

THE STEVENS BATTERY.

This celebrated American ironclad was, by the will of the late Edwin A. Stevens, of Hoboken, New Jersey, to have been presented, in a complete condition, to the State of New Jersey. It was further directed that the machinery and tools used in construction and not exceeding 1,000,000 dols. in money, should be appropriated for the purpose of carrying out this provision of the will. It was still further provided that, should the State of New Jersey not receive the said vessel, the executors were to sell the ship and to retain the proceeds of such sale as part of the estate of the testator. A special Act of Congress having been obtained, authorising the State to accept the gift under the provisions of the will, the Legislature, by an Act approved April 1st, 1869, accepted the vessel on the terms above stated. It was the intention of the executors and their engineers to put afloat a vessel that should be the most formidable iron-clad on the ocean. The amount of money appropriated proved insufficient to complete the vessel, and after the hull and the machinery had been nearly finished, the work was necessarily stopped, leaving the ship in the condition hereafter described. A question having been raised as to the real ownership of the vessel, suits in Chancery were commenced, and, pending these suits, the State Legislature, by an Act, to which reference has already been made, directed a positive sale and the payment of the proceeds into court. The vessel was accordingly sold and the Federal Government, being the highest bidder, secured it, subject to the approval of Congress. The following description of the vessel is from *The Engineer*.

Length over all of the vessel is 401 ft.; length between perpendiculars, 330 ft.; breadth, 45 ft.; armour, 54 ft.; depth to main deck, 24 ft.; draught, maximum, fore and aft, 22 ft.; displacement at 22 ft. draught, 6006.02 tons; area of immersed midship section to circumscribing parallelogram, 0.867; ratio of displacement to circumscribing parallelogram, 0.544. The general appearance of the vessel, if completed as here proposed, will be that of a "monitor" iron-clad, such as is illustrated in the annexed cut. The proportion of length to breadth—3.666 to 1—is that now usually observed in sea-going high powered steamers, and is somewhat less than in those which represent the extreme limit yet attained. The lines are fair and fine, giving a sharp bow and the fine run which is essential to the efficient working of screw propellers. The proportions of the midship section, which has a breadth equal, nearly, to double the intended draught, are such as are best calculated to make the vessel easy in a sea-way. The displacement per foot of draught at the intended load line is 14.19 tons, or 35.35 tons per inch. The hull of the ship is double, the inner and outer skins being separated by a space varying from 22 in. at the bottom to 6 in. at the top of the turret portion. Seven transverse bulkheads are built, dividing the ship into distinct water-tight compartments. Two additional bulkheads are carried across the ship below the berth deck. Coal bunker bulkheads, forward and aft, and the several smaller bulkheads in the extreme ends of the vessel, still further strengthen the structure, and assist in securing immunity from liability to founder in consequence of injury to the hull. The hull is further strengthened by the bulkheads of the "turret chamber," which stiffen the whole structure by tying the decks, the coal bunkers, and the lower longitudinal bulkheads firmly together. The double bottom is not only made water-tight as a whole, but is divided into spaces of 32 ft. in length each, separated by water-tight partitions, formed by caulking frames and cross-floors. These spaces were to be fitted each with its own pipe leading to the bilge pumps, thus enabling them to be pumped out separately. The stem of the vessel rises vertically, and is of a section 10 in. by 3 in. The cell-like construction of the vessel behind it, and the immense strength of this portion of the hull, will enable it to receive very heavy shocks without serious injury. The whole of this part may be torn away to a distance of 35 ft. from the stem, by intentional or accidental collision, without endangering the safety of the vessel. Three of the partitions in the lower part being horizontal, formed by the extension of the bulkheads to the transverse bulkheads, a projectile may penetrate, and a seam may start, at any one point without doing other injury than to fill one of these small compartments with water. The stern "overhang" is carried well out over the rudder, which it fully protects. It is prepared to receive armour-plating like other portions of the vessel. The outer skin is

