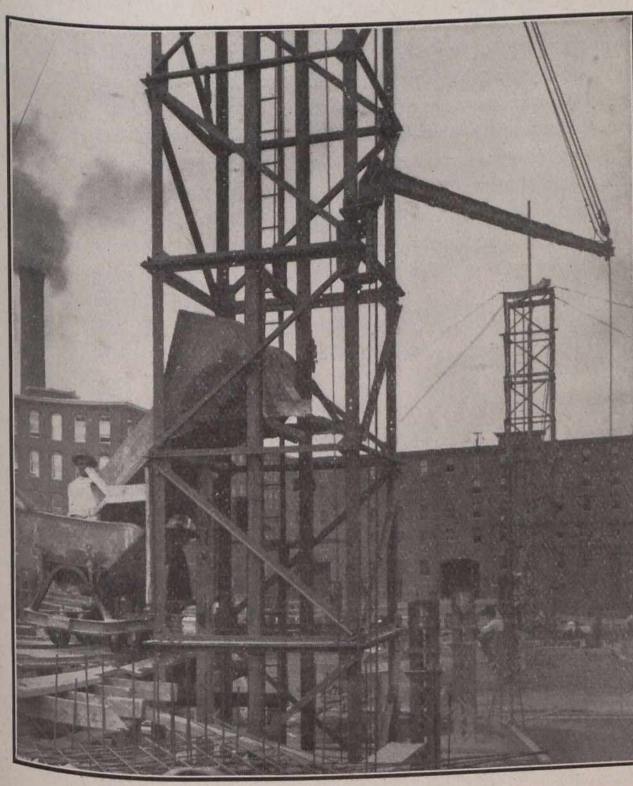
height of 10 feet 9 inches over all. They are of very simple design, composed principally of 4 x 4 x 3/8 angles for the uprights, and 2½ x 2½ x ¼ angles for the horizontals and braces. On two opposite sides are 5-inch channels which serve as guides for the automatic dumping concrete bucket. A good view of this pocket is shown in the diagram just after it has been tripped and is dumping the concrete into an industrial car.

These towers are suitable for any class of building, and can be erected to any desired height by simply adding additional sections. They are sufficiently stiff to be used for heights over 100 feet. On this particular job they will eventually be 108 feet high. The top and bottom flanges of every section are all marked from a flat pattern in order to secure interchangeability. In each section holes are punched



View of Tower.

in the 4 x 4 uprights in order that the seat plates of the derrick can be bolted thereto, thus making it possible to place the derrick at any desired height. On one side of the tower is a ladder made up of 5" x 3" x 5-16" angles and 5/8" rods, the ladders being made up in sections the same length as the sections of the tower. Two towers of ten sections each are being used on this job. They cost the Aberthaw Company, laid down and ready for erection, approximately $500 each, or $50 per section. This may appear high as compared with wooden towers, but the steel towers are subject to very little depreciation and can be used over and over again.

So far five sections of each tower have been erected, bringing the height of each up to 54 feet. The total cost of labor for erecting same has so far amounted to $441, but this figure will be materially reduced on future work, as the laborers are entirely green in the handling of the towers and consequently the labor costs run high. The tower was designed by the Aberthaw Construction Company, and was built by the Boston Bridge Company, Boston, Mass.

PROTECTION OF WOOD BY CRYSTALLINE PIGMENTS.*

By Henry A. Gardner.

It makes little difference what paint is tested when faulty wood is used, for the result in every case will be failure. A notable instance of such failure is recorded in the tests conducted at Fargo, N. Dak., by the Agricultural Experiment Station and the Paint Manufacturers' Association, where most of the wood used on the western side of the test fences (northern hard pitch pine) was extremely sappy and of a hard grain. After a few months' wear, the resinous sap, through the action of the sun, pushed itself through the paint and completely obliterated the latter in many spots. Again, at Atlantic City and at Pittsburgh, in the paint tests made under the inspection of the American Society for Testing Materials and the direction of the Carnegie Technical Schools, it developed that cypress and yellow pine gave unsatisfactory results in many cases. The inspectors, therefore, were forced to draw their conclusions from these tests almost universally from the white pine panels. Paint tests, therefore, if their object is to determine the value of pigments, should be made upon high grade wood, such as white pine or poplar, carefully inspected and seasoned.

Seasoning and Drying.

The importance of the proper seasoning and drying of wood cannot be overestimated, as the effect of an excess of moisture in lumber is bad from every standpoint. Every one is familiar with the appearance of a building painted immediately upon erection in the early spring, when the excess moisture in the wood, or the moisture that comes from the plaster, works itself to the surface. The badly stained appearance of the paint, which first indicates that moisture is working through, is followed by scaling and blistering, and the effect to beautify and protect has been defeated.

The strength of wood is also vitally affected by the moisture content. It is fairly well known that the strength begins to be greatest when the excess moisture in the cells or honeycomb part of the wood is removed, and when that point is reached where the fibres or cell walls are satisfied. Kiln drying may remove even more of this moisture, but if the moisture does not extend beyond the fibre saturation point, a fair degree of safety and strength is to be depended upon.

Action of Crystalline Pigments.

The effect of certain crystalline pigments in aiding the opaque white pigments in their battle to properly protect wood has been demonstrated in practice, and by test, and to-day the paint manufacturer is using these crystalline pigments in small percentage for this purpose. The filling of wood, such as floors for instance, has almost always been done by the use of pigments such as quartz silica, or very fine barium sulphate. The action of these pigments in penetrating the pores of the wood and becoming attached by their rough surfaces to the tentacles of the wood is extremely important. Pigments such as zinc oxide or white lead are made up of particles more spherical and with smoother surfaces, and will not secure the same hold upon the woody fibre, obtainable through the use of the rougher or more crystalline pigments. The painter often uses materials such as yellow ochre for the priming coat for wood, understanding that the ochre has a high content of crystalline pigments. such as silica or silicates. It has been found, however, that a much better practice is to have the priming coat of a paint made up with a small percentage of the pure crystalline pigments.

Treatment of Refractory Woods.

Yellow pine, cypress and other hard woods used in the construction of frame buildings, generally contain a large

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