

THE 25-KNOT TURBINE LINER "LUSITANIA."

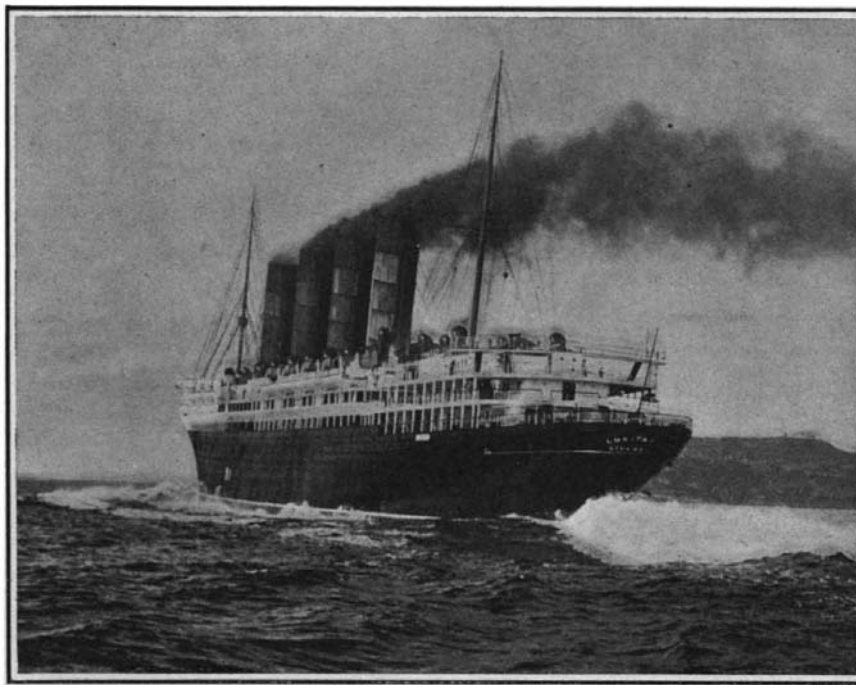
Everyone who is interested in the advancement of the art of shipbuilding will be gratified to learn that on a preliminary speed trial of the new turbine liner "Lusitania" of the Cunard Line, the great ship easily reached a speed of 25 knots, and this in spite of the fact that her bottom was "heavily coated with the chemically-saturated mud of the river Clyde." The data obtained, under these conditions, of the measured mile runs, were verified on her subsequent official acceptance trials, when she maintained the contract speed of $25\frac{1}{4}$ knots an hour, over a course 1,200 miles in length, on which she steamed continuously for forty-eight hours.

The accompanying photographs, taken during this acceptance trial, will give an impression of the great proportions of this ship. A study of the wave-lines proves that for her size and speed, she presents a remarkably small wave-making resistance. This is due, of course, to the fine form of the underbody. From the point of view of the traveling public, perhaps the most important point developed by these trials was that, at 25 knots an hour, the new Cunarders will be free from vibration.

It is no exaggeration to state that the new liners mark the most important advance in size and speed which has ever been made in the history of steam navigation—always excepting, of course, Brunel's giant ship, the "Great Eastern." With all due deference to the "Lucania" and "Campania," and the splendid ships of the German companies, the "Lusitania" and "Mauretania" may be said to be in a class by themselves. With an indicated horse-power which will probably work out at 80,000, with a displacement of 45,000 tons, and a probable speed, ultimately, of $25\frac{1}{2}$ knots, these vessels, in comparison with the finest of the express steamers, are found to be about 50 per cent larger, 2 knots faster, and of double the horse-power of their nearest competitor. The great breadth of the "Lusitania," of 88 feet, has enabled the company to provide state-rooms of 50 per cent more capacity than those found on existing steamships. The promenades, also, are wider and longer, and these facts, coupled with the absence of vibration, will do much to increase the comfort of transatlantic travel.

