

A LARGE WATER ROLLING MILL.

Perhaps the largest mill of its kind ever built for the purpose of flattening round metal has been designed by Messrs. Blake & Johnson, of Waterbury, Conn. Apart from its size (it weighs 4,200 pounds), the machine is distinguished from similar apparatus of its kind by certain novel features of construction.

Of these features the most noteworthy is the use of a pair of intermediate auxiliary gears (seen at the left side of the machine in our cut), whereby the rolls can be separated to admit $\frac{3}{4}$ -inch rods. Usually the two roll-arbors are geared together, one gear being used on the end of each arbor, thereby allowing the rolls to be separated only a short distance, since the gear-teeth would otherwise be weakened. The advantages of the new arrangement over the old are therefore obvious.

The rolls are 10 inches in diameter and 6 inches face. In their construction flawless Krupp roll steel is used, perfectly hardened, ground, and lap finished. The arbors are made of steel and are bored the entire length. Water is allowed to circulate through both arbors and rolls, so as to prevent heating and to insure accurate rolling. The driving shaft is supported at the outer end by a heavy floor hanger, and is fitted with tight and loose pulleys.

The mill is particularly serviceable to manufacturers of flat wire and articles made from flat wire, because the larger the diameter of the rolls, the smaller will be the elongation of the wire, and the greater the width. Rolls of small diameter lengthen more than they broaden the wire; and for this reason the machines in which they are used do not always meet the requirements of the manufacturer.

ACCIDENT TO THE TORPEDO-BOAT "DUPONT."

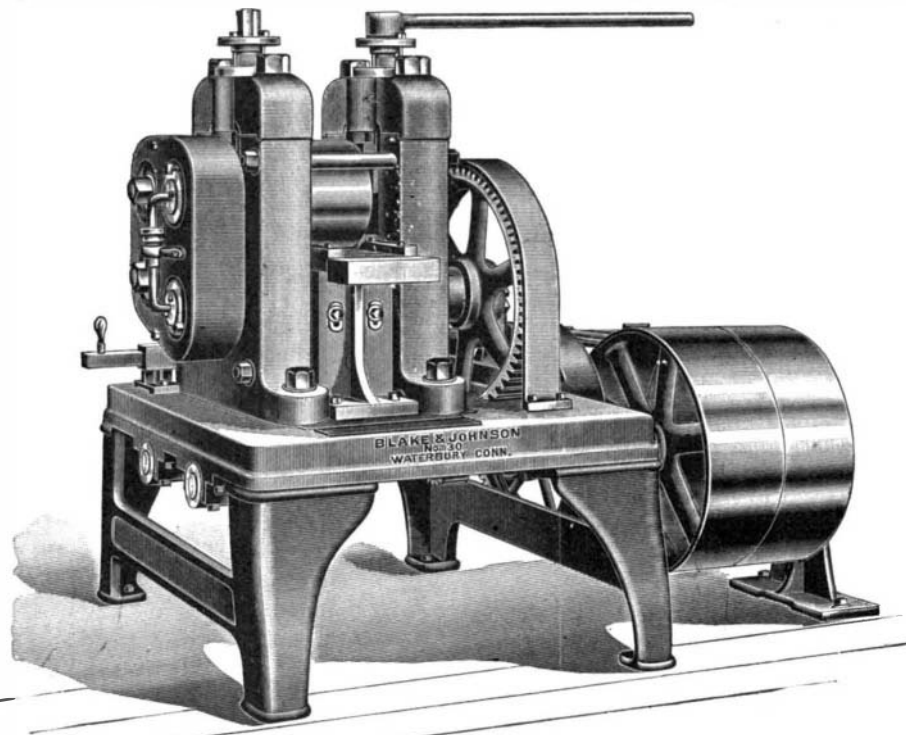
If one were in search of ocular evidence of the fine quality of steel which is used in the construction of torpedo boats, he could not do better than study the crumpled up bow of the torpedo boat "Dupont," as shown in the accompanying illustration. It will be seen that the plating has been folded back on itself, concertina-fashion, so that the whole of the forward compartment, which was about 8 feet in length, has been compressed within a space of not more than 2 or 3 feet. This was an extemporized "cold-bending test" that speaks well for the quality of the material. Not only does the mild, open-hearth, steel, of which the thin $\frac{1}{8}$ -inch plates are composed, fail to show a single crack in any of the folds or laminations, but the riveted joints of the plating in many cases are not even started.

