

BROADSIDE LAUNCHINGS.

BY WALDON FAWCETT.

The launching sidewise of steel vessels of large dimensions is distinctively an American practice. The development of the idea in its application to vessels of considerable size has occurred on this side of the Atlantic, and indeed this is the only country where the plan is followed to any considerable extent. Broadside launchings have always been the rule at the shipyards on the Great Lakes, and of late years have been introduced to some extent in shipbuilding plants on the Atlantic coast. The side launching is not claimed to have any advantage over the more common mode of getting a new hull into the water, but the adoption of the method has been dictated by limitations in the depths and areas of the waterways which has been available for launchings at the shipyards where this scheme has been employed. In other words, a vessel may by means of the broadside method be launched into a slip or river so shallow and narrow that the reception of the hull would be practically impossible were it sought to slide the vessel into the water endwise, as is the custom at yards possessed of a generous extent and depth of water.

The ways utilized in a broadside launching are, of course, dissimilar in many respects to those employed in the ordinary end-on launches. In the first place, the groundways for use in an endwise launch must necessarily exceed to some extent the extreme length of the vessel, whereas in the case of the side launch the groundways may not represent 5 per cent of the length of the vessel which travels over them. For a 500-foot vessel to be launched in the ordinary manner ways 550 feet or 600 feet in length might be necessary, whereas for launching a 500-foot vessel broadside groundways of 20 or 25 feet should prove sufficient.

The groundways are usually of yellow pine, 12 by 12 inches in size, and have an inclination of approximately two inches to the foot. The plan followed in the shipyards on the Great Lakes is to so gage these groundways that the ends, carefully rounded, will just reach the water's edge. The natural result is that it is necessary for the vessel being launched to literally drop from the end of these ways into the water. The vessel is certain to turn slightly on her bilge as she travels down the ways, and the impetus of the plunge from the ways adds to the force with which the great hull careens. Very frequently the ship would go over on her beam ends—"turn turtle" as the marine men say—were it not for the heavy checking lines which extend from shore to the stem and stern of the boat. The sudden impact of so large a craft in a shallow body of water causes the tidal-like wave which is raised by the vessel and which forms one of the picturesque features of a broadside launching.

In the lake shipyards the vessels are built on level stocks, and the cradles on which the vessel rests, as well as the sliding ways on which it travels, are usually constructed of pine. For greasing the ways in order to facilitate the movement of the vessel there is employed a mixture consisting of one part of grease

to five parts of beef tallow. This proportion is varied considerably, however, owing to the condition of the weather, and after the mixture has been applied the ways are given a coating of lard oil. The manner of wedging up the vessel and removing the blocking preparatory to launching do not differ materially from the practice in vogue at yards where the end-on method of launching is employed exclusively.

There appears to be almost no limit to the size of vessel which may be successfully launched broadside, as several vessels, each approximately 500 feet in length, have been placed in the water in this manner. It is essential that both ends of a vessel shall start at exactly the same time and that the hull shall travel evenly down the ways, otherwise a very severe strain is imposed; and inasmuch as the lake vessels are of great length and comparatively narrow beam, this might be attended by serious consequences. A majority of the vessels which are set afloat on the Great Lakes, in accordance with the practice outlined, are

100 feet in width and not exceeding 18 feet in depth.

The launching plan as evolved at the Southern shipyard presented some modifications of that followed at the shipbuilding establishments along the northern border of the country. For instance, instead of the groundways ending at the water's edge, as they do in lake shipyards, the groundways for the torpedo craft were carried down well under the water, and the boats were thus entirely water-borne before leaving the ways. It was claimed that this saved considerable strain on the hulls during launching. The groundways, consisting of four groups of two each, the spacing between the members of each group being 15 feet, were fewer in number than would have been employed in launching a vessel of equal size on the Great Lakes. After the blocking had been removed, the vessel to be launched was held in place by four trigger ropes, and to start the hull on its journey to the water it was only necessary to sever these four ropes simultaneously. The really unique feature in connection with

