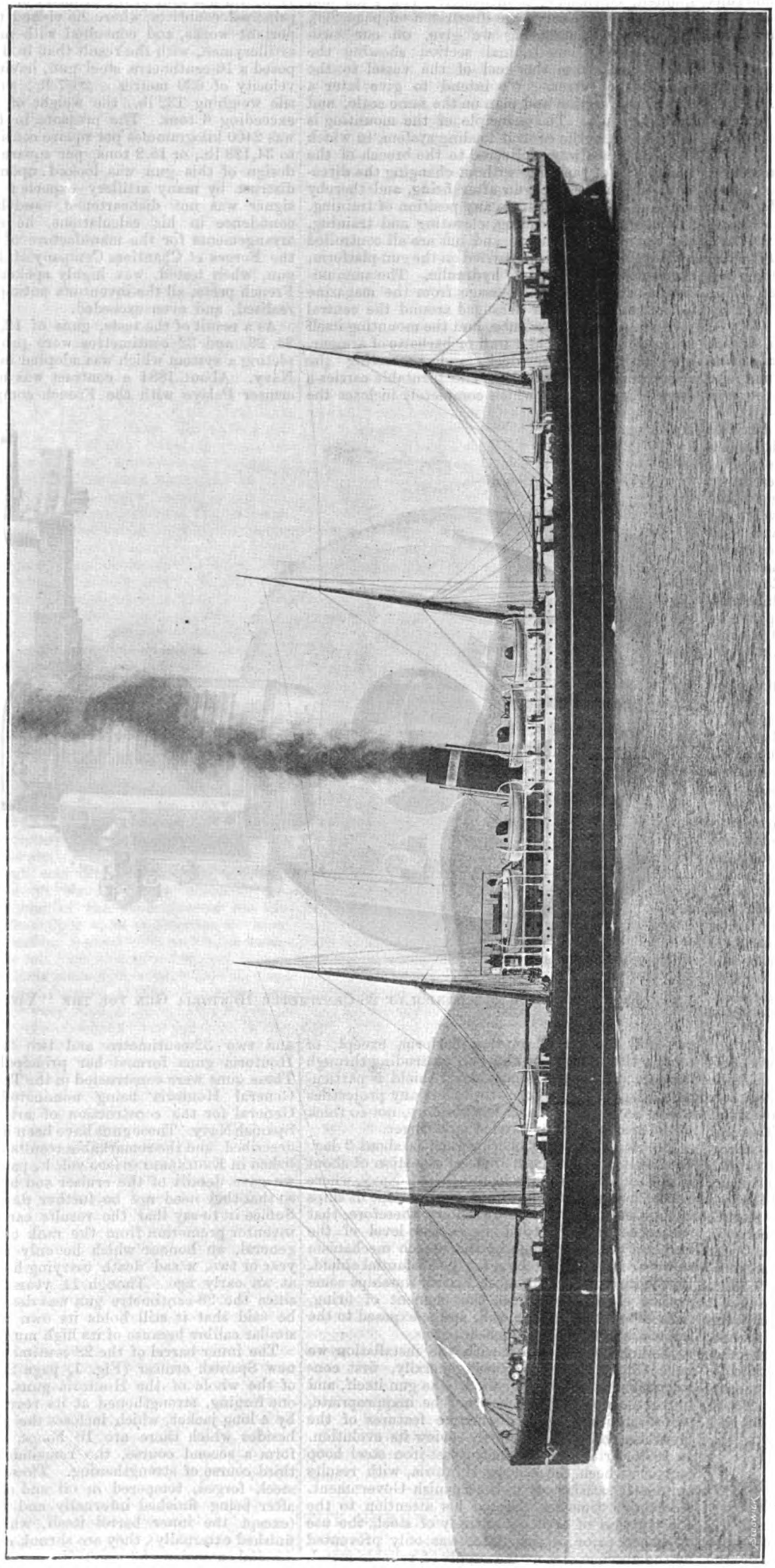
THE INTERNATIONAL NAVIGATION COMPANY'S SCREW STEAMER "KENSINGTON."

CONSTRUCTED AND ENGINED BY MESSRS. JAMES AND GEORGE THOMSON, LIMITED, CLYDEBANK, GLASGOW.

(For Description, see Page 260.)



