Both the station buildings are constructed of iron. The viaduct to accommodate passengers at the Brooklyn end is about 600 feet long. Beginning at Sands Street it is 56 feet wide (the two passage ways for vehicles are at either side of the building) for 205 feet, of which 185 feet is roofed and inclosed on the sides. This forms a building, the ground floor of which is used by foot passengers, with the exception of a waiting room, 60 by 18 feet, on the left as we enter. The next floor is at a height of about 20 feet above Sands Street, and contains three lines of rails in the central space and two capacious passenger platforms, one at each side, and raised 2¼ feet above the rails. These platforms extend to some distance beyond the end of the building. The sides of the building from the main floor to the eaves of the roof are of ornamental cast-iron work and glass. The lantern framing is over the center of nearly the whole length of the building, and is 14 feet wide by 3 feet high. The car passengers enter the waiting room below, pass up wide stairs to the platform, and enter cars on the right track. Incoming passengers get off on the other side.

The New York station is 260 feet long by 52⅛ feet wide; the height to peak of small roof at rear end is 52½ feet, at front end 61 feet. The general arrangement is very similar to that of the other station.

The twenty-four cars are like those now in use on the elevated roads of this city. They are 44 feet between couplings, 9½ feet wide from out to out, and will comfortably seat 48 passengers. In the middle of the car the seats are placed crosswise, leaving an aisle between; near the doorways they are placed along the sides.

The cars are moved by being attached to an endless rope operated by powerful engines situated beneath the Brooklyn approach. This steel wire rope, 1½ inches in diameter, passes over the bridge in the middle of the right railway track, and returns along the other. It is supported throughout its length on 490 pulleys, placed 22½ feet apart. Motion is communicated to the rope by winding it three times around a pair of grooved driving drums, placed facing each other. These drums are made of cast iron, 12 feet in diameter, and have faces 27½ inches and 26 inches across respectively.

The drums are revolved by means of a friction drum placed between them, and being 5 feet in diameter and 31½ inches across the face. This drum is mounted upon a shaft of hammered wrought iron 12 inches in diameter, and at each end of the shaft is a crank to which the engines are attached. By means of a clutch at each end of the shaft the engines can be worked alone or together. The engines have a variable cut-off, 48 inches stroke, 26 inches diameter of cylinders, and will work safely with 100 pounds of steam. The boiler house contains 4 boilers, and is placed in a separate building located to the right of the approach. From the driving drums the rope passes upward and over a grooved sheave 10 feet in diameter, and a loop is then passed around another sheave of the same size, mounted on a heavily loaded car moving on a steeply inclined plane, thus serving as a balance weight to draw the rope tightly. The returning part of the rope goes under a third sheave, then up over a summit sheave placed between the rails, and then out on the pulleys. The switching of the cars on this side is done by dummy engines.

Just before the New York station proper is reached, the rope is passed down over a summit sheave around return sheaves to the other track, up over another summit sheave and back to the Brooklyn side. Before leaving the New York side the rope passes over and then under two sheaves placed near together, thereby giving them motions in contrary directions. On the shafts of these sheaves are small grooved friction drums, which can be pressed by a lever against either sheave according to the direction of the revolution desired. Wound about these two drums is an auxiliary rope leading into the station. After the car has discharged its passengers, it is attached to this auxiliary rope, which takes it to the upper end of the station. The grade of the road is such that upon being released the car descends by gravity to its station at the other platform, where it meets the endless rope over the bridge.

The engineers are not prepared to make public the plan of the clutching device by which the cars will be attached to the rope. From end to end the bridge is lighted by arc electric lights, the dynamos and engines being under the Brooklyn approach.

On the 31st of last March the financial condition of the bridge was, briefly stated, as follows:

Cash received from New York	$4,871,900 00
" " " Brooklyn.	9,423,692 73
" " " rests interest, sale of material, etc.	391,463 03
Total.	$14,687,057 66
There is still due from the city of New York	216,666 66
And from Brooklyn	433,333 34
Total cost of Bridge	$15,337,057 66

