

## CONTENTS OF SUPPLEMENT.

PERSONAL .....	205
Obituary .....	205
ENGINEERING SOCIETIES .....	205
Coming Technical Meetings .....	205
NEW PUBLICATIONS .....	206
Trade Publications .....	206
CONSTRUCTION NEWS:	
Condensed List of Contracts Pending .....	206
Railways .....	207
Street and Electric Railways .....	208
Bridges .....	209
Buildings .....	209
Water-Works .....	209
Irrigation .....	210
Sewerage .....	210
Garbage Disposal and Street Cleaning .....	210
Streets and Roads .....	210
Manufacturing Plants .....	211
Gas Plants .....	211
Miscellaneous Contracts .....	211
Contract Prices .....	212
INDUSTRIAL NOTES .....	212

## PERSONAL.

Mr. Abram Wing, Superintendent of the Iowa Water Co., Ottumwa, Ia., has resigned.

Mr. H. Nelson Hyde, for 20 years Superintendent of the water-works at Newton, Mass., has resigned.

Mr. Samuel Sloan, President of the Delaware, Lackawanna & Western R. R., will, it is reported, resign that office in February at the annual meeting of the company. He has held the office for 32 consecutive years.

Mr. Henry B. Seaman, M. Am. Soc. C. E., and M. Am. Soc. M. E., with offices at 40 Wall St., New York city, has resigned as Chief Engineer of the Audit Co., of New York, and will devote his entire time to private practice.

Prof. W. H. Dean, for several years past Water Inspector under the direction of the city council of Wilkes-Barre, Pa., has resigned to accept the position of Expert on Chemical Analysis for the Spring Brook Water Supply Co., of that city.

Mr. Rudolph Hering, M. Am. Soc. C. E., hydraulic and sanitary engineer, of New York city, has been appointed Expert Mechanical and Sanitary Engineer to review the plans of the City Engineer of Buffalo, N. Y., to abate the Hamburg Canal nuisance.

Mr. George W. Jones, who has just completed a large bridge over the Magdalena River in the United States of Colombia, arrived in New York, Dec. 19, on the steamer "Altal." The bridge has taken seven years to build on account of the swiftness of the river.

Mr. Clemens Herschel, M. Am. Soc. C. E. and M. Inst. C. E., has been awarded the Elliott Cresson gold medal by the Franklin Institute, of Philadelphia, for his invention of the Venturi water-meter. This is a well-deserved recognition of the value of a most useful discovery in hydraulic engineering.

Mr. Frederick H. Mason has opened an office as a consulting mechanical engineer, at 1020 Monadnock Block, Chicago, and will also act as the Western representative of the Frankford Steel & Forging Co., Philadelphia, Pa. He has been associated with a number of engineering firms in the West, until recently having been with the Railroad Supply Co., Chicago.

Mr. George Lewis Bradbury, Vice-President and General Manager of the Lake Erie & Western R. R., with headquarters in Chicago, has been elected President of that railway, to succeed the late Senator Calvin S. Brice, whose death was noted in our last issue. Mr. Bradbury is also Vice-President of the Cleveland, Akron & Columbus Ry., General Manager of the Northern Ohio Ry., and President of the Peoria & Pekin Union Ry.

**OBITUARY.**

Mr. Charles Hessean, architect, of Danville, Ill., died Dec. 16.

Capt. John Adams, of the Adams Bros. Co., bridge contractors, of Findlay, O., died Dec. 18, aged 58.

Mr. Charles Hillman, President of the Chas. Hillman Ship & Engine Building Co., Philadelphia, Pa., died Dec. 22, aged 75.

Mr. Walter Rosser, Sr., Division Superintendent of the Nashville, Chattanooga & St. Louis Ry., died at his home in Stevenson, Ala., Dec. 26.

Mr. Charles Hughes, senior partner of the firm of Hughes Bros. & Bangs, government contractors, of Syracuse, N. Y., died Dec. 15.

Mr. Charles G. Martin, brass manufacturer, of Mount Vernon, N. Y., died Dec. 21, aged 84. He was a brother of the late Daniel B. Martin, who was an engineer in the U. S. navy.

Col. Daniel Morris, civil engineer, of Atlantic City, N. J., died Dec. 21, aged 79. He laid out the city, and was the constructing engineer of the first railway from Camden to Atlantic City.

Mr. Albert C. Robnson, architect, of East Kingston, N. H., died Dec. 18, aged 52. He was for several years Superintendent of water-works at Knoxville, Tenn.; Fort Payne, Ala., and other places in the South.

Mr. Edward F. Randolph, of the firm of Randolph & Clowes, manufacturers of brass and copper tubing, etc., of Waterbury, Conn., died Dec. 18, of pneumonia, at his residence in New York city, aged 68. The business, we are informed, will continue under the same management as heretofore.

Dr. Wellington Adams, an electrical engineer and inventor, of St. Louis, Mo., died Dec. 20, aged 42. He came into prominence some years ago as the promoter of an electric railway from St. Louis to Chicago.

Major Frederick Henry Smith, M. Am. Soc. C. E., civil engineer and bridge builder, died at Baltimore, Md., on Dec. 24, aged 59 years. He was a brother of the late C. Shaler Smith, M. Am. Soc. C. E., and was associated with the latter in many of his bridge enterprises.

Col. Philip Henry Moore, Editor and owner of "The Ohio Valley Manufacturer," died at Wheeling, W. Va., Dec. 26, of paralysis. He served in the Engineer Corps of the Confederate Army during the Civil War. In 1859 he established the "Daily Union" of Wheeling, W. Va.

Mr. Stephen A. Morse, inventor and founder of the firm of Morse, Williams & Co., Philadelphia, Pa., elevator manufacturers, died in that city Dec. 22. He was born in Holderness, N. H., May 28, 1828, and learned the trade of a machinist. He went to Philadelphia about 25 years ago and soon after began the manufacture of elevators. He was the inventor of the well-known Morse twist drill.

Mr. R. T. McDonald, President of the Fort Wayne Electric Corporation, Fort Wayne, Ind., died in Dallas, Tex., Dec. 24, of pneumonia, aged 49. He was born in Pennsylvania, and removed to Fort Wayne in 1859, where he identified himself with various business enterprises and was instrumental in introducing electric lighting into that city. Later he gave his attention to electric railways and assisted in the formation of the company of which he was the head at the time of his death. He was also interested in a large ice-making plant in New Orleans, La., and had lately obtained the contract to build sewers in that city.

## ENGINEERING SOCIETIES.

**COMING TECHNICAL MEETINGS.**

ENGINEERING SOCIETY OF WESTERN NEW YORK. Jan. 2. Secy., H. J. March, Library Bldg., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL. Jan. 2. Secy., C. L. Annan, City Engineer's Office, St. Paul, Minn.

FRANKLIN INSTITUTE. Jan. 3. "Methods for the Examination of Explosives," Dr. W. J. Williams. Jan. 11. "Segregation Tests on Steel Ingots," A. W. Allen. Jan. 17. "The Clarification and Purification of Municipal Water Supplies," Mr. Allen Hazen. Jan. 20. "This Country of Ours," John Birkluhine. Secy., Wm. H. Wahl, 15 South 7th St., Philadelphia, Pa.

WESTERN SOCIETY OF ENGINEERS. Jan. 3. Annual meeting. Secy., N. L. Litten, Monadnock Block, Chicago, Ill.

FOUNDRYMEN'S ASSOCIATION, PHILADELPHIA. Jan. 4. Secy., Howard Evans, Pier 45, Delaware Ave., Philadelphia, Pa.

ENGINEERS' CLUB OF ST. LOUIS. Jan. 4. Secy., Richard McCulloch, 2401 N. Spring Ave., St. Louis, Mo.

AMERICAN SOCIETY OF CIVIL ENGINEERS. Jan. 4. Secy., C. W. Hunt, 220 West 57th St., New York city.

AMERICAN INSTITUTE, AND THE HENRY ELECTRICAL SOCIETY. Jan. 6. "Polarized Light," Louis H. Laudy. Jan. 20. "Alternating Currents," Wm. H. Freedman. Secy., D. R. Lovejoy, 111 W. 38th St., New York city.

TECHNICAL SOCIETY OF THE PACIFIC COAST. Jan. 6. Secy., O. Von Geldern, 19 Market St., San Francisco, Cal.

BROOKLYN INSTITUTE OF ARTS AND SCIENCES. Jan. 6. "The Electro-Metallurgy of Copper," John B.F. Herschoff. Secy., Henry I. Weed, Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

CHICAGO ELECTRICAL ASSOCIATION. Jan. 6. "Telephone Engineering: Some Problems, Solved and Unsolved," S. G. McMeen. Secy., J. R. Cravath, 825 Monadnock Block, Chicago, Ill.

THE ENGINEERS' CLUB OF PHILADELPHIA. Jan. 7. Secy., L. F. Rondinella, 1122 Girard St., Philadelphia, Pa.

ENGINEERS' CLUB OF COLUMBUS. Jan. 7. Secy., H. M. Gates, 12½ North High St., Columbus, O.

THE LOUISIANA ENGINEERING SOCIETY. Jan. 9. Secy., J. F. Coleman, 712 Union St., New Orleans, La.

ENGINEERS' CLUB OF KANSAS CITY. Jan. 9. Secy., F. W. Tuttle, Baird Bldg., Kansas City, Mo.

DENVER SOCIETY OF CIVIL ENGINEERS. Jan. 10. Secy., W. B. Lawson, 36 Jacobson Bldg., Denver, Col.

NORTHWEST RAILWAY CLUB. Jan. 10. Secy., T. A. Foque, Soo Line, Minneapolis, Minn.

NEW ENGLAND RAILWAY CLUB. Jan. 10. Secy., Edw. L. James, P. O. Box 1158, Boston, Mass.

CIVIL ENGINEERS' CLUB OF CLEVELAND. Jan. 10. Secy., Wm. H. Searles, Case Library Bldg., Cleveland.

CANADIAN SOCIETY OF CIVIL ENGINEERS. Jan. 12. Annual meeting. Secy., C. A. McNab, 112 Mansfield St., Montreal, Can.

ENGINEERING ASSOCIATION OF THE SOUTH. Jan. 12. Secy., C. B. Wilson, 1000 Broad St., Nashville, Tenn.

CENTRAL RAILWAY CLUB. Jan. 13. Secy., H. D. Vought, 114 Fifth Ave., New York city.

ST. LOUIS RAILWAY CLUB. Jan. 13. Secy., H. H. Roberts, 511 Commercial Bldg., St. Louis, Mo.

SCRANTON ENGINEERS' CLUB. Jan. 14. Annual meeting. Secy., F. E. Pratt, 730 Madison Ave., Scranton, Pa.

MONTANA SOCIETY OF ENGINEERS. Jan. 14. Annual meeting. Helena, Mont. Secy., A. S. Hovey, National Bank Bldg., Helena, Mont.

AMERICAN INVENTORS' AND MANUFACTURERS' ASSOCIATION. Jan. 15. Annual meeting, Washington, D. C. Secy., Arthur Stewart, Washington Loan and Trust Bldg., Washington, D. C.

ENGINEERS' AND ARCHITECTS' CLUB OF LOUISVILLE. Jan. 16. Secy., Marshall Morris, 16 Norton Bldg., Louisville, Ky.

## TECHNICAL CLUB OF OMAHA.

Jan. 16. Secy., J. Harry Lawrie, Omaha, Neb.

ENGINEERS' CLUB OF MINNEAPOLIS. Jan. 16. Secy., H. E. Smith, 1020 S. E. 14th St., Minneapolis, Minn.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA. Jan. 17. Secy., R. A. Fessenden, 410 Penn Ave., Pittsburgh, Pa.

WESTERN RAILWAY CLUB. Jan. 17. Secy., F. M. Whyte, 225 Dearborn St., Chicago, Ill.

BOSTON SOCIETY OF CIVIL ENGINEERS. Jan. 18. Annual meeting. Secy., S. E. Tinkham, City Hall, Boston, Mass.

WESTERN FOUNDRYMEN'S ASSOCIATION. Jan. 18. Secy., B. M. Gardner, 1522 Monadnock Block, Chicago, Ill.

THE IOWA ENGINEERING SOCIETY. Jan. 18-19. Annual meeting, Iowa City, Iowa. Secy., E. P. Boynton, Cedar Rapids, Ia.

NEW YORK RAILROAD CLUB. Jan. 19. Secy., W. W. Wheatley, 168 Montague St., Brooklyn, N. Y.

ENGINEERS' CLUB OF CINCINNATI. Jan. 19. Secy., J. F. Wilson, P. O. Box 333, Cincinnati, O.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB. Jan. 19. Secy., F. A. Charplot, P. O. Box 13, Savannah, Ga.

THE WEST VIRGINIA SOCIETY OF CIVIL ENGINEERS AND ARCHITECTS. Jan. 19-20. Annual meeting, Charleston, W. Va. Secy., W. Steenbergen, Point Pleasant, W. Va.

NORTHWESTERN ELECTRICAL ASSOCIATION. Jan. 19-21. Semi-annual meeting, Milwaukee, Wis. Secy., Thos. R. Mercier, 511 Montgomery Bldg., Milwaukee, Wis.

TECHNICAL SOCIETY OF THE PACIFIC COAST. Jan. 20. Annual meeting. Secy., O. Von Geldern, 519 Market St., San Francisco, Cal.

ROCHESTER ENGINEERING SOCIETY. Jan. 20. Secy., John F. Skinner, Reynolds Library Bldg., Rochester, N. Y.

THE DETROIT ENGINEERING SOCIETY. Jan. 20. Secy., Henry Goldmark, Wayne Co., Sav. Bank Building, Detroit, Mich.

NATIONAL ASSOCIATION OF MANUFACTURERS. Jan. 24-26. Annual convention, Cincinnati, O. Secy., E. P. Wilson, Room A, Chamber of Commerce, Cincinnati, O.

INDIANA ENGINEERING SOCIETY. Jan. 24-26. Annual meeting, Indianapolis, Ind. Secy., J. B. Nelson, 61 Baldwin Block, Indianapolis, Ind.