As these ships have been built with government assistance, they have been so designed that they may be quickly converted into fast cruisers, capable of overtaking any merchant or war ship afloat. Each vessel will be armed with twelve high-velocity 6-inch guns, and will be considerably protected by the great depth of her coal bunkers. Hence they would be capable of putting up a stiff fight against any pro-

$4\frac{1}{2}$ tons apiece. The main frames and beams which form the skeleton of the ship would, if placed end to end, extend for a distance of 30 miles. To rivet the plating upon the beams required 4,000,000 rivets, whose aggregate weight is 500 tons. The rudder weighs 65 tons, and the castings for the stem, stern-post, shaft bracket, and rudder, together weigh 280 tons. The ship carries three 10-ton anchors, and 1,800 feet of cable, the links of which measure 24 inches and are forged of $3\frac{3}{4}$ -inch iron. From the keel to the roof of the pilot house, the "Lusitania" measures 100 feet;



Stern View of the "Lusitania," Showing Her Great Beam. Note the Very Slight Wave-Formations.

and at her full draft of 37 feet 6 inches, she will displace 45,000 tons. Each of the four funnels is 24 feet in diameter and extends 155 feet above the grate-bars of the furnaces. The extreme length of the ship over all is 790 feet; the breadth, 88 feet; and the plated depth, 60 feet. The "Lusitania" will accommodate 2,200 passengers; and as she will carry a crew of 800, her total complement is 3,000 souls.

The designed horse-power is 70,000; but it is invariably the case that a marine turbine, when pushed to its full limit on a trial trip, shows an output considerably in excess of the estimate, and it is likely that in the forthcoming trials, the horse-power will work out at nearer 80,000 than 70,000. The power is developed on four shafts, the outer pair of which are driven by high-pressure turbines, and the inner by low-pressure. Steam is supplied by 25 boilers, carrying 192 furnaces. With a coal consumption at the rate of 1.3 pounds per horse-power per hour, the "Lusitania" will consume about 45 tons of coal per hour, or say about 1,100 tons per day. Hence, she

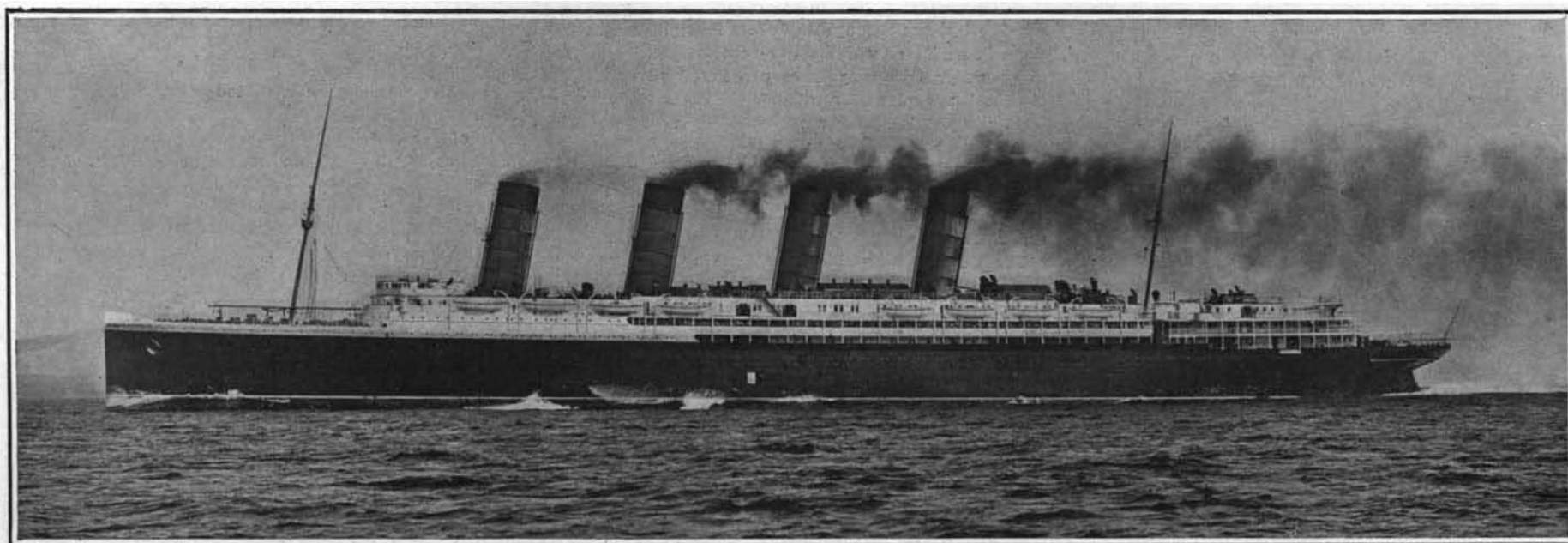
not seen fit to make these public. We understand, however, that this consumption compares favorably with that of the sister ship "Caronia," which is equipped with reciprocating engines, and is known to be a highly economical vessel. There is one feature in the turbine problem which augurs favorably for the economy of the new Cunarders, namely, that the marine turbine shows increasing fuel economy as the speed is increased; and since these vessels will never steam at less than 24 knots, they should prove to be easy on steam consumption. The work of constructing the turbines has been tedious and costly. The casing of the low-pressure turbine is an enormous casting, the finished internal diameter of which is $16\frac{1}{2}$ feet. All of the turbines taken together call for the separate fitting and alignment of no less than 3,000,000 blades.

