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THE STEVENS BATTERY.; INTERESTING EXPERIMENTS IN HOBOKEN. Distinguished Company Present -- Highly Successful Trial.

The invited guests assembled at 11 A.M. in the Battery office, in Hoboken, where carriages were in waiting to convey them to the scene of the proposed experiments. EDWIN A. STEVENS, Esq., was present in person, and received his guests with great cordiality. The latter comprised Hon. Robert J. Walker, Ex-Secretary of the U.S. Treasury; Assistant Secretary of the Treasury Harrington; Collector Hiram Barney, Collector of the Port of New-York; Gen. Benham, of Western Virginia fame; Major-General Sanford; Hon. Geo. Opdyke, Mayor of New-York; Gen. E.R.V. Wright, of New-Jersey; Ex-Gov. King, of this State; Col. Lefferts, of the Seventh Regiment N.Y.S.M.; Gen. Barry and Col. Kingsbury, of Gen. McClellan's Staff; Gen. Prosper M. Wetmore; Denning Duer, Esq., and R.H. McCurdy, of the N.Y. Chamber of Commerce; Hon. Simeon Draper, of the N.Y. Union Defence Committee; Capt. Meace, of the U.S. receiving-ship North Carolina; Capt. Foote, of the New-York Navy-yard; Col. Loomis, Dr. Griscom, Mr. Park Godwin, of the New-York Evening Post; Capt. Nye, Capt. Rogers, Judge Hoffmann, Mr. Craven, Chairman of the Croton Water Works; Wm. E. Morris, President of the Long Island Railroad; Henry R. Dunham, Civil Engineer; Commodore Stringham and Chief Engineer Stimers, of the Government Commission appointed to investigate and report upon the battery and many others of note.

An hour was spent in the office in examining the models of the battery, the leading statistics of which are exhibited in the following resume:

"The Stevens Battery is a shot-proof vessel of war capable of unusually great speed and manageableness, and of throwing a broadside of unusual weight. It was suggested to the Government by ROBERT L. and EDWIN A. STEVENS in 1841, commenced in 1854, and advanced to its present state during the period of twenty months. The hull of the vessel, with the exception of some of the decks and cross-bulkheads, is completed, and the engines, screw-propeller shafting, boilers, and blowing and pumping machinery, are finished and in their places. The armor, the armament, the remaining portion of the decks and bulkheads, the screw-propellers, joiner work, and upper works, are yet to be completed.

The cost of the work done has been \$728,435, of which Congress appropriated \$500,000 -- the remainder, \$228,435, having been advanced by ROBERT L. and EDWIN A. STEVENS. The sum of \$730,484 is required to complete the vessel and her armament, including the sum advanced by the Messrs. STEVENS.

THE HULL.

Length, over all, 420 feet; breadth, over all, [??] feet; depth from upper or gun deck, 28 feet, draft of water, without coal or stores, 17 feet 2 inches; draft of water, with coal and stores, 20 feet 6 inches; fighting draft, 22 feet 6 inches.

The vessel is an iron screw-steamer, constructed in the usual way, of the best-selected plates, beams, and angle-bars. The lines of the hull are unusually sharp, resembling those of the fastest North River and modern ocean steamers.

Unusual strength of hull is secured by longitudinal bulk-heads, by a heavy box keelson running from stem to stern, and by the shot-proof decks and continuous side armor.

THE ENGINES AND BOILERS.

Number of screw-propellers, 2; number of engines, 8; diameter of cylinders, 3 feet 9 inches; length of stroke, 3 feet 6 inches; number of boilers, 10; horse-power, 8600.

The screws are under the quarters of the vessel, and work independently, each being driven by four compact beam engines, situated entirely below the water line. The valve gear is the link motion, adjusted by separate engines, as in modern screw steamers. The engine frames, eight in number, are, [??] effect, cross arches, connecting the bottom, the [??] and the main deck of the vessel. They are composed of wrought-iron plates formed into [??], on the principle of the Britannia tubular [??] The strength, proportions and workmanship of the engines are not excelled, it is believed, by these of any war or commercial steamer. The boilers are of the flue-tubular variety, as used in modern ocean steamers and in the best river steamboats.

THE ARMOR.

