

THE AVONDALE MARBLE COMPANY'S NEW CRANE.

There is now in operation in the quarries of the Avondale Marble Company, at Avondale, Pa., what is perhaps the largest derrick yet erected, and the most powerful in lifting capacity. This derrick covers a circle 160 feet in diameter, and can raise or place 100 tons straight lift at any point within this circle. It is operated entirely by steam power, the boom, as well as the load, being raised and lowered and the derrick rotated on its centers by this means; and these three motions are entirely independent of each other, or can all of them be operated at the same time.

The power is applied from a large capstan especially constructed for the purpose, a view of which is shown in one of our illustrations. The main shaft of this capstan is directly connected with the shaft of a 40 horse power stationary engine, the capstan shaft bearing at certain points paper friction pulleys. The winding drums are set in motion by band wheels being brought to bear against these pulleys by means of cam boxes, operated by the different levers in front of the machine, and the shafts of these band wheels being suitably geared to the winding drums. The main hoisting drum is geared to lift its full load (40 tons single line) at a speed of 12 feet per minute, and for light loads up to 10 tons single line, by means of a clutch, the speed can be changed to 48 feet per minute. The boom hoist is geared to a speed of 70 feet per minute, and using seven parts of rope between mast and boom, raises the boom with full load at rate of 10 feet per minute. The turning drum rotates the derrick—by means of a large bull wheel 12 feet in diameter at the base of the mast—at the rate of one complete revolution of the derrick in three minutes. The main hoisting rope runs directly from the capstan around a sheave in the foot block, through the center of mast, over another sheave turning on same pin as boom socket, and directly up the boom to the boom cap, passing over several trolleys on the way, and thence over the sheave in outer end of boom to the load.

The boom fall runs back from the capstan to a snatch block at the side of the quarry, thence over the capstan house to the top of the mast, through center of mast to sheave in boom head, and thence through the two triple blocks to the boom end. By this method the derrick can make a full revolution without twisting the two ropes, as in the old method of having both ropes enter the foot of mast, besides having many other advantages, which will be apparent to any one acquainted practically with the use of old style derricks.

Another point worthy of note is that all sheaves turn on pins in main castings, and the timbers are practically uncut, adding greatly to their strength and durability. This is rendered practicable at the outer end of boom by an ingenious arrangement called a "follower," which keeps the main hoisting rope on the sheave in any position; this consists of two iron spools between which the rope passes as it leaves the sheave, which spools turn on pins, and which pins in turn are fastened in one end of arms, the outer end of which arms are fastened back to the ends of the sheave pins.

One of our illustrations shows the derrick lifting a large platform, and gives a good idea of the method of rigging and the style of castings used.

The guy cap rests on small bearings, all sheaves are phosphor bronze bushed, the ropes leading from mast to capstan pass over vrolleys, keeping them off the quarry bottom, the turning rope, by a special appliance, is "gathered" as it leaves the bull wheel and let down to same level as the other transmission ropes, so that they all run through the same rope-way, and everything done that experience could suggest to make this derrick the most complete and durable, as well as the largest of its kind. Some

idea of the size of the derrick can be obtained from the following figures: Length of the mast, 105 feet 6 inches; length of boom, 90 feet 6 inches; mast, 31 inches square at base, 26 inches diameter at top; boom, 25 inches diameter at base and 21 inches at top; mast socket, 30 1/4 inches diameter by 26 inches deep; mast hood, 24 5/8 inches diameter by 26 inches deep;



THE NEW CRANE, AVONDALE QUARRY.

boom socket, 24 inches diameter by 25 1/2 inches deep; boom hood, 20 inches diameter by 21 1/4 inches deep, all inside measurements; guy cap, 48 inches diameter; guys (8), 1 1/4 inches diameter, best galvanized rigging cable; main hoisting rope, 1 1/2 inches; boom fall, 3/4 inch, and turning rope, 5/8 inch diameter, best crucible steel.

Total length of wire rope in derrick is 5,550 feet, or over one mile, the guys alone taking 3,000 feet; the castings for the derrick weighed over seven tons; the large gear wheel on main hoisting drum of the capstan is 72 inches diameter by 8 inches face; the large band wheels, 4 feet in diameter by 14 1/2 inches face.

The timbers are the best Oregon pine, and six

of the largest flat cars were necessary to transport them to the quarry.

This derrick and capstan were erected for the Avondale Marble Company, who recently discovered a valuable deposit of superior white marble immediately below their already extensive workings, from which for a number of years they have been supplying in large quantities a high grade stone for ordinary building and heavy masonry purposes. The crane was put in for the purpose of deepening their present quarry to the level of this marble and for working the latter when reached. The timbers for the derrick were furnished by Messrs. Holder & Smith, of South Brooklyn, the wire rope and cable by Messrs. John A. Roebling's Sons Company, of Trenton, N. J., and the derrick castings and capstan by Messrs. Smith, Whitcomb & Cook, of Barre, Vt.