Although to the lay mind the fact that the plating of the "Dupont" should submit to such rough usage without a sign of fracture is very astonishing, it is well understood by builders of torpedo boats and other naval craft that this test is not nearly as severe as that which the plates have to undergo before they are accepted and built into the vessels. Thus, for instance, in the cold-bending test, two pieces cut from each heat during the manufacture of the steel must be capable of being bent over flat upon themselves, without showing any sign of fracture on the outside of the bend; while in the quenching test the specimens are heated to a dark cherry-red, plunged into water at eighty degrees Fahrenheit, and then must submit to be bent over a piece of their own diameter without fracture. This, it will readily be seen, is far more severe than the treatment to which the plates were subjected in the collision.

The accident to the "Dupont" happened at Newport when the craft was being brought into her berth. Ordinarily in bringing these little craft to their moorings, they are run into the dock at a speed of from 10 to 12 knots, and when a given point on the vessel passes the end of the dock the bell is rung for full speed astern. Such is the power of the engines that the craft is brought to rest as soon as the stern has passed within the pier head. On this particular occasion the signal was given about a second too late, with the result that the "Dupont" struck the end

of the dock when she was yet traveling about four knots an hour. As it happened, the bow served as an excellent buffer, bringing the vessel gradually to a rest without dislocating the steampipes, boilers or engine fittings. It is a remarkable fact that, although

10 tons, and were divided into five series, 0 to $\frac{1}{2}$, $\frac{1}{2}$ to 1, 1 to 2, 2 to 3, 3 to 10 tons. A great number of boats were assembled on the first day, 66 in all, including American, German, English and other yachts. The first day's races were, however, deprived of interest by a dead calm which prevailed, and it was only on the second and third days that the real interest began. On the second day a number of races took place between the yachts of the different series, and among the victors were some of the boats well known in Mediterranean regattas. Of the 2 to 3 ton series, the race was won by "Ollé," belonging to M. Exshaw, over "Favorite," "Gwendoline," and others; of the 1 to 2 ton series, "Lerina," of Count de Pourtales, won, followed by "Martha," of M. Vilamitjana, "Nina Claire," and others. The third day was devoted to the races for the Coupe International de l'Exposition; this cup, by the sculptor, Belloc, executed in silver by M. Linzler, is a veritable work of art. It was allotted to the second series, from $\frac{1}{2}$ to 1 ton, and 32 yachts were assembled. A fine contest took place between the English yacht "Scotia" and the German yacht "Aschenbrodel," which started together and kept very close during the whole of the race, followed by the small racer, "Crahe II.," designed by M. Valton. The victory fell to the German yacht, which came in first with scarcely a second's advance over the "Scotia;" it was, however, gaged officially and found to exceed the limit of one ton, being thus disqualified. Accordingly the cup was awarded to the "Scotia," which is owned by Messrs. J. H. Gretton and Lorne Currie.



WATER ROLLING MILL.

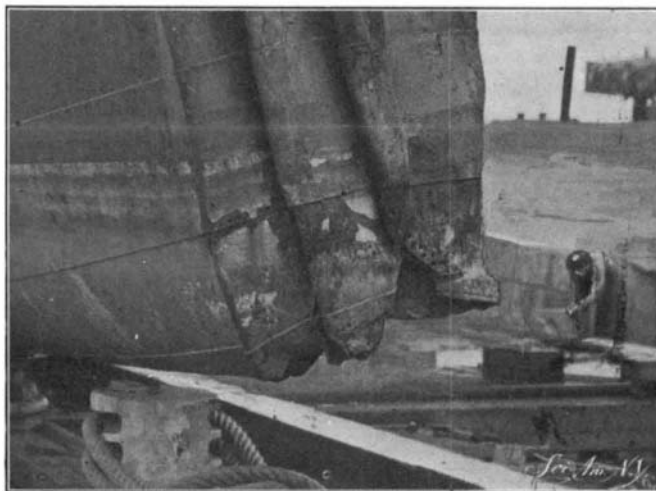
the crumpling of the bow extended to the first watertight bulkhead, the latter remained practically watertight, and the little vessel, had she been at sea, would have made the trip to her dock with safety.

International Yacht Races at Paris.

