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## PERSONAL.

Mr. George H. Cox has been appointed Park Commissioner of Cambridge, Mass.

Mr. Sumner Thomas has been appointed Street Commissioner of Glens Falls, N. Y.

Mr. Robert T. Danner has been appointed Superintendent of Water-Works of Frederick, Md.

Mr. Clark Smith has been appointed Superintendent of Water-Works of Fort Collins, Colo.

Mr. Joseph M. Byrne has been elected a Board of Works Commissioner of Newark, N. J.

Mr. George W. Keller has been elected President of the Board of Water-Works Trustees of Wooster.

Mr. T. W. Bauer has been appointed Secretary to the Board of Water-Works Trustees of Sandusky, O.

Mr. Theodore C. Hewson has been elected President of the Board of Works of Newark, N. J., to succeed Mr. William Stainsby.

Mr. Walter McCulloch, M. Am. Soc. C. E., has removed his office from 7 Crick Building to the Arcade Building, Niagara Falls, N. Y.

Mr. Walter Dixon, electrical engineer, of Glasgow, Scotland, is on a tour of inspection of the electrical power plants of the United States.

Mr. I. Fujjoka, manufacturer of electrical apparatus, of Tokyo, Japan, is visiting this country on a tour of inspection of electrical machinery.

Mr. A. W. Trotter, M. Am. Soc. C. E., has removed his office in New York city from the Havemeyer Building to the Empire Building, No. 71 Broadway.

Messrs. Ford, Bacon & Davis, engineers, have removed their New York office from the St. Paul Bldg., 220 Broadway, to the Singer Bldg., 149 Broadway.

Mr. H. O. Nourse, Chief Clerk of the Water Department of Chicago, Ill., has been appointed Superintendent of the Water Office, to succeed Mr. Felix Lang, resigned.

Messrs. J. S. Van Horne, M. Am. Soc. C. E., and P. Warren Allen, Jun., M. Am. Soc. C. E., have removed their offices from 26 Cortlandt St. to 71 Broadway, New York city.

Mr. Eugene Washington Stone, M. Am. Soc. C. E., has resigned as Engineer of the Koken Iron Works, St. Louis, Mo., and is now located at 56 West 72d St., New York city.

Mr. P. J. Crossen, a member of the Board of Water-Works Trustees of Sandusky, O., has resigned and has been appointed Superintendent of Street Work of that city.

Mr. Austin Lord Bowman, M. Am. Soc. C. E., Civil and Consulting Engineer, has removed his office from the Havemeyer Bldg., New York city, to the new Empire Bldg., 71 Broadway.

Mr. William S. Turner, M. Am. Inst. E. E., consulting and constructing electrical and mechanical engineer, has removed his office from 1 Nassau St. to 141 Broadway, New York city.

Prof. Massashi Namba, Professor of Electrical Engineering in the University of Kioto, Japan, is on a visit to the United States for the purpose of studying the latest electrical developments.

Mr. G. R. Joughins, Superintendent of Motive Power of the Norfolk & Southern R. R., with headquarters at Berkeley, Va., has been appointed Mechanical Superintendent of the government railways of Canada.

Mr. F. S. Higbid, formerly Roadmaster of the New York Division and Assistant Engineer of the Erie R. R., has resigned to accept a position as Assistant Engineer of the Panama R. R., with headquarters in Panama, Colombia.

Mr. Perry Lawton, Assoc. M. Am. Soc. C. E., has opened an office as a civil engineer in the Savings Bank Bldg., Quincy, Mass. He is also a member of the Boston Society of Civil Engineers and of the New England Water Works Association.

Messrs. Nagle & Ball, consulting mechanical engineers, have removed their offices to the New York Life Bldg., Chicago. They are at present the consulting engineers for the new electric lighting plant under construction at Grand Rapids, Mich.

Mr. S. Potts, Jr., M. Am. Soc. M. E., who for many years has been the Mechanical Engineer for the Yerkes System of street railways in Chicago, has recently resigned his position to engage in business for himself, and will locate in New York city.

Mr. William Barclay Parsons, M. Am. Soc. C. E., consulting engineer, with offices at 22 William St., New York city, and Chief Engineer of the Rapid Transit Commission of that city, has been commissioned Chief of Engineers on the staff of Gov. Black, of New York.

Prof. William A. Pratt, of Delaware College, and President of the Street and Sewer Department of Wilmington, Del., has offered to the United States Government to raise a full corps of engineers for service in the war against Spain. The corps will be officered by practical and experienced engineers, and the rank and file will be composed of railway bridge builders, carpenters, machinists and other mechanics.

Mr. A. Tropenas, inventor of the Tropenas steel process, a modification of the Bessemer process, whose coming to this country was noted in our issue of April 21, has now arrived and will start a Bessemer plant on his system at the works of the Driggs-Seabury Gun and Ammunition Co., Derby, Conn. Mr. Tropenas' headquarters in New York will be with Messrs. Powell & Colne, Bowling Green Offices, 11 Broadway.

Messrs. Frank Boggs, of Pennsylvania; C. S. Smith, of Illinois; W. W. Worten, of North Carolina; Lytle Brown, of Tennessee; Robt. D. Kerr, of West Virginia; E. I. Brown, of Georgia, and A. A. Fryes, of Oregon, have been commissioned as Second Lieutenants in the Engineer Corps of the United States Army. They are the seven highest graduates of the U. S. Military Academy this year, and have been ordered to duty at once at Willet's Point, N. Y.

The court martial to try Civil Engineer A. G. Menocal, M. Am. Soc. C. E., U. S. Navy, on charges growing out of the failure of the dry dock in the New York Navy Yard, Brooklyn, has been reorganized on account of the necessity for giving sea duty to all the active officers of the Navy, and will consist of Rear-Admiral A. E. K. Benham, retired; Capt. Edwin Shepard, Capt. H. Picking, retired; Capt. A. E. Reid, retired; Capt. Yates Sterling, Capt. Thos. Nelson, retired; Commander G. R. Durran, retired, and Commander W. B. Newman, retired.

The Maryland Geological Survey has been constituted as follows: Mr. William Bullock Clark, State Geologist and Superintendent of Survey; Mr. Edward B. Mathews, Assistant State Geologist and Chief of Division of Geology of the Piedmont Plateau; Mr. Charles S. Prosser, Chief of Division of Geology of the Appalachian Region; Mr. George B. Shattuck, Chief of Division of Geology of the Coastal Plain; Mr. Harry Fielding Reid, Chief of Division of Highways, and Mr. L. A. Bauer, Chief of the Division of Terrestrial Magnetism. Mr. A. N. Johnson, formerly a road engineer on the Massachusetts Highway Commission, has been appointed Road Expert in the Division of Highways.

Mr. George W. Vanderbilt, son of the late William H. Vanderbilt, is to be married, June 1, to Miss Edith Stuyvesant Dresser, daughter of the late Bvt. Major George W. Dresser, U. S. A. Major Dresser, who died at Newport, in 1883, was a member of the American Society of Civil Engineers; and, having resigned from the Army in 1865, he practiced civil engineering in the neighborhood of New York city until his death. From 1870 to 1873 he was Assistant Engineer of the Department of Public Works, in New York; and from 1875 until his death he was the Editor of the "American Gas-Light Journal." Major Dresser was well known to many of the older members of the American Society of Civil Engineers.

## OBITUARY.

Mr. Joseph Darragh, for 22 years Chief Engineer of the Isabella Furnace Co., Sbarsburg, Pa., died April 27, aged 76.

Mr. G. R. Cook, formerly Superintendent of Parks of Cambridge, Mass., died in Salem, Mass., May 2, aged 37. He was born in Pawtucket, R. I., and was at one time an editor on the Cambridge (Mass.) "Press." In 1893 he was city editor of the Cambridge "Tribune."

Mr. Joseph C. Turk, C. E., has been appointed General Agent and Resident Engineer for the Union Bridge Co., with headquarters at Key West, Fla., to superintend the construction of the two large steel marine piers and coaling stations at Dry Tortugas and Key West, the contracts for which were recently awarded to this company, as noted in our recent issues.

Mr. Frederick Bernhard Otto Baensch, the Engineer of the North Sea and Baltic Ship Canal, died on April 8. Mr. Baensch was born in Zeltz, Germany, June 6, 1825, and was educated as a civil engineer in the employ of the Prussian government. He was first engaged in bridge construction, over the Rhine and at Liegnitz; and later he built the barbers at Stolpmuende, at Ruegenwalde and at Colberg. His successful efforts in maintaining the dikes along the Baltic coast were especially commended by the government, and, in 1871, he was attached to the Ministry of Public Works, and was still connected with it at the time of his death. During this time he designed and built the rectification works of the Rivers Elbe and Rhine, and designed the Main River Canal, and the extensive dikes and harbor works in Schleswig-Holstein. In 1881 he reported upon the project for a North Sea

and Baltic ship canal, and was later made its chief engineer. He completed this difficult work in a manner which won for him the praise of his government and the approval of engineers throughout the world.

Maj. William Dransfield, railway contractor, of Manchester and Liverpool, England, died April 14, at Harrogate, aged 70. About 50 years ago he joined the late firm of Geo. Thompson & Co., railway and dock contractors, and was the principal manager of the firm until 1874. While in this capacity he built, among other important works, a portion of the Birkenhead Docks, the North Docks branch of the Lancaster & Yorkshire Ry., the Edge Hill and Bootle branch, the extension of Lime St. station, the Huyton & St. Helen's Ry., and numerous works of the London & Northwestern, the Great Eastern, the Lancashire & Yorkshire and the London & Southwestern Rys. In 1874 he joined Mr. Arthur H. Holme, of the present firm of Holme & King, and with him carried out heavy works on the Lancashire & Yorkshire Ry. Later he formed a partnership with Mr. James Thompson and Mr. William Smith under the firm name of Dransfield, Thompson & Holme, and afterwards left this firm to establish that of Dransfield & Smith. In the past five years Mr. Dransfield has done considerable work in the neighborhood of Manchester in widening the Lancashire & Yorkshire Ry.

## ENGINEERING SOCIETIES.

## COMING TECHNICAL MEETINGS.

CHICAGO ELECTRICAL ASSOCIATION.  
May 6. Secy., J. R. Cravath, 825 Monadnock Block, Chicago, Ill.

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

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

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

RAILWAY SIGNALING CLUB.  
May 10. Secy., Earl M. Seitz, Signal Engr., C. & N. W. Ry., Chicago, Ill.

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

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

NEW ENGLAND RAILROAD CLUB.  
May 11. Secy., Edward L. Janes, P. O. Box 1158, Boston, Mass.

ENGINEERING ASSOCIATION OF THE SOUTH.  
May 12. Nashville, Tenn. Secy., C. B. Wilson, Nashville, Tenn.

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

CIVIL ENGINEERS' CLUB OF CLEVELAND.  
May 12. Secy., Wm. H. Searles, Case Library Bldg., Cleveland, O.

BROOKLYN ENGINEERS' CLUB.  
May 12. Secy., A. J. Provost, Jr., 191 Montague St., Brooklyn, N. Y.

CENTRAL RAILWAY CLUB.  
May 13. Buffalo, N. Y. Secy., H. D. Vought, 114 Fifth Ave., New York city.

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

MONTANA SOCIETY OF ENGINEERS.  
May 14. Secy., Albert S. Hovey, Helena, Mont.

INDIANAPOLIS ENGINEERING CLUB.  
May 14. Secy., Edson F. Folsom, Indianapolis, Ind.

TECHNICAL CLUB OF OMAHA.  
May 16. Secy., J. Harry Lawrie, Omaha, Neb.

ENGINEERS' CLUB OF MINNEAPOLIS.  
May 16. Secy., H. E. Smith, 1620 S. E. 4th St., Minneapolis, Minn.

ENGINEERS' AND ARCHITECTS' CLUB OF LOUISVILLE.  
May 16. Secy., Jas. K. Zollinger, 16 Norton Bldg., Louisville, Ky.

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

ILLINOIS STREET RAILWAY ASSOCIATION.  
May 18. Annual meeting. Secy., C. K. Minary, Springfield City R. R., Springfield, Ill.

WESTERN RAILWAY CLUB.  
May 18. Secy., F. M. Whyte, 225 Dearborn St., Chicago, Ill.

BOSTON SOCIETY OF CIVIL ENGINEERS.  
May 18. Secy., S. E. Thinkham, City Hall, Boston, Mass.

WESTERN FOUNDRYMEN'S ASSOCIATION.  
May 18. Annual meeting. Secy., A. Sorge, Jr., 1020 Monadnock Block, Chicago, Ill.

ENGINEERS' AND ARCHITECTS' ASSOCIATION OF SOUTHERN CALIFORNIA.  
May 18. Secy., Frank H. Olmstead, Los Angeles, Cal.

ENGINEERS' CLUB OF ST. LOUIS.  
May 18. Secy., Richard McCulloch, St. Louis, Mo.

AMERICAN SOCIETY OF CIVIL ENGINEERS.  
May 18. Secy., C. W. Hunt, 220 West 57th St., New York city.