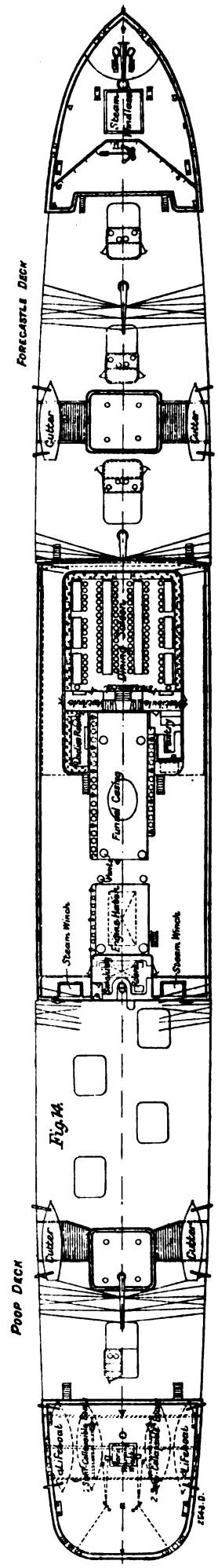


FIG. 11.

THE INTERNATIONAL NAVIGATION COMPANY'S SCREW STEAMER "KENSINGTON."

CONSTRUCTED AND ENGINED BY MESSRS. JAMES AND GEORGE THOMSON, LIMITED, CLYDEBANK, GLASGOW.

(*For Description, see Page* 260.)

Fig.12.

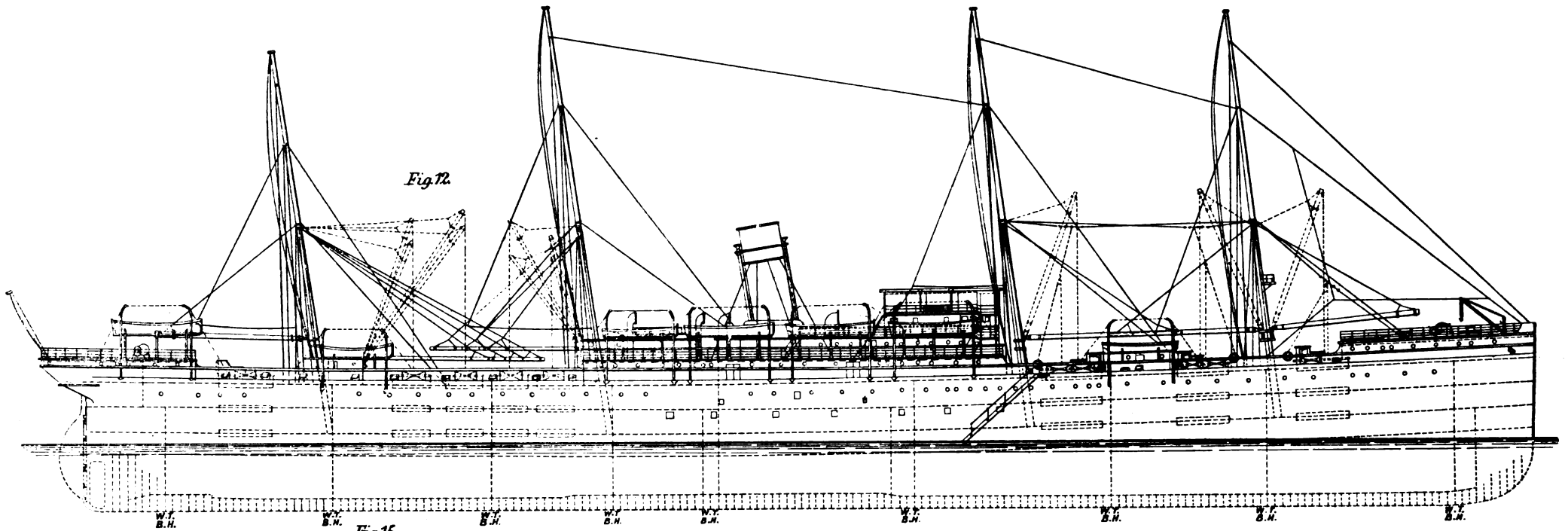


Fig.15.

