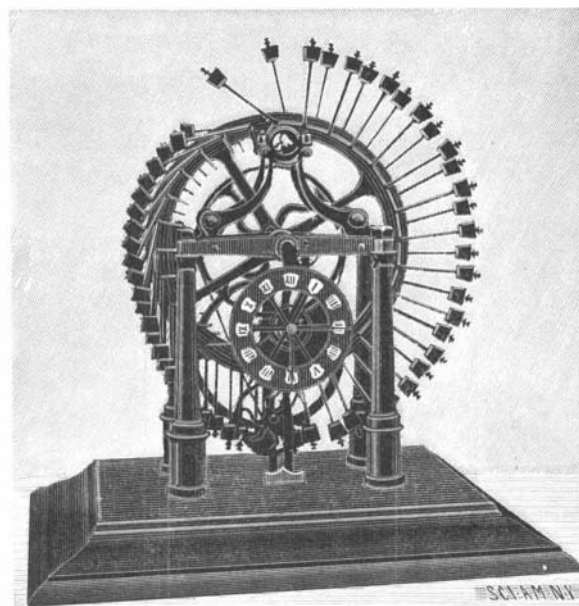


A PERPETUAL MOTION CLOCK.

At the Paris Exposition there was exhibited a clock which ran for two months without having to be wound up, therefore the makers were somewhat justified in calling it a "perpetual motion clock." The inventor obtained his result by combining a system of jointed levers or armatures with permanent magnets in order to permit the wheel to revolve indefinitely around its axis to coil a spring. The principle is based upon the fact that poles of the same name repel, while those of opposite names attract. Two series of movable levers are placed upon the faces of the rim of a large wheel. The two arms of such levers form between them an angle of forty-five degrees; the shorter one is provided at its extremity with a weight which acts as a counterpoise. The counterpoise most distant from the center has a preponderating action upon the side of the wheel. It makes four revolutions a minute, and actuates a regulating flywheel through the medium of an endless chain. The frame of the apparatus is constructed of magnetized steel. It supports the axle of the wheel and is surmounted by a roller that constitutes a pole. When in its motion the wheel brings the short arm of one of the levers opposite the roller, the phenomenon of repulsion is produced. We are indebted to La Vie Scientifique for our engraving.



A PERPETUAL MOTION CLOCK.

LAUNCH OF THE WHITE STAR LINER "CELTIC."

The launch at Belfast of the huge liner "Celtic" marks another great step of the rapid growth in size of the modern steamship. This truly gigantic vessel is easily the largest steamship ever constructed, for on her maximum draught of 36 feet 6 inches she will displace 37,700 tons, which is more than double that of the heaviest battleship afloat, and 10,300 tons more than that of the "Great Eastern." The next largest steamship is the "Oceanic." When they are completed, the big freighters under construction at New London, Conn., which, it is claimed, will be of 33,000 tons maximum displacement, will equal the "Oceanic" in size.

The "Celtic" is 700 feet long, her beam is 75 feet, and her depth 49 feet. She measures 20,880 tons gross, and 13,650 tons net. How these dimensions compare with those of other well-known liners is shown in the tabulated statement below. Gross tonnage is used in the table, and the lengths given are over all.

As will be observed, she is a few feet shorter than the "Oceanic," with, however, 7 feet more beam. She is, as the figures also show, the first vessel to exceed 20,000 tons. The task of building such a vessel was necessarily very heavy, and possibly there are not half a dozen ship-building yards in Great Britain which could have looked at it.

The shell plates of the "Celtic," of which there were 1,392, averaged 30 feet by 5 feet, were an inch and a quarter thick, and in some cases weighed as much as 4 tons. Machine riveting was adopted wherever possible in the keel, double bottom, hull, and stringers; 167,095 inch and quarter rivets were driven in this way.

There are altogether nine decks, and as their arrangement in some way facilitates the task of describing the vessel, the names may be given. They are—lower orlop, orlop, lower, middle, upper, bridge, upper bridge, boat, and sun decks. With obvious exceptions they are all real plated decks and of full length. The greatest

care has been taken to secure her against the alternate hogging and sagging stresses she will experience. She has a flat bar keel riveted onto the skin plating

sheer strake and the next but one lower are also doubled and the upper deck stringers have been treated similarly except at the extreme ends. Strength fore and aft is further secured by six longitudinals worked intercostally, three on each side of the inner keel; with the thwartship vertical divisions these make the cellular double bottom, which is bounded by margin plates and covered by the inner skip plat-