WESTERN SOCIETY OF ENGINEERS.  
May 18. "Gaging of Streams." Wm. G. Price, and "The Use of Coke Breeze in Sewage Purification," John W. Alvord. Secy., N. L. Litten, Monadnock Block, Chicago, Ill.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.  
May 19. Secy., F. A. Charplot, Macon, Ga.

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

NEW YORK RAILWAY CLUB.  
May 19. Secy., W. W. Whetley, 168 Montague St., Brooklyn, N. Y.

ENGINEERS' CLUB OF COLUMBUS.  
May 21. Secy., M. S. Hopkins, 14½ N. High St., Columbus, O.

AMERICAN INSTITUTE ELECTRICAL ENGINEERS.  
May 25. Secy., R. W. Pope, 26 Courtlandt St., New York city.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.  
May 30, June 4. Spring meeting, Niagara Falls, N. Y. Secy., Prof. F. R. Hutton, 12 W. 31st St., New York city.

**NATIONAL ELECTRIC LIGHT ASSOCIATION.**  
June 7-9. Annual meeting, Chicago, Ill. Secy., George F. Porter, 136 Liberty St., New York city.

**AMERICAN FOUNDRYMEN'S ASSOCIATION.**  
June 7-10. Annual meeting, Cincinnati, O. Secy., John A. Penton, Buhl Block, Detroit, Mich.

**OHIO STREET RAILWAY ASSOCIATION.**  
June 8. Annual meeting, Columbus, O. Secy., Frank J. J. Sloat, Akron, O.

**AMERICAN WATER-WORKS ASSOCIATION.**  
June 14-16. Annual meeting, Buffalo, N. Y. Secy., Peter Milns, 95 William St., New York city.

**MASTER CAR BUILDERS' ASSOCIATION.**  
June 15-17. Annual meeting, Saratoga, N. Y. Secy., Jno. W. Cloud, 974 Rookery, Chicago, Ill.

**AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.**  
June 20-22. Annual meeting, Saratoga, N. Y. Secy., John W. Cloud, 974 Rookery, Chicago, Ill.

**DETROIT ENGINEERING SOCIETY.**—The annual meeting of this society was held at the Hotel Ste. Claire on April 30. The following officers were elected for 1898: Pres., Geo. Y. Wisner; First Vice-Pres., Wm. J. Keep; Second Vice-Pres., Alex. Dow; Secy., Gardner S. Williams; Treas., T. H. Hinchman.

**CIVIL ENGINEERS' CLUB OF CLEVELAND.**—At the meeting held April 26, Capt. Louis J. Germain lectured on the Des Moines River Improvements. It was maintained that it was the office of the real engineer to exercise his own genius in contending with emergencies, as well as to follow precedents in the routine of business. Wm. H. Searles, Secy.

**ENGINEERS' CLUB OF CINCINNATI.**—At the meeting of this club held April 21, Mr. A. O. Elzner read several short papers in reply to questions on the following subjects:

"Amount of Compressibility of Soils," G. Bouscaren; "Timber Cribbing on Pile Foundations," Bert L. Baldwin; "Impurities in Water to be Used for Cement Mortar," W. B. Ruggles; "Draining Vaults for Dwelling Houses in Suburbs," Thos. B. Punshon. No action was taken upon the question of affiliating with the Association of Engineering Societies. J. F. Wilson, Secy.

**AMERICAN FOUNDRYMEN'S ASSOCIATION.**—The 34 annual convention of this association is scheduled to begin June 7 at the Grand Hotel, Cincinnati, O. The session will continue until the 10th, inclusive, during which time the following papers will be read:

"A Modern Foundry," A. W. Walker; "The Micro-Construction of Iron and Steel," S. S. Knight; "The Adoption of a Standard System of Test Bars for Cast Iron," R. G. G. Moldenke; "A Talk on Brass Founding," Chas. Vickers; "Manganese in Cast Iron," Guy R. Johnson; "The Overhead Trolley Track," H. M. Ramp; "Necessity of Well Mixed Furnace Casts and True Reports of Analysis," Thos. D. West; "The Manufacture of Steel Castings," Stewart Johnson; "A Test for Determining the Hardness of Cast Iron," C. A. Bauer.

**AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.**—The 124th regular meeting of the institute was held in New York city on April 27. A paper by Prof. W. E. Goldsborough, of Perdue University, entitled "An Economy Test of a Central Station," was read by title only, owing to the absence of the author. A brief abstract of this is given elsewhere in this issue. Mr. C. J. Reed followed, reading a paper entitled "A Novel Form of Thermo-Electric Battery." This was a description of a battery using a fused mass of caustic potash or soda and two steel rods as electrodes. It was claimed that as one rod had a smaller section than the other, and consequently became hotter, an electromotive force was produced. The paper also described a series of experiments with different materials employing, however, the same principle.

**ENGINEERS' CLUB OF PHILADELPHIA.**—At the meeting of this club, held on April 16, Mr. J. W. Ledoux presented the first paper of the evening on "The Deep Well Pumping Plant at Waukesha, Wis.," in which the details of the water-works plant at this place was discussed as they were in February, 1897. This plant supplied an average of 723,000 gallons per day from three artesian wells located at the corners of a triangle having sides 50, 70 and 90 ft., the depth of two wells being 1,000 ft. and the third 1,500 ft., all being furnished with 6-in. drop pipes to the depth of 300 ft. At the center of the triangle was a cylindrical brick-lined reservoir 25 ft. deep by 27 ft. in diameter. The pumping station contained boilers, engines, pumps and air compressors. The coal consumption at that time was 12,000 lbs. per 24 hours. To reduce expenses, two more wells 10 ft. apart were drilled, and two deep well pumps, manufactured under patents of E. E. Johnson (Eng. News, Jan. 20, 1898) were installed. These were guaranteed to give an unusually high efficiency. In this way operating expenses were reduced and a duplicate plant obtained. Later, Mr. Wilfred Lewis explained the difficulty of measuring the inertia of moving machinery, and described an instrument devised by himself for this purpose. It consists of a curved tube filled with water except for a small bubble which moves backward and forward, and a graduated scale besides the tube for measuring the amount of movement.

**THE NATIONAL ASSOCIATION OF MANUFACTURERS OF NON-BESSEMER IRON.**—This association is the outcome of a meeting held at the Waldorf Hotel, New York city, on April 22-23, in response to a call authorized by the Southern Pig Iron and the Eastern Pig Iron Associations, to consider the practicability of an organization to co-operate among the different pro-

ducing districts. The preliminary work consisted in the formation of local organizations, in which about 37 companies were represented.

Two representatives from each district were appointed to form a committee on permanent organization, on representation and on plan of procedure. The name given above was adopted, and it was stated that the object of the association "shall be the collection and distribution of all statistics bearing upon the production, sale, shipment and consumption of non-Bessemer pig iron, and for the prompt distribution among the members of the association of this information, and also for such other objects as the association may deem proper from time to time."

The general plan finally adopted was that the votes would be on a basis of number of stacks and output, each stack entitling the holder to a vote, and each 10,000 tons monthly output also adding a vote. It is likely that a secretary will be employed to collect daily statistics, such as production, sales and shipments, and it is understood that the position has been offered to Mr. John Birkinbine, of Philadelphia.

An Executive Committee, holding monthly meetings and composed of two elected delegates from each district, will manage the association. Operating expenses will be defrayed from a fund raised by an assessment of 10 cts. per ton on the best monthly output of the last six months. In the future a monthly assessment of 10 cts. per ton will be made, from which the Executive Committee will expend such amount as it thinks necessary to promote the best interests of the trade. The plan as outlined will be put in operation provided furnace companies aggregating 225,000 tons monthly output will join the association on or before May 20.

## NEW PUBLICATIONS.

**LITERARY MAGAZINES.**—In the April "Fortnightly Review" we find a paper on "The Maine Disaster and After," in which the author displays a sublime ignorance of the United States that would be amusing if his topic were a less serious one. We need only remark that he considers Spain's hope of success in a war with the United States would be to foment internal dissensions in this country which would cause it to split up. To quote verbatim:

A reverse at the hands of Spain would mean the splitting up of the United States into two, if not three, independent republics. The East hates the West and the South hates both, and many are the men biding their time.

Comment on such a statement is superfluous, in these columns at least. We only wonder that the editor of the "Fortnightly" should give space in his columns to the work of so ill-informed a writer. Other articles in the same magazine which deserve mention here discuss British trade conditions in China and the clash of French and British colonizing interests in the Niger.

In the "Nineteenth Century" we find a most valuable article on "The Latest Reconstruction of the Navy," by Sir Wm. H. White, Director of Naval Construction, which should be of interest just now when naval matters are of such absorbing interest here. Mr. A. S. Hurd writes on "British Ships in Foreign Navies," and advances the idea that should England become involved in a naval war with a first-rate power, the ships she has sold to foreign nations might prove most unwelcome aids to the enemy.

In "The Contemporary Review" we find an article on the "Cyclo Industry" in Great Britain. Summed up in a nutshell, the English bicycle manufacturers have sold out their plants to hugely over-capitalized stock companies on the strength of the profits of 1895 and 1896. The result is that British bicycle building concerns are keeping up their prices in the attempt to pay dividends on enormously watered stock, and the product of the small English manufacturers and the well-made American machines are furnished at a lower price, and are taking the trade.

In the May "Popular Science Monthly" Mr. Worthington C. Ford continues his discussion of "The Question of Wheat," which we noticed last month. He shows that in normal seasons the four countries of Europe which produce a surplus of wheat (Russia, Hungary, Roumania and Bulgaria) can export about 75,000,000 bushels, which about supplies the needs of Belgium, Switzerland, and the Scandinavian countries, leaving Great Britain, France, Germany, Austria and Italy, whose combined demands over and above their own production amount to 430,700,000 bushels per annum, to be supplied from abroad. Except for the small contribution of India, nearly all this enormous demand must be supplied from the vast plains in the temperate regions of North and South America. "The West Indian Bridge Between North and South America" is the title of a paper by Mr. J. W. Spencer, in which the strange conformation of the ocean bottom in the vicinity of the West Indies is explained. Mr. Geo. J. Varney contributes a summary of the progress of kite-flying achievements in 1897, and there is a thoughtful paper translated from a French scientific journal entitled "Man's Dependence on the Earth," which raises many questions worthy of serious consideration.

The May "Century," despite a delirium of color on its cover which is unpardonable, is a most excellent number. The article of most interest to our readers is entitled "Railway Crossings in Europe and America," by Franklin B. Locke. The paper gives an interesting account of foreign practice and American progress in the elimination of grade-crossing; but the writer displays very lame logic when he reasons that because European railways, which

have few grade-crossings, make larger returns on the capital invested in them than American, therefore, American railways could increase their dividends by eliminating grade-crossings. His criticism of the railways for not cultivating suburban traffic, also displays scant knowledge of the real facts in connection with American railway management. Among articles of scientific interest are an account of the ascent of the "Mesa Encantada" last summer, and its archaeological significance. "What Are the X-Rays," by John Trowbridge; "Submarine Photography," by Louis Bouton, and a description of the Pyramids.

In "Harper's" for May we find a most valuable and interesting discussion of "The Trans-Isthmian Canal Problem," by Col. Wm. Ludlow, U. S. Engineer. As most of our readers will recall, Col. Ludlow was one of the Commission of Engineers which reported on the Nicaragua Canal enterprise in 1895, and his remarks on this work are so interesting that we have reprinted this portion of his paper elsewhere in this issue. Julian Ralph writes on "Awakened Russia," and gives a most interesting discussion of the people, the resources and the industries of modern Russia.

The "Review of Reviews" for May is very largely devoted to a discussion of the stirring events in connection with the Cuban question which have characterized the past month. As a rule this journal is noted for its judicial discussion of the questions of the day, but in its remarks on the Cuban question, like many other journals, its sympathies appear to be enlisted to such a degree as to make it depart somewhat from its usual non-partisan attitude.

In the English "Pall Mall Magazine" the series of articles on "The Evolution in Comfort in Railway Traveling," which we noticed last month, is continued with an article in which the progress in English passenger-car equipment is described. The writer goes out of his way to cast slurs on American passenger accommodations, prefacing his remarks on the subject with the statement that "American railroads have done but little to provide comfortable vehicles for their patrons." As might be expected from a writer who starts out with a statement so wide of the truth, his further remarks respecting American passenger and parlor-car accommodations are very far from the mark.

In the May "North American Review," papers by Clara Barton on "Our Work and Observation in Cuba," and by Horatio S. Ruhens, Counsel of the Cuban Junta, on "The Insurgent Government in Cuba," will doubtless attract chiefest interest. Only second to these are papers on the methods of recruiting an army, by Capt. Parker and Lieut. Dapray. The former of these is a careful study of the recruiting methods adopted during the Civil War, and a discussion of the best means of raising an army for the United States to adopt. Our present experiences should teach us some valuable lessons as to the length of time required to transform even our trained militia into United States troops. It seems likely that when peace again permits the careful study of these matters, we shall see some arrangement perfected by which a national militia will supplement our present state organizations. Added interest is given to this subject by the paper by Sir Wm. H. Russell, in the same magazine, on "Recollections of the Civil War," in which he vividly describes the tumult of disorder in military matters which existed in the dark days of '61.

