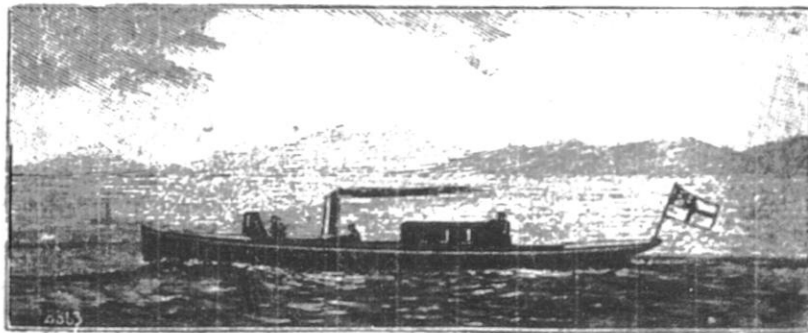


A Description of the "KINGDON" MACHINERY,

Its Characteristics, and Special Advantages for
STEAM LAUNCHES, LIGHT PORTABLE, & FIXED ENGINES;
ALSO FOR
AUXILIARY ENGINES, ELECTRIC LIGHTING, &c.,
WITH
NUMEROUS DESIGNS OF LAUNCHES, YACHTS, TUGS, AND OTHER CRAFT.



ILLUSTRATED.
PRICE ONE SHILLING.

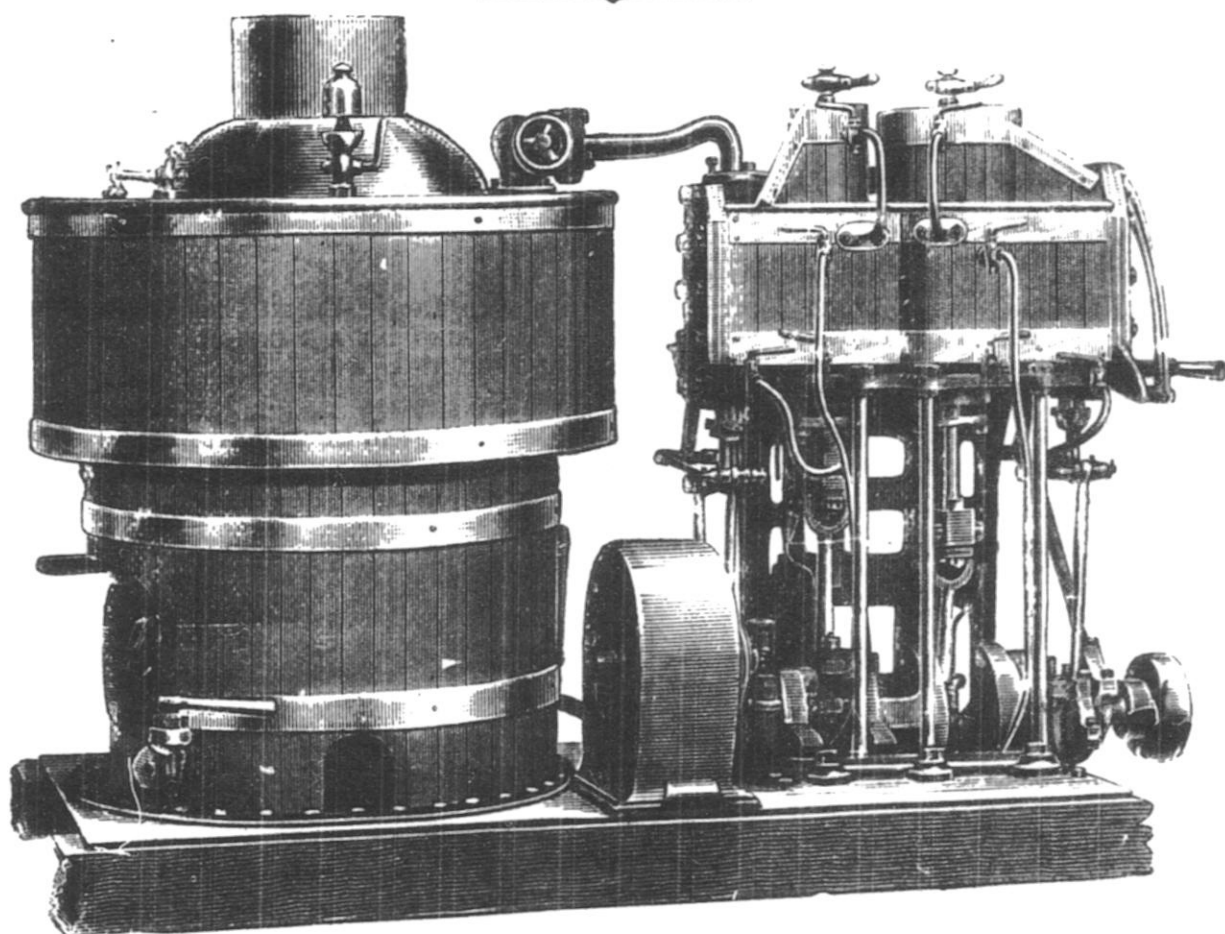
FIRST EDITION.

London :
THE "KINGDON" YACHT, LAUNCH, & ENGINEERING CO., LIMITED
Registered Office :—181, QUEEN VICTORIA STREET, E.C.
Works :—TEDDINGTON.

1891.

THE "KINGDON" MACHINERY

FOR
STEAM LAUNCHES, LIGHT PORTABLE, AND FIXED ENGINES;
ALSO FOR
AUXILIARY ENGINES, ELECTRIC LIGHTING, AND FACTORIES,
&c., &c.



VIEW SHEWING A SET OF LAUNCH MACHINERY, COMPRISING THE
"KINGDON" PATENT QUADRUPLE EXPANSION ENGINE, AND "KINGDON" BOILER.
(Engraved from a Photo.)

THE "KINGDON" YACHT, LAUNCH, AND ENGINEERING CO.,
(LIMITED,)

Registered Offices: 181, QUEEN VICTORIA STREET,
LONDON (ENGLAND).

Works:

TEDDINGTON (on the Thames).

Managing Director—

ARTHUR WADHAM.

INDEX TO CONTENTS.

*. Every care has been taken to make the Illustrations and information given in the pages of this Catalogue as complete and accurate as possible, but it is to be understood that they are to be taken as general only, and the makers do not hold themselves responsible for variations or modifications except by specific agreement to the contrary.

	CHAPTER I.	PAGE
DISinguISHING FEATURES OF THE "KINGDON" MACHINERY AND ITS ADVANTAGES		3
	CHAPTER II.	
DESCRIPTION OF THE "KINGDON" MACHINERY		7
	CHAPTER III.	
SOME LEADING DESIGNS OF LAUNCHES, YACHTS, AND OTHER CRAFT FITTED WITH THE "KINGDON" MACHINERY		13
	CHAPTER IV.	
EXAMPLES OF LAUNCHES, &c., BUILT AND FITTED WITH THE "KINGDON" MACHINERY		49
	CHAPTER V.	
THE "KINGDON" MACHINERY AS AN AUXILIARY FOR SAILING YACHTS ...		53
	CHAPTER VI.	
AS TO THE ECONOMY OF THE "KINGDON" MACHINERY AND ITS ADAPTABILITY FOR WOOD OR COAL FUEL		
	CHAPTER VII.	
SOME REPORTS OF EXPERTS AND PRESS OPINIONS RELATIVE TO THE "KINGDON" MACHINERY		57
	CHAPTER VIII.	
THE "KINGDON" AS A LIGHT PORTABLE ENGINE, AND LIGHT FIXED ENGINE AND BOILER, FOR FACTORY USE, CRANES, &c.; ALSO AS A STATIONARY ENGINE FOR DRIVING MACHINERY, ELECTRIC LIGHTING, &c.		61
	CHAPTER IX.	
THE PRESS ON THE "KINGDON" ENGINE AT THE ROYAL AGRICULTURAL SHOW, PLYMOUTH, 1890		65
	CHAPTER X.	
THE "HARRISON" PATENT RUDDER		72
	CHAPTER XI.	
"UP THE RIVER"		75
	APPENDIX.	
THE TOLLS FOR PLEASURE BOATS ON THE THAMES		77
LIST OF LOCKS ON THE THAMES (WITH DISTANCES IN MILES AND FURLONGS)		78
PRINCIPAL PLACES ON THE THAMES (WITH DISTANCES FROM ANY ONE TO ANOTHER)		78
OUR REGISTER OF YACHTS, LAUNCHES, &c., FOR SALE		79
MARINE INSURANCE		79
REPAIRING DEPARTMENT AND HOUSING LAUNCHES		79
OTORES AND SUPPLIES FOR LAUNCH OWNERS, &c.		81
SILS AND LUBRICANTS		82
GENERAL CHARTS, SHEWING THE NAVIGATION AROUND GREAT BRITAIN & IRELAND		83
" " BELGIUM, HOLLAND AND GERMANY		83
" " NORWAY, SWEDEN, AND NORTHERN COAST		84
" " BALTIC SEA		84
" " COASTS OF WESTERN EUROPE		84
A SPECIAL LIST OF BOOKS, INTERESTING TO YACHTSMEN		85
MURRAY'S HANDBOOKS		87
STEAM LAUNCH ENQUIRY FORM		89
MACHINERY		90

N.B.—Our Price List is issued separately and will be forwarded to intending buyers free on receipt of card addressed to the "Kingdon" Yacht, Launch, and Engineering Co., Ltd., 181, Queen Victoria Street, London, E.C., or Teddington.

The Price List includes specifications of the various types of "Kingdon" Engines and Machinery, with full particulars of sizes, weights, &c. It gives prices of various types of Steam Launches and other craft, complete, as well as a complete Telegraphic Code, specially compiled for our business.



CHAPTER I.

DISTINGUISHING FEATURES OF THE "KINGDON" MACHINERY, AND ITS ADVANTAGES.

BEFORE pointing out the special characteristics of the "Kingdon" Machinery and its points of merit, we may appropriately first refer to the history of its introduction, and give some account of its subsequent success.

History.—Until its advent, some ten or eleven years ago, many fruitless attempts had been made to secure the enormous advantages of condensing machinery for Steam Launches and other purposes requiring small types of motors. The "Kingdon" machinery was the *first* successfully to accomplish this great desideratum, and it remains *unrivalled* as the best type of Engine on the market for every purpose requiring small power.

The adoption of Compound Condensing Engines for large marine types, which became general about the year 1869, reduced the consumption of coal in one decade from about 5 lbs. per indicated h.p. per hour to 2 or 2½ lbs., thus bringing down the weight of coal to be carried for a specific voyage to one-half, allowing so much more cargo space, saving money all round, and revolutionising shipping. Further improvements and the adoption of the Triple and Quadruple expansion systems have enabled still greater economy to be gained, until the average consumption of coal for a large set of marine Engines of the most modern type is not more than 1½ lbs. per indicated h.p. per hour, whilst in some cases it is reported to have been brought down to 1.12 lbs. It is no exaggeration to say that the "Kingdon" Machinery has done for the Launch and Steam Yacht what the Compound and Triple expansion Engine did for the larger class of vessels. The "Kingdon" Machinery has, in fact, revolutionised the Steam Launch trade. It has enormously reduced the consumption of fuel and cost of working; it has reduced the space required for the machinery; or, to put it in another way, it has increased the speed; and it has added to the comfort.

Reverting, however, to its history it may be remarked that after practically proving the reality of its claims, the demand increased for the "Kingdon" machinery to such an extent that the works commenced for its manufacture, at Dartmouth, with only two or three workpeople, have grown until they now employ some 300 to 350 hands or more. At the present time a large extension is taking place there, comprising the erection of entire new works, and the "KINGDON" YACHT, LAUNCH, and ENGINEERING COMPANY (LIMITED) has been formed for the purpose of further working the invention and developing the business on the Thames in co-operation with Messrs. Simpson, Strickland and Co., of Dartmouth, who are the pioneers, and are still the sole owners of the Patent rights.

Summary of Advantages.—Launches fitted with the "Kingdon" machinery possess the following advantages:—

1. They have greater power, and consequently a higher rate of speed than any other craft possessing machinery of the same weight and occupying the same space.
2. They consume less coal, and are consequently much more comfortable, cleanly and economical.
3. There is much less noise and vibration; moreover, the machinery is exceedingly compact, and it is as simple as the ordinary high pressure machinery, having no more parts than in a single cylinder engine, or in the case of the double and quadruple engines, no more than those of a double cylinder high pressure engine.

Other advantages of the "Kingdon" machinery are that the engines being surface condensing, the necessity for carrying fresh water is, to a great extent obviated, as the same water is used over and over again, and they run well either in salt or fresh water; the feed pump is self-acting; the boiler will raise steam very quickly, and sustain a full head with a very moderate natural draught, thereby saving an immense amount of wear and tear in the boiler, and doing away with smuts, spitting and other disagreeable effects. The "Kingdon" boiler raises steam from cold water in one-third the time taken in the ordinary horizontal type, and it is suitable for burning either coal or wood fuel.

It may also be mentioned that with this Machinery a constant speed is maintained over long distances, which is by no means the case with most launches, and it is easy for a small launch fitted with the "Kingdon" machinery to run over distances which could not be attempted in the case of high pressure machinery. *Apropos* of this, it is worth while stating here that one of the large shipping lines in London has recently had under consideration the question of carrying Steam Launches capable of taking the sea for a week, so that, in event of disaster, passengers may be practically assured of being carried to a port of landing. The "Kingdon" machinery is the type which is capable of answering the conditions required, and estimates have been submitted for the scheme. There is no doubt that the outlay, though somewhat heavy, is one well worth while in the interests of safety of the large travelling public.

Growth in Favour.—In the face of such numerous and obvious advantages the sale of the “Kingdon” machinery, and of Launches fitted with it, has naturally attained considerable dimensions in a short time. It has done this with a minimum amount of advertising, the recommendations of users one to another having alone largely supplied the pioneer works at Dartmouth with the business done. The “Kingdon” machinery has attracted attention in high quarters, and amongst the customers who have ordered Launches or other craft fitted with it are the British Government (Admiralty and War Department), the Crown Agents for the Colonies, the Thames Conservancy, the Russian Government, the Italian and Dutch Governments, as well as the Governments of Spain, Brazil and the Argentine; the P. & O. Company have had some special Launches, to which we shall refer again elsewhere. Other customers include the best known Yacht owners and firms in all parts of the world too numerous to mention here.

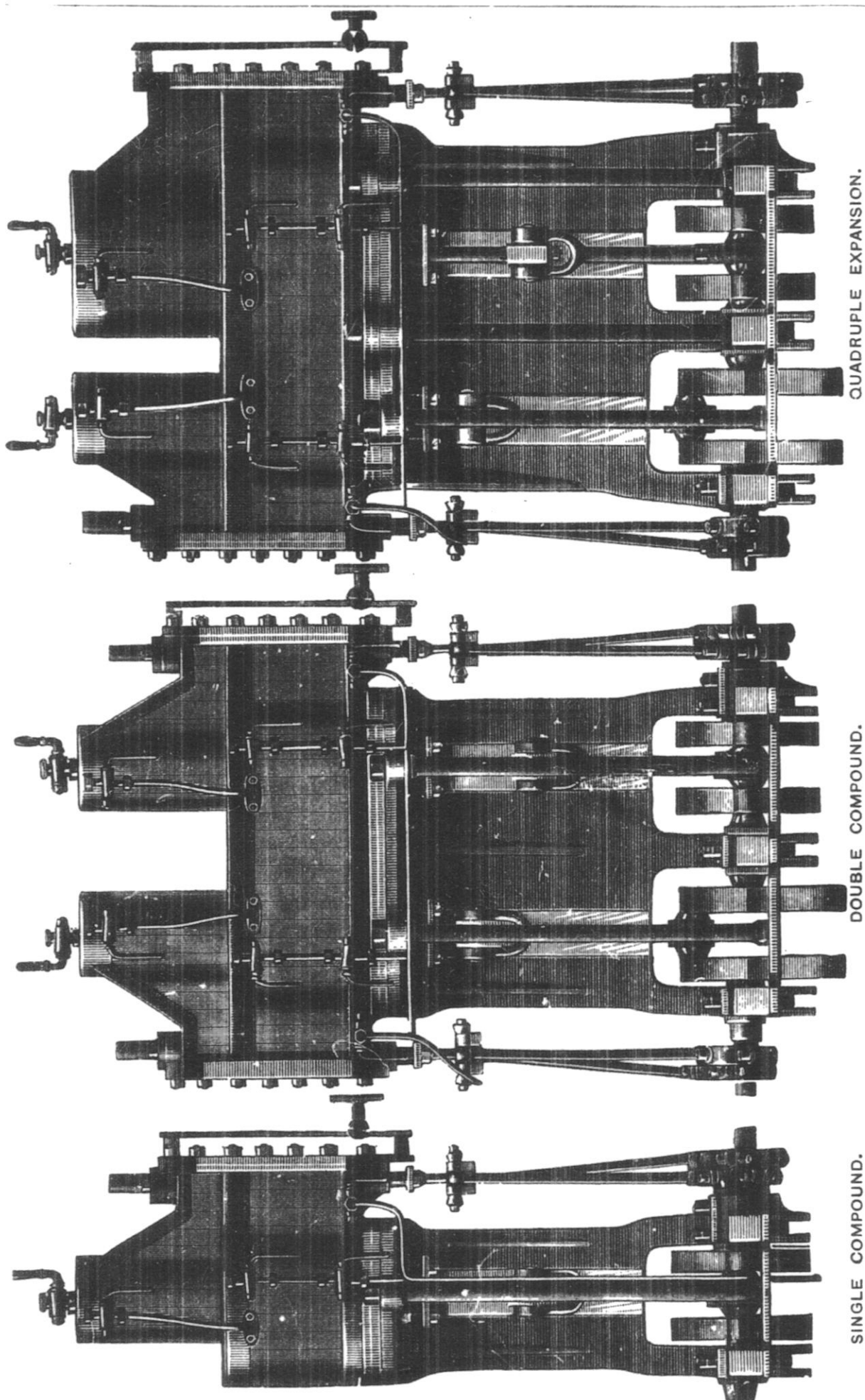
Distinction Gained at Exhibitions.—At the various Exhibitions where the “Kingdon” machinery has been shown distinction has invariably been gained. The only prize medal for Steam Launches was awarded at the International Inventions Exhibition, held in London in 1885, for a Launch fitted with this machinery. Two prize medals were awarded at the Liverpool Exhibition, in 1886; a gold medal at the Parana Exhibition (Argentine), in 1887; a medal at Paris, 1889 (the only award for Steam Launch machinery); and the First prize at the Plymouth Show of the Royal Agricultural Society last year (1890). The latter was gained in competition, open to every maker of light motors in the country, and the award was most unhesitatingly given upon the report of the Judges selected by the Society, viz.: Mr. Dan Pidgeon, C.E., and Professor Unwin, F.R.S., C.E.

We shall refer to the report of the latter elsewhere in speaking of the “Kingdon” machinery for Portable and small fixed Engines; meantime, we may point out that the result of the competition at Plymouth proved the “Kingdon” machinery to be *three to one ahead* of its next competitor—thus practically demonstrating its immense superiority and unrivalled advantages wherever a light, compact, and economical motor is required.

In order to show that this statement is not made at haphazard we quote the following from the Judges' report (p. 589 *Journal of the Royal Agricultural Society*, No. 111, 30th September, 1890), in which, after giving a tabular summary of Engine results, they say:—

“These figures show the enormous superiority in economy of the small compound engine to the two others. The compound engine works with half the expenditure of coal required by the single cylinder engine, and, as might be expected, as a consequence develops three times as much power per cwt. of weight of engine and boiler.”





SINGLE COMPOUND.

DOUBLE COMPOUND.

QUADRUPLE EXPANSION.

THE "KINGDON" PATENT ENGINE, FOR STEAM LAUNCHES.

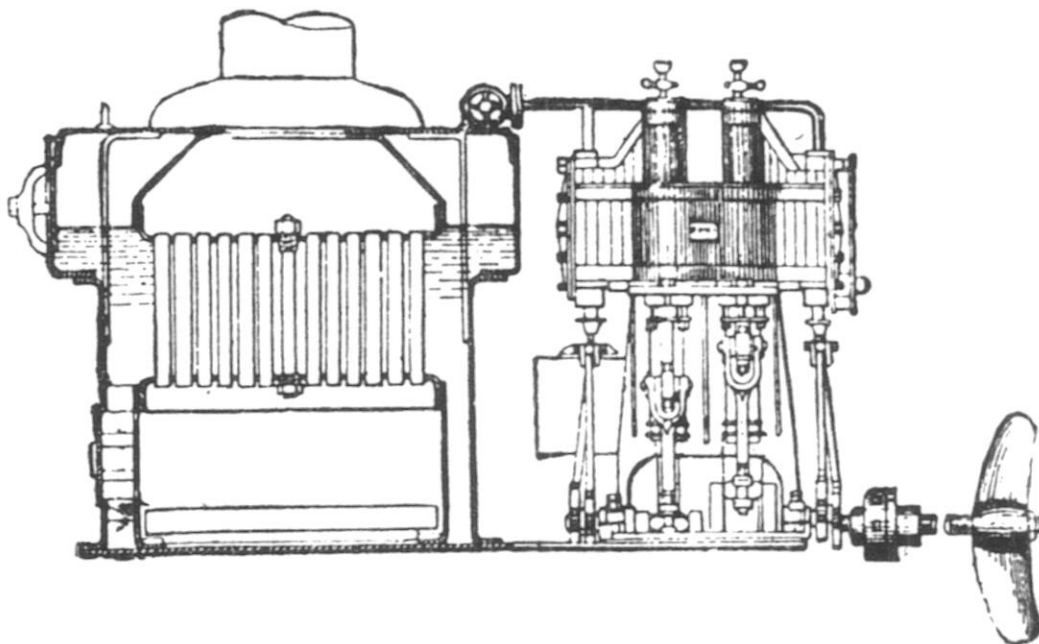


CHAPTER II.

DESCRIPTION OF THE "KINGDON" MACHINERY.

THE answer to the question, "In what respect does your Engine and Boiler differ from the ordinary kind of thing?" may be summarised by stating that the "Kingdon" Machinery is a successful adaptation of the Compound Surface Condensing principle to Marine and other Engines of small types.

General description.—The "Kingdon" Machinery consists of a simple form of Tandem Compound or Quadruple Expansion Engine and a natural draught Boiler, both of which are protected by Patent right. The Machinery is adaptable for all kinds of Steam Vessels, even to Launches of the smallest size; besides which, the recent success at the Plymouth Show has proved that it is "the Engine of the future" for Land purposes wherever a small, powerful, economical, and light Motor is required.



SECTIONAL VIEW OF THE "KINGDON" BOILER, AND ELEVATION OF DOUBLE COMPOUND
"KINGDON" ENGINES.

For Steam Launch purposes, for which it has hitherto been almost exclusively constructed, the "Kingdon" Machinery has made its mark all over the world; and has to all intents and purposes, superseded the old-fashioned type of High Pressure Engine.

When first introduced, the Engines were made Compound only. Further improvements have, however, been introduced and patented, enabling the principle of the "Kingdon" Machinery to be successfully adapted to Quadruple Expansion, thereby still further increasing the power obtainable from machinery of corresponding weight and coal consumption. Engines on the Quadruple Expansion principle are now regularly built from the smallest size, having a High-pressure Cylinder of no more than 1 $\frac{3}{4}$ -in. diameter and upwards.

The Compound Type.—The Engines are made either single or double, *i.e.*, with either one double Cylinder (arranged tandem) on one crank, or with two double Cylinders on a double crank. (*See Illustration, p. 6*).

The Simplicity will be at once apparent, as only one valve is needed to regulate the admission and emission of steam in the Cylinders, which are both double-acting, consequently there are no more moving parts than in a single Cylinder Engine.

The grade of expansion is directly proportioned to the area of the Cylinders, and there is far less loss of pressure between them than is the case in most Compound Engines, owing to the shortness of the passages, and owing also to the fact that the temperature of the steam is maintained during its passage through the valve by the live steam with which it is surrounded.

The steam is carried throughout about nine-tenths of the stroke in all cylinders, and consequently the effort on the crank is very uniform. Both pistons being on the same piston-rod, the strains on the crank shaft, due to an unequal amount of work being done in the two cylinders at different portions of the stroke, are entirely done away with.

The high-pressure piston-rod has annular grooves, which prevent any passage of steam from the high to the low-pressure cylinder on the up-stroke,* and on the down-stroke the steam is required to pass from the bottom of the high to the top of the low, and consequently any steam which is carried through in the grooves is of no consequence, the principle on which it acts being, that the steam which passes the large portions of the piston-rod expands in the grooves, and is carried back by them into the cylinder in which the high pressure exists. Thus the necessity for, and the friction of, a high-pressure gland is done away with. The friction of the engine itself is much reduced by these arrangements, thus allowing a larger proportion of power to be exerted on the screw, and consequently putting an increased speed on the boat.

The ground space occupied by these Engines is governed by the size of the large cylinder, and the height is much less than in the ordinary type of Tandem Engine. They are exceedingly easy to start or reverse, in consequence of the steam being carried throughout nearly the whole stroke.

The Quadruple Expansion Type.—In this type there are four

*In no instance has any trouble ever been experienced with this form of piston-rod, nor has any leakage been found to take place between the two cylinders. That it is absolutely tight can be proved by actual demonstration if required.

cylinders arranged in two pairs with a double crank. There are no more parts than in the double Compound Engine, described above, or in any double cylinder engine. The space occupied is the same, as the double compound "Kingdon," whilst the power exerted—space for space and weight for weight—is considerably increased. (*We give Illustrations on pp. 1 and 6 of this type.*)

As regards the principle and the details of construction, the particulars given above respecting the Compound type apply also to the Quadruple.

To give an idea of the power of these Engines, we may mention that a set of the smallest size, "A Quadruple," having cylinders $1\frac{3}{4}$ in., $2\frac{5}{8}$ in., 4 in. and 6 in. diameter, with $3\frac{1}{2}$ in. stroke, and weighing with boiler not more than 8 cwt., will develop about 10 indicated h.p. in regular work, with 175 lb. steam pressure.

Size "N," with cylinders 7 in., $10\frac{1}{2}$ in., 16 in. and 24 in. diameter, and $13\frac{1}{2}$ in. stroke, weighing with boiler about 15 tons, will develop about 200 indicated h.p. in regular work, with natural draught.

High-pressure Non-condensing Engines and Boilers to develop the same power would require double the weight of machinery, and at least double the coal consumption.

The Single Compound "Kingdon" of equal power to the "A Quadruple," would be the "C" size; this would cost as much, would weigh half as much again, and consume 25 per cent. more coal.

These figures will sufficiently demonstrate the comparative advantage of the Quadruple Expansion type, which is the latest development of the "Kingdon" Machinery.

The Feed and Air Pumps.—These form an important feature of the "Kingdon" Machinery. They are also protected by Patent right, and orders are to be addressed to THE "KINGDON" YACHT, LAUNCH, AND ENGINEERING COMPANY (LIMITED).

The Feed and Air Pumps are fitted with metal valves, are of the most solid and durable character, and are not liable to get out of order. Amongst other advantages is the important consideration that, being self-acting, the feed-pump cannot stop working while the Engine is running without attracting attention.

The Air-pump gives an almost perfect vacuum, and although driven at a high speed will maintain steadily from 25 to 27-in. In no case has it failed or given any trouble whatever until worn out.

The bottom valve of the feed-pump is formed with a long spindle, which is made a working fit in a hole bored in the pump-plunger, which spindle, becoming coated with grease from the condensed water, causes sufficient friction to lift the valve at the commencement of the up-stroke of the plunger, keeps it open during the stroke, thereby leaving a free passage for the water, and closes it at the commencement of the down-stroke, compelling the water in the pump-barrel to pass through the top valve. The bottom valve of the air-pump is made in the piston, which is allowed a small amount of vertical motion on the piston-rod, and is so arranged that, on the down-stroke, the friction of the packing against the bore of the pump raises it, thereby leaving a free

passage through the valve, and on the up-stroke presses it down, and so closes the passage, thereby compelling the contents of the pump-barrel to pass through the top valve, which is constructed of metal.

Both pumps are driven direct from the cross-head of the Engine, so that all levers and weigh-shafts are done away with, (except in machinery for the larger Launches where an independent pumping engine is found desirable), and will work perfectly at 400 or 500 revolutions a minute. There is consequently no necessity to employ gearing or other means to reduce the speed of the pump as is generally done in torpedo and quick-running launches. They are fixed in the framing of the Engine so that there are no pipes projecting in the boat.

Large numbers of these Pumps are now running in all parts of the world, and their great superiority over all others, for quick-running Engines using condensed water, has been amply demonstrated by nearly 15 years practical use.

The Condenser.—In Launches of the smaller sizes the condenser is formed of a solid drawn copper tube of "D" Section, placed outside the boat, the ends of which are fastened into suitable metal castings passing through the skin, and is so made as to be stronger and less liable to injury than any other part of the boat. It is connected at the forward end with the exhaust pipe, and at the after end with the air-pump suction. No difficulty is found in maintaining a vacuum of 25 or more inches.

No case of injury, such as to prevent their working, has ever been known to occur to one of these outside Condensers. The simple condensing arrangement by an outboard pipe, which is fitted to all the "Kingdon" Launches, unless otherwise specified, to a great extent obviates the necessity for using fresh water, which, in Non-condensing Engines when used in salt water, often causes much inconvenience and expense. In the "Kingdon" Patents, the steam being condensed and the same water used over and over again, a small tank of fresh water is sufficient to keep the boiler supplied for several days, without fear of injury to the boiler from "salting."

The Kingdon Boiler.—This is vertical, and with the exception of the "A" and "A B" sizes, it has the *tubes entirely immersed*. The sectional illustration, which we give on p. 7, will explain the method of construction, and the principles on which it is designed are as follows:—

It is so made that the diameter is practically equal to the height, and therefore its centre of gravity is as low as a horizontal one. From its formation, it has a very large steam space and water surface, which obviate all tendency to prime. The tubes, being proportionally smaller as the depth of water through which they pass is less, cause the products of combustion to pass off at a very low temperature, extracting the maximum of heat out of the fuel and so effecting great economy. The large size of the fire grate enables it to raise steam very quickly, (in average sized launches the time being only 20 minutes to half an hour), and to sustain a full head with a VERY MODERATE NATURAL DRAUGHT, thereby saving an immense amount of wear and tear in

the boiler, and securing an entire freedom from smuts, which are found so objectionable where a forced draught is used. From its formation, it is very easy to construct and repair, and will carry a high pressure in proportion to its weight. The quantity of water in it is small for the power developed, but from its shape a considerable alteration in the amount of water in the boiler can take place without materially affecting the water level. It is impossible for the boiler to get short of water without attracting attention, owing to the pump being self-acting. It will supply a good head of steam for an hour or more without firing. It is fitted with a water ash-pan, which prevents dust and dirt, and enables the fire-bars to last many months. We may also state that it is utterly impossible to cause an explosion through want of water in the boiler. If the water gets too low experience has proved that the tubes will melt and extinguish the fire.

From the shape of these boilers the strains are so equally divided that no case of a cracked plate has ever been known to occur. It is also lighter in proportion to the power given out than ordinary launch boilers, and occupies far less space in the boat. Having a large fire-box and grate surface, the boiler, as we have already pointed out, is well adapted for burning wood.

The excellent steaming qualities of the "Kingdon" Boiler and the economy of the Engines render the use of a steam jet unnecessary, and there is, therefore, the freedom from the smuts and noise which are so frequently a source of great annoyance and which we have already referred to; in addition to which, all loss of fresh water from this cause is obviated.

