

**A GREAT WAR SHIP.**

The British cruiser *Terrible* was launched on the 27th ult. from Messrs. J. & G. Thomson's yard, at Clydebank, near Glasgow.

The *Terrible* far exceeds in size any vessel of her class that has gone before. The *Blake* and *Blenheim* are 375 feet long and 65 feet wide, the displacement being 9,000 tons. The *Terrible* and her sister ship the *Powerful*, now under construction at Barrow, are each 500 feet long between perpendiculars, or 538 feet over all, and 71 feet wide, and are to be 14,200 tons each in displacement. In the machinery department the advance is hardly less marked. On trial the engines of the *Blenheim*, which alone of the two vessels was tried with forced draught, gave off 21,411 indicated horse power; the *Powerful* and *Terrible* are to be driven by engines exerting 25,000 horse power. On the natural draught trials, however, the *Blake's* propelling machinery gave out 14,525 horse power, with an air pressure equal to a head of 0.4 inch of water, that of the *Blenheim* 14,924 horse power, with an air pressure equal to 0.2 inch of water only. The chief feature of interest in the two new cruisers, however, is the manner in which the steam is to be generated to supply that power. In fitting water tube boilers to these important ships the Admiralty authorities have made one of the boldest and most important steps ever taken in the history of naval engineering. The ship has no fewer than 48 boilers, these being all of the Belleville water tube type. The *Terrible* has no side armor, the protective element being entirely confined to the armored deck, which extends over the whole length of the ship. The edges of the deck join the skin of the vessel 7 feet below the load water plane, and the deck rises amidships to 3 feet 6 inches above that level, so that in cross section the deck forms a flattened arch 10 feet 6 inches from the springing to the crown.

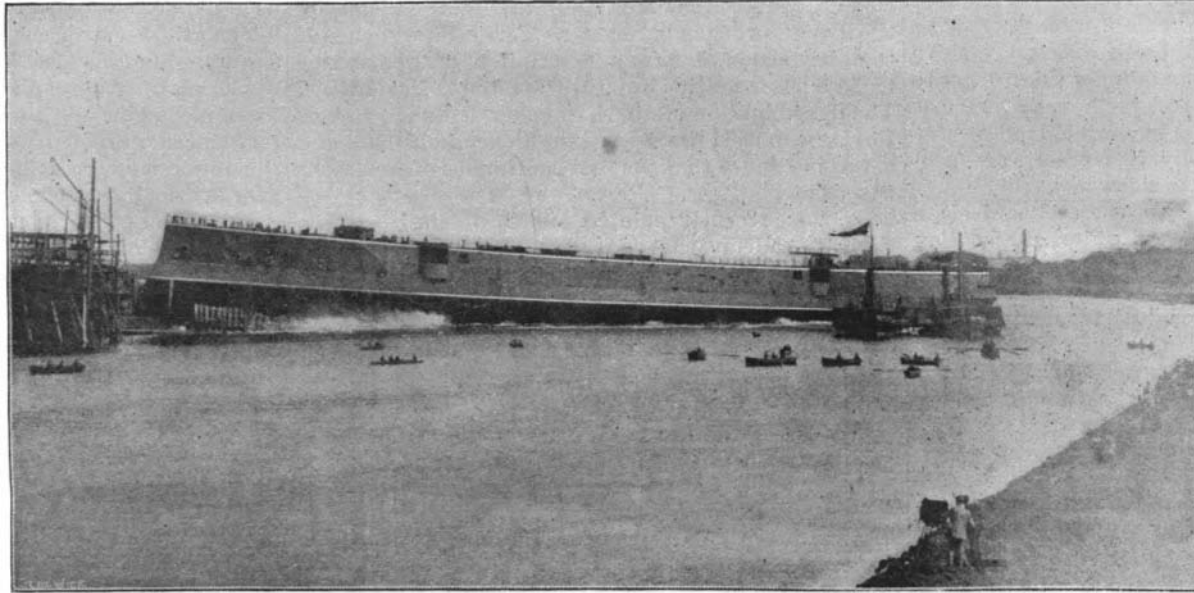
In regard to hull construction, the universal dou-