composed of selected boiler plate, which is stated to have been tested as received, under the inspection of an officer of the Government, and received only when found to have a tensile strength of 60,000 lb per square inch of cross section. Its tenacity is at least 20 per cent greater than that of iron customarily used in the construction of iron vessels by foreign builders. The thickness of keel strake is 1 in.; the garboard strakes are 3/4 in. thick; the intermediate strakes are of 3/4 in. iron; and the wale strakes are 3/4 in. in thickness. The keel strake is double riveted, as are also the garboard and two wale strakes. The riveting has all been done by hand, with both care and skill. The inner skin is also of selected charcoal iron, of "C No. 1" quality, such as is generally used only for boiler-plate. Its joints were all planed and fitted under the inspection and the direction of the engineer in charge, and the workmanship is unexceptionable. Its thickness is 1 in. for a distance of 193 ft amidships, 3/4 in. for a distance of 30 ft. at the ends, and 3/4 in. at the intermediate portions. It is double riveted fore and aft, with treble riveted butt-straps for 240 ft. amidships. The inner skin is carried up to the 14 ft line, and is made water-tight throughout, as already stated, permitting the rupture of the outer skin without endangering the safety of the vessel. This, with the division of the whole into short water-tight spaces by caulking the frames, is an insurance against even loss of trim by the penetration of the water throughout the space between the two hulls. The four bulkheads nearest the middle of the vessel are of plating 3/4 in. thick. All joints are planed and fitted, and all lines of junction with the hull are carefully strengthened and made water-tight. Water-tight doors with packing are fitted to the passages leading fore and aft to these bulkheads. The bulkheads are stiffened by angle iron frames. The four bulkheads immediately beneath the intended location of the turret are strengthened by angle iron frames, spaced 20 in. apart, extending from top to bottom. The coal bunker bulkheads are of 3/4 in. iron, are water-tight and are strengthened by angle iron frames 4 in. x 4 in. x 3/4 in. riveted back to back. The main deck is supported by heavy yellow pine deck beams, of scantling 14 in. x 14 in. and 16 in. x 4 in. spaced usually 36 in. between centres. They rest at each end upon a heavy and very strong iron shelf, which serves also to strengthen the ship as a stringer. The beams are also secured to the skin of the vessel by strong iron knees. They are intended to be supported in the middle by a line of iron stanchions not yet in place. This deck is planked with selected Southern yellow pine, free from sap, shakes, or other defects, and thoroughly seasoned. Its thickness is 8 1/2 in. throughout. It is not fastened down. The berth deck extends from the foremost bulkhead to the boiler compartment, and from the stern to the engine-room bulkhead. It is supported by angle iron beams measuring 4 in. x 3 in. x 3/4 in. and spaced 24 in. apart. The planking is laid with splined joints, and is 3 in. in thickness, except under the anchor hoist, where it is 4 in. thick. This deck is laid down, and permanently secured in place. The plans of store-rooms, officers quarters, and all other work remain to be prepared, and may be given any shape that may be desired by the purchaser, or such as may be determined by the form ultimately given the vessel.

The machinery consists of two main engines, number of steam cylinders, 4; diameter of ditto, 72 in.; stroke of piston, 45 in.; refrigerating surface of surface condensers 12,650 square feet; number of screw propellers, 2; diameter of ditto, 18 ft.; pitch of ditto, 27 ft.; number of boilers, 10; area of heating surface, 28,000 square feet; area of grate surface, 866 square feet.

The main engines are arranged in pairs, each of the two pairs driving a screw independently. Each pair has its own surface condenser and its own set of pumps, including a centrifugal circulating pump, driven by a small independent engine, taking steam from the main steam pipe. The main engines are of the vertical return connecting-rod type, formerly known as the Maudslay and Field engine. They are shown in the engraving in side elevation and section, and in end elevation. This general design was decided upon as being at once compact, readily accessible, and convenient in operation, and as stowing well in a ship of which the form was too fine to admit of twin engines of other types.

The Sarnia and Point Edward Street Railway Company expected that the rails would be laid and the road in running order by Christmas.