Where exceptionally large power is required, and weight limited, a small fan-blast can be fitted, with excellent results.

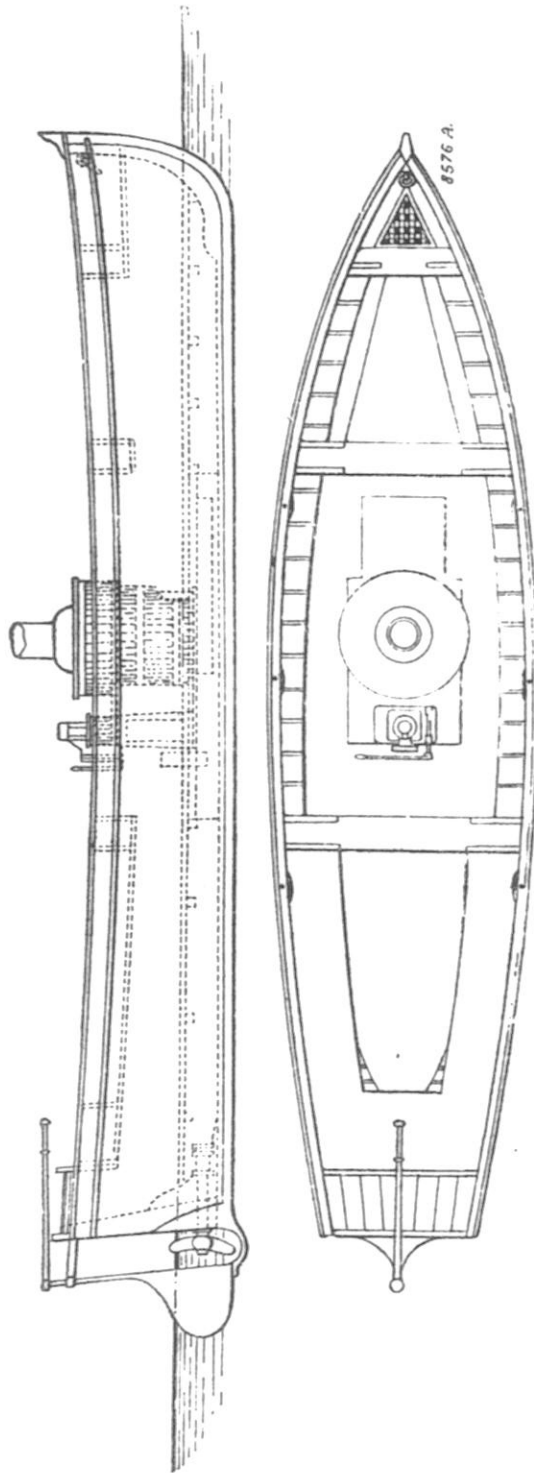
Workmanship and Materials.—All the working parts of the Engines are constructed of the best quality of mild Siemen's Steel. The Boilers, also (excepting the tubes), are of the same quality of steel.

Only one quality of work is turned out, and neither expense nor trouble is spared to make the "Kingdon" Machinery as perfect as possible; and it is believed that the prices will be found lower than any others for the same class of work.

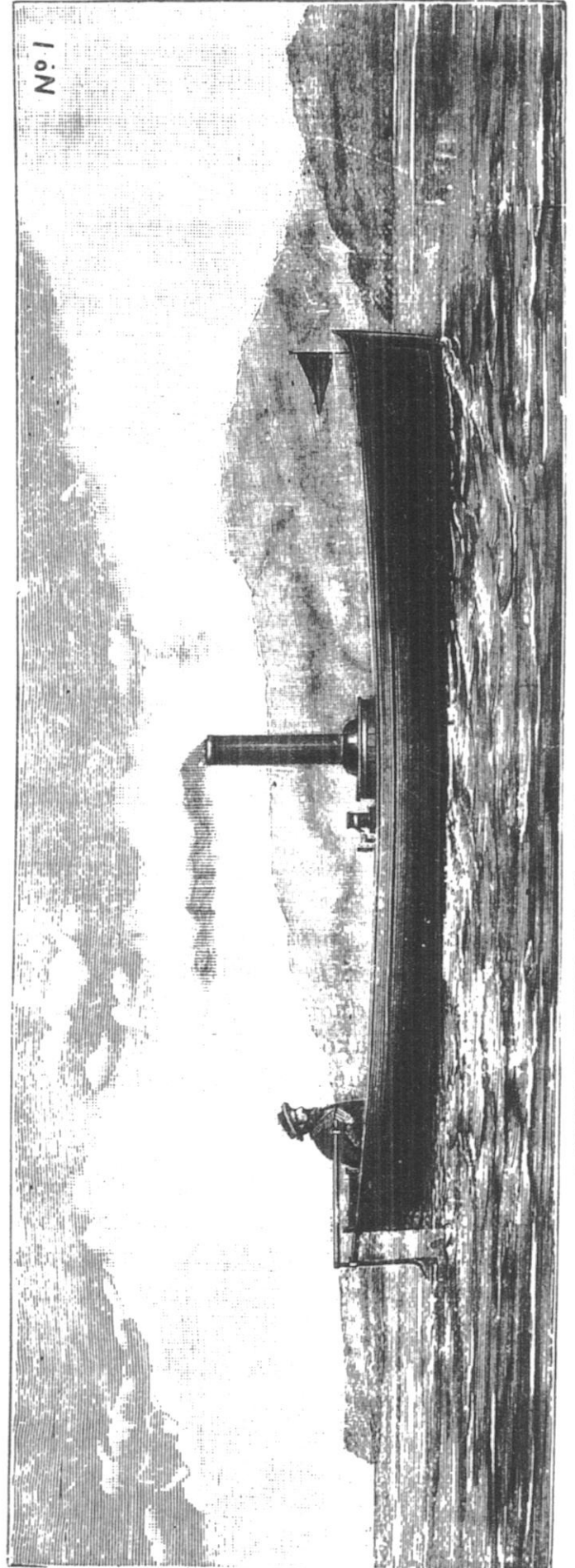
The prices given include lagging the Boiler with hard wood and fastening with brass bands. All pipes are of copper, and unless otherwise specified, an outside copper Condenser is supplied, as previously stated.

The "Kingdon" Machinery is built to the requirements of the Board of Trade and Lloyd's when required, the buyer paying the extras fees and expenses.





PLAN AND SECTION.



GENERAL VIEW OF YACHT'S STEAM DINGHY.—(Type No. 1).



CHAPTER III.

SOME TYPICAL DESIGNS OF LAUNCHES, YACHTS, AND OTHER CRAFT FITTED WITH THE "KINGDON" MACHINERY.

IN giving the following selection, we desire to point out that the types of boats we describe do not by any means represent the whole of the designs of the "Kingdon" Yacht, Launch, and Engineering Company (Limited); we select only a few out of the many hundred types of boats which have been actually built and fitted with the "Kingdon" machinery. We are prepared to submit designs of craft up to about 150 feet long, suited for any purpose, whether for sea or river use, and whether for business or pleasure. We can alter or modify any of our designs to almost any extent to meet customer's wishes, and shall be glad to supply estimates and drawings of Launches or other Craft (without charge to intending buyers), arranged to meet the special requirements of each case. The Nos. given in the following descriptions correspond with those in our Price List. (The price list is issued separately, and will be forwarded to intending buyers on receipt of card.)

TYPE NO. 1.

Yacht's Steam Dinghy.—On page 12 we give an illustration, with the plan and section of a Yacht's Cutter, suitable for carrying in a yacht of 40 tons and upwards.

The Dinghy is Carvel or Clincher built, and is constructed of pine or mahogany, as may be desired. Dimensions, 16 ft. by 4 ft.; speed, about seven miles, with the "Kingdon" " $\frac{1}{2}$ A" size Patent Single Compound Surface Condensing Engine, having one high pressure and one low pressure Cylinder, and the "Kingdon" Patent Boiler. It has been specially designed to meet the case of yachts of small size which cannot carry a Launch of the ordinary kind, and so supplies a want long felt. On account of the lightness of the machinery, it can be easily removed from the boat in two or three minutes, or the boat can be hoisted in davits with it in, if preferred. A small cutter so fitted is found most useful for towing in calm weather, and tows with at least as much power as two four-oared gigs.

Notes as to the " $\frac{1}{2}$ A" Machinery.—The " $\frac{1}{2}$ A" single compound size, recommended for the above description of boat, is by far the smallest size of compound machinery in the market. The total weight is $4\frac{1}{2}$ cwt. Its lightness and compactness renders it especially convenient where land portage is required, as the heaviest portion can be slung on the shoulders of two men.

This machinery (" $\frac{1}{2}$ A") can be used for boats from 14 ft. up to 30 ft. for light river boats, the speed being considerably increased in the longer boats.

TYPE NO. 2.

Yacht's Steam Gig.—A very useful size, and one suitable for carrying on a yacht of 60 tons and upwards, is of the following description, viz:—Length, 21 ft.; beam, 5 ft.; draught, 14 in. Carvel or Clincher built of pine or mahogany. Speed about 8 miles per hour, with the "A" single Compound Surface Condensing Engine, and the "Kingdon" natural draught boiler.

These steam gigs are chiefly supplied for yachting purposes, and a very large number, fitted with the "Kingdon" machinery, have been supplied to yacht owners in this country as well as abroad with the most satisfactory results. A yacht of 60 tons carried a 21 ft. steam gig with this machinery on a voyage across the Bay of Biscay without inconvenience, although forced by hard weather to lay-to for four days. A 24 ft. yacht's gig of this type has been steamed, unaccompanied, from Dartmouth to Antwerp, in charge of two men who had never seen one of the Launches before the day they left with her. A Launch of this kind is invaluable for towing purposes in the case of a calm, or for canal or river work. As an example of the power of one of these Launches, fitted with the size of machinery named, it may be mentioned that a yacht of 163 tons (yaw) was towed by her 21 ft. steam gig, as here described, for distances of 20 and 30 miles at a time, on the Thames and on the Caledonian Canal.

An Account of the performances of these small Launches, fitted with the "Kingdon" machinery, in Steam Launch Races at Dartmouth Regatta, open to all comers, where they have always won, appeared in the *Field* of Sept. 6th, 1884; Sept. 5th, 1885; Sept. 11th, 1886; and Sept. 4th, 1888.

Notes as to the "A" Machinery.—The "A" size Patent Single Compound Surface Condensing Engine, recommended for this class of boat, is suitable for gigs from about 18 ft. to 30 ft. in length. It is also frequently fitted into yacht's four-oared gigs up to 24 ft. or 27 ft. in length, the longer length giving increased speed.

Another purpose for which the "A" size is very suitable is as an auxiliary for a small yacht, when used in a tidal harbour or for fishing. Very little room is taken up, and the machinery, when cased in, forms a small table about 2 ft. high in the well, without interfering with the accommodation. The machinery is of sufficient power to drive a sailing boat 24 ft. by 7 ft. 6 in., about 6½ miles an hour. An account of a "Small Auxiliary Yacht," fitted with this machinery, appeared in the issue of the *Field* of 27th February, 1886.

The machinery is fastened to the Steam Gig by four gun-metal corner-plates, with screw bolts, so as to be removeable with ease. If required, the boat can be arranged for hoisting in davits with the machinery in position, so that it can be lowered with steam up. The compactness of the machinery renders it easily stowable on deck, or even below.

The Boiler is 2 ft. diameter, and stands only 2 ft. 1 in. above the boiler bearers. The Engine occupies a space of 1 ft. 6 in. in width, by 9 in. in length,

and the total weight of the machinery is about 7 cwt. Being light, the machinery can easily be transported overland if necessary.

The Boiler is adapted for burning wood, and this advantage, coupled with the exceedingly small consumption of fuel in the "Kingdon" machinery, renders one of these Launches especially suited for foreign work where land portage is necessary or fuel scarce.

The following is an extract from a letter written by the captain of a yacht carrying one of the above 21 ft. steam gigs. It gives an account of the practical working of the "Kingdon" machinery under the rough conditions of exploring work in the rivers of South America. The letter is dated, Rio de Janeiro, 4th January, 1884, and the writer says:—

"She has done a deal of work in the River Plate, as I have been away from the ship 30 days at a time in her, surveying all the small rivers about here. Burning nothing but wood cut from the river banks as required. I can safely say that since entering the River Plate she has steamed quite 1,500 miles, and towed our gig, loaded with tents and stores astern, making an average three knots against the strength of the Parana."

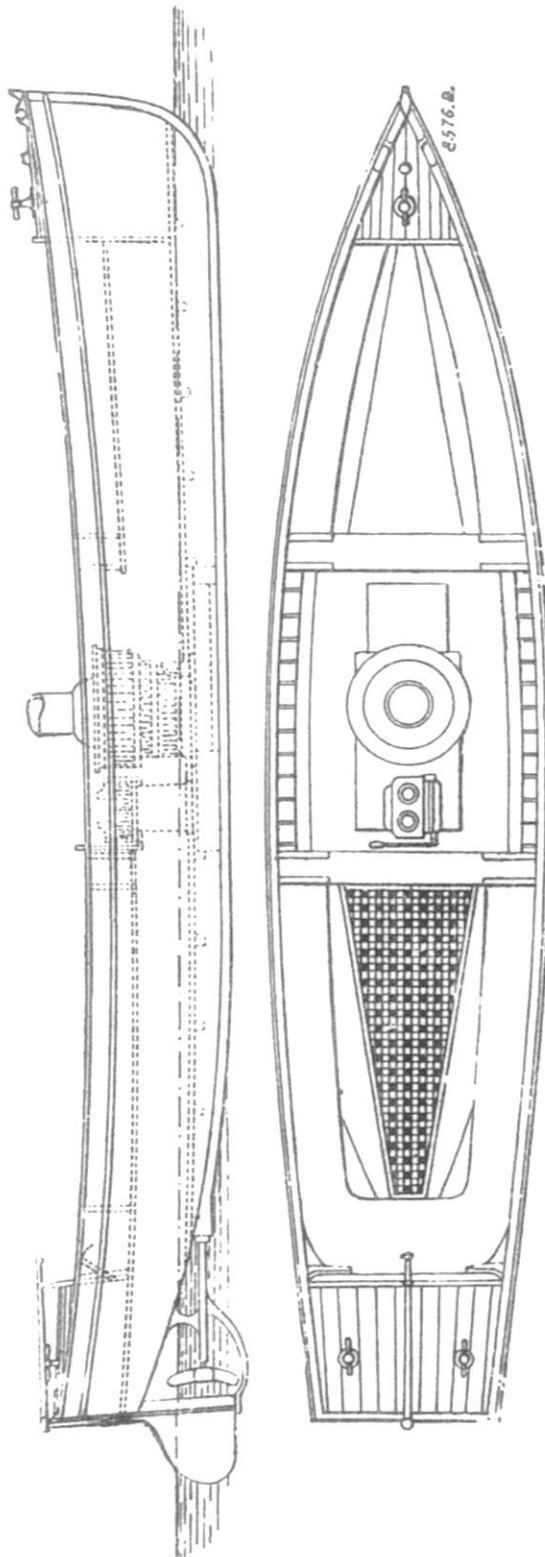
TYPE NO. 3.

Yacht's Steam Launch.—The illustration on page 16 represents a Yacht's Launch of the following dimensions:—length, 27 in.; beam, 5 ft. 8 in.; depth, 2 ft. 8 in. It is built in either pine or mahogany, and either Carvel or Clincher as may be desired. The stern is built either cut-a-way as shown, or screw-in-well, if preferred, at the same price.

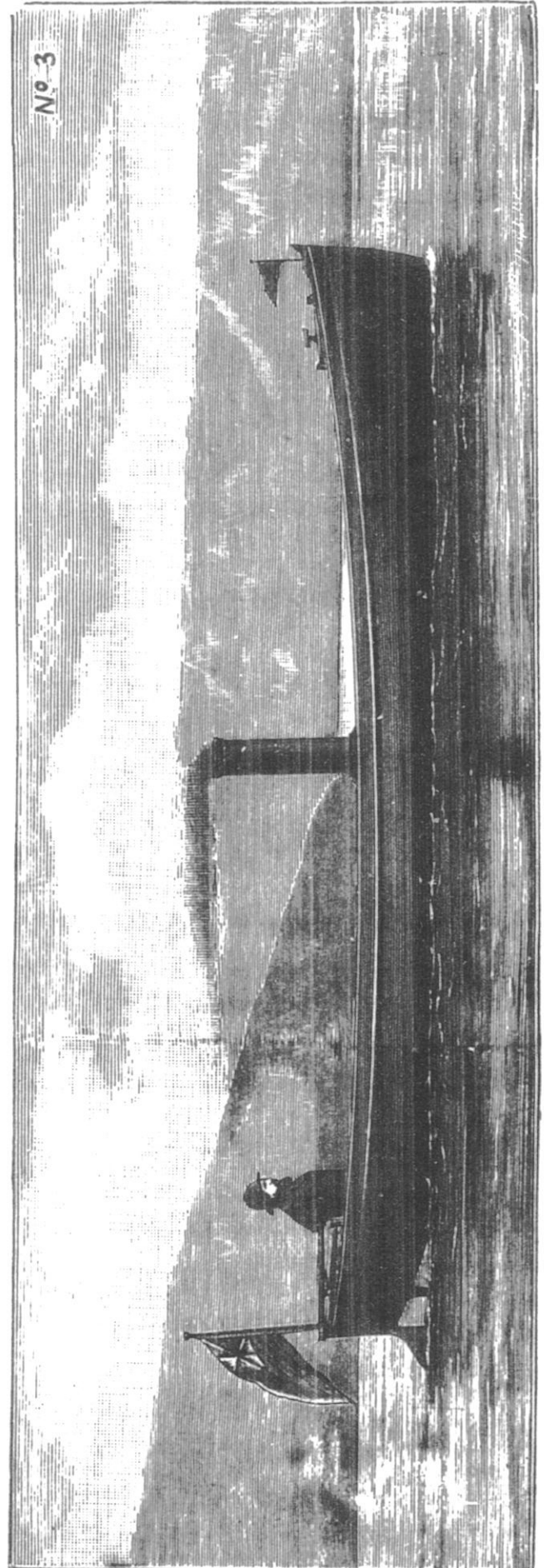
The speed is about $9\frac{1}{2}$ miles an hour with the "Kingdon" patent "A Quadruple" Engines and Natural Draught Boiler.

Notes as to the "Double $\frac{1}{2}$ -A" and "A Quadruple" Machinery.—This size is suitable for Launches from about 20 to 35 ft. long, and of varying beams, according to the service for which they are intended. Of the two designs, we strongly recommend the "A Quadruple." This size machinery has to a great extent superseded the single engines for the smaller sized boats, and we can confidently recommend it as being the best machinery for Launches belonging to yachts from 100 to 300 tons. The Steam Launch races at Dartmouth Regattas, 1887, 1888, 1889, and 1890, were won by Launches fitted with this machinery.

The "Double $\frac{1}{2}$ -A" Compound Engines have two high-pressure and two low-pressure cylinders, and the "A Quadruple" have four cylinders, respectively $1\frac{3}{4}$, $2\frac{1}{2}$, 4, and 6 in. in diameter, the boiler being 2 ft. 6 in. wide by 2 ft. 1 in. high, and the total weight of machinery about 8 cwt.



PLAN AND SECTION.



GENERAL VIEW OF YACHT'S STEAM LAUNCH. - (Type No. 3)

TYPE NO. 4.

Yacht's Launches from about 23 ft. long and upwards.—

The design shown on page 18 is suitable for Launches from about 23 ft. to say 33 ft. long. Our drawing represents one 27 ft. by 6 ft. beam. It is either Carvel or Clincher built, and of pine or mahogany as may be required. The stern is either cut-a-way or screw-in-well, as preferred, at the same price. Launches of this description are very suitable for carrying on yachts of 150 to 100 tons.

The speed with the "A B" "Kingdon" Patent Machinery, either the Double Compound or the Quadruple Expansion design is about $9\frac{3}{4}$ miles; the advantage in weight and economy being in favour of the latter.

In some cases Launches of Type No. 4 are supplied with a Single Engine and the same size Boiler. This reduces the cost about £25.

Notes as to the "AB" Machinery.—The "AB" size, recommended for these Launches, was introduced as an intermediate between the "Double $\frac{1}{2}$ -A" and the "B."

TYPE NO. 5.

Yacht's Steam Pinnace.—Boats of this type are suitable for carrying on Yachts or Steamships of 200 tons and upwards, and are specially useful when required for towing, and similar heavy work. A good specimen of this type is a Launch 27 ft. long, 6 ft. beam, and 3 ft. deep. Such a Launch can be carried in davits, with machinery in place, or the latter can be removed and stowed separately if lightness is an object. In the former case the boat can be lowered with steam up. From her good sea-going qualities, a boat of this description is of great service for a large yacht or for commercial purposes.

When required, these boats can be fitted with air cases of wood or copper (the latter being strongly recommended), making the boat unsinkable.

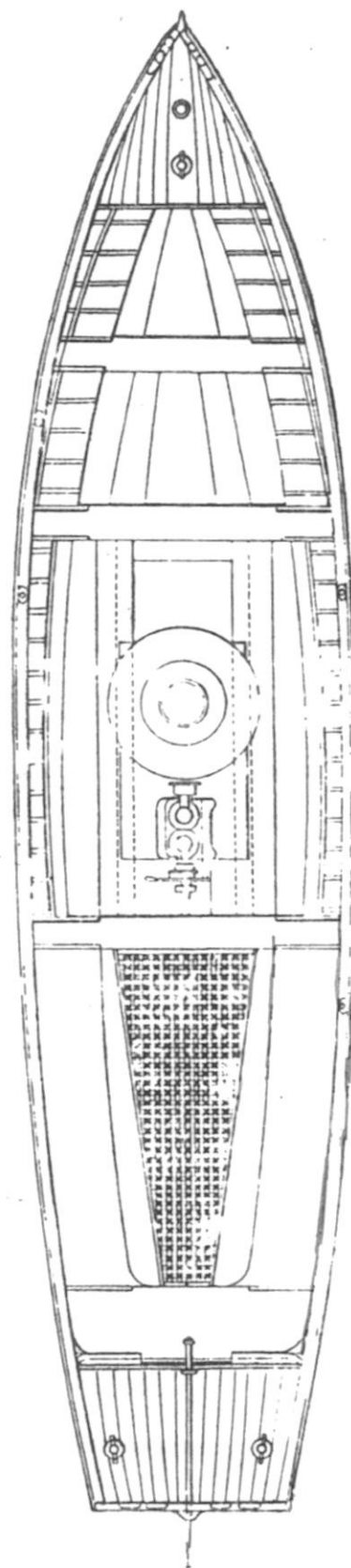
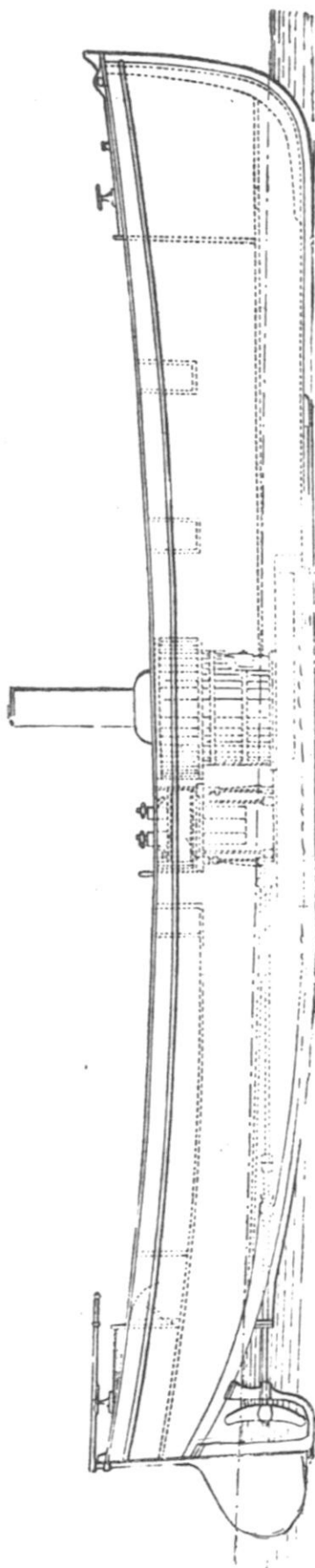
They are either Carvel or Clincher built, and of pine or mahogany as may be required. The stern is either cut-a-way or screw-in-well as preferred, at the same price.

The speed with the "B" size "Kingdon" Quadruple Expansion Machinery is about $10\frac{1}{2}$ miles per hour.

The following is a report as to the working of one of the No. 5 type of Launches fitted with the above machinery. It is dated 30, Great St. Helen's, London, 6th February, 1885, and is signed by A. Alliman. The letter is addressed to Messrs. Simpson and Denisons, and states:—

"It will not be without interest to you to know that I have received from St. Petersburg an official communication to the effect that the Steam Launch you built to my order last October, and which is destined to be part of the equipment of one of the Imperial Yachts, has been tried on the Neva, and has given entire satisfaction.

"During the trial were on board the "Minister of Marine," the Chief Engineer of the Navy, and the Manager of the Baltic Iron Shipbuilding and Engineering Company, St. Petersburg."



PLAN AND SECTION OF YACHT'S STEAM LAUNCH FROM 23 FT. AND UPWARDS,--(Type No. 4).

Notes as to the "B" size Machinery.—This size machinery is suitable for sea or river Launches of from about 25 to 36 ft. long, with a speed of about 10½ miles an hour. When ordinary Launch work is required approximately, the same speed will be attained with a size smaller machinery.

The "B" size is made either Double Compound or Quadruple Expansion, and "Kingdon" Natural Draught Boiler is supplied with it. The Quadruple design is lighter, burns less coal, and is therefore decidedly the best.

In some cases a Single Compound Engine is supplied, and the cost of this, with the same size boiler as above, is about £25 less.

TYPE NO. 6.

Merchant Vessels' Steam Cutter.—This type of Launch is somewhat similar in style to No. 5, but is a larger and more powerful seaboat. A size suitable for carrying with a large sized yacht or steam vessel of 400 tons and upwards, or for coasting work, is of the following dimensions, viz.:—length, 30ft.; beam, 7ft.; draught, 2ft. 3in.

The Launch is usually built in pine, and is fitted with the "E" size "Kingdon" patent single compound surface condensing engine, having one high-pressure cylinder and one low-pressure cylinder, and the "Kingdon" patent vertical boiler.

Three Launches, fitted with the "E" Single Machinery, are now in use with the Steamships of the Netherlands' India Steam Navigation Company, Limited, with excellent results. The following letter may be interesting, being the report received from the Engineer in charge, as to the practical results obtained from actual working on Foreign Service:—

HONG KONG, 27th December, 1884.

TO THE MARINE SUPERINTENDENT, N.I.S.M.

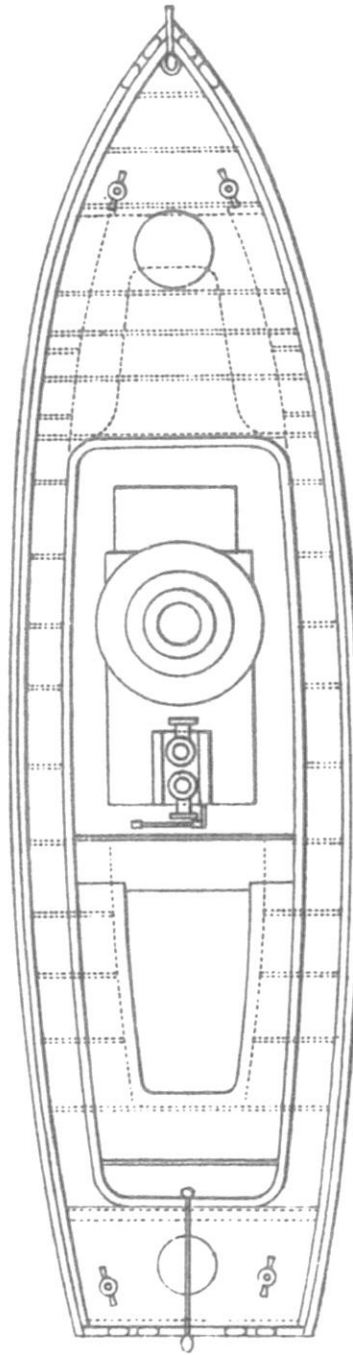
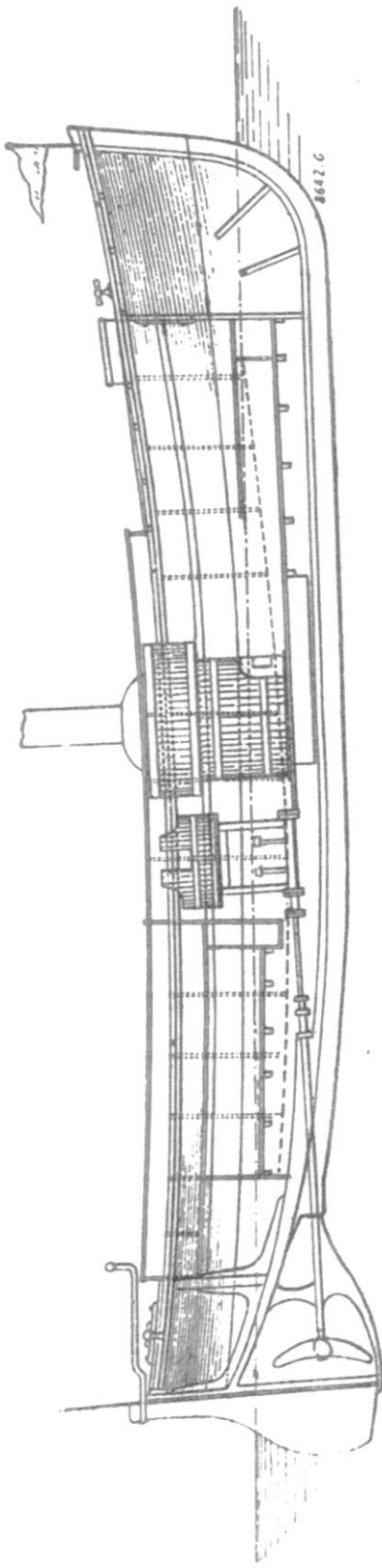
SIR,—I have much pleasure in reporting the abilities of the "Celebes" Launch. The Engines and Boiler are so complete and efficient in the construction, causing so little trouble, and the propelling power so good, that I have never seen anything to equal them. I may add that here in Hong Kong the Launch has been admired on account of its miniature compound principles.