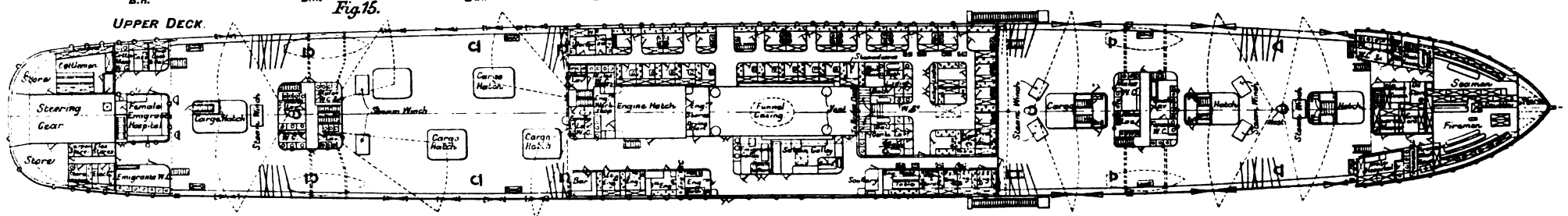
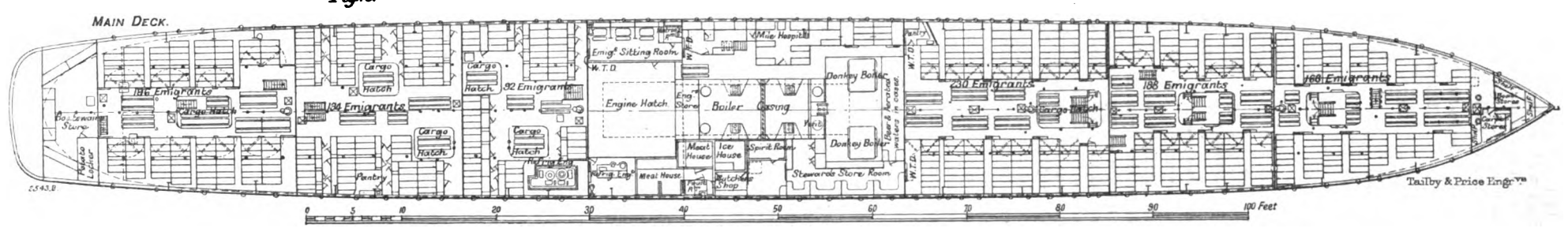


Fig.16.



calibres, and of a barrel shape. Armstrong's guns have a chamber somewhat similar in shape; but it is not of the same length in calibres. The object is to get as small a diameter as possible on the breech-block, and to get a nice cone or easy lead into the bore. The volume is thus obtained without increasing the outside diameter of the gun, instead of making the chamber short and larger with a shoulder into the bore, and the strain on the breech-block is thus much reduced. The gun is fitted with the usual type of interrupted thread breech-block, with three interruptions, as illustrated by Figs. 3 to 7. It is fitted, as shown, with the plastic obturator of the De Bange type. The opening of the breech-block is performed by turning a vertical lever carrying a pinion which gears into a rack at the breech end of the gun. This pinion is rotated by a crank handle. The block having been turned through an arc equal to the width of one of the interruptions, can be withdrawn by hand by means of two handles provided at its rear. In doing this it passes through a hinged carrier ring which forms a support for the block when removed from the gun. This carrier ring can be turned about its hinged pin to swing the block clear of the bore of the gun. The closing of the breech is performed by reversing the operations.

The guns, as we indicated in our article on the

vessels in a preceding volume, and on page 7 *ante*, were manufactured at the ordnance works in the Astilleros del Nervion, where Lieut.-Colonel Albarran is chief director, while Major Navarrete supervised the work on behalf of the Government. The gun, as shown by Fig. 1, page 266, is trunnionless, but is provided with collars which fit into corresponding recesses in the cradle of the carriage, and is secured therein by four keys. The dimensions of the gun are given in Table I.

Table I.—*Dimensions of 28-Centimetre Hontoria Gun.*

Total length	10.310 metres = 33 ft. 9.91 in.
Sight line	2.370 metres = 7 ft. 9.31 in.
Length of rifled portion ...	309.1 in.
Powder chamber	77.1 in.
Bore over all in calibres ...	35
Number of rifled grooves ...	70
Depth and width	1.5 mm. and 4 mm. = .06 in. and .16 in.
Total weight	33 metrical tons.
Segment shell weight ... Common shell	617 lb.
Armour-piercing shell... ...	704 ,,
Firing charge for armour-piercing shell...	352.7 lb.
Reduced charge for other projectiles...	319 ,,

The muzzle velocity attained on the trials of the Spanish cruiser Pelayo, already referred to, reached 2034 ft., the total muzzle energy being 2403 foot-tons. The powder used was a brown cocoa powder made at the Spanish factory of Santa Barbara. The results indicate great power for a gun of this weight. Indeed, in Brassey's "Naval Annual" for two or three years there has been a foot-note to the effect that "the muzzle velocity and energy are probably estimated, and the power of the guns so great as to be out of the question; compare with British, French, or German guns, and the mistake is apparent." This statement is made notwithstanding that long ago the official results were published, verifying the figures questioned.* Indeed, the muzzle velocity reached 2038 ft. in some of the tests. It is true very few of these guns have been manufactured, and probably the firing from them has been a relatively limited number of rounds—some of them on board the Pelayo, however, fired 28 rounds before acceptance. It remains, therefore, to be seen what the effect of continued firing, such as takes place with British guns at quarterly practice, may have on the life of the gun.