MICHIGAN ENGINEERING SOCIETY. Jan. 24-26. Annual meeting, Lansing, Mich. Secy., F. Hodgman, Cilmex, Mich.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Jan. 25. Secy., Ralph W. Pope, 26 Cortlandt St., New York city.

ILLINOIS SOCIETY OF ENGINEERS AND SURVEYORS. Jan. 25-27. Annual meeting, Champaign, Ill. Secy., Jacob A. Harman, Peoria, Ill.

ROCHESTER ENGINEERING SOCIETY.—The annual meeting of this society was held on Dec. 16. The following officers were elected for the ensuing year: Pres., William Jordan; First Vice-Pres., Wm. R. Storey; Second Vice-Pres., C. C. Laney; Secy., John F. Skinner; Treas., Robert Cartwright.

THE ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—A regular meeting of this society was held at Pittsburgh, Pa., on Dec. 20. The paper of the evening, entitled "Design and Construction of the 29th St. Power Station of the Consolidated Traction Company," was read by Mr. G. F. Greenwood, Chief Engineer and General Manager of the company.

THE ELECTRICAL TRADES SOCIETY OF NEW YORK, a society composed of manufacturers of electrical goods, held a meeting at the Astor House, New York city, on Dec. 6, at which it was decided to file incorporation papers under the New York State laws.

The following officers were elected for the ensuing year: Pres., R. E. Gallaher; Vice-Pres., C. P. Geddes; Secy.-Treas., A. P. Eckert.

ENGINEERS' CLUB OF CINCINNATI.—This club held its annual meeting on Dec. 15 with an attendance of over 40. Routine business was transacted, after which the customary banquet was enjoyed. The officers elected for the ensuing year are as follows: Pres., Schuyler Hazard; Vice-Pres., T. B. Punshon; Secy.-Treas., J. F. Wilson; Directors, A. O. Elzner, W. C. Jewett and L. E. Bogson.

BOSTON SOCIETY OF CIVIL ENGINEERS.—This society attended a meeting of the Society of Arts held in the new Pierce Building of the Institute of Technology, on Dec. 22, to inspect the equipment of the new building. Descriptions of the heating and ventilating, and electric light equipments were given by Prof. S. Homer Woodbridge and W. L. Puffer. The apparatus in the mechanical laboratories was inspected and the large Emery testing machine was shown in operation.

ENGINEERS' CLUB OF ST. LOUIS.—The annual meeting and dinner of this club was held at the Mercantile Club, Dec. 21. Previous to the toast officers for the ensuing year were elected as follows: Pres., B. H. Colby; Secy., E. R. Fish; Treas., Thos. B. McMath; Librarian, E. J. Jolley; Directors, J. H. Kinealy and John A. Laird; Members of the Board of Managers of the Association of Engineering Societies, J. B. Johnson and Richard McCulloch. Richard McCulloch, Secy.

THE AMERICAN CHEMICAL SOCIETY.—The 18th annual meeting of this society opened on Dec. 27 at the House of the Chemists' Club of New York, 108 W. 63th St., New York city. Hon. Randolph Guggenheimer, President of the City Council, welcomed the society to New York. Prof. Alexander S. Webb, President of the College of the City of New York, spoke in behalf of the educational institutions of the city. The President of the society, Mr. Chas. E. Monroe, responded, and the reading of the papers was then taken up.

**CONNECTICUT ELECTRIC LIGHTING ASSOCIATION.**—The annual meeting of this association was held at New Haven, Conn., on Dec. 17. Papers were read by Prof. W. L. Robb on the "Use of Rotary Transformers and Storage Batteries by the Hartford Electric Light Co.," and on "The Merits and Demerits of the Welsbach Lamp," by H. L. Purrington.

The following officers were elected for the ensuing year: Pres., James English; First Vice-Pres., C. A. Learned; Second Vice-Pres., C. H. Nettleton; Secy., A. F. Hunie; Treas., A. M. Young.

**UNDERWRITERS' NATIONAL ELECTRICAL ASSOCIATION.**—The 6th annual meeting of the Electrical Committee of this association was held in New York city, Dec. 6-8. Such matters as specifications for standard electric light fittings and slight changes in the national electrical code were discussed. A committee was appointed to formulate specifications for tests of rubber covered wires.

Several resolutions were passed recommending the general adoption by all underwriters' associations of a List of Approved Electrical Fittings. This is a list of fittings approved by the National Board of Fire Underwriters.

**MONTANA SOCIETY OF ENGINEERS.**—A regular meeting of this society was held on Dec. 10, at which Mr. Francis W. Blackford read a paper on the "Butte-Centerville Electric Ry.," in which the construction of this road was fully described. The next meeting, to be held at Helena, Mont., Jan. 12-14, will be the 12th annual meeting. Mr. M. S. Parker will present a paper upon the "Big Hole River Dam." The State Engineer's Bill will also come up for discussion. Excursions will be made to the dam at Canyon Ferry, Missouri River, the Peck concentrator, East Helena and the East Helena smelter.  
A. S. Hovey, Secy.

**NORTHWESTERN ELECTRICAL ASSOCIATION.**—The 7th annual convention of this association will be held at Milwaukee, Wis., on Jan. 18-19.

The following papers will be read: "Trend of Central Station Design," B. J. Arnold, Chicago; "Meter-rate Systems," E. L. Debell, Sheboygan, Wis.; "Design of Secondary Circuits in Alternating Plants," George L. Thayer, Belle Plaine, Ia.; "Electricity Direct from Coal," Prof. A. J. Rogers, Milwaukee, Wis.; "Inductive Loads on Alternating Current Transformers," Prof. D. C. Jackson, Madison, Wis.; "Electric Vehicles and Their Relation to Central Stations," H. M. Maxim, Hartford, Conn.; "Association Management," H. L. Doherty, Madison, Wis.

**WESTERN SOCIETY OF ENGINEERS.**—At the meeting on Dec. 21, Mr. W. H. Fluley, Bridge Engineer of the Chicago & Northwestern Ry., described the design and erection of the new Kluzie St. drawbridge over the Chicago River. It is a riveted lattice structure, replacing an old pin-connected bridge built of "Hay" steel, which is hard and brittle. In order to provide an increased width of channel and still prevent interference with the adjacent Kinzie St. highway bridge, the railway bridge has its pivot under one of the trusses. On the inner side of the roller tracks are top and bottom racks, with which engage spur wheels on roller shafts. This is done to prevent any tendency of the rollers to work out from under the bridge. The structure was partially erected on launching ways on land, then hauled out 30 ft. to allow of its completion, the completed structure being then carried by scows to the site, the old bridge being floated away on scows at the same time.

**NEW PUBLICATIONS.**

**THE USE OF COKE BREEZE IN SEWAGE PURIFICATION.**—A Paper by Jno. W. Alvord, C. E., read before the Western Society of Civil Engineers, May 18, 1898. Paper; 6 x 9 ins.; pp. 11. Address the author, The Rookery, Chicago.

A number of experiments with filters designed to work at a high rate, both in this country and abroad, are reviewed in this pamphlet.

**MUNICIPAL REPORTS.**—The following reports have been received, and the reports and the names given being those of city engineers, unless otherwise specified: Boston, Mass., Benj. Wells, Superintendent Street Department. Cambridge, Mass., Special Report on Means to Prevent Back Flooding from Sewers, L. M. Hastings. Newton, Mass., H. D. Woods. Central Falls, R. I., W. F. Keene. Easton, Pa., Harrison R. Fehr. Philadelphia, Pa., Thos. M. Thompson, Director Public Works. Wilmington, Del., T. Chalkley Hatton, Engineer Sewers. Glenville, O., Report on Sewerage and Sewage Purification for Glenville, O., by John P. Force, Columbus, O. Indianapolis, Ind., J. Clyde Power, Engineer and Superintendent of Parks. Detroit, Mich., Henry D. Ludden. Duluth, Minn., Thos. F. McGilvray, Minneapolis, Minn., W. M. Berry, Superintendent of Parks. St. Paul, Minn., L. W. Rundlett. St. Louis, Mo., A. N. Milner, Street Commissioner. Toronto, Ont., Report on Sewage Disposal, C. H. Rust.

**TRADE PUBLICATIONS.**

(The standard sizes for pamphlets and trade catalogues recommended by all the principal engineering societies of the United States are: 3 1/2 x 6 ins., 6 x 9 ins., and 9 x 12 ins.)

**STEEL LATH.**—Bostwick Steel Lath Co., Niles, O. Pamph.; 6 x 9 ins.; pp. 28; illustrated.

This catalogue contains descriptions and illustrations of the Bostwick patented, perforated metal lath, Holton's patent slip joint eave trough, and a general line of gutters, ventilators, etc., etc.

**IRON AND STEEL ROOFING.**—Sykes Iron & Steel Roofing Co., Niles, O. Pamph.; 9 x 6 ins.; pp. 40; illustrated.

This is a descriptive catalogue of a general line of corrugated iron and steel roofing and siding.

**FRICION CLUTCHES.**—G. D. Grannis, Syracuse, N. Y. Pamph.; 3 3/4 x 5 1/2 ins.; pp. 15; illustrated.

This pamphlet describes and illustrates the construction and operation of the Jackson friction clutch for which several advantages are claimed in economy and efficiency.

**WIRE CABLE FERRIES.**—Trenton Wire Co., Trenton, N. J. Pamph.; 5 3/4 x 8 1/4 ins.; pp. 7; illustrated.

This pamphlet gives a pretty complete illustrated description of the above company's system of wire rope ferry construction.

**VALVES, INJECTORS, STEAM SPECIALTIES, ETC.**—The Lunkenheimer Co., Cincinnati, O. Pamph.; 4 3/4 x 7 1/4 ins.; pp. 208.

This is a very complete illustrated catalogue of the well-known Lunkenheimer specialties for steam, water, gas and oil.

**STRUCTURAL STEEL WORK.**—The Pittsburg Bridge Co., Pittsburg, Pa. Pamph.; 6 x 3 3/4 ins.; pp. 40; illustrated.

This pamphlet is made up chiefly of illustrations of a great variety of bridges and buildings for which the company named has furnished the steel work.

**VALVES, EXPANSION JOINTS, STEAM AND WATER APPLIANCES.**—Caldwell Wilcox Co., Newburgh, N. Y. Pamph.; 9 x 5 ins.; pp. 20.

This is an illustrated catalogue of a variety of appliances used in connection with steam and water piping, including screens, flexible joints, steam and water separators, or water-catchers, slip joints, etc.

**RECENT BALDWIN LOCOMOTIVES.**—Baldwin Locomotive Works, Philadelphia, Pa. Pamph.; 9 x 6 ins.; pp. 32; illustrated.

This is No. 9 of the 1898 series of pamphlets describing the locomotives built by the above-named company to American and foreign orders, and it is devoted mostly to heavy locomotives for freight service.

**WINTER TOURS: LEHIGH VALLEY R. R.—**Passenger Department, Lehigh Valley R. R., New York, N. Y. Pamph.; 5 1/2 x 8 ins.; pp. 14; illustrated.

This pamphlet outlines a large number of tours to the winter resorts of Florida and other southern states, with such details of the natural attractions, hotel accommodations, railway and hotel rates, etc., as are likely to interest the prospective tourist.

**STEEL ROOFING.**—Canton Steel Roofing Co., Canton, O. Pamph.; 6 x 9 ins.; pp. 128; illustrated.

This is a catalogue and price list of the different forms of stamped sheet metal manufactured by the above company. Among the various forms of plain and stamped work produced are sittings, ceilings, moldings, cornices, gutters and eaves troughs, roofing, ridges, skylights, vanes, ventilators, finials, etc.

**FIREPROOF GRAIN ELEVATORS.**—Steel Storage & Elevator Cons. Co., Buffalo, N. Y. Pamph.; 6 x 9 ins.; pp. 31; illustrated.

This catalogue gives a very good illustrated description of the steel storage grain elevators and pneumatic grain conveying system of which the above company makes a specialty. Views of a number of elevator plants built by the company in the Western and Central States are given.

**STREET SWEEPING MACHINES.**—Improved Street Sweeper Co., German National Bank Building, Pittsburg, Pa. Paper; 4 1/2 x 7 ins.; pp. 12; illustrated.

This catalogue describes a pick-up street sweeping machine. The broom is of wire, instead of fiber. The dirt is accumulated in a tank, which is emptied mechanically either at intervals on the street, or at the dump, the broom being raised in case the dirt is to be hauled to the dump.

**STEEL ROOFING.**—Niles Iron & Steel Roofing Co., Niles, O. Pamph.; 6 x 9 ins.; pp. 25; illustrated.

This catalogue describes the construction of the different forms of steel roofing, ceilings, ridges, gutters and other forms of stamped sheet metal work produced by the company named. Special qualities of roof paints and tools used in laying sheet metal roofing are also described and a price list of all articles is given.

**STEAM SHOVELS AND DREDGES.**—The Toledo Foundry & Machine Co., Toledo, O. Pamph.; 9 1/2 x 6 1/4 ins.; pp. 94; illustrated.

The several classes of "Victor" shovels which are built by this firm are quite fully described and illustrated in this pamphlet. It also contains a number of illustrations of dipper dredges built by the same company, together with the "Victor" railway pile driver and the "Victor" turntable.

**HOISTING AND CONVEYING MACHINERY.**—G. D. Grannis, Syracuse, N. Y. Pamph.; 8 1/2 x 6 ins.; pp. 16; illustrated.

This pamphlet describes and illustrates quite fully the Jackson hoister and conveyor for sewer and trench work, the Jackson rotating hoister and conveyor, and the Jackson revolving, self-propelling pile driver. These machines have been quite extensively used on the Erie Canal enlargement, and on various pieces of sewer work.

**"SALAMANDER" FIREPROOFING.**—The American Fireproofing Co., Boston, Mass. Pamph.; 6 x 3 1/2 ins.; pp. 32; illustrated.

Salamander is made in rolls, like roofing felt, and is designed to be used as a lining between floors, and in other places where a sound deadener or a dust and air-proof lining is desired. Among the claims made for the material are that it is non-inflammable and a non-conductor of heat, and this pamphlet describes more particularly the results of various tests made to demonstrate these characteristics.