The New British Battleships.

In the two new battleships which are to be laid down for the British navy in accordance with the current year's programme, a departure from the policy adopted in regard to the armament of the "Dreadnought" is to be effected. While of the same class and type, they will be 2,000 tons heavier, their displacement being about 20,000 tons. In regard to the main armament, there will not be so many weapons of the larger caliber, though they will be much heavier, a new 13.5-inch weapon which has been severely tested being adopted in the place of the 12-inch. This gun fires a shell weighing 1,250 pounds as compared with the 850-pound shell of the 12-inch arm. Moreover, a secondary battery of medium quick-firing guns is to be carried, a feature which is entirely absent in the "Dreadnought," and which deficiency has been severely criticised. The effect of this modification will be that the new vessels will have an aggregate broadside fire of some 8,500 pounds as compared with 6,800 pounds in the "Dreadnought." These two vessels are to be laid down at once at the Portsmouth and Devonport dockyards respectively, and they will each cost over ten million dollars. At the present time the armament firms in the country are working at full pressure to deliver the present order of 12-inch guns for the navy's immediate requirements, no less than 120 of these weapons being in course of construction.

Wound Sucking in Ancient Times.

That ancient customs are still practised by primitive tribes is interestingly shown by the two following incidents. In the Iliad we are told that when Asclepias "saw the wound where the bitter arrow had lighted he sucked out the blood," and so forth. In his recent work on the Australian aborigines, John Mathew



Length, 790 feet. Beam, 88 feet. Depth (plated), 60 feet. Displacement, 45,000 tons. Speed, $25\frac{1}{4}$ knots.

THE TURBINE CUNARDER "LUSITANIA" MAKING $25\frac{1}{4}$ KNOTS ON HER 1,200-MILE TRIAL TRIP.

TECTED cruiser which they might encounter. The constructive features of the ship are novel, and because of her mammoth proportions are of unusual interest. The keel plate is 5 feet wide and $3\frac{3}{4}$ inches thick. The double bottom, covering the whole of the ship's length, is 5 feet in depth. There are nine decks in all, and the hull is divided into 175 separate water-tight compartments, which, surely, establishes the claim that she is unsinkable by any ordinary disaster. Into the construction of the hull entered 26,000 steel plates, the largest of which are 48 feet in length and weigh

must stow in her bunkers, for a single trip, not less than about 7,000 tons of coal. The fact that the Cunard Company installed turbine engines in the "Carmania," and that they have had the advantage of some two years of observation of this ship, has been of great assistance in the working out of the designs for the turbine motive power in the new ships. The engineering world has been watching with great interest for the publication of the fuel consumption and other valuable data of the "Carmania's" turbine engines; but up to the present time, the company has

informs the reader that the doctor or sacred man made a practice of sucking the part affected. He then proceeds: "There seems to be some efficacy in the sucking, for a friend of mine who was suffering severely from an inveterate, inflamed eye allowed a black 'doctor' to mouth the eyeball, and the result of the treatment was immediate relief and speedy cure." A further parallelism between the rise and practice of the healing art and the priestly class, although in Greece the connection was less close than elsewhere and did not long continue, is shown by this extract.