

The gun contained two new inventions: a breech-loading device and a mechanism permitting the discharge of "several" shots. How many? Two or twenty? For two, it would only be necessary to have two barrels. This alone would have been a great improvement; but there is every reason to believe that Abraham Soyer's gun had a special mechanism which made a profound impression on the governor of Languedoc because it enabled "several" shots to be fired. In other words, it was a repeating gun.

THE BRITISH BATTLESHIP "DREADNOUGHT."

The construction of the new British battleship "Dreadnought," of which so much has been said and written during the past few months, has progressed to a point at which it has become possible to make a drawing of the ship which is essentially accurate. The accompanying engraving is reproduced from a wash drawing of the "Dreadnought" which appeared in a recent issue of our esteemed contemporary, *The Engineer*.

Perhaps the most striking feature in this battleship is her extraordinary length; for her over-all length of 520 feet renders her longer even than the biggest of the armored cruisers, and longer by 70 feet than any battleship afloat. Another striking feature in the outboard profile is the long, unbroken sweep of the topsides, which to the level of the upper deck are unpierced by a single gun port, the usual secondary battery of 6-inch guns being entirely absent from the ship. The two funnels appear to be very stunted, but

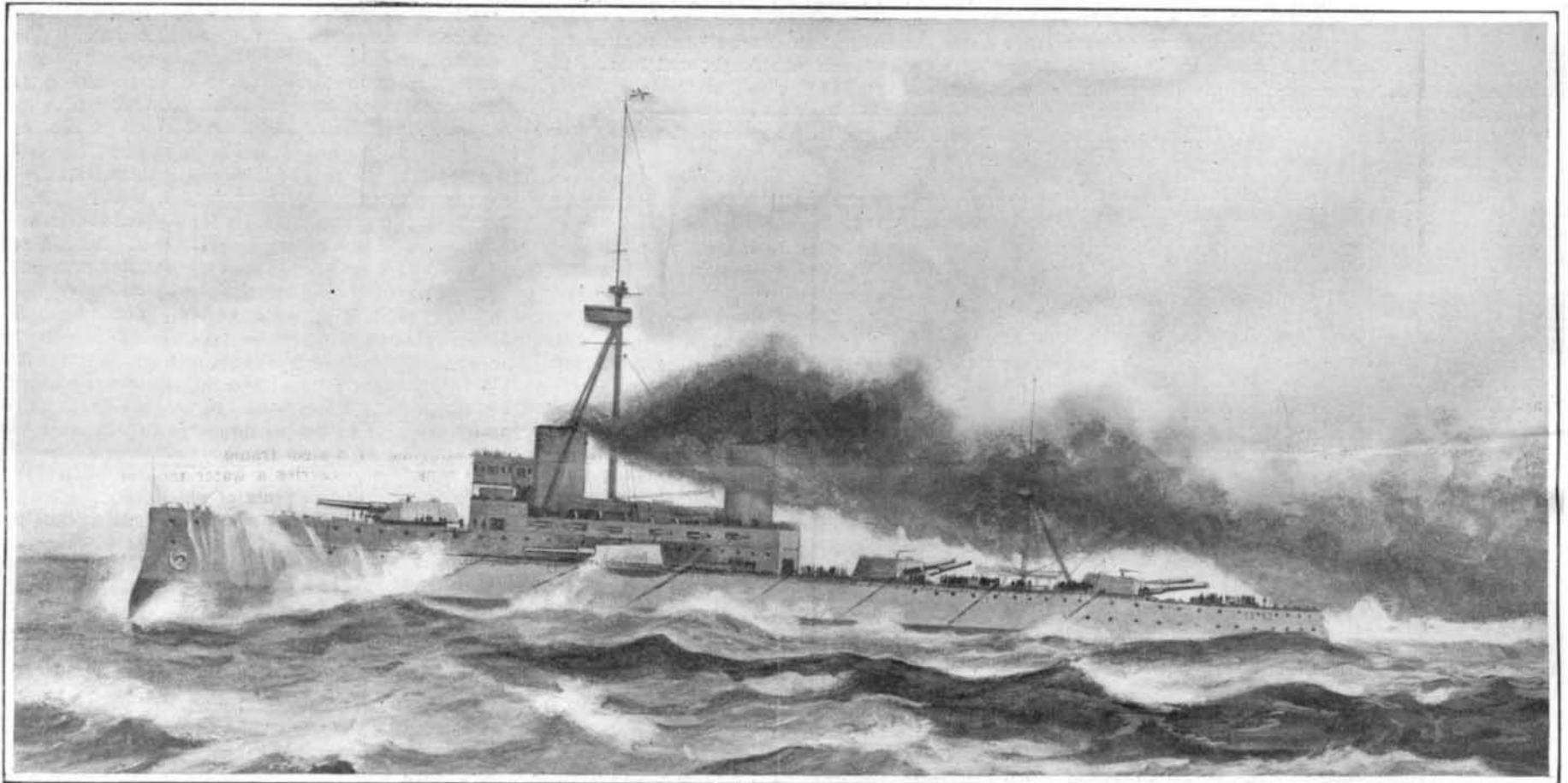
COMPARISON OF SOUTH CAROLINA AND DREADNOUGHT.

