Avenue Y and on a line distant 400 feet east of and parallel with the line VIII-IX above referred to; thence southwardly and along said parallel line to point XXV, which point is distant 400 feet, measured at right angles, north of the line connecting points XXIII and XI; thence along a line deflecting 45 degrees to the left to point XXIV on the line XXIII-XI.

3rd—(a) The establishing of Mill Basin between the lines connecting the points "R'," "Q'," "P'," "O'," "X," "Y," "Z," "XIX" to XXII, inclusive, and "5" and the points "6," XXIII, X to XVII, inclusive.

(b) The establishing of East Mill Basin between the lines connecting the points I to X, inclusive, and XXIV to XXVI, inclusive, all as shown on the attached map.

4th—The establishing of a marginal street, wharf, or place, 100 feet in width along the southerly side of Mill Basin, as now proposed, beginning at the marginal street, wharf, or place, along the easterly side of Flatbush ave. adopted by the Commissioner of Docks, March 26, 1915, and approved by the Commissioners of the Sinking Fund, May 5, 1915, and extending eastwardly to a junction with the marginal street, wharf, or place just referred to and retained at point "L" along a portion of the line "L"-5 on War Department map already referred to.

Co-ordinates of points mentioned above are referenced to the intersection of the easterly side of Flatbush ave. and the southerly side of Avenue U easterly from Flatbush ave.

JOHN PURROY MITCHEL, Mayor, and Chairman, Commissioners of the Sinking Fund.

Dated, June 28, 1917.

jy9.14

PUBLIC NOTICE IS HEREBY GIVEN THAT the Commissioners of the Sinking Fund, pursuant to the provisions of Chapter 372 of the Laws of 1907, will hold a public hearing at 11 o'clock in the forenoon, on Thursday, July 26, 1917, in Room 16, City Hall, Borough of Manhattan, relative to the proposed new plan for improvement of the waterfront and harbor of The City of New York, between Canal st. and Harrison st., Stapleton, Borough of Richmond, made and adopted by the Commissioner of Docks in accordance with law June 27, 1917, and transmitted to the Commissioners of the Sinking Fund for approval.

The proposed new plan consists in:

1st—The establishing of a bulkhead line described as follows:

Beginning at a point in the southerly side of the pier at the foot of Canal st., Stapleton, Borough of Richmond, distant 500 feet east of the easterly side of Front st., said point being the point of intersection of the bulkhead line adopted by the Commissioner of Docks, Jan. 21, 1916, and approved by the Commissioners of the Sinking Fund March 16, 1916, with the southerly side of said pier; thence southwardly and in prolongation of the aforesaid bulkhead line to a point in same where the same is intersected by the easterly prolongation of the northerly side of Harrison st.

2nd—The establishing of a marginal street, wharf or place between the proposed bulkhead line described above and the easterly line and its southerly prolongation of Front street and extending from the southerly side of Canal st. southwardly to the easterly prolongation of the northerly side of Harrison st.

3rd—The establishing of one pier 125 feet in width, the northerly side of which is distant 220 feet measured along the established pierhead line, south of the pier at the foot of Canal st., as shown on the new plan for improving the waterfront, adopted by the Commissioner of Docks Jan. 21, 1916, and approved by the Commissioners of the Sinking Fund March 16, 1916, and 350 feet measured along the proposed bulkhead line described above south of the southerly side of the Canal st. pier just above referred to.

JOHN PURROY MITCHEL, Mayor and Chairman, Commissioners of the Sinking Fund.

Dated, June 28, 1917.

jy9,14

BOARD OF ESTIMATE AND APPORTIONMENT.

Notice of Public Hearings.

PUBLIC IMPROVEMENT MATTERS.

NOTICE IS HEREBY GIVEN THAT THE Board of Estimate and Apportionment of The City of New York, deeming it for the public interest so to do, proposes to change the map or plan of The City of New York so as to close and discontinue that portion of Depot place, between the United States Pierhead and Bulkhead Line of the Harlem River, and the westerly line of the approach to the bridge over the Spuyten Duyvil and Port Morris Railroad, Borough of The Bronx, and that a meeting of said Board will be held in Room 16, City Hall, Borough of Manhattan, City of New York, on Thursday, July 19, 1917, at 10.30 o'clock a. m., at which such proposed change will be considered by said Board; all of which is more particularly set forth and described in the following resolutions adopted by the Board on Friday, June 22, 1917 (Cal. No. 142), notice of the adoption of which is hereby given, viz:

Resolved, That the Board of Estimate and Apportionment of The City of New York, in pursuance of the provisions of Section 442 of the Greater New York Charter as amended, deeming it for the public interest so to do, proposes to change the map or plan of The City of New York, by closing and discontinuing that portion of Depot place, between the United States Pierhead and Bulkhead Line of the Harlem River, and the westerly line of the approach to the bridge over the Spuyten Duyvil and Port Morris Railroad, Borough of The Bronx, which proposed change is more particularly shown upon a map or plan bearing the signature of the President of the Borough, and dated March 22, 1917.

Resolved, That this Board consider the proposed change at a meeting of the Board, to be held in the City Hall, Borough of Manhattan, City of New York, on Thursday, July 19, 1917, at 10.30 o'clock a. m.

Resolved, That the Secretary of this Board cause these resolutions, and a notice to all persons affected thereby that the proposed change will be considered at a meeting of the Board to be held at the aforesaid time and place, to be published in the *City Record* for ten days continuously, Sundays and legal holidays excepted, prior to the 19th day of July, 1917.

Dated, New York, July 6, 1917.

JOSEPH HAAG, Secretary, Board of Estimate and Apportionment, Municipal Building. Telephone, 4560 Worth. jy6,17

NOTICE IS HEREBY GIVEN THAT THE Board of Estimate and Apportionment of The City of New York, deeming it for the public interest so to do, proposes to change the map or plan of The City of New York so as to increase the width of Rosedale ave., between Gleason ave. and Westchester ave., Borough of The Bronx, and that a meeting of said Board will be held in Room 16, City Hall, Borough of Manhattan, City of New York, on Thursday, July 19, 1917, at 10.30 o'clock a. m., at which such proposed change will be considered by said Board; all of which is more particularly set forth and described in the following resolutions adopted by the Board on June 22, 1917 (Cal. No. 143), notice of the adoption of which is hereby given, viz:

Resolved, That the Board of Estimate and Apportionment of The City of New York, in pursuance of the provisions of Section 442 of the Greater New York Charter as amended, deeming it for the public interest so to do, proposes to change the map or plan of The City of New York, by increasing the width of Rosedale ave., between Gleason ave. and Westchester ave., Borough of The Bronx, which proposed change is more particularly shown upon a map or plan bearing the signature of the President of the Borough, and dated May 9, 1917.

Resolved, That this Board consider the proposed change at a meeting of the Board, to be held in the City Hall, Borough of Manhattan, City of New York, on Thursday, July 19, 1917, at 10.30 o'clock a. m.

Resolved, That the Secretary of this Board cause these resolutions, and a notice to all persons affected thereby that the proposed change will be considered at a meeting of the Board to be held at the aforesaid time and place, to be published in the *City Record* for ten days continuously, Sundays and legal holidays excepted, prior to the 19th day of July, 1917.

Dated, New York, July 6, 1917.

JOSEPH HAAG, Secretary, Board of Estimate and Apportionment, Municipal Building. Telephone, 4560 Worth. jy6,17

Public Hearings.

NOTICE IS HEREBY GIVEN THAT AT THE meeting of the Board of Estimate and Apportionment held on June 29, 1917 (Cal. No. 35), the following resolution was adopted:

Resolved, That the Board of Estimate and Apportionment hereby fixes Thursday, July 19, 1917, at 10.30 o'clock a. m., and Room 16, City Hall, Borough of Manhattan, City of New York, as the time and place for a public hearing on a proposed amendment to Use District Map, Section No. 22, so as to include within an Unrestricted District all the area not already so included within the block bounded by 60th street, New Utrecht avenue, 14th avenue, 61st street and 13th avenue, Borough of Brooklyn.

Dated, New York, July 6, 1917.

JOSEPH HAAG, Secretary, Board of Estimate and Apportionment, Municipal Building. Telephone, 4560 Worth. jy6,17

NOTICE IS HEREBY GIVEN THAT AT THE meeting of the Board of Estimate and Apportionment held on July 3, 1917 (Cal. No. 2), the following resolution was adopted:

Resolved, That the Board of Estimate and Apportionment hereby fixes Thursday, July 19, 1917, at 10:30 o'clock a. m., and Room 16, City Hall, Borough of Manhattan, City of New York, as the time and place for a public hearing on a proposed amendment to Use District Map, Section No. 13, so as to include within an Unrestricted District the area bounded as follows:

Beginning at the southwesterly corner of Skillman avenue and Kingsland avenue; thence southerly on the westerly line of Kingsland avenue to the southerly side of Maspeth avenue; thence easterly on said southerly side of Maspeth avenue to the westerly side of Olive street; thence southerly on said westerly side of Olive street to a line parallel with Maspeth avenue and 100 feet southerly therefrom measured at right angles; thence westerly on said line parallel with Maspeth avenue to its intersection with a line parallel with Conselyea street and 100 feet southerly therefrom, measured at right angles; thence westerly along said line parallel with Conselyea street to a line parallel with Wood Point road and 100 feet westerly therefrom, measured at right angles; thence northerly on said line parallel with Wood Point road to a line parallel with Skillman avenue and 100 feet northerly therefrom, measured at right angles; thence easterly on said line northerly of and parallel with Skillman avenue to a line parallel with Kingsland avenue and 100 feet westerly therefrom, measured at right angles; thence southerly on said line westerly of and parallel with Kingsland avenue to the southerly side of Skillman avenue; thence easterly on the southerly side of Skillman avenue to the point of beginning, Borough of Brooklyn; as shown upon a map bearing the signature of the Secretary of the Committee on the City Plan and dated June 18, 1917.

Dated, New York, July 6, 1917.

JOSEPH HAAG, Secretary, Board of Estimate and Apportionment, Municipal Building. Telephone, 4560 Worth. jy6.17

NOTICE IS HEREBY GIVEN THAT THE Board of Estimate and Apportionment will hold a Public Hearing on Thursday, July 19, 1917, at 10.30 o'clock a. m., in Room 16, City Hall, Borough of Manhattan, on a *proposed amendment to paragraph a of Section 24 of the Building Zone resolution;* as more particularly shown in the following resolution adopted by the Board on July 3, 1917 (Cal. No. 57):

Resolved That the Board of Estimate and Apportionment hereby fixes Thursday, July 19, 1917, at 10.30 o'clock a. m., and Room 16, City Hall, Borough of Manhattan, City of New York, as the time and place for a public hearing on a proposed amendment to paragraph a of Section 24 of the Building Zone Resolution, adopted by said Board on July 25, 1916, by adding at the end thereof the following:

Provided also that the Board of Appeals may, after public notice and hearing, extend for not to exceed six months the time within which such ground-story framework, including the second tier of beams, shall be completed in any case where, in the judgment of said Board, actual construction or fabrication was begun early enough to allow under the then existing conditions adequate time for completion as above specified, and where such construction or fabrication was diligently prosecuted and where such completion has been prevented by conditions impossible to foresee and beyond the control of the owner and builder.

Dated, New York, July 6, 1917.

JOSEPH HAAG, Secretary, Board of Estimate and Apportionment, Municipal Building. Telephone, 4560 Worth. jy6.17

BOARD OF ASSESSORS.

Completion of Assessments.

PUBLIC NOTICE IS HEREBY GIVEN TO the owner or owners of all houses and lots, improved and unimproved lands affected thereby, that the following proposed assessments have been completed and are lodged in the office of the Board of Assessors for examination by all persons interested, viz.:

Borough of The Bronx.

5647 Sewer and appurtenances in Lyvere st., between Castlehill ave. and Walker ave. Affecting Blocks 3997 and 3998.

5648 Sewer and appurtenances in E. 243rd st., between White Plains rd. and Barnes ave. Affecting Blocks 5115 and 5116.

Borough of Queens.

5172 Regulating, grading, curbing, flagging, paving, etc., Jerome ave. (Broadway), from Boyd (Park) ave. to Greenwood ave., Fourth Ward, together with a list of awards for damages caused by a change of grade. Affecting Blocks 339, 342, 345, 348, 350, 353, 356, 359, 362, 364, 382, 386, 389, 391, 393, 395, 397, 398, 400, 402, 404, 434, 436, 440, 442, 445, 448, 451, 454, 457, 460, 462, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542 and 544.

5245 Regulating, grading the sidewalk spaces and laying sidewalks in Thedford (Oakley) ave., from Chichester ave. (University pl.) to Kimball ave., Fourth Ward, together with a list of awards for damages caused by a change of grade. Affecting Blocks 362 to 365, 402 and 404.

Borough of Richmond.