The first of the international yacht races, held near Paris in connection with the Exposition, took place at Meulan. The races were open to yachts not exceeding

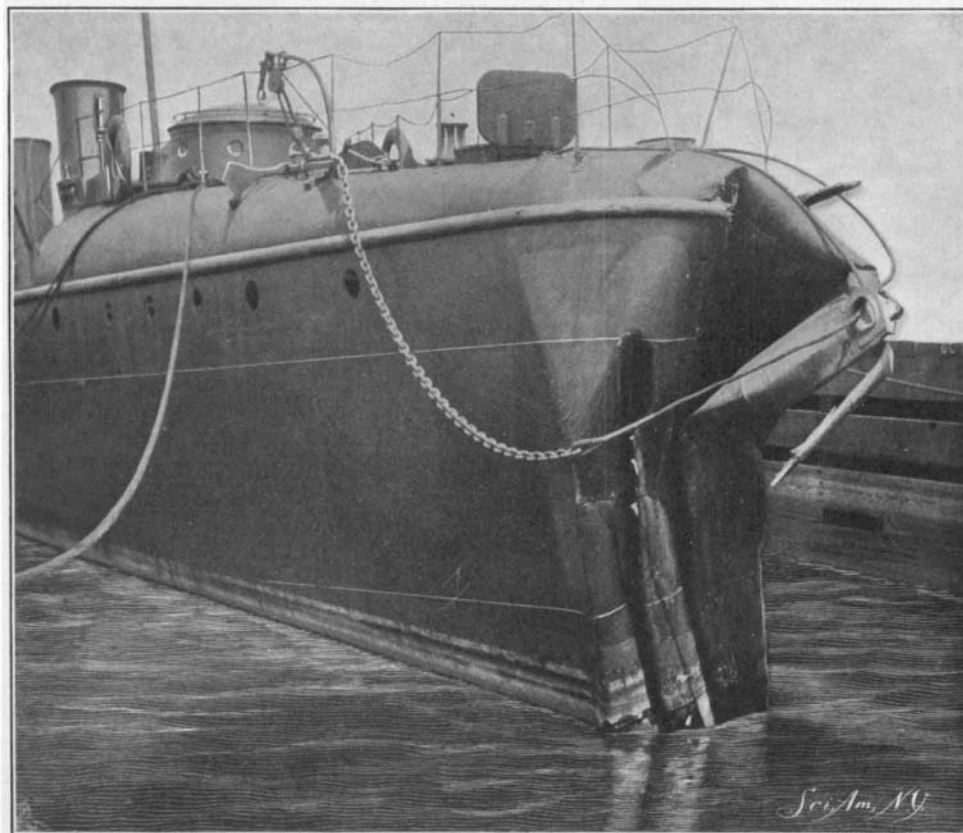
Piercing of Limestone by Snails.

M. Stanislas Meunier has observed the fact that limestone rocks near Constantine, Algeria, are pierced with holes by snails, which use cavities thus formed as a shelter from the summer heat. In the same connection, M. Edouard Harlé has observed an analogous fact at Salies-du-Salat, in France; calcareous rocks of compact structure or marble present here and there groups of cylindrical holes as large as the thumb; according to the inhabitants, these holes are made by a species of snail, and several of these were found lodged in them. Cases of this kind have been already observed, and as far back as 1854 M. Constant Prevost gave an account to the Académie des Sciences of a series of cylindrical holes made by snails in the limestone rocks at Monte Pellegrino, in Sicily. These holes are from three to four inches long and have diameters varying from one-fifth to two inches, according as they were made by young or adult specimens. Near Boulognesur-Mer he observed hard limestone rocks which had been perforated with circular holes, grouped on the inner or less exposed faces of the rocks, these being from five to six inches deep and having a slight upward slope to prevent the accumulation of water. The snail in this case is the *Helix hortensis*, and it passes the winter there. In the neighborhood of Salies-du-Salat there are numerous rocks perforated in this way, and in the spring they contain a great many inhabitants. The snails seem to be the *Helix nemoralis* and the *Helix hortensis*. The holes occur generally in groups, and are often so close together that the partition wall is pierced and destroyed wholly or partially. As to the manner in which the snail is enabled to perforate the rock, no satisfactory conclusion has been reached.



Photograph by E. Muller, Brooklyn.

FOREFOOT OF THE "DUPONT" AFTER THE COLLISION.



Photograph by F. H. Child, Newport, R. I.

UNITED STATES TORPEDO-BOAT "DUPONT"; SHOWING BOW COMPARTMENT CRUMPLED UP BY COLLISION WITH DOCK.

THE burial grounds of the Ming dynasty are of great interest. The Holy Road is the most interesting feature of the burial grounds. It is lined on both sides with colossal monolithic statues standing about 200 yards apart. There are thirty-six statues of which twenty-four represent animals and twelve high dignitaries. The statues are by no means crude. The statues are made without pedestals and are disposed in groups of four each; four lions, four rams, then camels, elephants, horses and chimeras. In each group two animals are shown standing and the others lying down. They are fully illustrated in the current issue of the SUPPLEMENT.