I remain, yours obediently,

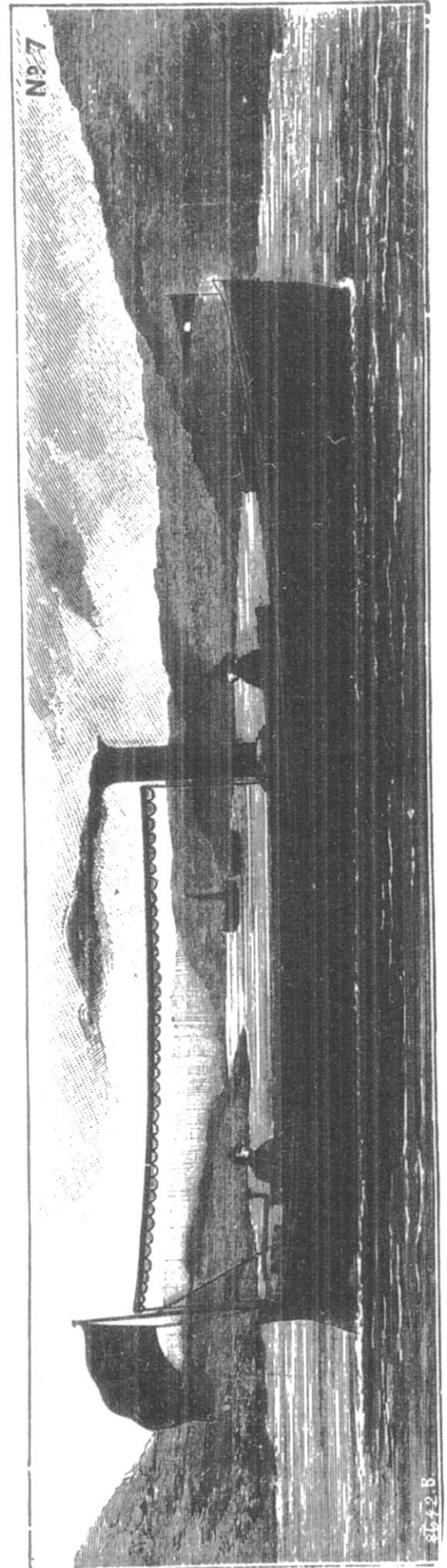
(Signed) A. RITCHIE,
Engineer, s.s. "Celebes."

Notes as to the "E" size Machinery.—This sized Machinery is suitable for Launches from about 25 ft. to 36 ft. in length. Owing to possessing fewer moving parts and greater simplicity, as well as being lower in price, it was formerly frequently preferred for commercial purposes, and in cases where a Launch was required by Steamships, but is now almost entirely superseded by the double crank Quadruple "Kingdon" Engines.

The Machinery can be arranged in the boat so that the Engine and Boiler can be taken out together; or, the Engine can be left in the Launch and the boiler removed; or, again, the Launch can be arranged to be lifted with the Machinery in, so that she can be lowered from davits with steam up.



SECTION AND PLAN.



TYPE NO. 7.

Man of War's Steam Cutter.—The illustration on page 20 represents a 30 ft. Service Cutter, as supplied to H.M.'s Navy. It is built with a double skin of mahogany, and the dimensions are:—length, 30 ft.; beam, 7 ft.; draught, 2 ft. 4 in.

A Cutter of this description has been supplied for H.M.'s Yacht "Osborne," and fitted with the "D" size Double Compound "Kingdon" Machinery. Stern cut away, as shown, but the latter can be built with screw-in-well, if desired, at the same price.

This Launch has very powerful sea-going qualities, as she is fitted with air chambers, rendering her unsinkable, and she has also comings fore and aft. Such a Launch is especially serviceable in cases where it is necessary to be away from the ship for any length of time, owing to the small consumption of fuel with the "Kingdon" Machinery.

Notes as to the "D" Size Machinery.—This is suitable for Launches for various kinds of work, from about 30 ft. to 40 ft. long, having speeds up to twelve miles an hour.

The "D" size is made of the Double Compound design, or the Quadruple Expansion, and the "Kingdon" Patent Boiler is supplied with it.

A single Compound "Kingdon" Engine, with the same size boiler, can be supplied at a reduction of about £35.

TYPE NO. 8.

Powerful Sea-going Launch.—The illustration on page 22 represents a Launch 43 ft. by 8 ft. She has cabin aft, with w.c. and lavatory, and is decked in forward to make a forecastle. This is a type of a good and powerful sea-boat, roomy and comfortable, and well suited for sea-fishing and shooting, at a moderate price. She is usually built of pine, and the speed is $9\frac{1}{2}$ to 10 miles an hour, fitted with the "G" size "Kingdon" Patent single Compound Surface Condensing machinery.

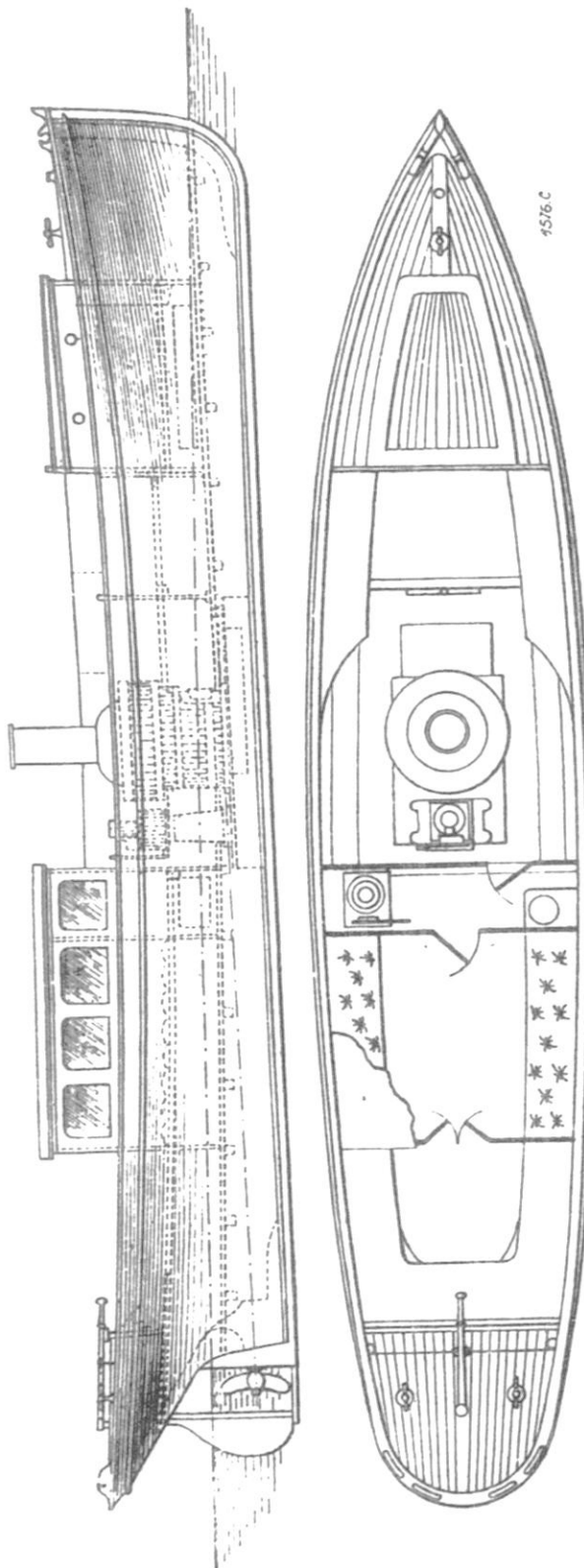
Notes as to the "G" Size Machinery.—This machinery is adopted for Launches of this description, on account of its great simplicity and cheapness.

TYPE NO. 9.

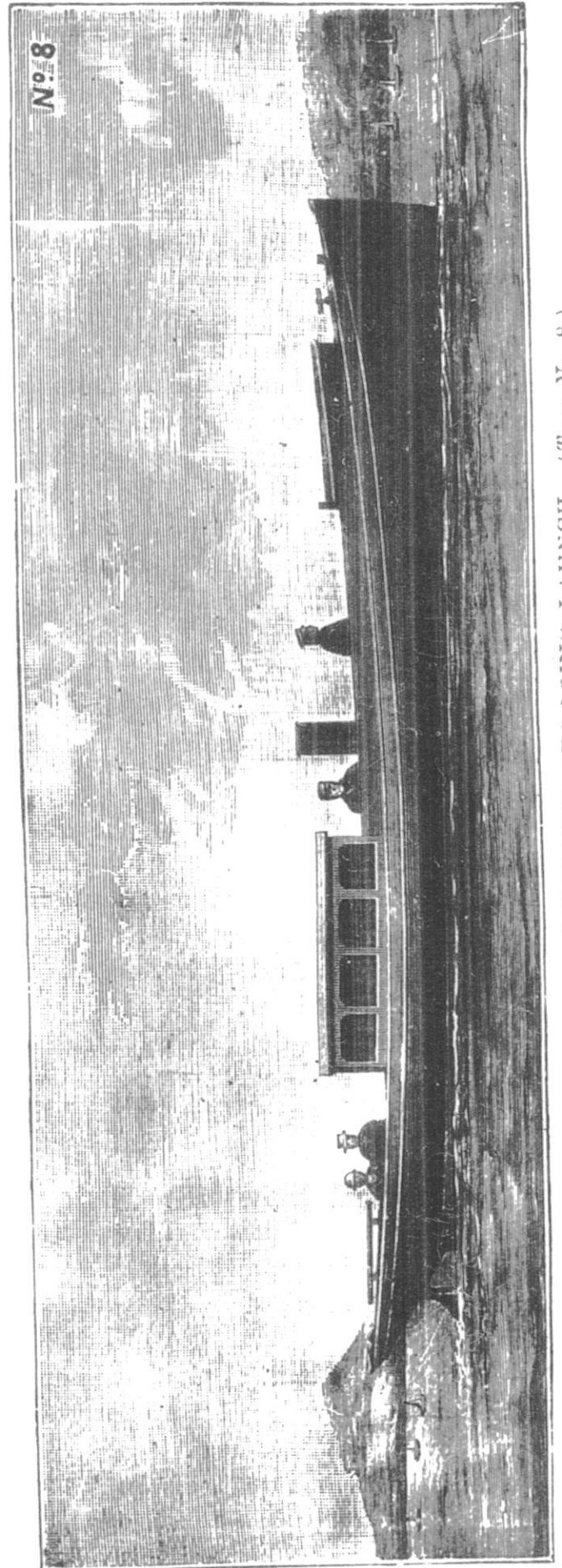
Fast and Powerful 50 ft. Launch.—We show on page 23 a design of a fast and powerful Launch, suitable for sea and river work. She is shewn with cabin aft, and a screen forward to protect the steersman. This screen is not required in fine weather or in river work, and is made removeable.

This boat is built of pine, teak, or mahogany, as may be required, and having a cut-away stern is very handy. She will turn in her own length, and is moreover a good sea-boat.

This boat has a speed of about 13 miles an hour, with the "Kingdon" "F" size Quadruple Expansion machinery, and the "Kingdon" Natural Draught-Boiler.

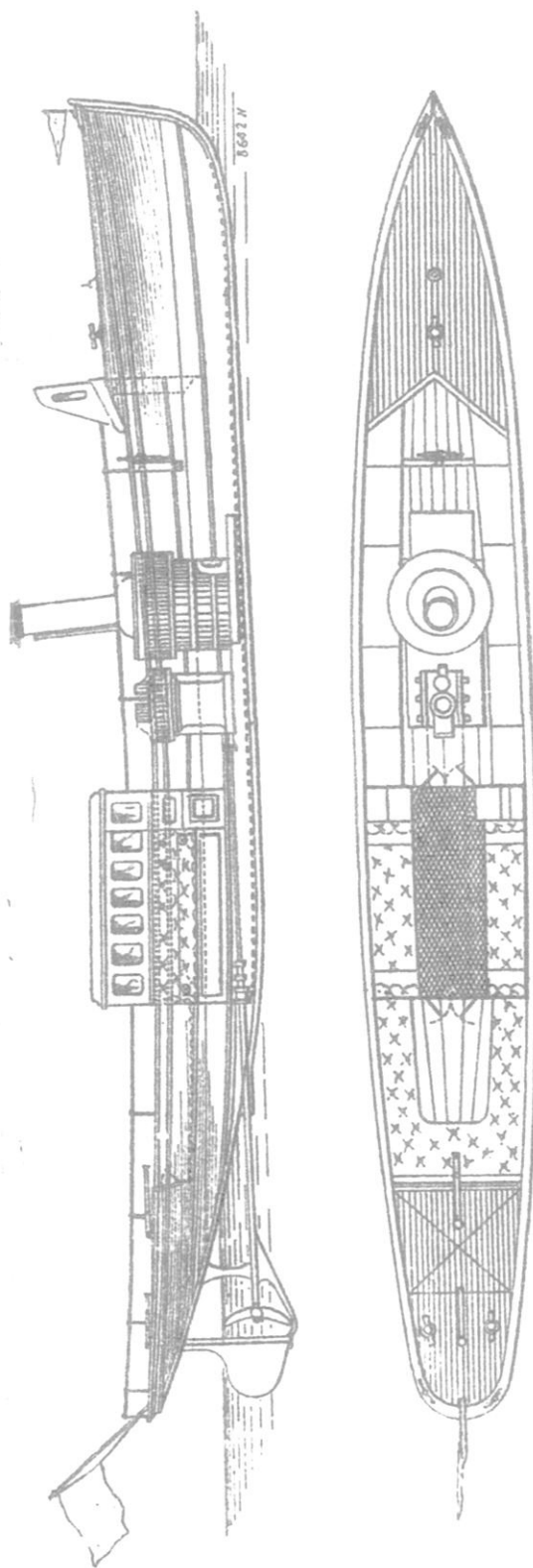


PLAN AND SECTION.

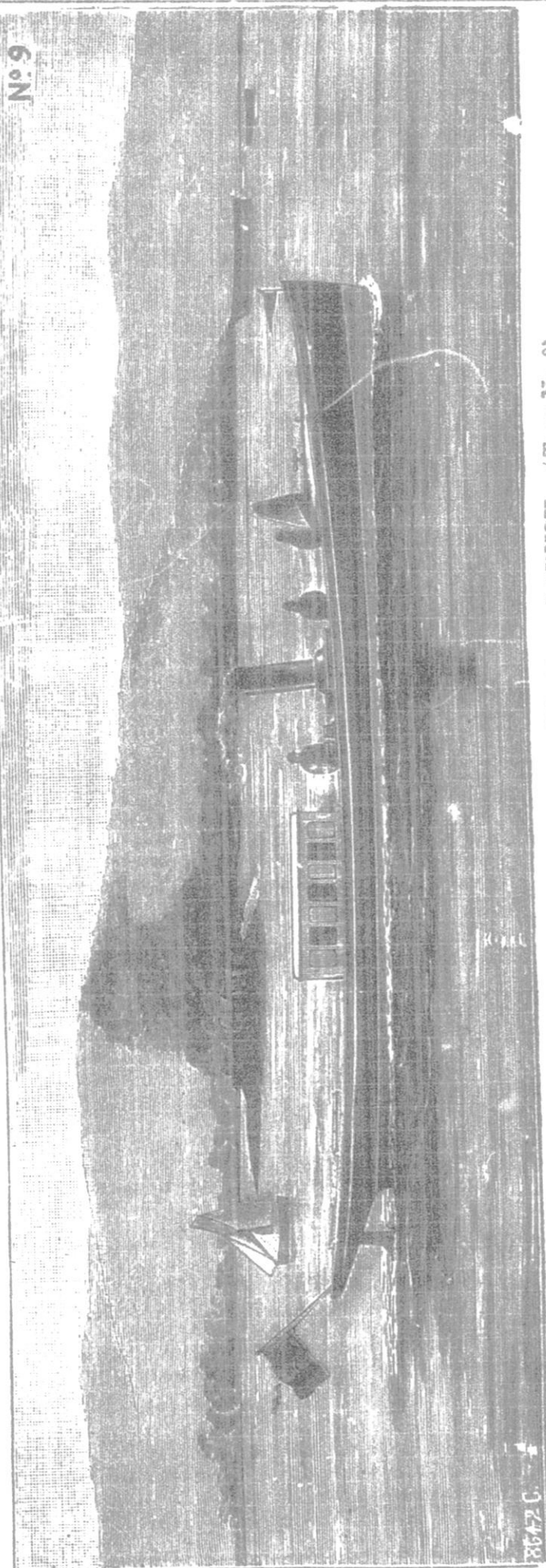


GENERAL VIEW OF A POWERFUL SEA-GOING LAUNCH.—(Type N^o. 8.)

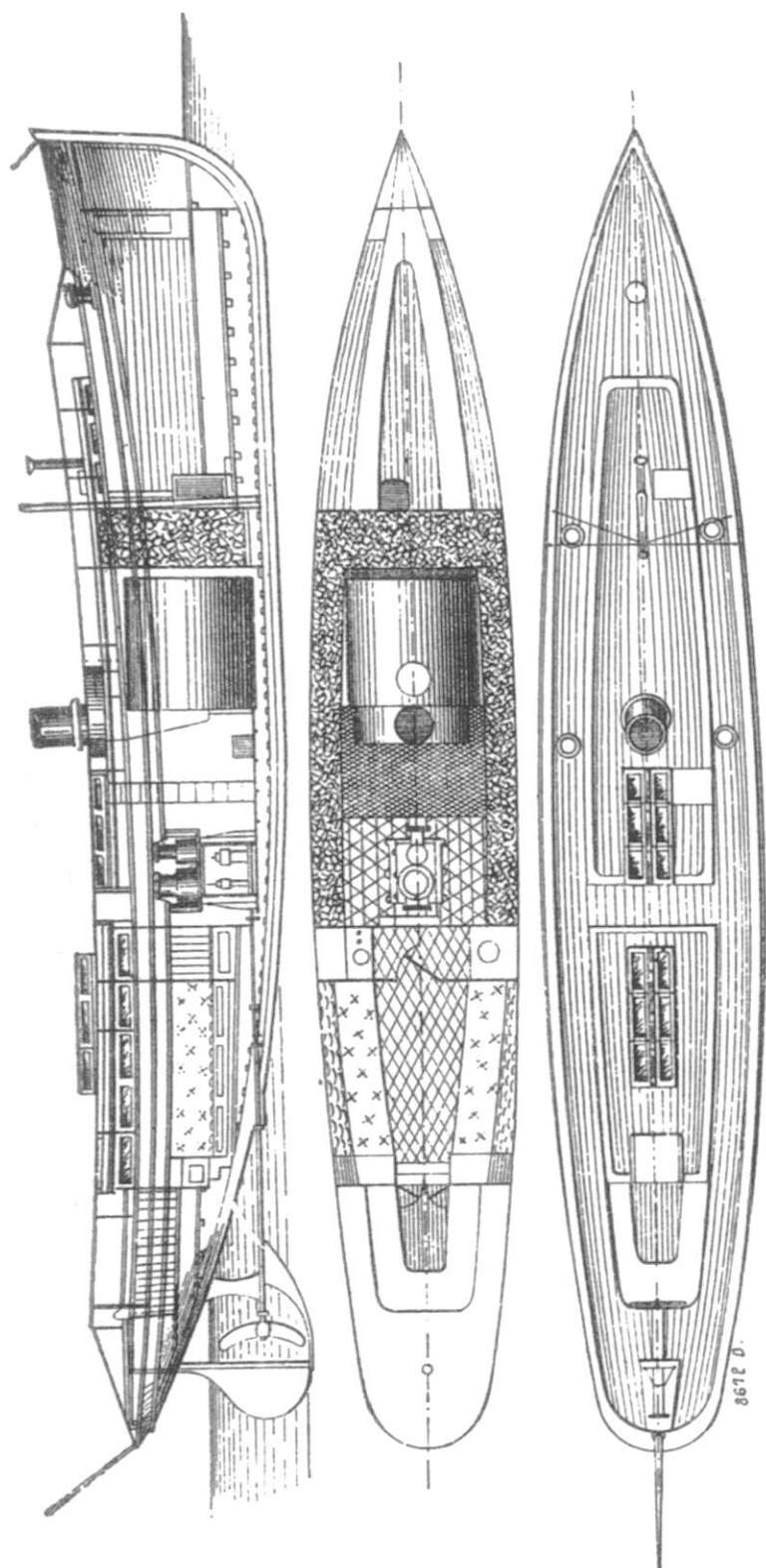
GENERAL VIEW OF A POWERFUL SEA-GOING LAUNCH.—(Type No. 8.)



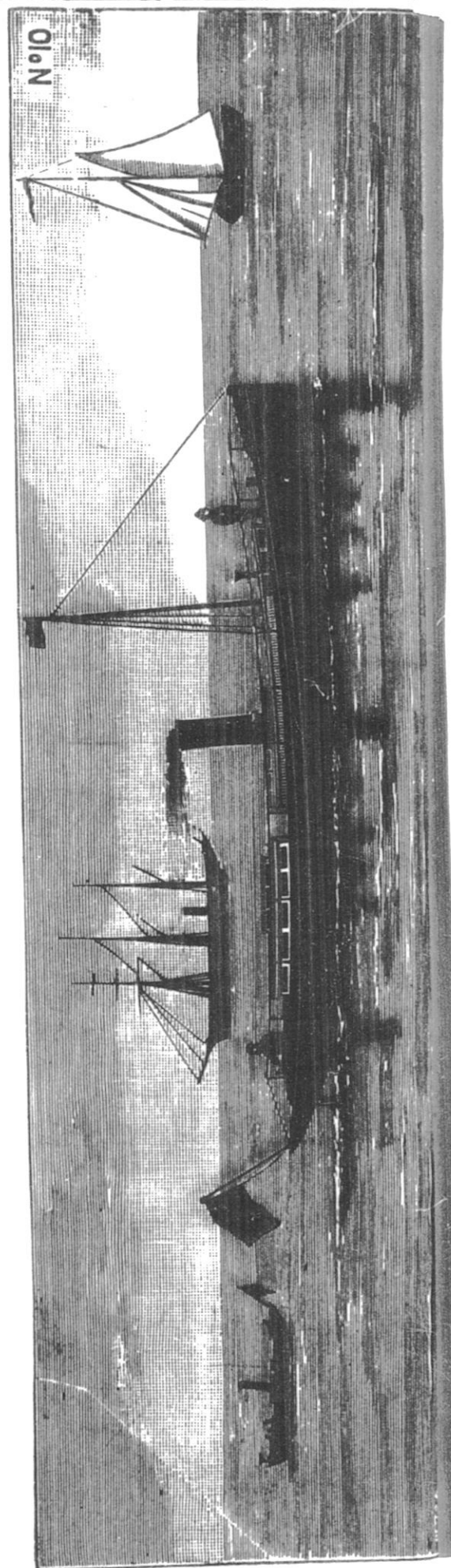
PLAN AND SECTION.



GENERAL VIEW OF FAST AND POWERFUL 50 HP. LAUNCH.—(Type No. 9.)



PLANS AND SECTION.



TYPE No. 9—continued.

Estimates will be given for the Launch as an open boat when required. The cost of fitting a teak cabin with plate-glass windows is from about £30.

Notes as to the "F" size Machinery.—This size is made either of the Double Compound or the Quadruple Expansion design of Engine Surface Condensing, and the Boiler is the "Kingdon" Patent Natural Draught.

It is suitable for boats of all classes from about 40 ft. to say 55 ft. long, having speeds up to about 13½ miles an hour.

A Single Compound "Kingdon" Engine can be supplied with the same sized boiler, to drive Launches of this No. 9 type, at a reduction of about £40.

TYPE NO. 10.

25-Ton Steam Yacht.—On page 24 we show a small Steam Fishing Yacht, decked, with well aft, capable of standing heavy weather. She is rigged with mast and sail; has a large cabin aft; the accommodation for the crew is forward, and is unusually large; the owner only requiring her in the day-time.

This type of boat is well suited for towing purposes, and will be found most useful as a tender to large sailing yachts. It can be built with cut-a-way stern or with screw-in-well, as may be preferred, at the same price.

The speed is about 12 miles, fitted with the "J" size "Kingdon" Patent Quadruple Expansion Surface Condensing Engines, and a Return Tube Boiler.

The price is given approximately for the boat built in pine, and the actual cost will vary with the fittings, &c., required.

Notes as to the Machinery.—The machinery recommended above for this type is suitable for boats of from about 15 to 35 tons. The "Kingdon" Patent Compound Engines can be supplied instead of the Quadruple Expansion at a somewhat lower price.

TYPE NO. 11.

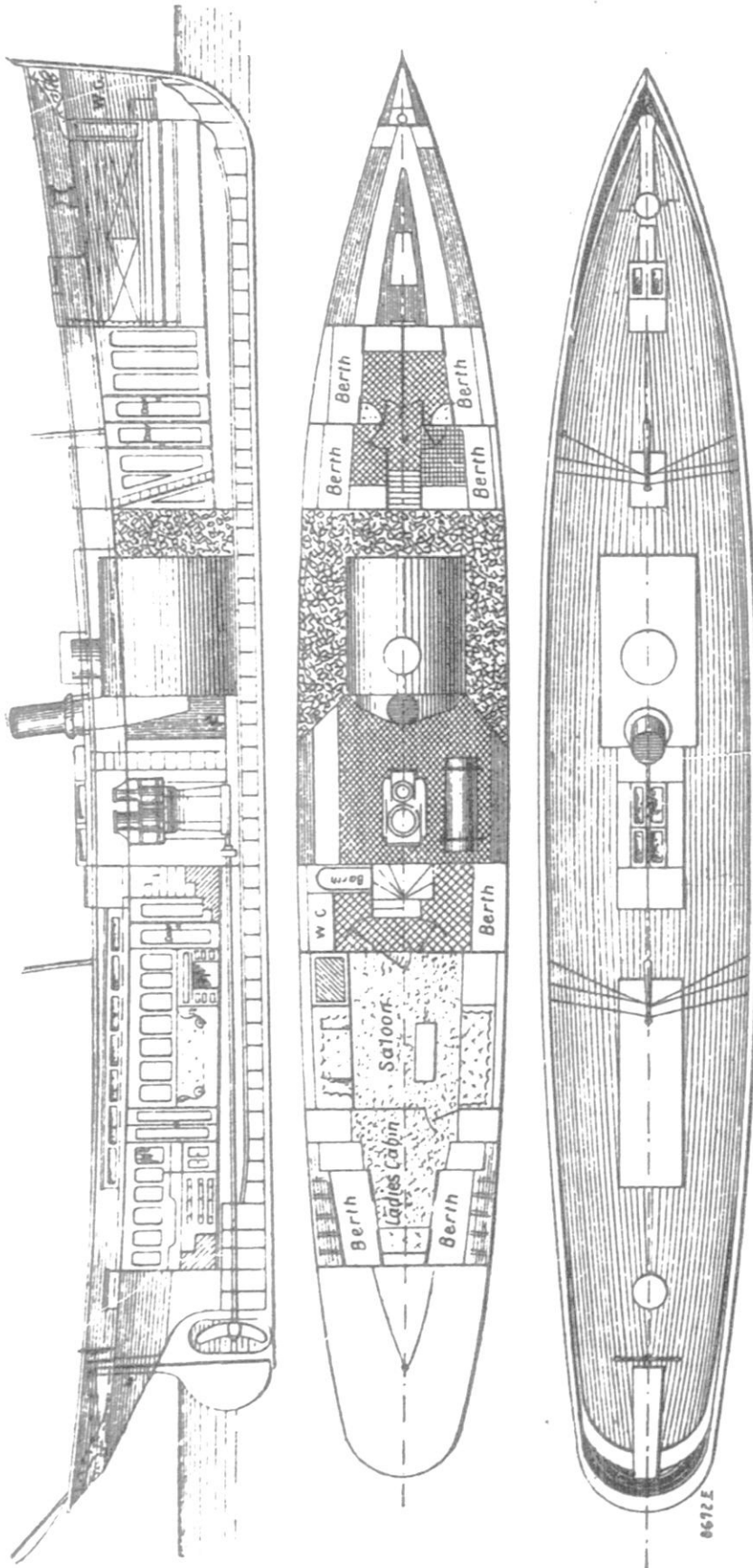
70-Ton Steam Yacht.—On page 26 we represent a small Steam Yacht suitable for rough weather, and of moderate draught, so as to be able to enter small harbours without difficulty. It is built either in iron, steel, or wood, according to requirements. The cabin arrangements can be made in any way to suit the purchaser's wishes. The boat is schooner-rigged.

The machinery is a pair of the "Kingdon" Patent Tandem Quadruple Expansion Surface Condensing Engines, Return Tube Horizontal Boiler, Inside Condenser, and Centrifugal Circulating Pump on the Main Shaft, of sufficient power to drive the boat at a speed of about 11 knots.

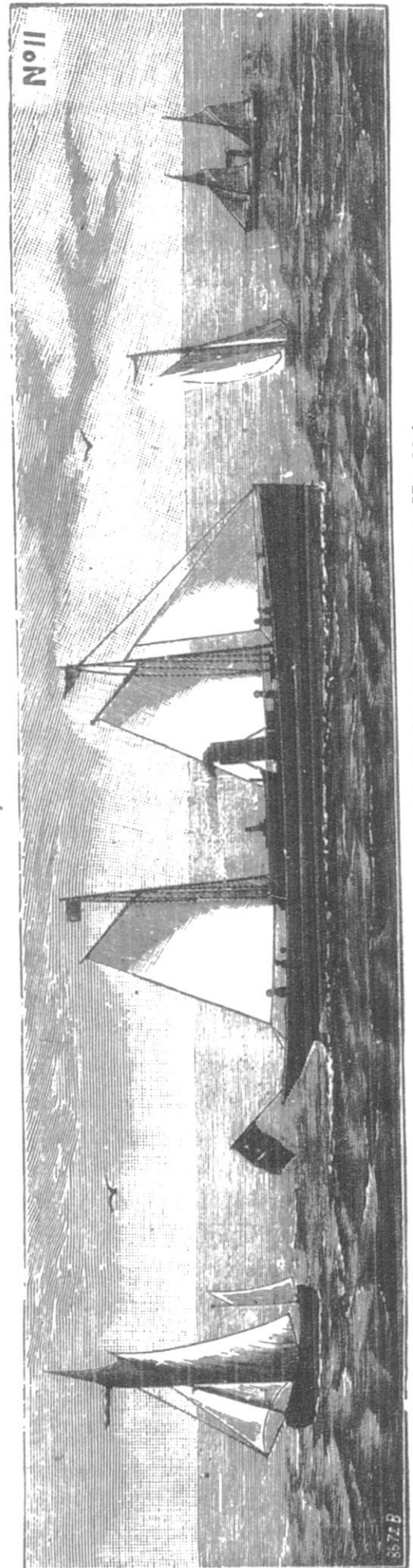
This vessel has great power, and carries coal in the bunkers for about 2,000 miles' steaming.

TYPE NO. 12.

