Coal Tip.—A typical hoist, as used for loading coal into vessels for exportation, is shown in Fig. 64. The loaded cars run by gravitation from the terminal storage area on to a hydraulic turntable in front of the hoist, which automatically tips up slightly and sends the car on to the hoist cradle. The whole car, weighing from 20 to 30 tons, is then lifted by hydraulic power to a height of 40 feet above quay-level, if necessary, and the contents tipped down the chute into the hold. The empty car is then run off by gravitation at a high level while the next loaded car is being got into position. In this way about 250 tons an hour is loaded.

MATERIALS

Cement Concrete.—The proportions of cement to broken stone, sand, and gravel varied from three to one to fifteen to one of cement. It is not necessary to decribe all the various proportions. Suffice it to say that the great bulk of the walls were constructed of eight of broken stone and sand to one of cement, with a 6-inch face of four to one.

The stock of cement was never allowed to be less than 6,000 tons in store, which, when delivered on the works, was emptied out of the bags and kept thoroughly dry and well aerated in sheds specially constructed for the purpose. Cartoon drawing No. 1 shows a cross-section of a cement shed specially designed for this purpose on other works, which, however, the author considers much too expensive a structure for such purpose.

In the interior of this shed there were three floors, one above another, on which the cement was spread. The floors were formed of 12-inch x 3-inch planks, suspended at each end by a pivot placed a little out of the centre of the plank end, so that when thus suspended the flat sides of the planks were vertical. By a mechanical contrivance, as shown in cartoon drawing No. 2, hand wheels on the outside of the shed were made to raise the planks to a horizontal position when cement was to be laid on them, or to lower them to a vertical one when it was required to drop the cement to a lower floor. Beneath the bottom floor were large hoppers, which discharged into wagons for delivery on the works. Cartoon drawing No. 3 shows a crosssection of the sheds and the system adopted at Avonmouth, where the cement was aerated by compressed air. The bins were constructed of timber in the usual manner, but the sides were pierced with holes 11 inches diameter, 20 inches apart, in two rows near the bottom of the bin. Compressed air was supplied from a compressor to each shed by means of a pipe running the whole length of the building, with connections at intervals, to which an indiarubber pipe was attached. A wrought-iron pipe, 1 inch diameter, was provided

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