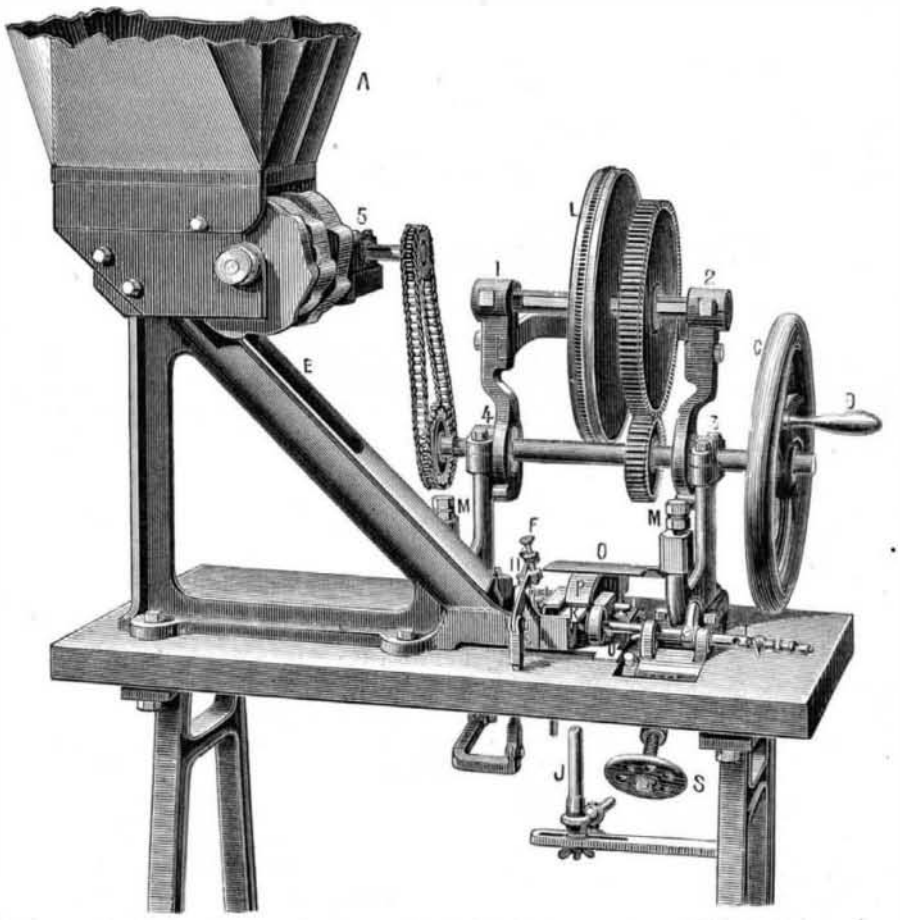

Fig. 1.—MACHINE FOR BRANDING CORKS AND STOPPERS.

Some of the principal items of cost up to March 1, were:

Engineering, salaries, etc.	$498,963 68
Office expenses	167,446 41
Timber and lumber.	469,031 23
Construction	3,126,969 46
Labor.	2,416,151 32
Machinery and Tools	161,015 56
Land, damages, and buildings.	3,780,988 94
Limestone.	668,041 37
Cast steel cable wire	623,733 16
Granite.	2,129,004 93