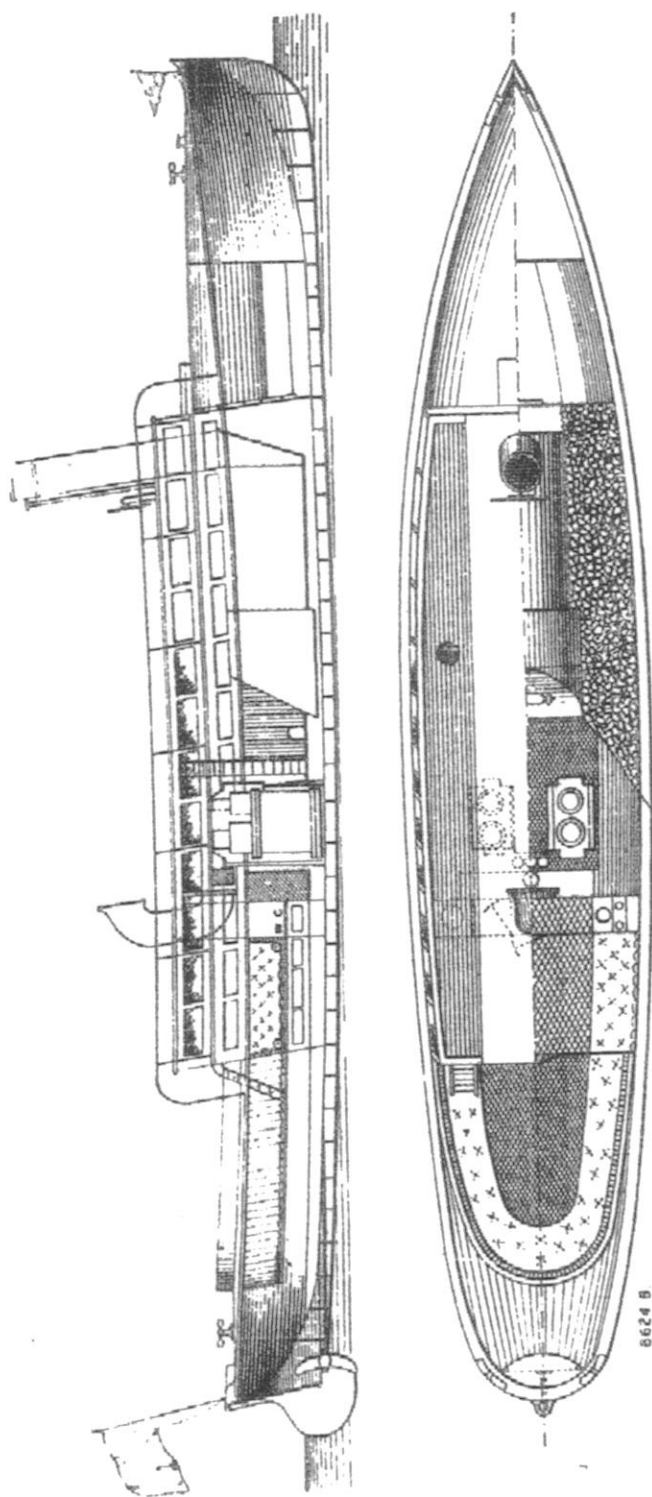
High Speed Launch.—We give on page 27 a design of a High-speed Launch suitable either for sea or river work. She has a turtle back forward with forecastle underneath; a cabin aft with w.c., and a lavatory and well aft. This arrangement can, however, be altered to almost any extent to suit customers' requirements.



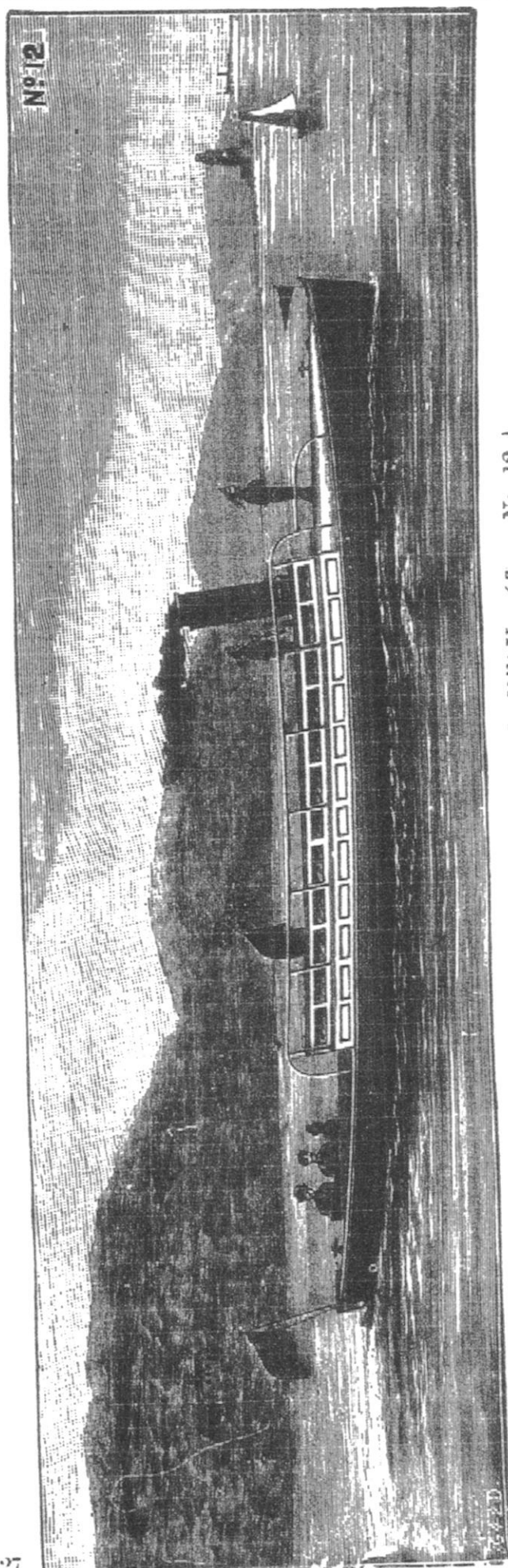
PLANS AND SECTION.



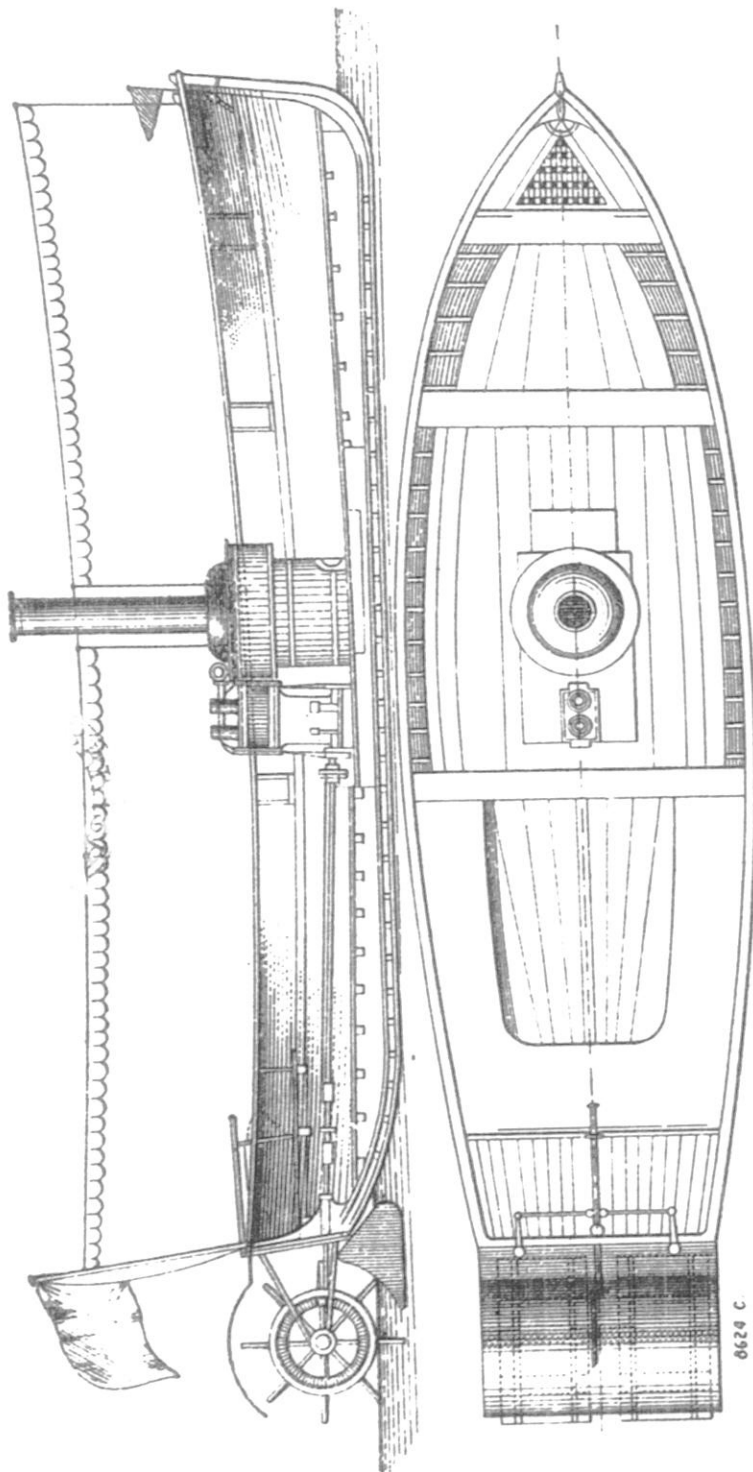
GENERAL VIEW OF 70-TON STEAM YACHT.—(Type No. 11.)



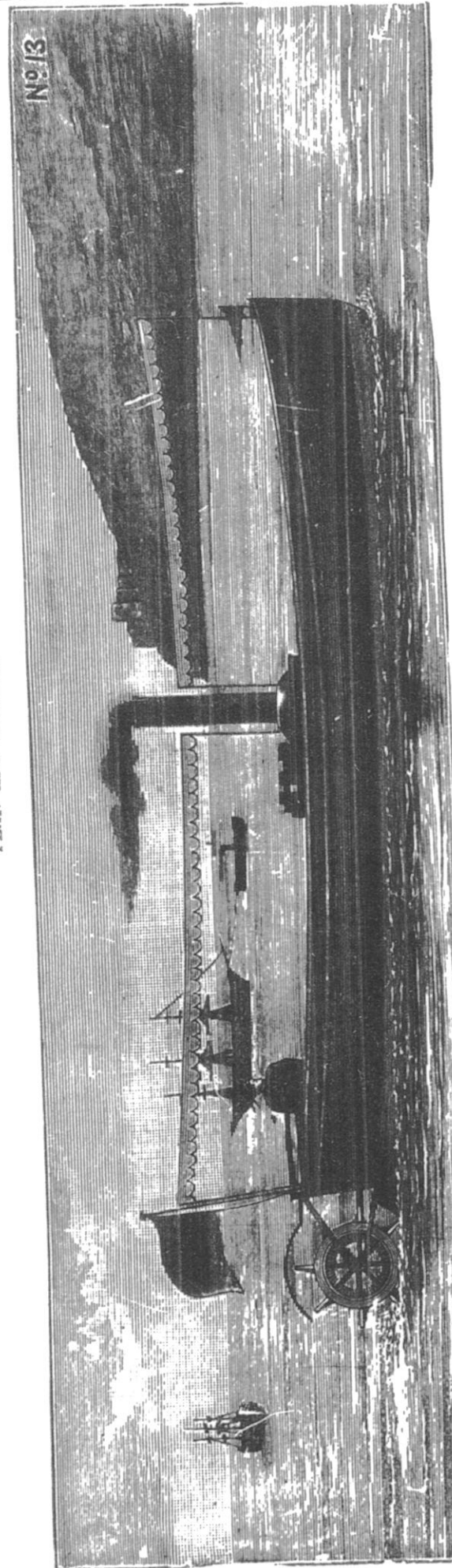
PLAN AND SECTION.

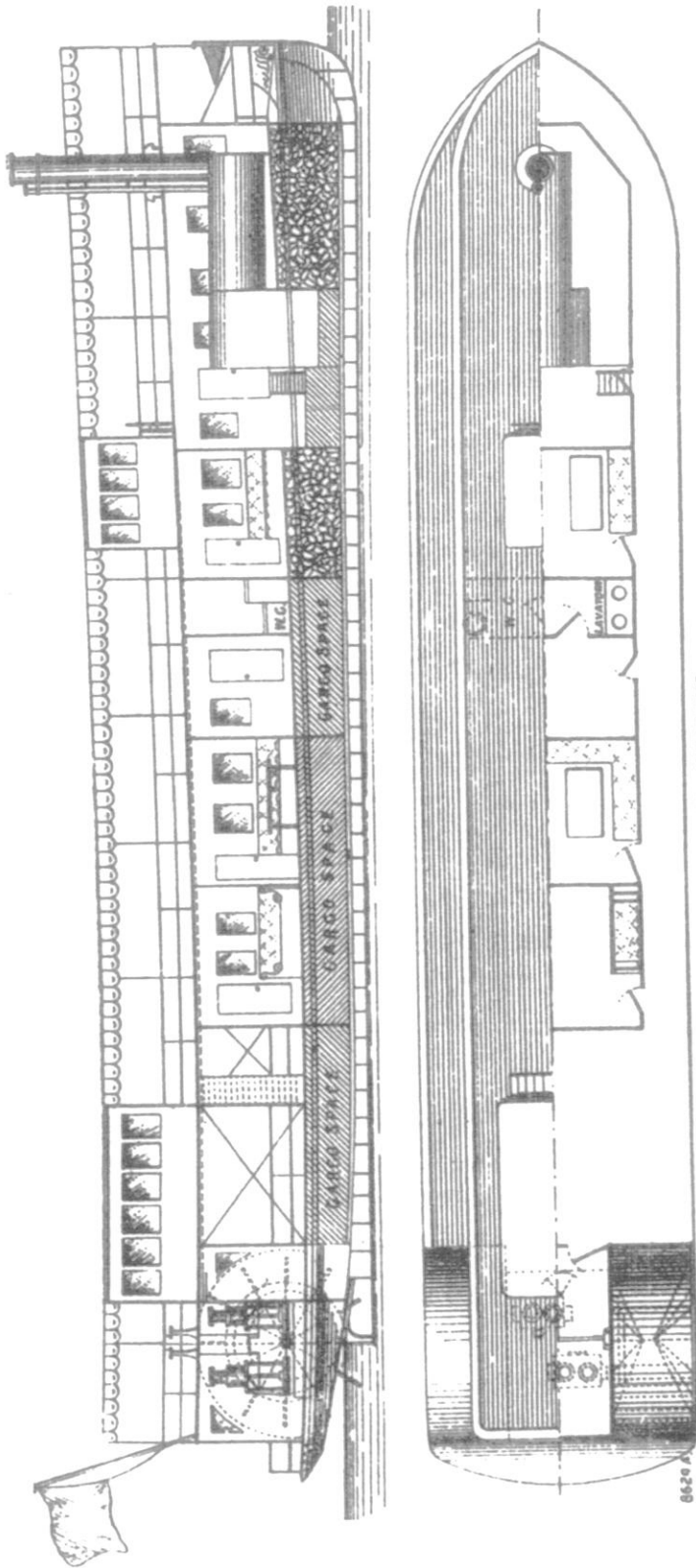


GENERAL VIEW OF A HIGH-SPEED LAUNCH.—(Type No. 12.)



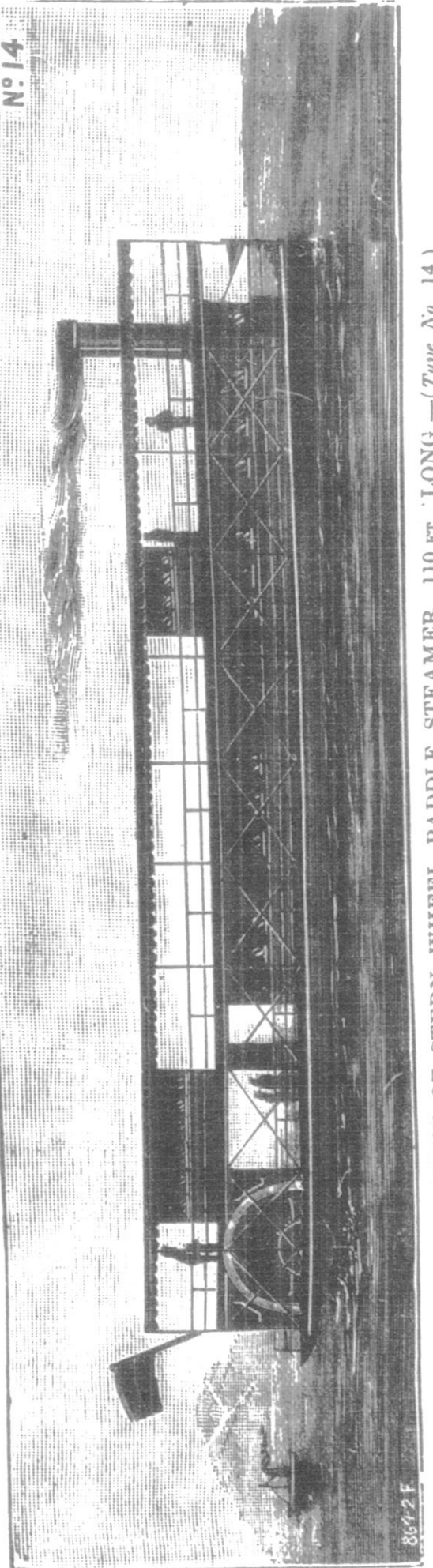
PLAN AND SECTION.





PLAN AND SECTION.

Nº 14



GENERAL VIEW OF STERN WHEEL PADDLE STEAMER, 110 FT. LONG.—(Type No. 14.)

TYPE No. 12—*continued*.

The speed is about 17 to 18 miles per hour, fitted with a Locomotive Boiler worked with forced draught, and either single or Twin Screws, each set driven by a set of the "Kingdon" Patent Quadruple Expansion Engines.

TYPE NO. 13.

Small Light Draught Paddle Boat.—The drawings on page 28 show a specimen of a light draught stern wheeler, suitable for shallow rivers. She is 24 ft. long, with a draft of 6 in., and is built in steel, teak or pine, or can be supplied in frames ready for planking abroad, at the same price as in pine.

The machinery is the "Kingdon" Patent "Double $\frac{1}{2}$ -A" size. The arrangement shown keeps the machinery in the centre of the boat, and renders it very compact and light.

This arrangement of machinery and wheels is found very suitable for boats of small sizes and powers. We shall be pleased to submit plans of boats of this type to answer any special requirements, and to be fitted either with stern or side wheels, as may be preferred.

TYPE NO. 14.

Stern Wheel Paddle Steamer, 110 ft. long.—This boat, which is illustrated on page 29, is designed for carrying passengers and cargoes on shallow rivers, and is most useful for foreign purposes.

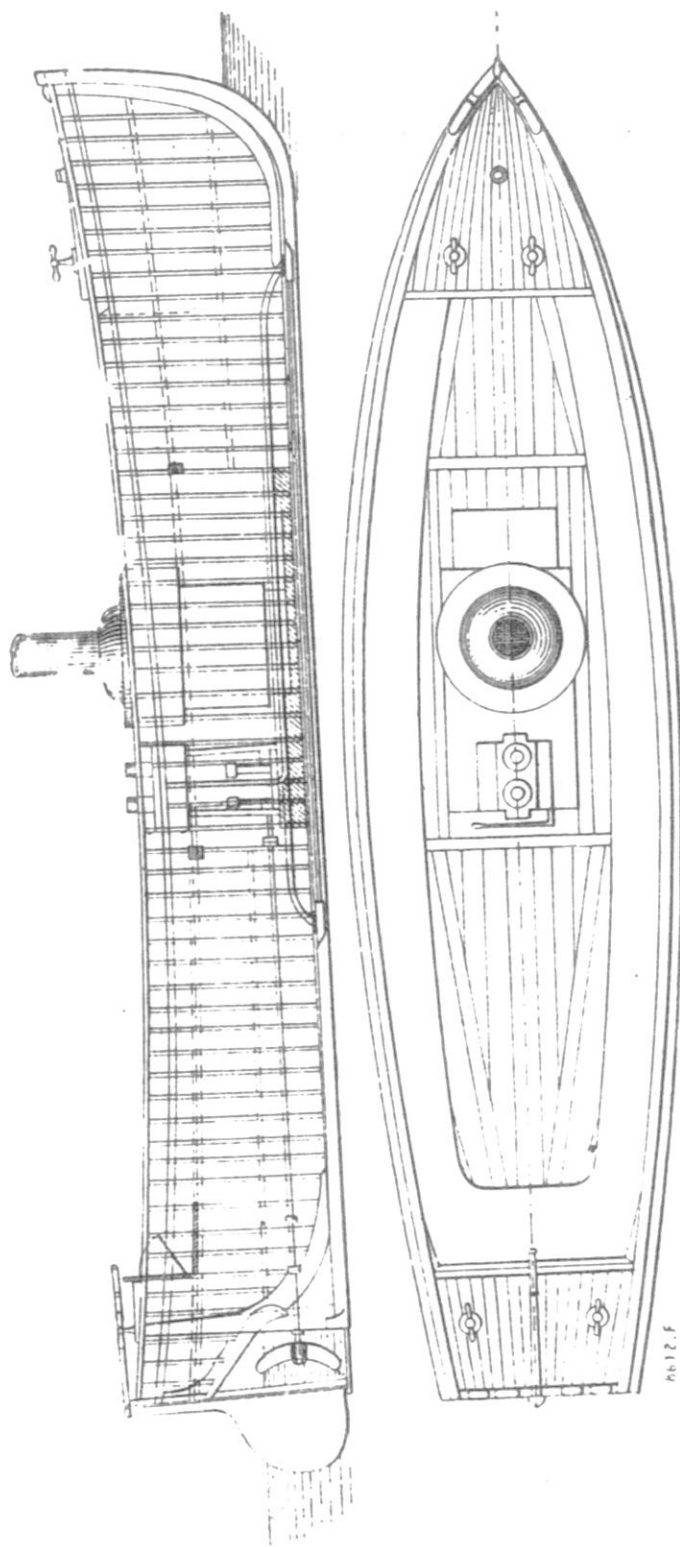
The machinery includes two pairs of Compound or Quadruple Expansion Surface Condensing Engines of ample power for towing against a strong current, each engine driving one of the stern wheels. This arrangement, besides greatly reducing the weight of the machinery, allows the paddles to be worked independently, and, therefore, greatly adds to the manœuvring and towing powers of the boat.

The arrangement can be suited for side wheels if required, and in this case the boiler is placed between the two engines, making the whole very compact. If required the engines can be arranged to work from the deck instead of as shown. For this class of boat, where machinery has to be conveyed overland, the engines and boilers can be arranged in duplicate throughout, thereby very much reducing the number and weight of the heaviest portions.

Estimates will be furnished for this type of boat of any length from 60 ft. and upwards, and for varying drafts of water or speed.

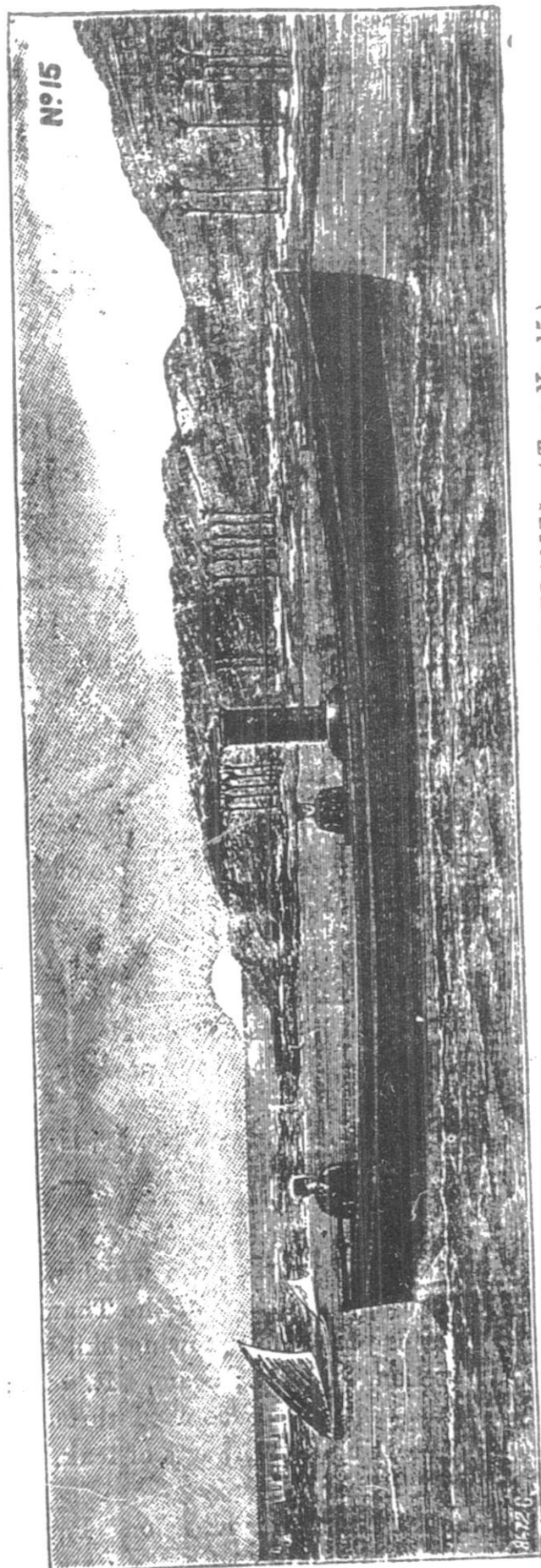
TYPE NO. 15.

Boat Built in Frames—We show on page 31 an illustration of a Boat put together with steel or iron frames, ready for planking abroad. This mode of building has met with great approval for foreign purposes, and it can be adopted for any of the boats described in this catalogue.



PLAN AND SECTION.

6612.F



GENERAL VIEW OF BOAT BUILT ABROAD FROM FRAMES.—(Type No. 15.)

8526

The Boat is complete in every respect, except the skin. All the necessary fastenings are supplied, and drawings are sent, showing all particulars, so that the whole can easily be put together by an ordinary carpenter, or even by native labour.

By this method a large saving in the cost of freight is secured. The frames fit one inside the other, and the whole Boat can thus be packed in a flat box.

The price of a Boat built in Frames is approximately the same as quoted for a pine built Boat.

We also supply Boats fitted up in sections, and shall be pleased to quote for these on application.

TYPE NO. 16.

Thames Pleasure Launch.—This is a roomy and handsome boat which we have specially designed for pleasure purposes on the Thames. She is, of course, equally suited for any other similar river, and we think will prove quite a favourite class of Launch. The design is entirely new, and every modern convenience is provided for. The arrangement includes chain locker forward, machinery covered in, rail at each side of engine space, cabin aft built of teak, with w.c. and lavatory, cushions, steering wheel and half-length awning. She is Carvel built of Teak, copper and metal fastened throughout, clipper bow and dead wood in stern cut away.

Length, 45 ft. by 7 ft. 6 in. beam; 3 ft. 8 in. deep.

Speed about 10 miles per hour, fitted with the "B" size "Kingdon" Patent Quadruple Expansion Engine and "Kingdon" Patent Vertical Natural Draught Boiler for 175 lbs. working pressure.

TYPE NO. 16A,

Thames Pleasure Launch, is another design of this type, having the same dimensions as No. 16, but with straight stem, and engines open, allowing more room for passenger accommodation.

The cost of this type of Launch, built and fitted with the same size machinery as in Type No. 16, is £35 less.

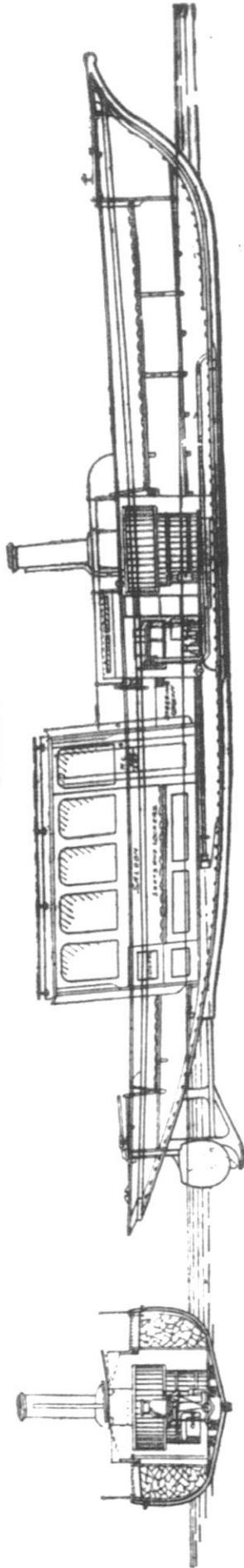
TYPE NO. 17.

Pleasure Launch for the Upper Thames.—This is one of our newest designs, and one which will be found a novel and popular type for use on the upper reaches of the Thames, being arranged in accordance with the Thames practice for rowing skiffs.

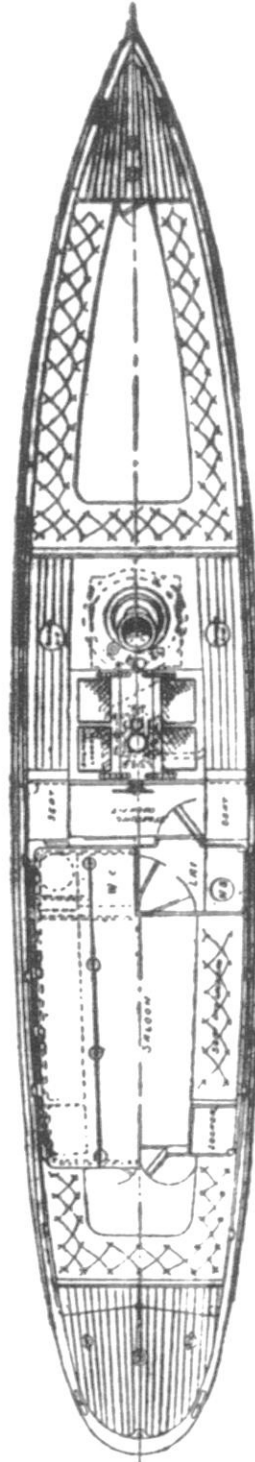
Length, 30 ft.; beam, 4 ft. 6 in.; by 2 ft. 2 in. deep. Carvel built of Cedar, copper and metal fastened throughout. There is a short deck forward and aft; seating and thwarts of teak.

The machinery is the "A" size "Kingdon" Patent Quadruple Expansion Engine, and the "Kingdon" Patent Vertical Natural Draught Boiler for a working pressure of 175 lbs.; speed about 11 miles per hour.

SECTION.

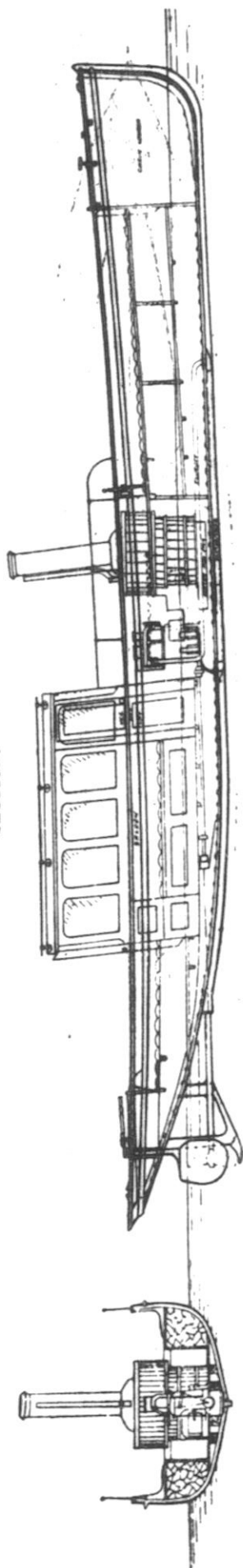


PLAN.

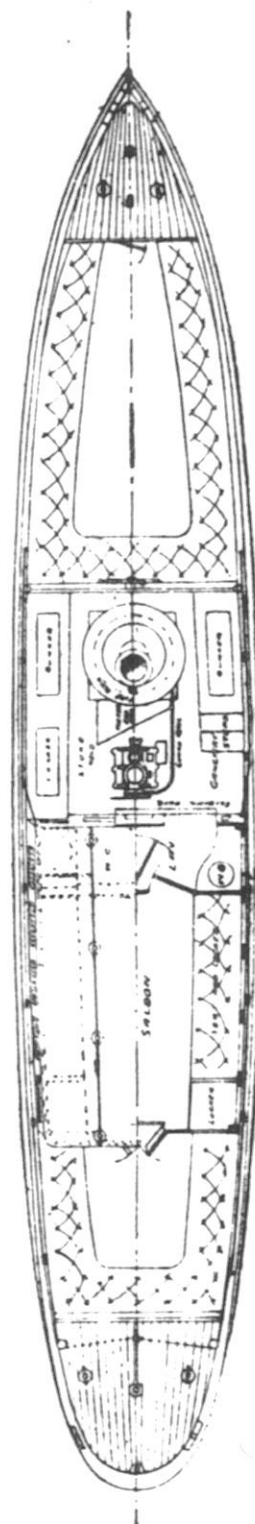


THAMES PLEASURE LAUNCH.—(Type No. 16.)