5303 Regulating and grading the sidewalk spaces and laying sidewalks on both sides of Richmond Turnpike, between Jewett ave. and Little Clove rd., First Ward. Affecting District 5, Plot 14, Blocks 5 and 7 and District 6, Plot 7, Block 5.

5433 Constructing sidewalks on Van Pelt ave., between Washington ave. and the S. I. R. T. R. R. tracks, Third Ward. Affecting Blocks 94, 182, 183, 184, 191 and 192.

Borough of Brooklyn.

5585 Regulating, grading, curbing, flagging and paving E. 22nd st., between Duryea pl. and Beverley rd. Affecting Blocks 5132 and 5133.

5586 Regulating, grading, curbing, flagging and paving E. 34th st., from Farragut rd. to a line about 340 feet northerly thereof. Affecting Blocks 4997 and 4998.

5599 Regulating, grading, curbing and flagging Bay 38th st., between Bath ave. and Benson ave., together with a list of awards for damages caused by a change of grade. Affecting Blocks 6877 and 6878.

All persons whose interests are affected by the above named proposed assessments, and who are opposed to the same, or either of them, are requested to present their objections in writing to the Board of Assessors, Room 809, Municipal Building, Manhattan, New York, on or before Tuesday, Aug. 7, 1917, at 10 a. m., at which time and place the said objections will be heard and testimony received in reference thereto.

WILLIAM C. ORMOND, JACOB J. LESSER, ST. GEORGE B. TUCKER, Board of Assessors.

July 7, 1917. jy7.18

FIRE DEPARTMENT.

Auction Sale.

HYAMS & HAMBURG, AUCTIONEERS, ON behalf of the Fire Department, will offer for sale at public auction to the highest bidder, on

FRIDAY, JULY 13, 1917,

at 12 noon, at the Fire Department stables, Bolivar and St. Edwards sts., Brooklyn.

THE FOLLOWING TWENTY-FIVE HORSES: REGISTERED NOS., 42-B., 75-B.,

110-B., 260-B., 276-B., 283-N. Y., 326-N. Y., 354-B., 357-B., 360-B., 488-B., 449-B., 454-B., 535-B., 551-B., 573-N. Y., 606-N. Y., 611-B., 651-N. Y., 697-N. Y., 766-N. Y., 812-N. Y., 835-B., 863-N. Y., 873-N. Y.

The horses may be seen at any time before the day of sale at the place above specified.

The Commissioner reserves the right to withdraw any horse or horses from the sale.

ROBERT ADAMSON, Fire Commissioner.
jy10,13

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Fire Commissioner at his office, 11th floor, Municipal Building, Manhattan, until 10.30 a. m., on

TUESDAY, JULY 24, 1917.

FOR FURNISHING, DELIVERING AND INSTALLING MOTOR-GENERATORS IN MANHATTAN CENTRAL OFFICE ON TRANSVERSE ROAD NO. 2, CENTRAL PARK.

The time allowed for doing and completing the entire work will be ninety (90) consecutive calendar days.

The amount of security required for the performance of the contract is Fifteen Hundred Dollars ($1,500).

No bid will be considered unless it is accompanied by a deposit, which shall be in the form of money or a certified check upon one of the State or National banks or trust companies in the City of New York, or a check of such bank or trust company signed by a duly authorized officer thereof, drawn to the order of the Comptroller, or corporate stock or other certificates of indebtedness of any nature issued by the City of New York and approved by the Comptroller as of equal value with the security required. Such deposit shall be in the amount of Seventy-five Dollars ($75).

Award, if made, will be to the lowest bidder for the entire contract.

Blank forms and further information may be obtained at the office of the Fire Department, 11th floor, Municipal Building, Manhattan.

A deposit of Five Dollars ($5) in cash will be required from all intending bidders for each set of specifications received. The deposit will be returned in each case on the surrender of the specifications or filing of bid.

ROBERT ADAMSON, Fire Commissioner.
jy13,24

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Fire Commissioner at his office, 11th floor, Municipal Building, until 10.30 a. m., on

WEDNESDAY, JULY 18, 1917.

FOR FURNISHING, DELIVERING AND ERECTING RELAY BOARD IN MANHATTAN CENTRAL OFFICE ON TRANSVERSE ROAD NO. 2, CENTRAL PARK.

The time allowed for doing and completing the entire work will be ninety (90) consecutive calendar days.

The amount of security required for the performance of the contract is Six Thousand Dollars ($6,000).

No bid will be considered unless it is accompanied by a deposit, which shall be in the form of money or a certified check upon one of the State or National banks or trust companies in the City of New York, or a check of such bank or trust company signed by a duly authorized officer thereof, drawn to the order of the Comptroller, or corporate stock or other certificates of indebtedness of any nature issued by the City of New York and approved by the Comptroller as of equal value with the security required. Such deposit shall be in the amount of Three Hundred Dollars ($300).

Award, if made, will be to the lowest bidder for the entire contract.

Blank forms and further information may be obtained at the office of the Fire Department, 11th floor, Municipal Building, Manhattan.

A deposit of Five Dollars ($5) in cash will be required from all intending bidders for each set of specifications received. The deposit will be returned in each case on the surrender of the specifications or filing of bid.

ROBERT ADAMSON, Fire Commissioner.
jy7,18

☞See General Instructions to Bidders on last page, last column, of the "City Record."

BOROUGH OF BROOKLYN.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Brooklyn, at Room No. 2, Borough Hall, Brooklyn, until 11 a. m., on

WEDNESDAY, JULY 25, 1917.

NO. 1. FOR REGULATING AND PAVING WITH PERMANENT ASPHALT PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF HEGEMAN AVE. FROM MALTA ST. TO LOUISIANA AVE.

The Engineer's estimate is as follows:

280 cubic yards excavation to subgrade.

105 linear feet bluestone heading stones set in concrete.

185 cubic yards concrete.

1,115 square yards asphalt pavement (5 years maintenance).

Time allowed, 20 consecutive working days. Security required, $1,000.

NO. 2. FOR REGULATING, GRADING, CURBING, LAYING SIDEWALKS AND PAVING WITH PERMANENT GRADE 1 GRANITE PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF AVENUE "I" FROM GRAVESEND AVE. TO WEST ST. THE BLOCKS USED ON THIS CONTRACT SHALL BE NEW GRANITE BLOCKS.

The Engineer's estimate is as follows:

425 cubic yards excavation.

110 cubic yards fill (not to be bid for).

10 linear feet old curbstone reset in concrete.

520 linear feet new curbstone set in concrete.

100 linear feet granite heading stones set in concrete.

2,300 square feet cement sidewalks (1 year maintenance).

2,300 square feet 6-inch cinder or gravel sidewalk foundation.

225 cubic yards concrete.

1,365 square yards Grade 1 granite pavement with joint filler of tar, asphalt and sand.

Time allowed, 30 consecutive working days. Security required $2,300.

NO. 3. FOR REGULATING AND PAVING WITH PERMANENT ASPHALT PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF AVENUE "I" FROM FLMORE PL. (E. 22ND ST.) TO DELAMERE PL. (E. 23D ST.), OMITTING THE SPACE OCCUPIED BY THE MALL IN THE CENTER OF THE STREET.

The Engineer's estimate is as follows:

265 cubic yards excavation to subgrade.

105 linear feet bluestone heading stones set in concrete.

50 linear feet steel-bound cement curb (1 year maintenance).

180 cubic yards concrete.

1,070 square yards asphalt pavement (5 years maintenance).

Time allowed, 20 consecutive working days. Security required, $1,000.

NO. 4. FOR REGULATING AND PAVING WITH PERMANENT ASPHALT PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF 10TH AVE. FROM 68TH ST. TO BAY RIDGE AVE.

The Engineer's estimate is as follows:

325 cubic yards excavation to subgrade.

75 linear feet bluestone heading stones set in concrete.

220 cubic yards concrete.

1,310 square yards asphalt pavement (5 years maintenance).

Time allowed, 20 consecutive working days. Security required, $1,100.

NO. 5. FOR REGULATING, CURBING WHERE NECESSARY AND PAVING WITH PERMANENT ASPHALT PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF 19TH AVE. FROM 60TH ST. TO 66TH ST.

The Engineer's estimate is as follows:

2025 cubic yards excavation to subgrade.

370 linear feet bluestone heading stones set in concrete.

100 linear feet cement curb (1 year maintenance).

1,350 cubic yards concrete.

8,100 square yards asphalt pavement (5 years maintenance).

Time allowed, 35 consecutive working days. Security required, $7,000.

NO. 6. FOR REGULATING AND PAVING WITH PERMANENT ASPHALT PAVEMENT ON A 6-INCH CONCRETE FOUNDATION THE ROADWAY OF 35TH ST. FROM 14TH AVE. TO WEST ST.

The Engineer's estimate is as follows:

435 cubic yards excavation to subgrade.

290 cubic yards concrete.

1,735 square yards asphalt pavement (5 years maintenance).

Time allowed, 25 consecutive working days. Security required, $1,500.

NO. 7. FOR FURNISHING AND DELIVERING 13,000 GALLONS OF RESIDUUM OIL.

To be delivered to the yard of the Municipal Asphalt Plant, 7th st. Basin, Gowanus Canal.

Time for completion of contract, on or before Dec. 31, 1917.

Security required, 30 per cent. of the amount for which the contract is awarded.

The bidder will state the price per cubic yard, square yard, linear foot, square foot or other unit of measure by which the bids will be tested. The bids will be compared and the contract awarded at a lump or aggregate sum for each contract.

Blank forms and further information may be obtained and plans and drawings may be seen at the office of the Bureau of Highwasy, Room 502, No. 50 Court st., Brooklyn.

jy13,25 L. H. POUNDS, President.

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of the Borough of Brooklyn, at Room No. 2, Borough Hall, Brooklyn, until 11 a. m., on

WEDNESDAY, JULY 25, 1917.

NO. 1. FOR FURNISHING ALL THE LABOR AND MATERIALS REQUIRED TO CONSTRUCT SEWERS IN BAY 37TH ST. FROM BENSON AVE. TO THE SEWER SUMMIT ABOUT 520 FEET SOUTHWEST OF BENSON AVE., AND IN BAY 38TH ST., FROM BENSON AVE. TO THE SUMMIT ABOUT 475 FEET SOUTHWEST OF BENSON AVE.

The Engineer's preliminary estimate of the quantities is as follows:

1,072 linear feet of 12-inch pipe storm sewer, laid complete, including all incidentals and appurtenances; per linear foot, $1.95	$2,090 40
1,056 linear feet of 8-inch pipe sanitary sewer, laid complete, including concrete cradle and all incidentals and appurtenances; per linear foot, $3.35	3,537 60
450 linear feet of 8-inch sanitary house connection drain, laid complete, including concrete cradle specials and all incidentals and appurtenances; per linear foot, $1.60	720 00
310 linear feet of 6-inch sanitary house connection drain, laid complete, including concrete cradle and all incidentals and appurtenances; per linear foot, $1.25	387 50
20 linear feet of 6-inch storm house connection drain, laid complete, including all incidentals and appurtenances; per linear foot, $0.90	18 00
10 manholes on storm sewer complete, with standard storm manhole heads and covers, including all incidentals and appurtenances; per manhole, $60	600 00
8 manholes on sanitary sewer, complete, with standard sanitary manhole heads and covers, including all incidentals and appurtenances; per manhole, $65	520 00
7,000 feet, board measure, of foundation planking and pile capping, laid in place complete, including all incidentals and appurtenances; per thousand feet, board measure, $25	175 00
1,000 feet, board measure, of sheeting and bracing, driven in place complete, including all incidentals and appurtenances; per thousand feet, board measure, $20	20 00
50 linear feet of piles, driven in place complete, including all incidentals and appurtenances; per linear foot, $0.30	15 00
5 cubic yards of concrete, Class "B," laid in place complete, including extra excavation, all incidentals and appurtenances; per cubic yard, $7	35 00
5 cubic yards of extra excavation, including sheeting and bracing, and all labor, materials, incidentals and appurtenances; per cubic yard, $0.60	3 00
Total	$8,121 50

The time allowed for the completion of the work and full performance of the contract will be sixty (60) consecutive working days.

The amount of security required will be Four Thousand Dollars ($4,000).

NO. 2. FOR FURNISHING ALL THE LABOR AND MATERIAL REQUIRED FOR CONSTRUCTING A SEWER IN MONTGOMERY ST., BETWEEN BEDFORD AND ROGERS AVES.

The Engineer's preliminary estimate of the quantities is as follows:

92 linear feet of 15-inch pipe sewer, laid complete, including all incidentals and appurtenances; per linear foot, $4.25	$391 00
806 linear feet of 12-inch pipe sewer, laid complete, including all incidentals and appurtenances; per linear foot, $2.75	2,216 50
20 linear feet of 6-inch house connection drain, laid complete, including all incidentals and appurtenances; per linear foot, $1	20 00
8 manholes complete with iron heads and covers, including all incidentals and appurtenances; per manhole, $70	560 00
3,000 feet, board measure, of sheeting and bracing, driven in place complete, including all incidentals and appurtenances; per thousand feet, board measure, $25	75 00
Total	$3,262 50

The time allowed for the completion of the work and full performance of the contract will be thirty (30) consecutive working days.