**ELECTRICALLY OPERATED TURNTABLES.**—The Westinghouse Electric & Mfg. Co., Pittsburg, Pa. Pamph.; 9 x 6 ins.; pp. 12; illustrated.

In this pamphlet the company presents a brief description and a number of illustrations of its special motor car, or "donkey," for turntable operations. The device requires no changes in the turntable proper, and can be attached to any construction of table, and a quite complete account of its construction and operation was given in Engineering News of May 27, 1897, and Aug. 25, 1898.

**BRIDGE RAILINGS.**—Chester B. Albrece, Allegheny, Pa. Pamph.; 9 x 6 ins.; pp. 130; illustrated.

This pamphlet illustrates and describes very briefly a large number of structural and special styles of railings, portal castings, lamp posts, cornice and facias, stairways, etc., for bridges, which are manufactured by the above-named firm. The variety of designs shown is very large and most of them are examples of actual work. In a supplement the pamphlet devotes several pages to the special forms of bridge riveters designed and built by Mr. Albrece.

**THE REMINGTON TYPEWRITER AFLOAT.**—Wyckoff, Seamans & Benedict, New York, N. Y. Pamph.; 9 x 6 ins.; pp. 24; illustrated.

This pamphlet contains handsome half-tone engravings of the different larger vessels of the United States Navy, each accompanied by a brief description giving dimensions, armament, a general outline of the machinery, and other similar details. The statement that each vessel's equipment also includes one or more Remington typewriters constitutes the "trade" feature of the pamphlet, which is in many respects a better handbook of our larger war ships than many more formal and pretentious books which we have seen.

**TRANSFORMER DESIGN AND OPERATION.**—General Electric Co., Schenectady, N. Y. Pamph.; 8 x 10 1/2 ins.; pp. 30.

This pamphlet, number 9,064 of the General Electric series, is a reprint of two papers on transformers, one, "Alternating Current Transformers from the Station Manager's Standpoint," by Mr. W. F. White, read before the American Institute of Electrical Engineers, and the other, "Transformer Economy," by Prof. W. E. Goldsborough, read before the National Electric Light Association. These are supplemented by several maps of Conshohocken, Pa., showing how a few large transformers were substituted for a number of smaller ones, with a considerable saving in operating expenses. As a further example of the economy of large transformers, the alternating current distribution system at Pueblo, Colo., is shown in the same way. Instruments for making transformer tests are also illustrated and briefly described.

**TARGET-READING TACHEOMETER.**—Bell-Elliott patent, Messrs. Elliott Brothers, Opticians to the Government, 101-102 St. Martin's Lane, London, England. Paper; 8 x 5 1/2 ins.; pp. 22.

This pamphlet describes the method of using a target-reading tachometer invented by Mr. George Joseph Bell, Assoc. M. Inst. C. E., of Carlisle, England. The instrument is intended to measure distances and altitudes, and a graduated staff is placed on the point to be measured, and it accomplishes the work of a transit, level and chain at one operation and with extreme accuracy. In general the instrument resembles a transit with level divided wide and compass attached. But it is also provided with a tangent scale, moved by a micrometer drumhead, dividing one full division of 1-16 in. on the tangent scale into 1,000 equal parts; it is read by a microscope. The instrument reads the actual natural tangent of the observed angle, and books of tables are not required for field work. While instruments of this type are not much used in this country, the results obtained with the Bell-Elliott tachometer are said to be accurate to five places of decimals, and to be more precise than when obtained by the chain. The cost of the instrument complete ranges from \$200 for a 4-in. reading to 1', to \$250 for a 6-in. reading to 20'.

**CONSTRUCTION NEWS.**

**CONDENSED LIST OF CONTRACTS PENDING WITH DATE OF OPENING BIDS.**

Bids to be opened.	Work.	Place.	See Eng. News.
Dec. 29.	Street bonds,	Georgetown, Ky.	Dec. 8
Dec. 29.	Asphalt paving,	Louisville, Ky.	Dec. 22
Dec. 29.	Bridge superstructure,	Boston, Mass.	Dec. 22
Dec. 29.	Heating, etc.,	Brockton, Mass.	Dec. 22
Dec. 29.	Pumping station,	Boston, Mass.	Dec. 22
Dec. 29.	Street lighting,	Camden, N. J.	Dec. 22
Dec. 29.	Removing garbage, etc.,	Hudson, N. Y.	Dec. 22
Dec. 30.	Laundry machinery,	Danville, Ill.	Dec. 22
Dec. 30.	Electric light wiring,	Syracuse, N. Y.	Dec. 22
Dec. 30.	Building alterations,	Wilkesbarre, Pa.	Dec. 22
Dec. 30.	Riveted steel pipe,	Pittsburg, Pa.	Dec. 22
Dec. 30.	Repairs to workhouse,	New York, N. Y.	Dec. 22
Dec. 30.	Station house repairs,	New York, N. Y.	Dec. 22
Dec. 30.	Towing garbage scows,	New York, N. Y.	Dec. 22
Dec. 30.	Scow, New York, N. Y.		Dec. 22
Dec. 30.	Self-dumping cars (6),	New York, N. Y.	Dec. 22
Dec. 30.	Sewers, East Cleveland,	O.	Dec. 22
Dec. 31.	Plans for station, etc.,	Stockholm, Sweden.	June 23
Dec. 31.	Bridge work,	Plattsmouth, Neb.	Dec. 15
Dec. 31.	Steam boilers,	Alexandria, Egypt.	Dec. 15
Dec. 31.	Cleaning market grounds,	Cleveland, O.	Dec. 15
Dec. 31.	Electric lighting,	Eau Claire, Wis.	Dec. 22
Dec. 31.	Water bonds,	Bemidji, Minn.	Dec. 22
Dec. 31.	Road materials, etc.,	New York, N. Y.	Dec. 22
Dec. 31.	Wooden pier,	New York, N. Y.	Dec. 22
Dec. 31.	Bridges, Columbus, Neb.		Dec. 22
Dec. 31.	Bridges for 1898,	Geneva, Neb.	Dec. 22
Jan. 1.	Electric lighting,	Pleasantville, O.	Dec. 15
Jan. 1.	City hall plant,	Bridgeport, Conn.	Aug. 18
Jan. 1.	Drawbridge,	Cathlamet, Wash.	Nov. 17
Jan. 1.	Water-works,	Pasadena, Cal.	Nov. 17
Jan. 1.	Electric plant,	Pasadena, Cal.	Nov. 17
Jan. 2.	Bridge, Quebec, Que.		Sept. 20

Advertised, Eng. News, Sept. 29 and Oct. 6.











ferent makes of brick were submitted. The bidders included Thomas McGuigan, Meadville; James McAfee & Co., Allegheny; Peter Schenck, Butler, Pa.

Shanghai Inland Water Co. secured the concession for the water-works, and will also take an engineer from Cincinnati to put up the plant and operate it under contract for one year or 18 months.

South African General Electric Co., Schenectady, N. Y.; \$50,000; to deal in electrical apparatuses and construct works and plants involving their use in the United States, South Africa, and other foreign countries; S. D. Greene, Henry W. Darling, D. Mazent, J. R. Lovejoy and M. F. Westover, of Schenectady.

BIDS RECEIVED AT NEWBURGH, N. Y., DEC. 19, 1898, FOR CONSTRUCTING MAIN SEWER.

Table with columns: Bidder, No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, No. 9, No. 10, No. 11, No. 12, No. 13, No. 14. Includes bid amounts and specifications for tunnel sewers.

The estimated quantities are as follows: No. 1—About 30 ft. timber trunk sewer, 4 x 4 ft., at Hudson River; No. 2—About 860 ft. cast-iron pipe sewer, 42-in., with average depth of about 8 ft.; No. 3—About 320 ft. brick sewer with invert blocks, 54 ins. diameter, and average depth of 12 to 20 ft.;

INDUSTRIAL NOTES.

THE MONASH WATER HEATER CO., Pittsburg, has leased the 4-story building, 306 Wood St., for its new factory.

THE RITER-CONLEY MFG. CO., Pittsburg, has a contract for cyanide tanks, to cost \$30,000, for the Gold Hill Mining Co., Johannesburg, South Africa.

THE Q & W TIE PLATE, illustrated in our issue of Dec. 15, has been declared in interference in the patent office with a plate known as the Glendon Flange tie-plate, patented by Wm. Goldie, of Dilworth, Porter & Co., Sept. 6, 1898, Patent No. 610,179.

THE CRUMBLISH FORGE CO., 18 and 20 Elk St., Buffalo, N. Y., announces that the increasing demand for its forges has necessitated the removal of its shops to the above address. The company was formerly located at 80 Virginia St.

THE WESTINGHOUSE ELECTRIC & MFG. CO., Pittsburg, is said to have a contract from the Kings County Electric Light Co., Brooklyn, for two 3,000 K-W generators, which will produce about 4,000 HP. each, and reported as to cost \$80,000 to \$85,000.

THE F. W. EMERSON MFG. CO., Rochester, N. Y., informs us that there were about 50 adjustable drafting tables in the large shipment just made to the University of California. These tables are now in use in many drafting rooms, and are said to give excellent satisfaction.

THE NEW YORK & OHIO CO., Warren, O., manufacturer of the Packard incandescent lamps and transformers, received a contract Dec. 22 for 15,000 incandescent lamps of from 8 to 100 c. p. from the Bangkok Electric Light Syndicate, Bangkok, Siam, which has a 20-years' contract to light the king's palace. The order is for one year's supply.

THE ERIE CAR CO., Erie, Pa., reports that it has so many orders on hand that it has been obliged to enlarge the plant. The company has an order for 400 gondola cars for the Pennsylvania R. R., and another order for 300 gondola cars for the Pennsylvania Lines West of Pittsburg. The cars are to be of 50,000 lbs. capacity each. Mr. William H. Hamilton is the President of the company.

THE CARNEGIE STEEL CO., Pittsburg, is reported in local papers to have purchased 35 acres west of Homestead upon which will be erected a 250 x 1,500-ft. shop for the manufacture of flat and hopper-bottom freight cars, similar to those now made by the Schoen Pressed Steel Co., of Allegheny. It is said that the new plant will have a capacity of 40 cars a day, in addition to a forge for the manufacture of car axles.

THE THOMSON METER CO., 79 Washington St., Brooklyn, states that it recently received from a large city, a 6-in. water meter, No. 44,368, for repairs. On examination it was found that this meter was sold Oct. 17, 1893, since which time it has registered 99,989,870 cu. ft., or 749,924,025 gallons, of water, and it has never been repaired before. The cost of repairs necessary to put it in as good shape as new was less than \$28.

THE PENNSYLVANIA & MARYLAND STEEL CO., is announced in press despatches to have contracts from the Russian Government for 80,000 tons of steel rails for the Eastern Chinese Railway, and from the government of Victoria, Australia, for 35,000 tons. One cargo of rails has already been sent to the latter country. It is stated that each contract was secured because the American bidder named a lower price than any competitor.

THE ERIE GAS ENGINE CO., Erie, Pa., is now installing a 200-HP. gas engine in the plant of the McCoy Glass Co., Kane, Pa. This is claimed to be the largest gas engine ever built in the United States. The company has, among other orders on hand, one for a 100-HP. gas engine for the Grand Driller Co., New Kensington, Pa., and an order for seven 50-HP. gas engines for use in the natural gas district. Mr. F. F. Curtze is the Secretary of the company.

THE LOMBARD WATER WHEEL GOVERNOR CO., 61 Hampshire St., Boston, reports that the demand for its governors is constantly on the increase. Last month orders were received for upwards of 20 governors to regulate 41 water wheels, which will develop 15,750 HP. More than half of this machinery will be used in electric stations, principally in power transmission plants, and electric railway stations, the balance being in textile and other manufacturing plants driven by water power.

THE LAIDLAW-DUNN-GORDON CO., Cincinnati, has just shipped to Shanghai, China, four carloads of machinery, consisting of two cross-compound condensing pumping engines, with condensers, boilers and other equipments. It is said that the machinery goes to New York

companies will control five-eighths of the annual world's production of crude rubber. Among the companies mentioned as included in the new concern are the Boston Belting Co., New York Belting & Packing Co., B. F. Goodrich, Akron, Ohio; New York Mechanical Rubber Co., Cleveland Rubber Co., New York Gutta Percha & Rubber Co., New York Rubber Co., Stoughton Rubber Co., Stoughton, Mass.; Hartford Rubber Co., and Morgan & Wright, Chicago.

THE BALL ENGINE CO., Erie, Pa., reports a good business in Ball engines, having a number of government orders on hand, among them the following: A 300-HP. vertical, double Ball engine, direct-connected to a Siemens-Halske dynamo, for the New York Navy Yard; two 175-HP. double Ball engines, direct-connected to Siemens-Halske dynamos, for the Norfolk Navy Yard, and a 175-HP. double Ball engine, direct-connected to a General Electric dynamo, for the naval station on Puget Sound, at Bremerton, Wash. The company also has orders for a 250-HP. engine and a 275-HP. engine to be direct-connected to Western Electric dynamos, by means of the Arnold system of connecting, for the Garrett Building, Chicago; also orders for three 250-HP. cross-compound engines, to be direct-connected to Western Electric dynamos, for the Great Northern Hotel, Chicago. The officers of the company are: Pres. and Mgr., Jas. McBrier; Vice-Pres., D. N. McBrier, and Secy. and Treas., H. L. McBrier.