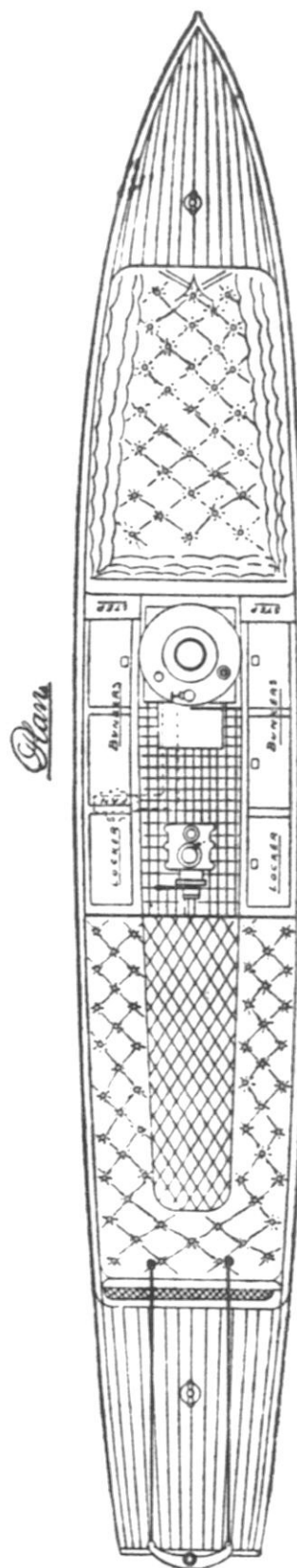
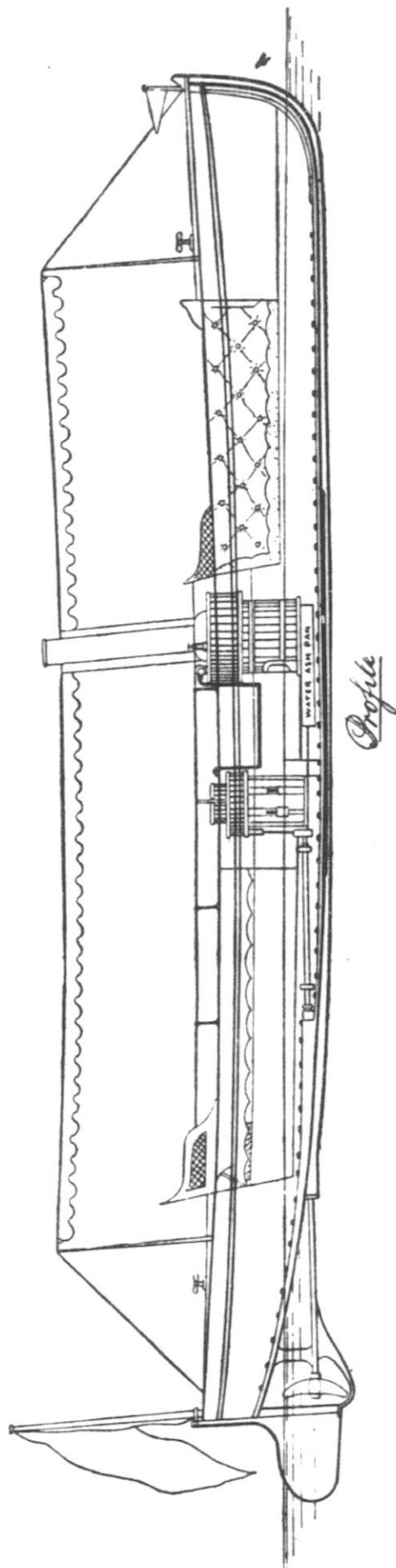
SECTION.



PLAN.

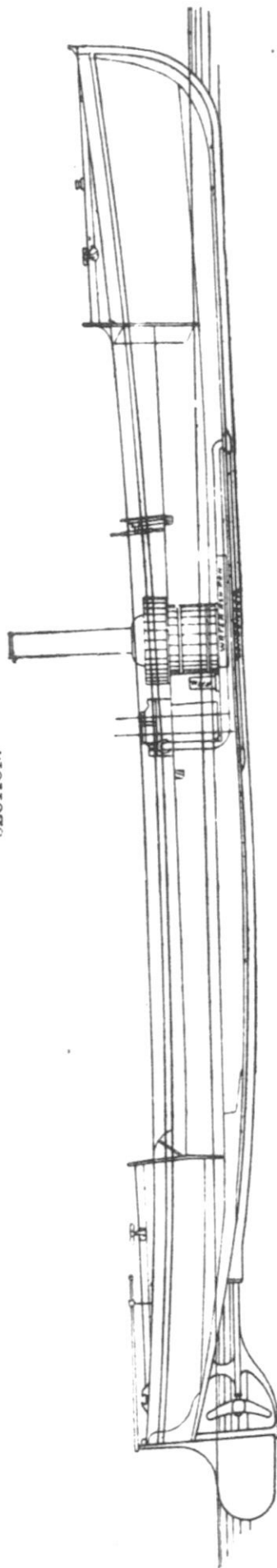


THAMES PLEASURE LAUNCH.—(Type No. 16a).

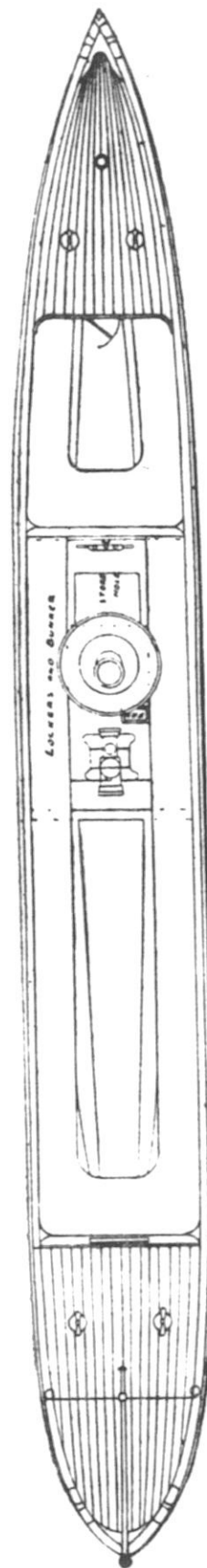


PLEASURE LAUNCH FOR THE UPPER THAMES.—(Type No. 17).

SECTION.



PLAN.



PLEASURE LAUNCH FOR THE UPPER THAMES—(Type No. 18).

TYPE NO. 18.

Pleasure Launch for the Upper Thames.—This is a larger boat than Type No. 17, and is designed on the same lines, being also arranged in accordance with the Thames practice for rowing skiffs, and is specially suited for the upper reaches of the river.

Length, 40 ft.; beam, 4 ft. 6 in.; by 2 ft. 8 in. deep. Carvel built of Cedar, Teak, or Mahogany, copper and metal fastened throughout; deck forward and aft.

The machinery is the "A B" size "Kingdon" Patent Quadruple Expansion Engine, and the "Kingdon" Patent Vertical Natural Draught Boiler for a working pressure of 175 lbs.; speed, 12½ to 13 miles per hour.

The price of this boat as fitted is slightly less than Type No. 17.

TYPE NO. 19.

Powerful Sea-going Passenger Launch.—Is suitable for carrying passengers, or for sea fishing or similar work where a large and powerful boat is required.

Length, 35 ft.; beam 9 ft.; by 4 ft. 4 in. deep. Carvel built of Pine; copper, and metal fastened throughout. Fitted with deck forward and aft, and coal bunkers and lockers forming seats for passengers.

The machinery is the "D" size "Kingdon" Patent Quadruple Expansion Engine, and the Boiler is of the Horizontal Direct Tube Type for a working pressure of 175 lbs.

Speed, about 10 miles an hour.

TYPE NO. 20.

Powerful Tug.—This is a special design which we have newly got out for towing purposes, having extra powerful engines, and arranged with awning suitable for hot climates.

Length, 45 ft.; beam 10 ft.; by 5 ft. 9 in. deep. Carvel built of Teak; copper and metal fastened throughout. Forecastle forward having seats and lockers. Arranged with coal bunkers and lockers in engine room; wood awning over engine space; canvas awning over stern sheets; towing beam and hook, bilge pump, steering wheel, anchor, and chain.

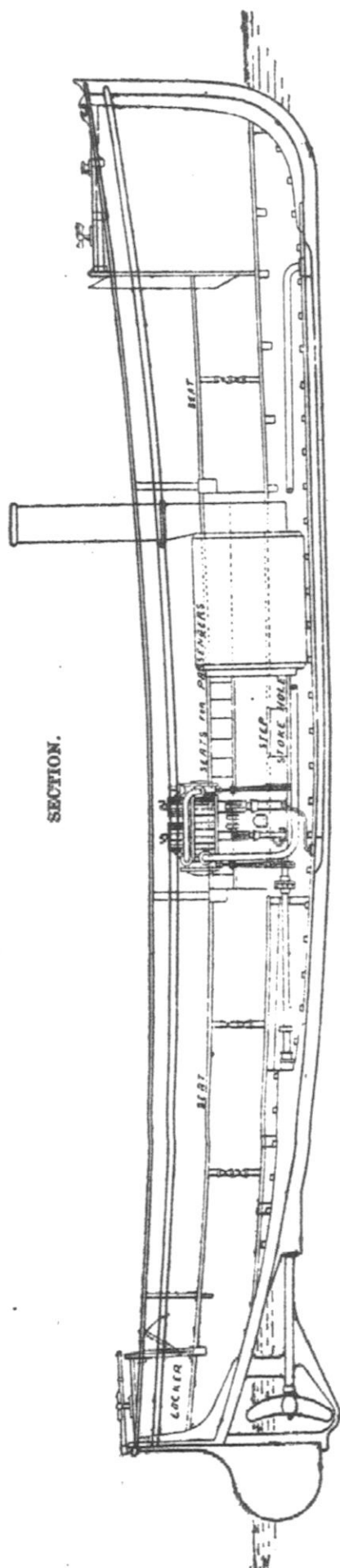
The machinery is the "H" size "Kingdon" Patent Quadruple Expansion Engine and Horizontal Return Tube Boiler for a working pressure of 175 lbs.

Speed, about 11 miles per hour when driving alone.

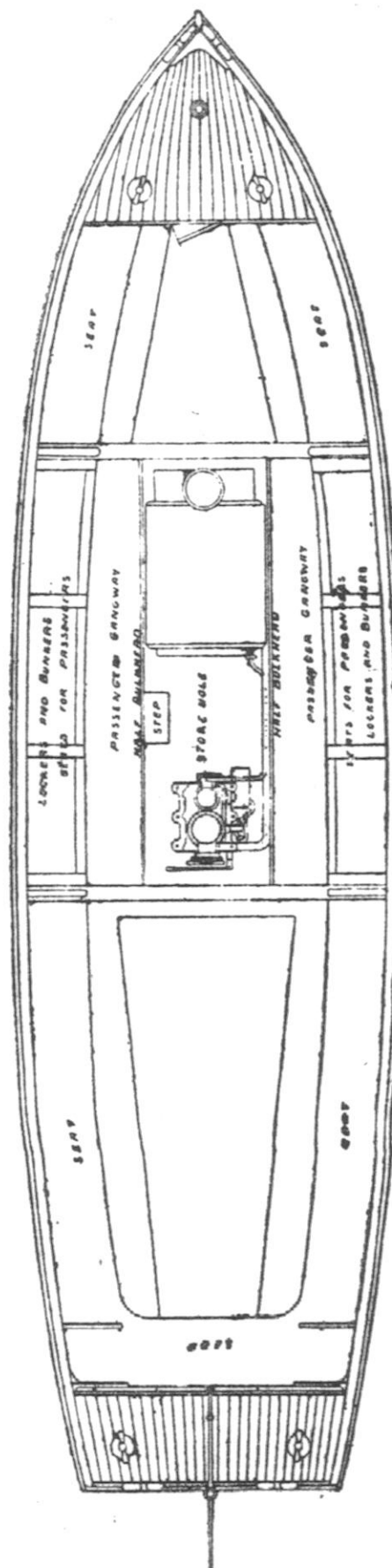
TYPE NO. 21.

Coasting and Sea-going Launch.—This is a sea-going Launch, arranged with accommodation for living on board, and is very suitable for coasting. Possesses good cabin accommodation for the price and size of vessel. Being of a light draught, is also suitable for river work.

Length, 50 ft.; beam, 9 ft.; by 4 ft. 6 in. deep. Carvel built of Pine; copper



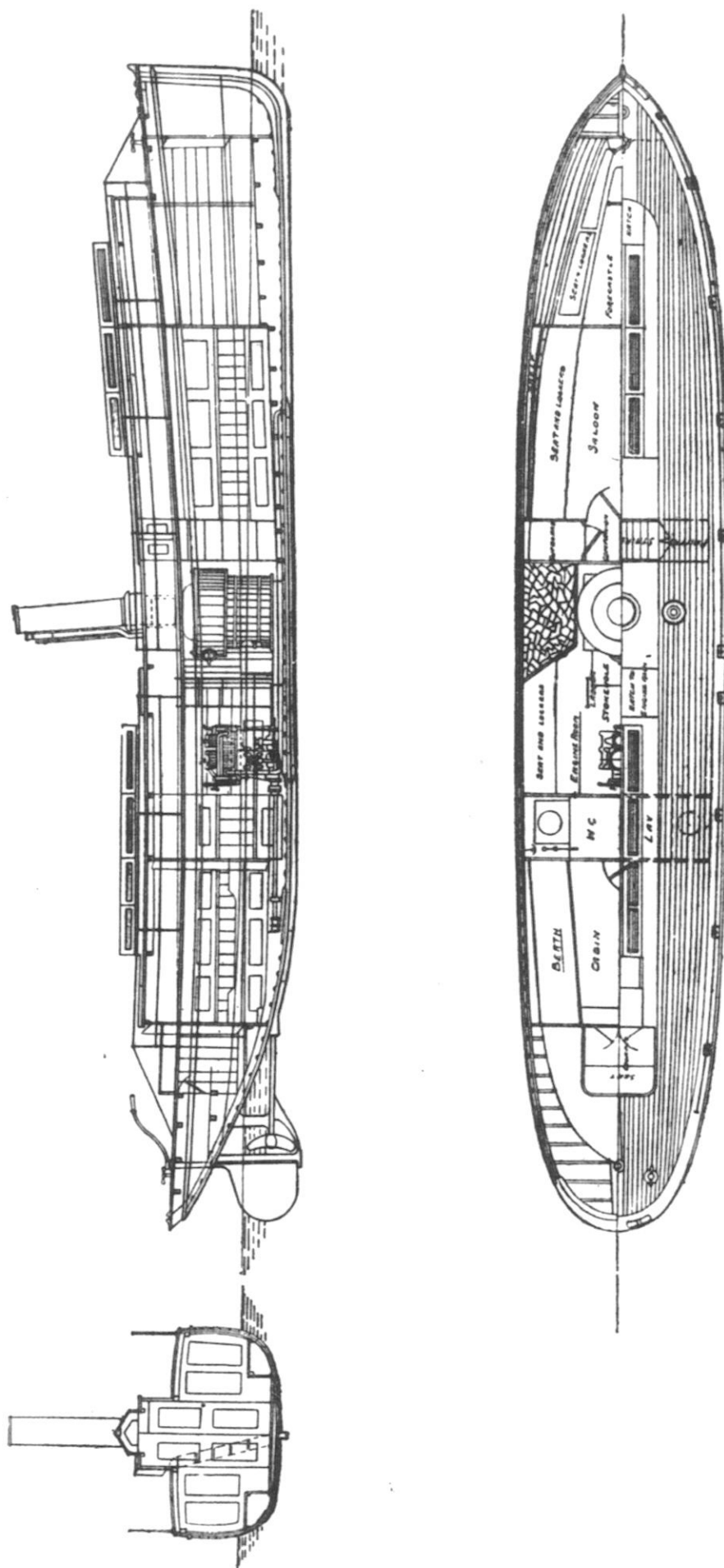
PLAN.



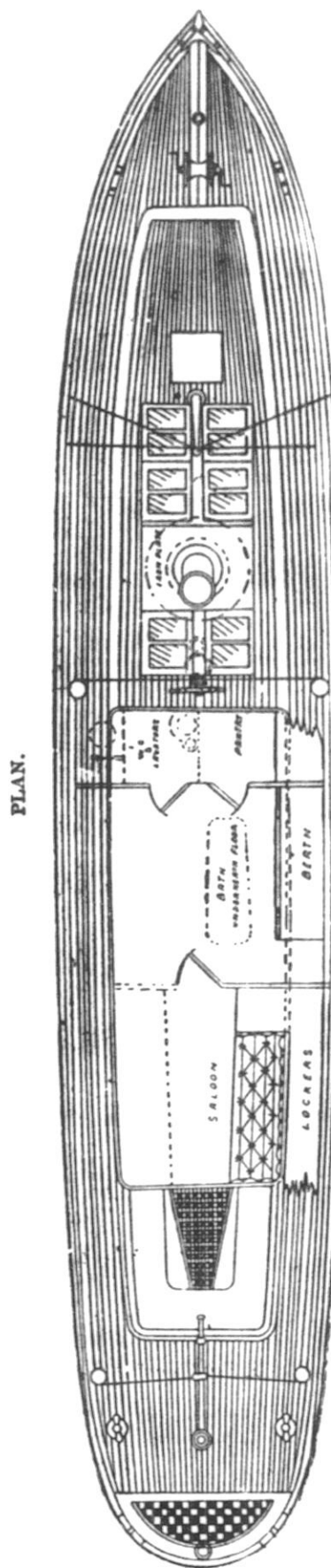
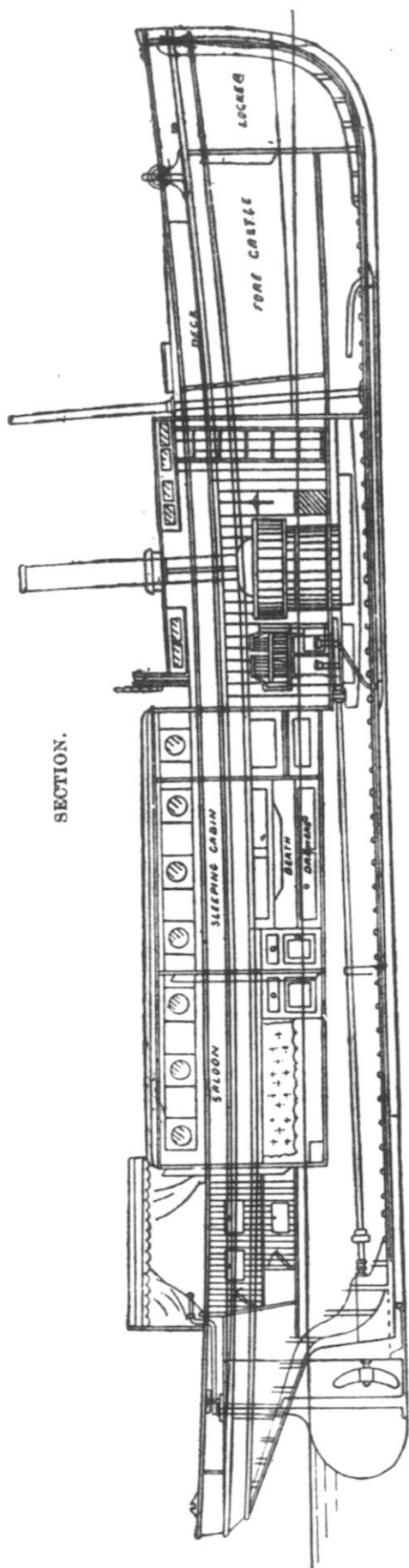
POWERFUL SEA-GOING PASSENGER LAUNCH—(Type No. 19).



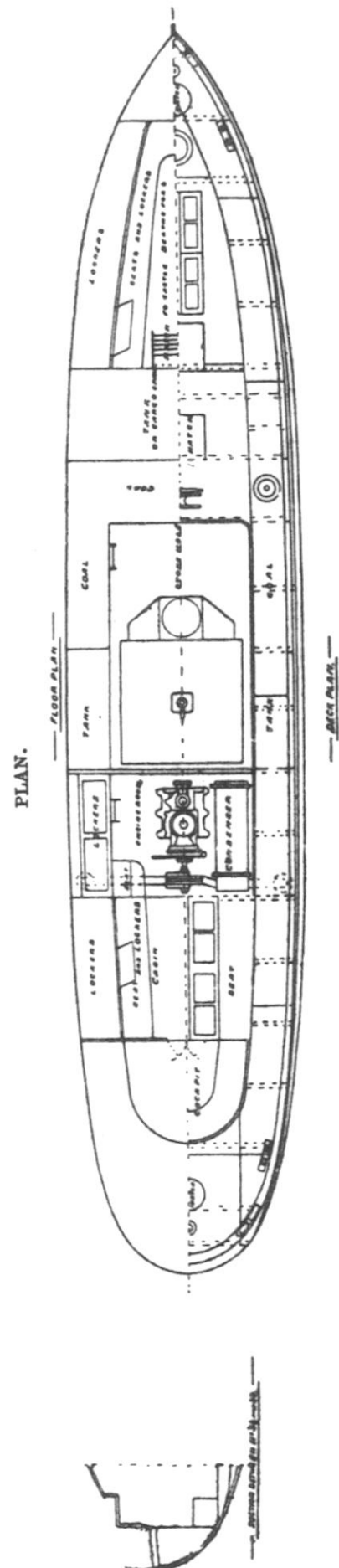
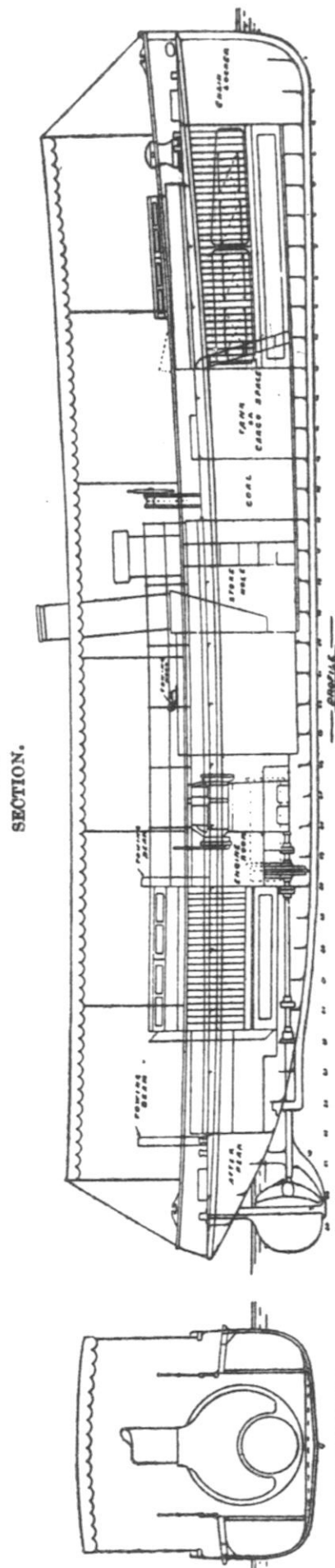
POWERFUL TUG—(Type No. 20).



COASTING AND SEA-GOING LAUNCH—(Type No. 21).



COASTING LAUNCH—(Type No 22).



DECKED TUG OR TENDER—(Type No. 23).

TYPE No. 21—continued.

and metal fastened throughout. Decked fore and aft, with the exception of a small cockpit aft. Fitted with two short pole masts with lugsails. The arrangement provides forecabin forward with seats and lockers; saloon with pantry and cupboard; machinery space; cabin with w.c., and lavatory, and two berths. Hatches and skylights of teak; tiller and stanchions of gun-metal.

The machinery is the "D" size, "Kingdon" Patent Quadruple Expansion Engine, and "Kingdon" Patent Vertical Natural Draught Boiler for a working pressure of 175 lbs. Speed, about 10 miles per hour.

TYPE NO. 22.

Coasting Launch.—This is a boat similar, in all general respects, to the foregoing (Type No. 21) and fitted up for the same purpose, but is larger.

Length, 62 ft.; beam, 11 ft.; by 5 ft. 9 in. deep. Carvel built of Pine; copper and metal fastened throughout. Fitted with deck forward, chain locker, cabin aft of teak, with w.c. and lavatory, berths, bath and lockers, mast and sails, windlass, steering wheel, bilge pump and ejector.

The machinery is the "F" size "Kingdon" Patent Quadruple Expansion Engine, and "Kingdon" Patent Vertical Natural Draught Boiler for a working pressure of 175 lbs. Speed, about 11 miles per hour.

TYPE NO. 23.

Decked Tug or Tender.—This is a decked Tug with open engine space, which could, however, be covered over for use at sea or in a temperate climate. Is a powerful boat for towing purposes and is arranged so that it can also be used as a water tank, when required for carrying water for shipping or for other purposes.

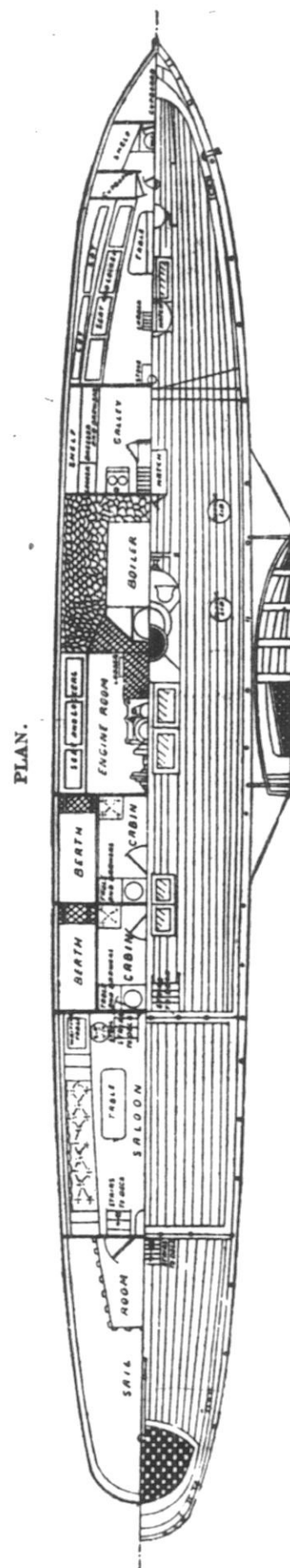
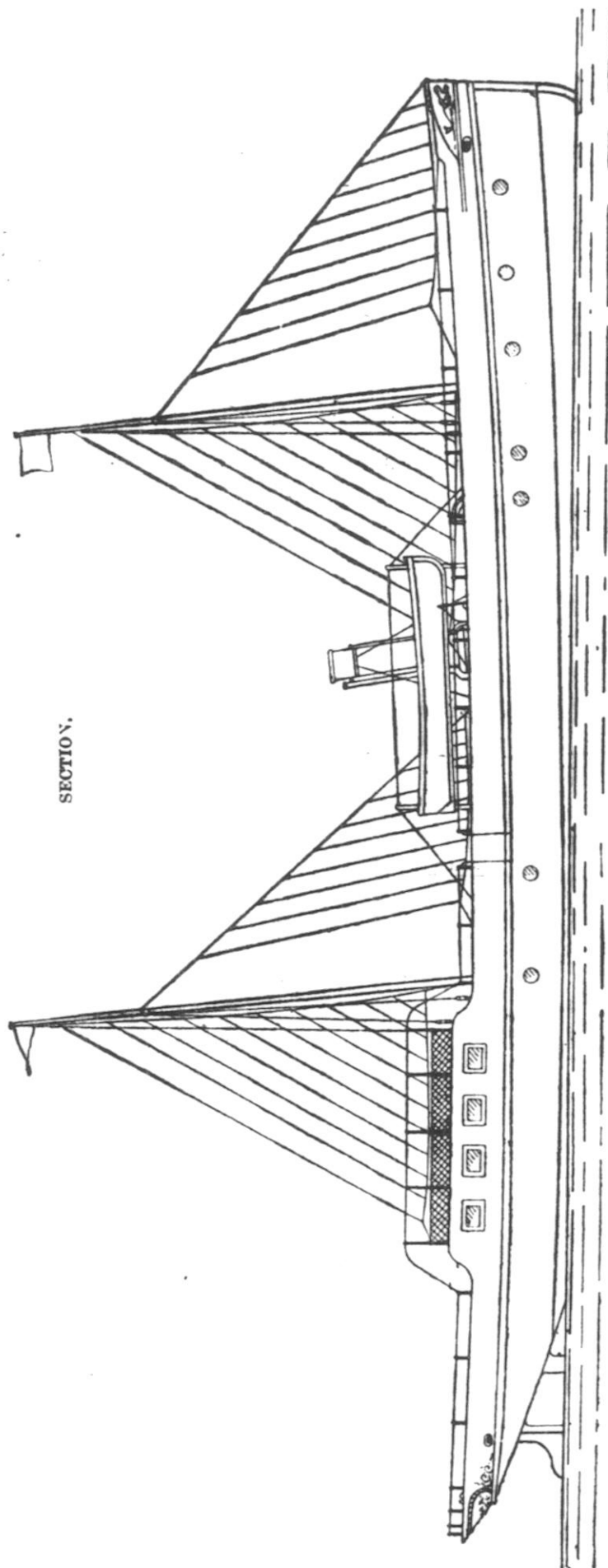
Length, 56 ft.; beam 11 ft.; by 4 ft. 6 in. deep. Clincher built of Steel, with iron decks and forgings, fitted with plain floor boards of pine. Arranged with large hold forward capable of being used as a fresh-water tank, holding 8 to 10 tons of water. Bunkers to hold 4 tons of coal; steering wheel forward, hand rail round engine pit; fore and aft skylights of teak with plate-glass windows. Four bunks in forecabin; seats in after cabin; iron stanchions and awning; anchors and chains; side-lights and towing hook and bridges.

The machinery is the "J" size "Kingdon" Patent Quadruple Expansion Engine and Boiler of Horizontal Marine Type, for 175 lbs. working pressure. Speed, about 12 miles an hour when driving alone.

TYPE NO. 24.

Commodious Steam Yacht for Sea or River Work.—Is of moderate draught, and therefore suitable for river work, whilst, at the same time, a powerful and commodious sea boat.

Length, 95 ft. between perpendiculars (102 ft. over all); beam, 13 ft.; by 8 ft. 3 in. deep. Carvel built of Teak, with elm bottom, copper and metal



COMMODIOUS STEAM YACHT FOR SEA OR RIVER WORK.—(Type No. 24)

TYPE No. 24—continued.

fastened throughout. Keel and steamed timbers of American elm; stem sternpost and knees of English oak; floors of steel; bulwarks, saloon and all fittings above deck of teak; rudder, rudder-post, and shoe of gun-metal.

Arranged with forepeak, w.c., forecastle, galley, and pantry, engine and boiler space, three berths, with bathroom and w.c. Main cabin under after deck; fore and aft bulkheads of engine room of iron, with door in after end; two w.c.s, stove in galley, and four berths in forecastle. Forecastle and engine-room and hull to be fitted as described above, but cabin bulkheads and partitions of plain match-board only, suitable for future decoration.