The two leading principles of the protection of the vessel from shot and shell are as follows:

First -- The settling of the vessel two feet lower into the water while in action, by letting water into compartments, arranged to be rapidly emptied by powerful steam pumps. This is

done for the purpose of saving the weight and cost of two feet of the depth of the armor which would otherwise be necessary; of allowing a flatter slope, and [??] a greater resistance of the armor; of [??] to the greatest practical extent the best known armor -- water; or giving the vessel greater speed while cruising, chasing or retreating, by [??] overboard the weight of water in the tanks, or, in other words, by [??] with this two feet of water [??] and of enabling her, for the same reason, to pass into bars and into harbors which she could not otherwise react.

Second -- The use of the inclined instead of vertical armor, for the purpose of changing the direction [??] stead of stopping the whole force of the enemy's projectiles.

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(Page 2 of 4)

The ship armor consists of a triangular structure of locust timber extending outside the shell of the vessel, from stem to stern. Its lower slope is [??] with iron, three and a half inches thick, to a depth of four feet below the fighting-line. From the [??] of this side protection the shot-proof [??] main armor proceeds upward and it [??] of one vertical to two horizontal, to a height of 28 feet from the bottom of the ship, and five and a half feet from the fighting-line, where it is covered by a flat shot-proof deck. This main armor extends only over the engines, boilers and flowing and pumping machinery that is [??] feet forward and 74 feet at the centre. Its ends slope upward and inward at a similar angle, from the 21 feet deck, which is shot-proof, and which extends forward and aft the armor, to the extreme bow and stern.

The inclined armor, or casemate, is composed of 6 [??] inches of iron plates, backed by 14 inches of locust timber, in which are embedded 6-inch wrought-iron girders, two feet apart. The whole is lined with half-inch plate iron. It is supported by the engine frames, by heavy braces and girders between the boilers, and by the frames and sides of the ship. The horizontal shot-proof decks are composed of 1 1/2 inches of iron plates, resting on 6-inch wrought-iron girders, filled in with locust timber, and backed with half-inch iron plate.

THE ARMAMENT.

This consists of five 15-inch guns, weighing 25 tons each, and capable of throwing round shot of 425 pounds weight; and two 10-inch rifled guns.

The guns rest in wrought-iron, shot-proof carriages, of which the recoil is taken up by India-rubber springs. The carriages are situated on the top of the casemate, and are trained by steam power, by means of a shaft passing through the gun-deck to within the casemate. Each gun is loaded with celerity, by being pointed to a hole in the deck, protected by a shot-proof hood, below which is a steam cylinder, of which the [??] is the ramrod of the gun. All the machinery and men for working the guns are thus within the shot-proof armor. The guns are protected by a covering of wrought-iron armor, in addition to their [??] thickness -- sixteen and a half inches, maximum, outside the bore.

THE UPPER WORKS, &c.

The 21 feet shot-proof deck, fore and aft the central armor or casemate, affords ample accommodation for men and officers. Above this deck, and flush with the shot-proof 28 feet gun-deck, which forms the top of the casemate, is a light deck, extending at the sides of the casemate, and forward and aft, from stem to stern. The entire 28 feet or upper deck is thus level (excepting the usual camber) and unnumbered, over the whole vessel. Only the part of it that forms the top of the casemate is shot-proof. Above the 28 feet deck are flying bulwarks, to be turned down in action. The height of the bulwarks from the water, at the load line, will be 13 1/2 feet.

The fourteen-feet deck affords ample space for stores, &c., and for the salt-water tanks for settling the vessel to the fighting line. Below the fourteen-feet deck, forward of the boilers, are the blowers and pumping-engines, and coal-bunkers. Aft the engines are coal-bunkers. The total coal capacity is one thousand tons. The fresh water, for consumption on board, will be condensed from the exhaust steam, besides which there will be ample fresh-water tanks. The vessel will be lighted with gas, made on board. The ventilation of the officers' and men's quarters will be superior to that of ordinary vessels, as they are situated entirely above water. In cruising, and in action, the entire vessel will be ventilated by the blowers. As the guns are in the open air, and the ship's company separated from them, during action, by a casemate, the deleterious effect of smoke and sound will be avoided.

The ventilation by blowers, the freeing of the vessel from water in the manner proposed, and other operations new to the naval practice of the Government, have been successfully employed, by Mr. STEVENS for many years.

The vessel will have two light masts for emergencies, but will not ordinarily carry sail.

FIGHTING QUALITIES.

