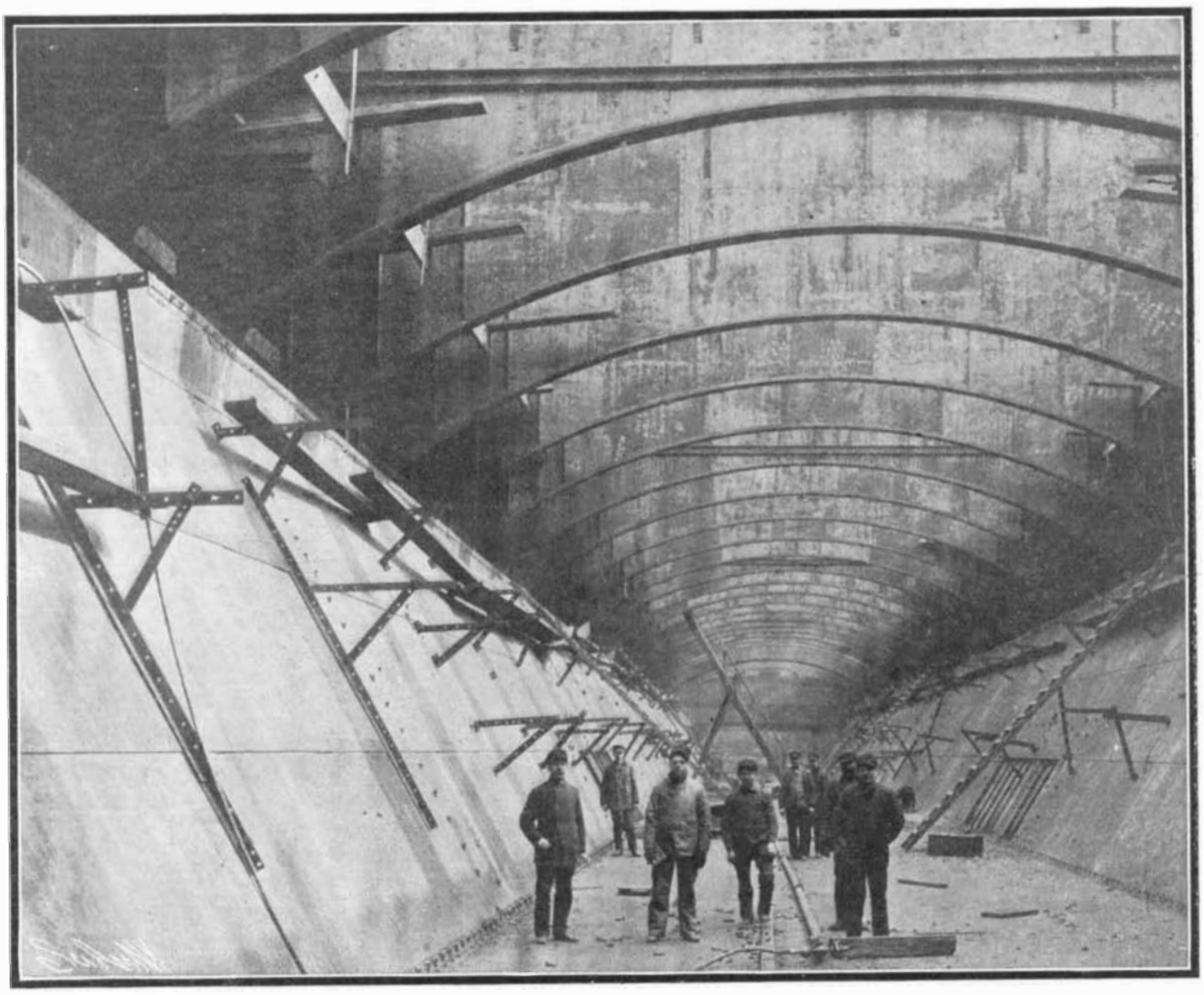
THE "WOLVIN," THE LARGEST FRESH-WATER STEAMSHIP AFLOAT.

BY W. FRANK M'CLURE.