	SOUTH CAROLINA.	DREADNOUGHT.
Length.....	450 ft.	520 ft.
Beam.....	80 ft. 2½ in.	82 ft.
Draft.....	24½ ft.	26½ ft.
Displacement.....	16,000 tons.	18,000 tons.
Horse-power.....	16,500	23,000
Speed.....	18½ knots	21 knots
Coal supply.....	2,200 tons	2,700 tons
Maximum freeboard.....	30 ft.	28 ft.
Minimum freeboard.....	12 ft.	20 ft.
Belt armor.....	12 in.	11 in.
Main armament.....	Eight 12-in.	Ten 12-in.
Number of guns ahead.....	Four 12-in.	Six 12-in.
Number of guns astern.....	Four 12-in.	Six 12-in.
Number of guns broadside.....	Eight 12-in.	Eight 12-in.
Minimum distance between centers of gun positions.....	35 ft.	110 ft.

Taken altogether, the appearance of the "Dreadnought" is about as wide a departure from previous battleships as can well be imagined. With her high forecandle, wide smokestacks, and lofty foremast, she might well be mistaken at a great distance for a torpedo-boat destroyer—a delusion which would be greatly helped by the comparative absence of yards and general top hamper. She should prove to be a fine sea boat, her freeboard being nowhere less than 20 feet, and her forecandle deck, upon which the forward pair of 12-inch guns is mounted, having a clear freeboard of 28 feet. The forecandle deck extends for about one-half of the length of the ship, and on its after portion is carried a superstructure deck, upon which is mounted a numerous battery of small rapid-fire guns for defense against torpedo attack. Another

in the "Dreadnought" is a striking evidence of the advantages that come from large displacement and great size; for such a separation of gun positions would not be possible on a smaller ship. It has the further advantage, moreover, from the naval architect's point of view, that the weights are more evenly distributed throughout the ship, and that it is not necessary to introduce material into the hull merely for the purpose of counteracting the excessive bending strains which would come from the concentration of the heavy armament near the ends of the vessel.

The guns appear to be admirably placed with regard to the two important features, first of securing a maximum concentration of fire in every direction, and second of avoiding the disastrous consequences of "blast," or the disturbance of the crews of one gun position by the blast of other guns that are placed too contiguous to them. The two turrets which are carried on either beam abreast of the superstructure are sponsoned out beyond the side line of the ship, and the superstructure itself is cut away in the forward and aft direction sufficiently to allow the guns of each turret to be fired either dead ahead or dead astern. This enables the "Dreadnought" to concentrate six 12-inch guns ahead, six astern, and eight on either broadside. When these guns are firing dead ahead, there can be no blast interference with the guns on the forecandle deck, which are shielded by the vertical walls of the superstructure, and, moreover, are about 110 feet distant, nor when firing dead astern will there be any interference with the crews of the aftermost



Length, 520 feet. Beam, 82 feet. Draft, 26½ feet. Displacement, 18,000 tons. Speed, 21 knots. Armor: belt, 11 inches; turrets, 11 inches. Guns: ten 12-inch, eighteen 3-inch.