First -- Iron armor, six and three-quarter inches thick, backed with fourteen inches of the most impenetrable wood, and standing at the acute angle of one in two to the line of fire, is a vastly stronger protection than has ever been applied or found vulnerable by any experimenters at home or abroad. At the same time, it is comparatively light, as its extent is reduced by confining it to the central part of the vessel, and by immersing the vessel to a deeper fighting draft. The parts of the vessel fore and aft the central casemate are also thoroughly protected by a horizontal deck, which is not only shot-proof, but a foot below the fighting water-line. The water protection, as far as it can be judiciously employed, is at once the most perfect and the cheapest armor.

Second -- The side-protection, extending from stem to stern, is intended to answer these four important purposes: 1. Protection from projectiles; 2. Protection from disaster by collision; 3. Increasing the immersed beam, and the stability of the vessel when fighting; 4. Adding, in a very great degree, to the horizontal and vertical strength and stiffness of the vessel.

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Third -- The immense power of the engines and the fineness of the lines guarantee a much higher speed than has been attained by any sea-going, war, or commercial steamer. This vessel will have the entire horse-power of the Great Eastern, with about one-third the Great Eastern's resistance, or twice the horse-power of any war-vessel. The sharpness of her lines is unprecedented in any Government practice, and in any, except the latest and most successful commercial practice.

Fourth -- The ability of the vessel to turn round rapidly on her own centre without making headway, by means of two screws, instead of occupying the time and making the circuit required by all other war vessels, will give her remarkable and important facilities for manoeuvring in action. In connection with her great speed, it will enable her to overhaul one after another of an enemy's fleet within a very short time; to run close alongside an enemy; to present herself for action in her most effective position; to bring her broadside to bear in any direction; to turn round in narrow channels, and, when necessary, to retreat, in any direction, with facility.

Fifth -- The employment of two entirely distinct means of propulsion -- the two screws and their respective sets of engines -- will enable her to be steered in case of accident to the rudder, and will afford double the ordinary security against disability from breakage of machinery in fighting or cruising.

Sixth -- The situation of the guns en barbette, or on the top of the casemate, instead of within it, gives all of them the entire range of the horizon. Three guns at a time can be fired in a line with the keel, forward or aft.

By setting the guns, by a graduated index-plate, within the casemate, so that they shall point at the proper relative angles, and then placing the vessel, either by turning her on her centre, or by going ahead or astern, so that one gun bears upon the object to be hit, the fire of all the guns may be instantly concentrated upon that object, without losing time in training each gun.

Seventh -- The use of the heaviest successful ordnance known, not only makes the gun its own armor, but affords the following advantages in fighting the ship:

1. The smashing effect of a single heavy projectile upon a single point on an enemy's sides, is vastly greater than that of an equal weight of lighter projectiles. In close quarters -- a position the vessel is, by her speed and manageableness, able to assume at her option -- the velocity of projective may be so much reduced that its weight may be, in like proportion, increased, without bringing a greater strain upon the gun. It is believed that the fifteen-inch gun can carry an elongated projectile of half a ton weight. The smashing effect of such a missile would not only be a greater than that of a lighter missile, but even more destructive at a low than at a high velocity, according to the representations of military engineers.

2. As there is no casemate over the guns, there will be no port-holes into which an enemy might pour snells and grape-shot with terrible effect, at close quarters.

3. For the same reason, the range of the guns will not be limited to the few degrees permitted by the size of port-holes; but all the guns will sweep the whole horizon.

4. The immense weight and cost of casemates over the guns are dispensed with.

5. The seven guns, thus arranged, will do the duty of fourteen guns arranged in the ordinary way, since each gun is equally available on both the port and starboard sides of the vessel. The weight of broadside would be nearly double that of the British mailed steamer Warrior.

Such is, once for all, an elaborate description of the battery, with all the advantages proposed to be attained by it. The beautiful model exhibited in the Battery Office was interestingly explained, and with the leading data in their minds, the Committee proceeded, some in carriages and some on foot, to the scene of the experiments on the edge of the Elysian Fields, opposite Perry's Hotel. At that point the margin of the Hudson River trends

inward, forming a spacious bay, faced by abrupt bluffs, beyond and scarcely ever visited by traffic. The bitter severity of the cold, although the sky was fair and the sunshine bright, would, without other warning, have kept the space of water free from any intrusion of skiffs or sail-boats.