As to the material used, the greatest care is taken. Messrs. T. Firth and Sons, Limited, Sheffield, supplied the steel, which was subjected to a tensile strain of 30 to 34 tons per square inch, before tempering, with from 25 to 30 per cent. elongation, and of 42 tons to 44 tons after tempering, with an elongation of 15 to 20 per cent. The elastic limit before tempering was 14 tons, after tempering 21 tons. We may take at random the detailed results (given in Tables II. and III.) of the tests of one of the tubes tested:

Table II.—*Tensile and Shock Tests on Tubes for 28-Centimetre Hontoria Guns.*

(Before Tempering. Specimens 13.8 millimetres = .542 in. in diameter).

	Elastic Limit. Tons Per Square Inch.	Breaking Strain. Tons Per Square Inch.	Elongation. Per Cent.
Breech ...	14.98	33.21	27
,, ...	13.90	31.24	27
Muzzle ...	14.92	32.63	26
,, ...	14.86	31.81	26
After Tempering.	(Specimen 13.8 millimetres = .542 in. in diameter).		
Breech ...	21.46	40.89	20
,, ...	21.21	41.33	18
,, ...	21.59	41.46	24.5
Muzzle ...	21.59	43.17	17
,, ...	21.65	43.94	18
,, ...	22.03	44.06	19

In all cases the aspect was fibrous. In the case of the shock test, of which the results in the case of the same tube are also appended, the weight of the tup was 18 kilos = 39.68 lb., and the height of fall being 1.10 metres = 43.3 in., the calculated force of the blow being 143 foot-pounds. The deflection at each fifth blow is given in the Table III.

During the construction of the gun, and before any hoops were placed on the barrel, the tubes, as is the usual practice with Hontoria guns, were submitted to an exceptionally severe test—two projectiles were placed in the bore, with a charge of powder between them. This charge was adjusted to give when firing a pressure in the bore of 11 to 12¾ tons to the square inch, so that, when considering the relative strength of other guns which have not a naked chase, this test should be borne in mind.

* See ENGINEERING, vol. l., page 718.

Table V.—*Gun Mountings of Spanish Belted Cruisers. Key to Lettering on Two-Page Plate.*

A	The revolving turntable.
A^1	Upper floor of turntable.
A^2	Turntable clips.
A^3	Sighting platform.
B	Central revolving ammunition tube.
B^2	Central pivot box for hydraulic pressure.
B^3	Loading bracket.
B^4	Upper shelf for projectile.
B^5, B^6	Lower shelves for powder.
C	Armour protecting ammunition tube.
D	Barbette armour protecting turntable.
D^1	Locking bolt.
E	Charge carrier.
E^1	Hydraulic presses for raising and lowering charge carrier.
E^2	Receptacle in charge carrier for projectile.
E^3, E^4	Receptacle in charge carrier for powder.
F	Circular overhead rail.
G	Hydraulic rammer.
G^1	Standard supporting rammer.
G^2	Rammer valve.
G^3	,, head.
H	Pedal for working catch pawl.
J	Hoist valve handle.
K	Gun cradle.
K^1	Piston-rod crosshead.
K^3, K^4	Sliding faces on gun cradle.
K^5	Slide clips.
L	Brake piston rod.
M	Slide beams.
M^1	Non-return valve on slide beams.
M^2	Discharge pipe of ditto.
M^5	Buffer stops on ditto.
M^6	Securing stays.
N	Trunnion bracket.
N^1, N^2	Pipes to brake cylinder.
N^3, N^4	Swivel joint for cylinder.
O	Brake cylinder.
P, P^1	Elevating rams.
Q, Q^1	,, cylinders.
R	Stops on gun slide
R^1	Supporting pawls.
R^2	Shaft for pawls.
R^3	Working lever for pawls.
S	Elevating valve.
T	Handwheel for controlling elevating rams.
T^1	Arc on gun slide.
U	Training valve.
V	Handwheel for controlling training rams.
V^1	Shaft for operating training rams.
W	Toothed ring on central tube.
X, X^1	Training presses.
X^2, X^3	Rams of training presses
Y	Shield armour.
Y^1	Rear extension of shield
Y^2	Sighting tower.
Z	Shield structure.
Z^1	Skin plating of structure.
Z^2	Fore sight.
Z^3	Rear sight.
Z^4	Weighted lever attached to wire rope.
Z^5	Wire rope for safety bolt.
Z^6	Safety bolt in shield.
a	Upper roller path.
a^1	Rollers.
b	Lower roller path.
b^1	Fixed vertical pivot ring.
b^2	Packing ring below roller path.
c	Revolving vertical pivot ring.
c^1	Vertical rollers.
c^2	Vertical roller ring.
d	Guides in central tube.
d^1	Socket for locking bolt.
e	Rollers in charge carrier.
e^1	Ditto.
f	Wire ropes.
f^1	Leading pulleys.
f^2	Ditto.
g	Stop catch.
g^1	Ditto
g^2	Ditto
h, h^1	Securing keys.
i	Discharge pipe of wash-out tank.
k^1, k^2	Grooves on gun cradle.
m	Wash-out tank.
n	Trunnion pivots.
o	Clips for trunnion bracket.
r	Pinion gearing with arc on gun slide.
r^1	Shafting for ditto.
r^2	Bevel gear for ditto.
t	Pitched wheel on elevating handwheel shaft.
t^1	Pitched wheel on sleeve.
t^2	Pitch chain.
u, u^1	Swivel joint for training pipes.
v	Rack for training valve automatic control.
v^1	Pinion gearing with automatic control rack.
v^3	Vertical shaft for automatic control.
x	Pitch chain for training presses.
x^1	Auxiliary tension press.
y^2	Horizontal shaft for training valve.
y^3	Valve operating lever for ditto.
M^*	Water tank.