THE PLAYFORD STOKER CO., Cleveland, O., received the following orders for stokers on Dec. 19: From the Apollo Iron & Steel Co., Pittsburg, 24 stokers, to be attached to 24 250-HP. Cahall vertical water-tube boilers at Vandergriff, Pa., where the former company has just completed installing six stokers, and for which it also has six more under construction; from the Heine Safety Boiler Co., Pittsburg, one stoker for a 200-HP. water-tube boiler, for the H. J. Heinz Co., Allegheny, Pa. and from W. F. Patterson, Pittsburg, one stoker to be fitted to a 250-HP. Erie City water-tube boiler, for the Howard St. pumping station of the Allegheny, Pa., water-works. The Playford Co. is also installing eight stokers to 300 HP. boilers for the National Tube Works, McKeesport, Pa.; three to 250-HP. boilers for the Crystal Ice Co., Allegheny, Pa., and three to 250-HP. Babcock & Wilcox boilers in the electric light plant, Allegheny. The company, since Sept. 1, has had orders for 58 stokers, of which all but one were 250 HP. or over. The exception is noted above.

NEW COMPANIES.—American Central Contracting Co., 127 Market St., Camden, N. J.; \$100,000; to do general contracting; John C. Calhoun, 617 West End Ave.; James McNaught, Syndicate Bldg., New York; John W. Gephart, Bellefonte, Pa.; Samuel P. Langdon, 315 Drexel Bldg., Philadelphia, Pa.; Norman Grey, Woodbury, N. J.

Faragon Fan & Motor Co., New York; \$2,500; to manufacture electric fan motors; James H. Williams, of 39 Cortlandt St., New York, and two others.

Yaryan Hot Water Distributing Co., Chicago, Ill.; \$200,000; to operate hot water plants; H. T. Yaryan, H. C. Adams, T. P. Keater.

Metropolitan Water Filtering Co., New Jersey Guarantee & Trust Co. Bldg., Camden, N. J.; \$2,000,000; Leander P. Randall, Edward P. Evans, Howard H. Sypher and Christian Pfbaum, Jr., of Camden.

Mexican Land & Colonization Co., New Jersey Registration & Trust Co. Bldg., Orange, N. J.; \$100,000; to deal in rubber, fruit, etc., construct bridges, canals, etc.; F. M. Crawford, S. M. Biddison, J. W. Le Rieur and John W. Burns, 67 Clark St., Chicago, Ill.

Moritz-Borwick Construction Co., St. Louis, Mo.; \$10,000; Olive J. Borwick, Ellwin P. Moritz and M. W. Hoff. Franklin H. Bullis Mfg. Co., New York; \$100,000, commencing with \$500; to manufacture and sell snow melting machines; Franklin H. Bullis, V. L. Haines, Frank Kugler, Brooklyn, N. Y.

Philadelphia & Baltimore Ice Cold Storage & Produce Co., 127 Market St., Camden, N. J.; \$100,000; R. H. Parker, Joseph H. Young, Thomas Williams, James G. Pratt and James W. Gill, of Philadelphia, Pa.; Alexander Duer, Camden.

Pacific Coast Coal Co., Philadelphia, Pa.; \$2,500,000, with \$2,500 paid in; to own and lease lands; to mine and sell coal; to build and operate railroads; W. H. Ingham, F. T. Patterson, A. L. Green, F. B. Lee, W. D. Marks, Philadelphia.

Harbor Water Front Co., Portsmouth, Va.; \$10,000; to buy and develop real estate and maintain factories, warehouses and wharves; to do general storage and wharfage business and to furnish light, water and sewerage; O. F. Byrd, L. C. W. Page, I. L. Watson, T. J. Wool, F. D. Gill, A. A. Blissoly, I. S. Crawford. Speed Elevator Co., Louisville, Ky.; \$20,000; to conduct an elevator and storage business, and to buy and sell coal; J. S. Speed, W. S. Speed, F. M. Locket, Louisville.

Randsburg Reduction Works, Los Angeles, Cal.; \$50,000, with \$23,000 paid in; Austin Granville, Edward Osborn, George R. Wilton, E. W. Gilmore, John A. Fairchild, Chas. St. Morris and James McLachlan.

Garretton Engine Co., Buffalo, N. Y.; \$5,000, commencing with \$3,000; to deal in engines and machinery; Albert F. Garretton, 786 Ellcott Sq.; N. H. Wolcott, R. L. Cox, all of Buffalo.

Dennison Motor Carriage Co., 1 Montgomery St., Jersey City, N. J.; \$100,000; to manufacture engines and electrical and other motors; Geo. L. Record and Ernest Merrick, 1 Montgomery St., Jersey City; J. F. Dennison, New Haven, Conn.

Knoble Filter Co., Chicago, Ill.; \$10,000; to manufacture filters; T. J. Knoble, M. E. Knoble, J. A. O'Donnell. Liquid Pressed Casting Co., Chicago, Ill.; \$80,000; to manufacture metal castings; F. G. Hewser, T. B. McGregor, R. I. Terry.

American Chemical Co., St. Louis, Mo.; \$100,000; John E. Keller, Frank C. Lewis and Harmon J. Bliss. Finlayson Steam Generator Co., Detroit, Mich.; \$25,000, with \$16,800 paid in; to manufacture steam generators, heaters and engines; A. W. Finlayson, J. L. Hackett, E. Lutz, C. A. Howell, Detroit.

Missouri Wrecking Co., St. Louis, Mo.; \$4,000; G. M. Cherry, J. W. Drabell and Robert A. Cherry. Western Railway Equipment Co., East St. Louis, Ill.; \$300,000, commencing with \$100,000; to manufacture railway equipment; E. S. Barreiras, R. Payne, J. D. Houseman, Jr., G. W. Tausig, H. P. Tausig, H. L. Magee.

Manhattan Dry-Dock Construction Co., New York; \$5,000,000, commencing with \$100; to build, repair, sell and operate ships, vessels, etc.; C. F. Peck, J. A. McDuffie, W. A. Davis, G. H. Smith, W. H. Brower, New York.

Kitson Lighting & Heating Co. of Japan and China, Charleston, W. Va.; \$1,000,000, commencing with \$100; to buy, sell and manufacture apparatus or materials for the production of heat, light or power; A. D. MacCorkie, J. W. Malcom, J. E. Chilton, J. E. Scaggs, W. E. Chilton, Charleston.

Norwich Construction Co., Norwich, Conn.; \$1,000, commencing with \$200; to encourage new industries in Norwich; H. H. Osgood, C. P. Cogswell, C. D. Noyes, C. W. Gale, Z. P. Learned, A. Reid, J. C. Averill, J. T. Desmond, Norwich.

Western Iron Works, Los Angeles, Cal.; \$50,000; Frank S. Livingston, Arthur H. Ruggles, Frank P. Snow, Wm. W. Wood, Cassius Smith.

Lafayette Telephone Co., Mexico, Mo.; \$12,500; D. P. Moore, M. B. Moore, E. D. Graham, E. C. Kennan, P. M. Kennan.

Electrical Construction Co., Waco, Tex.; \$35,000; to construct, maintain and operate telephone lines; E. Rotan, W. W. Seley, S. Sawyer, E. N. Stephenson, J. B. Earle, J. E. Hoynton, C. C. Barrett.

Hygienic Filter & Refrigerating Co., Chicago, Ill.; \$25,000; general manufacturing; W. S. Kammerer, J. H. McDonnell, J. J. Purcell.

Pelley River Mining Co., 259 Washington St., Jersey City, N. J.; \$125,000; to mine silver, gold and copper; Roscoe M. Wiers, Ralph M. Jacoby, John M. Enright, Jersey City.

Thompson & Moab Telephone Co., Salt Lake City, Utah; \$1,400; to build and operate a telephone line between Thompson and Moab, Utah; Arthur A. Taylor, Pres.; J. C. Taylor, Vice-Pres.; Robert James Thompson, Treas.; Chas. Wilson, Secy.

Eagle Iron Co., Attalla, Tenn.; \$20,000; to manufacture iron, etc.; company has secured and will put in blast the furnace at Attalla; L. S. Colyar, George H. Webb and James H. Barr, all of Chattanooga, Tenn.

Mail Delivery Notice.

Special efforts are made to deliver our paper to its readers each week at the earliest possible moment. The largest binding and mailing establishment in New York begins work on Engineering News early each Wednesday evening, and all papers for Boston, Philadelphia and Washington are usually in the New York post-office by midnight; all Brooklyn and New York city papers by 3 o'clock—in ample time for the first delivery Thursday morning. The entire edition, including foreign copies, is in the mail soon after 6 o'clock Thursday morning. If your paper is not received promptly we advise that you make a complaint to your local post-office officials.

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No. 52.

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Alphabetical List of Advertisers is on page VI.

A New Classified Directory of Advertisements begins on page VIII.

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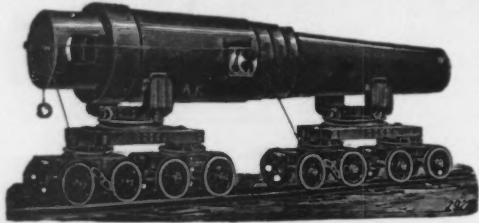
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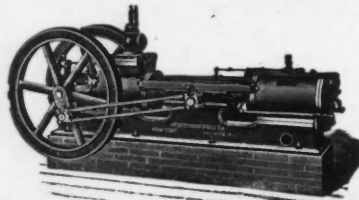
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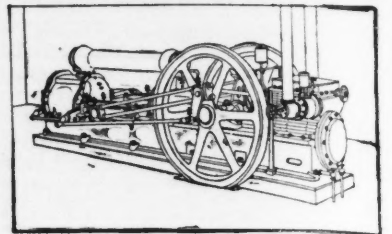
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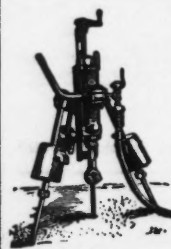
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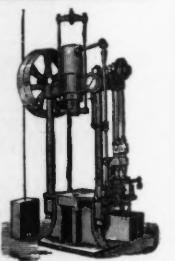
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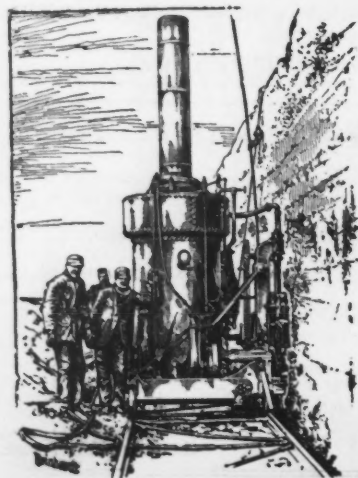
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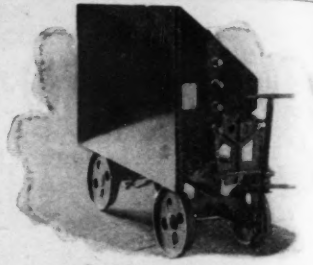


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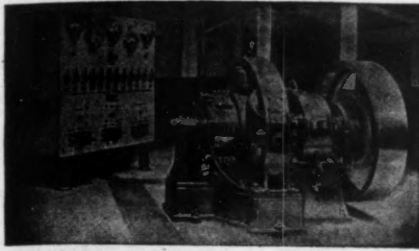
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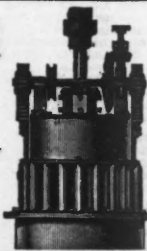
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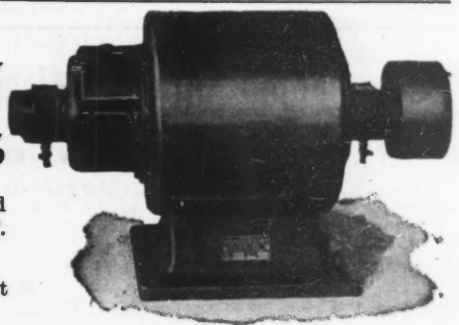
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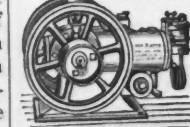
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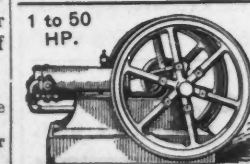
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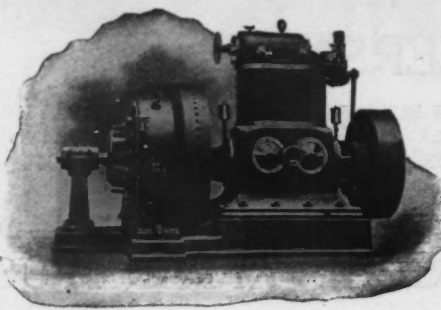
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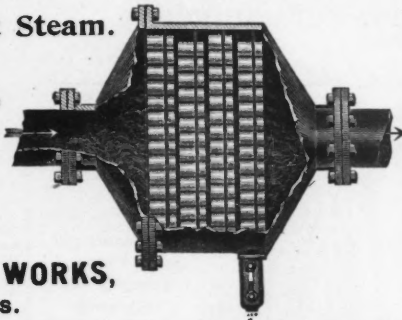
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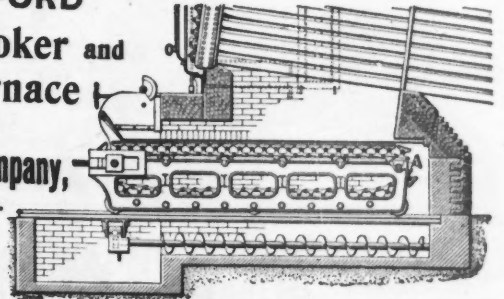
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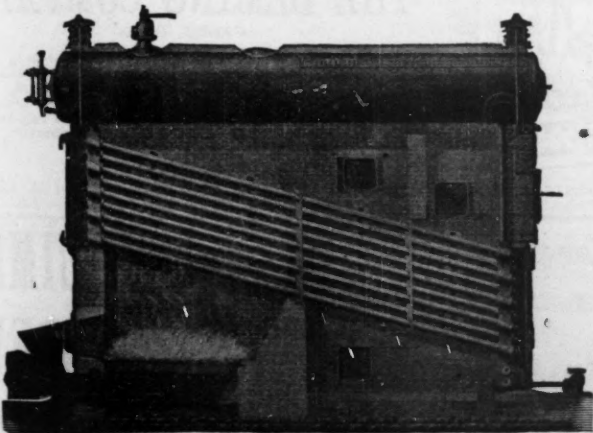
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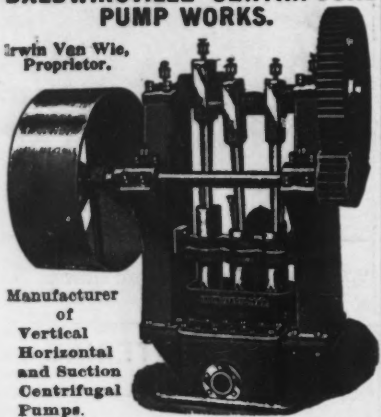
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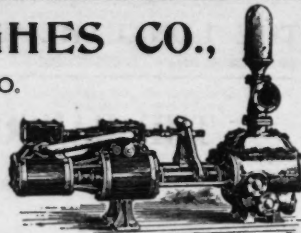
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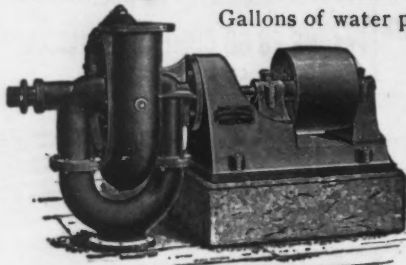
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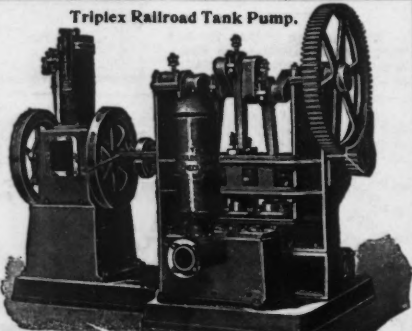
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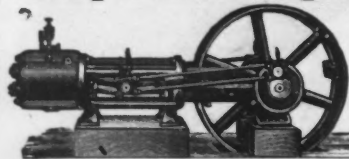
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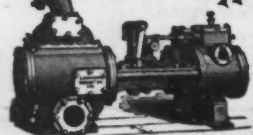
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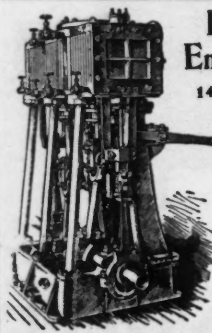
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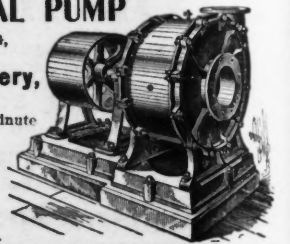
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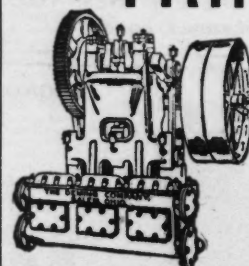