Vessel.	Length. Ft. In.	Breadth. Ft. In.	Depth. Ft. In.	Tons.
Great Eastern.....	691 0	82 8	48 2	18,915
Britannic.....	468 0	45 2	33 7	5,004
City of Rome.....	500 0	52 3	37 0	8,144
Alaska.....	520 0	50 0	38 0	6,400
Etruria.....	530 0	57 3	38 2	7,718
Paris.....	560 0	63 2	39 2	10,500
Teutonic.....	582 0	57 8	39 2	9,984
Fürst Bismarck.....	520 0	57 6	38 0	8,744
La Touraine.....	540 0	56 0	34 6	9,209
Campania.....	620 0	65 0	43 0	12,950
Kaiser Wilhelm der Grosse.....	648 0	66 0	43 0	14,349
Oceanic.....	705 6	68 0	49 0	17,274
Deutschland.....	686 0	67 0	40 4	15,540
Celtic.....	700 0	75 0	49 0	20,880

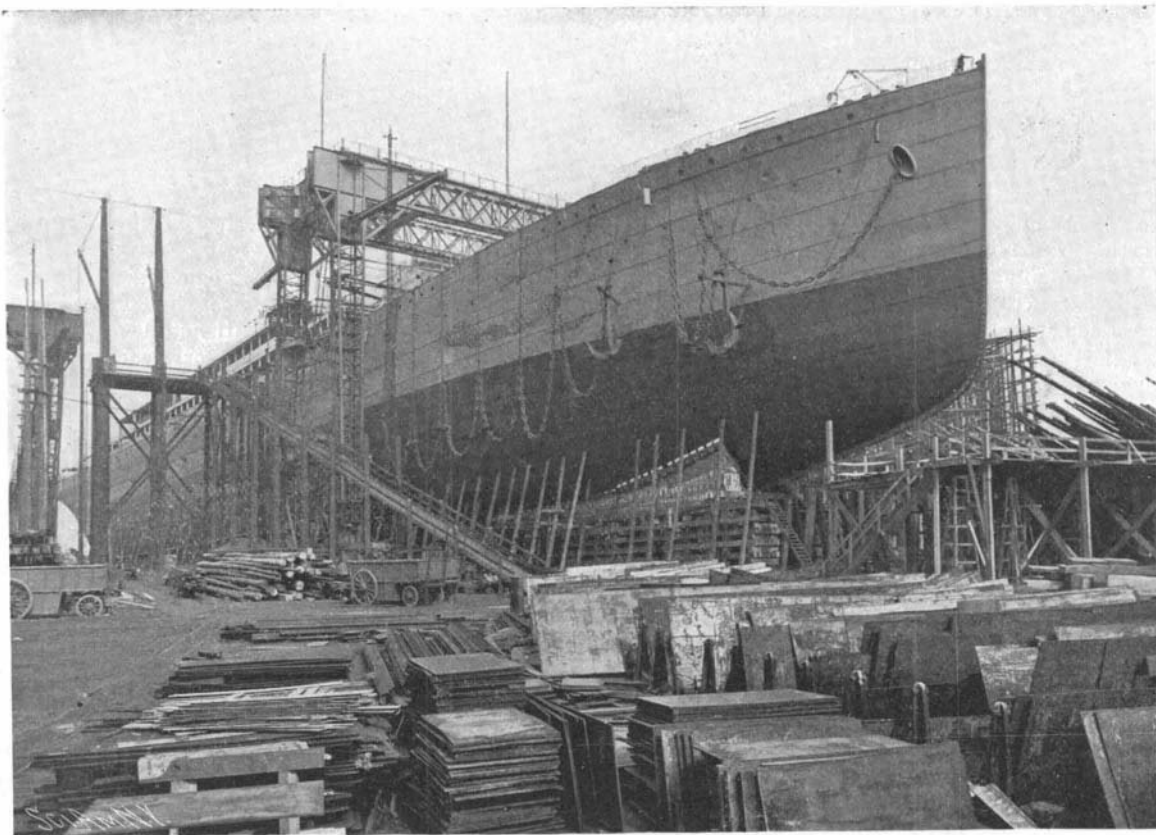
ing. At the sides the frame brackets are attached to the margin plates by double angles, and the floor plates have been similarly treated. And to further increase the longitudinal stiffness there are two intercostal keelsons running fore and aft. At the decks, too, there is a beam to every frame, so that care could, to no greater extent, ensure a stoutly built ship. The arrangement for carrying the propellers is exactly that of the "Oceanic," and the rudder is of cast steel sections bolted together. The engines are of Harland & Wolff's quadruple expansion "balanced"

type, with cylinders of 33, 47½, 68½, and 98 inches diameter. The stroke is 5 feet 3 inches. Steam will be supplied at a pressure of 210 pounds by eight double-ended boilers, each 15 feet 9 inches by 19 feet 6 inches. The vessel is not intended to be a record-breaker.