The amount of security required will be Fifteen Hundred Dollars ($1,500).

The foregoing Engineer's preliminary estimate of the total cost for the completed work is to be taken as the 100 per cent. basis and test for bidding. Bids shall each state a single percentage of such 100 per cent. (such as 95 per cent., 100 per cent. or 105 per cent.) for which all materials and work called for in the proposed contract and notices to bidders are to be furnished to the City. Such percentages as bid for each contract shall apply to all unit items specified in the Engineer's preliminary estimate to an amount necessary to complete the work described in the contract.

Blank forms and further information may be obtained and the plans and drawings may be seen at the office of the Bureau of Sewers, 215 Montague st., Brooklyn.

jy13,25 L. H. POUNDS, President.

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the President of Borough of Brooklyn, at Room No. 2, Borough Hall, Brooklyn, until 11 a. m., on

WEDNESDAY, JULY 18, 1917.

NO. 1. FOR REGULATING, GRADING, CURBING AND LAYING SIDEWALKS ON ELDERT LANE FROM JAMAICA AVE. TO ATLANTIC AVE.

The Engineer's estimate is as follows:

2,020 cubic yards excavation.

200 cubic yards filling (to be furnished).

50 linear feet old curbstone reset in concrete.

5,690 linear feet steel-bound cement curb (1 year maintenance).

22,300 square feet cement sidewalks (1 year maintenance).

22,300 square feet 6-inch cinder or gravel sidewalk foundation.

2 sewer basins rebuilt.

Time allowed, 50 consecutive working days. Security required, $2,800.

NO. 2. FOR REGULATING, GRADING, CURBING AND LAYING SIDEWALKS ON 20TH AVE., FROM GRAVESEND AVE. TO WEST ST.

The Engineer's estimate is as follows:

50 cubic yards excavation.

610 cubic yards filling (to be furnished).

20 linear feet old curbstone reset in concrete.

700 linear feet steel-bound cement curb (1 year maintenance).

3,180 square feet cement sidewalks (1 year maintenance).

3,180 square feet 6-inch cinder or gravel sidewalk foundation.

1 sewer basin rebuilt.

Time allowed, 30 consecutive working days. Security required, $450.

NO. 3. FOR FURNISHING AND DELIVERING 4,000 CUBIC YARDS OF BINDER STONE.

To be delivered to the Municipal Asphalt Plant, 7th st. Basin, Gowanus Canal.

Time for completion of contract, on or before Dec. 31, 1917.

Security required, 30 per cent. of the amount for which the contract is awarded.

The bidder will state the price of each item or article contained in the specifications or schedules herein contained or hereto annexed, per lin. ft., sq. ft., sq. yd., cu. yd. or other unit of measure, by which the bids will be tested. *The bids will be compared and the contract awarded at a lump or aggregate sum for each contract.*

Blank forms and further information may be obtained and the plans and drawings may be seen at the office of the Bureau of Highways, the Borough of Brooklyn, Room 502, No. 50 Court st., Brooklyn.

L. H. POUNDS, President.

Dated, July 5, 1917. jy6,18

☞See General Instructions to Bidders on last page, last column, of the "City Record."

DEPARTMENT OF DOCKS AND FERRIES.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Commissioner of Docks at his office, Pier "A," Foot of Battery pl., North River, Manhattan, until 12 noon, on

MONDAY, JULY 16, 1917,
Borough of Manhattan.

CONTRACT NO. 1573.

FOR FURNISHING ALL THE LABOR AND MATERIALS REQUIRED FOR ENCLOSURES AND EQUIPMENT AT THE FREIGHT SHED ON W. 46TH ST. PIER, NORTH RIVER, BOROUGH OF MANHATTAN, CLASS 1; FOR HEATING, CLASS 2; FOR PLUMBING, CLASS 3.

The time allowed for doing and completing the work and the amount of security required are as follows:

Class 1: Time, 240 consecutive calendar days; security, $40,000. Class 2: Time, 240 consecutive calendar days; security, $3,600. Class 3: Time, 60 consecutive calendar days; security, $2,000.

The bidder shall state, both in writing and in figures, the total price for doing all of the work called for in the class of the contract upon which he is bidding. Bids may be submitted on one or more classes, as each class will be the basis of a separate and distinct contract. Award on any class, if made, will be to the bidder whose total price is the lowest for doing all of the work called for in the class and whose bid is regular in all respects. In case of discrepancy between the written price and that given in figures the price in writing will be considered as the bid.

Work must be done at the time and in the manner directed.

Blank forms and further information may be obtained and the plans and drawings may be seen at the office of the said Department.

R. A. C. SMITH, Commissioner of Docks.

Dated, June 30, 1917. jy3,16

DEPARTMENT OF PUBLIC CHARITIES.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Department of Public Charities, 10th floor, Municipal Building, Manhattan, until 10.30 a. m., on

FRIDAY, JULY 13, 1917.

FOR FURNISHING ALL THE LABOR AND MATERIALS REQUIRED FOR THE ERECTION AND COMPLETION OF: CONTRACT NO. 1—HEATING AND HOT WATER MAINS AND APPARATUS. CONTRACT NO. 2—ELECTRIC EQUIPMENT, FOR THE TWENTY-ONE (21) PAVILION BUILDINGS, A GROUP BUILDING AND A DINING HALL AT SEA VIEW HOSPITAL, BOROUGH OF RICHMOND, THE CITY OF NEW YORK.

The time allowed for the completion of the work and full performance of each contract is two hundred (200) consecutive working days.

The security required will be as follows: Forty Thousand Dollars ($40,000) on Contract No. 1, and Nine Thousand Dollars ($9,000) on Contract No. 2.

The deposit accompanying bid on each item shall be five per cent. (5%) of the amount of security required.

The bidder will state a separate price for each contract. Bidders may bid on any or all contracts.

Award will be made to the lowest bidder for each contract described and specified.

Blank forms and further information may be obtained at the office of Frank Sutton, Consulting Engineer, 80 Broadway, Manhattan, where plans and specifications may be seen.

JOHN A. KINGSBURY, Commissioner.

Dated, July 2, 1917. j2,13

☞See General Instructions to Bidders on last page, last column, of the "City Record."

DEPARTMENT OF HEALTH.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Board of Health of the Department of Health, Centre and Walker sts., Manhattan, until 10.30 a. m., on

MONDAY, JULY 16, 1917.

FOR FURNISHING AND DELIVERING AND INSTALLING, WHERE INDICATED IN THE SCHEDULES, LAUNDRY MACHINERY AND ELECTRIC MOTORS AT THE MUNICIPAL SANATORIUM, OTISVILLE, ORANGE COUNTY, N. Y.

The time for the completion of the work and the full performance of the contract will be seventy-five (75) calendar days.

No bond will be required with the bid, but will be required upon awarding of the contract, in an amount equal to 30 per cent. of the contract.

The bid, however, must be accompanied by a deposit of an amount of not less than 1½ per cent. of the amount of the bid.

Bids will be compared and contracts awarded to the lowest bidder on each item complete.

Blank forms for the above work and further information may be obtained at the office of the Chief Clerk of the Department of Health, Centre and Walker sts., Manhattan.

HAVEN EMERSON, M. D., President; ALFRED E. SHIPLEY, Secretary.

Dated, July 3, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

MUNICIPAL CIVIL SERVICE COMMISSION.

Notices of Examinations.

PUBLIC NOTICE IS HEREBY GIVEN THAT applications will be received by the Municipal Civil Service Commission, Municipal Building, Manhattan, New York City, from

FRIDAY, JULY 6, 1917, TO FRIDAY, JULY 20, 1917,

for the position of

TYPEWRITING COPYIST (MALE AND FEMALE), GRADE 2 (TYPIST).

No applications delivered at the office of the Commission, by mail or otherwise, after 4 p. m., FRIDAY, JULY 20, 1917, will be accepted. Application blanks will be mailed upon request provided a self-addressed stamped envelope or sufficient postage is enclosed to cover the mailing. The Commission will not guarantee the delivery of the same. Postage on applications forwarded by mail must be fully prepaid.

Applicants must be citizens of the United States and residents of the State of New York.

The subjects and weights of the examination are: Copying, 6; 70 per cent required. Tabulation, 2; Letter, 2; 70 per cent, general average required.

A qualifying physical examination will be given.

Applications for this examination must be filed on the general form.

Duties—The duties of incumbents of these positions, which may involve the performance of incidental clerical work, are to make on ordinary typewriting machines plain copies of written or typed information reports, notices and memoranda.

Requirements—In the test in Copying, which will consist of the copying of a mimeographed passage of three hundred words on the typewriting machine in five minutes, both the correctness and the rapidity of the performance will be considered by the examiners. In rating the correctness of the exercise the exactness, form, neatness, freedom from interlineation and alterations, etc., will be considered. In the exercise in tabulation the candidates will be required to present the narrative matter given to them for this purpose in columns with suitable headings as a typewritten tabulation. In rating the tabulation primary consideration will be given to the candidates ability in selecting all the essential items or facts and arranging them in as many columns as may be advisable for their most effective presentation. Clearness and brevity of expression will also be considered, but no credit will be given for the rapidity with which this exercise is performed.

Candidates must furnish their own typewriting machines, pens and ink. The Commission will not at any time or in any way be responsible for machines, nor will any allowance be made where they are missing, late in arriving, defective or out of order.

Candidates must be at least 16 years of age on or before the closing date for the receipt of applications.

The salary of Grade 2 is from $600 up to but not including $1,200 per annum.

The compensation rates proposed by the Board of estimate and Apportionment for this position are from $600 to $780 for women and from $660 to $780 for men. Under the terms and conditions of the budget for the year 1917, appointments will, as a rule, be made at the lowest compensation rate.

Vacancies occur from time to time.

The term of the eligibility of the list resulting from this examination is fixed at not less than one year nor more than four years.

jv6,20 ROBERT W. BELCHER, Secretary.

PUBLIC NOTICE IS HEREBY GIVEN THAT applications will be received by the Municipal Civil Service Commission, Municipal Building, Manhattan, New York City, from

THURSDAY, JULY 5, 1917, TO THURSDAY, JULY 19, 1917,

for the position of

STENOGRAPHER AND TYPEWRITER (MALE), GRADE 2 (STENOGRAPHER).

No applications delivered at the office of the Commission, by mail or otherwise, after 4 p. m., THURSDAY, JULY 19, 1917, will be accepted. Application blanks will be mailed upon request provided a self-addressed stamped envelope or sufficient postage is enclosed to cover the mailing. The Commission will not guarantee the delivery of the same. Postage on applications forwarded by mail must be fully prepaid.

Applicants must be citizens of the United States and residents of the State of New York.

The subjects and weights of the examination are: Transcription, 5; 70 per cent, required. Spelling, 1; Tabulation, 1; Facility, 1; Letter, 2. 70 per cent, general average required.

A qualifying physical examination will be given.

Applications for the examination must be filed on the general form.

Duties—The duties of incumbents of these positions are to take symbolic notes of and to typewrite work which may include technical, scientific, legal or other matter recognized as difficult dictation and to perform incidental clerical work.

Requirements—Three letters will be dictated to the candidates, the dictation of each letter being completed in one minute. The first letter will contain ninety words and must be transcribed in three minutes. Facility of transcription as well as accuracy will be rated on this letter. The second letter will contain one hundred words, and spelling as a separate subject will be rated on this letter, in addition to accuracy of transcription. The third letter will contain one hundred words. Two transcripts of this letter will be required; the first will be a verbatim transcript and the second a tabulated transcript. In rating Accuracy, exactness, correctness of form, neatness, freedom from interlineations, alterations, etc., will be considered.

Candidates must furnish their own notebooks, typewriting machines, pens and ink. The Commission will not at any time or in any way be responsible for machines, nor will any allowance be made where machines are missing, late in arriving, defective or out of order on the day of the examination.

Candidates must be at least 18 years of age on the date of filing application.

The salary of Grade 2 is from $600 up to but not including $1,200 per annum.

The compensation rates proposed by the Board of Estimate and Apportionment for this position are from $780 to $900. Under the terms and conditions of the budget for the year 1917, appointments will, as a rule, be made at the lowest compensation rate.

Vacancies occur from time to time.

The term of the eligibility of the list resulting from this examination is fixed at not less than one year nor more than four years.

jy5,19 ROBERT W. BELCHER, Secretary.

BOARD OF ELECTIONS.

Proposals.

SEALED BIDS WILL BE RECEIVED BY the Board of Elections at Room 1840, Municipal Building, Manhattan, until 12 noon, on

THURSDAY, JULY 19, 1917,

FOR FURNISHING AND DELIVERING CONGRESS, SENATE, ASSEMBLY AND MUNICIPAL COURT DISTRICT MAPS, AS PER SPECIFICATIONS.

