

DREDGING AT OAKLAND, CAL.

A part of the extensive harbor improvements in progress at Oakland, near San Francisco, consists in the excavation of a tidal basin to improve the scour, at or near the harbor entrance. The material removed by the dredging operations is deposited in adjoining salt marshes, and retained there by means of embankments constructed along the shore line, so that a considerable area will be reclaimed. Fig. 2 shows the floating discharge pipe that carries away the mud. The dredging machines employed are, says *Engineering*, on the same principle as those used at the Grand Amsterdam Canal Works, that is to say, they belong to the type in which the material to be raised is first reduced by suitable machinery to a condition of mud, and then pumped to the surface, and delivered by means of a pipe line.

Fig. 1 illustrates the general form of the dredging machinery used at Oakland Harbor. The submerged and mixing part of the arrangement consists of a horizontal wheel with plowshares attached around the lower face. By means of steam power on the boat, rotation is given to this wheel, which is inclosed in a casing, so that water can enter only on the under side. On the top of this casing is fixed the rising main, 20 inches in diameter, of a centrifugal pump, 6 feet in diameter, placed on the boat. The delivery main of this pump, also 20 inches in diameter, is extended from the vessel by a line of wrought iron pipe, with ball and socket joints and rubber connections; it is supported in position to the marsh where the mud is delivered. By this arrangement, which is shown clearly in the engravings, the material excavated, after being mixed, passes directly through the pump and delivery mains, and only comes to rest when it is discharged. As much as 40 per cent of solid matter can be carried in this way, but 15 per cent is found by experience to be the most convenient amount; one obvious advantage resulting from this dilution being that the solid material is more widely and uniformly distributed over the area to be reclaimed.

The pump is driven by a pair of engines having cylinders

or an average of 30,000 yards per month. In one month of this period there were moved over 60,000 yards, through a distance of 1,100 feet. The total expense per day of ten hours of one of these machines, including interest, depreciation, and insurance, amounts to 100 dollars, or about 20%, and in connection with the work there are other expenses, as follows:

1. The construction and maintenance of levees or embankments for confining the freshly dredged material.
2. The

consumption of smoke in their locomotives. It is believed that success has been attained in No. 85, and those who travel behind that big locomotive the coming summer will not have to close the windows of their cars, either in the tunnel or elsewhere, so far as smoke is concerned. The smoke consumer is in itself simple enough, being merely two pipes, one in front of the firebox and one in the rear, each of which admits jets of steam into the flames, rising through the burning coal. The steam effects perfect combustion, and while completely consuming the smoke makes a gain also in the heat obtained. Usually, when the fireman is throwing in coal or stirring the fire, and for a few moments after each operation, a cloud of smoke pours from the chimney of the locomotive. In the whole trip to Albany (where the engine was taken off) nothing that was visible came from the chimney except the escape steam. The improvement was wonderful, and the Central officials seem to be justified in feeling that they are a little ahead of the rest of the world with their new device. So far only two or three locomotives have been supplied with the smoke consumers, but others are to be soon.

"The trip to Albany was also noteworthy because the engine ran the whole 147 miles from New York without stopping for water, oiling up, or anything else. The company are aiming to introduce this idea in all their fast trains. Of course, water enough could be carried in a tender sufficiently large for such a trip. But the weight would heat the journals. The plan adopted is to scoop up a fresh supply of water from troughs laid at intervals between the rails, the train holding its headway and never stopping a moment. To run an engine so far without oiling requires alterations in the oil cups, etc., but all the difficulties have been overcome, and the long run was made successfully. The improvement shows that the Central Road keeps up with the times."

Keeping Wood in Moist Ground.