**STATISTICS OF RAILWAYS.**—Ninth Annual Report of the Statistician of the Interstate Commerce Commission for the Year Ending June 30, 1897. Pub. Doc.; 6 x 9 ins.; pp. 709; map.

This is the full report of the Commission, the advance sheets of which were re-viewed in Engineering News of Oct. 21, 1897.

**L'ARCHITECTURE DU FER ET DE L'ACIER.**—Par A. Vierendeel. Professeur a L'Université de Louvain. Conférence donnée au Congrès International des Architectes réuni en Aout 1897, a Bruxelles. Paris, 1898; Ed. Lyon-Claesen. Pamph.; 8 x 10 1/2 ins.; pp. 16; illustrated.

This paper discusses the use of iron and steel for buildings and bridges from the point of view of developing its capabilities for ornamental construction and ornamentation. A number of illustrations show the practical application of the ideas advanced in the body of the paper.

**COMMERCIAL DIRECTORY.**—Providence Journal of Commerce, Providence, R. I., March, 1898.

In this number of this publication is begun the publication of a commercial directory in four languages, English, German, French and Spanish, which will be continued in succeeding issues until completed. The purpose of this publication is to develop a complete directory of the commercial, industrial and manufacturing establishments of the United States, which will ultimately be published in book form.

**MUNICIPAL REPORTS.**—The following municipal reports have been received, being by city engineers, and the names mentioned being those of city engineers unless otherwise noted:

Metropolitan Sewerage Commission, Boston and vicinity, Wm. M. Brown, Jr., Chief Engineer, Boston, Mass.; Brockton, Mass., F. Herbert Snow; Cambridge, Mass., L. M. Hastings; Chelsea, Mass., J. H. Stubbs; Fitchburg, Mass., David A. Hartwell; Haverhill, Mass., Robert R. Evans; Spencer, Mass., Special Report on Sewage Disposal, Nathan E. Craig, Superintendent of Sewers; Providence, R. I., Otis F. Clapp; Albany, N. Y., Horace Andrews; Gloversville, N. Y., C. Fiske, Jr.; Utica, N. Y., Chapman L. Johnson; Bridgeton, N. J., Special Report on Sewerage and Sewage Disposal, Alex. Potter, Engineer, 137 Broadway, New York city; Baltimore, Md., Report of City Commissioner, William A. Hanway; Peoria, Ill., Department of Public Works, Almon D. Thompson; Minneapolis, Minn., F. W. Cappellet; Des Moines, Ia., L. Higgins; Montreal, P. Q., Percival W. St. George.

**TIDE TABLES FOR CHARLOTTETOWN, PICTOU AND ST. PAUL ISLAND, C. B., FOR 1898.**—With Tidal Differences for Northumberland Strait; and for the Open Gulf Shore, from Miramichi along the North Coast of Prince Edward Island. Issued by the Tidal Survey Branch of the Department of Marine and Fisheries of the Dominion of Canada: W. Bell, Dawson, Engineer in charge. Paper; 9½ x 6½ ins.; pp. 10.

**SPECIFICATIONS FOR STEEL FIRE BOAT,** for the city of Chicago. Fire Department, March 1, 1898. Pamph.; 9½ x 12 ins.; pp. 26.

This pamphlet contains a very elaborate set of specifications for a new fire boat for the city of Chicago, 118 ft. long, 24 ft. beam, 9 ft. draft. It is to be provided with three double-acting duplex vertical crank and flywheel fire pumps of a capacity of 3,000 gallons per minute for each pump.

**NEW JERSEY STATE BOARD OF HEALTH.**—Report for 1896-7. Henry Mitchell, M. D., Secretary, Trenton, N. J. Paper; 6 x 9 ins.; pp. 389; many tables.

A large part of this volume is taken up with reports from local boards of health, some of which give information regarding water supply, sewerage and garbage disposal systems. Two papers read before the New Jersey Sanitary Association in 1896 are reprinted: "The Public Health Law of New Jersey," by Judge W. M. Lanning, and "River Pollution," by E. J. Marsh. The usual report of vital statistics is given.

**FATIGUE OF METAL IN WROUGHT-IRON AND STEEL FOLGINGS.**—By H. F. J. Porter. The Bethlehem Iron Co., South Bethlehem, Pa. Pamph.; 6 x 9 ins.; pp. 55.

This pamphlet is a reprint from the Journal of the Franklin Institute of a lecture delivered by Mr. Porter on the relative endurance of wrought iron and steel of different qualities to repeated loads. The results of the tests show that high carbon steel has a much longer life than low carbon steel under stresses like those to which axles directions.

**THE COLLECTION AND DISPOSAL OF HOUSE AND STREET REFUSE IN ENGLAND.**—By H. Alfred Roebling, C. E., Leicester, England. Paper; 6 x 9 ins.; pp. 28. Address the author, as above.

This is a general survey of the subject named, "with especial reference to the destruction by fire of such refuse." The author states that the contract system of collection and disposal has been almost entirely abandoned in England, the work being done by the municipalities and the cost met by general taxation. He estimates that 70 towns and cities, with an aggregate population of 8,279,000, have adopted refuse destruction by fire since 1876.

**THE GREAT NORTH SIDE OR BOROUGH OF THE BRONX.** New York: Issued by the North Side Board of Trade, 278 Alexander Ave., near 130th St., New York City. 8vo.; paper; pp. 249, xxv. Profusely illustrated.

This is a very credible publication issued to show the advantage, for residence and business, of that portion of New York city included in the Borough of the Bronx, and greatly exceeding in area, of course, the Borough of Manhattan, which is still commonly thought of and spoken of as New York city. Among the dozen or more contributors to the volume are such well-known men as Gen. Egbert L. Viele, Hon. Louis F. Haffen, the late John C. De La Vergne and Hon. Samuel McMillan.

**CONNECTICUT CIVIL ENGINEERS' AND SURVEYORS' ASSOCIATION.**—Proceedings of Annual Meeting at Hartford, Conn., Jan. 11, 1898. Secretary and Treasurer, Geo. K. Crandall, New London. Paper; 6 x 9 ins.; pp. 51 + IV.; illustrated. 50 cts.

This report contains the three following papers: "Chemical Precipitation Works at New Rochelle, N. Y.," by J. K. Wilkes, of New Rochelle, N. Y.; "Roaring Brook Water Supply for New Britain," by T. H. McKenzie, of Southington; "The Loss to the Civil Engineer by His Lack of Sociability," by Edwin D. Graves, of Hartford, are subjected, such as repeated bending in opposite There is also a list of members and a general index to the reports of the association from 1885 to 1895, inclusive.

**REPORT OF NORTH CAROLINA RAILROAD COMMISSION.**—Commissioners, L. C. Caldwell, John H. Pearson and D. H. Abbott. Pub. Doc. Cloth; 6 x 9 ins.; pp. 527.

The first 90 pages of this report give in full the proceedings in the matter of the suspension by Governor D. L. Russell of J. W. Wilson and S. O. Wilson from their positions of Commissioners, for violation of the section of the Railway Commission Law, which requires that no Commissioner shall hold any stock or bond of any railway company or have any interest in any way in such company. The remainder of the report is given up to the statistics of railways and the routine proceedings of the Commission.

**STREAM MEASUREMENTS.**—Report of Progress for the Calendar Year 1896. By Arthur Powell Davis. Extract from the Eighteenth Annual Report of the U. S. Geological Survey, 1896-7; Chas. D. Walcott, Director. Paper; 7½ x 12 ins.; pp. 418; 23 plates, 75 figures in the text and many tables. Washington, D. C.: Pub. Doc.

Detailed descriptions of the several gaging stations and the results obtained during 1896, and sometimes for other periods, are given in this volume. The work was extended to the southeastern part of the country in 1896. The survey is gradually accumulating a large number of widely distributing gagings which bid fair to become of great importance, especially when taken in connection with the special studies of the water resources of a number of states, now in progress, and the rainfall records of the Weather Bureau. The report contains numerous maps and diagrams and many half-tone reproductions of photographs.

**DIE KNICKFESTIGKEIT IN THEORIE, VERSUCH UND PRAXIS.**—By Fr. V. Emperger. Pamph.; 6 x 9 ins.; pp. 85. Published by der Zeitschrift des Oesterr. Ingenieur und Architekten Vereines, Vienna. Price, 50 cts.

This is a paper on the strength of columns, contributed to the Proceedings of the Austrian Society by Mr. von Emperger, together with the discussion. Among those taking part in the discussion were Professors Tetmajer of Zurich, Melan of Brunn, Mayer of Vienna, Ostenfeld of Copenhagen and our own Merriman and Duhols, making the discussion international in its scope.

**WATERBORNE TYPHOID.**—A Historic Summary of Local Outbreaks in Great Britain and Ireland, 1858 to 1893, with a Tabular Analysis of 205 Epidemics. A Report Prepared for the Parliamentary Bills Committee of the British Medical Association. By Ernest Hart, D. C. L., Chairman of the Committee. London: Smith, Elder & Co., 15 Waterloo Place. Paper; 8½ x 11 ins.; pp. 62; tables and illustrations. English price, two shillings; American price, \$1.

This is a carefully prepared summary and discussion of all well authenticated epidemics of typhoid fever that have occurred in Great Britain and Ireland during the past 36 years. Its important bearing upon the question of pure water supplies is apparent at first thought, and grows stronger as one sees from the record the various ways in which water supplies become polluted.

**MASSACHUSETTS STATE BOARD OF ARBITRATION AND CONCILIATION.**—Report for the Year Ending Dec. 31, 1897. Chas. H. Walcott, Chairman; Bernard F. Supple, Clerk, State House, Boston. Paper; 6 x 9 ins.; pp. 176.

The efforts of this board to bring about speedy and equitable settlements of difficulties between employers and employed seem to have been more successful in 1897 than in previous years. This, however, is only the general impression received in reading the detailed reports from year to year. Work of this sort cannot easily be summarized, and the board does not attempt it. It gives 36 reports and decisions of cases coming before it in 1897. A valuable feature of the report is an appendix containing the constitutional or statutory provisions of 24 states of the union "for mediation of one kind or another in the settlement of industrial disputes."

**VIADUCT ACROSS ROCK CREEK, DISTRICT OF COLUMBIA.**—Letter from the Commissioner of the District of Columbia, transmitting report, descriptions, specifications, plans and estimates for a bridge or viaduct across Rock Creek, on the extension of Connecticut Avenue, Washington. Senate Document No. 96, 55th Congress, 2d Session; 9 x 5½ ins.; pp. 26; 35 folding plans and diagrams.

This is the full report and the competitive plans for the proposed viaduct on Connecticut Ave., in Washington, illustrated and described in our issue of Jan. 27, 1898. As there announced, six plans were sent in by Messrs. George S. Morison, L. L. Buck and W. H. Breithaupt, all Members of the American Society of Civil Engineers. The Commissioners decided in favor of Mr. Morison's plans for a masonry bridge; and awarded prizes to Messrs. Buck and Breithaupt, for alternate Melan and steel construction.

**LE PONT VIERENDEEL.**—Notes pour le Jury Concours Somzee, de l'Exposition Universelle de 1897 a Bruxelles. Bruges, 1898. Chas. Houdmont. Paper; 8 x 10½ ins.; pp. 75; illustrated.

Mr. Vierendeel, who is an architect and a professor of architecture in the University of Louvain, has devised a type of bridge in which the truss element is the rectangle instead of the triangle. At the Brussels Exhibition of last year a bridge of this type was tested to destruction. The results of this test and the conclusions of the jury by which it was made, together with the claims made by the designer for his construction, his answers to various criticisms, and a discussion of the methods of calculating both this construction and the ordinary truss construction are collected in this publication. The whole makes a very interesting little pamphlet to engineers who may be interested in seeing what an able engineer has to say for the advantages of replacing the triangle so long used as the fundamental truss element with the rectangle or portal construction.

**SIXTEENTH ANNUAL REPORT OF THE STATE BUREAU OF LABOR STATISTICS CONCERNING COAL IN ILLINOIS, 1897.** David Ross, Secretary of the Bureau, Springfield, Ill. Pamph.; 6 x 9 ins.; pp. 223.

This report, besides the usual statistical record of the state inspectors of mines, concerning production, accidents, etc., contains a review of the great coal miners' strike, which lasted four months, involving 28,700 men, and resulted in an average increase of wages of 26%. It also contains much interesting matter relating to coal mining economy. The output of coal in the state for the year 1897 was 20,072,758 tons of 2,000 lbs., an increase of 1.46% over the preceding year. The average value of lump coal at the mines was 85.2 cts. and of other grades 36.5 cts. The average value of all coal was 72.1 cts., ranging from \$1.036 in the second district to \$0.531 in the sixth district. The average value of lump coal at all the mines in 1893 was \$1.025. The use of mining machines has made but slight progress, only 19.66% of all the coal having been cut by machines.