ble bottom system has been followed, the virtues of which were so notably made manifest in the grounding of the *Apollo* and the *Howe*. The ship is extensively subdivided into watertight compartments. The armament of the *Terrible* will consist of two 9.2 inch guns, twelve 6 inch quick firing guns, sixteen 12 pounder quick firing guns, twelve 3 pounder quick firing guns, nine machine guns and two light guns. There will also be four torpedo dischargers. There will

be four funnels, having a total height of 80 feet above the grate bars, and with these it is hoped to get the 25,000 horse power without forced draught. One of our engravings, from *Engineering*, shows the appearance of the great vessel at the time of her launch. The other illustration, from *The Engineer*, gives an idea how she will look when fully rigged.

**Molten Metal Shipped by Rail.**

The Cleveland Rolling Mills Company has just inaugurated a novel system of metal transportation.



LAUNCH OF THE WAR SHIP TERRIBLE.

They ship great pots of molten metal from their central blast furnace to their Newburg mills, five miles away. The trip consumes fifteen minutes, and about 500 tons are carried daily over the tracks of the Erie Railroad. At the rolling mills the car is raised on a hoist to the mixer, the ladle is tipped by machinery and the metal poured into the mixer.

**Novel Lighthouse.**

The lighthouse that has been erected by the light-house board at Paris Island, Port Royal Sound, South Carolina, is novel in form, and, though erected as an experiment, it has done its duty well. It is the most economical structure in the history of lighthouse construction. When first erected it was regarded with many misgivings by experts. The light, which is run up and down on rails in the

**THE HIGH BRIDGE OVER THE NORTH SEA CANAL NEAR LEVENS AU.**

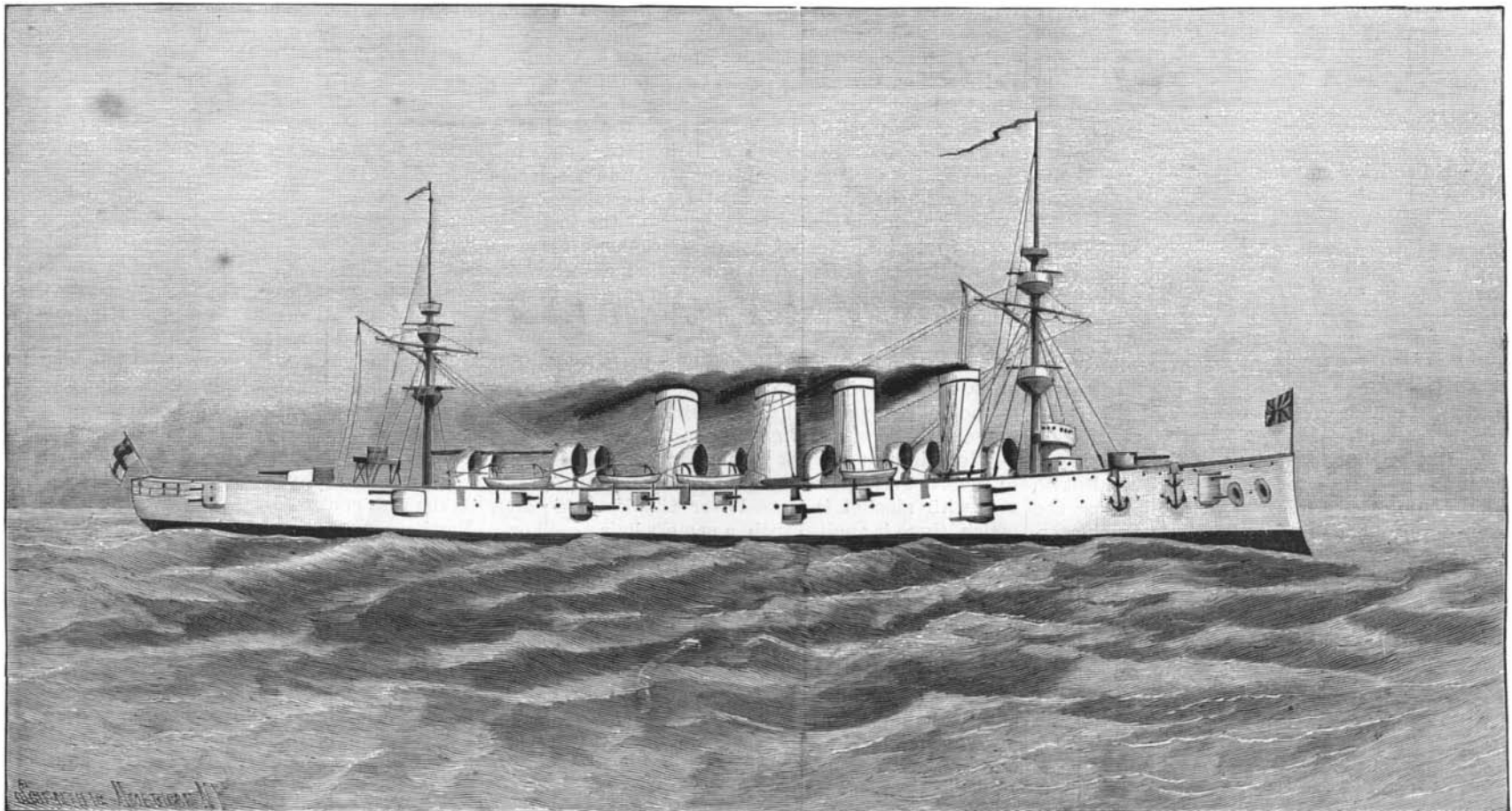
The German princes and representatives of all the civilized nations of the world will soon meet to witness the opening of the great North Sea Canal, by which the voyages of vessels plying between the Baltic and North Seas will be shortened by three days and at the same time they will be enabled to avoid the dangers of the Danish coast.