The time allowed for the performance of the contract, after the indorsement of the certificate of the Comptroller upon the executed contract, is thirty (30) consecutive calendar days after the delivery of copy to the contractor.

The amount of security required to guarantee the faithful performance of the contract is fifty (50) per cent. of the total amount for which the contract is awarded.

Delivery will be required to be made to the general and various Borough Offices of the Board of Elections in the manner and in such quantities as is shown in the schedule.

Blank forms and other information may be obtained, and the proposed maps may be examined, at the General Office of the Board of Elections, Room 1840, Municipal Building, Manhattan.

Dated, New York, July 6, 1917.

EDWARD E. BOYLE, MOSES M. McKEE, JAMES KANE, JACOB A. LIVINGSTON, Commissioners of Elections.

S. HOWARD COHEN, Chief Clerk. jy9,19

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SEALED BIDS WILL BE RECEIVED BY the Board of Elections at Room 1840, Municipal Building, Manhattan, until 12 noon, on

MONDAY, JULY 16, 1917,

FOR FURNISHING AND DELIVERING STATIONERY AND SUPPLIES FOR 1917 FALL PRIMARY ELECTION, REGISTRATION, GENERAL ELECTION AND GENERAL SUPPLIES, 1917-1918, AS PER SPECIFICATIONS.

The time allowed for the performance of the contract and the delivery of the supplies contained therein, after the indorsement of the certificate of the Comptroller upon the executed contract, is as follows:

(a) For the delivery of the General Supplies, 1917-1918, sixty (60) calendar days.

(b) For the delivery of Fall Primary Election Supplies, on or before 10 a. m. on Tuesday, Sept. 18, 1917.

(c) For the delivery of Registration Supplies, on or before 10 a. m., Saturday, Oct. 6, 1917.

(d) For the delivery of General Election Supplies, on or before 10 a. m., on Monday, Nov. 5, 1917.

The amount of security required to guarantee the faithful performance of the contract is fifty (50) per cent. of the total amount for which the contract is awarded.

Delivery will be required to be made at the various Police Stations or other points, as directed, in the City at the time and in the manner and in such quantities as may be directed.

Blank forms and other information may be obtained, and the samples may be examined, at the General Office of the Board of Elections, Room 1840, Municipal Building, Manhattan.

EDWARD F. BOYLE, MOSES M. McKEE, JAMES KANE, JACOB A. LIVINGSTON, Commissioners of Elections.

S. HOWARD COHEN, Chief Clerk.

Dated, July 2, 1917. jy3,16

☞See General Instructions to Bidders on last page, last column, of the "City Record."

SUPREME COURT—FIRST DEPARTMENT.

Filing Bills of Costs.

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired, to the lands, tenements and hereditaments required for the opening and extending of WEST 165TH STREET, from Amsterdam avenue to St. Nicholas avenue, in the 12th Ward, Borough of Manhattan, City of New York.

NOTICE IS HEREBY GIVEN THAT A BILL of costs, charges and expenses incurred by reason of the above entitled proceeding will be presented to one of the Justices of the Supreme Court of the State of New York, First Department, at a Special Term thereof, Part I, to be held at the County Court House in the Borough of Manhattan, in The City of New York, on the 24th day of July, 1917, at 10.15 o'clock in the forenoon of that day, or as soon thereafter as Counsel can be heard thereon, for taxation in accordance with the Certificate of the Corporation Counsel, and that the said bill of costs, charges and expenses, with the Certificate of the Corporation Counsel thereto attached, has been deposited in the office of the Clerk of the County of New York, there to remain for and during the space of ten days, as required by law.

Dated, New York, July 9, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, New York City. jy10,20

In the Matter of the Application of the Corporation Counsel of The City of New York for the appointment of Commissioners of Estimate and Assessment to ascertain and determine the compensation which should justly be made to owners abutting on William and North William streets, who have filed claims with the Comptroller of The City of New York for damages for the closing of portions of said William and North William street, in the Borough of Manhaattan, City of New York, as shown by a map dated April 11, 1912, adopted by the Board of Estimate and Apportionment on the 16th day of May, 1912, and approved by the Mayor on the 22nd day of May, 1912.

NOTICE IS HEREBY GIVEN THAT THE bill of costs, charges and expenses incurred by reason of the proceedings in the above-entitled matter will be presented for taxation to one of the Justices of the Supreme Court of the State of Netw York, First Department, at a Special Term thereof, Part I, to be held at the County Court House, in the Borough of Manhattan, in The City of New York, on the 23rd day of July, 1917, at 10.30 o'clock in the forenoon of that day, or as soon thereafter as Counsel can be heard thereon; and that the said bill of costs, charges and expenses has been deposited in the Office of the Clerk of the County of New York, there to remain for and during the space of ten days, as required by law.

Dated, New York, July 6, 1917.

VALENTINE TAYLOR, G. EDWIN LEET, BENAR LEWINSON, Commissioners of Estimate and Assessment.

JOEL J. SQUIER, Clerk. jy9,19

Application to Court to Condemn Property.

In the Matter of the Application of The City of New York relative to acquiring title, wherever the same has not been heretofore acquired, for the same purpose, in fee to the real property required for the opening and extending of MONTGOMERY PLACE, from Tremont avenue (Walker avenue) to Maclay avenue, in the Twenty-fourth Ward, Borough of The Bronx, City of New York.

NOTICE IS HEREBY GIVEN THAT AN application will be made to the Supreme Court of the State of New York, First Judicial District, at a Special Term of said Court, held in and for the County of Bronx, at the County Court House, in the Borough of The Bronx, in the City of New York, on the 24th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard thereon, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement ascertained and determined by the Supreme Court without a jury, and to have the cost of such improvement assessed by the said Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title in fee by The City of New York, for the use of the public to the real property required for the opening and extending of Montgomery place, from Tremont avenue (Walker avenue) to Maclay avenue, in the Twenty-fourth Ward, Borough of The Bronx, City of New York. The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Beginning at a point in the southern line of Tremont avenue, distant 244.357 feet easterly from the intersection of said line and the northeastern line of St. Peters avenue; thence easterly along said southern line of East Tremont avenue 50.31 feet; thence southeasterly, deflecting 52° 40′ 00″ to the right 319.675 feet to the northwestern line of Maclay avenue; thence southwesterly along said northwestern line of Maclay avenue 40.0 feet; thence northwesterly 350.183 feet to the point of beginning.

Montgomery place is shown on "Map showing the locating, laying out and grades of Montgomery place, between West Farms road and Maclay avenue, Amendment to Section 46," which map was filed as follows: In the office of the President of the Borough of The Bronx on July 23, 1915, in the office of the Register of the County of Bronx on Map No. 124, and in the office of the Counsel to the Corporation of the City of New York on July 22, 1915, in pigeonhole 243.

The land required for Montgomery place is located in Block 4001 of Section 15 of the Land Map of the City of New York.

The Board of Estimate and Apportionment, by a resolution adopted on the 2d day of February, 1917, determined that the whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby, and that the area of assessment for benefit in this proceeding be fixed and determined to be as follows:

Bounded on the northeast by a line midway between Montgomery place and Overing street and by the prolongation of the said line; on the southeast by a line distant 100 feet southeasterly from and parallel with the southeasterly line of Maclay avenue, the said distance being measured at right angles to Maclay avenue; on the southwest by a line midway between Montgomery place and St. Peters avenue and by the prolongation of the said line; and on the north by the southerly line of East Tremont (Walker) avenue.

Dated, New York, July 12, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy12,23

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the real property required for the opening and extending of EAST 211TH STREET, from White Plains road to Barnes avenue, in the Twenty-fourth Ward, Borough of The Bronx, City of New York.

NOTICE IS HEREBY GIVEN THAT AN application will be made to the Supreme Court of the State of New York, First Judicial District, at a Special Term of said Court, held in and for the County of Bronx, at the County Court House in the Borough of The Bronx, in the City of New York, on the 24th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard thereon, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement, ascertained and determined by the Supreme Court without a jury, and to have the cost of such improvement assessed by the said Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title in fee by The City of New York, for the use of the public to the real property required for the opening and extending of East 211th street, from White Plains road to Barnes avenue, in the Twenty-fourth Ward, Borough of The Bronx, City of New York. The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Parcel "A."

Beginning at a point in the eastern line of White Plains road, distant 148.765 feet northerly from the intersection of said line and the northern line of Gun Hill road; thence northerly along said eastern line of White Plains road 50.16 feet; thence easterly, deflecting 85° 23′ 00″ to the right 361.553 feet to the western line of Holland avenue; thence southerly along said western line of Holland avenue 50.0 feet; thence westerly 365.591 feet to the point of beginning.

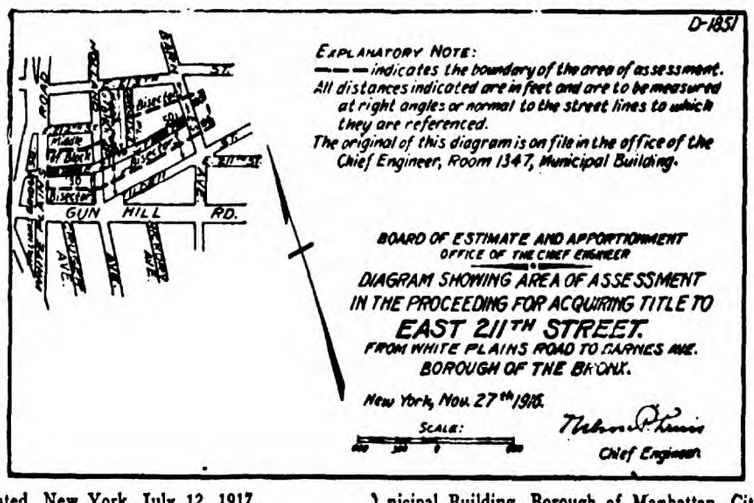
Parcel "B."

Beginning at a point in the eastern line of Holland avenue, distant 197.284 feet northerly from the intersection of said line and the northern line of Gun Hill road; thence northerly along said eastern line of Holland avenue 52.0 feet; thence easterly, deflecting 74° 04′ 10″ to the right 306.81 feet; thence still easterly, deflecting 5° 09′ 10″ to the left 452.75 feet; thence southerly, deflecting 94° 11′ 47.7″ to the right 50.13 feet; thence westerly, deflecting 85° 48′ 12.3″ to the right 451.33 feet; thence still westerly 323.333 feet to the point of beginning.

East 211th street is shown on "Amendment of Section 30" of the Final Maps of the Borough of The Bronx, which map was filed as follows: In the office of the President of the Borough of The Bronx on January 9, 1911, in the office of the Register of the County of New York on January 4, 1911, as Map No. 1479, and in the office of the Counsel to the Corporation of the City of New York on January 5, 1911, in pigeonhole 150.

The land required for East 211th street is located in Blocks 4657, 4659, 4660 of Section 16 of the Land Map of the City of New York.

The Board of Estimate and Apportionment, by a resolution adopted on the 5th day of January, 1917, determined that the whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby, and that the area of assessment for benefit in this proceeding be fixed and determined to be as shown in the following diagram:



Dated, New York, July 12, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy12,23

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose in fee to the real property required for the opening and extending of BUTLER PLACE, from Zerega avenue to Herschell street, in the Twenty-fourth Ward, Borough of The Bronx, City of New York.

NOTICE IS HEREBY GIVEN THAT AN application will be made to the Supreme Court of the State of New York, First Judicial District, at a Special Term of said Court to be held in and for the County of Bronx, at the County Court House, in the Borough of The Bronx, in the City of New York, on the 20th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard thereon, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement ascertained and determined by the Supreme Court without a jury, and to have the cost of such improvement assessed by the said Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title in fee by The City of New York, for the use of the public, to the real property required for the opening and extending of Butler place, from Zerega avenue to Herschell street, in the Twenty-fourth Ward, Borough of The Bronx, City of New York. The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Beginning at a point in the northeastern line of Zerega ave., distant 204.239 feet southeasterly from the intersection of said line and the southeastern line of Westchester ave.; thence easterly along said northeastern line of Zerega ave., 73.93 feet; thence northeasterly deflecting 54° 15′ 11″ to the left 350.78 feet; thence northwesterly deflecting 99° 03′ 30″ to the left 60.76 feet; thence southwesterly 384.40 feet to the point of beginning.

BUTLER PLACE is shown on Section 50 of the Final Maps of the Borough of The Bronx, which section was filed as follows: In the office of the President of the Borough of The Bronx on Nov. 13, 1911, in the office of the Register of the County of New York on Nov. 10, 1911, as Map No. 1565, and in the office of the Counsel to the Corporation of the City of New York on Nov. 10, 1911, in pigeonhole 173.

The land required for Butler place is located in Blocks 3845, 3846 and 3848 of Section 14 of the Land Map of the City of New York.