**PROPOSED SEA WATER PIPE LINE FOR THE CITY OF NEW YORK.**—Reports of Chief of Department Hugh Bonner and Consulting Engineer Foster Crowell to the Board of Fire Commissioners. Paper; 6 x 9 ins.; pp. 27.

This report contains descriptions by both Mr. Crowell and Mr. Bonner of the special fire protection systems of Cleveland, Milwaukee, Detroit, Buffalo and Boston, each of which consists of a separate system of pipes supplied with water from the lake front or ocean by means of

fire boats. The Boston system alone makes use of salt water. The report recommends an experimental system for New York, consisting of nearly a mile of 12-in. and 14-in. mains, extending from the North River through Franklin St. to Broadway, with two branches. Stand-pipes and aerial lines of pipe are also considered advisable for the protection of tall buildings and for checking the spread of fires from roof to roof. In our issue of March 24, 1898, there appeared a description of the separate high pressure fire protection system of Providence, R. I. The water for this system is taken from the same source as the regular supply of the city.

**BROOKLINE PUBLIC BATH.**—Reports of the Building Committee and of the Committee on Care and Management. With an Appendix Containing a Description of the Building, Illustrations, Schedule of Hours, etc. H. Lincoln Chase, M. D., Secretary Committee on Care and Management of the Public Bath. Paper; 6 x 9 ins.; pp. 20; illustrated. Address the Secretary at Brookline, Mass.

The report states that this is "the first municipal all-the-year-around bathing establishment, with swimming facilities as well as cleanliness baths," to be established in this country. Besides private baths, tub and rain, there are two swimming tanks, one for general use, 26 x 80 ft., and one for instruction, 10 x 22 ft. The water for the bath house is taken from the public supply. The water for the tanks is maintained at a temperature of 70° to 75° F. by means of a pulsometer. The total appropriation for the construction of the bath house, including grading around it, was \$43,000. This does not include the cost of land, the site having been already owned by the city. Mr. F. Joseph Untersee, of Brookline, was architect for the bath house, and Mr. F. F. Forbes, Superintendent of the water-works of Brookline, is a member of the Committee on Care and Management.

**GAS AND ELECTRIC LIGHT COMMISSIONERS OF MASSACHUSETTS.**—Report for 1897. Paper; 6 x 9 ins.; pp. 184 + CLXXXVI.; many tables. Boston: Address the Commission.

The board now has under its supervision 134 companies, 13 towns and two cities. Of the companies 45 supply gas, 65 supply electricity and 24 both gas and electricity. Of the municipalities two supply both forms of light and 13 electric light only. The report contains the usual reviews of the proceedings to establish municipal plants; petitions, hearings and decisions for revisions of rates; reports on deaths caused by gas and electricity; the detailed operations of the several companies, with the character and extent of their works; and tables of rates charged for gas and electric lighting both public and private. The prices for lighting are the most detailed and satisfactory of any published in this country, so far as we know. Of course they are limited to Massachusetts towns and cities. The volume contains the following special reports by the board: On "Certain Deaths from Asphyxiation by Illuminating Gas;" on "Water and Coal Gas Used in the City of Boston;" and on "The Causes of the Gas Explosion on March 4, 1897, at the Corner of Tremont and Boylston Streets in the City of Boston."

**WATER RESOURCES OF INDIANA AND OHIO.**—By Frank Leverett. Extract from the Eighteenth Annual Report of the U. S. Geological Survey, 1896-7; Chas. D. Walcott, Director. Washington, D. C.: Pub. Doc. Paper; 7½ x 12 ins.; pp. 139; five plates, two figures in the text and numerous tables.

This volume first describes the surface waters of Ohio and Indiana, after which the underground waters of Indiana are treated at length and those of Ohio more briefly. The less full treatment of the underground waters of Ohio is due to the fact that arrangements have been made for a separate report on that subject. The present volume does not take up water power, owing to the fact that Ohio was well covered in this respect in the Reports of the Tenth Census, while a special report on the water power of Indiana is forthcoming. A considerable amount of information, largely statistical, is given regarding the city water supplies of the two states. This is based on correspondence, supplemented by "The Manual of American Water-Works" for 1897. A number of water analyses are included. Among the plates one shows the topography and another the geological formation of the two states and a third shows the relation of the glacial deposit to ordinary wells.

**ANNUAL REPORT, MASSACHUSETTS RAILROAD COMMISSION, 1898.**—Commissioners, John E. Sanford, Geo. W. Bishop and Hersey B. Goodwin. Pub. Doc.; 6 x 9 ins.; pp. 421.

The main body of this report is about equally divided between steam railways and street railways, and one of the most interesting discussions in the report is that comparing the relative growth of steam and street railway passenger traffic during the past three or four years. During the year there was a decrease of 1½ miles in steam railway mileage, and a general falling off in traffic and earnings in all particulars, although this shrinkage was very nearly counterbalanced by strict economy and a marked reduction in operating expenses. During the year it is stated that freight rates reached their lowest average point in Massachusetts, at 1.25 cts. per ton per mile. Although the falling off in the number of passengers carried by steam railways has been very marked since 1893, the report says that no exact statement can be made as to how much of this is due to the general commercial depression and how much to the competition of electric railways for the local and suburban travel. These electric roads have, according to the report, however, been increased by 148 miles during the year, making now a total street railway mileage in this state of 1,453 miles, of

which 1,428 miles are operated by electric power alone. The average cost of this railway per mile of main track has been \$44,457, ranging from \$10,000 to \$97,000. The business and earnings of these street railways both show an increase over the preceding year. Of the total 93 companies, 50 paid dividends of from 2% to 10%.

**REPORT ON THE CHARACTERISTICS OF THE LAKE ERIE & WESTERN RAILROAD SYSTEM,** as Existing on Jan. 1, 1898.—Written and Compiled by W. F. Goltra, C. E., Secretary to the Vice-President and General Manager, and Chief Clerk to the Chief Engineer and Purchasing Agent. Indianapolis, Ind. Cloth; 6 1/2 x 8 1/2 ins.; flap cover; pp. 133; illustrated; profile sheets in pocket of cover.

This is the third issue of a comprehensive and condensed report upon the history, construction, equipment and physical condition of the railways of the Lake Erie & Western system. The first issue of this "characteristic" report, made by Mr. Goltra, was reviewed at some length in our issue of April 25, 1895, and an extract from the second issue, dealing with the bridge renewals and substitution of permanent for temporary structures, was published in our issue of Aug. 6, 1896. This extract is partially repeated in the 1898 issue, but the cost of the work has been higher than was estimated in 1896, and the work yet remaining to be done is now estimated to cost \$17, instead of \$15 per ft. The report contains complete lists of sidings, railway and highway grade crossings, interlocking plants, bridges and culverts, buildings, turntables, coal and water stations, etc., with various particulars in each case. There are also descriptions of the track, fencing, telegraph system, track inspection, etc. The merits of this kind of report we discussed in connection with Mr. Goltra's first report.

### 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.)

**NATIONAL BICYCLES.**—National Cycle Mfg. Co., Bay City, Mich. Pamph.; 6 x 8 ins.; pp. 31. This pamphlet illustrates the various models of 1898 bicycles offered by this company.

**DE LA HUNT FLUSH TANKS.**—Malcolm V. Bolton, Cedar Rapids, Ia. Folder; 3 1/2 x 6 ins.; pp. 4. This pamphlet describes an automatic siphon, without moving parts. A section is shown.

**VALVES, INJECTORS, STEAM SPECIALTIES.**—The Lanckenheimer Co., Cincinnati, O. Pamph.; 4 1/4 x 7 1/4 ins.; pp. 208. This is a very complete illustrated catalogue and price list of a great variety of steam, water, gas and oil fittings.

**EFFICIENT POWER PUMPS.**—The Goulds Manufacturing Co., Seneca Falls, N. Y. Pamph.; 8 x 7 ins. This is a six-page supplement to the catalogue of power pumps issued by this company to show some of the larger types of machines it builds.

**WELL DRILLING PLANT.**—O. P. Benjamin Mfg. Co., Lafayette, Ind. Paper; 6 x 8 ins.; pp. 48. Well drilling rigs operated by hand and horse-power, are illustrated and described, together with a variety of tools and appliances used in this class of work.

**STEAM BOILERS.**—The Murray Iron Works Co., Burlington, Iowa. Pamph.; 9 x 6 ins.; pp. 6. This pamphlet contains half-tone cuts of five styles of horizontal return tubular boilers, designed for high pressures.

**STEAM FIRE ENGINES, ETC.**—Waterous Engine Works Co., St. Paul, Minn. Pamph.; 9 1/2 x 6 1/2 ins.; pp. 50. This is a catalogue of steam, gasoline and chemical fire engines, hose carts, hook and ladder trucks and other fire apparatus.

**STEAM VALVES.**—Thos. G. Oakes & Co., 54 John St., New York city. Paper; 6 x 3 1/2 ins.; pp. 16; illustrated. This is a priced catalogue of the Oakes acorn, globe and other steam valves, from 1/2-in. upwards in size, and of Oakes acorn jointing and royal red packing.

**MECHANICAL STOKERS.**—Westinghouse, Church, Kerr & Co., 17 Cortlandt St., New York. Pamph.; 11 1/4 x 7 1/4 ins.; pp. 39. This pamphlet contains an illustrated description of the well-known Roney stoker, with views of boiler plants in which it is in use.

**THE NATIONAL FEED WATER HEATER.**—The National Pipe Bending Co., New Haven, Conn. Pamph.; 3 1/2 x 6 ins. In this small pamphlet the gain by the use of feed water heaters is set forth, and the National heater is illustrated and described.

**FIREPROOF BUILDING MATERIALS.**—Henry Maurer & Sons, 420 E. 23d St., New York. Pamph.; 6 x 9 ins.; pp. 96. This is a handsomely illustrated catalogue of fire brick, porous terra cotta, flat hollow arches, tiles, etc., for fireproof building construction.

**MECHANICAL STOKERS.**—Wm. Sellers & Co., Incorporated, 1600 Hamilton St., Philadelphia. Pamph.; 5 x 7 1/2 ins.; pp. 26. This pamphlet describes the Vicars' mechanical stoker, which is in extensive use in Great Britain, and has recently been introduced in this country.

**THE FINAL EFFORT OF THE TRUST DEFEATED.**—The Walker Co., Cleveland, O. This somewhat warlike title introduces circular No. 1071 of the Walker series, in which the decision of the United States Circuit Court of Appeals in the case of Thomson-Houston Co., appellee, vs. Union Railway Co. et al., appellant, is given. The Walker Co. considers this a great victory, as it practically throws the manufacture and sale of the underrunning trolley open to all.

**STATIC TRANSFORMERS.**—Circular 1072, by the same company, gives notice that all the transformers necessary in connection with Walker alternating current machinery will be of the well-known "Wagner type." These are manufactured for the Walker Co. by the Wagner Manufacturing Co., St. Louis, Mo. The circular describes the details of this make of transformer and gives tables of dimensions and results of tests.

**DYNAMITE.**—King Powder Co., Cincinnati, O. Paper folder; 9 1/4 x 6 ins. This company's "Rex powder" is a high class of dynamite, and it also manufactures an ammonia powder of a somewhat low grade. Both explosives are put up in cartridge form.

**TRAVELING CRANES.**—Case Mfg. Co., Columbus, O. Paper; 8 x 10 1/2 ins.; pp. 8. A great variety of cranes and hoists is manufactured by this company, but this pamphlet deals with its three-motor electrical traveling cranes for heavy lifting in railway erecting shops and foundries, etc.

**EXCAVATING MACHINE.**—Calhoun Excavator Co., Unity Building, Chicago. Paper; 6 x 8 1/2 ins.; pp. 8. This pamphlet contains a reprint of an illustrated article in Engineering News, describing the Calhoun excavating and conveying machine for handling coal, ore, etc. etc.

**TENTS AND CAMP OUTFITS.**—H. Channon Co., 24 Market St., Chicago. Paper; 6 1/2 x 10 ins.; pp. 88. Tents of all kinds, flags, camp cooking outfits, waterproof coats, caps, gun cases, etc.; camp furniture, hammocks, boat fittings and a variety of articles of this character are included in this catalogue.

**ROCK DRILLS.**—The John M. Rogers Boat, Gage and Drill Works, Gloucester City, N. J. Circular; 4 pages. This circular describes a rock drill which has some novel features. The valve is of the Corliss type, which it is claimed has many advantages over the piston or spool valve used in other drills.

**TELESCOPIC METER COUPLING.**—Neptune Meter Co., 253 Broadway, New York city. One-page circular. The Trident telescopic coupling is designed for use in connecting meters to iron pipes. It consists of a regular coupling inserted into a sleeve provided with plastic packing material, giving a telescopic movement of 3/4-in.

**PUMPS AND WATER SUPPLIES.**—O. P. Benjamin Mfg. Co., Lafayette, Ind. Paper, 4 1/4 x 7 ins.; pp. 268. This is a comprehensive catalogue and price list of the lighter styles of pumps and an almost endless variety of supplies. Numerous styles of windmill and well pumps are shown, also hydraulic rams and special pumps for irrigation work.