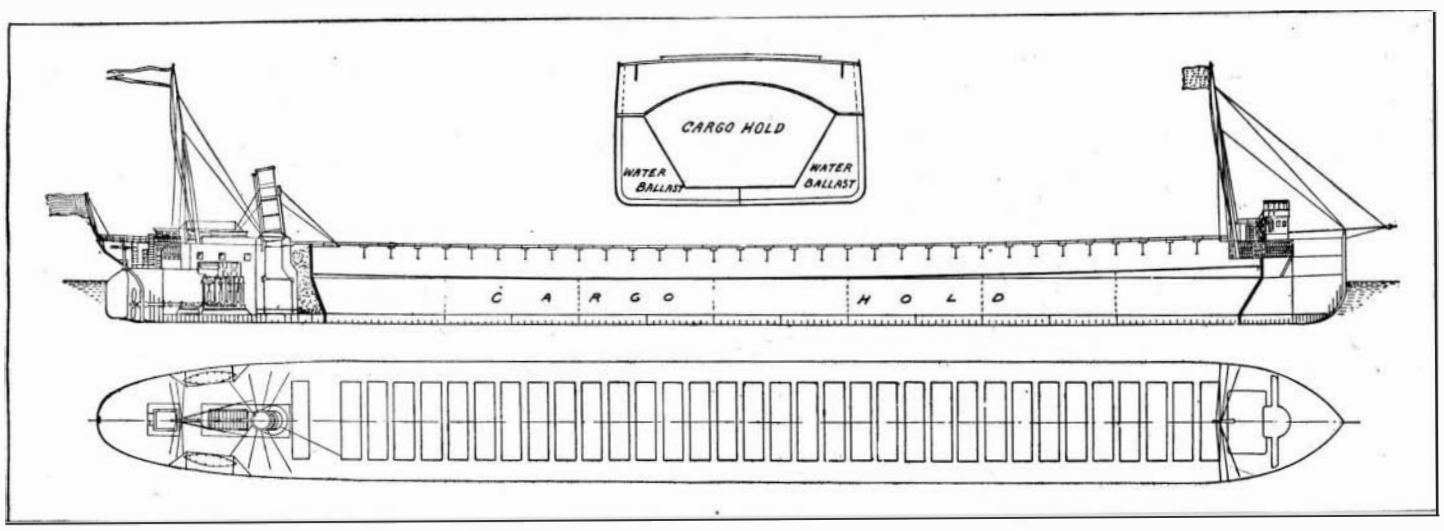
On April 9 the new steamer "Augustus B. Wolvin," the largest fresh-water vessel in the world, was launched at the yards of the American Shipbuilding Company at Lorain, O., harbor. Inasmuch as this vessel is 62 feet longer than the largest vessel ever before built for the Great Lakes, and embraced several important new features of construction, the launching was of unusual interest throughout the industrial world, and was witnessed by some 20,000 people. Men from the coast yards were present.

In dimensions, it is said that there are few strictly freight vessels upon the ocean that exceed the "Wolvin." She is 560 feet over all, 540 feet keel, 56 feet beam, and has a depth of 32 feet. She is built of steel, and in this connection it is a noteworthy fact that she is just twice the length of the first steel vessel built for the lakes, in the year 1887. About three years ago four vessels were launched from the yards at Lorain with a length of 498 feet, 52-foot beam and 30-foot depth. These were the "John W. Gates," "J. J. Hill," "Isaac L. Elwood," and the "Edenborn." The cost of the new steamer "Wolvin" is close to a half-million dollars. On account of the building of this boat, the drydock at Lorain was lengthened 60 feet, at a cost of $10,000.