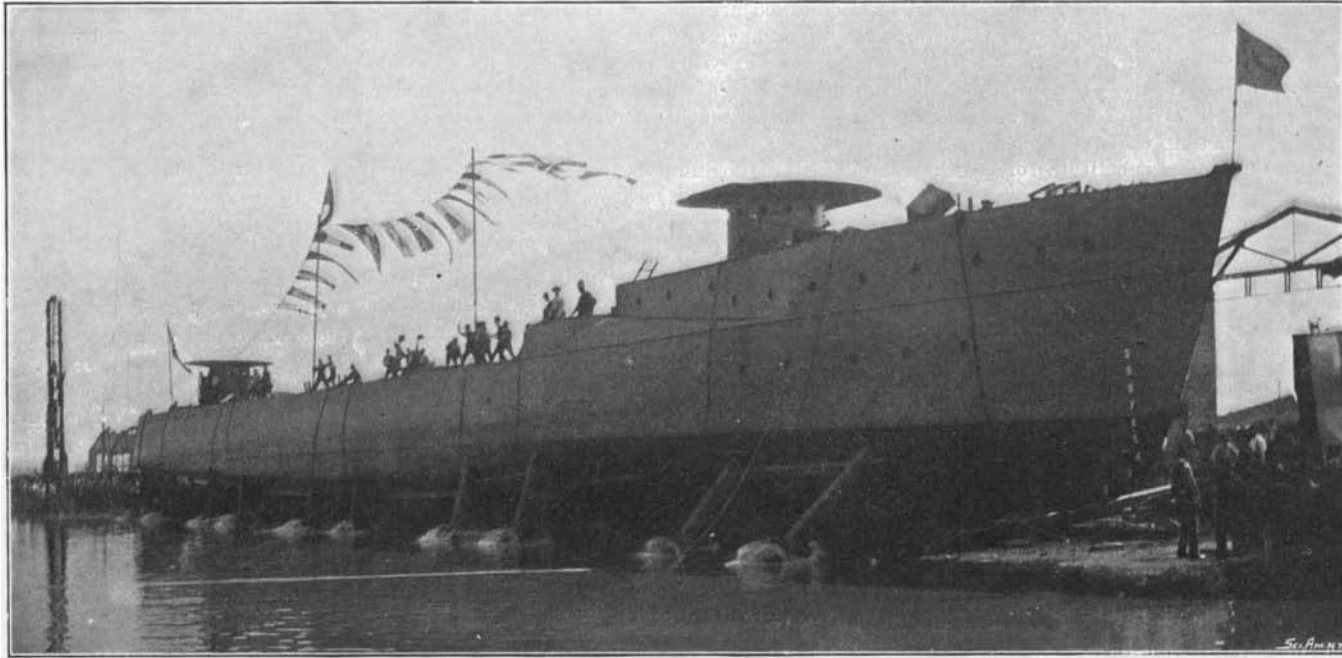
the launchings at Richmond is found in the methods employed in gradually lowering two of the vessels distances of 30 and 32 feet respectively to positions formerly occupied by other vessels, in order that the launching process proper might not present a necessity for so great a distance of travel to the water. This was accomplished by means of 8-ton screw jacks, of which two were provided for each cradle. The positions of these jacks were so arranged that one was always about a foot in advance of the other, and after one set of jacks had been backed down as far as possible the vessel was held in place by the other jacks, while those whose limit of immediate usefulness had been reached were removed. After they had been replaced at a point lower down the lowering operation was resumed until it became necessary to shift the other jacks, and so on.

In some instances difficulty has been experienced in starting the vessels, and it has been necessary to use rams; but this is exceptional, and there is practically no danger that once the vessel has started it will, as is sometimes the