Table VI.—*Gun Mountings of Spanish Belted Cruisers. Key to Numbering of Pipes on Two-page Plate.*

1. Main pressure pipe.
2. Main exhaust pipe and discharge from brake.
3. Pressure pipe from distributing box to rammer slide valve.
4. ,, ,, ,, ,, hoist slide valve.
5. ,, ,, ,, ,, run in and out slide valve.
6. Pressure pipe from distributing box to elevating press slide valve.
7. Pressure pipe from distributing box to training press slide valve.
8. Pressure pipe from distributing box to gun wash-out valve.
9. Exhaust pipe between collecting box for exhaust water and rammer slide valve.
10. Exhaust pipe between collecting box for exhaust water and hoist slide valve.
11. Exhaust pipe between collecting box for exhaust water and run in and out slide valve.
12. Exhaust pipe between collecting box for exhaust water and elevating press slide valve.
13. Exhaust pipe between collecting box for exhaust water and training press slide valve.
14. Pipe between rammer slide valve and rear of rammer.
15. ,, ,, ,, front ,,
16. ,, hoist ,, rear of piston.
17. ,, ,, front ,,
18. ,, run in and out slide valve and front of brake.
19. ,, ,, ,, rear ,,
20. ,, elevating press ,, ,, of presses.
21. ,, ,, ,, front ,,
22. ,, training press ,, right-hand press
23. ,, ,, ,, left-hand ,,
24. ,, foot valve and hose connection for wash-out.
25. Discharge of wash-out from gun.

Table III.—*Shock Tests of Tube for 28-Centimetre Hontoria Gun.*

(Specimen, side, .79 in.)

Deflection at	5th Blow. in.	10th Blow. in.	15th Blow. in.	20th Blow. in.	Broken at
Breech ...	.63	1.06	1.38	1.61	38th blow.
,, ...	.63	.98	1.34	1.54	54th ,,
,, ...	.63	1.02	1.38	1.58	81st ,,
Muzzle ..	.63	1.02	1.38	1.61	44th ,,
,, ...	.59	.98	1.34	—	20th ,,
,, ...	.59	1.02	1.34	—	16th ,,
,, ...	.63	1.02	1.26	1.54	63rd ,,

Table IV.—*Firing Proof of Spanish 28-Centimetre Tubes.*

—	Centre. Recorded Pressure in Tons per Sq. In.	Breech. Recorded Pressure in Tons per Sq. In.	Muzzle. Recorded Pressure in Tons per Sq. In.
First tube ..	11.42 / 12.12	12.88 / 13 64	6.59 / 6.80
Second tube ..	12.74 / 14.76	14.06 / 14.20	8.36 / 8.02
Third tube ..	12.0 / 11.8	11.9 / 13.4	7.5 / 7.4
Fourth tube ..	12.7 / 12.4	13.0 / 13.6	8.1 / 6.8
Fifth tube ..	12.6 / 12.2	13.6 / 13.7	8.2 / 6.9
Sixth tube ..	12.7 / 12.5	13.5 / 13.6	8.3 / 7.0

The proofs were conducted in this country, the tubes being smooth-bored to within 8 millimetres of the finished size, and carefully measured at various points of the length, both before and after firing. The internal and external diameters in each case showed no alteration.

On the two-page plate showing the mounting and equipment of the gun, we have adopted a system of lettering the principal items in the complete installation, and of numbering all the pipes. The key to this lettering and numbering is given in Tables V. and VI. annexed. In a subsequent issue we shall give further drawings of the mountings, and may therefore defer our description of them.