The deck fittings include steering wheel forward, telegraph and speaking tube to engine room; Mountsbay capstan, necessary hawse pipes, cleats, bollards, fairleads, &c., of galvanised iron; raised saloon with deck on top, rails and stanchions, with the necessary fastenings for the same; removable galvanised iron tiller, copper deck pump, side, masthead, and riding lights, flag and ensign staff. Saloon and cabin fitted with ports, making 8 large square, and 14 small, 8 inch diameter.

This boat is also provided with tanks, including one in engine room to carry one ton of water. Two boats, 18 ft. and 12 ft. long respectively, with galvanised iron davits with blocks and falls complete; each boat being fitted with rudder, crutches, paddles, and boat hooks. Binnacle and spirit compass, anchors, chain and warps according to Lloyd's requirements for a yacht of 60 tons.

The machinery is the "L" size "Kingdon" Patent Quadruple Expansion Engine, Condenser with centrifugal circulating pump; gun metal Propeller, stern tube, and propeller shaft, with iron intermediate shaft. The Boiler is of the Horizontal Return Tube Type for a working pressure of 175 lbs.

Speed, about 13 miles an hour.

TYPE NO. 25.

Vedette Boat.—This is a high-speed Launch of the type now used in the British and other Admiralties, and is suitable for use as a Vedette boat or second-class torpedo boat.

Length, 54 ft.; beam, 8 ft. 6 in.; by 4 ft. 9 in. deep. Carvel built of Mahogany; copper and metal fastened throughout; keel and steamed timbers of American elm; stem, sternpost, and knees of English oak; fitted with plain floor-boards of pine, strengthened with angle iron floors and bulkheads where necessary. The "Harrison" patent rudder is fitted to this boat, giving great steering power.

The Machinery consists of the "Kingdon" Patent *Triple* Expansion Surface-condensing Engine, "J" size, and a Locomotive Type Boiler for 175 lbs. working pressure. The feed and air pumps are driven by an independent engine, and a fan and engine are provided for forced draught.

The speed with the foregoing is about fifteen knots.

TYPE NO. 26.

Special Thames Launch ("Scout" Class).—This Boat is specially designed for the Thames, and is a type which has already proved most successful on the river, being very fast for her size, as well as comfortable, smart, and handy. It is believed that this boat will meet the requirements of a numerous class of buyers, for whom the larger sizes are scarcely suitable.

Length, 24 ft.; beam, 5 ft. 8 in.; by 2 ft. 8 in. deep. Carvel built of Mahogany; copper and metal fastened throughout, and fitted with deck forward.

The Machinery consists of the "Kingdon" Patent Quadruple Expansion Engine "A" size, and the "Kingdon" Patent Vertical Natural Draught oiler for 175 lbs. working pressure; brass dome and funnel, also brass water ashpan and damper. The "Harrison" patent rudder is fitted, giving the boat great steering power, enabling her to be turned round, if necessary, almost at her own length when driving at full speed.

Speed, about 9 miles an hour.





CHAPTER IV.

EXAMPLES OF LAUNCHES, ETC., BUILT AND FITTED WITH THE "KINGDON" MACHINERY.

AMONGST the large number of Steam Launches and Yachts now afloat, built and fitted with the "Kingdon" Patent Machinery, it is difficult to select and give particulars within a reasonable space without becoming tedious.

One of the most recent and noteworthy, is a high-speed steel-built Steam Launch for Mr. James Gordon-Bennett, of the *New York Herald*, for use on French waters. This boat was launched last year, and is 100 ft. in length, 13 ft. beam, and 8 ft. 8 in. in depth. She is named the *Sereda*, and is fitted with two pairs of Patent *Triple* Quadruple Expansion "Kingdon" Engines on three Throw Cranks, about 150 h.p. each, and Return-tube Marine Boilers. She is equipped with Steam-steering Gear, Capstan, etc., and is lit throughout with the Electric Light. Her fittings are of the handsomest character, and her appearance is described by the *Dartmouth and Brixham Chronicle* as "light and pleasing"; having plate-glass windows all round her. Her speed is 13 knots.

The *Philomel*, launched from the Dartmouth yard in April of last year, may also be appropriately mentioned here as another recently built Launch. She was built to the designs of the owner, Sir Frederic Sykes, of Holcombe, Dawlish, for use chiefly in the English Channel and along the French coast. She is a fast, roomy, steady sea boat, 62 ft. in length, 11 ft. beam, and a depth of 5 ft. 9 in.; built of wood, metal-fastened throughout, with short deck forward and fitted with cabins, having 5 ft. 6 in. of head-room, containing separate saloon, sleeping-berths, pantry, and lavatory. She carries sufficient fresh water in tanks for a week's consumption, and her bunkers can carry enough coal to keep her steaming at sea for the same length of time. The "Kingdon" Patent Machinery, of the latest type, with all recent improvements, is fitted in, and the details of her construction (says the *Western Morning News*, Plymouth, 25th April, 1890), "have been highly approved by naval architects." At the steam trials of the *Philomel* over the measured mile, she attained a speed of 12 miles per hour, and gave the utmost satisfaction to her designer.

To private owners on the Thames, the *Glenorchy* will be of special interest. This Steam Launch was built to the order of Mr. George Newnes, M.P., of Wildcroft, Putney, who has courteously expressed his readiness to allow

anyone interested to be referred to him. The *Glenorchy* is a handsome mahogany-built boat, 50 ft. long; and was built in 1889 for use on the Thames in summer, and at Torquay in the winter. She is coppered, 7 ft. beam and 4 ft. deep; fitted with cabin of mahogany, w.c. and lavatory, removable bulk-head aft, mast, lugsail and staysail, wheel forward and lever alongside engines. The machinery is the "F" size "Kingdon" quadruple expansion engines, and the "Kingdon" patent vertical natural draught boiler, built for a working pressure of 175 lbs., capable of driving at a speed of 13 miles an hour. She is very handsomely fitted throughout, and with the most complete appointments.

The foregoing represent the larger class of Launches. We can hardly particularise here from the numerous smaller Launches built and fitted with the "Kingdon" Machinery, but, as examples, we quote from notices in the Press. Thus, the *Dartmouth and Brixham Chronicle*, referring to the work on hand in the Dartmouth yard, in April, 1890, mentions a new Steam Launch building on account of Mr. Stewart Clarke of Paisley. This boat was 25 ft. in length, 5 ft. 8 in. beam; fitted with the "Kingdon" Patent Quadruple Expansion Engines, of about 6 h.p., and the "Kingdon" Vertical Boiler. Another in progress at the same time was a Steam Launch for Mr. Laycock, of Banbury; 30 ft. in length, 7 ft. beam, and 3 ft. 7 in. in depth. She was built of teak, and was fitted with Quadruple Expansion Engines of about 15 h.p., with all the latest improvements.

Amongst Thames owners to whom reference can be made, we are courteously enabled to mention the names of Mr. Gerald Tatham, of the Park, East Moulsey; Mr. H. T. Tatham, of "Chesfield," Hampton Wick, Kingston-on-Thames; and Mr. Geo. H. Harrison, J.P., of 4, Gt. George Street, Westminster.

A Man-of-War's Steam Cutter, built for H.M.'s yacht *Osborne* represents another type of craft for which the "Kingdon" Machinery has been adopted. This Cutter was 30 ft. long, 7 ft. beam, 2 ft. 4 in. draft. She has very powerful sea-going qualities, and is fitted with air chambers, rendering her unsinkable.

Amongst governmental work for which the "Kingdon" Machinery has been adopted, are a set of three Lifeboat Cutters for Torpedo high-speed Cruisers, built on account of the Admiralty. These were described in the *Engineer* and also in *Engineering*, of 14th December, 1888. They are 21 ft. long, built of two skins of mahogany, and fitted with the "Kingdon" Patent Quadruple Expansion Surface-condensing Machinery, and the "Kingdon" Patent Vertical Natural Draught Boiler. Their weight, complete, with machinery, is 24 cwt. each; and on the official trials (which went off without a hitch) they attained a mean speed, for the three boats, of 6.52 knots, or 7.5 miles, with five persons on board, and in rough weather. When light the speed was over one mile an hour more.

Last year four Launches were built at Dartmouth Works for the War Office, fitted with the "Kingdon" Patent Machinery. These were 48 ft. in length, 11 ft. beam, and 5 ft. 9 in. in depth. They were fitted with Twin Screws, driven by Engines of about 80 h.p. each, their contract speed being 9 knots each, which was considerably exceeded on trial. These Launches were intended for submarine mining purposes.

Amongst Foreign orders may be mentioned a yacht's Steam Launch, with the "Kingdon" Machinery, made for H.I.H. the Grand Duke Alexander of Russia, supplied last year; and several sets of the "Kingdon" Machinery, made to the order of Prince Sye Sanitwongse, of Bangkok, being repeat orders. France and Italy are countries also to which Launches have been shipped, fitted with this machinery; one for the War Department of the Italian Government having been supplied during the past year.

Two Steam Launches, 50 ft. long, very handsomely appointed, were built recently for South America. These were fitted with the "Kingdon" Machinery, capable of driving them 12 miles an hour easily, and they were made the subject of a very complimentary reference in the *Buenos Ayres Standard* upon the occasion of their arrival and inaugural trip abroad. In concluding the notice, this paper remarks: "There is no doubt they are the handsomest steam craft that have yet been seen here, and are the best adapted for our climate and waters."

We must conclude this chapter with only one or two examples, to show the varied class of work for which the "Kingdon" Machinery has been adopted, and the various distant parts of the world to which its reputation has reached, and where it is now performing daily service.

One of these is a Galvanized Steel Dinghy, 14 ft. long and 4 ft. beam, built in sections, for the Universities Mission, Central Africa, to go up the rivers of that country. This was to be used as tender to the larger craft built in 1887 for the Mission, and which is now in use on Lake Nyanza. This Dinghy is described and illustrated in the journal *Industries*, of 17th January, 1890. Another example is a Steel Paddle-wheel Launch, built to the order of Messrs. J. Pook & Co., of London, for a foreign river. This boat was 45 ft. over all, 10 ft. beam, and fitted with the "Kingdon" Patent Quadruple Expansion Engines, and the "Kingdon" Patent Boiler. She was built for a draught of not more than 12 inches of water.

A handsome Steam Launch, built of teak, for the Marquis Pallavinci, of Genoa, is a recent specimen. She was 50 ft. in length, 7 ft. beam, and 4 ft. in depth. Her Engines were the "Kingdon" Quadruple Expansion type, of about 35 h.p.; steam being supplied by the "Kingdon" Patent Boilers; and the fittings included cabins aft, lavatories, &c.

For Mr. M. D. Croll, manager of the Netherlands Steamship Company, two Launches have recently been built, 30 ft. in length, 8 ft. beam, and 3 ft. 6 in. in depth; fitted with Quadruple Engines of about 20 indicated h.p.

A 21 ft. Launch, 5 ft. beam, is another, built to the order of Mr. W. H. Gedge, of Queensland; clincher-built, of mahogany, with engines of about 10 h.p.

We may also mention a 50 ft. Launch, in frames, for transport to Manilla; a 30 ft. Steel Launch for Costa Rica; and a 45 ft. Launch, handsomely fitted, for Mexico.

Sir William Geo. Pearce has had a fast Steam Launch built and fitted with the "Kingdon" Machinery, for use with his yacht, the *Lady Torfrida*. This was ordered to replace a vapour Launch discarded.

We have, we think, mentioned sufficient examples of Launches and craft, fitted with the "Kingdon" Machinery, to prove its popularity, and the wide area over which its reputation now extends. Indeed, it is scarcely too much to claim that Launches and craft, fitted with this Machinery, are not only the most efficient and the most economical—size for size—but also the most fashionable of the day.





CHAPTER V.

THE "KINGDON" MACHINERY AS AN AUXILIARY FOR SAILING YACHTS.

AS an Auxiliary Propelling Power for Sailing Yachts, there is no machinery which can compare with the "Kingdon" system, and the conditions which have won for it its reputation for other uses are precisely those which have made it so successful for this purpose.

The chief requirements in an auxiliary set of machinery on a sailing yacht are that it must not trench on the space one inch more than can be avoided; the weight must be as small as possible to provide the necessary power, so that the trimming of the boat may not be affected; it must require the minimum supply of coal to be carried; and the machinery must be simple and easily managed.

These points are the special characteristics of the "Kingdon" Machinery, viz.:—*compactness*, giving a greater power for the weight and the space occupied than any other machinery; *economy* of a remarkable character in the consumption of fuel; and *simplicity* of arrangement.

In another portion of these pages we have explained in detail the reasons why these advantages pertain to the "Kingdon" Machinery; consequently we need not repeat here.

Amongst instances of yachts to which the "Kingdon" Machinery has been fitted as an auxiliary, may be mentioned the yachts *Zoe*, the *Ianira*, the *Adelaide* the *Cambria*, and *Witch*.

Captain Hargreaves' yacht the *Ianira*, just mentioned, which was one of the first to adopt this machinery for auxiliary purposes, is a large and powerful schooner of 100 feet in length, by 22 ft. beam, and 11 ft. deep; well known in yachting circles both at home and in the Mediterranean.

The *Zoe* is a schooner of 150 tons; the *Adelaide* and the *Cambria* are yachts of 80 tons; and the *Witch* a schooner of 10 tons.

On board these yachts the machinery is so arranged as hardly to interfere with the accommodation, one small berth being the utmost space required. No screw-well is needed, and no alteration whatever is made to the sailing qualities of the vessel.

The owner of the yawl *Adelaide* writes as follows:—

"Captain Cross is quite right in saying that the engine answers the purpose for which I wanted it. I never intended it for use against tide or wind, or even with ever so light a fair wind. As I always said, 'I find myself stuck fast within eight miles or so of my destination, or I have to stay in harbour becalmed when I want to get to some place 50 miles off in lovely weather'; and this steam power just exactly does what I want on such occasions. For instance, I came from Tobermory into Loch Hown one day—could not have done it by wind—steamed from Loch Hown in time to get the tide through the narrows into Loch Alsh another day; then got a breeze and sailed on to near Portree. I steamed from Oban 20 miles or so to Ballachulish and back, had a delightful day, and saw a schooner yacht which had been becalmed 24 hours."

An example of one of the smallest sizes of sailing boats to which the "Kingdon" machinery has been fitted has been already mentioned under the notes respecting the "A" size machinery given in the description of type No. 2 (p. 14). This may appropriately be repeated here. A description of this appeared in the issue of the *Field* of 27th February, 1886. In this size (the "A") the Boiler is 2 ft. diameter and stands only 2 ft. 1 in. above the boiler-bearers. The Engine occupies a space of 1 ft. 6 in. wide by 9 in. in length, so that very little room is taken up, and the machinery being cased-in, forms a small table about 2 ft. high in the well—not interfering with the accommodation. This machinery is of sufficient power to drive a sailing boat 24 ft. by 7 ft. 6 in. about $6\frac{1}{2}$ miles an hour, using about 10 lbs. of coal per hour.

We invite intending purchasers to send us particulars of the dimensions of yachts to which they wish an Auxiliary Set of Machinery to be fitted, and also to say what approximate speed is required. We shall then be pleased to send an estimate for the set of machinery we consider most suitable.





CHAPTER VI.

AS TO THE ECONOMY OF THE "KINGDON" MACHINERY AND ITS ADAPTABILITY FOR COAL OR WOOD FUEL.

ELSEWHERE we have referred to the results of the competitive trials at the Plymouth Show. There is, however, a great deal more to be said as to the comparative economy of the "Kingdon" Machinery, which will interest steam launch owners more particularly.

A customer from India, calling at the Dartmouth Works not very long ago, was told that he could be supplied with a Launch which would work on a coal consumption of 12 lbs. per hour. "Impossible!" said he; "we burn on our launches in India not less than 1 cwt. per hour." The "Kingdon" Machinery represents the newest and most approved modern practice in Launch Machinery, and the experience of the customer from India the old.

To mention examples of what is done in actual practice, we may say that a yacht's steam or four-oared gig for carrying in davits on board a yacht, fitted with the "A" size single machinery, weighing 7 cwt., has an approximate speed of eight miles on a consumption of about 8 lbs. of coal per hour. Again, a 50 ft. powerful launch, suitable for sea or river work, fitted with the "Kingdon" patent quadruple "F" size machinery, has an approximate speed of thirteen miles on a consumption of about 25 lbs. of coal per hour, thus making the cost of fuel per day of ten hours, say 2s. 6d., exclusive of lighting up. It may be added, that a launch of the latter size is frequently worked under the sole charge of one hand. This result is attained partly from the economy effected by the "Kingdon" natural draught boiler, and partly from the small quantity of steam used by engines of the "Kingdon" type.

The following, which is a copy of an unsolicited letter from an owner of a launch fitted with the "Kingdon" Machinery, will be of special interest to Thames yacht and launch owners:—

"DEAR SIRS,—

"Hernes, Henley-on-Thames, March 21, 1890.

"It may perhaps interest you to know what my little boat did last season. She went just 1,000 miles, and burnt 19½ cwt. of Aberdare coal in 57 days of use. It seems wonderful the small amount of fuel she uses.

"Yours faithfully,

"(Signed) J. L. KEENE."

At the close of 1888 two steam launches were built at Dartmouth for the P. and O. Company on account of the new steamers the *Peninsular* and the *Oriental*. The launches were 30 ft. long, 8 ft. beam, and 3 ft. 9 in. deep; and they were built to keep the sea in heavy weather. These boats were fitted with the "Kingdon" Patent Quadruple Expansion Surface-condensing Engines, and the "Kingdon" Patent Vertical Natural-draught Boiler; and each launch weighed only 45 cwt. with steam up. The coal-consumption of these is about 15 lbs. per hour.

In response to the request of the P. and O. Company's Engineer, special trials were made on two separate days to demonstrate the actual consumption of coal under varying conditions. We need not weary readers here with the tabular results, which were taken in precise detail during each 30 minutes of the trial, which lasted in each case four hours. We may, however, state that on the first occasion the steam was throttled in order to keep the speed down as nearly as practicable to five knots per hour. In this case the result showed a consumption of coal per mile run of 1.652 lbs., or 10 lbs. per hour.

In the second trial—with the same boat and same machinery—on the following day, the throttle-valve was opened full before the commencement of the trial, and steam kept up throughout to about blowing-off point; the throttle-valve not being touched during the four hours. The result showed a speed of 7.375 knots per hour, and a consumption of coal at this speed of 2.6 lbs. per mile, or 22 lbs. per hour.

We could multiply instances, but these we have quoted, and the official results tabulated by the Royal Agricultural Society which we have given elsewhere are, we think, sufficient to convince anyone of the remarkably economical qualities and efficiency of the "Kingdon" Machinery.

We promised to speak of the capability of this machinery for burning wood or coal fuel. The Boiler is well adapted for either, and we cannot do better than quote from a letter received from the Captain of a yacht carrying a 21 ft. steam-gig fitted with the "A" size "Kingdon" Machinery. The latter was used under the rough conditions of exploring work in the rivers of South America; and the Captain thus writes:—

"Rio de Janeiro, January 4th, 1884.

"She has done a deal of work in the River Plate, as I have been away from the ship thirty days at a time in her, surveying all the small rivers about here, burning nothing but wood cut from the river banks as required. I can safely say that since entering the River Plate she has steamed quite 1,500 miles, and towed our gig, loaded with tents and stores astern, making an average three knots against the strength of the Parana."





CHAPTER VII.

SOME REPORTS OF EXPERTS AND PRESS OPINIONS RELATIVE TO THE "KINGDON" MACHINERY.

THE Report of the Judges appointed by the Royal Agricultural Society to test the Engines offered for competition, at the trials of Light Motors instituted by the Society at Plymouth last year, is so recent and must necessarily carry such great authority that we quote from this in the first instance. The Judges appointed by the Society were Mr. Dan Pidgeon, C.E., and Professor Unwin, F.R.S.; and the **First Prize** (£30) was unhesitatingly awarded to the "Kingdon" Engine, as we have pointed out elsewhere, after a series of exhaustive tests.

There is an impression amongst some buyers that the "Kingdon" Machinery, being the subject of patent right, and being different in several respects from the ordinary wasteful high-pressure type of engine, must necessarily be complicated or difficult to manage. We may as well, therefore, refer at once to what Mr. Pidgeon and Professor Unwin have to say on the point. They describe* the Engine as—

"A small, comparatively fast-running Compound." And they remark: "The Compounding is of a very simple kind, and involves no special complication or extra working parts. The cylinders are tandem, and the peculiarity is that a single slide-valve regulates the admission and exhaust for both cylinders. The cylinders are cast in one without jackets, and clothed with silicate cotton and sheet-steel. There is no stuffing-box between the cylinders, but the piston-rod connecting the pistons is grooved; and this, in the maker's opinion, insures sufficient steam tightness."

The above testimony to the simplicity of the "Kingdon" Engines is conclusive, and buyers have the satisfaction of knowing that they obtain all the advantages of economy without more complication than in the common wasteful type of engine. The "Kingdon" Boiler is also perfectly simple. It is thus described by the Judges (page 582 *ib.*):—

"The boiler was a small vertical boiler with rather closely-packed vertical tubes. There were 156 tubes (brass), 2 ft 3 in. long and 1 in. outside diameter. These tubes give sufficient heating-surface in a small boiler, and as they pass up through the steam-space the superheating surface is not inconsiderable. Probably a very distinct advantage in economy was derived from the drying of the steam by the upper part of the boiler."

The Engine which gained the Royal Agricultural Society's First Prize of £30, and to which this Report refers, was mounted on wheels for farm use.

* Page 582. The Journal of the Royal Agricultural Society of England. Vol. I. Part 3. 30th Sept., 1890. London: John Murray.

The principle on which the machinery is constructed is, however, the same as that of other types of the "Kingdon" Machinery, with the modifications of double-compounding and quadruple expansion, and, therefore, it will be understood that whatever of merit attaches to the "Kingdon" Engine shown at Plymouth belongs also in principle to the other types of the "Kingdon" Machinery. At the outset of their Report the Judges express the following decided opinion (p. 581):—

"Amongst the three Engines submitted to them the Judges had no difficulty in deciding the Order of Merit."

And after giving a summary of engine results, they say (p. 589):—

"These figures show the enormous superiority in economy of the Small Compound Engines to the two others. The Compound Engine works with half the expenditure of coal required by the single cylinder engines, and as might be expected as a consequence, **developes three times as much power per cwt. of weight of engine and boiler.**"

A Report by Mr. John Dickinson, an artisan expert who was deputed by the Mansion House Committee to examine the Marine Engineering section at the Paris Exhibition, 1889, refers to the "Kingdon" Machinery exhibited there. Referring to the "A" Quadruple type, the writer makes mention of the fact that—

"The Steam Launch races (open to all comers) at Dartmouth Regatta in the years 1885-6-7-8 were won by Launches fitted with this machinery."

He adds the following:—

"The Single Compound Engine exhibited has a $3\frac{1}{2}$ in. High-pressure and an $8\frac{1}{2}$ in. Low-pressure Cylinder, and is shown as an example of the extreme simplicity of this type of engine, having no more moving parts than a Single Cylinder High-pressure engine, but possessing all the advantages of a Compound Condensing Engine. It is an engine, from its extreme simplicity, well adapted for mercantile marine fishing boats, and similar work, where a strong, simple engine, with high efficiency, is required.

"The 'F' Quadruple Expansion Engine is a powerful one, having cylinders of $3\frac{1}{2}$, $5\frac{1}{2}$, 8, and 12 inches in diameter, suitable for Launches of 45 to 50 ft. in length, and will drive a Launch at a speed of 12 to 14 knots per hour.

"The largest sized engine exhibited by this firm is a 'J' tandem Compound Surface-condensing engine, having two cylinders of 4 in. diameter high-pressure, and two low-pressure cylinders of 10 in. diameter, suitable for a yacht of from 15 to 30 tons."

Articles descriptive of the "Kingdon" Machinery have appeared in the following technical journals:—*Engineering*, 17th May, 1889; *Industries*, 26th July, 1889; *Machinery Market*, 1st Oct., 1888; *Marine Engineer*, 1st Oct., 1889; *The Steamship*, 2nd Dec., 1889, and 1st Nov., 1890; *Mariner*, 15th April, 1889; *Railway Supplies Journal*, 8th June, 1887.

In a long special article descriptive of the Works at Dartmouth where the "Kingdon" Machinery is made, written after a personal visit by a representative of the Journal, the *Machinery Market*, of 1st Oct., 1888, speaks of the productions seen as—

"... some of the most beautiful, and, withal, the most economical in construction of the steam launches which are to be found anywhere in this country."

Referring to the Works, now employing some 250 to 300 hands, the writer says—

"It may fairly be claimed for them that they have sprung into existence and grown into a flourishing concern by virtue of the meritorious nature of their productions."

Reverting to the history of the invention, the same writer says:—

"It is the claim of this firm that they were the first to make condensing machinery satisfactorily for steam launch and similar small services. It had been often enough tried in vain, and another celebrated maker in the south of England laughed at Messrs. Simpson & Co. for persisting in their efforts. 'He that laughs last laughs longest.' . . .

"The difference in the consumption over the old high-pressure system is certainly most astonishing. A customer from India, calling on the firm not long ago, was told that he could be supplied with a launch which would work on a coal consumption of 12 lb. per hour. 'Impossible,' said he; 'we burn on our launches in India not less than 1 cwt. an hour.' However, he was convinced by actual demonstration that the statement was not exaggerated."

In an article in the *Steamship*, of 1st Nov., 1890, the writer, referring to the introduction of "a simple form of tandem compound engine under 'Kingdon's' patents for launches," speaks of the constant improvements which have been made upon the original design

"With the most remarkable results. . . . Their simplicity is obvious, as one valve regulates the admission and emission of steam in both cylinders, and there are no more moving parts than in a single cylinder engine."

Complimentary references to boats fitted with the "Kingdon" Machinery have been given in numerous other papers, including *The Dartmouth and Exeter Chronicle*, April, 1890; *Western Morning News*, 25th April, 1890, &c.

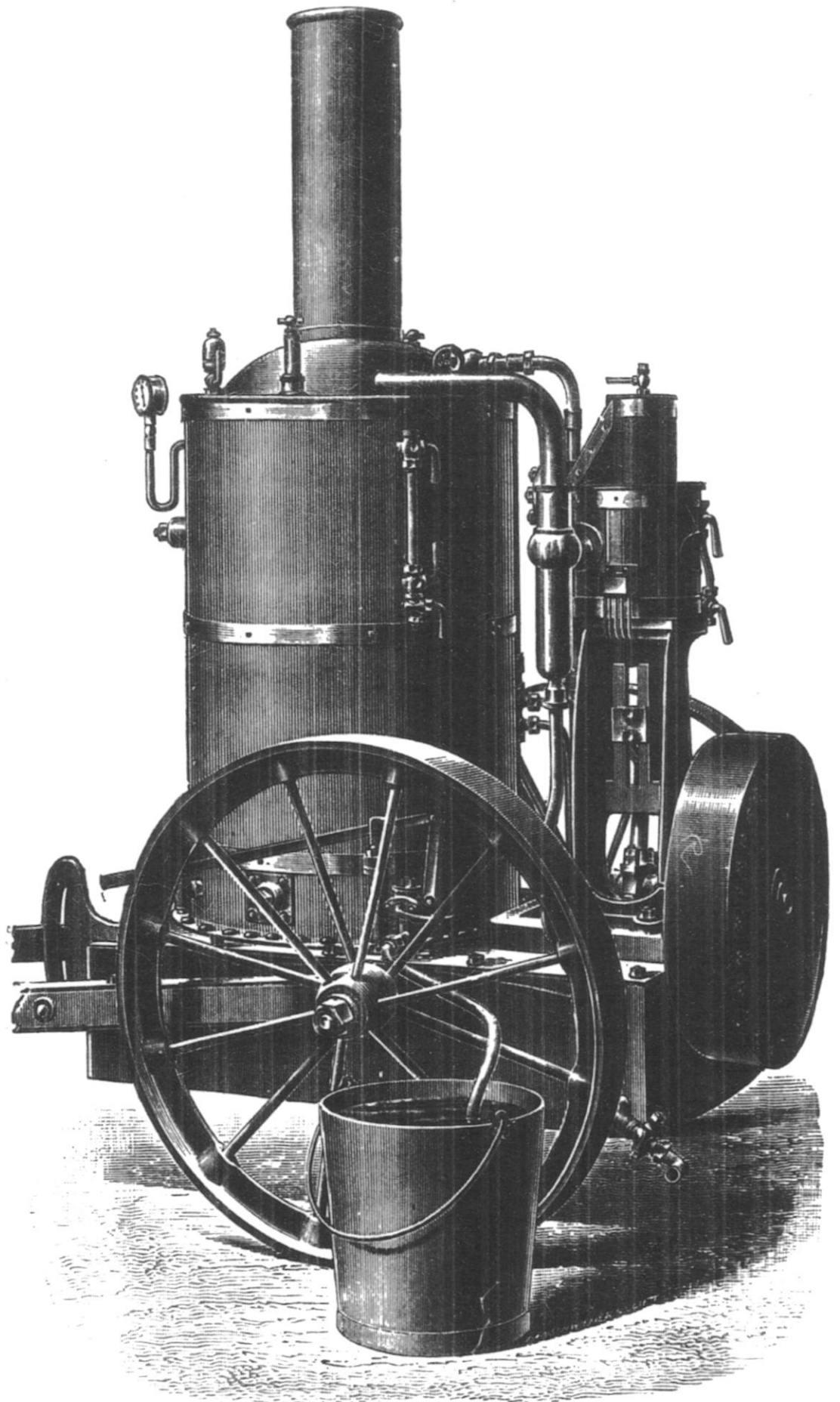
The *Buenos Ayres Standard*, in an issue early in 1890, thus refers to some steam launches fitted with the "Kingdon" Machinery:—

"The chief event at the Tigre Hotel on Sunday was the visit of Dr. Quintana's (junior) handsome steam yacht, the *Mercedes* which has lately arrived from England, and on that day made its inaugural trip. Early in the morning it left with a party of friends for the Carabelas in the Parana de las Palmas, where breakfast was served. In the evening other friends joined the party at dinner, whilst moored to the trees in the Abra Nueva, and later on the *Mercedes* steamed slowly up to the Tigre Hotel, which was saluted with a brilliant display of fireworks from on board. Mr. Sala's beautiful steamer, the *Guayraca* was also very much admired by the many visitors at the hotel. Dr. Quintana's boat is a duplicate of Count di Bardi's yacht, which cruises in the Adriatic, and is fitted with hoods and canvas and back for bad weather, to admit of trips up the Uruguay. Mr. Sala's craft has been built specially for the requirements of Tigre navigation, but it is also well fitted for bad weather, of which it has already had its share. Both are about 50 ft. long, very handsomely appointed, and steam easily twelve miles an hour. They were built by Simpson, Strickland and Co., under the directions of the Yacht Club Argentino, whose burgee they fly, and there is no doubt they are the handsomest steam craft that have yet been seen here, and are the best adapted for our climate and waters."

