

that much longer distances will be covered in the near future.

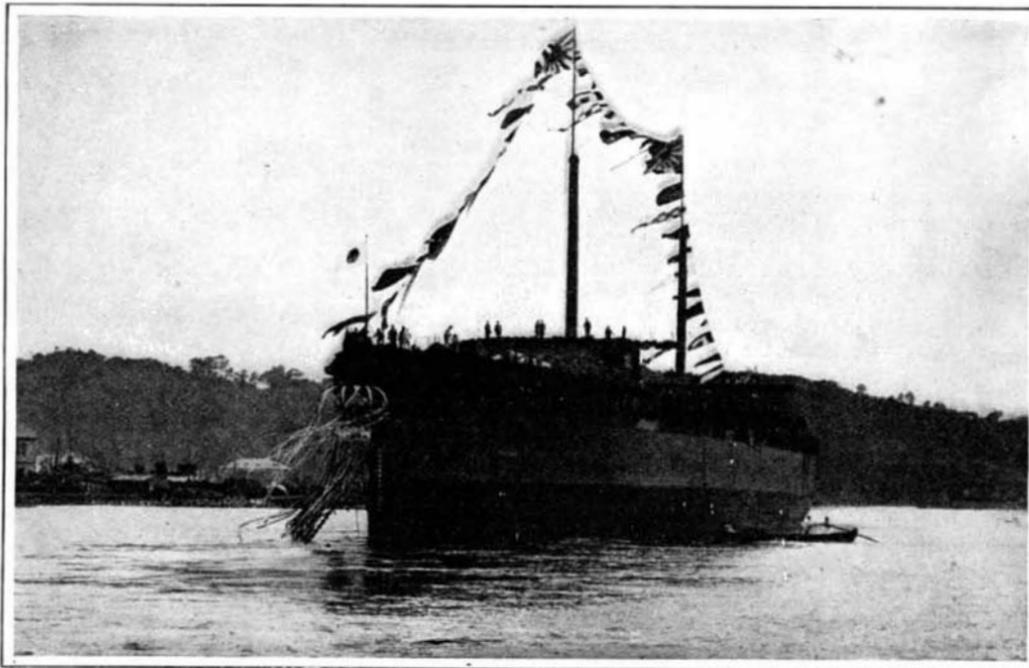
A method has now been put in use whereby messages can be printed on receipt at the receiving station (the messages being transmitted by typewriter).

**THE LAUNCH OF THE "SATSUMA."**

To the Editor of the SCIENTIFIC AMERICAN:

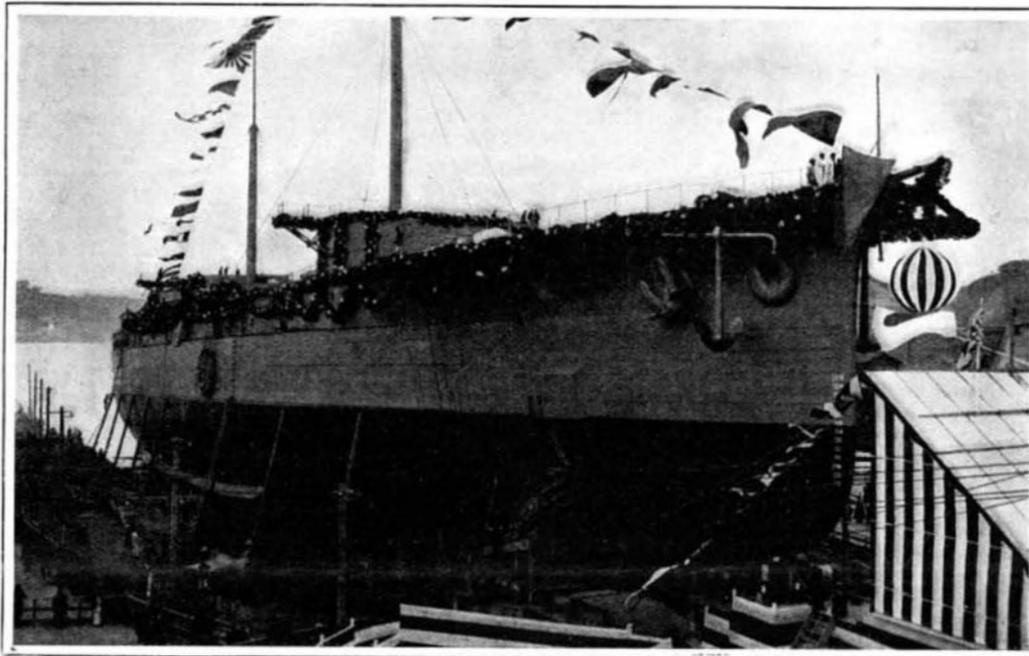
One year and one month after the peace of Portsmouth, which was brought about by the noble efforts of your great President, the launch of the largest battleship afloat took place in the presence of H. M. the Emperor, the Crown Prince, many princes and princesses, and a huge number of all classes of people, at the Yokosuka navy yard, which is but five miles from Uraga, where the monument to Commodore Perry stands.