(To be continued.)

THE INTERNATIONAL LINER "KENSINGTON."

(Concluded from page 200.)

ON pages 258 and 259 are given illustrations of the International Liner Kensington, including a profile and deck plans. As indicated in our previous article, when we illustrated and described the machinery, the vessel was built to carry a large cargo, as well as 120 cabin passengers and a large number of emigrants, attaining a moderate speed on a low consumption of fuel. The dimensions are:

Length between perpendiculars ...	480 ft.
Breadth moulded	57 ,,
Depth ,, ...	40 ,,
Gross tonnage	8670 tons

In a vessel such as this, which is intended to cross the North Atlantic at all seasons of the year, and with very large cargoes of varying density, the question of structural strength is of the first importance. The vessel is framed on the cellular double-bottom principle, the distance between the outer and inner skins being generally about 4 ft. The vertical keelplate is 48 in. in depth, with double angles on top and bottom edges. It extends continuously for the whole length of the ship, and is made water-tight for the midship portion of the ship, so that the midship compartments of the ballast tank can be used for correcting any heel which the ship may get. The edgeplates of the tank are, of course, continuous, and three intermediate intercostal girders are fitted between the centre keelplate and the edgeplate on either side. The floorplates, which are spaced 30 in. apart, and are ½ in. in thickness, extend in one plate from the vertical keel to the edgeplate, and are lightened by oval manholes 30 in. by 20 in. between the intercostal girders. These manholes were punched out in one operation by a hydraulic machine. The inner bottom plating is 1 in. in thickness under the engines, ⅝ in. under the boilers, and less than ½ in. at the ends of the ship. The butts and edges are overlapped, except under the engines, the butts being treble, and the landings double, riveted.

Under the engines the double bottom is somewhat increased in depth, additional longitudinal girders are fitted, and the thickness of the floorplates is increased to nearly ⅝ in. The bedplates of the engines are bolted directly to the inner bottom, thus giving a thoroughly rigid foundation for the machinery. Outside the limits of the inner bottom the framing is almost entirely of channel bars, which have to a very great

extent superseded the old system of frame and reverse bar in vessels of this size and class. The channel bar also has advantages over the Z-bar section, which is almost exclusively employed for vessels of the Royal Navy, as, owing to the form of the channel section, the bars lie flat on the slabs when in process of bending or bevelling, which is not the case with the Z-bar section. The frames of the Kensington are 7 in. deep, spaced 30 in. apart. Web frames formed of plates 36 in. deep, with double angles on their inside edges, are fitted at close intervals both in the machinery compartments and in the cargo holds.

The beams of the upper, main, and lower decks are also of channel steel 8 in. deep and spaced 30 in. apart. They are supported by three rows of pillars, and at the head of each row of pillars a longitudinal girder is fitted. The upper, main, and lower decks are each plated with steel from end to end of the ship. The shell of the ship varies in thickness from nearly 1 in. to little over $\frac{1}{2}$ in. at the ends, the average thickness amidships being about $\frac{3}{4}$ in. The plates are generally about 26 ft. long and 62 in. wide, and the butts of all, except the sheerstrake, are overlapped and quadruple-riveted amidships, and treble-riveted at ends. The sheerstrake butts have double straps treble-riveted, and the sheerstrake is doubled for three-quarter length amidships.

The water-tight bulkheads, which are nine in number, extending from the keel to the upper deck, have been spaced so that even in the event of two adjacent compartments being flooded the ship would not only float, but would still have considerable freeboard and be capable of steaming. The bulkheads have been constructed in accordance with the recommendations of the Bulkhead Committee. The part of the bulkheads below the lower deck is stiffened by 10-in. vertical Z-bars spaced 30 in. apart, connected by knee-plates to the tank top, and having their upper ends connected to the lower deck plating. On the opposite side of the bulkhead, at the height of the orlop stringer, a horizontal girder 30 in. deep is fitted. The upper part of the bulkheads, where the water pressure would not be so great, is suitably stiffened by lighter channel or angle bars.

The pumping arrangements are carried out in the most modern and complete manner, and by a special arrangement the water can be pumped from one tank to any other for the purpose of trimming the ship. The pumping arrangements for freeing the bilges of water are also of a very powerful and complete character, and in addition to these, large ejectors are fitted in the engine space, which, being controlled from the upper deck, can be set to work even in the event of the pumps being disabled or submerged.

The Kensington is the largest cargo-carrier in the world, as when loaded to her Plimsoll mark she will carry 10,600 tons weight all told. The vessel is fitted with very complete arrangements for handling the cargo expeditiously, there being 10 powerful steam winches of Messrs. Clarke, Chapman, and Co.'s most improved make, fitted near the hatches on the upper deck, and worked in conjunction with strong derricks, of which there are no less than 16, of lengths varying from 40 ft. to 60 ft. The position of the winches will be readily seen from the plan of the main deck (Fig. 15).