One of the most important works in the construction of this canal is the high bridge near Levensau, which

has just been finished. It was built by the Gutehoffnungshutte in Oberhausen-Sterkrade to make a crossing for the Kiel-Flensburg Railroad on the one hand, and for the macadamized road from Kiel to Eckernforde on the other hand. This masterpiece of engineering has the longest span (541 feet) of any bridge on the Continent; the highest point of its span is 137 feet 9 inches above the surface of the water in the canal, and the floor of the bridge is 33 feet 5 inches wide, 26 feet 10 inches of which is devoted to the railroad track

and the carriage way, the rest being used as a promenade.

The total weight of the structure is 3,000 tons, and it was built by the Gutehoffnungshutte (Good Hope Iron Works) in fifteen months, a remarkably short time for such a piece of work. The iron frame was set up between May and October, but this could never have been done without the perfect machinery at the command of the company. The immense iron parts were raised directly from the vessels by means of cranes driven by electricity, and in placing them other hoisting devices were used which were also driven by electricity. In the bridge proper there are half a million rivets, and 50,000 lb. of red lead and paint were used in painting the iron work. The scaffolding contained 2,616 cu. yd. of wood, 49,212 lineal yards of framing timbers, 330,000 lb. of iron beams. It should be stated



H. M. SHIP TERRIBLE.

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plane of the structure, is housed by day. At night it is hoisted to its place at the apex of the triangle by machinery worked in the oil house at the base of the structure. The large foundation plates are about 40 feet apart. The focal plane of the light is 120 feet above the sea level, but the top of the structure is 132 feet from the ground. The cost of the iron work set up is \$9,400 and that of the structure complete and lighted about \$12,000.

that the work has been successfully completed without any serious accident to any of the workmen.—*Illustrirte Zeitung*.

THE big landing stage built in the Mersey by the Liverpool Dock Board does away with the use of tenders, and the steamship passengers enter directly the trains of the Great Northern Railroad. The necessity for crossing the city in stage coaches is avoided.