**MELAN ARCH BRIDGE, TOPEKA, KAN.**—The Commercial Club, Topeka, Kan. Pamph.; 9 x 7 ins.; pp. 32; illustrated. This pamphlet illustrates and describes briefly the new five-span Melan arch bridge recently completed at Topeka, Kan., and fully described in Engineering News of April 2, 1896; Sept. 23, 1897, and Feb. 10, 1898.

**FAN MOTORS.**—General Electric Co., Schenectady, N. Y. Pamph.; 5 1/4 x 7 ins. This is a very attractive little circular bearing the number 9000, in the General Electric Series. Its 14 pages are devoted to illustrations and descriptions of the types of fan motors, both direct and alternating current, that this company is offering for the summer of 1898.

**RAILWAY WATER SUPPLY.**—U. S. Wind Engine & Pump Co., Batavia, Ill. Paper; 6 1/4 x 10 ins.; pp. 48. This company manufactures a full line of machinery and supplies for railway water stations, including tanks and tank trestles, gas and windmill pumps, well pumps, tank fittings, and the Mansfield water column for filling locomotive tenders.

**PAVING TOOLS AND MACHINERY.**—The Contractors' Tool Co., 727 Arch St., Philadelphia, Pa. Paper; 6 x 9 ins.; pp. 30; illustrated. This is a priced catalogue of asphalt mixers, wagons, rollers and thermometers; mastic and roofing kettles; dippers, stirrers and buckets; shovels, rakes and other asphalt tools; cement and concrete tools; picks and hammers; plows, scrapers and tools for road work.

**COAL HANDLING FOR STEAM GENERATION.**—C. W. Hunt Co., 45 Broadway, New York. Pamph.; 6 1/4 x 9 1/4 ins.; pp. 64. This pamphlet contains illustrated descriptions of the well-known Hunt Conveyor and other machinery for handling coal, ashes and other materials, for boiler rooms, coal yards, etc. Many sectional and photographic views are shown of actual illustrations.

**LUNDELL FAN MOTORS.**—Sprague Electric Co., 20 Broad St., New York city. Pamph.; 7 x 9 1/4 ins.; illustrated. This pamphlet describes the various types of fan motors manufactured under the trade name of Lundell. A portion of the space is given up to illustrations of details of armature, field, bearings and brush holders. The motors are made for both alternating and direct current.

**PIPE THREADING AND CUTTING MACHINES.**—The Bignall & Keeler Manufacturing Co., Edwardsville, Ill. Paper; 4 x 6 ins.; pp. 108; illustrations and tables. This is a priced descriptive catalogue of hand and power pipe threading and cutting machines, combination bench and pipe vises, shapers, emery surfaces, screw punches and special tools and machinery. Many testimonials are given and a number of useful tables.

**FIREPROOF STEEL GRAIN ELEVATORS.**—The Steel Storage and Elevator Construction Co., Buffalo, N. Y. Pamph.; 6 x 9 ins.; pp. 31; illustrated. The steel tank system of elevator construction controlled by this company was described in Engineering News of

March 17, 1897. This is a trade pamphlet describing the same construction quite fully and illustrating a number of the more important installations.

**CENTRIFUGAL PUMPS.**—The Lawrence Machine Co., Lawrence, Mass. Pamph.; 8 x 5 1/4 ins.; pp. 40. This is the 7th edition of an illustrated catalogue and price list of different forms of centrifugal pumps, adapted for a variety of conditions. Some of the pumps are built with engines direct connected. One of the pumps made by this company has a record of lifting water 26 ft. by suction for 60 days continuously without ones losing its suction.

**RAILWAY VELOCIPEDES.**—The Railway Cycle Mfg. Co., Hagerstown, Ind. Paper; 3 1/2 x 6 ins.; pp. 20. The Hartley & Teeter inspection cars built by this company, are built on the bicycle system of construction, with tube frames and wire-spoke wheels. The single-seat car has a diamond frame with transverse members connected to the axles, while the double-seat car has two drop frames side by side. The weights are 60 and 75 lbs., respectively.

**ELECTRIC ROCK DRILLS.**—Marvin Electric Drill Co., Canastota, N. Y. Pamph.; 6 x 9 ins.; pp. 31; illustrated. This pamphlet gives a very good general description of the Marvin electric percussion rock drill, which has been quite extensively used for quarrying and rock excavation at the quarries of the Solvay Process Co., on the New York State Canals Improvement, and at other places. Both the drill and the generator construction are fully described, and a number of records of capacity are also given.

**GENERATORS AND MOTORS.**—Armitage-Herschell Co., North Tonawanda, N. Y. This is a card giving a very brief description of a type of slow-speed multipolar machine. A table of sizes, rating and prices is given from 1-16 to 50 HP. This is based on the output at a speed of 1,000 revolutions per minute. Several electrical and copper equations and a table of weight, and drop per ampere per 1,000 ft. of copper wire, are included.

**PORTABLE TESTING SET.**—Queen & Co., Inc., 1010 Chestnut St., Philadelphia, Pa. Pamph.; 6 1/4 x 10 ins. This pamphlet describes the Queen-Acme Portable Testing Set, an instrument for making quick and reliable tests of electric resistance. The set includes a D'Arsonval galvanometer, a battery of 6 chloride of silver cells, two contact keys and the various platinumoid resistance coils necessary to form a Wheatstone bridge with a range of 0.001 to 11,110,000 ohms.

**ENGINEERS' AND SURVEYORS' INSTRUMENTS.**—Queen & Co., 1010 Chestnut St., Philadelphia, Pa. Paper, 8 1/2 x 5 1/2 ins.; pp. 186. First edition; illustrated. A new descriptive catalogue of transits of various types, levels, plane table adjustments, stadia rods, etc. This is not a priced catalogue, but rather a treatise upon these instruments, their care, handling, adjustment, faults or errors, details of manufacture, etc. Included are a number of useful tables to be employed in connection with instrumental work.

**TRINIDAD LAKE ASPHALT PAVING.**—Warren-Scharf Asphalt Paving Co., 81 Fulton St., New York. Paper; 8 x 5 1/4 ins.; pp. 53; illustrated. This pamphlet sets forth the advantages of Trinidad Lake asphalt sheet-pavement and illustrates its use by excellent photographs of asphalt paved streets in many American cities. Tables are also given, showing the sq. yds. laid in each year in a number of these cities, with city maps indicating in red the location of these streets. These last will be found convenient by wheelmen.

**INSTRUCTIONS IN PHOTOGRAPHY.**—(1) A Reference Book of Practical Photography; (2) First Step in Photography; (3) Second Step in Photography. By F. Dundas Todd. Chicago: The Photo-Beacon Co. Three pamphlets; paper; 4 1/4 x 6 ins.; (1) pp. 191; 50 cts.; (2) pp. 52; 25 cts.; (3) pp. 98; 50 cts. These little books by Mr. Todd, Editor of the "Photo-Beacon," give practical instructions as to focusing, light, position, apparatus, and other matters connected with the taking of photographs, and also full instructions as to methods of developing, printing and enlarging.

**TURBINE WHEELS, "CASCADE" WATER-WHEELS, ENGINES AND BOILERS.**—The James Lefell & Co., Springfield, O. Three pamphlets; 7 1/2 x 5 ins.; pp. 124, 42, 40. The Lefell turbine wheels are well known. The "Cascade" is an impulse wheel, something like the Pelton in external appearance, the form of the buckets being different. The engines and boilers described are mostly of the agricultural portable and semi-portable type, but center crank stationary engines, both throttling and automatic cut-off, are also described.

**ILLINOIS STEEL CO., Chicago, U. S. A.**—Pamph.; 5 1/4 x 7 1/4 ins.; pp. 42. This pamphlet contains descriptions of the five iron and steel plants owned by the Illinois Steel Co. at Chicago and Joliet, Ill., and Milwaukee, Wis. The company is now a competitor in the markets of the world, although it is located 1,000 miles from the seaboard and assembles its materials from distances of 300 to 700 miles. The pamphlet is illustrated by numerous excellent half-tone cuts of scenes about the works.

**GOLD DREDGING MACHINERY.**—Catalogue No. 15. Gold Dredging on Feather River, California, Catalogue No. 16; Risdon Iron Works, San Francisco, Cal. Pamph.; 6 1/4 x 10 ins.; pp. 32 and 16. The Risdon Iron Works has purchased the patents and rights of building Mr. R. H. Postlethwaite's dredges, which have been used with great success in New Zealand and are now being introduced in California. Dredges on the Feather River, Cal., are said to be handling gravel at a cost of 3 cts. per cu. yd. The pamphlets have a number of half-tone cuts showing the dredges in operation.

ELECTRIC MOTORS IN THE ART OF PRINTING.—Sprague Electric Co., 20 Broad St., New York city. Pamph.; 6 7/8 x 8 1/4 ins.

As implied in the title, this pamphlet presents the advantages of electric motors for driving printing machinery, under the heads of Power and Increased Product. The experiences of the American Book Co. and the American Lithographic Co., both of New York city, are given as evidence. The pamphlet is a most beautiful specimen of the printer's art, especially in its artistic cover.

CAMERAS AND PHOTOGRAPHIC SUPPLIES.—The Western Camera Mfg. Co., 133 Wabash Ave., Chicago, Ill. Paper; 7 x 5 1/4 ins.; pp. 48.

The principal specialty now being introduced by this company is its "Magazine Cyclone" camera, which holds 12 plates and does not require any extra plateholders. The magazine holds the plates, and as each plate is used it is lowered to the proper position by means of a button outside the case. When all the plates have been used the magazine can be removed from the case and replaced with another containing 12 new plates.

TRINIDAD LAKE ASPHALT PAVING.—The Barber Asphalt Paving Co., Main Office, Bowling Green Building, New York. Paper; 7 1/2 x 5 ins.; pp. 126; illustrated.

This is a new edition of the company's catalogue, handsomely illustrated by photographic views of the Trinidad Lake, the works of the company and many streets in principal American cities paved by the company. Lists of streets and areas laid in each, and maps of the cities paved, are also given, along with testimonials from public health officers, city officials, etc.

ENGINES AND BOILERS.—The Phoenix Iron Works Co., Meadville, Pa. Pamph.; 10 x 7 1/2 ins.; pp. 26.

This is a catalogue of the "Dick and Church" engine, which is of the automatic high-speed type, and is equipped with the Rites governor. Tandem engines are built with the high pressure cylinder in front of, or nearer the shaft than the low, which is the reverse of the usual position. The pamphlet also has illustrations of four different types of boilers made by the company, viz., horizontal tubular, Manning vertical, internal corrugated furnace drop flue, and Moyes "Combine" water-tube.

TEST OF A NASH GAS ENGINE.—National Meter Co., New York. Pamph.; 6 x 9 ins.; pp. 14.

This pamphlet contains the report of a test of a 20-HP. Nash gas engine coupled by a friction clutch to a Riker dynamo. The test was made at the Stevens Institute of Technology. Using gas of a heating value of 701 B. T. U. per cu. ft., the engine developed 22.71 brake HP., with a gas consumption of 17.62 cu. ft. per hour per B. HP. The amount of light furnished by the electric lamps fed by the dynamo was 1.69 times as much as would have been given by the gas burned in ordinary gas burners.

CONVERTED BELTED GENERATORS.—Walker Co., Cleveland, O. Pamph.; 7 1/2 x 10 1/2 ins.

This circular is issued to call attention to a line of generators known as the "Converted type," which has been developed by the Walker Co. to suit conditions where a belted generator is preferred. The machine closely resembles in design and operation the well-known line of direct connected generators manufactured by this company. Some details of construction are illustrated and explained, and outline dimension drawings of two-bearing and three-bearing belted generators are given.

STEAM ENGINES.—The "Twiss" Automatic Cut-Off Engine. Nelson W. Twiss, New Haven, Conn. Pamph.; 8 x 5 1/2 ins.; pp. 8.

The "Twiss" engine has some novel features. It is of the general form of the Corliss engine, with two rotary valves instead of four, each valve being both steam and exhaust valve. The valve is of a hollow cylindrical form, and inside of it there is journaled an auxiliary or cut-off valve. This cut-off valve is liberated by a tripping cam. The engine, therefore, appears to combine the principles of the Rider cut-off valve with a modified Corliss trip motion.

ELECTRIC, HYDRAULIC AND STEAM ELEVATORS.—Standard Elevator & Mfg. Co., Chicago, Ill. Pamph.; 6 1/2 x 9 1/2 ins.; pp. 12.

This pamphlet is issued to call attention to some of the types of elevators manufactured by the Standard Co. It includes a full-page half-tone of the interior of the company's shop, to give an idea of its facilities, and several illustrations of electric elevator motors of two and four-pole types. A small portion is given up to describing the "special features" of the electrical construction, such as operating devices, variation of speed, safety devices, pitons and cages and cars.