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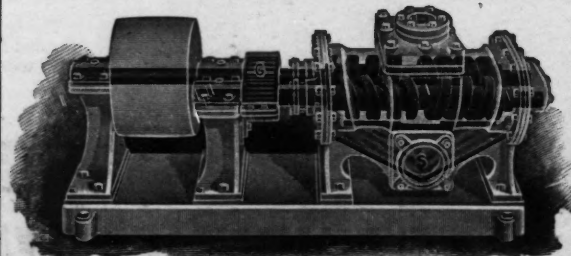
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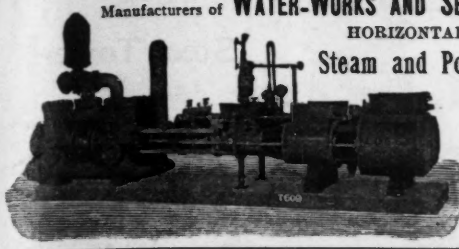
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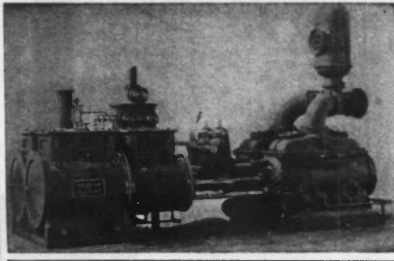
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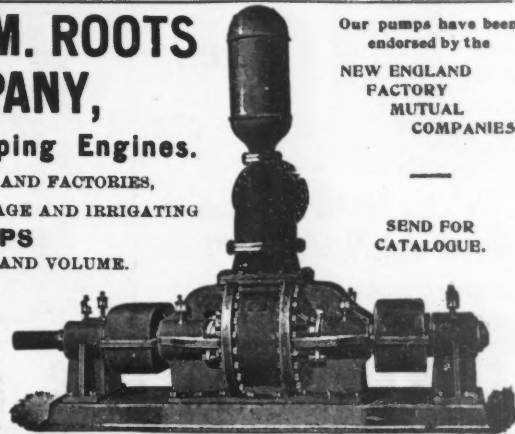
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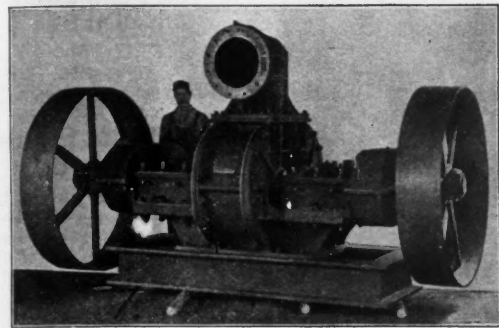


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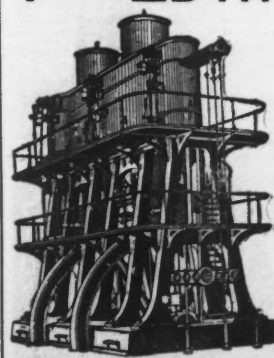
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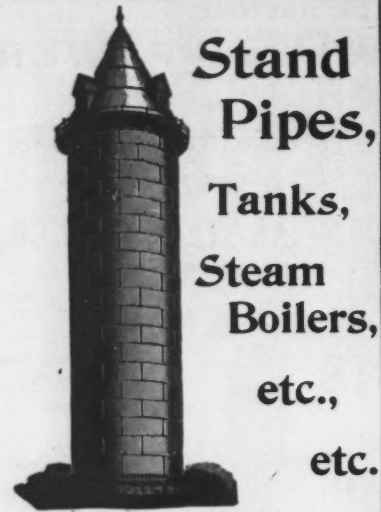
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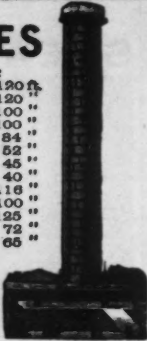
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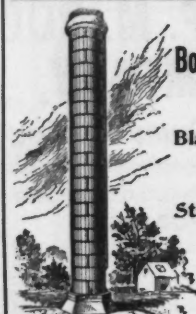
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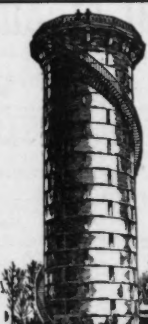
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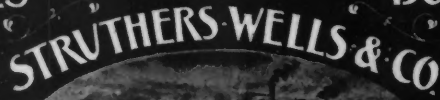
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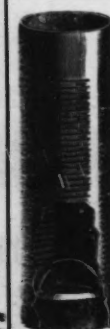
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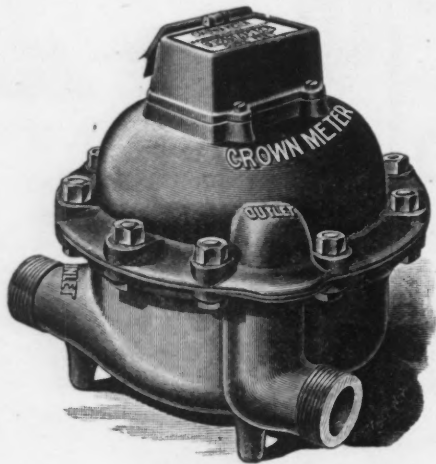
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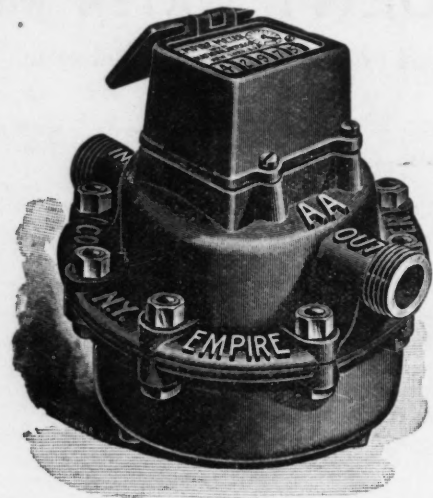
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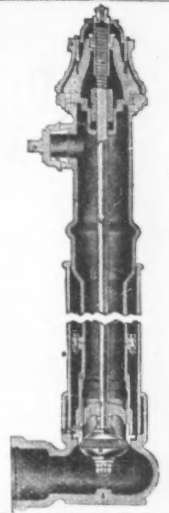
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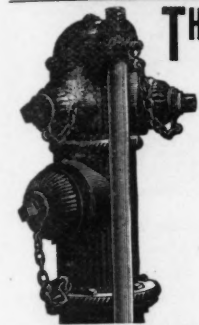
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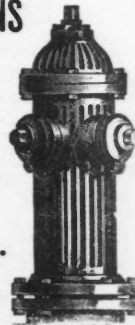
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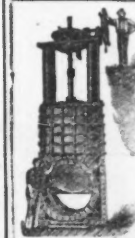
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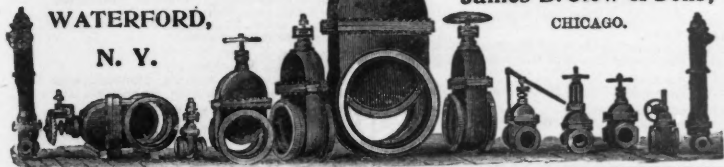
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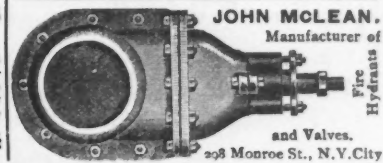


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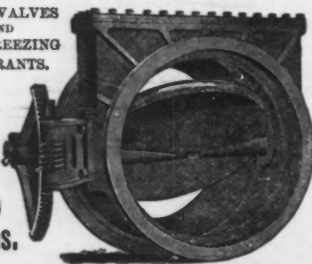
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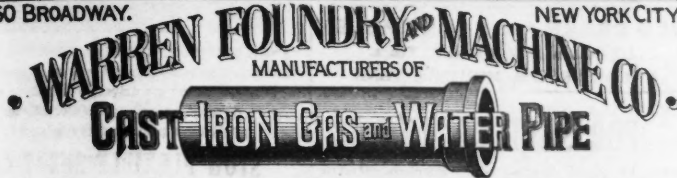
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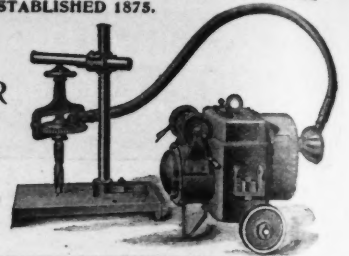
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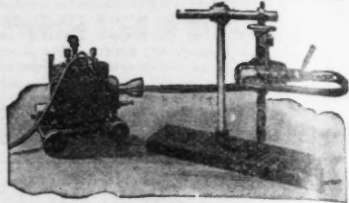
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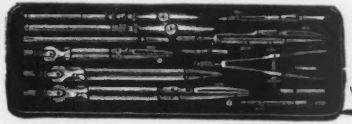
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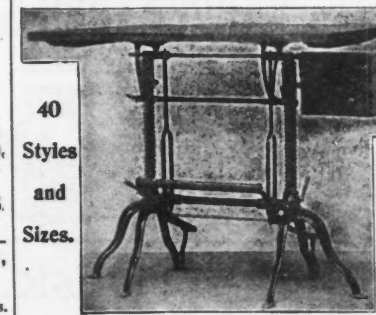
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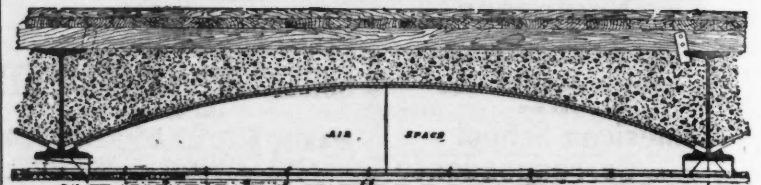
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SANITARY DISTRICT OF CHICAGO.

TO CONTRACTORS:

CHICAGO, Dec. 21, 1898.

Sealed proposals addressed to the Board of Trustees of the Sanitary District of Chicago and indorsed:

Proposals for erecting the substructure and the superstructure of a railroad bridge crossing the Chicago River near Taylor street, and also a bridge for Taylor street across the same river, all in the city of Chicago...

The railroad bridge for which said tenders are invited is a two (2) track structure for the use of the Chicago Terminal Transfer Railroad Company...

The work for which said tenders are invited includes supplying all materials for the substructures and superstructures of said bridges and erecting them completely according to plans furnished by the Sanitary District of Chicago...

The designs for said bridges are owned and controlled by said Sanitary District of Chicago.

Each bid for the railroad bridge must be accompanied by a certified check or cash to the amount of four (4) thousand dollars...

All certified checks must be drawn on some responsible bank doing business in the city of Chicago and be made payable to the order of the Clerk of the Sanitary District of Chicago...

The amount of fifteen hundred (\$1,500) dollars deposited with bid for the street bridge will be held by the Sanitary District until all of the bids for said structure have been canvassed...

All bids must be upon blank forms furnished by the Sanitary District.

No bid will be considered unless the party making it shall furnish evidence satisfactory to the Board of Trustees of his experience in this class of work...

Bidders are required to state in their bids their individual names and places of residence in full.

Designs of bridges may be seen and specifications and plans may be obtained at the office of the Chief Engineer, room 1010 Security building, Chicago, Ill., on or after Jan. 25, 1899.

The said Board of Trustees reserves the right to reject any and all bids.