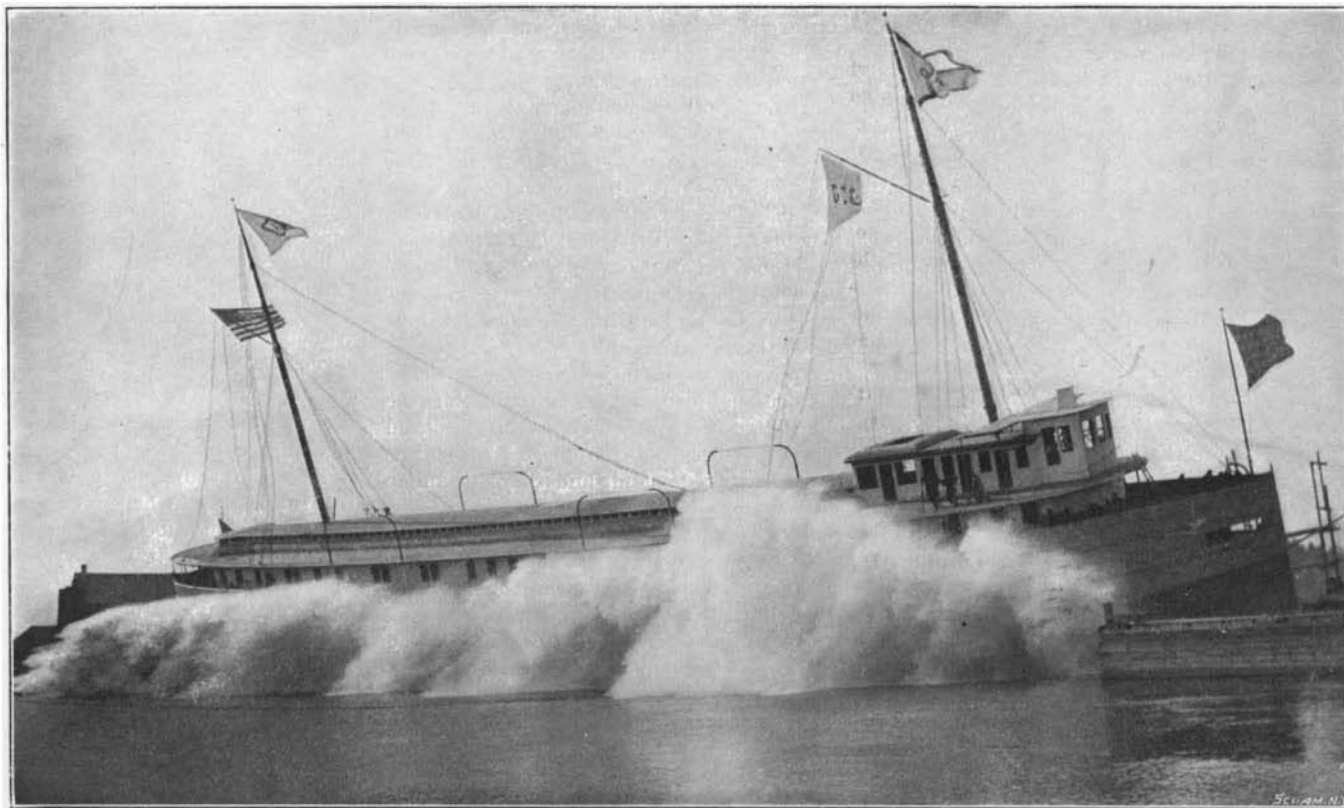
case in end-on launchings, become so firmly lodged at a point on the ways that a postponement of the launch is necessary.

Tensile Strength of Bronze.

Prof. C. Bach, of Stuttgart, has made an investigation of the effect of temperature upon the tensile strength and ductility of bronze. When the temperature exceeds 400 deg. F. both of these important properties decreased astonishingly. The alloy experimented with consisted of copper 91 per cent, zinc 4 per cent, tin 5 per cent. The reduction of strength and ductility at 400 deg. F. is about 6 per cent, but at 600 deg. F. about 50 per cent. Since the alloy tested elongated but little, it may be considered safe for use in connection with steam at ordinary pressures. For valve bodies, stuffing boxes and the like, or other parts coming in contact with highly superheated steam, the metal would probably be not fully trustworthy.



SIDE LAUNCH OF TORPEDO-BOAT DESTROYER "DECATUR."



SIDE LAUNCH OF STEAMSHIP "INDIANA."

launched when not more than two-thirds completed, and before any portion of the machinery installation has been placed aboard; but this ingenious method of launching has been successfully employed in the case of vessels with engines, boilers and every detail of equipment complete, and which were ready to go into commission within a few hours after the launch.

As has been stated, the broadside method of launching has been employed in several shipyards on the Atlantic coast, notably at the plant of the William R. Trigg Company, at Richmond, Va., where the torpedo boats "Shubrick," "Stockton," and "Thornton," and the torpedo-boat destroyers "Dale" and "Decatur," all building for the United States government, were slipped into the water in this manner. The action of the Trigg Company in adopting the sidewise method of launching was prompted by the same necessity which impels such procedure on the Great Lakes, namely, limitations of room for launching purposes. At Richmond it was necessary to launch into a canal