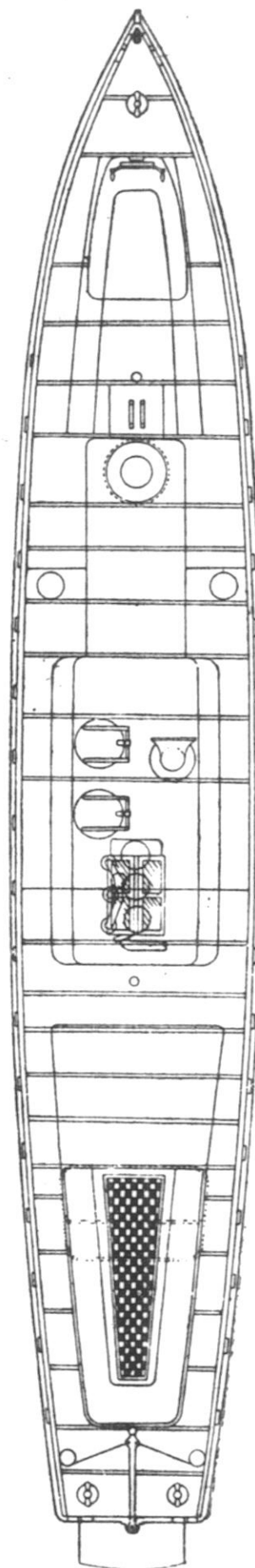
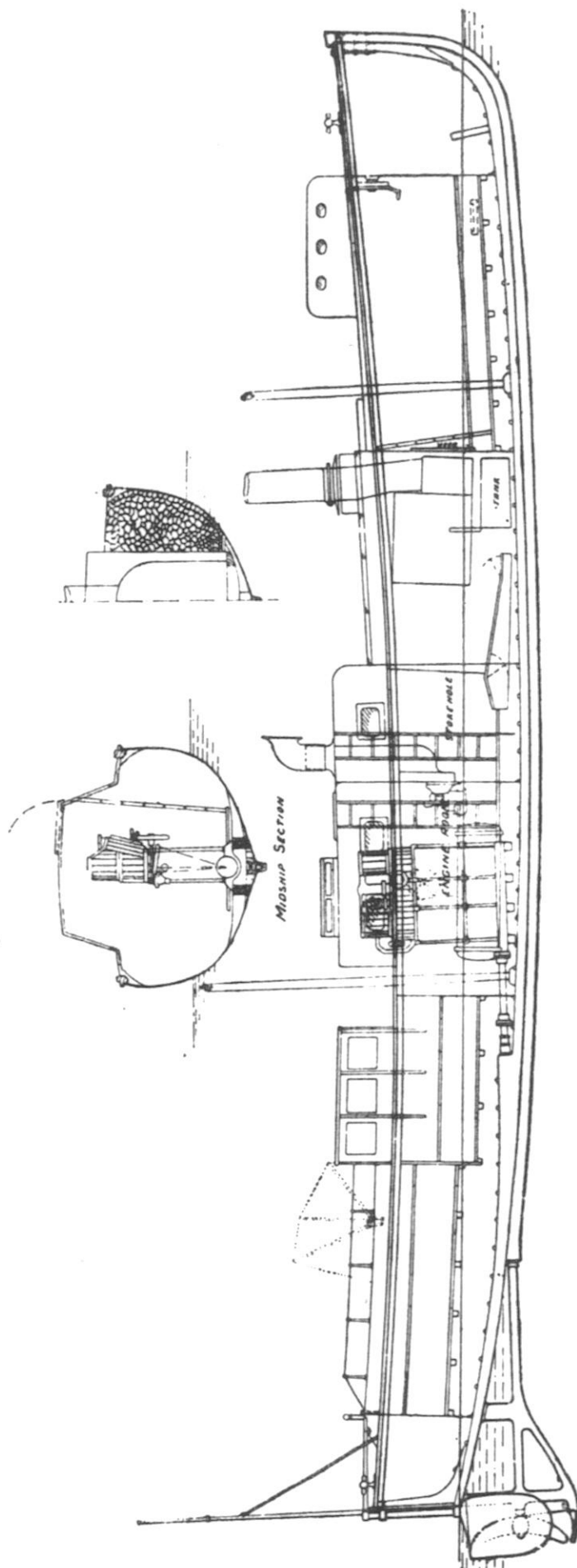
The *Bangkok Times*, of 5th Feb., 1890, recording the arrival of the first quadruple expansion steam launch for the Meinan waters, says:—

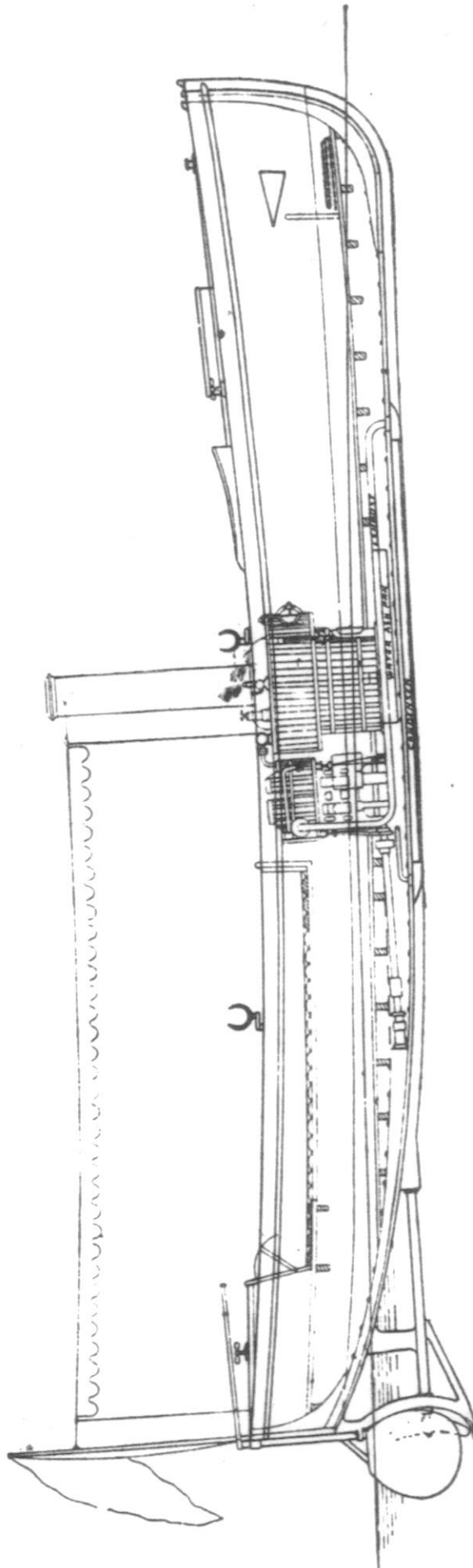
"Every part of the machinery is of most superior make and finish, and as an example of excellence of workmanship, is well worth an inspection."



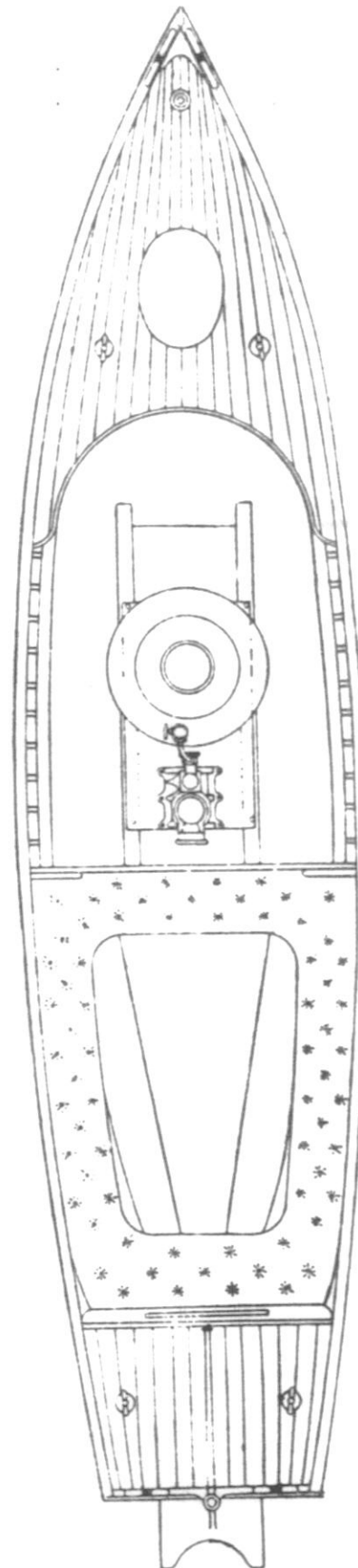


GENERAL VIEW OF THE "KINGDON" PATENT LIGHT PORTABLE ENGINE.





PLAN AND SECTION.



SPECIAL THAMES LAUNCH—“SCOUT” CLASS.—(Type No. 26).



CHAPTER VIII.

THE "KINGDON" AS A LIGHT PORTABLE ENGINE, AND LIGHT FIXED ENGINE AND BOILER FOR FACTORY USE, CRANES, &c. ALSO AS A STATIONARY ENGINE FOR DRIVING MACHINERY, ELECTRIC LIGHTING, &c.

THE "Kingdon" Engine, proved, unmistakably last year, in open competition, that it is superior to any other type where the great essentials of lightness, compactness, portability, and economy of fuel, are concerned.

As a Portable.—The award of the Royal Agricultural Society's first prize of £30 at Plymouth, which it gained in competition open to all makers, after the most exhaustive and thorough trials by the Society's judges, is conclusive on this point. We can, therefore, confidently recommend it as the best Engine on the market, either as—

1. A Light Portable, for Farm purposes.
2. A Light Fixed Engine and Boiler combined.
3. A Light Engine and Boiler for mounting on Cranes or for Winches, Steam-pumps, and the like.*
4. A Factory Engine, or for driving dynamos, electric lighting, &c.

Although the "Kingdon" Engine has only lately attracted prominent attention, its adaptability to the above-named purposes is not a matter of experiment. One of these Engines, made for Farm purposes as far back as 10 or 11 years ago, was exhibited at the Royal Show at Plymouth, side by side with one of the newest design; and the following copy of a letter from its late owner will serve to show how it has answered:—

" FALLAPIT, MOUNTS R.S.O.

" SOUTH DEVON,

" 23rd May, 1890.

" DEAR SIRs,—

" I have much pleasure in saying that I have worked your little engine continuously for 10 years, driven by a farm labourer, cutting chaff, pulping roots, and elevating hay. During this time it has worked most satisfactorily, the repairs not having exceeded £10.

" It has been fired almost entirely with wood produced on the Estate, and the consumption is extremely small. Any small-sized horse can easily draw it with steam up, and I frequently send it ten or twelve miles by road, the draught not exceeding that of an ordinary farm cart.

" I am, etc.,

(Signed) " WILLIAM CUBITT.

* See leading article in *Engineering*, 14th Nov., 1890, p. 577.

The experience gained with the "Kingdon" Engine demonstrated the fact that the weights and coal-consumption of the ordinary type of small engine are quite out of proportion to the power developed, and there was pressing need for an engine of better design. The makers* of the "Kingdon" Engine fully recognised this fact, and foresaw, also, the wide scope for a land engine such as they could put on the market, but owing to the demand for the "Kingdon" Engine, for Steam Launch and other marine work, they were too pressed with orders for the latter class of machinery to devote their attention to the Portable and Light Land type until lately. Further considerable extensions to the factories at Dartmouth, and the arrangement entered into with this Company, enable us to meet the demand, both for Home and Foreign use.

The advantages which the "Kingdon" Engine possesses for Home use are essentially those which will make it a great boon to Foreign purchasers. It is very much lighter than any other engine of the same power, and it uses less coal than any other,† consequently, for portable purposes in particular, it is unrivalled. It can be taken more easily along farm roads and lanes, and even across ploughed fields and turnip grounds. Moreover, for rapidity in getting to work, the "Kingdon" Engine has no equal. It can be taken with steam up from one field to another, so as to work in several different localities on the same day when required. Other advantages are that the working is quiet; steam is quickly raised with *either wood or coal* fuel; and full pressure is easily maintained. The engine is entirely self-contained, and carries with it sufficient coal and water for several hours' work.

Arrangement of the Machinery, and Sizes Made.—As will be seen from the illustration, the Boiler is vertical, and the Engine is also vertical, with two cylinders placed tandem. The whole rests on an iron platform, and is mounted on light wrought-iron wheels. The fly-wheel is on a shaft running parallel with the horse shafts. The larger sizes are mounted on a four-wheeled travelling carriage.

The Portable Engine can be removed from the under-carriage and used as a stationary engine when so required.

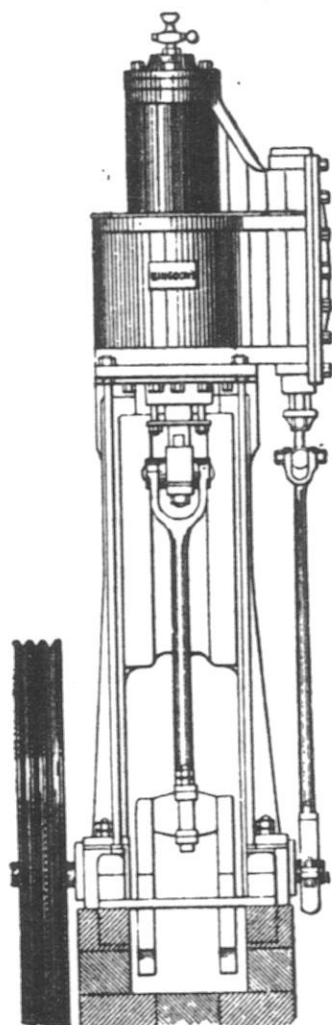
The **Fixed type** is the same, in all general respects, as the Portable, but is without tank, wheels, and shafts, and is mounted on a strong bed-plate. It can be fixed anywhere with slight foundations.

As a Factory Engine.—The compact design, economy in fuel-consumption, and steady running of the "Kingdon" Engine, render it also

* Messrs. Simpson, Strickland & Co., who are sole owners of the patent right.

† See the Report (quoted on p. 58) of Professor Unwin, F.R.S., and Mr. Dan. Pidgeon, C.E., the experts appointed by the R.A.S., to conduct the Plymouth trials. According to their finding, the "Kingdon" Engine develops **three times** the power, as proved by the brake test, weight for weight of Engine and Boiler, as compared with the second best, and uses half the coal of the second prize engine of same power.

one of the most satisfactory motors ever produced for driving the machinery of Factories and Works, as well as for running the Electric Light. In construction, it is simplicity itself.



At Messrs. Simpson, Strickland & Co.'s Works at Dartmouth, an Engine of the annexed design has been running for several years with the most satisfactory results, and the experience there gained with it enables us to recommend it to the notice of Steam Users with confidence as being far superior to the ordinary type of High-pressure Engine, whilst it occupies much less room than an ordinary type of Compound Engine of equal power.

The Engine at Dartmouth drives the whole of the machinery at the works, and maintains the Electric Light with perfect steadiness.

60 indicated h.p. is obtained from an engine occupying a floor-space of 2 ft. by 4 ft. and 8 ft. in height. This Engine replaced an 8 h.p. Portable; and only one-third the coal is consumed by the "Kingdon," though giving off more than double the horse-power. This is a striking fact which speaks for itself. Steam Users may be assured of a large economy by adopting the "Kingdon" Engine for Factory purposes, or for Electric Light driving.

This design is made Condensing, and is recommended where plenty of water is available. In the latter case a K rting Condenser or an ordinary Condenser is used.

A very useful engine for Factories is our No. 4 size, having one 5 in. h.p., and one 10 in. l.p. cylinders by 10 in. stroke, fitted with the "Turner-Hartnell" cut-off governor, actuating the slide valve direct. This engine will indicate about 18 h.p., at 120 lbs. steam pressure, on a consumption of about 80 lbs. of coal per hour.

The same engine combined with the "Kingdon" boiler and without a governor is suitable for a large variety of industrial purposes of practically unlimited scope.

For **Mills and large Factories** requiring a motor to work with the greatest possible economy, we make some special designs. To this class of users we strongly recommend either our **Stationary Compound Jet-condensing, Inverted, Direct-acting Engine**, or our **Stationary Compound Surface Condensing Engine**. The latter is fitted with the "Turner-Hartnell" automatic cut-off governor, actuating the slide valve direct.

THE "KINGDON" YACHT, LAUNCH, AND ENGINEERING CO., LD.

The former of these (Jet-condensing) 8 in. h.p., and one 24 in. l.p., by 18 in. stroke will indicate about 125 h.p. on a consumption of about 2 cwts. of coal per hour, with a working steam pressure of 125 lbs.

The latter (Compound-surface Condensing), with 8 in. h.p., and 24 in. l.p., by 18 in. stroke, will also indicate about 125 h.p. on a consumption of about 2 cwts. of coal per hour, with a working steam pressure of 125 lbs.

These figures will convey an indication of the advantage to be gained by the adoption of the "Kingdon" engine for stationary purposes.

For **Electric Lighting** purposes where the engine is coupled direct to the dynamo, we recommend a shorter stroke.

In all the essentials of steady running, economy of fuel, simplicity, and openness of arrangement, the "Kingdon" engine is, we believe, without a rival in the market.





CHAPTER IX.

THE PRESS ON THE "KINGDON" ENGINE AT THE ROYAL AGRICULTURAL SHOW, PLYMOUTH, 1890.

AS these references deal exclusively with the portable type of "Kingdon" Engine and the noteworthy trials of the Royal Agricultural Society, we reprint them separately :—

Engineering, of 27th June, 1890, says :—

"Messrs. SIMPSON, STRICKLAND & Co. naturally received the First Prize of £30, and certainly deserved not only it but all the credit which is attached to it. . . . The coal used per brake H.P. per hour was 4.82, and water 42.03, the evaporation being 8.72 lb. of water per lb. of coal. . . . Their Engine exhibited a commendable economy, partly due to good construction, and partly to the high pressure of 110 lb. employed. It ran exceedingly well. . . .

"At their stand Messrs. SIMPSON, STRICKLAND & Co. have a similar Engine which they made ten years ago. During the interval it has done the odd work of a farm, been sent hither and thither, and the owner testifies that it has not cost him £10 for repairs the whole time. Probably he will feel still better pleased now that he learns how economical it is."

The Engineer, of 4th July, 1890, says :—

"It is a very well-known thing that small motors are every day growing in the number of their applications. It is of no use to affect, as some makers or their representatives do, that these little machines are beneath their notice. This is disproved by evidence which a walk through the Show accumulates. It is quite evident that unless the purchasers of small engines exercise some judgment in their selection they may be buying engines that will cost them about £3 for every £1 they would expend on fuel if they got a really good engine. . . . Yet buyers of small engines are content to, or at least do buy engines upon assurances concerning economy, which means money value, which are not necessarily worthy of greater credence than those of the artificial manure maker or merchant. They will not continue to do so, and there is no reason for their doing so. If an engine giving off 5-horse power consumes 12 lb. of coal per horse-power per hour, and works 10 hours per day throughout the year, it costs about £50 per year more than it need. We therefore repeat . . . it is in the interest of those who wish to be credited with making good engines that they should enter their engines for trial by the R. A. Society . . . and it is certainly to be expected that purchasers will in future demand satisfactory proof of the economical qualities of the engines they are expected to buy."

The Times, of 23rd June, 1890, says:—

"Some of the awards were made by the Judges yesterday. The leading contests were for light portable motors suitable for farm work up to 5-brake horse-power. . . . The Judges awarded the first prize to Messrs. SIMPSON, STRICKLAND & Co., of Dartmouth, for a Compound Non-condensing Engine (Kingdon's Patent), suitable for light farm work, and which sells for £100.

"This engine is more of a marine than an agricultural type, but as it consumes some two-thirds less coal than either of the others . . . and occupies a much smaller space, the award of the Judges is generally supported."

Mark Lane Express, of 23rd June, 1890, says:

"It thoroughly deserved the first prize owing to its economy in the use of fuel, burning about two-thirds less coal than either of the others."

Iron, of 27th June, 1890, says:—

"Messrs. SIMPSON, STRICKLAND & Co. have taken the first prize in competition at the present Show . . . and we congratulate the manufacturers upon the results of the competition."

The Machinery Market, of 1st July, 1890, says:—

"The engine for which SIMPSON, STRICKLAND & Co., [Dartmouth, have taken the first prize award at the Show is a light and thoroughly economical engine of the upright portable type. The makers have been convinced that there is a wide scope for a small engine capable of developing say 5-brake h.p., and of a size sufficiently light to be taken about by one horse. The weights of coal consumption of most small engines are quite out of proportion to the h.p. developed, and Messrs. SIMPSON, STRICKLAND & Co. have brought forward this design as an improvement on any existing type of engine of this class. The award of the Society shows that their belief has been warranted, and they are to be congratulated on their great success. As we have said, there is great economy of fuel, and in addition the workmanship is first class. Taking into consideration the power obtained, the space occupied by the engine and the weight of the whole are very small indeed. Steam can be raised very rapidly, and there is no noise or vibration."

The British Trade Journal, of 1st July, 1890, says:—

"Before the Show opened on Saturday morning, the 21st ult., the news had got abroad that the first prize for light portable motors had been awarded to Messrs. SIMPSON, STRICKLAND & Co., Dartmouth, and when we arrived on the exhibition ground this award was the subject of general interest and comment. Curiously enough it has been carried off by a firm of engineers hitherto almost entirely devoted as regards engine construction to those required for steam yachts and launches—a department in which they are well known as highly successful, and in connection with which they have frequently been referred to in these pages. The high degree of perfection attained in the designing of boilers and engines for marine purposes—the regard which must be had to economy of fuel, compactness, and proportionately high power, has tended to produce a specially well-designed and well-constructed type of engine, which when applied to the purposes of an ordinary portable engine could hardly fail of effect. It appears certain that the nice requirements exacted in engines for marine purposes have been the secret of the firm's success in designing the portable engine which took the first prize last week at Plymouth. In Section A of class 1—'motors using solid fuel, including steam engines and hot-air engines up to 5 brake horse-power'—the firm had three competitors, among them leading makers of standard patterns of vertical portable engines; and we understand that, for efficiency of working, economy of water and fuel and proportionate power developed, Messrs. SIMPSON, STRICKLAND & Co.'s light portable vertical engine on Kingdon's patents was in every way superior. The working is entirely noiseless, steam is quickly raised, and pressure fully maintained, with economy of fuel. The boiler has the tubes wholly immersed, and the tubes are proportionately smaller as the depth of water through which they pass is less, steam being raised from cold water, we are informed, in one-third the time taken in the ordinary horizontal type."

The Engineer, of 15th August, 1890.

Following up their previous remarks, *The Engineer*, of 15th August, 1890, published an important editorial article in its leader pages entitled "Modern Small Steam Engines," the substance of which is an acknowledgment that the

"Kingdon" Engine introduces a better type, and one that ought to supersede the other more wasteful makes. We give the following lengthy extract from this article :—

" MODERN SMALL STEAM ENGINES.

"So large a proportion of all the small engines made in this country are produced by those who make the agricultural engine, that the design adopted for them has an important influence on the whole. Alleged stupidity, slowness, and obtuseness with regard to things necessary to efficiency are characteristics which, whether real or imagined, are exercising a great and deterrent influence on the development of the small steam engine. It is not necessary that these characteristics should actually be operative. They are alleged to exist and to be operative, and that is in itself sufficient to produce the effect. The average owner and attendant of the small steam engines required on farms and estates are assumed to be incapable of exercising the care which is necessary to the proper working of an engine and boiler, if it be designed for economical working. Acting on this alleged stupidity and this assumed disregard by farmers of their own interests, the makers of engines and boilers of small power have been long accustomed to speak of an agricultural engine as though it were necessarily a thing of low order, capable of withstanding the roughest treatment, and of doing its work without the bestowal upon it of the least care. The consequence of this is that these small engines are made heavy and slow, and the boilers are made heavy and cumbersome, with large water space and small heating surface and low pressure.

"Now it may be asked whether the time has not arrived for ceasing to act upon these assumptions. The recent trials of steam engines at Plymouth by the Royal Agricultural Society, and the correspondence which has appeared in our columns and those of other journals since those trials, have proved that there is much difference of opinion concerning the requirements of modern small engines. Three engines were tested. One of these, that of Messrs. Adams and Co., was a simple, well-made heavy engine, with a large, heavy boiler. Another, that of Messrs. E. R. and F. Turner, was a somewhat less simple engine fitted with automatic cut-off, with a smaller and less simple boiler. The third was that of Messrs. Simpson, Strickland, and Co., the engine being a small light Kingdon's compound engine, with a small boiler and large heating surface. The latter engine and boiler is similar to that which the makers have made in considerable numbers for launches. Only one has been used for agricultural purposes, but this has been at work about ten years, and was exhibited at the Show still in good working order. It used, on the trials, less than half the water required by the other engines, and very much less than half the coal. The cubic space occupied by the boilers were respectively 49 ft., 19 ft., and 11 ft., so that the largest one was four and a-half times, and the second one two and a-half times the size of the small one; and the weights may be taken as proportional to these figures. On a farm, or with an engine which needs be portable, this is a consideration, and the quantity of water to be carried to it is not an unimportant matter. The engines would do the same work, but one would consume, if constantly at work eight hours per day, about forty tons of coal less per year than the other. These are surely very important advantages, but the farmer is denied them because he is assumed to be incapable of exercising care in the selection and supervision of his engine driver. Yet if the farmer happens to have riverside property, and chose to use a small steam launch, he is forced to possess and work just such an engine. He is supposed to be unable to prevent his farm men from feeding the boiler with mud instead of water, and equally unable to see that the boiler is cleaned more or less frequently according to the character of the water used. He is, on the one hand, credited by the makers of the delicate machinery of the small milk separators to be capable of carrying out the instructions as to its use, and yet he is denied the credit of using the same care with a steam engine which would pay him for his trouble. Years ago farmers, as owners of steam engines, might have been as stupid or as slow of comprehension of the ways of machinery as this, and there may be some even now; but this is not a sufficient reason for forcing all to pay a coal bill of more than double the amount it need be.

"The arguments that are commonly used concerning an agricultural engine by those who look upon the little compound engine at Plymouth as hopelessly unfit for anything but launch work, would preclude all improvement in the efficiency of small engines. They are arguments of exactly the same order as those which have marked the history of the development of every mechanical achievement. . . .

The engine showed what ought to be done as much as it showed what had been done; it pointed the way to future improvements and to even greater economy, and we shall be very much mistaken if in a very short time it is not understood that the farmer or estate owner who requires a small engine is as capable of insuring it proper attention as he is of winding his watch or of using a milk separator. There is no doubt that the prizes were properly awarded at Plymouth, although with regard to the second it is questionable whether the engine and boiler might not say of the judges that they were 'not weighing our merits, but pardoning our offences.' Another point that should be mentioned is the not uncommon remark that a high-pressure is not suitable for farm use. No satisfactory reason is given for this. One is bid to 'imagine a farm labourer tending a boiler with steam at 150 or 200 lb. pressure,' as though the picture so conjured is sufficient to put an end to the argument or such a proposal. We must admit that we see no adequate reason for denying the farmer, or other user of small steam engines, the advantages of high-pressure steam. There need be no more danger. A boiler designed to work at 75 lb. will probably be less safe for its pressure than one designed to work at 200 lb., and the farm labourer could learn to use the one carefully as soon as he could the other.

"These questions are of some importance even in connection with engines up to five horse-power, as at Plymouth, for the gas engine will certainly take the place of the steam engine when it is found that there is little to choose between them in the cost of fuel; but they are far more important when we recognise the fact that, for all we can tell, the ordinary make of steam engines of much more than five horse are nearly, if not quite, as bad."

Engineering, of 14th Nov., 1890.

After the publication of the detailed Report of the Judges appointed by the Royal Agricultural Society (see *Journal of the Royal Agricultural Society of England*, Part III., Sept. 30th, 1890), *Engineering* reverted to the subject, and considered the award of such importance as to make it the subject of a leading article. The latter appears in the issue of 14th November, 1890, under the title of "The Economy of Small Engines," and occupies nearly two pages of space in the columns of that influential journal.

A large portion of the article is occupied with a critical examination of the "Kingdon" Portable, and its performances as compared with those of the other competing makers; but the following extracts will serve to show the unhesitating opinion of this authority upon the merits of the "Kingdon":

"The amount of steam that a particular engine uses is an affair that many builders prefer left indeterminate. As long as no exact trial has been made charity is able to take a hopeful view of the question, and to put the consumption somewhere about the lowest figure that has been publically demonstrated in engines of the class. It is pretty well known what is the best that an engine of a certain size can attain to under favourable conditions, and makers generally assume that they have learned and put in practice all the lessons that have been taught on the trial ground. No doubt a great deal of valuable information is disseminated in this way, but we doubt if it is acted upon so promptly as is sometimes suggested. If it be, it is certain that engineers who construct small portable engines, launch engines, winches, steam cranes, steam pumps, and the like, will have a busy time in studying Professor Unwin's very valuable report upon the motor trials carried out by the Royal Agricultural Society of England at the Plymouth Show.

"The evaluation of contradictory advantages is a matter of individual judgment, and is a subject of great difficulty. But in the case before us the portability of Messrs. Simpson's exhibit was so immensely superior to that of the others, that it gained it the first prize. . . . The engine was quite simple. The high-pressure cylinder was planted on the cover of the low-pressure cylinder, without a gland between the two. In place of this there was a long bush, and the piston-rod was grooved to reduce the leakage. One valve served to distribute the steam to both cylinders. There were thus no more parts requiring attention than in a simple engine. . . .

"The lessons to be learned from the trials are that in this class of engine, pressure and piston speeds should be kept as high as is possible in view of the class of labour employed. There is one feature on which elaboration can be permitted, that is, clothing the boiler and cylinders. This makes no demand on the intelligence of the driver, and the expense will repay itself many times over in engines that work out of doors."

The Machinery Market, of 1st Sept., 1890.

Under the title "The Engine of the Future," this journal publishes an article which so thoroughly summarises the finding of the Judges in favour of the "Kingdon" Engine that we feel justified in quoting *in extenso*. The writer says:

"The competitive trials of small portable steam engines made under the Royal Agricultural Society's auspices at the Plymouth meeting this year, and the unhesitating award in favour of the 'Kingdon' engine, manufactured and exhibited by the firm of Messrs. Simpson, Strickland & Co., of Dartmouth, have had an unexpected result. To the astonishment and utter confusion of makers of the ordinary style of engine, it has been discovered that the design, which up to the present time has been considered quite the proper thing for small vertical engines and boilers and small portables, is all at once proclaimed by leading authorities to be obsolete.

"Up to the time of the Plymouth Show, when Messrs. Simpson, Strickland & Co. appeared on the scene with their 'Kingdon' engine, no one appeared to doubt for a moment, that any fault could be found with the ordinary type of engines of this class. The eyes of the engineering world have been suddenly opened, with the result that the 'Kingdon' engine is discovered to be the steam motor of the future, at any rate for light purposes. If any one questions the ground on which we have made this somewhat strong statement, we would at once refer him to the report on the subject submitted by Mr. Dan Pidgeon, C.E., and Professor Unwin, F.R.S., the experts appointed by the Society to act as judges.

"It is on this public report that our remarks are based. The result of the exhaustive trials which were made has shown that the ordinary class of light portable is using just about twice as much fuel as it ought to do in proportion to the brake horse-power developed, and is three times too heavy. This being the case, it will naturally occur to readers to enquire how it is that this discovery has been so suddenly sprung upon the initiated public. It may be remarked, in answer to this, that the makers of the 'Kingdon' type of engine which took the first prize at Plymouth have hitherto devoted themselves to all intents and purposes exclusively with the manufacture of the engine for the purposes of steam launches, yachts, and similar classes of craft. The demand has increased so largely upon its merits, that the works of the makers, constantly increased as they have been, have been taxed to their greatest capacity for the production of the marine type. The firm have lately, however, still further augmented their powers of production, and decided to place before the public a design of the 'Kingdon' patent engine suitable for light farm work and land purposes. The award of the Royal Agricultural Society, favourable as it was, did not come altogether as a surprise to the makers, inasmuch as one of their portable farm engines had been working for some ten years to the very great satisfaction of its fortunate owner. This engine was also shown on the ground at Plymouth.