HOLLOW TILE SEWERS.—The National Web Tile Sewer Co., Kirk Building, Syracuse, N. Y. Paper; 9 x 7 ins.; pp. 32; illustrated.

This catalogue describes glazed hollow tile terra cotta sewers from 2 to 7 ft. in diameter, which the company named has been organized to introduce throughout the United States. The company claims as advantages for this kind of sewer over brick that the material is better burned, and therefore more durable and stronger; that it absorbs less water and gases; and, having a smoother surface and fewer joints, would have a greater carrying capacity. Shapes for manholes and keys for subway conduits are also described in the catalogue.

KODAKS.—Eastman Kodak Co., Rochester, N. Y. Pamph.; 5 1/4 x 7 3/4 ins.; pp. 52; illustrated.

This is a pleasing little catalogue of that type of camera known everywhere where cameras are used by the name of "Kodak." Descriptions are given of cameras ranging from the "Pocket kodak," which is 2 1/4 x 2 3/8 x 3 1/2 ins.,

through a variety of styles and sizes to what may be termed the very latest thing in cameras—the "Folding Cartridge Kodak" with bicycle case—a camera taking a 4 x 5-in. printed upon a film, enough of which is rolled on for 12 exposures. These cartridges, so called, can be placed in the camera or removed in broad daylight. Such accessories as tripods, lanterns, developing sets, etc., are also listed or described.

CONTRACTORS' AND RAILWAY SUPPLIES.—H. Channon Co., 24 Market St., Chicago. Cloth; 7 x 10 1/2 ins.; pp. 242.

This is a voluminous descriptive catalogue and price list of a large range of supplies, including wire rope, blocks and sheaves, differential haul-ropes, pumps, derricks, winches, tools of all kinds, emery wheels, wheelbarrows, etc., etc. A comprehensive catalogue of this kind, giving prices, is a very handy thing for any contractor or engineer to have at hand.

GRADING AND ROAD MACHINERY.—Western Wheel Scraper Co., Aurora, Ill. Paper; 9 1/2 x 6 1/2 ins.; pp. 56.

Much ingenuity has been expended in the design of machinery for excavating and handling earthwork, and this handsome catalogue illustrates and describes the various "Western" machines. It includes different styles of drag and wheel scrapers, grading plows and road machines. Some of these machines have elevating conveyors which load the excavated material directly into dump carts. Rock crushers, street sweepers, dump wagons, etc., are also included.

HORIZONTAL STEAM ENGINES.—W. J. B. Albrece Mfg. Co., Indianapolis, Ind. Paper; 10 x 6 1/2 ins.; pp. 48.

The "Economic" automatic engine is a single cylinder, horizontal, center-crank engine, with the crank disks running in an oil chamber. The slide valve is of triangular section, taking steam on the inside. The "Economic" boiler has a single furnace flue, with a combustion chamber and return tubes. The catalogue shows also simple and compound side-crank engines, and specialties in steam separators, condensers, coolers and tank lubricators for cylinders.

BRIDGE RAILINGS.—The Belmont Iron Works, Philadelphia, Pa. Pamph.; 10 x 9 ins.; pp. 28; illustrated.

This pamphlet contains illustrations and prices of a large number of standard and special designs for bridge railings, newel posts, lamp posts, name plates, bridge portal castings, etc., manufactured by the company named above. Special attention is directed to the company's rolled and drawn steel hand rail, which is claimed to be particularly rigid both laterally and vertically, and also to the rolled and drawn steel base molding designed to correspond with the hand rail.

WOODLINE.—The American Wood Preserving Co., Philadelphia, Pa. Pamph.; 6 x 4 1/2 ins.; pp. 39; illustrated.

This pamphlet contains a very good description of this new preservative for timber and of the methods of applying it which have been employed in a number of important works. Among the plants described are the one used in treating the ties of the Boston subway, the large plant of the Pennsylvania R. R. Co. at Pavonia, N. J. (Eng. News, Dec. 31, 1896), and a portable plant designed for railway use which is now employed by a prominent Western railway.

WIRE ROPEWAYS.—The Hallidie Wire Ropeway, manufactured by the California Wire Works, San Francisco, Cal. Pamph.; 6 x 9 1/2 ins.; pp. 44.

This pamphlet contains a most interesting illustrated description of the simplest method of conveying materials long distances by wire ropes. It is the single endless rope system, the same rope traveling in a continuous circuit and carrying buckets suspended from it. A recent installation of this system at Nelson, British Columbia, is 4 1/2 miles long, with a fall of 4,000 ft. During 1897 it carried 49,540 tons of ore. Its capacity is to be increased to 100,000 tons per annum by increasing the size of the carriers.

STEAM PUMPS.—National Foundry & Machine Co., Louisville, Ky. Cloth; 5 1/2 x 8 ins.; pp. 96.

This is a catalogue of the Reilly pumps, which are adapted to various classes of service. The ordinary patterns are horizontal (bilge pumps, vacuum pumps and pressure pumps, etc.), but vertical patterns are used for deep wells. The specialties also include horizontal air compressors, vertical blower engines, independent condensing apparatus for non-condensing engines, and horizontal compound plunger pumps. Several pages are devoted to testimonials, and useful information, and at the end are some 20 blank pages of cross-section paper for memoranda.

ROAD MACHINERY.—F. C. Austin Mfg. Co., Chicago, Ill. Paper; 10 1/2 x 7 1/2 ins.; pp. 76.

This is a handsome illustrated and descriptive catalogue of machinery for road making and maintenance. There are jaw rock crushers and complete crushing and screening plants, reversible rollers, grading machines (some of which are shown as used for removing snow on streets in Chicago), dump wagons, street sweepers and sprinklers, drag and wheel scrapers, etc. One New Era grader is shown hauled by a traction engine. Besides all this the catalogue includes tubular truss bridges, well drilling machinery, a ditching and sewer building machine and a current motor.

LAKE TRIPS.—Northern Steamship Co. Pamph.; 6 1/2 x 8 1/2 ins.

This is a very artistic pamphlet, entitled "In All the World No Trip Like This," and is a reprint of an article appearing in the Chicago "Tribune," in which Jeannette L.

Glider tells of the delights of the Great Lakes; nor must "A Briton's Frank Confession," which follows, be overlooked. The object of the pamphlet is twofold; the first, intimated by saying that it comes from the Northern Steamship Co., and in the second, shown best by quoting a statement printed in red ink on the cover: Steamer "Northwest," of this line, specially chartered by the Northwestern Electrical Association for 1898 Summer Convention, sails from Chicago June 10. For reservations apply before May 20 to Thos. R. Mercein, Secretary, 110 Mason St., Milwaukee, Wis., or to J. M. Hill, 1,240 Monadnock Block, Chicago.

AMERICAN PORTLAND CEMENT.—Commercial Wood & Cement Co., New York. Pamph.; 5 1/2 x 8 ins.; pp. 91; illustrated.

This pamphlet describes briefly the method of manufacturing Portland cement at the works of the Glens Falls Portland Cement Co., and contains a number of well considered remarks about the testing and general qualities of Portland cement and some rules for using it so as to get the best results abstracted from the little book, "Portland Cement for Engineering Works," by W. W. Mcclay, M. Am. Soc. C. E. By the same mail we have received from the Commercial Wood & Cement Co. pamphlets describing the "Commercial" Rosendale cement, the "Victor" Portland cement and the "Commercial" Portland cement, for which they are also the selling agents.

STEAM BOILERS.—The Moyes "Combine" Water Tube Boiler, Phoenix Iron Works Co., Meadville, Pa. Pamph.; 7 1/2 x 10 ins.; pp. 8.

The boiler described in this pamphlet is of the inclined sectional type, with a different arrangement of the steam and water drums than is customary in most boilers of the type. The setting is roofed over so as to cover the whole of the drums. We notice that the makers insert one of the old-fashioned sweeping claims to the effect that the boiler "will deliver more steam and of higher quality per square foot of heating surface for each pound of coal burned than any boiler in the market." We very seriously question whether a concern does not prejudice customers against its goods rather than in favor of them by making such sweeping claims. We see nothing in the design of the boiler to lead one to expect different results than are obtained with other standard makes of horizontal water-tube boilers.

NITRO HIGH EXPLOSIVES.—Nitro Powder Co., Kingston, N. Y. Pamph.; 7 x ins.; pp. 15.

This company manufactures Nitro-Plastine, Nitro-Powder and Nitro-Granular; and as compared with other nitro-glycerine powders it claims greater safety in handling, less liability to freeze and superior keeping qualities. Nitro-Plastine is of a gelatinous consistency and of high specific gravity; more powerful in the higher grades than the strongest dynamite; safe against violent shock, and especially adapted to difficult blasting. Nitro-Powder is an improved dynamite, made by substituting for part of the nitro-glycerine another substance which is in itself incombustible, but in combination with nitrate of soda yields a large volume of gas and adds to the strength of the explosive. Nitro-Granular Powder is in grains and free running; it is especially applicable in blasting stumps, frozen earth, tough clays and hard-pan. Full directions for use are given.

CONSTRUCTION NEWS.

CONDENSED LIST OF CONTRACTS PENDING WITH DATE OF OPENING BIDS.

Table with columns: Bids to be opened, Work, Place, See Eng. News. Lists various construction projects and their opening dates.











SIMSBURY, CONN.—Bids are asked until May 10 for grading sections of roads. W. H. Whitehead, First Selectman.

BUFFALO, N. Y.—Bids are asked until May 12 for macadamizing Mayer Ave. from Ontario St. to Rano St. R. G. Parsons, Secy. Bd. Pub. Wks.

ALBANY, N. Y.—Bids are asked for the following estimated work: Van Woert St., 2,930 sq. yds. of brick paving, 2,300 lin. ft. of 6-in. granite curb, and four receiving basins; Lexington Ave., 6,000 sq. yds. of brick paving, 3,400 lin. ft. of curb, 4,000 sq. ft. of flag and 20,000 sq. ft. of brick sidewalks. Thomas J. Lanaban, Clk. Bd. Contract and Apportionment.

NEW ROCHELLE, N. Y.—C. W. S. Wilson, Village Engr., writes us that the Westchester Electric Ry. Co., which is about to construct about eight miles of electric railway from Mount Vernon to and through New Rochelle, will pave the road between the rails and for 2 ft. outside with brick on a 6-in. concrete foundation. For further information see Street and Electric Railway.

CORTLAND, N. Y.—We are informed that it is not certain whether the proposed paving in Main St. for one mile will be constructed this year or next. A petition is being circulated among the property owners. E. E. Mellon is interested. D. F. Wallace, Chn. Com.

HOOSIC FALLS, N. Y.—The committee is contemplating the purchase of a stone crusher.

ITHACA, N. Y.—This city states in our advertising columns that it will spend \$20,000 for brick paving this year. A. W. Force, Secy.

SEA CLIFF (L. I.), N. Y.—An election was held May 4 to vote upon the question of raising \$8,000 for street improvements and issuing bonds for that purpose.

TROY, N. Y.—Bids are asked until May 10 for grading in Pawling Ave. E. Ogden Ross, Secy.

UTICA, N. Y.—The Warren-Scharf Asphalt Paving Co. submitted the lowest bids April 29 for paving in West St. at \$7,952, and in Albany St. at \$15,837.

ELIZABETH, N. J.—Bids are asked until May 16 for about 1,370 ft. of 4-ft. flagging, 1,200 ft. of 4 x 16-in. curb and 600 ft. of curb to reset. N. K. Thompson, St. Comr.

MONTCLAIR, N. J.—Bids are asked until May 9 for laying about 2,800 lin. ft. of stone sidewalk on Upper Mountain Ave.; estimated cost, \$1,771; also for constructing stone roads 16 ft. wide and for furnishing cracked stone for gutters and crosswalks. James Owen, Town Surv.; Harry Trippett, Town Clk.

NEWARK, N. J.—Bids are asked until May 5 for about 14,200 sq. yds. of sheet asphalt paving and curbing in portions of six streets. J. C. Mundy, Supt.—Bids are asked until May 9 for furnishing 1 1/2 and 2 1/2-in. broken stone, as may be required during the year. Joseph B. Brady, Chn. Bd. Freeholders.

EDGWOOD, PA.—Bids were received May 2 for about 5,800 cu. yds. of grading 5,200 lin. ft. of curbing and 6,300 sq. yds. of paving. R. L. Smith, Borough Engr.

FRANKLIN, PA.—Thos. L. Kennard, Cy. Engr., informs us that the question of constructing about 6,000 sq. yds. of brick paving is being contemplated. Plans are not yet ready.

FREEDPORT, PA.—Bids are asked until May 16 for brick paving, as described in our advertising columns. Engr., Robt. H. Wilson, Saltsburg, Pa.; Clk., Geo. B. Findley.

PHILADELPHIA, PA.—Bids are asked until May 12 for constructing Lincoln Ave. drive in Fairmount Park. Jesse T. Vogdes, Ch. Engr. and Supt. Park Comrs.

PITTSBURGH, PA.—Bids are asked until May 26 for improving the Butler Pike extension, the Bridge Road and the Temperanceville & Noblestown Turnpike. F. W. Patterson, County Engr.; W. E. Thompson, County Controller.