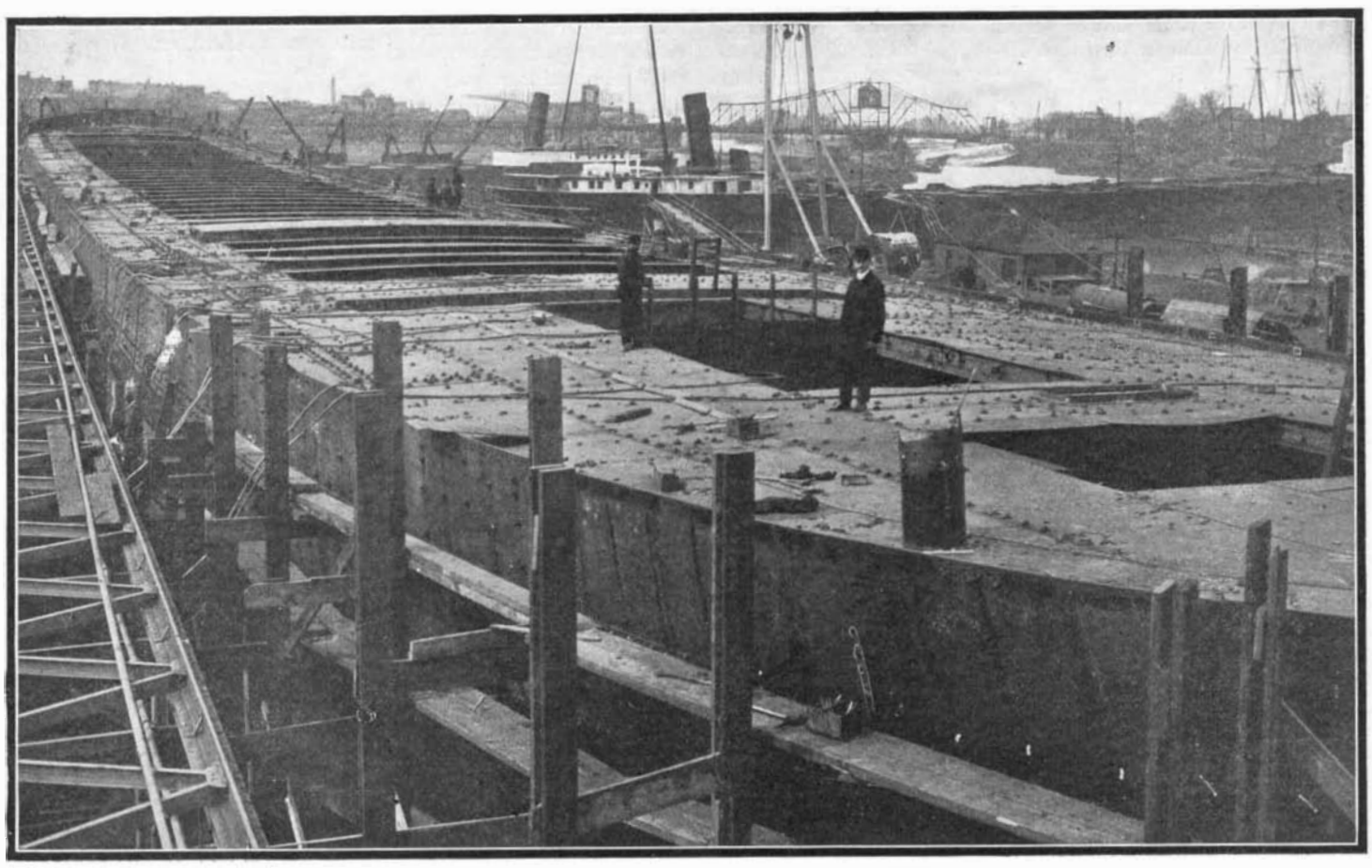
One of the most interesting features connected with the construction of the new vessel is the shape of the cargo hold, which is built in the form of a hopper, with sides that slope from the main deck to the tank top, and ends built on the same slope. The continuous length of this hopper, without divisions of any kind, is 409 feet. Its width at the top is 43 feet and at the bottom 24 feet. This form of construction, it will at once be seen, will best accommodate the automatic "clamshell" unloading machines, by keeping the ore cargo at all times within the grasp of the giant scoop. This will therefore obviate the greatest difficulty heretofore experienced in operating these machines.



The Hopper Hold, Showing the Steel Arches Which Support the Upper Deck and Hold the Sides of the Hull to Form.



Transverse Section, Inboard Profile and Plan, Showing the One Great Hopper Hold, 409 Feet Long, with Its 33 Hatches.



Length, 560 feet; Beam, 56 feet; Depth, 32 feet; Cargo capacity, 12,500 tons.

THE "WOLVIN," THE LARGEST FRESH-WATER SHIP IN THE WORLD.

The space between the sides of the hopper and the sides of the vessel is used for water ballast, so that the latter, as well as being in the usual double bottom underneath the hopper, extends up the sides to the height that may be desired. The water-ballast space is divided into compartments by water-tight athwartship bulkheads at intervals of some 60 feet. The total water-ballast capacity is 8,000 tons of water. Instead of the ordinary hold stanchions, there is a system of girder arches which support the upper deck as well as the sides of the ship. More than 750,000 rivets were used in the construction of this vessel. In all, it contains 4,500 tons of steel.