THE SANITARY DISTRICT OF CHICAGO. By WILLIAM BOLDENWECK, President of Its Board of Trustees. Attest: JOSEPH F. HAAS, Clerk. 52-1t

U. S. ENGINEER OFFICE, Custom House, Charleston, S. C., Dec. 10, 1898.—Sealed proposals for removing old and furnishing and placing new pumping engine on dredge "Charleston" in this harbor...

U. S. ENGINEER OFFICE, Duluth, Minn., Dec. 10, 1898.—Sealed proposals for furnishing 12,000 barrels of PORTLAND CEMENT for the concrete superstructure for piers for Duluth ship canal...

For Other Prososals see Page XXII.

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VAILSBURGH, N. J.

Sealed proposals will be received by the Council of the Borough of Vailsburgh, at the Borough Hall, Vailsburgh, N. J., at eight-thirty o'clock in the evening of Wednesday, the 11th day of January, 1899...

The materials required will be, approximately, 11,345 lineal feet of six-inch cast-iron pipe, weighing 390 pounds per length of twelve feet.

16,885 lineal feet of four-inch cast-iron pipe, weighing 226 pounds per length of twelve feet.

3,450 lineal feet of eight-inch cast-iron pipe, weighing 555 pounds per length of twelve feet.

14,000 pounds special castings.

45 Valves and valve boxes.

43 Hydrants.

Also for doing the work of laying said pipes and setting said special castings, valves, valve boxes and hydrants in the streets of the Borough of Vailsburgh.

Separate bids are requested for furnishing cast-iron pipes and special castings; and for furnishing valves, valve boxes and hydrants; and for trenching, back-filling, laying pipes and setting valves, valve boxes and hydrants.

A certified check upon some bank in the State of New Jersey for the sum of Three Hundred Dollars, made to the order of George V. Aschenbach, Treasurer, must accompany each bid, but shall not be sealed up with it.

Plans may be seen and specifications and blank forms for proposals procured at the office of the Clerk of the Borough of Vailsburgh, N. J., or at the office of the Engineer of the Borough, Eugene A. McMurray, 22 Clinton Street, Newark, N. J.

The Council reserves the right to reject any and all bids. THE MAYOR AND COUNCIL OF THE BOROUGH OF VAILSBURGH. 52-1t

U. S. ENGINEER OFFICE, St. Augustine, Fla., Dec. 26, 1898.—Sealed proposals for furnishing and delivering at Mullet Key and Egmont Key, Tampa Bay, Fla., BROKEN STONE, or GRAVEL, and RANDOM STONE...

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IRON BRIDGES.

ST. THOMAS, ONT., Dec. 19, 1898.

Sealed proposals for the construction of two iron bridges with solid floors, each 120-foot span, to be built across Kettle Creek in the City of St. Thomas, Ontario, will be received by the undersigned until noon on Tuesday, the 24th day of January, 1899.

Forms of tender and particulars may be had on application to the undersigned.

The Committee does not bind itself to accept the lowest or any tender.

JAMES A. BELL,

City Engineer.

TREASURY DEPARTMENT.—Office Supervising Architect, Washington, D. C., December 20, 1898.—Sealed proposals will be received at this office until 2 o'clock P. M., on the 19th day of January, 1899, and then opened, for the low pressure, return circulation, steam heating and ventilating apparatus for the U. S. Post Office Building at Pottsville, Pa., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Pottsville, Pa. JAMES KNOX TAYLOR, Supervising Architect. 52-2t

PROPOSALS FOR FURNISHING CEMENT.—U. S. Engineer Office, Globe Building, St. Paul, Minn., Dec. 12, 1898.—Sealed proposals for furnishing and delivering American Portland Cement, f. o. b. cars at factory, will be received here until 12 o'clock M., January 12, 1899, and then publicly opened. Information furnished on application. FREDERIC V. ABBOT, Major, Engrs. 50-4t

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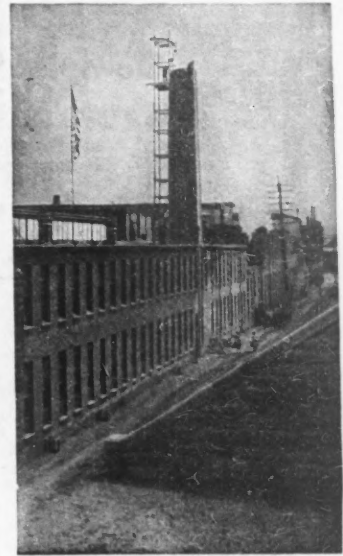
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DULUTH, MINN., Dec. 1, 1898.

Notice is hereby given that the City of Duluth will receive tenders for the purchase of a telephone franchise in said city, January 16, 1899. The condition of the sale of such franchise to be obtained upon application to the City Clerk of said City. All tenders must be addressed to the Common Council of the City of Duluth and handed to the City Clerk before 7.30 p. m. on said day.

H. W. CHEADLE,

City Clerk. 49-6t

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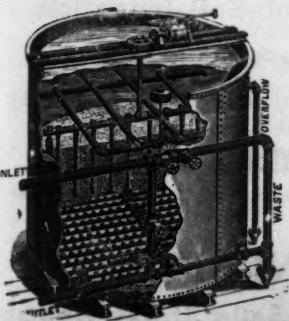
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### PAVING.

HOUSTON, TEXAS, Dec. 8, 1898.

Sealed proposals, addressed to P. S. Banner, City Secretary, will be received up to 12 o'clock, noon, on Monday, January 9th, 1899, for the repaving of Main Street, between Franklin Avenue and McKinney Avenue, in the City of Houston, Texas, as per plans and specifications on file in the City Engineer's office.

Estimated approximate quantities are:  
8,500 cubic yards Excavation.  
19,000 square yards Paving.  
4,500 lineal feet Stone Curbing.

Full information and conditions governing bids can be obtained on application to City Engineer.

S. H. BRASHEAR, Mayor.  
I. AUSTIN MILLER, City Engineer. 50-3t

SEALED PROPOSALS will be received at the office of the Light-House Engineer, Milwaukee, Wis., until 12 o'clock m., January 20, 1899, and then opened, for furnishing the boilers and machinery for six complete steam FOG SIGNALS, in sets of two, delivered at the Light-House Depot, St. Joseph, Mich., in accordance with specifications, copies of which, with blank proposals and other information, may be had upon application to J. G. WARREN, Captain, Corps of Engineers, U. S. A. 52-2t

OFFICE OF WASHINGTON AQUEDUCT, 2728 Pa. Ave., Washington, D. C., Dec. 27, 1898.—Sealed proposals for furnishing and delivering at shafts of Washington Aqueduct Tunnel, brick, cement, sand, special castings and bolts will be received here until 12 m., January 26, 1899, and then publicly opened. Information on application. A. M. MILLER, Lieut.-Col., Engrs. 52-4t

U. S. ENGINEER OFFICE, New London, Conn., Dec. 22, 1898.—Sealed proposals for furnishing and delivering at New London, Conn., and Fisher's Island, N. Y., broken stone, sand, lumber, steel beams, angles and bolts, doors and frames, hand-railing, speaking-tubes, sewer pipe, and manhole covers, will be received here until noon, Jan. 23, 1899, and then publicly opened. Information furnished on application. SMITH S. LEACH, Maj., Engrs. 52-4t

### BRIDGE.

BINGHAMTON, N. Y.

Notice is hereby given that the City of Binghamton, N. Y., will receive up to 7:30 o'clock p. m., January 17th, 1899, sealed, competitive plans, with approximate estimates of costs, for a bridge across the Susquehanna River at Thompkins Street, in said city. All plans and estimates must be marked "Plans and Approximate Estimates for a Bridge at Thompkins Street, Binghamton, N. Y.," and be addressed to B. W. Mosher, City Clerk. Such plans and estimates upon their receipt will be referred to the Special Committee on Bridges. Said Committee to examine the plans and estimates, and to report to Council the plan best adapted to meet the requirements of the situation. The person or company whose plans shall be selected shall receive therefor the sum of \$200, providing he or it shall not be the successful bidder for the construction of said bridge when bids for such construction shall be received, and the work awarded. Data as to requirements for bridge, surroundings, etc., can be obtained by addressing S. E. Monroe, City Engineer, Binghamton, N. Y.

By order of the Common Council.

B. W. MOSHER, City Clerk. 51-2t

### Pullman Exhibition Train.

Every one remembers the magnificent passenger train which the Pullman Palace Car Company exhibited at the World's Fair, Chicago, and subsequently at Atlanta, Nashville and Omaha. By special arrangement the Pennsylvania Railroad Company has secured this model train for its personally-conducted tour to California. It will be the first trip the train has ever made in service, and as it will be the home of the tourists throughout the entire tour, they may feel assured of luxurious accommodations. The train is lighted by electricity, and is made up of composite dining, sleeping, compartment, and library observation cars. Among its conveniences are a bath room, barber shop, refreshment buffet, and a piano.

The tour will leave February 9. Round-trip rate, including every necessary expense during the thirty-five days absent, \$400 from New York.

Itinerary of Tourist Agent, 1196 Broadway, New York, or address Geo. W. Boyd, Assistant General Passenger Agent, Philadelphia. 50-7t

### No Friction.

"The relations between the passenger departments of the Pennsylvania and the Baltimore & Ohio railways," said D. B. Martin, Manager Passenger Traffic of the B. & O., "are not strained, nor is there a rate war in progress, as has been stated in several recent newspaper paragraphs. While, of course, we do not like the new feature introduced by the Pennsylvania Railroad, considering the aggressive action of our own line and all other circumstances in connection with the passenger situation at this time, we are not in a position to find much fault."

### New Terminal Agent.

J. F. Legge has been appointed Terminal Agent of the Baltimore & Ohio Railroad at Washington, D. C., in charge of passenger and freight stations, and will assume the duties of that position on January 1. Mr. Legge is an old B. & O. man, having been Superintendent of the 4th and 5th Divisions in years gone by, and connected with the road in various other capacities. He was in charge of the Washington terminals from 1884 to 1887.

## SEWERAGE.

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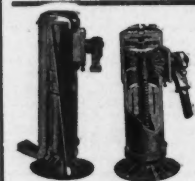
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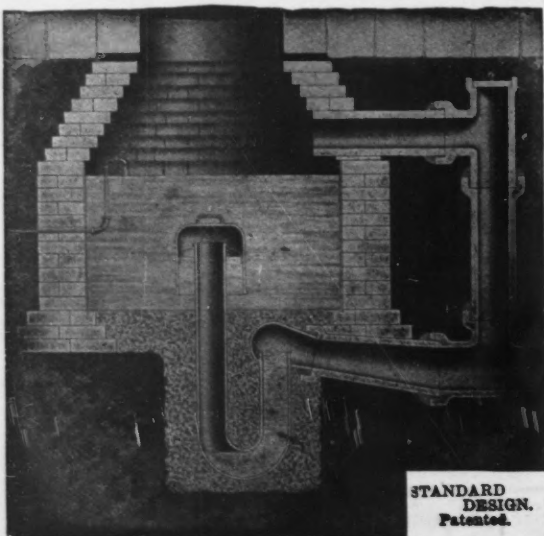
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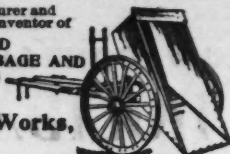
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Continued from **ADVERTISERS' CLASSIFIED DIRECTORY.** Page 50. Continued on Page 52.

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**Elevators (Electric).**  
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 Springfield Gas Engine Co., Springfield, O.  
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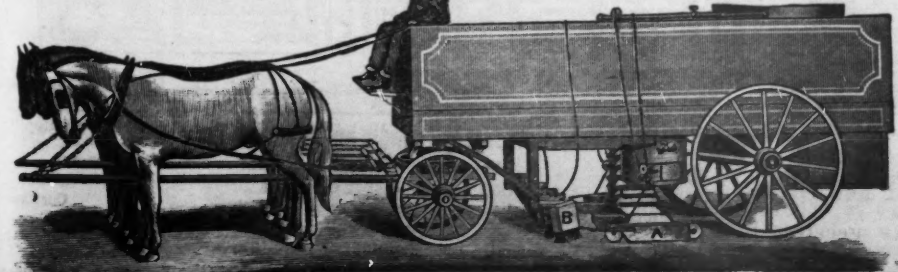
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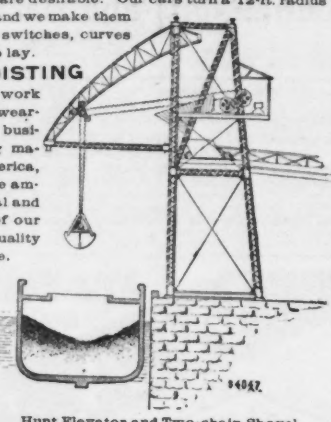
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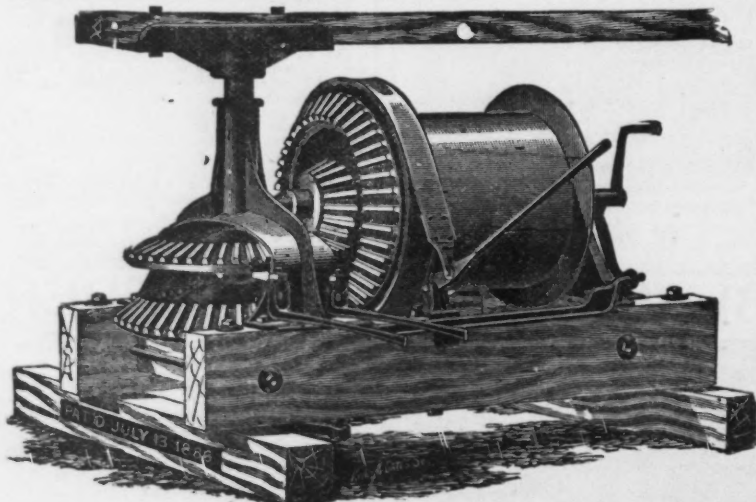
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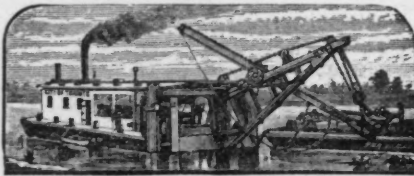