The Board of Estimate and Apportionment, by a resolution adopted on the 2nd day of February, 1917, determined that whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby, and that the area of assessment for benefit in this proceeding be fixed and determined to be as follows:

BEGINNING at a point on the easterly line of Zerega avenue where it is intersected by a line midway between Butler place and Halsey street, and running thence westwardly at right angles to Zerega avenue to the intersection with a line distant 100 feet southwesterly from and parallel with the southwesterly line of Zerega avenue, as this street is laid out where it adjoins Westchester avenue, the said distance being measured at right angles to Zerega avenue; thence northwestwardly along the said line parallel with Zerega avenue to the intersection with a line bisecting the angle formed by the intersection of the prolongations of the southeasterly line of Westchester avenue and the northwesterly line of Butler place; thence northeastwardly along the said bisecting line to the intersection with a line distant 100 feet northeasterly from and parallel with the northeasterly line of Herschell street, the said distance being measured at right angles to Herschell street; thence southeastwardly along the said line parallel with Herschell street to the intersection with the prolongation of a line midway between Butler place and Halsey street; thence southwestwardly along the said line midway between Butler place and Halsey street and along the prolongation of the said line to the point or place of beginning.

Dated, New York, July 9, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy9,19

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose in fee to the real property required for the opening and extending of PUTNAM AVENUE EAST, from West 238th street to Van Cortlandt Park South, in the Twenty-fourth Ward, Borough of The Bronx, City of New York.

NOTICE IS HEREBY GIVEN THAT AN application will be made to the Supreme Court of the State of New York, First Judicial District, at a Special Term of said Court, to be held in and for the County of Bronx, at the County Court House, in the Borough of The Bronx, in the City of New York, on the 20th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard thereon, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement ascertained and determined by the Supreme Court without a jury, and to have the cost of such improvement assessed by the said Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title in fee by The City of New York for the use of the public to the real property required for the opening and extending of Putnam Avenue East, from West 238th street to Van Cortlandt Park South, in the Twenty-fourth Ward, Borough of The Bronx, City of New York. The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Beginning at a point in the northeastern line of West 238th street, distant 160.916 feet northwesterly from the intersection of said line and the northwestern line of Bailey avenue; thence northwesterly along said northeastern line of West 238th street 50.18 feet; thence northeasterly curving to the right on the arc of a circle of 2,831.93 feet radius for 233.371 feet. The radius of which curve drawn northwesterly through the northwestern extremity of the preceding course forms an angle of 4° 51′ 01.7″ to the left with the prolongation of said preceding course; thence still northeasterly, tangent to the preceding course 408.706 feet to the southern line of Van Cortlandt Park South; thence easterly along said southern line of Van Cortlandt Park South 55.46 feet; thence southwesterly deflecting 115° 38′ 03″ to the right 432.699 feet; thence still southwesterly curving to the left on the arc of a circle of 2,781.93 feet radius for 233.494 feet to the point of beginning.

Putnam Avenue East is shown on a map entitled, "Map showing the change of lines and grades in the street system heretofore laid out within the territory bounded by Van Cortlandt Park South, Saxon ave., Sedgwick ave., W. 238th st., Albany rd., W. 236th st., Kingsbridge ave. and Broadway. Amendments to Sections 20 and 21," which map was filed as follows: in the office of the President of the Borough of The Bronx on Oct. 3, 1912, in the office of the Register of the County of New York on Sept. 30, 1912, as Map No. 1661, and in the office of the Counsel to the Corporation of the City of New York on Sept. 30, 1912, in pigeonhole 204.

The land required for Putnam Avenue East is located in Block 3271 of Section 12 of the Land Map of the City of New York.

The Board of Estimate and Apportionment, by a resolution adopted on the 19th day of January, 1917, determined that the whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby, and that the area of assessment for benefit in this proceeding be fixed and determined to be as follows:

Bounded on the north by a line distant 100 feet northerly from and parallel with the northerly line of Van Cortlandt Park South, the said distance being measured at right angles to Van Cortlandt Park South; on the southeast by a line bisecting the angle formed by the intersection of the prolongation of the southeasterly line of Putnam Avenue East, as this street is laid out adjoining Van Cortlandt Park South, with the prolongation of the northwesterly line of Bailey avenue as this street is laid where it adjoins West 238th street; on the southwest by a line distant 100 feet southwesterly from and parallel with the southwesterly line of West 238th street, the said distance being measured at right angles to West 238th street; and on the northwest by the northwesterly right-of-way line of the New York and Putnam Division of the New York Central Railroad.

Dated, New York, July 9, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy9,19

SUPREME COURT—SECOND DEPARTMENT.

Notice to File Claims.

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the real property required for the opening and extending of HAZEN STREET, from Astoria avenue to Berrian avenue; HOOD STREET, from Hazen street to Ditmars avenue; and the PUBLIC PARK bounded by Hazen street, Hood street and Ditmars avenue, in the First and Second Wards, Borough of Queens, City of New York.

NOTICE IS HEREBY GIVEN THAT BY AN order of the Supreme Court of the State of New York, Second Judicial District, dated June 15th, 1917, and duly entered and filed in the office of the Clerk of the County of Queens on June 19th, 1917, the application of The City of New York to have the compensation which should justly be made to the respective owners of the real property proposed to be taken in the above entitled proceeding ascertained and determined by the Supreme Court without a jury, and the cost of such improvement assessed by the Court

in accordance with the resolution of the Board of Estimate and Apportionment adopted on the 18th day of February 1916, was granted.

NOTICE IS HEREBY FURTHER GIVEN that, pursuant to Section 1000 of the Greater New York Charter, as amended by Chapter 606 of the Laws of 1915, the map or survey of the land to be acquired in that proceeding has been duly filed in the office of the Clerk of the County of Queens, and each and every party and person interested in the real property to be taken for the purpose of opening and extending of Hazen street, from Astoria avenue to Berrian avenue; Hood street, from Hazen street to Ditmars avenue, and the Public Park bounded by Hazen street, Hood street and Ditmars avenue, in the First and Second Wards, Borough of Queens, City of New York, having any claim or demand on account thereof, is hereby required to file his claim, duly certified, describing the real property which the claimant owns or in which he is interested, and his post office address, with the Clerk of the County of Queens on or before the 25th day of July, 1917, and to serve on the Corporation Counsel of The City of New York at his office, Room 606, Sixth Floor, Municipal Building, Court House Square, Borough of Queens, City of New York, on or before the 25th day of July, 1917, a copy of such verified claim.

Dated, New York, July 13, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy13,24

Hearings on Qualifications.

In the Matter of the Application of The City of New York, relative to acquiring title wherever the same has not been heretofore acquired, for the same purpose in fee, to the lands, tenements and hereditaments required for the opening and extending of CALDWELL AVENUE, from Harriet avenue to Mazeau street, and from Corinth avenue to Queens boulevard, subject to the easements of the main line division of the Long Island Railroad, in the Second Ward, Borough of Queens, City of New York.

NOTICE IS HEREBY GIVEN THAT BY AN order of the Supreme Court of the State of New York, Second Judicial District, dated June 26, 1917, and duly entered and filed in the office of the Clerk of the County of Queens on July 3, 1917, David Oggins was appointed a Commissioner of Estimate and the Commissioner of Assessment in the above entitled proceeding, in the place and stead of Thomas F. Doyle, resigned;

NOTICE IS FURTHER GIVEN THAT, PURsuant to the aforesaid order, the said David Oggins will attend at a Special Term for the hearing of motions of the Supreme Court of the State of New York, Second Judicial District, to be held in and for the County of Queens at the County Court House, in the Borough of Brooklyn, in the City of New York, on the 20th day of July, 1917, at the opening of the Court on that day or as soon thereafter as counsel can be heard thereon, for the purpose of being examined under oath by the Corporation Counsel of The City of New York, or by any other person having any interest in the said proceeding as to his qualifications to act as such commissioner.

Dated, New York, July 9, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, New York City. jy9,19

Application to Court to Condemn Property.

IN THE MATTER OF THE APPLICATION of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose in fee, to the lands, tenements and hereditaments required for the opening and extending of BAY 43RD STREET, from Benson avenue to Harway avenue, excluding the right-of-way of the West End Division of the Nassau Electric Railway Company, in the Borough of Brooklyn, City of New York.

NOTICE IS HEREBY GIVEN THAT AN APplication will be made to the Supreme Court of the State of New York, Second Judicial District, at a Special Term of said Court to be held for the hearing of motions in the County Court House, in the County of Kings, in the Borough of Brooklyn, City of New York, on the 19th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement, ascertained and determined by the Supreme Court, without a jury, and to have the cost of said improvement assessed by the said Supreme Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title by The City of New York in fee for the use of the public to all the lands and premises, with the buildings thereon and the appurtenances thereto belonging, required for the opening and extending of Bay 43rd street, from Benson avenue to Harway avenue, excluding the right-of-way of the West End Division of the Nassau Electric Railway Company, in the Borough of Brooklyn, City of New York.

The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Parcel "A."

Beginning at the intersection of the southwest line of Benson avenue with the northwest line of Bay 43rd street; thence southeasterly along the southwest line of Benson avenue 60.0 feet; thence southwesterly, deflecting 90° 00′ 00″ to the right 1,728.30 feet to the northeast property line of the West End Division of the Nassau Electric Railway Company; thence northwesterly deflecting 89° 44′ 50″ to the right along the northeast property line of the West End Division of the Nassau Electric Railway Company 60.0 feet; thence northeasterly 1,728.04 feet to the point of beginning.

Parcel "B."

Beginning at the intersection of the east line of Harway avenue with the south line of Bay 43rd street; thence northerly along the east line of Harway avenue 60.10 feet; thence easterly deflecting 86° 39′ 48″ to the right 145.61 feet; thence northeasterly deflecting 16° 44′ 50″ to the left 157.62 feet to the southwest property line of the West End Division of the Nassau Electric Railway Company; thence southeasterly deflecting 89° 40′ 55″ to the right along the southwest property line of the West End Division of the Nassau Electric Railway Company 60.0 feet; thence southwesterly deflecting 90° 15′ 10″ to the right 166.16 feet; thence westerly 157.90 feet to the point of beginning.

The property affected by the above proceeding is located in Blocks 6882, 6883, 6897, 6898, 6910-A and 6911-A in Section 21 on the Land Map of the County of Kings.

Bay 43rd street, from Benson avenue to Harway avenue, was laid out by the Town Survey Commissioners' Map of the County of Kings, filed in the Register's Office of the County of Kings on June 17th, 1874, which map, under Section 432 of the Charter, is now a part of the final map of The City of New York, and as amended by map adopted by the Board of Estimate and Apportionment on November 20, 1914, approved by the Mayor on December 14, 1914, and filed in the Office of the Register of the County of Kings on March 23rd, 1915,

—and also shown on a map of that portion of said street affected by this proceeding, made by the Topographical Division of the Bureau of Highways of the Borough of Brooklyn, and signed by E. W. Voorhies, Commissioner of Public Works, and Charles R. Ward, Chief Engineer, and dated the 8th day of May, 1917, and approved by the Board of Estimate and Apportionment on the 25th day of May, 1917, and signed by Joseph Haag, Secretary of said Board.

The Board of Estimate and Apportionment by a resolution adopted on the 16th day of March, 1917, determined that the whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby and that the area of assessment for benefit in this proceeding be fixed and determined to be as follows:

"Beginning at a point on the southwesterly line of Benson avenue, where it is intersected by a line midway between Bay 43rd street and Bay 44th street, as these streets are laid out northeast of Cropsey avenue, and running thence southwestwardly along the said line midway between Bay 43rd street and Bay 44th street, and along the prolongation of the said line, to the intersection with a line bisecting the angle formed by the intersection of the prolongation of the centre lines of Bay 43rd street and Bay 44th street, as these streets are laid out where they adjoin Harway avenue on the northeast; thence southwestwardly along the said bisecting line to the intersection with the northeasterly line of Harway avenue; thence northwestwardly along the northeasterly line of Harway avenue to the intersection with a line bisecting the angle formed by the intersection of the prolongation of the northwesterly line of Bay 43rd street and the southeasterly line of 26th avenue, as these streets are laid out where they adjoin Harway avenue on the northeast; thence northeastwardly along the said bisecting line to the intersection with the prolongation of a line midway between 26th avenue and Bay 43rd street, as these streets are laid out northeast of Cropsey avenue; thence northeastwardly along the said line midway between 26th avenue and Bay 43rd street, and along the prolongation of the said line to the intersection with the southwesterly line of Benson avenue; thence southeastwardly along the southwesterly line of Benson avenue to the point or place of beginning."

Dated, New York, July 6, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan. jy6,17

In the Matter of the Application of The City of New York relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the real property required for the opening and extending of HOMER LEE AVENUE, from Canonbury road to Burtis (Willow) street, in the Fourth Ward, Borough of Queens, City of New York.