A Brooklyn, N. Y., carpenter writes us that, in 1864, he

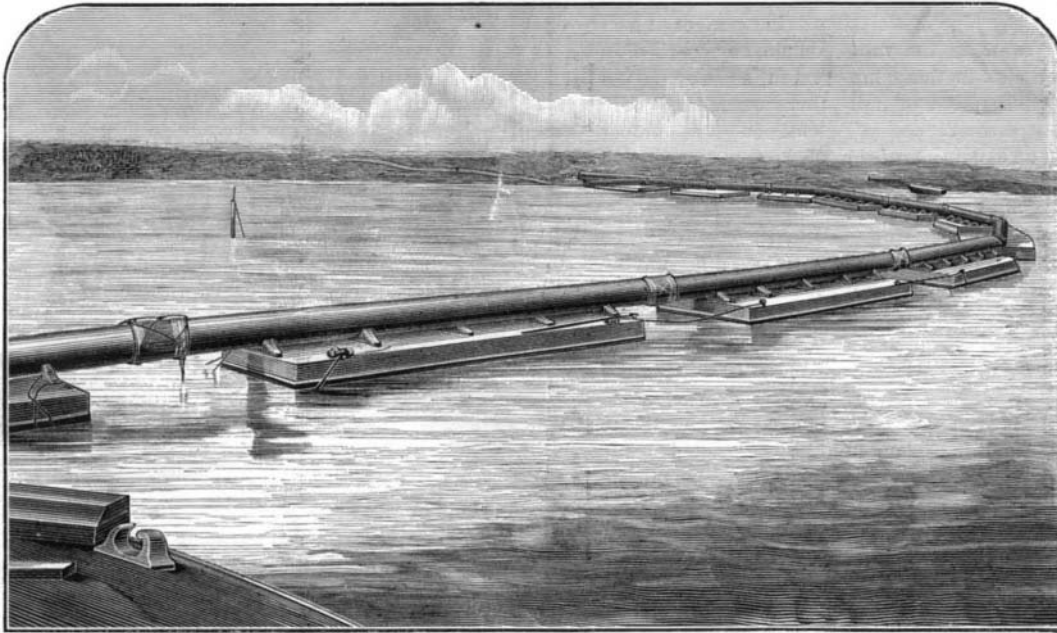


Fig. 2.—THE FLOATING DISCHARGE PIPES.

services of nine or ten men to guide the flow and distribution of the material as it is delivered. The cost of previous dredging operations on the Pacific coast by ordinary appliances has averaged 24 cents, or 1s., per yard, while the maximum expense per yard, with the system we now describe, is a maximum of 6 cents, falling in some cases to 5 cents per yard. The Oakland Harbor dredging operations are under the control of Col. G. H. Mendell, of the United States Corps of Army Engineers.

One Hundred and Forty-seven Miles without a Stop.

The New York Central and Hudson River is running special newspaper trains to Albany, and of a recent trip the *New York Tribune* speaks as follows:

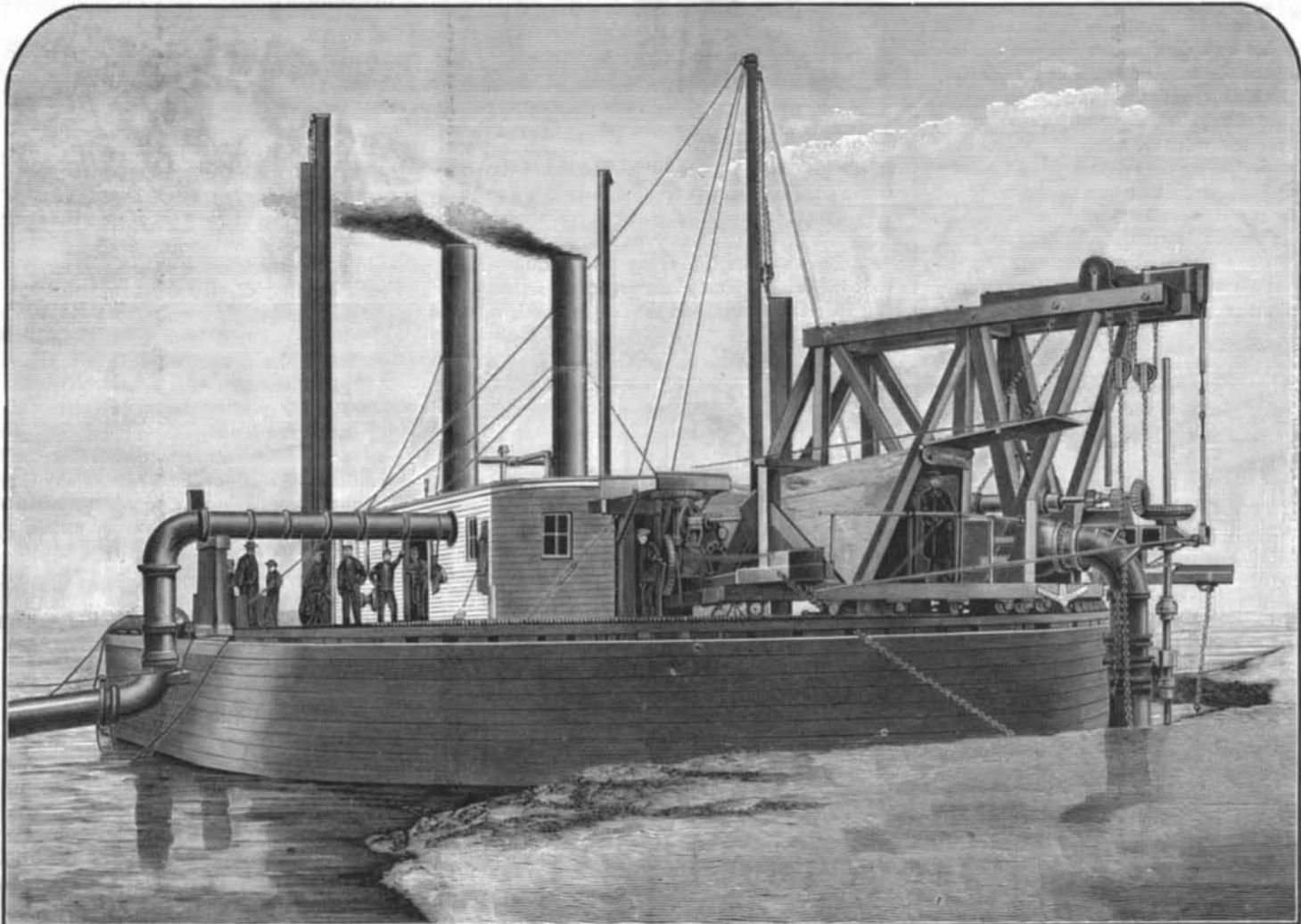


Fig. 1.—DREDGING APPARATUS AT OAKLAND HARBOR, CALIFORNIA.

16 inches in diameter and 20 inch stroke, and two other engines with cylinders 12 inches in diameter and 12 inch stroke drive the cutting and mixing gear, the winches, hoists, etc. Steam of 90 pounds to 95 pounds pressure is supplied by two 100 horse power boilers. The greatest length of delivery pipes employed has been 2,850 feet, and through this length 41,000 cubic yards of mud were delivered in 190 hours. During a period of eight months one of these machines raised and deposited 250,000 cubic yards,

"For the trip of the *Tribune's* special train from New York, Mr. Toucey, General Superintendent of the Central and Hudson River roads, detailed locomotive No. 85, George Remington engineer. No. 85 has only recently come from the shop, where certain slight but important alterations were made in the engine, in which Mr. Toucey and Mr. Buchanan, Superintendent of Motive Power, have been greatly interested. For ten years the New York Central Company has been trying to perfect some plan for the

laid down some old painted half-inch door panels as a flooring for a coal bin at the rear of his yard, and that, on taking them up seven years afterward, they were just as sound as if they had been but recently cut from a thrifty living tree, although so pliable with moisture that he could have bent one of them around a six inch stove pipe. Our correspondent suggests that the painting of railroad ties, or coating them with white lead and oil, would be very efficacious for their preservation.