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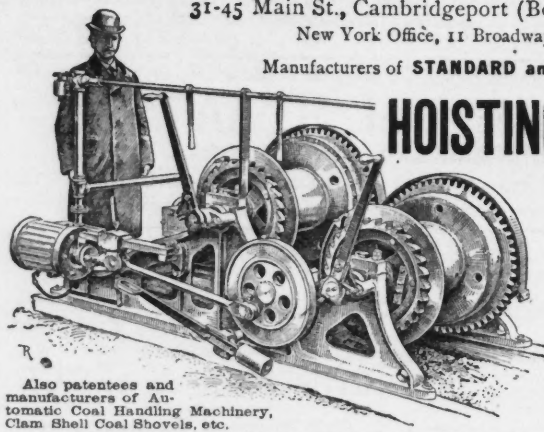
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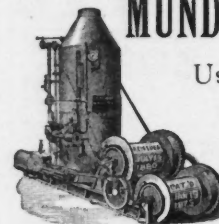
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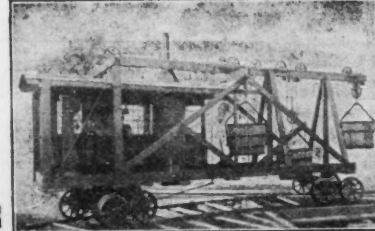
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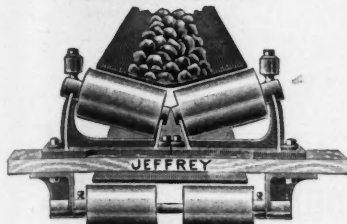
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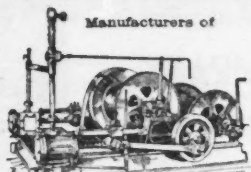
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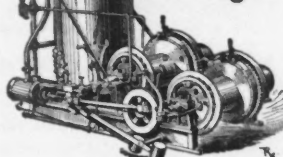
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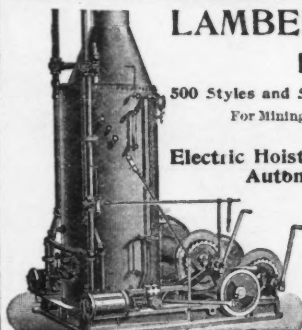
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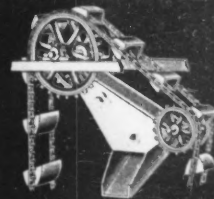
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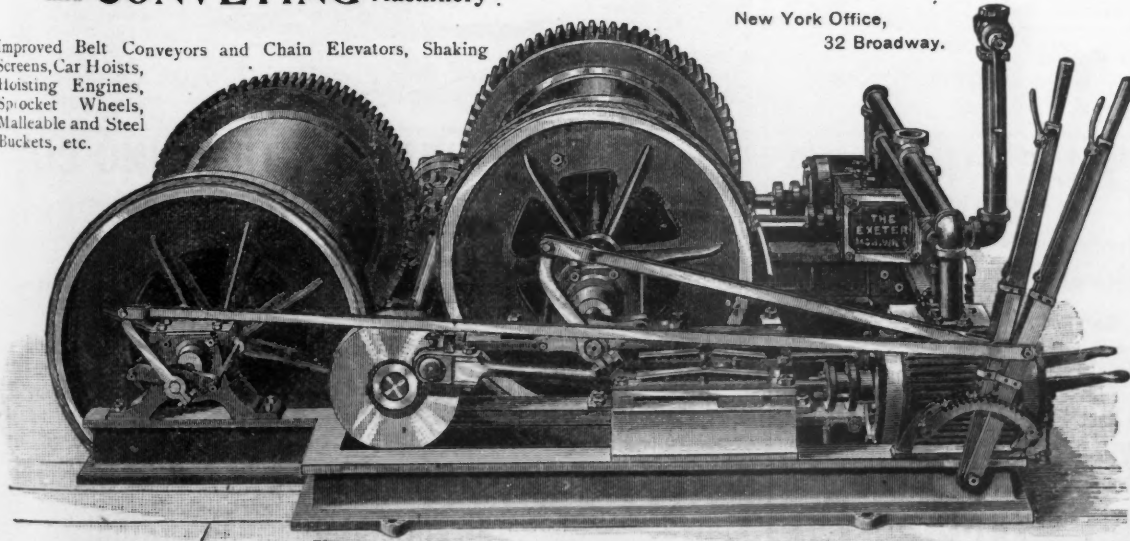
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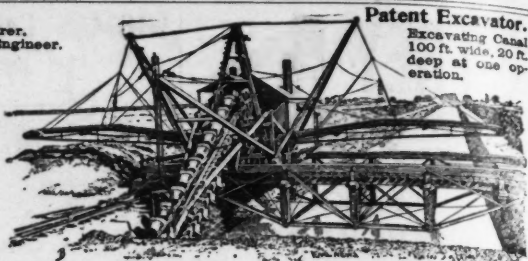
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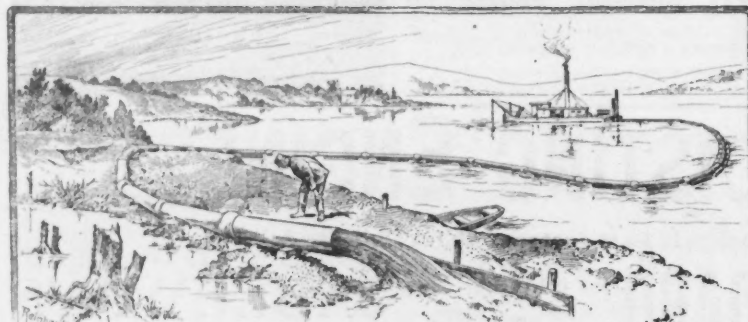
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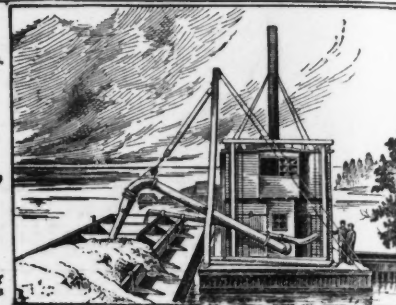
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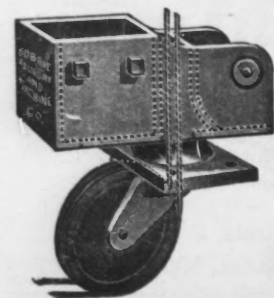
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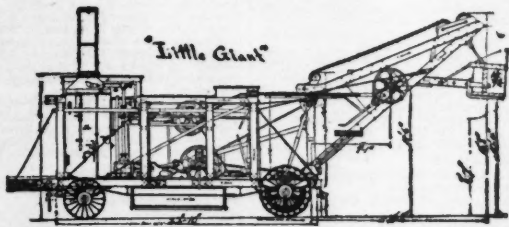
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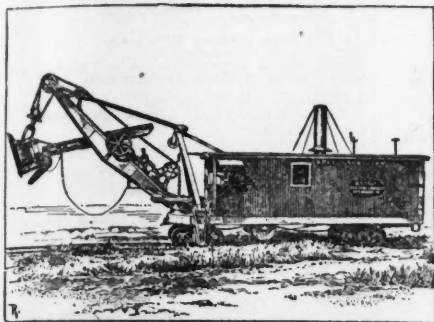
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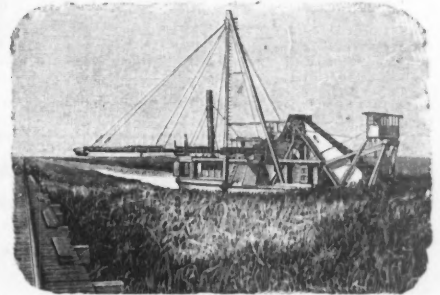
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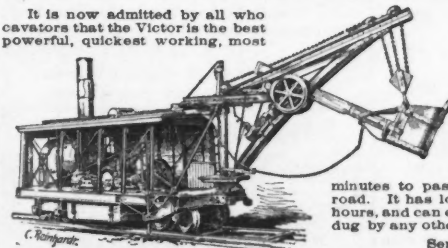
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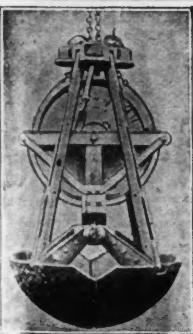


have used the different kinds of Excavators on the market. It is the most durable, best proportioned, easiest handled, fewest parts, least likely to get out of order, and therefore the least expense to keep up, and the cheapest, everything considered.

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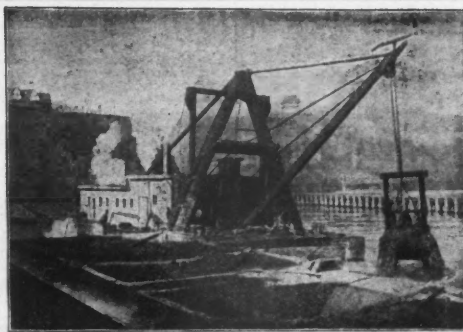
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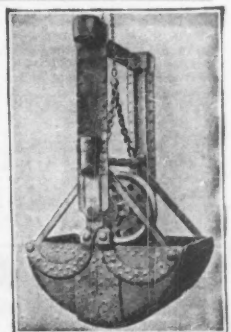
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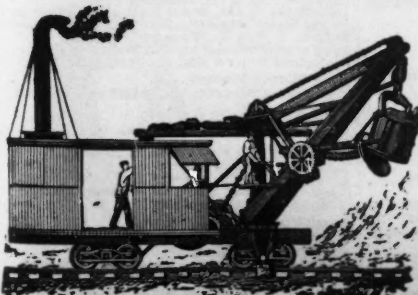
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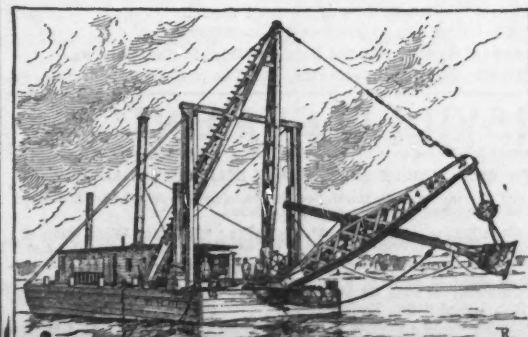
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### Continued from ADVERTISERS' CLASSIFIED DIRECTORY. Continued on Page 52.

NOTICE.—This new Advertisers' Classified Directory contains about 410 headings, against 181 in the old directory. More than double the space is required for the new directory and we cannot increase this more at present. We ask each advertiser however to see if his name is placed under the correct headings and to notify us of any mistakes.