READING, PA.—An ordinance has been passed by the council for paving portions of 12 streets with sheet asphalt. Jacob Weldel, Mayor; H. H. Hammer, Cy. Clk.

WASHINGTON, D. C.—The commissioners have ordered that Sherman Ave. from Grant to Irving Sts. be macadamized.

BALTIMORE, MD.—Bids are asked until May 12 for furnishing paving stones, curb, gutter, flag, cement, etc. L. F. Lewis, Cy. Comr.

WHEELING, W. VA.—Bids are asked until May 7 for paving certain streets with brick; bond, \$3,000. Wm. H. Hornish, Clk.

LOUISVILLE, KY.—Bids are asked by the board of public works until May 10 for 3,068 lin. ft. of granite block paving in Hamilton St., paving in 15 alleys with brick and constructing brick sidewalks in portions of 21 streets; estimated cost, about \$65,000.

CINCINNATI, O.—Bids are asked until May 16 for brick paving, grading, curb, etc. in Friendship St., from Pike St. to Butler St. A. P. Butterfield, Clk. Bd. Cy. Affairs.

CLEVELAND, O.—Bids are asked until May 24 for brick paving, grading, etc. in Church St., from Doan to Parkwood St., and paving Prospect St. with Medina dressed block between Erie and Brownell Sts. Geo. R. Warden, Dir. Pub. Wks.

EAST LIVERPOOL, O.—Bids are asked until May 26 for paving, etc., in three streets, according to reports. J. N. Hanley, Cy. Clk.

MIDDLETOWN, O.—J. V. Bronnoll, Clk., informs us that the council is not contemplating any paving at present.

SANDUSKY, O.—The following bids were the lowest received April 27 for paving in Wayne St.: F. E. Cole, Toledo, Market to Scott St., sheet asphalt, \$29,069; Michael J. Callan, New Castle, Market to Scott St., block asphalt, \$32,045; C. F. Hartman, Water to Market St., brick, Bolen's granite Portland cement filler, \$2,753.

TOLEDO, O.—Bids are asked until May 30 for stone Erie St., Woodville St. and Second St. L. P. Harris, Cy. Clk. Woodville St. L. P. Harris, Cy. Clk.

TOLEDO, O.—Bids are asked until June 6 for paving in Erie St., Woodville St. and Second St. Levi P. Harris, Cy. Clk.

BRAZIL, IND.—The following bids were received April 28 for constructing seven miles of macadam road. Thomas Phillips, County Audr.: Jean & Jean, Worthington, Ind. \$19,000 Miller & Williams, Marion, Ind. 19,325 Notter & Huxton, 19,108 Punk & Muehler, Bowling Green, Ind. 19,047

COVINGTON, IND.—Foster & Co. have been awarded a contract, at \$16,349, for paving Perry St. with brick from Jackson St. to Wabash depot.

ROCKVILLE, IND.—Bids are asked until May 16 for the construction of four highways, a total length of about 15 miles, in Green township. E. H. Owen, County Audr.

SALEM, IND.—Bids are asked until May 5 for the purchase of \$34,190 road bonds. Thomas B. Cauble, County Treas.

BATTLE CREEK, MICH.—Bids are asked until June 1 for furnishing four car loads of bluestone crossing flag and ten car loads of bluestone curb. W. H. Mechem, Cy. Engr.; Abraham T. Metcalf, Mayor; Albert S. Simpson, Recorder.

MORGAN PARK, ILL.—Bids are asked until May 10 for brick paving and concrete curb and gutter in Arlington and Fairfax Aves. Edgar Ayres, Village Clk.; M. H. King, Pres. Bd. Local Improvements.

CHICAGO, ILL.—Bids are asked until May 11 for cedar block paving in portions of 12 streets, macadamizing in three streets, brick paving in Lake St. and grading, etc., in four streets. L. E. McGann, Pres. Bd. Local Improvements.

MINNEAPOLIS, MINN.—Hayes & McDougall have been awarded a contract for grading Lake St. boulevard at a cost of about \$5,500. A contract has been awarded to Fielding & Shipley, at \$2,680, for sandstone block paving in Summit Ave.

ST. PAUL, MINN.—The following are the lowest bids received April 28 for asphalt paving in five streets: Hennesey & Cox, Sherburne Ave., \$3,482; Market St., \$8,552; Asblaud Ave., \$19,809; Warren-Scharf Asphalt Paving Co., Laurel Ave., \$27,339; Sixth St., \$6,513.

Bids Received at Somerville, Mass., April 20, for Constructing Storm Sewers in Broadway and Sargent St.

Table with columns for Bidder, Excavation (Earth, Rock), Under-drains, Cement (Portland, Rosendale), Brick masonry (Portland, Rosedale), and Total. Includes bidders like Richard Falvey, H. A. Hanscom & Co., etc.

\*For 64-in. sewer. †For 56-in. sewer.

MARSHALLTOWN, IA.—Bids are asked until May 23 for brick paving. F. G. Price, Mayor, informs us that about three miles of brick paving will be laid in streets 30 ft. wide. Wm. Bremner, Cy. Engr.; J. G. Trotter, Cy. Clk.

KANSAS CITY, MO.—The board of public works has awarded the Barber Asphalt Paving Co., New York, a contract to construct a pavement on Southwest Boulevard from Main St. to the bridge, estimated to cost about \$45,000. An ordinance has been approved for paving Holmes St. from 15th to 31st St., to cost from \$40,000 to \$50,000.

BERKELEY, CAL.—Bids are asked by the city trustees until May 8 for constructing about 33,000 sq. ft. of macadam road and 8,000 sq. ft. of concrete gutter in Russell St.

SAN FRANCISCO, CAL.—New bids will be asked by the street committee for paving Webster St. with wooden blocks on a concrete base from First St. to Fourth St. The lowest bid was submitted by the Piedmont Paving Co. at \$15,414.

TORONTO, ONT.—Bids are asked until May 9 for constructing brick and concrete sidewalks in six streets. John Sbaaw, Mayor and Chn. Bd. Control.

MANUFACTURING PLANTS.

MIDDLEBURY, VT.—The Brandon Italian Marble Co. is making arrangements to build a new shop in this town, according to reports. President Upham may be addressed.

TONAWANDA, N. Y.—It is reported that the Barnes Mfg. Co., of Syracuse, N. Y., contemplates the erection of a new factory building at this place.

WEST TROY, N. Y.—We are informed that estimates are being received for the erection of a 5-story collar factory, with engine room annex and water tower, at Watervliet, for William Barker; estimated cost, \$30,000. Arch., E. W. Loth, 253 Broadway, Troy, N. Y.

REYNOLDSVILLE, PA.—William A. Stamey, of this town, has been appointed by the state to investigate the growth and culture of sugar beets, preparatory to the erection of a sugar refinery in the Allegheny valley.

Bids Received at Somerville, Mass., April 20, for Constructing Storm Sewers in Broadway and Cross St.

Table with columns for Bidder, Excavation (Earth, Rock), Under-drains, Cement (Portland, Rosendale), Brick masonry (Portland, Rosedale), and Total. Includes bidders like T. H. Byrne, H. A. Hanscom & Co., etc.

\*For 42-in. sewer.

ARLINGTON, N. J.—The new roller mill of the Arlington Mfg. Co. was damaged by fire, May 1, causing a reported loss of \$40,000; fully insured. Supt., H. C. Pierce.

NASHVILLE, TENN.—Press reports state that W. B. McBride, representing a Chicago brewing company, has obtained an option on a large plot of ground in this city, on which his company proposes to erect one of the largest breweries in the country. The scheme is said to embrace, in addition to the brewery, the erection of an 8-story steel-constructed hotel.

NEW ATHENS, ILL.—The New Athens brewery plant was destroyed by fire, April 29, causing a reported loss of \$100,000; fully insured.

LOUISVILLE, KY.—The Tobacco Warehousing & Trading Co., 8th and Magnolia Aves., Louisville, informs us that the only contract which has not yet been awarded for the completion of its new plant is a contract for one 75-H.P. self-lubricating engine, compound vertical, with inverted cylinders, automatic cut-off and a steam pressure of 80 lbs. Full particulars regarding the cost of setting up such an engine are desired.

BUCYRUS, O.—Fred. Messner was awarded the contract by the city council, April 27, for the construction of new radiator shops, with slate roofs, at \$6,800.

ST. JOSEPH, MO.—It is reported that T. J. Gordon has purchased the old glucose factory near South Park, and that he will soon erect upon the site a new grain elevator with a capacity of 100,000 bushels; estimated cost, \$25,000.

DESERET, UTAH.—The Deseret Irrigation Co. has decided to build a new roller mill at this place, according to reports.

DESERONTO, ONT.—The plant of the Deseronto Terra-Cotta Works, owned by the Rathburn Co., was destroyed by fire, April 30, causing a loss of about \$50,000; partially insured.

CONTRACT PRICES.

ASPHALT BLOCK PAVING.—Fort Wayne, Ind.—C. E. Moellering & Co., Fort Wayne, has been awarded the contract for asphalt block paving in Columbus St., at \$1.81. The blocks will be 4x4x2 ins. on 5 ins. of broken stone and 2 ins. of sand. F. M. Randall, Cy. Engr.

STORM SEWERS.—Somerville, Mass.—E. W. Bailey, Cy. Engr., informs us that the following bids were received April 20 for constructing storm sewers in the eastern district at Broadway and Sargent Ave; the contract was awarded Richard Falvey:

WATER PIPE AND SPECIALS.—Buffalo, N. Y.—We are informed that the following bids were received April 27 for furnishing water pipe and special castings, for the proposed water-works, as advertised in Engineering News; contract was awarded the Lake Shore Foundry Co.; Engr., Paul Voorhees, Guaranty Bldg., Buffalo; Secy. Water Comrs., Samuel Rand:

Table with columns for Bidder, Pipe, Specials, Total. Includes bidders like Chas. Millar & Son, Reading (Pa.) Foundry Co., etc.

\*4-in., \$19.40; 6 and 8-in., \$18.40.

ASPHALT PAVING.—Minneapolis, Minn.—The following bids were received April 30 for 21,130 sq. yds. of asphalt paving; E. R. Dutton, St. Engr.:

Table with columns for Bidder, Warren-Scharf Asphalt Paving Co., Avers Asphalt Paving Co., Zygo Asphalt Co., Assyrian Asphalt Co., Total. Includes bidders like Warren-Scharf Asphalt Paving Co., Avers Asphalt Paving Co., etc.

STORM SEWER.—Somerville, Mass.—We are informed that the following bids were received April 20 for constructing storm sewers in the eastern district; Broadway and Cross St.; E. W. Bailey, Cy. Engr.:

CLEANING HARBOR.—Baltimore, Md.—The harbor board opened bids April 23 for the dredging of the harbor. The bids were divided into two classes, the first for taking the material out of the harbor and placing it behind the sea wall, and the other for dredging and dumping the dirt in deep water. The bids were as follows: Sanford & Brooks, 18 cts. a cu. yd. for taking 200,000 yds. of material out of the channels and placing it behind the sea walls, and 11.35 cts. for dredging it and dumping it in the water. The firm bid at the same figures for taking 30,000 cu. yds. from the back basin and docks and 20,000 yds. from the Spring Gardens. The Virginia Dredging Co., of Richmond, Va., 8.9 cts. a cu. yd. on 200,000 yds. from the channels, 30,000 cu. yds. from the back basin and docks at 9.9 cts., and 20,000 from Spring Gardens at 8.9 cts. a cu. yd. The bid was only under the second class. The Baltimore Dredging Co., second class, 200,000 cu. yds. 7 cts. a cu. yd.; 30,000 cu. yds., 8 cts. a cu. yd.; and 20,000 cu. yds. at 6.9 cts. a cu. yd.; awarded contracts, at \$17,780. The Fred. E. Jones Co., 200,000 cu. yds., 10.5 cts.; 30,000 at 13.5 cts.; and 20,000 cu. yds. at 19.9 cts. These bids were also made in the second class.

SEWER DEPARTMENT SUPPLIES.—Worcester, Mass.—We are informed that the following contracts were let April 5 for furnishing certain supplies for the sewer department: Benjamin F. Marsh, Worcester—Vitrified pipe, 82% off standard list, \$1 per ton for delivery on work; Sessions Foundry Co., Bristol, Conn.—Castings, manhole covers, \$5.75 each on work; catchbasins 1.15 cts. a lb. on work; Frank E. Powers, Worcester—Portland cement, \$2.25 a hbl. on work, \$2.05 a hbl. in bags on work; Rosendale cement, \$1.01 a hbl. in bags on work; lime, \$4.89 a ton in car lots; brick, \$7.40 a M. on cars; Amos M. Eaton Estate, Worcester—Sand, 75 cts. a yard on work; and Webb Granite & Construction Co., Worcester—Catchbasin stone, \$12.00 a set.