There are thirty-three hatches with 12-foot centers. Each hatch measures 33 x 9 feet in the clear. The patent hatch covers are opened and closed by machinery. The only erections on the spar deck are the dining-room skylight aft, the coamings around the engine and boiler openings, and the pilot-house and texas forward. Steam has been used in every possible instance where manual labor could be saved. On the spar deck there are six 8-inch by 10-inch single-drum engines, each carrying a steel-wire mooring line. Then there is a steam windlass to be used for handling the two 8,000-pound anchors, while on the spar deck aft there is a steam capstan.

The cargo hold, heretofore described, has a capacity

of 12,500 tons of coal or 401,000 bushels of grain. The vessel is expected to carry from 10,000 to 11,000 tons of iron ore on an 18-foot draft. In her coal bunker, which is located in front of the boiler room, she will carry 350 tons of fuel. During the early part of May the "Wolvin" will take on a cargo of 12,500 tons of coal at Lorain for the head of the lakes, and will thereby break all cargo records of the Great Lakes. In order to accommodate this vessel at some of the lake ports, quite extensive harbor improvements would be necessary. It is probable that her lower lake destination this season will be at Conneaut, the "Carnegie port," where the giant automatic unloaders were first installed, and where they are found to-day in largest numbers.

Comfortable staterooms, social parlor, and dining-room for the owners of the "Wolvin" and their families are situated immediately under the pilothouse and texas. The officers' quarters are on the deck immediately below those of the owners. Alongside of the engine aft are the quarters of the engine-room officers. The kitchen, dining-room, and messroom for the crew are also in the after end of the ship.

The new vessel has quadruple-expansion engines, cylinders 18½, 28½, 43½, and 66 inches, and having a 42-inch stroke. All the propelling machinery is located in the after end of the vessel. There are two boilers, both of the Babcock & Wilcox type, using 250 pounds working pressure, and the steam is superheated. Mechanical stokers are used, which is in keeping with the policy that nothing that can be done by machinery shall be done by hand. The coal is first fed into hoppers, from which it passes on to traveling grates. The ashes are taken from a point at the rear of the boilers and thrown overboard by means of steam-driven elevators. The boilers are fitted with a system of induced draft.

The new freighter, aside from its size, will be striking in appearance among other vessels of the Great Lakes, in that it is painted yellow. The bodies of most lake freight vessels are black in color. The vessel is named for Mr. A. B. Wolvin, of Duluth, who was instrumental in having this great ship built.

The Commerce of the Siberian Railway.

The total distance from St. Petersburg to Port Arthur by the Russian Trans-Siberian Railway and the Russian lines in Manchuria is 5,913 miles, or practically twice the distance from New York to San Francisco. This is one of the numerous interesting facts about Russia and her railway and commercial systems presented in a monograph just issued by the Department of Commerce and Labor through its Bureau of Statistics, entitled "Commercial Russia in 1904." The publication, which occupies more than 100 large pages, discusses in detail present commercial and financial conditions in Russia and other subjects closely allied therewith. Area, population, railways, water transportation, methods of communication, agriculture, manufactures, commerce, and many other subjects of this character are among those discussed. Agricultural conditions, and especially Russia as a rival of the United States in wheat production; mining conditions, and especially Russia as a rival of the United States in mineral oil production; manufacturing conditions, and Russia as a possible competitor of the United States in the markets of the Orient for manufactures are discussed in detail.

Regarding the railways, which are a subject of especial interest at the present time, in view of present conditions in Russia and the Orient, the report says:

The importance of railways as means of communication is now greater than that of the rivers and other water routes, as is shown by accompanying tables. The building of the trunk lines, with the exception of the St. Petersburg-Warsaw-Vienna, built during the years 1845-1848 and 1853-1862, respectively, and the St. Petersburg-Moscow (Nicholas line), constructed between 1843 and 1851, dates back to the decade between 1860 and 1870. These years witnessed the construction of the entire group of railways, with Moscow as their common starting point, viz.: Moscow-Nijni-Novgorod (1861-62), Moscow-Voronezh (1862-1869), Moscow-Volodga (1862-1872), Moscow-Kharkov (1866-1869), with its branch to Kief (1868-1870), and Moscow-Warsaw (1866-1871). Next in point of time comes the construction of roads connecting the black-soil region with its natural outlets, the ports of the Baltic and Black seas: Riga-Tsaritsyn (1861-1871), Kief-Konigsberg (1870-1873), Libau-Rommy (1871-1874), and Samara-Viasma (1866-1871), all of which lead to the Baltic. Simultaneously lines were built connecting each one of the more important southern seaports with the agricultural provinces. Chief among them are: The Odessa line, with its branch to Yelisavetgrad (1867-1869), and its Bessarabian branch (1871-1874), Kharkov-Nikolaiev (1869-1873), Kharkov-Taganrog (1869), Voronezh-Rostov (1861-1876), and, finally, Kharkov-Sevastopol (1869-1875).

The Russo-Turkish war of 1878-79 caused an almost entire suspension of railway building. It was only during the decade beginning with 1880 that activity in this field was again resumed, but the character and method of construction of the newly-built roads changed abruptly. In place of the former trunk lines, connecting either the black-soil area with the seaboards of the Baltic, Azov, and Black seas, or with the central industrial region around Moscow, these years witnessed the construction of great strategic railroads, such as the Trans-Caspian, the Polessie system, besides roads primarily destined for the service of relatively small though important industrial regions (Catherine line, Ivangorod-Dombrovo). Moreover, the system of granting franchises (concessions) was superseded by the building and working of roads directly by and on account of the state. At the same time the redemption by the government of great railway systems was going on, so that for some time it seemed as if all private roads were going to be acquired by the state. Although of late greater latitude has been given to private initiative, by for the greater part of Russian railways is in the hands of the government. Out of 36,673 miles under the control of the ministry of communication on January 1, 1904, 24,436 are worked by the state, and 12,237 miles only by private companies.

The adverse years, 1891 and 1892, gave a new impetus to railways. "In order to give employment to the starving peasantry" the government undertook and encouraged the construction of new roads. A new era of railway building began with these years, which, in its vigor, soon surpassed anything seen not only in Russia itself but anywhere else in Europe. Thus, while during the above years the number of versts opened for traffic was but 123 and 419 respectively, the succeeding years mark the beginning of an exceedingly energetic expansion of the railway system, whose termination does not seem to be at hand even in the near future. According to official figures there were opened for traffic during:

Year.	Miles.
1893	1,043
1894	1,147
1895	1,277
1896	1,953
1897	1,190
1898	1,897
1899	3,297
1900	1,647
1901	2,235

These figures include roads built not only by the state, which has its hands full with the construction of the grand trans-Siberian railway, but also by corporations whose activity now almost surpasses that of the early years of the decade beginning with 1870, the first period of great railway coustruction, when the building of roads, for some time at least, became the monopoly of a few private companies. At present franchises are eagerly contested by competing corporations, a fact unheard of until recently in Russia, where the state, not so very long ago, had yet to guarantee the interest on the stock and bonds of the chief railroad corporations. The ministries of finance and transportation have, during the latest years, been literally swamped with petitions coming not only from railroad and construction companies, but also from representatives of "local interests," as mining, manufacturing, and agricultural groups. The length of Russian railways in Europe alone has thus considerably increased during the last ten years, and surpasses now that of France and Great Britain, respectively, being inferior only to that of Germany.

Simultaneously with the redemption of the greater part of Russian railways the government undertook the difficult task of regulating the railway tariffs for both passengers and goods. The principles adopted were those of the "zone" tariff, and the results of the innovation have been very encouraging, for both passenger and freight traffic have increased considerably since the introduction of the new tariffs.

The present state of the Russian railways, according to the recently published returns of the ministry of communications, is stated as follows: At the beginning of 1902 the total length of all Russian railways (exclusive of railways in Finland) was 35,187 miles, of which 28,982 miles were in European Russia, 5,138 represented the length of railways in Asia (exclusive of the Manchurian Railway), and 1,067 were secondary railways of local character. Of this total of over 35,187 miles, 23,557 miles, or over 67 per cent, were owned and operated by the government. The value of this system, exclusive of the local secondary roads, is given as 5,149,399,000 rubles, or about 99,000 rubles per verst. Of this grand total expended in the construction of railways the government's share is 4,914,805,000 rubles, or about 95 per cent. This amount includes the value of all corporate securities, both stocks and bonds, the income from which was guaranteed by the government, those of the bonds amounting to 2,920,428,000 rubles, which are held by the treasury, and the total amount of subsidies granted for the construction of railways.