The derrick and capstan were erected by Messrs. Smith, Whitcomb & Cook under the immediate charge of their Mr. W. F. Howland for the derrick and Mr. F. E. Kinney for the capstan.

An Efficient Village Improvement Society.

Southampton, Long Island, has a village improvement society well worthy of imitation. The roads and lanes, as most of the winding streets are called, are kept in fine condition and their names, with the date of their opening, are placed where "he that runs may read." Spots of special historical interest are also suitably marked. The society has done what it could to perpetuate some of the musical Indian names; for instance, the pretty sheet of water called by the early settlers "Town Pond," is now "Agawam Lake." It extends from "Job's Lane," opened in 1663, to the dunes along the beach. The "Dune Road," opened in 1654, is lined on the shoreward side with the luxurious cottages of the New York people whose summer homes are here. "Meeting House Lane" leads around to the site of the original settlement, now covered by cultivated fields; an ample sign board shows where the first meeting house stood.

Thus has the improvement society made a drive about the beautiful old town a means of gathering interesting historical information. The thoughtful visitor can hardly fail to wish that many towns in our country which have a past might have the outline given along their streets after the manner of this first English settlement on Long Island.

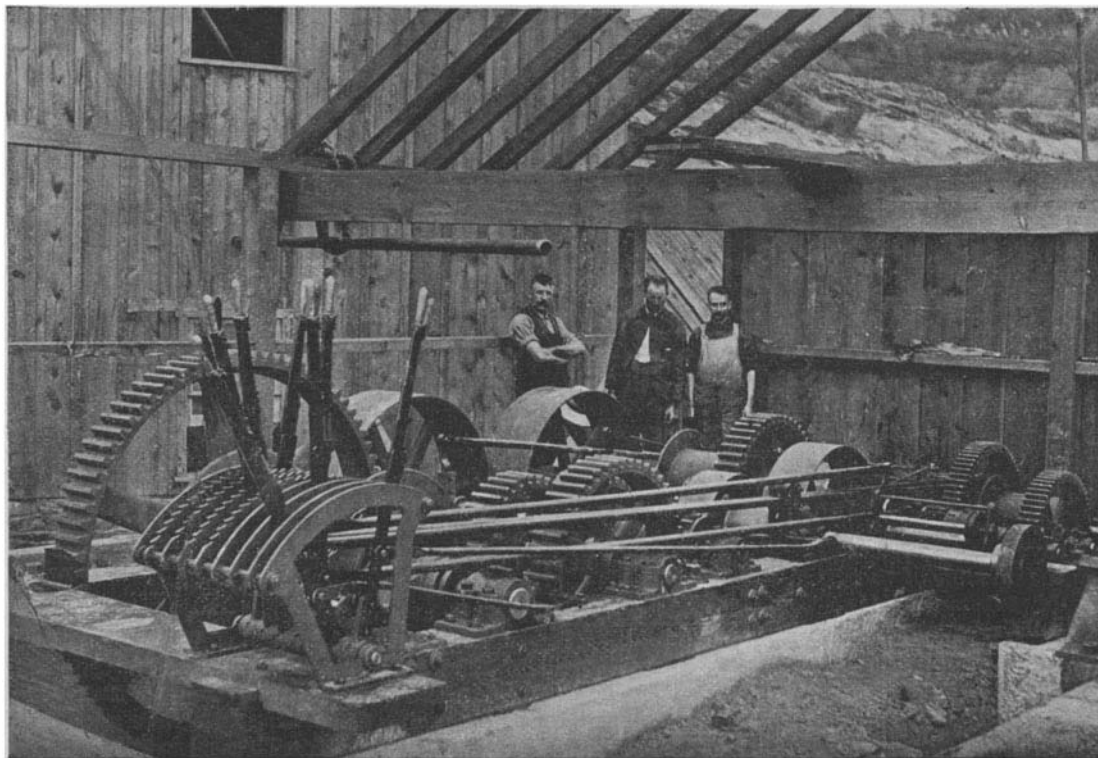
Armor Plate for Russia.

The Bethlehem Iron Company has received a cable message from Lieut. J. F. Meigs, at St. Petersburg, announcing the acceptance by the Russian government of the first lot of armor plate on the iron company's contract with the imperial Russian marine.

The lot includes about 700 tons of nickel steel armor that is not face hardened. The ballistic plate was tested on July 12. It weighs 23 tons and is 16 inches thick, tapering to 8. It measures about 14 feet in length and 7 1/2 feet in width. The Bethlehem Iron Company was represented at the test by Lieut. Meigs, its chief of ordnance.

Krushite.

Krushite, the new abrasive material, consists of chilled cast metal shot, varying in size from that of clover seed to a mere powder. The individual particles are said to be so hard, and at the same time so tough, that if one of them be struck on an anvil, the latter will receive a dent. Krushite is claimed to be three times as effective per unit of weight as the sharpest sand for sawing blocks of granite, polishing, etc., and as a substitute for sand in the blast and for diamond drills in boring. The wear on the saw blade, or rubber, is also said to be considerably less.



CAPSTAN OF THE AVONDALE CRANE.