GRADING CYCLE PATHS.—Minneapolis, Minn.—The following bids were received by the county commissioners last week for grading the Lake St. and Minnetonka Boulevard cycle paths: George Turnham, 14 cts. a cu. yd.; J. W. Kerr & Co., 15 cts.; E. F. Comstock & Co., 19% cts.; Hayes & McDougal, 12% cts., awarded contract, total, \$5,500; Norton & Gleason, 14 cts.; Winston Bros., 18 cts.

BRICK PAVING.—Waukesha, Wis.—We are informed that the following bids were received April 21 for brick paving, as advertised in Engineering News; contract awarded Glacoma Marfoll; William Powrie, Cy. Engr.:

Bids Received at Waukesha, Wis., April 21, for Brick Paving.

Table with columns for Bidder (John O. Jones, E. W. Cahill, August Dienan, R. J. Hickey, Thatcher & Burke, A. Kellner, Rickert Const'n Co., Glacoma Marfoll) and Quantities (Excavation, Galesburg paving brick, Filling, Purinton paving brick, New curbing, Protection curb, Curb reset, Catchbasin covers, Lampbore covers, Cast-iron gutters).

SEWERS.—Dayton, O.—We are informed that the following bids were received April 28 for constructing sewers in Broadway and 1st St.; Frank M. Turner, Cy. Engr.:

Bids Received at Dayton, O., April 28, for Constructing Sewers.

Table with columns for Bidder (John Munger & Co., David Beard, Adams Bros., E. J. Ryan) and Sewer specifications (48-in., 36-in., 30-in., 24-in., 18-in., 15-in., 12-in., Man-holes, Catch-basins, Stone).

CEMENT WALKS.—Indianapolis, Ind.—The following bids were received by M. A. Downing, Chn. Bd. Pub. Wks., April 25, for laying cement sidewalks; all local bidders: Robert L. King & Co., 50% cts. a lin. ft.; Henry Mang, 10 cts.; Indianapolis Improvement Co., 61% cts.; Rogers & Dunlop, 63 cts.; J. C. Vieney, 64% cts.; and Capitol Paving & Construction Co., 69 cts.

to the Alcatraz Construction Co., Otto E. C. Guelich, Western Manager, 623 Hammond Bldg., Detroit, Mich. This pavement is guaranteed for 10 years. Besides the above the

Alcatraz Co. was awarded the contract for 1,436 lin. ft. of paving in Harrison St., at \$5.60, width, 24 ft.; and for 1,950 lin. ft. in Hoagland Ave. at \$5.80, width, 24 ft. These streets will all have asphalt on 5-in. concrete, 1-in. binder and 2-in. surface; Berea curb, 5 x 22 ins.; solid limestone corners, 3 ft. radius; solid limestone corners, 2 ft. radius; 3 x 12-in. white oak plank; 15-in., 12-in. and 10-in. sewer pipe.

ASPHALT PAVING.—Fort Wayne, Ind.—We are informed that the Alcatraz Co., Hammond Bldg., Detroit, was awarded the contract April 25 for 17,974 sq. yds. of asphalt paving in Calhoun St., at \$1.60 a sq. yd. It will have a 6-in. concrete foundation, 1 1/2-in. binder and a 2-in. surface with double track on street.

MISCELLANEOUS CONTRACTS.

DAM.—Paris, Tex.—Bids are asked for the construction of an earth dam for an artificial lake. Walter C. Dean, Cy. Engr.

TELEPHONE SYSTEM.—Mason, Mich.—A franchise has been granted to the State Telephone Co. to operate an exchange in this place.

DREDGING.—Sahine Pass, Tex.—Bids are asked until May 26 for dredging at this place. Maj. James B. Quinn, U. S. Engr., New Orleans, La.

TELEPHONE SYSTEM.—Pekin, Ill.—Reports state that the Central Union Telephone Co. will improve its system throughout this place this summer.

FIRE HOSE.—New York, N. Y.—Bids are asked by the fire department until May 11 for furnishing about 43,500 ft. of 1 1/2 to 3 1/2-in. fire hose. John J. Scannell, Comr.

DRAINAGE CHANNEL.—Joliet, Ill.—Bids are soon to be asked by the drainage board for constructing section 18 of the drainage channel; estimated cost, about \$350,000.

TELEPHONE SYSTEM.—Chattanooga, Tenn.—Reports state that E. W. Coleman, Columbia, has applied to the council for a franchise to construct a telephone system.

REPAIRING WHARF.—St. John, N. B.—The board of works has recommended repairing the North Rhodney wharf to cost about \$2,700. Alderman Christie may be addressed.

DREDGING.—Milwaukee, Wis.—Local papers state that the contract for dredging for the season has been let by the board of public works to Adolph F. Bues, representing the C. H. Starke Dredge Co., at the following prices: Milwaukee River, 7 cts. a cu. yd.; Kinnickinnic River and Menomonee River, each, 6 cts. a cu. yd. This price is just half of that paid last year. It is estimated that there will be 100,000 yds. in the Milwaukee River and 50,000 yds. in the other two rivers.

BRICK PAVING.—Gloversville, N. Y.—We are informed that the following bids were received by the council April 26 for brick paving, as advertised in Engineering News; C. Fiske, Jr., Cy. Engr.:

Bids Received at Gloversville, N. Y., April 26, for Brick Paving.

Table with columns for Bidder (A. V. Purnell, Strain Bros., Callanan Road Imp. Co., Frank Pidgeon, A. S. Web, Baker, Banker & Co.) and Streets (Park, Mack, Syracuse, Concrete, Curb, Edging).

ASPHALT PAVING.—Fort Wayne, Ind.—We are informed that the following bids were received April 25 for 42,000 sq. yds. of asphalt paving in various streets; F. M. Randall, Cy. Engr.; Creighton Ave., 3,693 sq. yds., 1.15 cts. yds. excavation, 2,543 ft. Berea curb, 12 limestone corners, 174 ft. plank walk, 100 ft. 12-in. pipe sewer, 50 ft. 10-in. sewer, 3 catchbasins, 3 inlets, 1,256 1/2 ft. length of street, 24 ft. width; Barber Asphalt Paving Co., New York, bid was as follows: Sandstone curbing, a ft., \$5.80, \$7,288; The Columbia Construction Co., Toledo, O., \$6, \$7,539; The Alcatraz Co.,

STORM TUNNEL.—Cleveland, O.—Ford P. Beers has a contract to construct a storm overflow tunnel, 1,000 ft. long, with a diameter of 12 ft., from Lake Ave. and Detroit St. to Lake Erie.

TELEPHONE SYSTEM.—Minneapolis, Minn.—The Minnesota Central Telephone Co. has been granted a franchise by the council to operate a system. Charles Webster and David Jones, of Willmar, are interested.

POST-OFFICE SUPPLIES.—Washington, D. C.—Bids are asked by the post-office department, until May 5, for furnishing a quantity of wire, rivets, burrs, emery, steel, oils, etc., for the year ending July 1, 1899.

TELEPHONE SYSTEM.—Harrisburg, Pa.—The Pennsylvania Telephone Co. will construct and operate an underground telephone system, under the supervision of the city engineer and highway commissioner.

SURF BOATS.—Washington, D. C.—Bids are asked by the U. S. Life-Saving Service, until May 6, for constructing 15 23-ft. and six 26-ft. Monomoy surf boats. S. I. Kimball, Gen. Supt., 24 State St., New York.

RIVER WORK.—Chicago, Ill.—A contract has been awarded to Leyden & Drew, at \$47,063, for widening the channel of the Chicago River at Diversey Ave., requiring the removal of about 278,000 cu. ft. of earth.

TELEPHONE SYSTEM.—Rochester, N. Y.—The council committee, Chairman Rauher, is considering the question of granting a franchise to the Automatic Telephone Co., Buffalo. The system will comprise about 5,000 telephones.

CABLES AND ACCESSORIES.—Allegheny, Pa.—Bids are asked by the department of public safety until May 9 for furnishing underground cables and accessories for the fire and police telegraph systems; bond of \$10,000. J. H. Murphy, Dir.

DAM.—Helena, Mont.—Reports state that McNamara & Marlow are preparing to construct a dam across Big Sandy Creek, six miles below this place. It will contain 8,000 cu. yds. of material; length, 560 ft. D. P. Mumbrun, Engr., Helena.

PARK.—Indianapolis, Ind.—It is reported that about 100 acres of land will be purchased, bordering on North Meridian St., for a park. The following are interested: John P. Pearson, A. P. Hendrickson, M. B. Wilson, M. V. McGilliland and others.

DREDGING.—New York, N. Y.—Bids are asked by the department of docks, Pier A, North River, until May 13, for dredging at the foot of Barclay St. and of Park Place, North River; estimated amount, about 45,500 cu. yds. J. Sergeant Cram, Comr.

INTAKE PIER, TUNNEL AND PUMP PIT.—Cincinnati, O.—We are informed that the following bids, submitted by F. H. Kirchner & Co., Cincinnati, April 28, were the lowest for constructing the intake pier, tunnel and pump pit; as advertised in Engineering News; Chas. G. Roth, Clk. Water-Comrs.:

Table with columns for Bidder (Hill-O'Meara Construction Co., Strainka Construction Co., H. Ruecking & Co., McDonald & Thompson, St. Quary Construction Co., H. Wellman & Co., R. I. Boyd Paving & Construction Co., Black & Wycoff, Abbott-Gambling Co., John F. McNamee & J. F. Cooney) and Quantities (Caisson for intake pier, For pump pit, Masonry in intake pier, Bridge approach, Intake pier, Excavation bkg approach, Intake pier, Masonry in pump pit, Intake shaft, Tunnel, Setting seven sluice gates, 12-in. stop-gate with water cylinder and piping, Six outside cast-iron gratings, 6-in. and 12-in. cast-iron pipe, In shaft and pump pit, Brass ladders in wells & shaft, C. I. and bronze bolts in guides, Iron clamps and dowels for mas, I-beams, Steel shell diaphragm, Setting accumulator, Rolling excavated material, Pump pit shaft, lower portion, upper portions, Girder bridge, Fur and setting stop-gates with hand-gear lump sum, 2-in. brass pipe and fastenings, Iron ladder in pump pit, Setting 4 stop-gates in pump pit).

\*For support of accumulator and floor. †Top of caisson to bottom of sump. ‡Top of caisson to top of shell, steel.

The next lowest bid was that of the Globe Construction Co., of Cincinnati, O.; the others bidders were Griffith & McDermott, Chicago; T. A. Gillespie Co., Pittsburg, Pa.; McDonald & Thompson, St. Louis; Mason, Hope & Co., Frankfort, Ky.; Henkel & Sullivan, Cincinnati; Keeling, Ridge & Kaufman, Pittsburg; Foltz, Willard & Co., Cincinnati.

SEWERS.—St. Louis, Mo.—We are informed that the following bids were received April 29 for constructing sewers in Clarendon Ave., district No. 3; B. H. Coiby, Sewer Comr.; all local bidders:

Bids Received at St. Louis, Mo., April 29, for Constructing Sewers in District No. 3.

Table with columns for Bidder (Hill-O'Meara Construction Co., Strainka Construction Co., H. Ruecking & Co., McDonald & Thompson, St. Quary Construction Co., H. Wellman & Co., R. I. Boyd Paving & Construction Co., Black & Wycoff, Abbott-Gambling Co., John F. McNamee & J. F. Cooney) and Quantities (Earth excavation, Rock excavation, Brick masonry, Pipe laid, 12-in. vit., 15-in. vitrified, 18-in., 24-in., 30-in., 36-in., Junctions, Inlet stones, Cast-iron, Wrought iron, Vit. brick masonry).

FOUNDATION STONE.—Cleveland, O.—Bids for the furnishing and placing of stone for the foundation of the extension of the east breakwater were opened April 27 by Col. Jared A. Smith. The specifications called for a maximum of 25,000 tons of rip-rap and 75,000 tons of filling stone, the government guaranteeing to use at least 85,000 tons of 2,000 lbs. each. Bids were requested for the two items separately and for the work as a whole. There were six bidders, of whom James B. Donnelly, Buffalo, N. Y., was the lowest, at 92 cts. a ton for the work as a whole. The next lowest bidder was the Kelley Island Lime & Transport Co. at 97 1/2 cts.

San Francisco, \$4.47, \$5.617. Suttentfield St., 4,487 sq. yds., 2,385 ft. excavation, 3,203 ft. Berea curb, 16 limestone corners, 198 ft. plank, 384 ft. pipe sewer, 4 catchbasins, 2 inlets, 1 manhole, length of street, 1,570 ft., width 24 ft.: The Barber Asphalt Paving Co., \$5.91; The Columbia Co., \$6.16; The Alcatraz Co., \$5.42; total \$8,560. Woodlark Ave., 6,193 sq. yds., 3,543 yds. excavation, 5,123 ft. Berea curb, 50 solid limestone corners, 355 ft. plank, 20 ft. 10-in. pipe sewer, 2 inlets, length of street 2,518 ft., width 20 ft.; Barber Co., \$5.08; Columbia Co., \$5.29; Alcatraz Co., \$4.75. These bids are all per lin. ft. of street complete, based upon the quantities given for each street, and all were awarded



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