For January 1, 1904, the length of the entire Russian railway system, exclusive of 1,944 miles of railroad in Finland and 1,555 miles of the eastern Chinese road, is officially stated as 36,673 miles. Of this total, 31,493 miles were in Europe and 5,180 miles in Asia. Of the European railways, the government operates 19,256 miles, while 10,954 miles of railway of general interest and 1,312 miles of railways of local interest were operated by private corporations. The total length of double-track roads was 6,830 miles. The length of miles opened for operation during the year 1903 was 446 miles. The total number of miles under construction was 3,931.

For the five years 1897-1901 the net earnings per mile of the American railways and railways in European Russia compare as follows:

	American railways.	Russian railways in Europe.
1897	$2,016	$1,789
1898	2,325	1,778
1899	2,435	1,705
1900	2,262	1,664
1901	2,854	1,493
Average	$2,378	$1,686

It is seen that the net average per mile earnings of the American railways for the period in question are over 40 per cent higher than those of the Russian railways. Still more unfavorable comparisons might be drawn if the financial accounts of the Russian railways were set side by side with the same accounts of European railways having a much larger density of traffic than the United States railways.

Engineering Notes.

An immense scheme of additional irrigation for the Punjab, costing 6½ crores of rupees, is being prepared, and in order to keep pace with what is being done, the government of India has sanctioned a second chief engineer for irrigation for that province.

A new type of automatic loom has been devised by two Burnley operatives. In this device all the features of the existing Lancashire loom are retained, and by the introduction of a hopper containing weft in steel tubes and some simple mechanism on the slay, an automatic loom is produced. When the weft thread breaks, the weft fork sets in motion mechanism which forces the old weft tube out of the shuttle at the top, a full tube immediately taking its place at the bottom.

Pulverized coal for combustion under steam boilers was the subject of a paper read at a recent meeting of the Western Society of Engineers, Chicago, by Mr. John M. Sweeney. According to the results of comparative trials cited by him, 9.4 pounds of water, equivalent evaporation from and at 212 deg. Fahr., were realized per pound of fuel with the pulverized coal and 7.5 pounds per pound of fuel with hand firing. On the basis of combustible the equivalent evaporation in the two cases was 10.47 and 8.4 pounds, respectively.

A record railroad run is to be inaugurated by the London and South-Western Railroad of England in connection with the recent decision of the American Steamship Line to make Plymouth instead of Southampton the port of call in their transatlantic traffic. The boat train of this company is to convey the passengers direct from Plymouth to London without a single schedule stoppage, a total distance of 230¾ miles, in 270 minutes. This will represent an average speed of 51.27 miles per hour, which considering the difficult nature of the track will be a commendable performance. Furthermore, it will constitute the longest railroad run without a stop in the world.

The famous Morris Canal in New Jersey is practically condemned in a report just rendered to Governor Murphy by ex-Governors Werts, Griggs, and Voorhees. The canal company was incorporated in 1824 and built this waterway soon afterward, from Phillipsburg on the Delaware River to Jersey City, a distance of 106 miles. A number of reservoirs were constructed, some of which are now summer resorts and surrounded by valuable estates. The State has a right to take the canal in 1974. It was leased in 1871 to the Lehigh Valley Railroad Company, which has since operated it. The eminent commissioners report that even were the property in perfect condition, it could not be operated at a profit. The decline in its value has been due to the construction of railways which became powerful competitors, carrying freight at cheaper rates than is possible with the canal boats except at a loss. Eventually all traffic was diverted from it except the trifling amount from the lessee. At the present time it stands in the way of needed public improvements, but its abandonment involves the untangling of a complication of interests, including the stockholders of the canal company, the lessee railroad company, the State, the municipalities along the route, the landholders about the reservoirs, and the people having contracts for important water rights, not to mention a lot of trifling claimants for consideration. While the abandonment is assured, it now appears that it will involve more trouble and delay than the original construction of this canal, once the pride of northern New Jersey.—Engineering Record.