THE NEW BRITISH BATTLESHIP "DREADNOUGHT."

in reality are not so, their apparent lowness being due to the fact that they are elliptical in section, being very narrow in a transverse direction and of unusual length on the major axis parallel with the ship. The masting, also, has an extremely odd appearance, the foremast being removed from the neighborhood of the conning tower to a position abaft the forward smokestack. It is of tripod construction, consisting of a vertical hollow steel mast, and a pair of forwardly-inclined and diverging struts, one object of which construction is to prevent the mast being brought down by a single well-placed shot. At the top of the foremast, and immediately over the forward smokestack, is the fire-control platform, upon which will be placed the range-finders. It is probable that on this platform and in the turrets will be installed a new automatic system of range finding and gun elevating, by which the range will be electrically transmitted to each gun position, where by means of synchronized motors, the elevation of the guns will be steadily changed to correspond with the decreasing or increasing range as recorded by the range-finder on the platform. This method removes all possibility of error in the transmission of the ranges or the manual elevation of the guns, and leaves to the gun crew the duty of merely traversing the guns and keeping them fixed upon the enemy. It will be noticed that because of the lofty foremast the total height of the fore truck must be fully 200 feet above the water line. A short mainmast is carried in the usual position, mainly for the support of the antennæ of the wireless telegraph.

novelty is that the officers' quarters are forward instead of aft.

The great length and beam of the "Dreadnought," the latter being 82 feet, render it possible to give the heavy battery of ten 12-inch guns both a lofty command and a wide distribution. In addition to the pair of 12-inch guns on the forecandle deck, the ship carries eight 12-inch guns in four turrets mounted on the upper deck, the axes of these guns being 24 feet above the water. Two of the turrets are mounted on the center line of the ship aft of the superstructure in widely-separated positions, the aftermost pair being about 125 feet (center to center) astern of the forward pair. The other two turrets are mounted, one on each side of the superstructure, about 110 feet distant from the forward turrets. This wide distribution of the armament is one of the excellent military features of the "Dreadnought"; for it reduces the amount of damage which may be effected by a single heavy shell. Moreover, it complicates the work of the enemy's gunners by offering several widely-distributed centers of attack in place of a single position, such as the conning tower with its adjacent military mast, forward 12-inch turret and flanking 6-inch turrets, which formed such a favorite and successful point of attack for the Japanese in their engagements with the Russian battleships. In this respect the "Dreadnought" also has a decided advantage over our own "South Carolina" and "Michigan," in which the turrets are placed in pairs, with only sufficient distance between them for clearance in turning. This feature

turret, which is fully 250 feet distant, and furthermore, is shielded by the after wall of the superstructure. To enable the broadside guns to be fired parallel with the superstructure, the walls of the latter will be specially strengthened.

The "Dreadnought" will be driven by triple turbine engines at an estimated speed of 21 knots an hour. She will carry 2,700 tons of coal, and will be protected by a continuous belt of 11-inch armor, while as a protection against torpedoes a new system of subdivision of the hull of the ship has been adopted which, it is believed, will render her unsinkable by any weapon except a ram.

Since the announcement of the general features of the "Dreadnought" there have been many rumors of ships being built to "beat her," and various statements of the size, speed, and armament of these ships have been published. The only reliable figures of battleships that are comparable to the "Dreadnought" are those of our own "South Carolina" and "Michigan," an illustrated description of which appeared in our issue of August 4. These ships, however, were not built with any idea of surpassing the "Dreadnought," which, because of her much larger displacement, must naturally be a more formidable vessel; for the fighting efficiency of the modern battleship (so well are the principles of design understood the world over) must be directly in proportion to her displacement, however. The tabular comparison which we have made of the military elements of the two ships will, we think, be found to be decidedly interesting.