THE PLATFORM.

This was a mound of earth some six feet high, how low beneath, and concealing there a portion of the steam-apparatus and the workmen engaged upon it. Above it a structure of the heaviest timber secured, in fortification style, a central swivel, on which rested a 10-inch Columbia [???] nearly the heaviest piece of ordnance known to the modern service. This was [???] downward by steam, and loaded by the same power, the charge consisting of the maximum Government allowance of 11 pounds of powder, and the shot of ten-inch solid metal, weighing 124 pounds [???] home by steam, with the bag and wooden [???] secured to it beforehand.

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(Page 4 of 4)

A square target composed of iron plates amounting in the aggregate to 6 [???] inches thickness, backed by massive locust timber 14 inches thick, the whole 4 feet, and 4 feet in the [???] of the inclination, was [???] fastened to [???] anchor with the [???] in bights, at [???] feet from the shore. The target, which was an accurate representation of a section of the side of the Steven's Battery, was in the proportion, as to perpendicular, of two parts horizontal to one vertical.

At half-past one o'clock, amid the excitement of an immense crowd, among whom were several ladies, the first discharge of the Columbiad to be regarded as part of the grand experiment, was fired. Some delay had been experienced, owing to an accident at an earlier hour in the morning, which had thrown the gun from its trunnions, and the humming of the steam engine, the huge proportions of the gun, and manoeuvrings of the steam gunboat. Naugatuck in the stream, where she was in close proximity to the British gunboat Lady Le Merchant, that also plied up and down the river not far from the shore, added a mysterious interest to the scene.

The Naugatuck was built by Mr. STEVENS as a specimen of his steam iron-plated battery on a limited [???], and is to be presented by him as a free gift to the Government. She was, during the period of waiting for the performances of the great gun, inspected and

experimented upon by a Committee. It was found that she could turn upon her axis and in her own length of space in two minutes and forty seconds, and could be sunk until twenty-one inches of water were upon her decks in eighteen minutes, and pumped clear and raised again in eight minutes. This was done in the view of thousands, the intention being to show how readily she could diminish her chances of damage in the presence of so formidable a foe as the British mail-clad steamer, the Warrior or that of the French, La Gloire.

The British gunboat had come up for the purpose of being examined by Collector BARNEY and Assistant Secretary of the Treasury HARRINGTON, who went on board of her in the stream, with the mission to report in reference to her purchase by the American Government. Although she had the United States flag at her peak, the presence of the Union Jack at her stern induced many persons, who were not aware of the object of her presence, to make curious inquiry concerning the propriety of her visit. She cruised about all the afternoon, and exchanged civilities with the Naugatuck.

But to return to the firing. It was slow, in order that the scientific gentlemen and others present might have time to make close observation of all the arrangements. Of three shots fired that struck the target, the first produced 1 1/2 inches depression in its [??] front; the second indented it 1 1/8 inches. Each time the report was terrific and the shot, dashed to fragments, ricocheted over the sparkling surface of the river for three miles away, throwing up the water in [??] that glistened in the sun twenty and thirty feet above the waves. The recoil, which was taken up by India rubber railroad springs on the trunnion sides, was on the average about 8 1/2 inches. This part of the experiment, as well as the steam-loading, was a perfect success, the actual loading-time being but one minute, although the imperfections of a temporary platform produced longer detention. The idea that a deck or platform would be destroyed by such discharges from such a gun was, however, shown to be utterly fallacious.

The final shots were from a new 6 4-10-inch rifled Parrott gun, carrying a 100-pound solid shot, for which, of course, shell could be substituted.

The velocity of a round shot at short range, is about twice that of a rifled shot of the same weight, with the same charge of powder, and the indentation made by the latter on the target, was but 11-10 of an inch.

Commodore STRINGHAM and Chief-Engineer STIMERS, of the Committee, as well as the others Engineers present, expressed great satisfaction.

At dusk, the invited guests repatred to the palatial residence of EDWIN A. STEVENS, Esq., where a handsome collation and subsequent festivity gave opportunity for eloquent speeches by Mr. Stevens, Hon. R.J. Walker, Gen. Benham, Gen. Sanford, Col. Stimers, Engineer Martin, Parke Godwin, Esq., and others, in which due credit was given for the successes of the day.

At 8 P.M. the agreeable circle of officers and distinguished civilians dispersed.

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