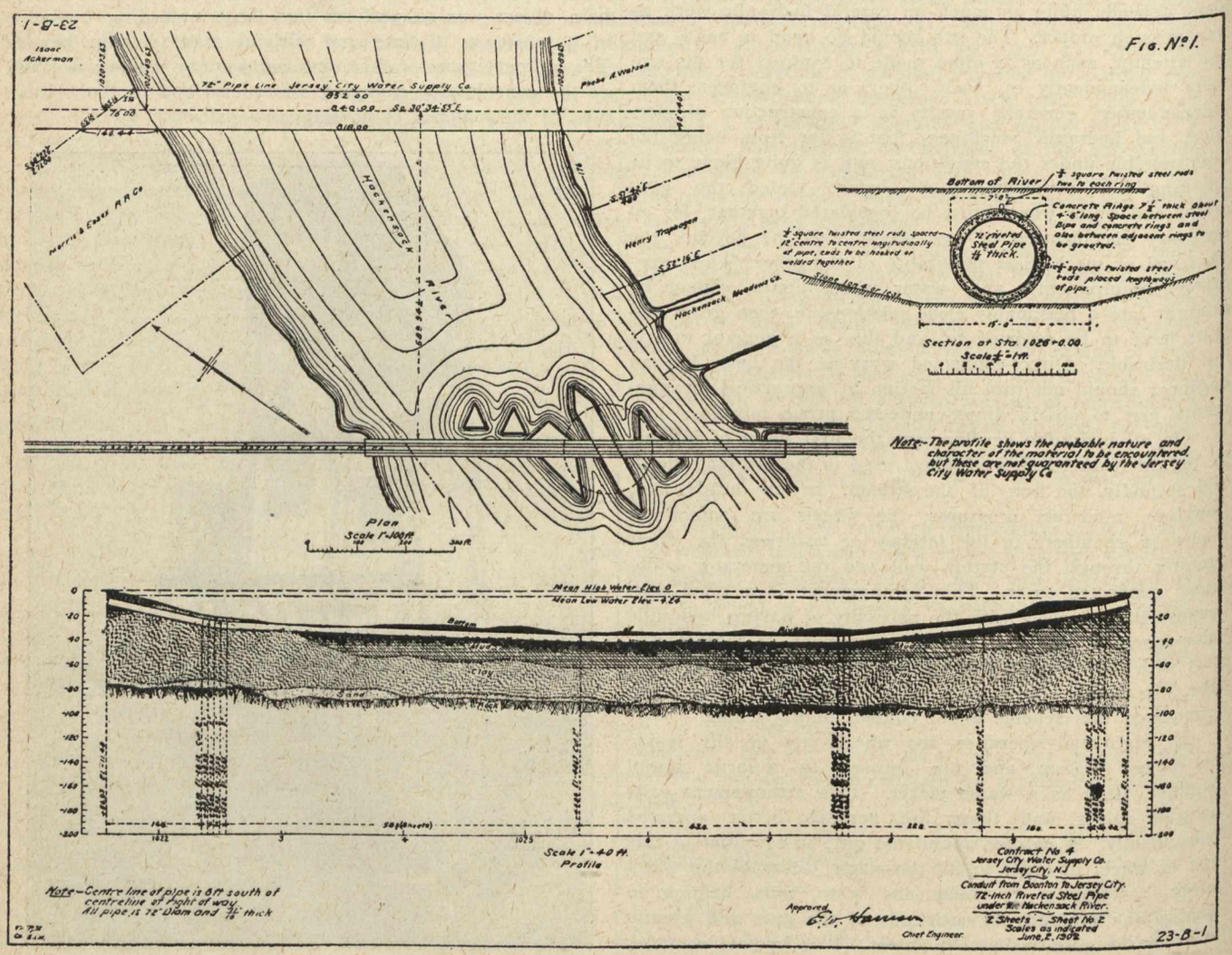
by heavy weights. In the horizontal position the platform is locked by automatic stop-devices in such a way that the ropes are relieved from the pull when a car is drawn upon the platform. The process is as follows: A loaded car arrives on the track and is pulled on the platform. At high water-level an electric hoist lifts the landside portion and tilts it to 45 degrees; at low level the other side is let down and so on. For this purpose a second electromotor is installed. An additional novel feature is also the way of moving the cars from and to the tilting apparatus. Here again electricity is employed, and this increases the economy of the process considerably, compared with the difficult, tiresome way of pushing the cars by hand, which always requires several men and is expensive and slow. An electric spill pulls first the cars upon a turntable, turns it at 90 degrees and then draws it on the platform. Here it is locked automatically by clamps fastened to the front axle. The platform is tilted and the material falls into a box with a funnel-shaped end. The latter is closed by a trap-door, which is also electrically operated. It can be opened more or less by the engineer from his place according to the quantity of coal. After the car is emptied the car is tilted back to horizontal position and pushed by the spill over the turntable to a side track to make room for another car. It can be seen that extensive use is made of electric energy. During the short time this fine apparatus is in service it has worked very satisfactorily.

REPAIRS TO A 72-INCH STEEL MAIN UNDER THIRTY FEET OF WATER.*

By A. W. Cuddeback,
Engineer Jersey City Water Supply Co.

The pipe to which these repairs were made is a part of the plant of the Jersey City Water Supply Company furnishing Jersey City, N.J., with water. This line is about 21 miles long, and runs from a large storage reservoir at Boonton, N.J., across country to Jersey City, and consists of concrete conduits, tunnel and steel pipe. The portion of this line in question under the Hackensack River was laid in 1902, and consists of 11-16-inch riveted steel pipe, six feet lengths, made up of four sheets. These were connected upon the west bank of the Hackensack River on staging suitable for the purpose, carried out across the river and supported on floats. As the pipe was connected, it was enclosed in reinforced concrete rings, which were made in forms and slipped over the pipe and afterwards grouted, making eventually a continuous concrete covering. The weight of the pipe and concrete covering being just sufficient to sink it. After



in diameter. Figure 1 shows the general plan of the Hackensack River at the point where the line crosses; a cross section of the pipe in place in the river bottom; and a longitudinal cross section showing the general character of the supporting soil.

The method employed in laying the pipe was as follows: The pipe was furnished on the ground in about 28 foot pipe composing the river crossing was completed and entirely supported by barges, it was lowered to its final position in a trench that had been prepared for it by dredging, as shown on Figure 2 accompanying the paper.

At the time the pipe was lowered into place and just as it was filled with water, a break occurred in a field joint at approximately the centre of the river. The exact point of this break is noted on Figure 2. This break was first noticed December 15th, 1902, shortly after the pipe was lowered

* Paper read before American Waterworks Convention, Washington.