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---The *Scientific American* of November 29, 1890, devoted its entire front page to representations of the armored cruiser "Maine," launched from the Brooklyn Navy Yard, Brooklyn, N. Y., on Tuesday. Nov. 18th, 1890, and gives a full account of the launch and of the ship from which we take the following interesting details:

The first keel plate of the “Maine" was laid Oct. 11, 1888, 80 that a little over two years have elapsed from commencement to completion of the shell. The hull was designed by Commodore Theodore D. Wilson. The engines were designed by Commodore G. W. Melville, of the Bureau of Engineering. The guns and equipments are to be supplied by the different bureaus of the Navy Department. It ranks as an armored cruiser of the first class. It is built of steel throughout. The dimensions are as follows: Length over all, 324 ft., 4½ in.; on load water line, 318 ft. 3 m.; extreme beam, 57 ft.; mean draught, 21 ft. 6 in. Displacement, 6,682 tons. Speed, estimated, 17 knots. As launched the displacement was only 1,700 tons on 8 draught of 7 ft. forward and 7 ft. 6 in. aft.

As at present determined, the ship 18 to have a protective belt of armor on the sides, 180 ft. long and 12 in. thick. Quite probably it may be made of the new nickel steel, of a type to be accurately determined by further tests. The large guns are to be worked in pairs from two Hichborn turrets, one forward on the starboard side and one aft on the port side. The guns will be protected by 12 in. armor for the turrets or barbettes, with 8 in. shields for the guns. The latter are 10 in. breech loading rifles, and form the main battery. An auxiliary battery of ten 6 in. rifles 18 to be mounted on the battery deck, protected by 2 in. shields. The secondary battery is to include four 6 pounder, eight 3 pounder, and two 1 pounder rapid firing guns; 4 revolving cannon and 4 gatling guns. There are also seven torpedo tubes covering the entire horizon.

The rig is to be all fore and aft sails on three masts. They are provided with armored tops, so as to constitute fighting masts.

The deck is to be of 2 in. steel amidships and of 4 in. thickness on the sloping parts. Cellulose or woodite is to be used where it may be useful in closing up after the passage of a shot. The bottom is double and cellular, with numerous water-tight subdivisions.

The engines are to be of vertical inverted cylinder type, and have three cylinders for triple expansion, of the following dimensions: H. P. cylinder 35½ in., I. P. cylinder, 57 in.,

L. P. cylinder 88 in., stroke 36 in. There are two engines actuating twin screws. At 132 revolutions the engine will give about 9,000 indicated H. P. Eight steel boilers, 14 ft. 8 in. by 10 ft. to work up to a pressure of 135 lb. are to be used. The propeller will be three-bladed and of 15 feet diameter. The pumps for all purposes are of the well-known "Blake" type. They will supply hydraulic power as well as water for the general requirements of the engine. With all bunkers filled there will be 822 tons on board, enough to last for 7,000 knots' steaming.

The engines are to be built by N. F. Palmer, Jr. '& Co., of this city. The armor plates are to be rolled at the Bethlehem Steel Works, Bethlehem, Pa. The cost of the entire structure will be about two and one-half millions of dollars. It is proposed to put the armor plates on while the ship is in the dry dock. Traveling cranes will have to be installed on each side of the dock for this purpose. The cranes are to be of forty tons capacity, and will cost $50,000 apiece. Two will be for the Brooklyn yard, and two others are proposed for the Norfolk, Va., yard for putting on the plates of the “Texas."

The following list of dates in connection with the "Maine," is of interest as showing how long it takes to execute the work and fulfill the legal requirements in such cases:

Built under act of Congre88 approved August 3, 1886. Designed by the Navy Department. Plans approved November 1, 1887. Bids for materials opened June 4, 1888. Contract for materials signed June 16, 1888, with Messrs. Carnegie, Phipps & Co., Pittsburgh, Pa. First frame bent September 10, 1888. First keel plate laid October 11, 1888. First rivet driven November 2, 1&88, 11 o'clock a. m. First frame raised December 3,1888. Vessel launched November 18, 1890.

— Chief Engineer Melville's report to the Secretary of the Navy 18 an interesting one. The report shows that the engineer officers do not receive the treatment that they should receive. There is no great encouragement for educated and Intelligent engineers to enter the service, and this when the navy has been and is being made more powerful and efficient by additional war ships equipped with a vast amount of steam machinery of the most modem [**page 260**] and improved description. The following extracts give a general idea of affairs as they now stand, and certainly it appears that there is room for changes and improvement in the management of the Engineering department:

"It is with regret that I have to report that matters are now in still worse condition than they were a year ago, and that troubles that were mentioned as likely to occur are already apparent, for the number of engineer officers now in the service is not sufficient for the proper performance of the duties required of them. The number of engineer officers is now 194, of whom four have not had the proper engineering education and two at least did not wish to be appointed in the engineering corps. When my last report was published, but one ship (the Yorktown), with modern machinery, had been commissioned; since then three others (Baltimore, Charleston and Philadelphia) have been placed in regular service, each with one or two less engineer officers than they should have for safety and efficiency, and less than they would have if the corps was sufficiently large to permit the proper detail, but still more than will be possible when the number in the corps has been reduced to the legal limit of 170. As had been foreseen, the worry and anxiety undergone by these officers in their endeavor to keep things going and in order with the insufficient number of trained men at their disposal has proved too much for some of them, and they are breaking down. A policy which leads

to such results can only be productive of disaster to the service. It requires a very simple calculation to show that the present legal numbers in the engineer corps will not be sufficient to properly Officer the ships now in commission, and those for whose construction appropriations have already been made, and this without taking into account the number required for shore duty, and to provide for sickness and occasional leave, etc. Something must be done, and done promptly, or we shall not only have some serious breakdown to repair, which might have been avoided, but also an accident more than likely to be attended with loss of life.

"We not only need a very much larger number of officers in the engineering corps, but we also need a very much better course of instruction for the young men who are each year appointed into it. It is sometimes asserted that educated engineer officers are not needed for sea duty; that practical mechanics can do the duty just as well. Such statements can only be made by the assurance of ignorance. To separate the sea and shore duties of the engineer corps into two distinct branches will entirely destroy the excellent system which is the result of years of experience and trial, and which this bureau has always claimed as best for the efficiency of the navy - that is, the combination of the designer, builder and competent user of machinery; for it is only by the actual working of the machinery at sea that many defects, either in design or construction, become apparent, and it is only when the experience gained by careful supervision and observation is afterward intelligently applied to other designs that the same or similar defects are avoided and improvements introduced.

"There is still another and very important point that is generally overlooked when considering the engineer corps of the navy, and that is that they are a part of the military organization, and second to none in importance. In the naval battle of the future the engineer staff will have a difficult and important part to perform, and if there is failure in the engine room no amount of skill and bravery on the bridge may suffice to avert disaster. Celerity of movement has decided many a naval battle and will decide many more, and the celerity of movement of a modern ship depends directly on the skill of her engineer officers." [**page 261**]