NOTICE IS HEREBY GIVEN THAT AN APplication will be made to the Supreme Court of the State of New York, Second Judicial District, at a Special Term for the hearing of motions, to be held in and for the County of Kings, at the County Court House in the Borough of Brooklyn, City of New York, on the 17th day of July, 1917, at the opening of the Court on that day, or as soon thereafter as counsel can be heard thereon, to have the compensation which should justly be made to the respective owners of the real property proposed to be acquired for such improvement, ascertained and determined by the Supreme Court without a jury, and to have the cost of such improvement assessed by the said Court, as hereinafter set forth, in accordance with the resolution of the Board of Estimate and Apportionment.

The nature and extent of the improvement hereby intended is the acquisition of title in fee by The City of New York, for the use of the public to the real property required for the opening and extending of Homer Lee avenue from Canonbury road to Burtis (Willow) street, in the Fourth Ward, Borough of Queens, City of New York. The real property, title to which is proposed to be acquired, is more particularly bounded and described as follows, to wit:

Beginning at a point formed by the intersection of the northerly line of Canonbury road with the westerly line of Homer Lee avenue; running thence easterly for 60.06 feet along the prolongation of the northerly line of Canonbury road to the easterly line of Homer Lee avenue; thence southerly, deflecting to the right 87° 32′ 02″ for 921.39 feet along the easterly line of Homer Lee avenue; thence southerly, deflecting to the right 2° 28′ 21″ for 417.95 feet along the easterly line of Homer Lee avenue to the southerly line of Burtis (Willow) street; thence westerly, deflecting to the right 90° for 60.00 feet along the southerly line of Burtis (Willow) street to the westerly line of Homer Lee avenue; thence northerly, deflecting to the right 90° for 416.65 feet along the westerly line of Homer Lee avenue; thence northerly for 922.68 feet along the westerly line of Homer Lee avenue to the northerly line of Canonbury road—the point or place of beginning.

The property affected by the above proceeding is located in Blocks 12828, 12829, 12462 to 12464, inclusive, and 12855 of the Land Map of the City of New York, Borough of Queens.

Homer Lee avenue, extending from Canonbury road to Burtis (Willow) street, in the Borough of Queens, City of New York, is shown upon "Map establishing the lines and grades of Homer Lee avenue, approved by the Board of Estimate and Apportionment March 9, 1911, by the Mayor March 15, 1911," copies of which were filed at the office of the County Clerk at Jamaica May 1, 1911, at the office of the President of the Borough of Queens April 29, 1911, and at the office of the Corporation Counsel April 24, 1911.

The Board of Estimate and Apportionment, by a resolution adopted on the 30th day of June, 1916, determined that the whole cost and expense of this proceeding shall be assessed upon the property deemed to be benefited thereby, and that the area of assessment for benefit in this proceeding be fixed and determined to be as follows:

Bounded in the north by a line distant 100 feet northerly from and parallel with the northerly line of Canonbury road, as this street is shown on a map adopted by the Board of Estimate and Apportionment on March 9, 1911, where it adjoins Homer Lee avenue on the west, and by the prolongation of the said line, the said distance being measured at right angles to Canonbury road; on the east by a line always distant 100 feet easterly from and parallel with the easterly line of Homer Lee avenue and by the prolongation of the said line, the said distance being measured at right angles to Homer Lee avenue; on the south by the northerly right-of-way line of the Main Line Division of the Long Island Railroad; and on the west by a line always distant 100 feet westerly from and parallel with the westerly line of Homer Lee avenue and by the prolongation of the said line, the said distance being measured at right angles to Homer Lee avenue.

Dated, New York, July 5, 1917.

LAMAR HARDY, Corporation Counsel, Municipal Building, Borough of Manhattan, City of New York. jy5,16

Filing Preliminary Abstracts.

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the lands, tenements and hereditaments required for the opening and extending of BATH AVENUE, from the line between the former towns of New Utrecht and Gravesend to Stillwell avenue, excepting the right of way of the Brooklyn, Bath and West End Railroad, in the 31st Ward, Borough of Brooklyn, The City of New York.

NOTICE IS HEREBY GIVEN TO ALL PERsons interested in the above entitled proceeding, and to the owner or owners, occupant or occupants, of all houses and lots and improved and unimproved lands affected thereby, and to all others whom it may concern, to wit:

First—That the undersigned, Commissioners of Estimate, have completed their estimate of damage, and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto, do file their said objections in writing, duly verified, with them at their office, No. 166 Montague Street, in the Borough of Brooklyn, in The City of New York, on or before the 19th day of July, 1917, and that the said Commissioners will hear parties so objecting, and for that purpose will be in attendance at their said office on the 24th day of July, 1917, at 3 o'clock p. m.

Second—That the undersigned, Commissioner of Assessment, has completed his estimate of benefit and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto, do file their said objections in writing, duly verified, with him at his office, No. 166 Montague street, in the Borough of Brooklyn, in the City of New York, on or before the 19th day of July, 1917, and that the said Commissioner will hear parties so objecting, and for that purpose will be in attendance at his said office on the 25th day of July, 1917, at 3 o'clock p. m.

Third—That the Commissioner of Assessment has assessed any or all of such lands, tenements and hereditaments and premises as are within the area of assessment fixed and prescribed as the area of assessment for benefit by the Board of Estimate and Apportionment on the 29th day of October, 1915, and that the said area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of Brooklyn, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Beginning at a point on the westerly line of Stillwell avenue where it is intersected by the prolongation of a line midway between Bath avenue and Cropsey avenue, as these streets are laid out between Bay 41st street and 26th avenue, and running thence northwestwardly along the said line midway between Bath avenue and Cropsey avenue, and along the prolongations of the said line to the intersection with a line bisecting the angle formed by the intersection of the prolongations of the centre lines of Bath avenue and Cropsey avenue as these streets are laid out between Bay 34th street and Bay 35th street; thence northwestwardly along the said bisecting line to the intersection with a line midway between Bay 32d street and 23d avenue; thence northeastwardly along the said line midway between Bay 32d street and 23d avenue to the intersection with a line bisecting the angle formed by the intersection of the prolongations of the center lines of Bath avenue and Benson avenue as these streets are laid out between Bay 34th street and Bay 35th street; thence southeastwardly along the said bisecting line to the intersection with the prolongation of a line midway between Bath avenue and Benson avenue as these streets are laid out between Bay 41st street and 26th avenue; thence southeastwardly along the said line midway between Bath avenue and Benson avenue and along the prolongations of the said line to the intersection with the easterly line of Stillwell avenue; thence eastwardly at right angles to Stillwell avenue a distance of 100 feet; thence southwardly and parallel with Stillwell avenue to the intersection with a line at right angles to Stillwell avenue and passing through the point of beginning; thence westwardly along the said line at right angles to Stillwell avenue to the point or place of beginning.

Fourth—That the abstracts of said estimate of damage and of said assessment for benefit, together with the damage and benefit maps, and also all the affidavits, estimates, proofs and other documents used by the Commissioners of Estimate and by the Commissioner of Assessment in making the same, have been deposited in the Bureau of Street Openings in the Law Department of The City of New York, No. 166 Montague street, in the Borough of Brooklyn, in said City, there to remain until the 30th day of July, 1917.

Fifth—That, provided there be no objections filed to either of said abstracts, the reports as to awards and as to assessments for benefit herein will be presented for confirmation to the Supreme Court of the State of New York, Second Department, at a Special Term thereof, to be held in the County Court House in the Borough of Brooklyn, in The City of New York, on the 30th day of August, 1917, at the opening of the Court on that day.

Sixth—In case, however, objections are filed to the foregoing abstracts of estimate and assessment, or to either of them, the motion to confirm the reports as to awards and as to assessments shall stand adjourned to the date to be hereafter specified in the notice provided in such cases to be given in relation to filing the final reports, pursuant to Sections 981 and 984 of the Greater New York Charter, as amended by Chapter 658 of the Laws of 1906.

Dated, New York, June 30, 1917.

JOHN N. HARMAN, FRANCIS A. McCLOSKEY, JAMES CUNNINGHAM, Commissioners of Estimate; JOHN N. HARMAN, Commissioner of Assessment.

ANDREW C. TROY, Clerk. j30,jy18

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the lands, tenements and hereditaments required for the opening and extending of ATLANTIC AVENUE from the Brooklyn Borough Line to Van Wyck avenue, as said Atlantic avenue is now laid out, excluding, however, all land which may fall within the limits of the right of way of the Long Island Railroad Company and all land actually occupied by railroad buildings, in the Fourth Ward, Borough of Queens, City of New York.

NOTICE IS HEREBY GIVEN TO ALL PERsons interested in the above entitled proceeding, and to the owner or owners, occupant or occupants, of all houses and lots and improved and unimproved lands affected thereby, and to all others whom it may concern, to wit:

First—That the undersigned, Commissioners of Estimate, have completed their estimate of damage, and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto, do file their said objections in writing, duly verified, with them at their office in the Municipal Building, Court House Square, Long Island City, in the Borough of Queens, in The City of New York, on or before the 20th day of July, 1917, and that the said Commissioners will hear parties so objecting, and for that purpose will be in attendance at their said office on the 23rd day of July, 1917, at 3 o'clock p. m.

Second—That the undersigned, Commissioner of Assessment, has completed his estimate of benefit and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto do file their said objections in writing, duly verified, with him at his office in the Municipal Building, Court House Square, Long Island City, in the Borough of Queens, in The City of New York, on or before the 20th day of July, 1917, and that the said Commissioner will hear parties so objecting, and for that purpose will be in attendance at his said office on the 24th day of July, 1917, at 3 o'clock p. m.

Third—That the Commissioner of Assessment has assessed any or all such lands, tenements and hereditaments and premises as are within the area of assessment fixed and prescribed as the area of assessment for benefit by the Board of Estimate and Apportionment on the 4th day of December, 1913, and that the said area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of Queens, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Beginning at a point on a line midway between Grant avenue and Elderts lane where it is intersected by the prolongation of a line midway between Fulton street and Atlantic avenue, as these streets are laid out between Shaw avenue and Nevada avenue, and running thence eastwardly along the said line midway between Fulton street and Atlantic avenue and along the prolongation of the said line to the intersection with the prolongation of a line midway between Bath avenue and Benson avenue and along the prolongation of the said line to the intersection with the easterly line of Stillwell avenue; thence eastwardly at right angles to Stillwell avenue a distance of 100 feet; thence southwardly and parallel with Stillwell avenue to the intersection with a line at right angles to Stillwell avenue and passing through the point of beginning; thence westwardly along the said line at right angles to Stillwell avenue to the point or place of beginning.

Fourth—That, provided there be no objections filed to the said supplemental and additional abstract, our supplemental and additional final report herein will be presented for confirmation to the Supreme Court of the State of New York, Second Department, at a Special Term thereof for the hearing of motions, to be held in the County Court House in the Borough of Brooklyn, in The City of New York, on the 13th day of September, 1917, at the opening of the Court on that day.

Fifth—In case, however, objections are filed to the said supplemental and additional abstract of assessment, the notice of motion to confirm our supplemental and additional final report herein will stand adjourned to the date to be hereafter specified, and of which notice will be given to all those who have theretofore appeared in this proceeding, as well as by publication in the "City Record," pursuant to Sections 981 and 984 of the Greater New York Charter, as amended by Chapter 658 of the Laws of 1906.

Dated, New York, June 26, 1917.

AUGUST REYMERT, Chairman; PHILIP S. HEUSS, Commissioners.

WALTER C. SHEPPARD, Clerk. j30,jy18

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the lands, tenements and hereditaments required for the opening and extending of JUNIPER AVENUE (although not yet named by proper authority), from the west side of Grand street to Metropolitan avenue, in the Second Ward, Borough of Queens, City of New York, as amended and corrected by an order of the Supreme Court, Second Department, dated the 30th day of September, 1910, and entered in the office of the Clerk of the County of Queens on the 4th day of October, 1910, so as to conform to the lines of said street as shown upon Section 17 of the Final Maps of the Borough of Queens, as adopted by the Board of Estimate and Apportionment on the 26th day of June, 1908, and approved by the Mayor on the 5th day of August, 1908, and as shown upon Section 28 of the Final Maps of the Borough of Queens as adopted by the Board of Estimate and Apportionment on the 15th day of January, 1909, and approved by the Mayor on the 29th day of January, 1909, and as further amended by an order of the Supreme Court, Second Department, dated the 4th day of September, 1912, and entered in the office of the Clerk of the County of Queens on the 9th day of September, 1912, so as to make said Juniper Avenue, between the above mentioned limits, relate to the street line as shown upon the map or plan bearing the signature of the President of the Borough of Queens, dated the 15th day of March, 1911, and adopted by the Board of Estimate and Apportionment on the 15th day of June, 1911.

The land to be acquired in this proceeding is more particularly bounded and described in the petitions attached to the aforesaid orders.