The winches are of the makers' ordinary horizontal type, having cylinders 7 in. in diameter by 12 in. stroke. There are 10 on board, constructed to work at 200 lb. pressure, each fitted with extra large warp ends and whipping drums. Crinoline drums are fitted over the barrels; thus very quick lifts can be obtained.

The ship, although intended as a first-class cargo-carrying steamer, has accommodation for about 120 passengers, as well as a large number of emigrants. The location of the public rooms and the state cabins will be appreciated by reference to the deck plans (Figs. 13 to 16). There are large state-rooms amidships on the upper deck (Fig. 15), while the accommodation for the officers of the ship is near their work on the lower bridge (Fig. 13) or adjoining the engine-room (Fig. 15). On the bridge deck (Fig. 14) is situated the dining saloon, a well-lighted commodious apartment, panelled and finished in polished oak, capable of dining 126 persons. This saloon is entered from either the bridge deck through a large vestibule, or from the upper deck, where the state cabins are situated, by a wide staircase (Fig. 15). The ladies' room, which is also on the bridge deck (Fig. 14) on the port side of the funnel casing, is also entered from the saloon vestibule. A large pantry is fitted up on the starboard side of the funnel casing. At the after end of the bridge deck a comfortable and well-appointed smoking-room is situated (Fig. 14). Above the dining saloon a strong steel house is built, containing a sitting-room and bedroom for the captain and rooms for the principal officers, as well as chart and wheel houses (Fig. 13); and surmounting the whole structure, as shown on the profile (Fig. 12) and on the engraving of the ship under steam, is the navigating bridge, at a height of 44 ft. above the water when the ship is loaded. From this an exceptionally clear and unobstructed look-out is had both fore and aft of the ship. Accommodation for the ship's crew is provided under the forecastle (Fig. 15), and provision is made under the poop for a large number of cattlemen, in the event of cattle being carried, for which suitable arrangements have been made. Accommodation is also provided for carrying over 1000 emigrants on the main deck (Fig. 16). Great care has been bestowed on the ventilation, heating, and sanitary arrangements of these spaces.

The vessel is steered by a very large single-plate rudder, the weight of which is carried inboard, there being no bearing pintles in the rudder frame. The rudder is actuated by Messrs. Brown Brothers' steam steering gear working direct on to the rudder head, and controlled from the bridge by Messrs. Brown's telemotor gear. These we have illustrated in previous volumes. Strong relieving tackles are also fitted to the tiller. The appliances for handling the ship are very complete, and of the most powerful and modern character. A very strong vertical windlass is mounted on the forecastle for working the anchors. This windlass is provided with large warping drums, so that a separate warping capstan is not required. We intend to illustrate this windlass later. It was constructed by Messrs. Clarke, Chapman, and Co., Limited. The engine, which is placed aft of the windlass gear, is of the vertical type, having two cylinders, 12 in. in diameter by 12 in. stroke. The windlass is fitted with the makers' siding spring brake and special frictional lifting purchases, the cones being fitted with hardwood blocks, which have been found most durable and efficient. The windlass side frames are built up of steel plates and angles, the bearings being steel castings. This not only makes a strong but also a light frame, which is a great advantage when so large a piece of machinery is placed on the forecastle of a ship. There are four warp ends, two on the main shaft and two on the intermediate shaft, which is extended to take them; all are fitted with whelps.

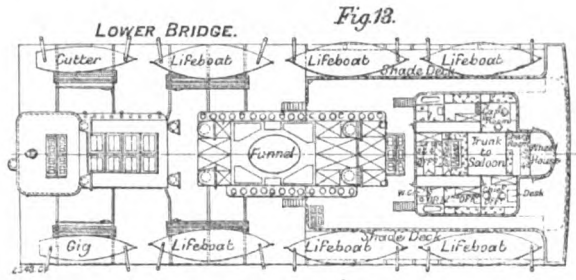
The cables are 2⅞ in. in diameter, and are led in under the cable lifters, then over and down a pipe at the forward corner of the bedplate. The hawse-pipes are made large enough to stow the anchor stocks in them if so desired, and as shown on the engraving of the vessel under steam. A powerful double-geared steam winch is mounted on the poop for warping purposes, and the leads for the steering gear relieving tackle are also taken to this winch.

An extensive installation of refrigerating machinery is provided in separate sections, one section for perishable cargo, the other for ship's requirements. In connection with the latter there are large ice-houses and store-rooms fitted on the main deck, on the principle adopted by Messrs. Kilbourn and Co., of Liverpool, and which has been fully illustrated and described in ENGINEERING in connection with similar vessels. This firm supplied all the refrigerating plant on board.