The battleship "Satsuma," the construction of which began in the midst of the Russo-Japanese war, is 482 feet in length, 83 feet 6 inches in beam, of 19,200 tons displacement and 18,000 horse-power. Her armament is not yet officially declared, and will be kept secret until completion. But the authorities, it is said, at first intended to provide four 12-inch guns, twelve 10-inch guns, twelve 4.7-inch guns, and five torpedo tubes. Thus it will be seen that Japan has not dispensed with intermediate armament, as is the case with the "Dreadnought." Incessant progress in naval matters, however, calls for some new alterations and improvements to be introduced to the armament; and the "Satsuma" will, it is believed, be finally found to be more powerfully equipped than was originally intended. Her armor belt of Krupp steel ranges from 5 to 9 (or 9½) inches, and her intended speed is 19 knots. The ram bow has been dispensed with in her, as in the two armored cruisers, "Tsukuba" and "Ikoma," just built respectively at Kure and Yokosuka. She has a very handsome semi-fiddle bow. Over a year ago, Admiral Sir Cyprian Bridge said it would be interesting to see how long the ram bow would be a feature of warship design. So far as the Japanese are concerned, the day of the ram has passed away, and will not be revived in our future warships, unless some development, as yet undiscovered, is made hereafter in naval warfare. When the "Satsuma" is fully equipped she will also be without the fighting tops so common in modern warships. Compared with our latest battleship, "Kashima," she has a larger displacement by 2,600 tons, and in armament has eight more 10-inch guns. Not only is the "Satsuma" much superior to the "Kashima" in her exterior design, but the difference in her interior design is incomparably greater, owing



The "Satsuma" After the Launch.

The striped ball hanging at the bow was opened at the launch, liberating a flock of pigeons.



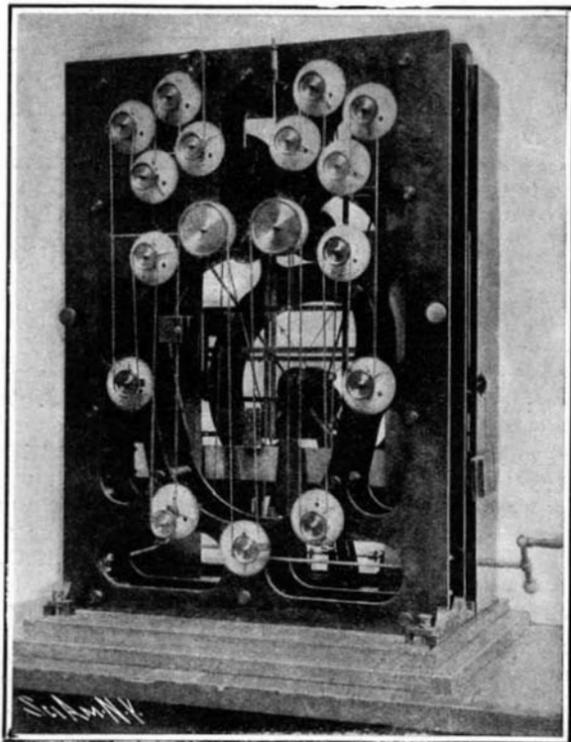
**Length, 482 feet. Beam, 83½ feet. Displacement, 19,200 tons. Horse-power, 18,000. Speed, 20 knots. Armor: Belt, 9½ inches. Armament: Four 45-caliber 12-inch; twelve 45-caliber 10-inch; twelve 50-caliber 4.7-inch. Torpedo tubes, 5.**

**LAUNCH OF THE JAPANESE BATTLESHIP "SATSUMA," THE LARGEST BATTLESHIP AFLOAT.**

to the fact that in the construction of the "Satsuma" every available experience obtained from the late war has been turned to account. The new battleship has a larger displacement than the "Dreadnought" by 1,300 tons, though she is inferior in point of speed; and there is a question as to the comparative strength of the two battleships' armaments. The "Satsuma" has four 12-inch and twelve 10-inch guns against the "Dreadnought's" ten 12-inch, so that in fire the latter

several pigeons flew away. The thunderous *Banzai* and applause continued for a time. The ship was entirely afloat at 2:25 P. M. It may be added that the "Satsuma" has been built entirely by Japanese experts, and there is no truth whatever in the reports circulated in Europe as to a number of foreign engineers having been employed. SAITO TSUNETARO.

The Imperial Fisheries Institute, Etchujima, Tokio, November 23, 1906.



Rear View of the Machine, Showing the Arrangement of Mechanical Elements.



Operator Turning Indices to Determine the Height and Time of the Tide at a Future Date.

**A MACHINE THAT PREDICTS TIDES.**

**A MACHINE THAT PREDICTS TIDES.**

BY D. A. WILLEY.

One of the most interesting devices utilized in connection with the United States Coast and Geodetic Survey is the mechanism by which the state of the tide at a certain seaport can be closely determined a year or more ahead. While with the machine are used tide tables which have been computed for a period of years, the automatic computation which the tide predictor performs is really wonderful in its accuracy. As the illustrations

opposes six 12-inch to the former ship's twelve 10-inch. The allied nations are to be congratulated upon their possession of the two most powerful battleships in the world. In the construction of warships, the most valuable of all experiences are undoubtedly those derived from the tests of actual engagements. A battleship, designed by the experts of a country which has had various experiences of modern naval warfare, cannot fail to have many characteristics peculiar to itself; though the public are yet in the dark as to the details of those characteristics.

On November 15, when the launch had been arranged to take place, His Majesty entered the imperial stand at about 2 P. M., which faced the stem of the ship. Preparations for the launch were soon commenced. The shores supporting both sides of the hull, the wedges, etc., were removed in accordance with signal orders Nos. 1 to 14. The Minister of the Navy, Vice-Admiral Saito, then proceeded before the throne and read the following document: "On the 15th day of May in the 38th year of Meiji (1905) the construction of the battleship numbered B was commenced, and the hull having now been completed, His Majesty is pleased to name her 'Satsuma.'" The Minister handed the document to Vice-Admiral Kamimura, commander of the Yokosuka naval station, and the latter immediately instructed the superintendent of the arsenal, Vice-Admiral Ito, to launch the ship. As soon as the cord was cut by Vice-Admiral Ito, the hull began sliding. As the "Satsuma" was smoothly going down toward the water, a ball hanging from her bow, as shown in one of the photographs, was automatically broken, scattering pieces of colored paper, cloth, flowers, etc., from among which