WE THE UNDERSIGNED, COMMISSIONERS of Estimate and Assessment in the above entitled matter, hereby gives notice to all persons interested in this proceeding, and to the owner or owners, occupant or occupants of all houses and lots and improved and unimproved lands affected thereby, and to all others whom it may concern, to wit:

First—That we have completed our supplemental and additional estimate of assessment, and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, and having objections thereto, do present their said objections in writing, duly verified, to us at our office, in the Municipal Building, Court House Square, Long Island City, Borough of Queens, in The City of New York, on or before the 12th day of July, 1917, and that we, the said Commissioners, will hear parties so objecting, and for that purpose will be in attendance at our said office on the 16th day of July, 1916, at 2.30 o'clock p. m.

Second—That the abstract of our said supplemental and additional estimate of assessment, together with our benefit maps, and also all the affidavits, estimates, proofs and other documents used by us in making the same, have been deposited in the Bureau of Street Openings in the Law Department of The City of New York, in the Municipal Building, Court House Square, Long Island City, in the Borough of Queens, in said City, there to remain until the 16th day of July, 1917.

Third—That the limits of our assessment for benefit include all those lands, tenements and hereditaments and premises situate, lying and being in the Borough of Queens, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Beginning at a point at the intersection of the southerly line of Grand street with a line parallel to and distant 200 feet westerly from the westerly line of Juniper avenue, running thence southerly along the said last mentioned line parallel to and always distant 200 feet westerly from the westerly line of Juniper avenue to the intersection with the northerly line of Metropolitan avenue; thence easterly along the northerly line of Metropolitan avenue to the intersection with the prolongation of a line distant 200 feet easterly and parallel with the easterly line of Juniper avenue, running thence northerly along said last mentioned line always parallel to and distant 200 feet easterly from the easterly line of Juniper avenue to the intersection with the southerly line of Grand street; thence easterly along the southerly line of Grand street to the point or place of beginning.

Fourth—That, provided there be no objections filed to the said supplemental and additional abstract, our supplemental and additional final report herein will be presented for confirmation to the Supreme Court of the State of New York, Second Department, at a Special Term thereof for the hearing of motions, to be held in the County Court House in the Borough of Brooklyn, in The City of New York, on the 13th day of September, 1917, at the opening of the Court on that day.

Fifth—In case, however, objections are filed to the said supplemental and additional abstract of assessment, the notice of motion to confirm our supplemental and additional final report herein will stand adjourned to the date to be hereafter specified, and of which notice will be given to all those who have theretofore appeared in this proceeding, as well as by publication in the "City Record," pursuant to Sections 981 and 984 of the Greater New York Charter, as amended by Chapter 658 of the Laws of 1906.

Dated, New York, June 26, 1917.

AUGUST REYMERT, Chairman; PHILIP S. HEUSS, Commissioners.

WALTER C. SHEPPARD, Clerk. j30,jy18

with the westerly line of Hatch avenue; thence eastwardly in a straight line to a point on the easterly line of Hatch avenue where it is intersected by the prolongation of a line midway between Sherry street and Fenhurst place, as these streets are laid out between Freedom avenue and Oxford avenue; thence eastwardly along the said line midway between Sherry street and Fenhurst place and along the prolongation of the said line to the intersection with the westerly line of Herald avenue; thence eastwardly in a straight line to a point on the easterly line of Herald avenue where it is intersected by a line bisecting the angle formed by the intersections of the prolongations of the southerly line of Fulton street and the northerly line of Atlantic avenue, as these streets are laid out between Guion avenue and Napier avenue; thence eastwardly along the said bisecting line to the intersection with the westerly line of Greenwood avenue; thence eastwardly in a straight line to a point on the easterly line of Greenwood avenue where it is intersected by a line midway between Fulton street and Atlantic avenue, as these streets are laid out immediately east of Greenwood avenue; thence eastwardly along the said line midway between Fulton street and Atlantic avenue and along the prolongation of the said line to the intersection with the southwesterly right of way line of the Montauk Division of the Long Island Railroad; thence southeastwardly along the said right of way line to the intersection with the westerly line of Van Wyck avenue; thence eastwardly at right angles to Van Wyck avenue a distance of 200 feet; thence southwardly and parallel with Van Wyck avenue to the intersection with the prolongation of a line distant 100 feet southerly from and parallel with the southerly line of Garden street, the said distance being measured at right angles to Garden street; thence westwardly along the said line parallel with Garden street and along the prolongations of the said line to the intersection with a line midway between South Vine street and South Curtis avenue, as these streets are laid out at Chichester avenue; thence northwardly along the said line midway between South Vine street and South Curtis avenue to the intersection with a line midway between Atlantic avenue and Chichester avenue, as these streets are laid out between Spruce street and South Vine street; thence westwardly along the said line midway between Atlantic avenue and Chichester avenue and along the prolongations of the said line to the intersection with a line midway between Church street and Lefferts avenue; thence northwardly along the said line midway between Church street and Lefferts avenue to the intersection with a line midway between Atlantic avenue and Chichester avenue as these streets are laid out between Hamilton avenue and Lefferts avenue; thence westwardly along the said line midway between Atlantic avenue and Chichester avenue to the intersection with the westerly line of Hamilton avenue; thence westwardly in a straight line to a point on the easterly line of Cedar avenue where it is intersected by a line midway between Atlantic avenue and Chichester avenue, as these streets are laid out between Greenwood avenue and Cedar avenue; thence westwardly along the said line midway between Atlantic avenue and Chichester avenue to the intersection with the westerly line of Greenwood avenue; thence westwardly in a straight line to a point on the easterly line of Napier avenue where it is intersected by a line midway between Atlantic avenue and Chichester avenue, as these streets are laid out between Portland avenue and Napier avenue; thence westwardly along the said line midway between Atlantic avenue and Chichester avenue to the intersection with a line midway between Portland avenue and Herald avenue; thence northwardly along the said line midway between Portland avenue and Herald avenue to the intersection with the prolongation of a line midway between Atlantic avenue and Colby street, as these streets are laid out immediately west of Freedom avenue; thence westwardly along the said line midway between Atlantic avenue and Colby street and along the prolongations of the said line to the intersection with a line midway between Vanderveer avenue and Hatch avenue, as these streets are laid out immediately north of Chichester avenue; thence southwardly along the said line midway between Vanderveer avenue and Hatch avenue to the intersection with the prolongation of a line midway between Atlantic avenue and Chichester avenue, as these streets are laid out at Woodhaven avenue; thence westwardly along the said line midway between Atlantic avenue and Chichester avenue and along the prolongations of the said line to the intersection with the prolongation of a line midway between Grant avenue and Elderts lane, as these streets are laid out north of Atlantic avenue; thence northwardly along the said line midway between Grant avenue and Elderts lane and along the prolongation of the said line to the point or place of beginning.

Fourth—That the abstracts of said estimate of damage and of said assessment for benefit, together with the damage and benefit maps, and also all the affidavits, estimates, proofs and other documents used by the Commissioners of Estimate and by the Commissioner of Assessment in making the same, have been deposited in the Bureau of Street Openings in the Law Department of The City of New York, in the Municipal Building, Court House Square, in the Borough of Queens, in said City, there to remain until the 23rd day of July, 1917.

Fifth—That, provided there be no objections filed to either of said abstracts, the reports as to awards and as to assessments for benefit herein will be presented for confirmation to the Supreme Court of the State of New York, Second Department, at a Special Term thereof for the hearing of motions, to be held in the County Court House in the Borough of Brooklyn, in The City of New York, on the 11th day of October, 1917, at the opening of the Court on that day.

Sixth—In case, however, objections are filed to the foregoing abstracts of estimate and assessment, or to either of them, the motion to confirm the reports as to awards and as to assessments shall stand adjourned to the date to be hereafter specified in the notice provided in such cases to be given in relation to filing the final reports, pursuant to Sections 981 and 984 of the Greater New York Charter, as amended by Chapter 658 of the Laws of 1906.

Dated, New York, June 25th, 1917.

GEORGE C. BUECHNER, Chairman; JOHN J. CONNOLLY, JOHN KINDRED GILLETTE, Commissioners of Estimate; GEORGE C. BUECHNER, Commissioner of Assessment.

WALTER C. SHEPPARD, Clerk. j29,jy17

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the lands, tenements and hereditaments required for the opening and extending of KIMBALL AVENUE, from Liberty avenue, near Digby street to Liberty avenue, near Baker avenue, as said Kimball avenue is now laid out, in the 4th Ward, Borough of Queens, City of New York, as amended and corrected by an order of this Court duly made and entered in the office of the Clerk of the County of Queens, on June 14, 1916, so as to conform to a map or plan adopted by the Board of Estimate and Apportionment, December 23, 1915, and approved by the Mayor January 10, 1916.

NOTICE IS HEREBY GIVEN TO ALL PERsons interested in the above entitled proceeding, and to the owner or owners, occupant or occupants of all houses and lots and improved and unimproved lands affected thereby, and to all others whom it may concern, to wit:

First—That the undersigned, Commissioners of Estimate have completed their estimate of damage, and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto, do file their said objections in writing, duly verified, with them at their office in the Municipal Buildnig, Court House Square, Long Island City, in the Borough of Queens, in The City of New York, on or before the 16th day of July 1917, and that the said Commissioners will hear parties so objecting, and for that purpose will be in attendance at their said office on the 18th day of July, 1917, at 2.30 o'clock p. m.

Second—That the undersigned, Commissioner of Assessment, has completed his estimate of benefit and that all persons interested in this proceeding, or in any of the lands, tenements and hereditaments and premises affected thereby, having any objection thereto, do file their said objections in writing, duly verified, with him at his office in the Municipal Building, Court House Square, Long Island City, in the Borough of Queens, in The City of New York on or before the 16th day of July, 1917, and that the said Commissioner will hear parties so objecting, and for that purpose will be in attendance at his said office on the 19th day of July, 1917, at 2.30 o'clock p. m.

Third—That the Commissioner of Assessment has assessed any or all such lands, tenements and hereditaments and premises as are within the area of assessment fixed and prescribed as the area of assessment for benefit by the Board of Estimate and Apportionment on the 3rd day of March, 1916, and that the said area of assessment includes all those lands, tenements and hereditaments and premises situate and being in the Borough of Queens, in The City of New York, which, taken together, are bounded and described as follows, viz.:

Beginning at a point on the prolongation of a line midway between Jerome avenue and Kimball avenue, where it is intersected by a line midway between Halifax street and Digby street and running thence eastwardly along the said line midway between Jerome avenue and Kimball avenue and along the prolongation of the said line to the intersection with a line distant 100 feet easterly from and parallel with the easterly line of Dakota avenue, the said distance being measured at right angles to Dakota avenue; thence southwardly along the said line parallel with Dakota avenue and along the prolongation of the said line to the intersection with a line distant 100 feet southerly from and parallel with the southerly line of Liberty avenue, where it adjoins Dakota avenue, the said distance being measured at right angles to Liberty avenue; thence westwardly along the said line parallel with Liberty avenue and along the prolongation of the said line to the intersection with the prolongation of a line distant 100 feet southerly from and parallel with the southerly line of Liberty avenue, where it adjoins Atfield avenue, the said distance being measured at right angles to Liberty avenue; thence westwardly along the said line parallel with Liberty avenue and along the prolongation of the said line to the intersection with the prolongation of a line midway between Atfield avenue and Nebraska avenue, as these streets are laid out north of Kimball avenue; thence northwardly along the said prolongation of a line midway between Atfield avenue and Nebraska avenue to a point distant 100 feet southerly from the southerly line of Kimball avenue; thence westwardly and parallel with Kimball avenue to the intersection with a line passing through points on the centre lines of Atfield avenue and of Frost avenue, respectively, midway between Kimball avenue and Liberty avenue; thence westwardly along a succession of straight lines passing through points on the centre lines of each of the streets between Atfield avenue and Boyd avenue, respectively, midway between Kimball avenue and Liberty avenue to a point distant 100 feet southerly from the southerly line of Kimball avenue, the said distance being measured at right angles to Kimball avenue; thence westwardly and parallel with Kimball avenue to the intersection with the prolongation of a line midway between Ferry street and Potomac street; thence southwardly along the said line midway between Ferry street and Potomac street and along the prolongation of the said line to a point distant 100 feet southerly from the southerly line of Liberty avenue, the said distance being measured at right angles to Liberty avenue; thence westwardly and always distant 100 feet southerly from and parallel with the southerly line of Liberty avenue to the intersection with the prolongation of a line midway between Halifax street and Digby street; thence northwardly along the said line midway between Halifax street and Digby street and along the prolongation of the said line to the point or place of beginning.

Fourth—That the abstracts of said estimate of damage and of said assessment for benefit, together with the damage and benefit maps, and also all the affidavits, estimates, proofs and other documents used by the Commissioners of Estimate and by the Commissioner of Assessment in making the same have been deposited in the Bureau of Street Openings in the Law Department of The City of New York, in the Municipal Building, Court House Square, in the Borough of Queens, in said City, there to remain until the 18th day of July, 1917.