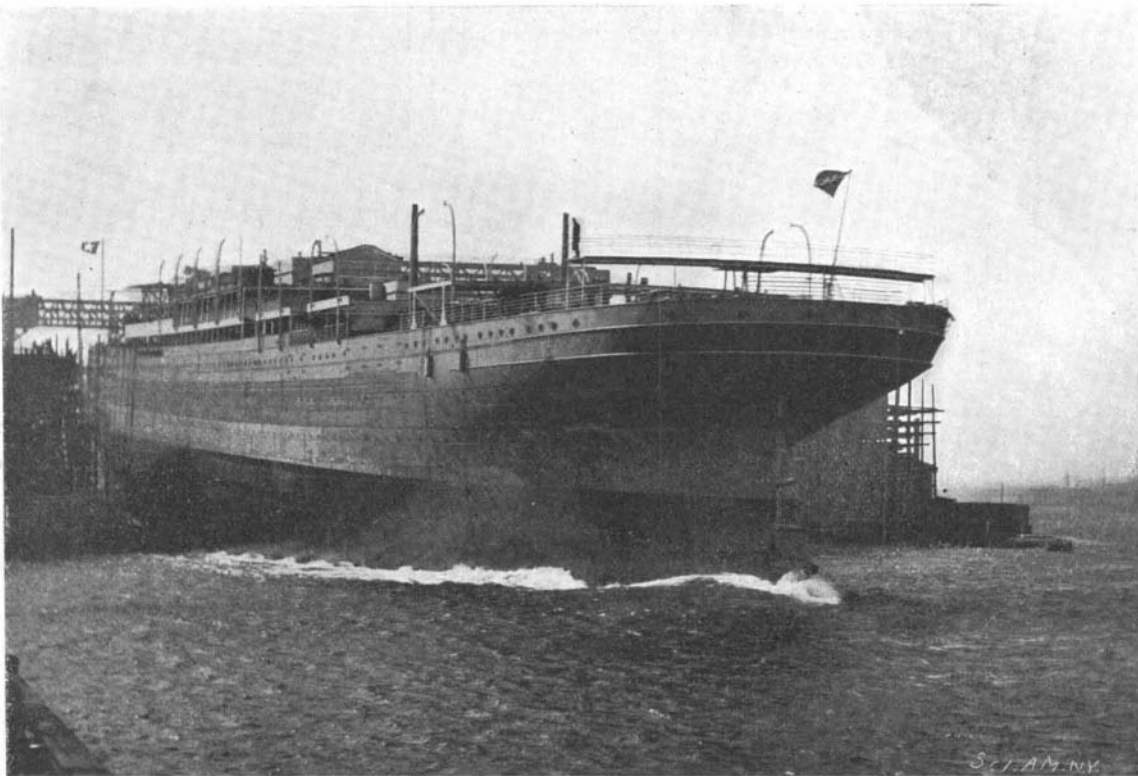
There are quarters for, altogether, 2,859 passengers and a crew of 335. The first class accommodation is on the upper, the bridge, the upper bridge, and the boat decks, and corresponds to that of the "Cymric." The number of first-class passengers provided for is 347. Aft on the upper and bridge decks there are quarters for 160 second-class passengers. Third-class passengers to the number of 2,352 are provided for on the upper, middle, and lower decks, some in staterooms and others in open berths.

The launching arrangements were those which worked so successfully in the floating of the "Oceanic," with the necessary difference for the greater weight that the chain was an eighth-of-an-inch thicker. The displacement of the hull was, it may be noted, no less than 13,500 tons. A massive steel casting, containing a hydraulic cylinder and ram, and a trigger half let in to a steel-shod niche in the sliding ways, was fixed in the standing ways. The lower half of the trigger was held in position by the ram until all was clear, and with the release of the pressure the upper half dropped flush with the ways. As the hull was water-borne its progress was checked by the dropping, pair after pair, of three pairs of anchors.

The official laboratory at Hamburg has discovered that the sand which fell during the recent snow-storm in southwestern Germany came from the African Sahara.



THE "CELTIC" ON THE STOCKS.



Length, 700 feet; beam, 75 feet; depth, 49 feet; maximum displacement, 37,700 tons; Speed, 16½ knots.

THE LAUNCH OF THE "CELTIC," THE LARGEST SHIP EVER CONSTRUCTED.