A complete installation of electric light, consisting of about 500 incandescent lamps, has been fitted up by the builders' electrical staff. The generating plant consists of three duplicate sets of direct-driven engines and dynamos, the engines being of the two-cylinder vertical type by Belliss, and the dynamos by Crompton, London.

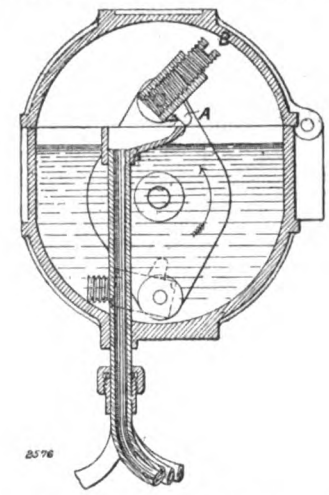
Elaborate arrangements have been made for extinguishing fire, powerful fire engines, with connections to all compartments on main, upper, and bridge decks, being provided, in addition to the steam fire extinguishers fitted to all the holds in the ship, in accordance with American Board of Trade requirements. The sanitary and ventilating arrangements throughout the ship are on the most modern and improved principle. A full complement of boats is carried, all stowed under davits, as shown on the engraving, Fig. 11, as well as the other life-saving appliances according to Board of Trade requirements. The vessel has a straight stem and elliptic stern, four steel pole masts rigged fore-and-aft, and one large oval funnel, and looks what she is—a substantial vessel.

Fig. 13.



REID'S MULTIPLE LUBRICATOR.

THE accompanying illustration shows a type of lubricator for bearings introduced by Messrs. William Reid and Co., 112, Fenchurch-street, London, E.C. The illustration is a section of an oil-box, through the bottom of which is carried a number of tubes to the bearings to be lubricated. Passing through the box from end to end is a shaft, fitted to which are plates, as shown, and to the ends of these plates are pivoted small cups marked B on the illustration. The shaft is



revolved by a ratchet wheel working outside the box through a lever connected to any moving part of the engine. With the revolving of the shaft the cup scoops up the oil, and a knob fitted to the cup coming in contact with the funnel of the lubricating tube, tilts the cup over sharply, and thus the supply of oil to the bearing is maintained. The quantity of oil carried by the cup can be regulated by simply turning the screw which forms the bottom of the cup.

CATALOGUE.—There is a belief, probably not unfounded, that a tourist's visit to Scotland is closely identified with Scotch whiskey; and this can be the only reason why Messrs. Greenlees Brothers, distillers in Argyleshire, gratuitously issue a work entitled, "A Tourist's Visit to Argyleshire and the West Highlands," almost entirely devoted to a history of their firm and a description of their works and process of distillation, although some justification of the title is found in the first six or eight pages, on which are given routes occupying various periods of time, but the information given is certainly not too copious. Perhaps if the firm had called the work by its legitimate title readers would have been as numerous and not disappointed, for the book has much interesting information.

LARGE NEW DRY DOCK IN COPENHAGEN.—At the shipyard of the Burmeister and Wain Shipbuilding and Engineering Company there is at present in course of construction a good-sized dry dock, which will be the largest in Scandinavia. Its total length will be 450 ft., and it is arranged so as to be able to receive two smaller vessels or one large by means of two large dock gates in the middle. Some 350 men have been engaged night and day on the work for several months, and the whole of the bottom is now completed, there being a cement foundation of 11 ft. in thickness. The dock itself will be 22 ft. deep, capable of accommodating vessels of up to 20 ft. draught. The dock is to a considerable extent intended for warships, and it is expected to be ready before the end of the present year.

SHIPMENTS OF IRON ORE FROM GELLIVARA.—The shipments of Gellivara iron ore from Lulea, the port terminus of the Gellivara Railway, during the present year, up to the end of July, amounted to 277,000 tons. Of this total, 56,400 tons belong to May (first shipment, May 11), 115,000 tons to the month of June, and the balance to July. For the shipment of this quantity, 129 vessels have been employed. The largest cargo was shipped by the Norwegian steamer Löcetakken, viz., 4670 tons. The increase in this year's shipments is, no doubt, due to the arrangement made by the Gellivara Mining Company, viz., that the company hire the steamers for whole or part of the period when Lulea is open, whereby they are far better able to regulate the whole concern. The conveyance of ore from Gellivara to Lulea is now done by three double trains every day, each train comprising from 30 to 38 wagons. The railway freight is 3 kr. 70 öre, or a trifle above 4s., per ton.