Fifth—That, provided there be no objections filed to either of said abstracts, the reports as to awards and as to assessments for benefit herein will be presented for confirmation to the Supreme Court of the State of New York, Second Department, at a Special Term thereof for the hearing of motions, to be held in the County Court House in the Borough of Brooklyn, in The City of New York, on the 11th day of September, 1917, at the opening of the Court on that day.

Sixth—In case, however, objections are filed to the foregoing abstracts of estimate and assessment, or to either of them, the motion to confirm the reports as to awards and as to assessments shall stand adjourned to the date to be hereafter specified in the notice provided in such cases to be given in relation to filing the final reports, pursuant to Sections 981 and 984 of the Greater New York Charter, as amended by Chapter 658 of the Laws of 1906.

Dated, June 19, 1917.

HARRISON S. MOORE, Chairman; WILLIAM O'MARA, HENRY MOLLENHAUER, Jr., Commissioners of Estimate; WILLIAM O'MARA, Commissioner of Assessment.

WALTER C. SHEPPARD, Clerk. j26,jy13

Filing Bills of Costs.

In the Matter of the Application of The City of New York, relative to acquiring title, wherever the same has not been heretofore acquired for the same purpose, in fee to the lands, tenements and hereditaments required for the opening and extending of SMITH STREET, from Brinkerhoff avenue to Ulster avenue; BRINKERHOFF AVENUE, from Smith street to Spangler street, and SPANGLER STREET, from Brinkerhoff avenue to Lambertville avenue, in the Fourth Ward, Borough of Queens, City of New York.

NOTICE IS HEREBY GIVEN THAT THE bill of costs, charges and expenses incurred by reason of the proceedings in the above entitled matter will be presented for taxation to one of the Justices of the Supreme Court of the State of New York, Second Department, at a Special Term thereof, for the hearing of motions, to be held at the County Court House in the Borough of Brooklyn, in The City of New York, on the 25th day of July, 1917, at 10 o'clock in the forenoon of that day, or as soon thereafter as counsel can be heard thereon; and that the said bill of costs, charges and expenses has been deposited in the Office of the Clerk of the County of Queens, there to remain for and during the space of ten days, as required by law.

Dated, New York, July 12, 1917.

WILLIAM W. GILLEN, ROBT. B. LAWRENCE, WM. RASQUIN, Jr., Commissioners of Estimate; WILLIAM W. GILLEN, Commissioner of Assessment.

WALTER C. SHEPPARD, Clerk. jy12,23

BELLEVUE AND ALLIED HOSPITALS AND THE DEPARTMENTS OF PUBLIC CHARITIES, CORRECTION AND HEALTH.

Proposals.

SEALED BIDS WILL BE RECEIVED BY Bellevue and Allied Hospitals, Departments of Public Charities, Correction and Health, at the office of the Central Purchase Committee, Room 1220 Municipal Building, Manhattan, until 12.30 p. m.,

MONDAY, JULY 16, 1917,

FOR FURNISHING AND DELIVERING BUTTER (FOR STORAGE).

The time for the performance of the contract is on or before Aug. 15, 1917.

The amount of security required is thirty per cent. of the contract amount awarded. No bid shall be considered unless it is accompanied by a deposit. Such deposit shall be in an amount not less than one and one-half per cent. of the total amount of the bid.

The bidder will state the price per unit, as called for in the schedules of quantities and prices, by which the bids will be tested. The extensions must be made and footed up, as the bids will be read from the total and awards, if made, made to the lowest bidder on each item or class, as stated in the schedules.

Bids must be submitted in duplicate, each copy in a separate envelope. No bid will be accepted unless this provision is complied with.

Specifications referred to in the schedules may be had upon application at the office of the Bureau of Contract Supervision, Room 1327, Municipal Building.

Blank forms and further information may be obtained at the office of the Central Purchase Committee, twelfth floor, Municipal Building.

BELLEVUE AND ALLIED HOSPITALS, Dr. JOHN W. BRANNAN, M. D., President.

DEPARTMENT OF PUBLIC CHARITIES, JOHN A. KINGSBURY, Commissioner.

DEPARTMENT OF CORRECTION, BURDETTE G. LEWIS, Commissioner.

DEPARTMENT OF HEALTH, HAVEN EMERSON, M. D., Commissioner. jy5,16

☞See General Instructions to Bidders on last page, last column, of the "City Record," except for the address of the office for receiving and opening bids.

NOTICE TO BIDDERS AT SALES OF OLD BUILDINGS, ETC.

TERMS AND CONDITIONS UNDER WHICH BUILDINGS, ETC., WILL BE SOLD FOR REMOVAL FROM CITY PROPERTY.

THE BUILDINGS AND APPURTENANCES thereto will be sold to the highest bidder, who must pay cash or certified check, drawn to the order of the Comptroller of The City of New York, and must also give a certified check or cash in half the amount of the purchase price as security for the faithful performance of the terms and conditions of the sale. Where the amount of the purchase price does not equal or exceed the sum of $50, the sum of $50 will be the amount of the security to be deposited. This security may at any time after the expiration of the contract period be applied by the City to the cost of completing any of the work required under the contract, but unfinished at the expiration of the contract period.

The purchaser shall not lease, occupy, cause or permit the building or buildings, etc., purchased by him to be used or occupied for any purpose other than that of their speedy removal nor shall he collect any rental or other revenue for the use of either the land or the buildings, etc., situated thereon. The breach of either or any of these conditions shall forthwith void the sale and cause immediate forfeiture of the purchase money and the security deposited for the faithful performance of the conditions of the sale. The placing therein or permitting the occupancy of any such building by any tenant free, for rent or otherwise, excepting the necessary watchmen or the workmen engaged in the actual demolition thereof, shall of itself be a breach of the above conditions of sale.

The sale will be as of the condition of the property on date of delivery thereof to the purchaser. The City of New York will not be responsible for any change or loss which may occur in the condition of the buildings, or their appurtenances, between the time of the sale thereof and the time of delivering possession to the purchaser, after being properly vacated of all tenants. The sale and delivery to purchaser will be made as nearly together as the circumstances of vacating the structures of their tenants will permit.

All the material of buildings, sheds, walks, structures and cellars of whatsoever nature, with their exterior and interior fixtures, appurtenances and foundations of all kinds, except the exterior walls of the buildings and their foundations, and the sidewalks and curb in front of said buildings, extending within the described area, shall be torn down and removed from the premises. None of the dirt, debris or waste resulting from demolition shall be allowed to remain on the premises, except old mortar or plaster only, which may be left, but not higher at any point than two feet below the curb opposite that point. The exterior walls and their foundations shall be taken down only to a plane whose elevation shall be the level of the curb in front of the building. Where there is no curb the elevation of the surrounding ground shall be considered curb level. All wells, cesspools, sinks, etc., existing on the property must be filled to the level of the surrounding ground with clean earth.

The purchaser at the sale shall also withdraw and remove all abandoned water taps and old service mains, and in place thereof cause to be inserted a brass plug in the main water pipe in the street, in compliance with the rules and regulations of the Department of Water Supply, Gas and Electricity, and furnish the Department of Finance with a certificate from the Department of Water Supply, Gas and Electricity that this has been performed.

The purchaser at the sale shall also remove all house sewer connections to the main sewer in the street and the openings of the main sewer in street shall be properly closed in compliance with the directions of the Bureau of Sewers in the Borough in which the buildings are situated, and furnish the Department of Finance with a certificate from the Bureau of Sewers that the work has been properly performed.

The permit for all opening in the street to be obtained by and at the expense of the purchaser of the building.

Failure to remove said buildings, appurtenances, or any part thereof, within thirty days from the day of possession will work forfeiture of ownership of such buildings, appurtenances or portions as shall then be left standing, together with all moneys paid by said purchaser on account thereof at the time of the sale, and the bidder's assent to the above conditions being understood to be implied by the act of bidding, and The City of New York will, without notice to the purchaser, cause the same to be removed and the cost and expense thereof charged against the security above mentioned.

The work of removal must be carried on in every respect in a thorough and workmanlike manner, and must be completed within thirty days from the date of possession, and the successful bidder will provide and furnish all materials or labor and machinery necessary thereto, and will place proper and sufficient guards and fences and warning signs by day and night for the prevention of accidents, and will indemnify and save harmless The City of New York, its officers, agents and servants and each of them, against any and all suits and actions, claims and demands of every name and description brought against it, them or any of them, and against and from all damage and costs to which it, they or any of them be put by reason of injury to the person or property of another, resulting from negligence or carelessness in the performance of the work, or in guarding the same, or from any improper or defective materials or machinery, implements or appliances used in the removal of said buildings.

Where party walls are found to exist between buildings purchased by different bidders, the materials of said party walls shall be understood to be equally divided between the separate purchasers.

Party walls and fences, when existing against adjacent property not sold, shall not be taken down. All furrings, plaster, chimneys, projecting brick, etc., on the faces of such party walls are to be taken down and removed. The walls shall be made permanently self-supporting, beam holes, etc., bricked up, and the wall pointed and made to exclude wind and rain and present a clean exterior. The roofs and adjacent buildings shall be properly flashed and painted and made watertight where they have been disturbed by the operations of the Contractor.

"No buildings, parts of buildings, fixtures or machinery sold for removal under these terms and conditions, shall in any case be re-located or re-erected within the lines of any proposed street or other public improvement, and if any such buildings, parts of buildings, fixtures or machinery, etc., shall be re-located or re-erected within the lines of any proposed street or other public improvement, title thereto shall thereupon become vested in The City of New York and a re-sale at public or private sale may be made in the same manner as if no prior sale thereof had been made."

The Comptroller of The City of New York reserves the right on the day of sale to withdraw from sale any of the buildings, parts of buildings and machinery included therein, or to reject any and all bids, and be it further

Resolved, That while the said sale is held under the supervision of the Commissioners of the Sinking Fund, the Comptroller is authorized to cause the sale to be advertised and to direct the sale thereof as financial officer of the City.

NOTICE TO CONTRACTORS.

GENERAL INSTRUCTIONS TO BIDDERS ON WORK TO BE DONE FOR, OR SUPPLIES TO BE FURNISHED TO THE CITY OF NEW YORK.

The person or persons making a bid for any service, work, materials or supplies for The City or New York, or for any of its departments, bureaus or officers, shall furnish the same in a sealed envelope, endorsed with the title of the supplies, materials, work or services for which the bid is made, with his or their name or names and the date of presentation to the President or Board or to the head of the Department at his or its office, on or before the date and hour named in the advertisement for the same, at which time and place the bids will be publicly opened by the President or Board or head of said Department and read, and the award of the contract made according to law as soon thereafter as practicable.

Each bid shall contain the name and place of residence of the person making the same, and the names of all persons interested with him therein, and, if no other person be so interested, it shall distinctly state that fact; also, that it is made without any connection with any other person making a bid for the same purpose, and is in all respects fair and without collusion or fraud, and that no member of the Board of Aldermen, head of a department, chief of a bureau, deputy thereof, or clerk therein, or other officer or employee of The City of New York is, shall be or become interested, directly or indirectly, as contracting party, partner, stockholder, surety or otherwise in or in the performance of the contract, or in the supplies, work or business to which it relates, or in any portion of the profits thereof. The bid must be verified by the oath, in writing, of the party or parties making the bid that the several matters stated therein are in all respects true.

No bid will be considered unless as a condition precedent to the reception or consideration of such bid, it be accompanied by a certified check upon one of the State or National banks or trust companies of The City of New York, or a check of such bank or trust company signed by a duly authorized officer thereof, drawn to the order of the Comptroller, or money or corporate stock or certificates of indebtedness of any nature issued by The City of New York, which the Comptroller shall approve as of equal value with the security required in the advertisement to the amount of not less than three nor more than five per centum of the amount of the bond required, as provided in section 420 of the Greater New York Charter.

All bids for supplies must be submitted in duplicate.

The certified check or money should not be inclosed in the envelope containing the bid, but should be either inclosed in a separate envelope addressed to the head of the Department, President or Board, or submitted personally upon the presentation of the bid.

For particulars as to the quantity or quality of the supplies, or the nature and extent of the work, reference must be made to the specifications, schedules, plans, etc., on file in the said office of the President, Board or Department.

No bid shall be accepted from or contract awarded to any person who is in arrears to The City of New York upon debt or contract, or who is a defaulter as surety or otherwise, upon any obligation of the City.

The contract must be bid for separately.

The right is reserved in each case to reject all bids if it is deemed to be for the interest of the City so to do.

Bidders will write out the amount of their bids in addition to inserting the same in figures.

Bidders are requested to make their bids upon the blank forms prepared and furnished by the City, a copy of which, with the proper envelope in which to inclose the bid, together with a copy of the contract, including the specifications, in the form approved by the Corporation Counsel, can be obtained upon application therefor at the office of the Department for which the work is to be done or the supplies are to be furnished. Plans and drawings of construction work may be seen there.