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THE ATLAS ENGINEERING COMPANY'S HYDRAULIC PONTOON DOCK.

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THE Atlas Engineering Company, about five years ago, on removing to their new premises at Woolwich, decided to go more extensively into marine engineering, shipbuilding, and repairs in that line—their position in Sydney Harbour being naturally adapted for the same, having an area of fourteen acres of ground, with a deep water-frontage of about 1,800 feet.

The advisability of having a patent slip was first gone into, but it was ultimately decided that a floating dock would be preferable. The next point to decide was what type of floating dock would be most advisable; and to decide this Mr. Edgington was sent to England to investigate the matter and report. On his arrival in the old country he had the advice of several eminent engineers, namely, the late Mr. William Denny, of Dumbarton; Mr. John Darling, Superintendent Engineer of the Union Company of New Zealand; Mr. Braithwait, Superintendent Engineer for Mr. John Waddington, of well-known engineering fame; and Mr. James Pollock, of Fenchurch-street, London (to whom Mr. Edgington entrusted the design and general supervision of the work should the class of dock so highly recommended be approved of by his colleagues.) On his return to the colony he submitted his report and recommended that a dock similar to the one at Barrow-in-Furness, which had been very highly spoken of, should be procured and imported in pieces ready for erection—which recommendation was adopted. The class of dock recommended is of the L section, having a tower or main body on one side only. It fulfils all that the similar class does with the tower on each side, with the advantage of being able to deposit vessels on stages on shore, which advantage is great in cases where vessels require extensive repairs, as the cost of fixed staging

is a small percentage of the cost of a dock of any kind. Where water-frontage permits it, these stages can be continued so as to accommodate a number of vessels—one dock thus doing the work of several docks.

This dock, when used simply for cleaning or repairing vessels, has the great advantage over graving docks and floating docks of the box type in cost of working, as the water required to be pumped is in proportion to the weight of the vessel; whereas in the others it is the reverse, for the smaller the vessel the more water has to be pumped; and even in large vessels the water required to be pumped out is much in excess of the weight of the vessel. Thus time comes in as an important factor; and when a vessel is docked, if quick dispatch is required, to have the sun shining on the sides, and dry air around instead of being in a hole, is of the greatest advantage, not only for painting, but for work in general. In the event of plates being required to be removed from a vessel's bottom, they can at once be placed in punts, which can be floated under the plate and landed at a wharf convenient by steam-crane and transported thence by rail, instead of having to be drawn along the bottom of a dock, through and amongst shores, blocks, etc., to a crane to be hauled up from the bottom, and thence transported by barrow. In the event of a rudder requiring to be unshipped, it can be lowered, landed, and replaced at pleasure without requiring to undock the vessel, which is not always the case in the others. The Atlas Engineering Company imported their dock in plates, etc., ready for erection. The quality of the work was much admired by the engineers who visited the erection, and appreciated by those who erected it; the plates being so carefully bored to template that they were interchangeable, and all very plainly marked to correspond with a very complete set of drawings, reflecting great credit on Mr. James Pollock, of London, the engineer in charge, and on the builders, Messrs. Kloss and Sons.

This dock, as I previously mentioned, is a single-sided dock of an L section and in two parts, each part being complete in itself with machinery and pumping-gear; so that the two parts

may be used separately or together as may be required ; one half being capable of docking, the other half available for cleaning or repairing. The lifting-power of the dock is in the pontoons, twelve in number, each 60ft. long, 13ft. wide, and 9ft. deep ; each being divided into four water-tight compartments, and all are securely connected at one end to a longitudinal cellular girder or tower, and spaced 8ft. from one another. The tower is 242ft. long, 13ft. wide, and 34ft. deep, and in this the pumping machinery is erected, consisting of two powerful centrifugal pumps placed near the bottom, discharging under water and capable of throwing 2,000 tons of water per hour. From these pumps, pipes extend the whole length of the tower with branch-pipes leading from them to each water-tight compartment in the tower, and in the pontoons, each with a sluice-valve, in all seventy-two sluice-valves, which are arranged in groups of three, and manipulated from the top of the tower, giving complete control in raising or lowering the dock and enabling it to be raised or lowered at any inclination desired. Thus, in raising a vessel of unequal draft forward and aft, her whole length of keel takes the blocks before she commences to be lifted, thus equally dividing the strain.

The dock, with tower and pontoons, has a beam of 73ft., and is very stable ; but, when being sunk empty, the moment the air-vessels on the points of the pontoons become submerged, the beam is decreased to 13ft., the width of the tower. The stability is then maintained by means of the outrigger, which consists of a broad, flat pontoon, 266ft. long, 40ft. wide, and 4ft. deep, loaded with stone ballast to a draft of 2ft., and connected to the tower by means of a strong parallel motion, which allows the outrigger to remain stationary, while the dock is free to be raised or lowered vertically. The movement is exactly the same as that of a parallel ruler. When a vessel is being raised after a portion of her weight has been taken, the services of the outrigger could be dispensed with, as the beam then becomes the distance from the outside of the tower to the opposite side of the vessel ; and, inversely, in sinking with a vessel on, the outrigger is brought in service necessarily only when the vessel is liberated.

It is not essential to have depositing-staging, but the full merits of the dock come into play only when this is provided. This is quite independent of the dock, and is constructed of strong piles braced together, forming narrow piers of about 6ft. in width, on which are fitted keel-blocks and arrangements provided for suitable bilge-blocks to receive a vessel.

One of the most important advantages of this kind of dock is the great facility with which the power of the dock may be increased as often as the growing trade of the port may render such enlargement necessary. This is accomplished by simply adding a third section in the centre of the dock, which may be done without any alteration to the existing portion, and at an expense not exceeding that which would have been incurred in the first instance.

This floating dock has also the advantages of requiring no fixed foundation, as, when being worked, it is not sunk to the bottom; of being easily removed from place to place, with or without a vessel on; and of being vastly quicker in operation than an ordinary graving-dock.
