

concentrated. It is also probable that the water penetrating the concrete as soon as the air-pressure ceased, would produce some heat by contact with the small quantity of free lime there existing. The concrete filling was permeated by air throughout. Even when the last charge was put in the air bubbled up under the edges of the caisson, requiring a passage of fifty feet through the concrete.

FIRES.

The danger from fire in an atmosphere of compressed air is very serious, and becomes doubly so, with a wooden caisson penetrating a water tight stratum. Already at a pressure of twenty-five pounds per square inch, the flame of a candle will return when blown out, and all inflammable materials have to be carefully banished. Several minor fires at the beginning showed the necessity of caution. One was of sufficient magnitude to demand the flooding of the caisson, which was then easily accomplished, because the water entered freely under the shoe, as the air escaped through valves provided for that purpose. When therefore the fact was settled that the river water was permanently excluded from the caisson, it became a matter of primary importance to guard against fires, and accordingly two hose connections were provided, throwing streams of one and a half inches at sixty-five pounds pressure. Steam pipes were introduced, connecting with boilers outside. In addition all seams between the roof timbers were carefully pointed with cement, and iron shields provided over the permanent lights. It was made the special duty of two men to watch continually over all lights. Notwithstanding all these precautions there was a seam where the supporting frames join the roof that had not been pointed; an empty candle box was nailed under it, in which some man kept his dinner, and while getting it he probably held a candle against the roof for some time. This proved to be the heel of Achilles, a fire being discovered there on the evening of December 2. Being directly over the frame it had remained undiscovered, until the latter had been partially burnt through. From its size it is supposed to have been burning for several