**Ice and Refrigerating Machines.** Westinghouse Machine Co., Pittsburg, Pa.  
**Injectors.** Lunkenheimer Co., Cincinnati, Ohio  
**Inspection of Bridges and Rolling Stock.** (see Directory of Engineers, pp. 3 and 4.)  
**Instruments (Engineering, Surveying, Drafting).** Aloe, A. S. Co., 517 Olive st., St. Louis  
Altendorf, Theo., & Sons, 945 Ridge ave., Phila., Pa  
Beckman, L., 57 Adams st., Toledo, Ohio  
Berger, C. L. & Sons, 9 Province st., Boston, Mass  
Buff Geo. L., 506 Atlantic av., Boston, Mass  
Dietzen, Eugene Co., 183 Monroe st., Chicago  
Eckel, F., 281 Washington st., New York  
Engineers' Instrument Exchange, Scranton, Pa  
Fauth & Co., Washington, D C  
Ferrari, Guido, 911 Vine st., Philadelphia, Pa  
Frost & Adams Co., 57 Cornhill, Boston, Mass  
Gurley, W. & E., Troy, N. Y.  
Heller & Brightly, Spring Garden st. & Ridge ave., Phila  
Kenfel & Easer Co., 127 Fulton st., New York  
Knight, F. C. & Co., 480 Locust ave., Philadelphia, Pa  
Kolesch & Co., 135 Fulton st., New York  
Leca, A., Co., 22 Sacramento st., San Francisco, Cal  
Queen & Co., Inc., Philadelphia, Pa  
Schwenke Kirk & Co., 26 Church st., New York  
Seelig, R., 13 E. Madison st., Chicago, Ill  
Stackpole & Bro., 59 Fulton st., New York  
Ulmer & Hoff, 224 Champlain st., Cleveland, Ohio  
Weber, F. & Co., Philadelphia, Pa  
Young & Sons, 43 N. 7th st., Philadelphia, Pa  
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Belmont Iron Works, Philadelphia, Pa  
Retling, Vilsack & Co., Ltd., Pittsburg, Pa  
**Iron Work (Structural).** (see Structural Steel and Iron Work.)  
**Jails.** Retling, Vilsack & Co., Ltd., Pittsburg, Pa  
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**Laboratories (Chemical and Testing).** Booth, Garrett & Blair, Philadelphia, Pa  
McKenna, Chas. F., 221 Pearl st., New York  
N. Y. University, Morris Heights, N. Y. City  
Olson, Tintus, & Co., Philadelphia, Pa  
Pittsburg Testing Laboratory, Pittsburg, Pa  
Riehl Bros. Test & Machine Co., Philadelphia, Pa  
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Donaldson Iron Co., Etnaus, Pa  
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**Lead (Pig).** Drummond, M. J. & Co., 192 Broadway, New York  
Miller, Chas., & Son, Utica, N Y  
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**Lead Furnaces.** Lead John 125 Monroe st., New York  
Ogden, J. Edward, 147 Cedar st., New York  
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**Lime.** Kelley Island Lime & Transport Co., Cleveland  
**Looks (Cannal Pneumatic).** Dutton Pneumatic Look & Eng. Co., 11 B'way, N Y  
**Locomotive Tires.** Latrobe Steel Co., 120 Girard Bldg., Philadelphia, Pa  
**Locomotives.** Baldwin Locomotive Works, Philadelphia, Pa  
Briggs, Marvin, 12 Broadway, New York  
Everson, B. M., Pittsburg, Pa  
Pittsburg Locomotive and Car Works, Pittsburg, Pa  
Porter, H. K. & Co., Pittsburg, Pa  
**Locomotives (Contractors).** Byers, John F., Machine Co., Ravenna, Ohio  
Porter, H. K. & Co., Pittsburg, Pa  
**Locomotives (Electric).** Baldwin Locomotive Works, Philadelphia, Pa  
General Electric Co., Schenectady, N Y  
Porter, H. K. & Co., Pittsburg, Pa  
Westinghouse Electric & Mfg. Co., Pittsburg  
**Locomotives (Mining).** Jeffrey Mfg. Co., Columbus, O  
Porter, H. K. & Co., Pittsburg, Pa  
Westinghouse Electric & Mfg. Co., Pittsburg  
**Locomotives (Passenger).** Baldwin Locomotive Works, Philadelphia, Pa  
Pittsburg Locomotive & Car Works, Pittsburg, Pa  
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Lidgerwood Mfg. Co., 96 Liberty st., N Y  
Marion Steam Shovel Co., Marion, Ohio  
**Lubricants.** Dixon, Jos. Crucible Co., Jersey City, N J  
Talmage, A. A. & Co., 230 Broadway, New York  
**Lubricators.** Lunkenheimer Co., Cincinnati, Ohio  
**Lumber (Creosoted).** International Creosoting & Con. Co., Galveston, Tex  
Lahig Valley Creosoting Co., 1 Broadway, New York  
Norfolk Creosoting Co., Norfolk, Va  
West Pascagoula (Miss.) Creosoting Works  
(see also Creosoting.)  
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Strook, S. C., 11 Broadway, New York  
**Lumber (Yellow Pine).** Vandenberg & Hopkins, 126 Liberty st., New York  
**Machies Tools.** Forsaith, S. C., Machine Co., Manchester, N H  
**Machinery (Second Hand).** Briggs, Marvin, 12 Broadway, New York  
Carlin, W. J., 880 S. Highland ave., Pittsburg, Pa  
Carlin's, Thos., Sons, Allegheny, Pa  
Dalley, John D., Harlem River & Third ave., New York  
Fitzsimmons, A. N., 1625 Monmouth Block, Chicago  
National Supply & Metal Co., Scranton, Pa  
Orr, John M., Second Natl. Bk. Bldg., Paterson, N J  
**Mail Chutes.** Outler Mfg. Co., Rochester, N Y  
**Manholes and Covers.** Curry & Co., Meadville, Pa  
Greger Engineering Co., 315 N. Broad st., Philadelphia  
Thompson, J. & Co., Philadelphia, Pa  
(see also Castings.)  
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**Mechanical Stokers (see Automatic Stokers).**  
**Metal Lath.** Buffalo Expanded Metal Co., Buffalo, N Y  
Central Expanded Metal Co., Pittsburg, Pa  
Eastern Expanded Metal Co., Boston, Mass  
Expanded Metal Fireproofing Co., Chicago, Ill  
Merritt & Co., Philadelphia, Pa  
N. Y. Expanded Metal Co., New York  
Northwestern Expanded Metal Co., Chicago, Ill  
Manhattan Concrete Co., New York  
Pittsburg Expanded Metal Co., Pittsburg  
Southern Expanded Metal Co., Washington, D C  
Youngstown Iron & Steel Roofing Co., Youngstown, O  
**Meter and Service Boxes.** Buffalo Meter Co., Buffalo, N Y  
**Meters (Current).** Berger, C. L. & Sons, 9 Province st., Boston, Mass

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**Meters (Fuel Oil).** Buffalo Meter Co., Buffalo, N Y  
National Meter Co., New York  
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Buffalo Meter Co., Buffalo, N Y  
Hersey Mfg. Co., South Boston, Mass  
National Meter Co., 118 Chambers st., New York  
Neptune Meter Co., 253 Broadway, New York  
Thomson Meter Co., 78 Washington st., Brooklyn, N Y  
Washington, Henry B., 58 Liberty st., New York  
**Mill Equipment.** General Electric Co., Schenectady, N Y  
**Mining Machinery.** Allis, Edward P., Co., Milwaukee, Wis  
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Bradley Pulveriser Co., 82 State st., Boston, Mass  
Bucyrus Co., South Milwaukee, Wis  
California Wire Works, San Francisco, Cal  
Fraser & Chalmers, 158 Fulton st., Chicago  
Gates Iron Works, 600 E. 11th ave., Chicago, Ill  
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Lidgerwood Mfg. Co., 96 Liberty st., New York  
Marion Steam Shovel Co., Marion, Ohio  
Sand Drill Co., 100 Broadway, New York  
Sullivan Machinery Co., 80 N. Clinton st., Chicago, Ill  
Weber Gas & Gasoline Engine Co., Kansas City, Mo  
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**Motors (Electric).** General Electric Co., Schenectady, N Y  
Sprague Electric Co., Dept. N, New York  
Surrey Motor & Tool Co., 212 Ionic st., Philadelphia  
Westinghouse Electric & Mfg. Co., Pittsburg  
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Worthington, Henry B., 88 Liberty st., N Y  
Poole, Robt. & Son Co., Baltimore, Md  
(see also Turbines.)  
**Narrow Gauge Railway Material.** Brill Co., J. G., Philadelphia, Pa  
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Koppel, Arthur, 78-80 Broad st., New York  
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**Ore Handling Machinery.** (see Coal and Ore Handling Machinery.)  
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Atlantic Alcazar Asphalt Co., 57 E. 59th st., N Y  
Baltimore Wood Preserving Co., Nashville, Tenn  
Detroit Graphite Mfg. Co., Detroit, Mich  
Dixon, Jos. Crucible Co., Jersey City, N J  
Gohsen Mfg. Co., Canton, Ohio  
Lawrence, W. W. & Co., Pittsburg, Pa  
Paterson-Sargent Co., Cleveland, Ohio  
Rinald Bros., Philadelphia, Pa  
Sicilian Asphalt Paving Co., Times bldg., New York  
Toleno, Edward, & Co., 45 Broadway, New York  
Suydam, M. B., & Co., Pittsburg, Pa  
Talmage, A. A. & Co., 230 Broadway, New York  
**Patent Solicitors.** Rosenbaum, Wm. A., Times bldg., New York  
**Paving Blocks (Wood).** Michigan Pipe Co., Bay City, Mich  
**Paving Brick (see Brick).**  
**Pile Driving Machinery.** American Hoist & Derrick Co., St. Paul, Minn  
Beatty, M., & Sons, Welland, Ont  
Bucyrus Co., South Milwaukee, Wis  
Carlin's, Thos., Sons, Allegheny, Pa  
Contractors' Plant Mfg. Co., Buffalo, N Y  
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Lidgerwood Mfg. Co., 96 Liberty st., New York  
Mundy, J. S., Newark, N J  
Toledo Foundry & Machine Co., Toledo, Ohio  
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**Pile Hammers.** Cram E. J. & A. B., 26 W. Hancock av., Detroit  
Carlin's, Thos., Sons, Allegheny, Pa  
Vulcan Iron Works, Chicago, Ill  
**Piling.** Eppinger & Russell Co., 66 Broad st., New York  
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Norfolk Creosoting Co., Norfolk, Va  
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American Pipe & Foundry Co., Chattanooga, Tenn  
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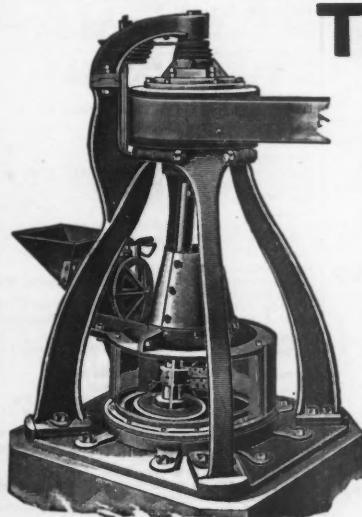
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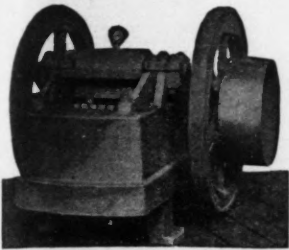
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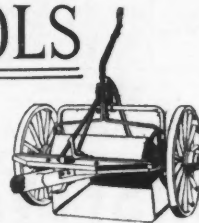
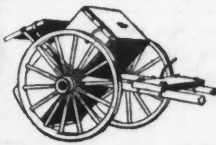
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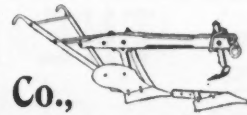
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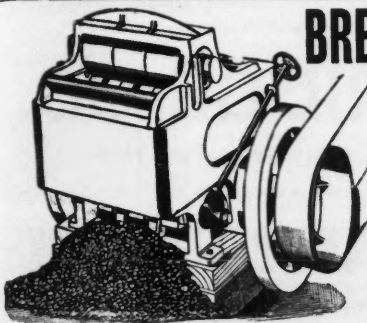


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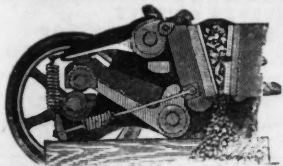
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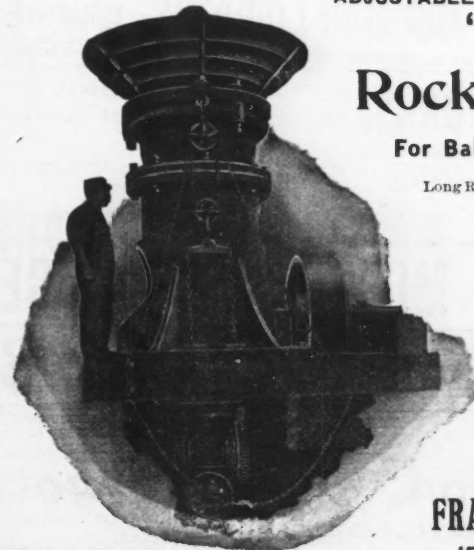
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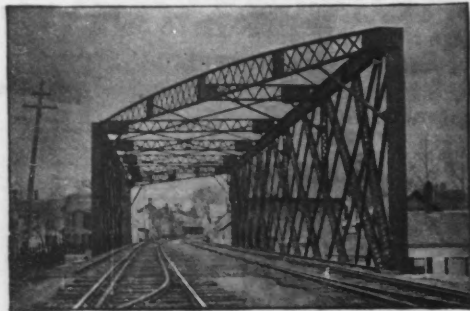
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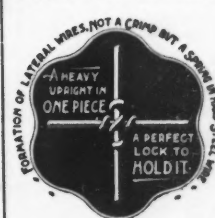
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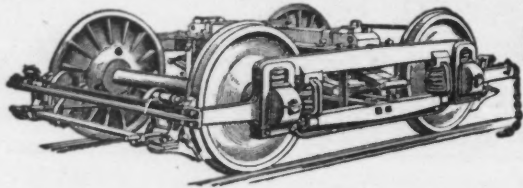
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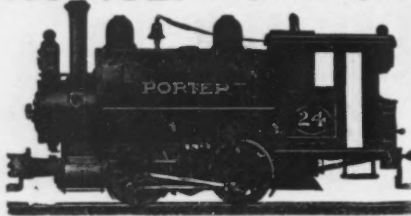
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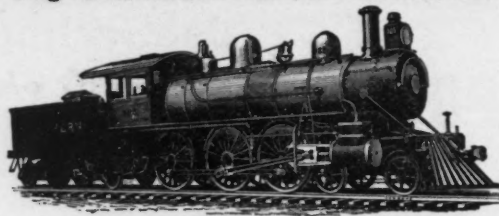
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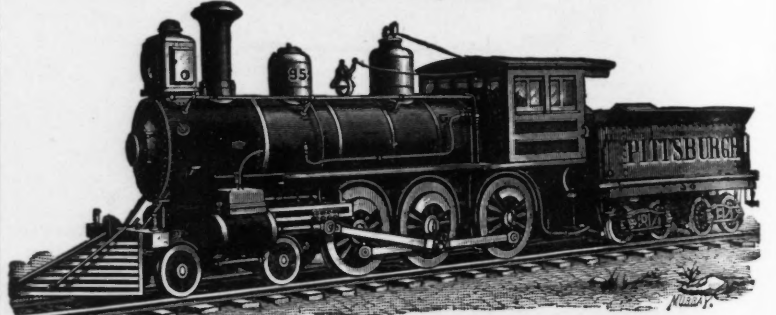


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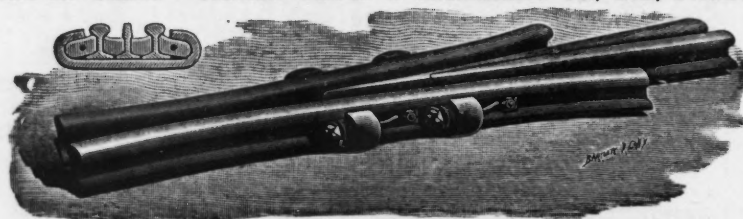
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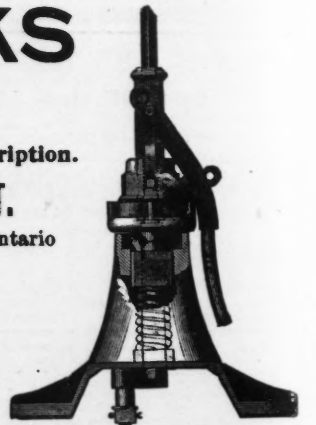
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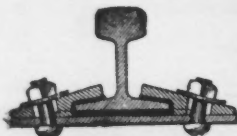
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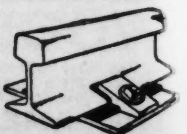
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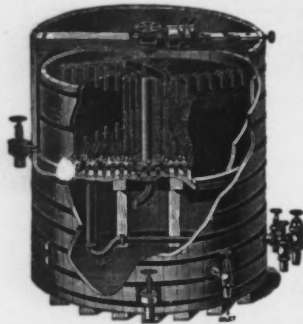
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