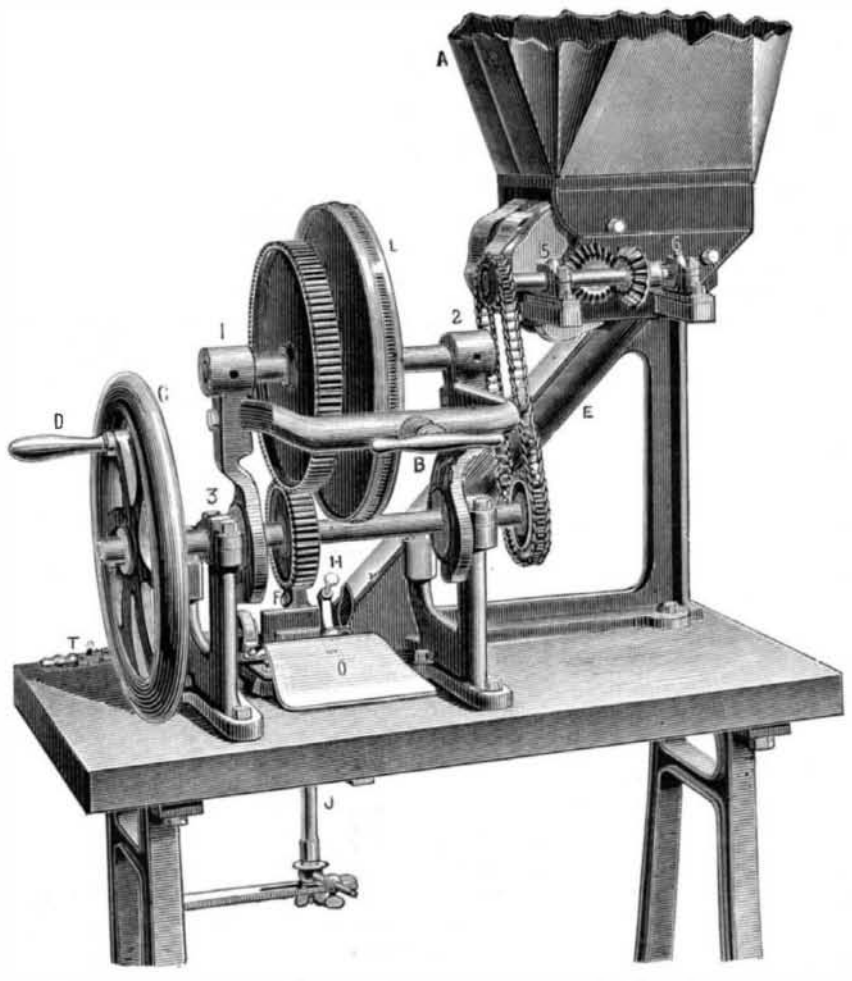

Fig. 2.—MACHINE FOR BRANDING CORKS AND STOPPERS.

The names of the engineers who planned and so successfully executed this work are:

JOHN A. ROEBLING.
WILLIAM A. ROEBLING.
C. C. MARTIN. W. H. PAINE.
F. COLLINGWOOD. G. W. MCNULTY.
S. R. PROBASCO. W. HILDENBRAND.
E. F. FARRINGTON.

MACHINE FOR BRANDING CORKS AND STOPPERS.

A number of machines for marking corks with hot irons have already been invented, but as a rule these machines have been designed to mark the cork only on its circumference. The machine which we describe below was invented by M. Chenet, and constructed by M. Leclère, of Paris, France. It differs from the machines which have been in use heretofore in that by one process it marks both the circumference and one of the ends of the cork. The machine Chenet is represented in elevation in the engravings given.

The corks are thrown loosely in the receiver, A, at the bottom of which is arranged an inclined duct, through which the corks are pushed one by one under the action of a wheel provided for the purpose, and constructed with two rows of bent teeth similar to those on a ratchet wheel. This wheel is connected with the crank, C, from which it receives its power by a sprocket wheel connected by an endless chain and by two miter wheels.

Each cork as it leaves the duct is guided by a screw and placed in a horizontal position by means of a suitable stop, against which it is brought in contact. At this instant the stop falls and the cork receives at its end the imprint of the brand, U, being held during this operation by the vise, F, which is attached to a lever that falls on the cork the same instant that the stop is withdrawn.

When this is accomplished the mark is pushed back by a spring, and the stop, as well as the lever, resume their original position. The cork thus branded on one end is now seized by the wheel with the serrated or grooved felly, L, which is represented in the drawings as raised and out of the way. The shaft, 1 2, which carries this wheel, being mounted upon the two levers, 1 4, 2 3, and united by the stirrup, B, may be given any position required by revolving it around the axis of the crank wheel, C. This arrangement is made with a view of rendering the wheel movable vertically when placed upon the cork, so that it may receive under the felly corks of a different size. The wheel, L, rests, as we have said, upon the cork already marked upon one end, and being put in motion by the crank wheel, moves the cork forward and rolls it to the point of discharge from the machine. Furthermore, the cork in being rolled along, passes over a key, which is not shown in the drawing, and which actuates on the one hand the screw, H, and on the other a marker. The cork then passes over a second brand, K, which acts upon the circumference of the cork; and finally it passes over a key which terminates in an inclined plane, after which the cork falls into a basket and the operation is completed. The same machine, with a few modifications in the details, could be used to mark corks upon both ends.

Rendering Cement Airproof.

A method of rendering cement impervious to air has been successfully practiced by Herr C. Pascher. This experimentalist claims to have found that the only way to render cement unalterable by atmospheric influences is by the application of a cold solution of 1 part of sulphate of iron in 3 parts of water. The articles to be protected should be left to soak in the solution for twenty-four hours, when they take a greenish black tint from the hydrated protoxide of iron. The absorbed solution is decomposed in the interior of the cement, which is increased in weight 10 per cent. All the pores of the mass are thus stopped by the hydrate; and as this compound is not attacked by air, the cement itself becomes impervious. Cement facings may be washed down with several coats of the solution. When dry, the cement may be covered with a wash of ocher, or by a solution of sulphate of alumina. If a greenish white face is desired, the surface may be first washed with a solution of chrome alum, and then with soapsuds. Either of these coats may be painted or colored in distemper. It has been observed that when oil colors are laid upon bare cement they easily peel or scale off; but this inconvenience may be avoided by washing the cement thoroughly with soapsuds, and when perfectly dry rubbing with a brush or linen cloth until the surface shines. Afterward the oil colors may be applied in the usual way.

A BRASS cannon, 6 feet long, has been found by an agriculturist, while plowing, at Coorum, near Soopa, in the Bhimthudy talooka. This cannon, it is said, was manufactured by Michael Burgerhays, and is dated 1640.