"Our remarks so far are chiefly introductory, as the object in this article is to call particular attention to the report of the judges, published in the journal of the Royal Agricultural Society, in part No. III. of their first volume, Sept. 30th, and to which we have already referred.

"We have given to this article the title of the 'Engine of the Future,' and we may appropriately here substantiate our reasons for doing so. We quote the report of Mr. Pidgeon and Professor Unwin, and leave our readers to judge whether we are justified in our description. They say (pp. 595 and 596):

"Two of the makers have adopted a moderate steam pressure, a low speed of piston, and for simplicity, a single cylinder, as governing conditions. Given these governing conditions, there is no reason for supposing that the engines tried were bad engines, or that any others in the market which could have been put into the competition would have achieved sensibly better results. For the conditions assumed are exactly those which involve as a practically unavoidable consequence

an enormous cylinder condensation, and a condensation which increases so fast with any increase of expansion that full steam must be carried through a great part of the stroke. Some amelioration might be obtained if a moderate super-heating can be given in the boiler, but this is almost the only way in which any sensible improvement is to be gained.

"But are the conditions of moderate pressure, low speed, and the extreme of simplicity rightly selected? It appears that makers have overlooked the fact that these conditions not only involve inefficiency in the engine and consequent cost in coal, and increased cartage of feed-water, but they also involve as a consequence that the engine and boiler are large, heavy and costly. The results for the engine of Messrs. Simpson, Strickland & Co., show that we may have, with very little additional complication, three times as much power per cwt. of weight of engine and boiler, and at the same time use less than half the coal and little more than half the feed-water."

"Hence the moral of the trial is that small single cylinder steam engines, such as those tried, are only defensible on the assumption that a quicker piston speed, a somewhat higher steam pressure, and a second cylinder, are altogether unsuited to engines for agricultural purposes. If economy of coal were alone in question, perhaps this view might be plausibly defended, but it can hardly be adhered to when the greater portability of the other type of engine is also taken into account."

The award at the Plymouth Show naturally caused some dissatisfaction on the part of makers whose style of engine is thus publicly announced to be superseded in favour of the newer type embodied in the 'Kingdon' patent. This was to be expected, and some sympathy must be expressed for those who for many years have worked to their customers' satisfaction in the old lines, and suddenly find themselves left behind. It is, however, impossible to ignore the fact that the ordinary design of small vertical engines and boilers is relegated by the judges of the Society to the antiquities of engineering. Amongst the three engines submitted to them, the judges remark they 'had no difficulty in deciding the order of merit,' and after tabulating the summary of engine results, they state (p. 583) :

"These figures show the enormous superiority in economy of the small compound engine to the two others. The compound engine works with half the expenditure of coal required by the single cylinder engines, and, as might be expected as a consequence, develops three times as much power per cwt. of weight of engine and boiler. The compound engine had some advantage in its higher steam pressure, some advantage in its higher piston speed, and some advantage, it is believed, in the drier steam supplied from a boiler with a reasonable amount of superheating surface. It has also a distinctly better mechanical efficiency, which, however, is partly due to the absence of the feed-pump and governor, and so far as it had an increase of efficiency in this respect, the gain is not fairly to be credited to it. There is no doubt, however, that the engine friction on this small, light, and quicker running engine was less than in the others."

CONDITIONS OF TRIAL.

The following copy of the official conditions of trial (p. 581) will enable our readers to follow the matter more closely :

"The trials of these engines will be generally similar to previous trials of steam engines by the Society. The indicated and brake horse-power will be ascertained; the fuel, and water, and consumption per horse-power will be measured, and due attention given to general design, excellence of workmanship, and uniform working of the engine. The adaptability of each engine for general purposes on a farm will be considered, especially as regards simplicity of design, strength, and durability. Engines indicating beyond five brake horse-power will be disqualified.

"The following will be the points awarded in each of the two classes, *a* and *b* :

1. Cost	...	...	...	...	...	15
2. Simplicity, workmanship, and durability	...	...	...	...	...	15
3. Lightness of weight combined with strength...	...	...	...	...	...	5
4. Governing power	...	...	...	...	...	5
5. Facility of transport	...	...	...	...	...	10
6. Fuel	...	...	...	...	...	15
7. Water consumption	...	...	...	...	...	10
8. Efficiency	...	...	...	...	...	15
9. Economy in getting to work, and attendance...	...	...	...	...	...	10
Total	...	...	...	...	...	100"

After quoting the above, the judges proceed in their Report to say :

“ In the first sub-class three steam engines were entered for competition. Two were single cylinder inverted engines with vertical boilers. The third was a tandem compound inverted engine with a vertical tubular boiler.”

We have no space to give here all the details of the trials, and it would be tedious to our readers were we to do so. They can be seen on referring to the copy of the journal of the Society from which we have already so largely quoted. We, however, give here a summary of the engine results, which is as follows (p. 589 :

Summary of Engine Results.	Simpson, Strickland & Co.	E. R. & F. Turner.	Adams & Co.
Piston speed in feet per minute ...	298.1	263.0	240.3
Indicated horse-power... ..	5.641	6.175	6.201
Brake horse-power	5.042	3.997	5.003
Mechanical efficiency	0.894	0.773	0.807
Brake horse-power per cwt. of engine and boiler empty ... ..	.3151	.1095	.0926
Cost of engine per horse-power ...	£19 16	£21 18	£22 18
STEAM.			
Steam used per indicated horse-power per hour, lb.	35.75	64.73	57.75
COAL.			
Per indicated horse-power per hour lb.	4.099	8.461	9.66
Per indicated horse-power per hour if condensed exhaust steam had been returned to feed tank as usual ...	4.072	7.917	—
Real ratio of Expansion	4.4	1.2	1.6

DESCRIPTION OF THE WINNING ENGINE.

On this point we quote as follows from p. 582. “ The engine of Messrs. Simpson, Strickland & Co. (first prize, £30) was a small comparatively fast-running compound engine (Kingdon's patent). The compounding is of a very simple kind and involves no special complication or extra working parts. The cylinders are tandem, and the peculiarity is that a single slide valve regulates the admission and exhaust for both cylinders. The cylinders are cast in one, without jackets and clothed with silicate cotton and sheet steel. There is no stuffing box between the cylinders, but the piston-rod connecting the pistons is grooved ; and this in the maker's opinion insures sufficient steam tightness. The engine had no governor, and was regulated during the trial by hand, the speed being very irregular. In ordinary work no doubt a governor would be necessary. The boiler was a small vertical boiler with rather closely packed vertical tubes. There were 156 tubes (brass) two ft. three in. long and one in. outside diameter. These tubes give sufficient heating surface in a small boiler, and as they pass up through the steam space the superheating surface is not inconsiderable. Probably a very distinct advantage in economy was derived from the drying of the steam by the upper part of the tubes. The boiler had a direct spring loaded safety valve. The boiler is ordinarily fed by an injector, but as this was arranged in connection with a tank so that the measurement of this feed was impossible, it was fed during the trial by a hand pump with which it was provided. To work this hand pump during the trial an extra attendant who did nothing else was permitted.

“ Our illustration herewith gives a general outside view of the engine, which we have no hesitation in pointing to as in our opinion undoubtedly the engine of the future for portable and light land work.”

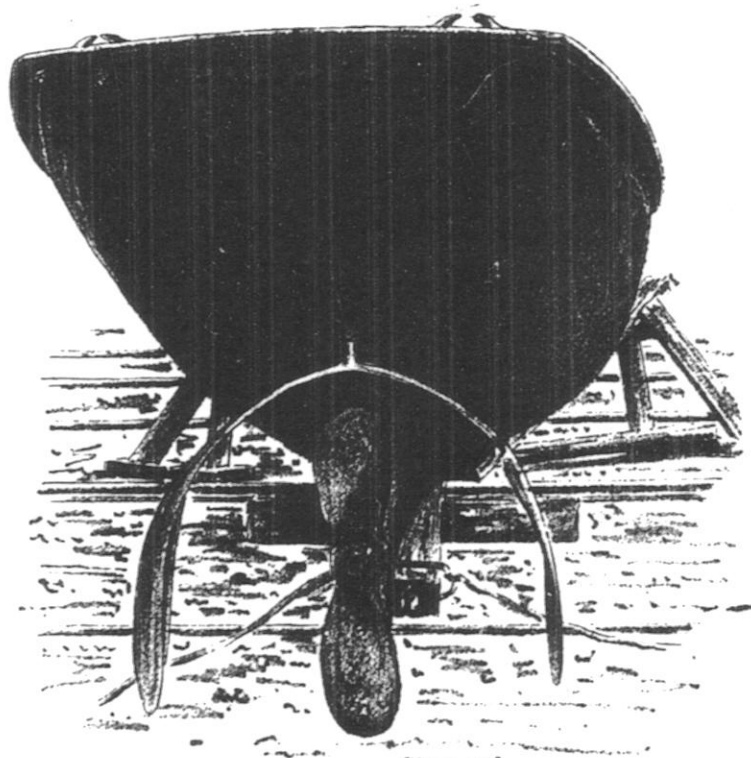


CHAPTER X.

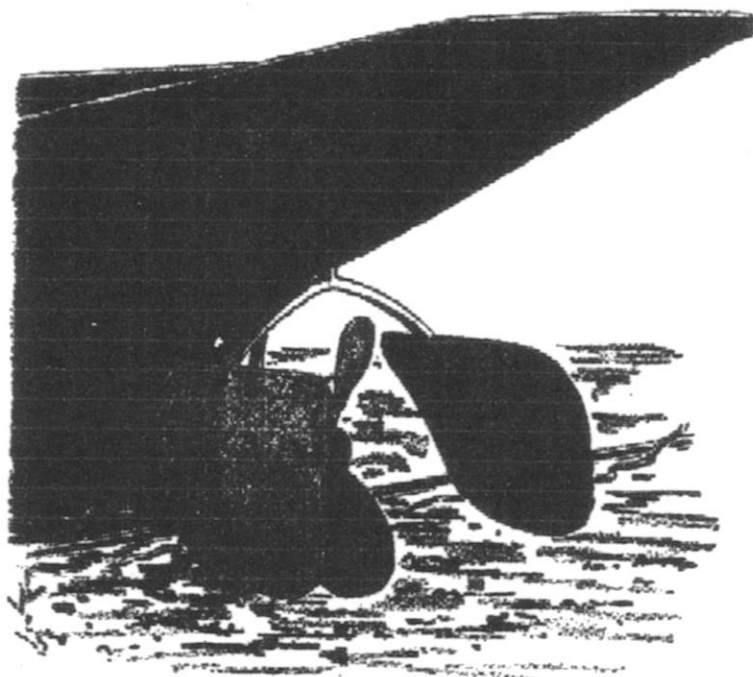
THE "HARRISON" PATENT RUDDER.

UNDER our arrangement with Messrs. Simpson, Strickland & Co., of Dartmouth (who have purchased the patent rights), we are now enabled to offer launch owners the advantages of this Rudder. The invention has proved an unqualified success, and we recommend its adoption as a valuable addition to the steering power of any boat. On the Thames especially it has proved most useful, and ample testimony has been borne to its qualities by owners and others who have adopted it, some of whose names are annexed.

The arrangement consists of two rudders moving bodily about a common centre. This will be made clear by the accompanying illustration—reproduced from a photo—the precise design being, however, subject to some little modification according to the class of craft to which it is to be fitted.



END VIEW OF LAUNCH FITTED WITH THE "HARRISON" PATENT RUDDER.



PERSPECTIVE VIEW OF THE "HARRISON" PATENT RUDDER FITTED TO LAUNCH.

Describing it, the *Engineer*, 1st February, 1889, says:

"When the rudders are put over to an extreme angle, almost the whole power evolved from the engines is exerted in turning the vessel owing to the fact that, practically, the whole of the water set in motion by the screw is deflected to the most advantageous angle for reacting in turning the stern of the vessel. In practical use it is found that directly the propeller revolves the power of steering is attained, a most valuable point for river and canal work, entering and leaving locks, &c. For torpedo boats it has the advantage of protecting the screw to a large extent from floating debris, whilst its design allows it to act as a shield against rifle bullets. Experiments have been made with one rudder removed, when it was found that excellent steering-power was still retained. The drawing [accompanying the description in the *Engineer*, of above date] shows the rudders as applied to an ordinary 40 ft. river launch; and a boat of these dimensions fitted with the patent will turn continuous circles under 60 ft. diameter with the engines running full speed ahead. It will be understood that in this size the rudders are simply suspended, and after four months hard wear there appears to be no sign of straining or bending in any point whatever. In vessels of larger dimensions it is preferable to have a pivot underneath the propeller as an additional support."

We may add to the foregoing that the "Harrison" Duplex Rudder is easily applicable to existing craft. For screw tugs the system is very valuable, as, by adopting it, a single screw-vessel can be as readily handled as one with twin screws.

Reference may be had to the following gentlemen and others who have adopted the "Harrison" Rudder, or have tested its capabilities:

H. T. Tatham, Esq., "Chesfield," Hampton Wick (fitted to two launches, September, 1887, and July, 1888); Charles A. Keith-Falconer, Esq. (on six ton launch); Mr. Alfred Burgoine, boat-builder, &c. (has fitted it to several launches); Mr. Wm. Agnew (fitted to the "Shipman" launch, shewn on the river Kelvin, at the Glasgow Exhibition, 1888); E. J. Allcard, Esq., "Holmesdale," Teddington (fitted to s.s. "Thetis" in 1888); E. R. Tymms, Esq., Worlingham, Spring Grove, Kingston-on-Thames (fitted to steam launch

"Ripple," in April, 1888); E. Campbell-Hancock, Esq., Claines, Worcester (fitted in 1889); Messrs. M. Immisch & Co., Electric Works, London, N. (fitted to four boats in 1889); Frank R. Harrison, Esq., 5, Bedford Road, Bedford Park, Chiswick (fitted to launch in 1890); Mr. James Taylor, The Wharf, Chertsey (fitted to launch 70 ft. by 12½ ft. by 3 ft. draft); Messrs. Tom Taylor & Son, Bridge Road, Chertsey (fitted to 30 ft. electric launch).

Copies of the testimonials from the foregoing may be had on application. We omit them here owing to want of space, but may quote the report of E. J. Allcard, Esq., as a specimen. That gentleman writes under date, 17th January, 1889:

"Last year I had your patent rudder fitted to my s.s. "Thetis," and I was at once astonished at the marvellous improvement effected in her steering. Before the alteration I could turn her with difficulty in the river, now no boat could possibly be more handy. I intend to have one fitted on the new boat I am now building."

The rudder is the invention of Geo. H. Harrison, Esq., C.E., who is a gentleman of considerable practical experience as a launch owner.





CHAPTER XI.

"UP THE RIVER."

AS one of the chief objects of the "Kingdon" Yacht, Launch and Engineering Co., Ltd., is to provide the most modern craft and machinery for the enjoyment of life on the water, and on the Thames in particular, we hope we shall be forgiven if in closing what is nevertheless a purely business publication, we take the opportunity of calling attention to this favourite form of recreation. Those who are already owners of yachts and steam craft, will, we hope, pay us a visit and make acquaintance with the facilities which this Company is prepared to offer for keeping their craft or machinery in repair, or taking care of it when out of use. Others who desire to become owners will find us prepared to study their requirements, and provide the most comfortable, fast, and easy running craft, which modern improvements have made available.

One of the London dailies referring recently to the issue of a new edition of Dickens's well-known "Dictionary of the Thames" writes so pleasantly on the subject of river life, that we are tempted to quote with some freedom. "This river cult" (says the writer), "is a comparatively new thing—a characteristic, and a very agreeable characteristic, of the later years of the nineteenth century. When the present reign began, the river cult was not in existence. People who lived on the river loved it as people who live on a beautiful river always must love it; and people who lived away from it sometimes, but seldom, paid it a visit. To fishermen, of course, the reaches of the river always were familiar, and adventurous spirits boated and belonged to boating clubs. But that recurring river worship which every year enumerates more votaries, which has turned tiny Thames villages into resorts as crowded as German spas, and which makes Marlow or Maidenhead the rivals of the Riviera in the affections of the wealthy—that worship is not a quarter of a century old, and its growth was slow at first. Now a holiday upon the river is an essential part of the true Londoner's life.

"He who has once been seized with the passion for the river never loses it again. Other tastes and fancies vanish, but that abides. It is like jungle fever, from which the system once inoculated is never wholly free; he who has caught the Thames fever feels it again and again as the years revolve. 'I have always loved rivers, and poets who sang of rivers,' said a great prose writer once. But there are rivers and rivers. The Englishman who is an amateur of rivers may have sounded the waters and stemmed the current of many streams, but his heart is always with his silver Thames. He may have raced along the Mississippi, running the risk of being snagged a thousand times; he may have drifted languorously along the yellow river which 'flows through hushed old Egypt and her sands like some fantastic thought threading a dream;' he may have pleasant memories of the Hudson; he may love the Rhine and the Rhone and the Liffey and the Mazaneres, and a hundred other haunts of river gods; but the softest spot of his heart is for his own dear stream, and for some particular spot on its enchanting waters which is always in his thoughts when his thoughts are with the Thames.

"Like the folk in the jigging country couplet which records the opposing tastes for apples, and for onions, the folk who love the river have widely different opinions as to the most attractive place upon its banks. There be those who swear by Taplow and Maidenhead, and who maintain that the river is only to be seen in perfection in the stretch between Bray Lock and Cookham Lock. These love to praise lordly Cliveden perched upon its wooded rise like the palace of some Italian hill-city; these love beyond all landmarks in the world those fifteen noble poplars, those green sentinels hard by Bray Lock 'that stand the warders of the river land;' others again are all for Marlow and Bisham and the Quarry Woods, where SHELLEY dreamed and wrote; and there are some who sing of Sonning, and some who delight in Datchet—but to enumerate all the places that are championed by the Knights of the River would be to rival the Catalogue of the Ships, and to write over again Mr. Dickens's Dictionary. There is not a place enrolled in this agreeable and admirable little volume which has not its own enthusiastic circle of admirers, admirers to whom at any time the word 'river' is a spell to conjure up a picture of their favourite haunt, and to bring its name in affectionate reverence to their lips. These lovers of a river town are as loyal to their love as if it were a cause or a creed.

"There is no pleasanter feature of modern London life than this devotion to the river. A summer on the river is a time to remember—a time of brilliant colour, and much sunshine and much laughter, a time which recalls the youth of the world in its delicious, almost delirious freedom from care. It is true that even the river life has its drawbacks. There are the block-heads who go out in boats which they have not the least idea how to handle. But these drawbacks do not count much more seriously in the sum of river life than the wasp which hovers for a while over the heads of a picnic party in some secluded glade. A temporary imprecation may rise to over-impatient

lips; but the objectionable episode is soon forgotten, while the consciousness of the enduring beauty of the river life remains. It is possible to understand the enthusiasms of those passionate lovers of the Thames who declare that the man or woman who has not lived the river life and loved the river life has never truly lived or loved at all. It is not necessary for the sober-minded majority to go so far as this. To the truly wise man—and are we not all truly wise? there are a variety of pleasures in life. But the pleasure of a river holiday is a very perfect pleasure in its way, and a pleasure that is, in the American phrase, bad to beat. To know the river, and in knowing it to learn to love it rightly, one must spend long days and weeks and months in its service and learn to appreciate it in every phase of its shifting moods.”

One word in anticipation of questions which some may feel inclined to ask

LIST OF LOCKS ON THE THAMES,

WITH DISTANCES IN MILES AND FURLONGS TO OXFORD.

	From place to place.	From Teddington.	From Oxford.		From place to place.	From Teddington.	From Oxford.
	M. F.	M. F.	M. F.		M. F.	M. F.	M. F.
1. Teddington ...	—	—	93 7	18. Marsh... ..	3 2	47 2	46 5
2. Molesey ...	4 7	4 7	89 0	19. Shiplake ...	2 4	49 6	44 1
3. Sunbury ...	2 7	7 6	86 1	20. Sonning ...	2 7	52 4	41 2
4. Shepperton ...	3 6	11 4	82 3	21. Caversham ...	2 5	55 5	38 5
5. Chertsey ...	2 0	13 3	80 3	22. Mapledurham .	4 3	59 4	34 2
6. Penton Hook	2 0	15 3	78 3	23. Whitchurch ...	2 2	61 6	32 0
7. Bell Weir ...	2 6	18 2	75 5	24. Goring ...	4 1	65 7	27 7
8. Old Windsor...	2 7	21 0	72 6	25. Cleve ...	0 5	66 4	27 2
9. Romney ...	3 0	24 1	69 6	26. Benson ...	6 4	73 0	20 6
10. Boveney ...	2 3	26 3	67 3	27. Day's ...	4 0	77 0	16 6
11. Bray ...	3 2	29 6	64 1	28. Clifton ...	3 0	80 0	13 6
12. Boulter's ...	2 1	31 7	62 0	29. Culham ...	2 7	82 7	10 7
13. Cookham ...	2 0	33 6	60 0	30. Abingdon ...	2 3	85 3	8 4
14. Marlow ...	4 2	38 0	55 6	31. Sandford ...	4 5	90 0	3 7
15. Temple ...	1 5	39 6	54 1	32. Iffley ...	2 1	92 1	1 6
16. Hurley ...	0 5	40 3	53 4	33. Oxford ...	1 6	93 7	—
17. Hambledon ...	3 5	44 0	49 7				

PRINCIPAL PLACES ON THE THAMES,

WITH DISTANCE FROM ANY ONE TO ANOTHER.

OXFORD ...	...	Folly Bridge.					SALTER'S Boat Yard and Barge.					Putney 103½						
ABINGDON ...	8	Abingdon.					Stevens' Wharf,					95½							
WALLINGFORD	21	13	Wallingford.					"Town Arms" Inn.					82½						
STREATLEY ...	27	19	6	Streatley.					"Swan" Inn.					76½					
PANGBOURNE .	31	23	10	4	Pangbourne.					Ashley's Boat Yard.					72½				
CAVERSHAM ...	37	29	16	10	6	Caversham.					Moss' Boat Yard.					66½			
HENLEY...	...	46½	38½	25½	19½	15½	9½	Henley. Johnson & Peacey's, or Parrot's.					57						
MAIDENHEAD .	61½	53½	40½	34½	30½	24½	15	Maidenhead. Bond's Boat Yard.					42						
WINDSOR ...	67½	59½	46½	4 ½	36½	30½	21	6	Windsor. Perkins' or Goodman's.					96					
STAINES...	...	74½	66½	53½	47½	43½	37½	28	13	7	Staines. Tims' Boat Yard.					29			
KINGSTON ...	90	82	69	63	59	53	4½	28½	22½	15½	Kingston. Burgoine's.					13½			
TEDDINGTON ...	92	84	71	65	61	55	4½	3½	24½	17½	2	The "Kingdon" Co.					11½		
RICHMOND ...	94½	86½	73½	67½	63½	57½	48	33	27	21	4½	2½	Wheeler's or Messum's.					9	
PUTNEY	103½	95½	82½	76½	72½	66½	57	42	36	29	13½	11½	9	W. East.				

OUR REGISTER OF YACHTS, LAUNCHES, &c., FOR SALE.

WE invite owners to send us full particulars and photographs of any boat they may wish to dispose of for entry on our Register free of charge. For convenience we give herewith a list of the chief particulars required, and these should be answered fully if possible. No charge is incurred unless a sale is effected.

Our terms are 5 per cent. commission, which is payable by the seller to the "Kingdon" Yacht, Launch, and Engineering Company, Limited, upon the amount obtained, when an actual sale is made through the Company's introduction.

Buyers wishing to meet with a secondhand boat are invited to send us particulars of their wants. We shall be happy to put them into communication with likely sellers without any charge; or if we have nothing on our books suitable, we will endeavour to find promptly what they require. It will greatly save time if gentlemen will state in detail what accommodation they require, and the price they are prepared to pay.

Communications to be addressed to the Secretary of the Company, 181, Queen Victoria Street, E.C.

MARINE INSURANCE.

We have special facilities for effecting Insurances upon all kinds of craft, and can quote close terms. We shall be glad to negotiate on behalf of owners, and have no doubt that in many cases we can save half the rates they might otherwise have to pay, and can secure advantages as to continuation of insurance and return of premium for laying-up, cancelling, &c.

Communications in reference to insurance, &c., to be addressed to the Secretary of the Company, 181, Queen Victoria Street, E.C.

REPAIRING DEPARTMENT, AND HOUSING LAUNCHES.

IN laying out our Works, we have kept the needs of Thames Launch Owners specially in view. We have aimed at establishing a Launch building and repairing shop of a better class and more complete character than is yet to be found on the Upper Thames.

An overhead gantry with travelling crane has been erected capable of lifting 4 tons, so that Launches can be lifted bodily into the sheds for painting, varnishing and general repairs without regard to the weather. We can thus execute work with the greatest promptitude. Only experienced workmen in their various branches are employed, and we guarantee, that whatever is entrusted to us shall be turned out in the best possible manner. The charges for repairs are based upon the time occupied, and will be found as reasonable as it is possible to make them consistent with good work.

For Housing Launches, we have ample accommodation, and can take charge for long or short periods.

PARTICULARS OF
Steam Launch for Sale.

TO BE FURNISHED BY SELLERS WHEN OFFERING TO THE COMPANY.

Name _____

Boat built by _____ *date* _____

Length _____

Breadth _____

Depth _____

Speed (approximate) _____

Machinery built by _____ *date* _____

Description of Engines _____

„ *Boilers* _____

Where lying _____

What Fittings _____

Price asked _____

General Remarks _____

NOTE.—Sellers will greatly assist us if they can also send a photograph or sketch of the boat.

STORES AND SUPPLIES FOR LAUNCH OWNERS, &c.

We are prepared to supply at short notice any of the following requisites of first-rate quality, and shall be pleased to quote prices on application.

Yachtsmen abroad, placing their orders with us, may rely on every attention being paid to their requirements.

Repairs done and sent out again in the shortest possible time.

ANCHORS (all Kinds).
BAROMETERS.
BINNACLES.
BOAT HOOKS.
BLOCKS (Iron, Brass or Wood) Patent.
BREAKERS (Water).
BRASS HINGES.
BRASS HOOKS (Cabin).
BRASS YOKES.
BELLS.
BRASS WOOD SCREWS.
CHRONOMETERS.
CLOCKS.
COPPER RIVETS, etc.
COMPASSES (All Kinds).
COUNTERS (Engine).
CHARTS AND BOOKS.
COOKING STOVES.
CORK FENDERS.
CANVAS DO.
CABIN FITTINGS.
CORK JACKETS.
CANVAS DUCK, etc.
CANVAS BUCKETS.
COTTON WASTE.
COPPER FUNNELING.
CAULKING IRONS.
CHAINS (Lloyds' Test, &c.)
CLEATS (Brass and Iron).
CABIN FURNITURE.
DO. LAMPS.
CUSHIONS.
DOUBLE GLASSES (Night and Day).
DECK LIGHTS.
DIVIDERS.
DECK SCRAPERS.
ENGINE ROOM LAMPS.
ENGINE ROOM STOVES.
FOG HORNS (All Kinds).
FLAGS AND SIGNALS.
FAIR LEADS (Iron and Brass).
GUNS (Signal, &c.)
GALVANIZED ANCHOR BUOY
(Painted with Luminous Paint).
GUNTER'S SCALES.
HYDROMETERS.
HAND LEAD-LINES, etc.

HANKS (Patent).
IRON LOCKS.
INDICATORS (Steam).
INDIARUBBER MATS.
JESTY'S COMPOSITION for YACHTS'
BOTTOMS.
LOGS (Patent). All Kinds.
LAMPS (Side Anchor, Cabin, &c.).
LIFE BUOYS.
LEADS (Hand and Deep Sea).
MOPS.
MAIN SHEET BUFFERS.
MARLING SPIKES.
MAN ROPES (White Cotton).
PARALLEL RULES.
PAINTS, OILS, etc.
PALMS' (Sailors').
PADLOCKS.
QUADRANTS.
ROWLOCKS (Iron, Brass, and Patent).
ROPE (All Kinds).
RIGGING SCREWS.
RACKS.
SAILS.
SEXTANTS.
SCUTTLES.
STOVES (All Kinds).
STANCHIONS.
SOUNDING MACHINES.
SALINOMETERS.
SACCHAROMETERS.
STEAM COAL (Welsh Smokeless).
STEAM GAUGES.
STEERING WHEELS.
SIGNALS.
SPLINES, etc. (For Building).
SQUEEGEES (For Deck).
SHEET HOOKS.
SERVING MALLETS.
SISTER HOOKS.
SPUN YARNS.
SAIL NEEDLES.
TELESCOPES.
TACK HOOKS.
TABLES (Swing).
WIRE ROPE.
WINDLASSES. YOKES.

OILS AND LUBRICANTS.

The most recent regulations in the Navy provide that **no oil whatever shall be used** for the cylinders of **vertical** engines. But where launch owners do not adopt this practice we strongly recommend them to use **the best Lubricants** only, and as little as possible.

Inferior "cylinder oils" are liable to cause considerable damage in the boiler, besides loss of heating-power, which will far more than counterbalance the extra first cost of a good lubricant.

The best "engine oil" that can be procured should likewise be used for other parts of the machinery. The advantages of easy running, no clogging, and less cleaning, fully compensate for having to pay a little more at the outset.

We supply the following first-rate Oils :—

Cylinder Oils. —"Valvoline"	...	...	...	at 5/- per gallon.
"Engelbert"	...	...	...	„ 3/9 „
Engine & Machinery Oils. —Pure Olive Oil				} „ 4/- „
Finest Quality				
Pure Olive Oil				} „ 3/9 „
2nd Quality				

Carriage paid in lots of not less than 10 gallons.—Drums charged for and allowed when returned.



GENERAL CHARTS.

NOTE.—We shall be pleased to procure and forward any of the following Charts. Orders to be addressed to the Secretary of the “Kingdon” Yacht, Launch, and Engineering Company, Limited, 181, Queen Victoria Street, E.C.; to be accompanied with remittance for the amount and sufficient to cover postage. If too much is remitted the balance will be returned.

ON LARGE SCALE, SHOWING THE NAVIGATION AROUND GREAT BRITAIN AND IRELAND.

	s.	d.
River Thames and Medway, in 2 sheets, and Book of Sailing Directions	8	0
English Channel, in 3 sheets, and Book of Sailing Directions ...	12	0
St. George's Channel, in 3 sheets, and Book of Sailing Directions ...	12	0
Bristol Channel, in 3 sheets, and Book of Sailing Directions ...	10	0
North, West and South of Ireland, in 2 sheets, and Book of Sailing Directions	10	0
West Coast of Scotland and Lewis Islands, in 3 sheets, and Book of Sailing Directions	10	0
East Coast of Scotland from Cape Wrath to Newcastle, in 3 sheets, and Book of Sailing Directions	10	0
East Coast of England, in 3 sheets, from Newcastle to Orfordness, and Book of Sailing Directions	10	0
Backing the above General Charts with Cloth at 1s. 3d. per sheet.		
Portfolio 25s., or with lettering piece, 30s.		

BELGIUM, HOLLAND, AND GERMANY.

(Prices for Harbour Plans on application.)

	s.	d.
Southern Part of the North Sea, on a large scale, Mouths of the Thames to Antwerp and Rotterdam, also Boulogne, Calais, Nieuport, and Ostend, with Plans of Harbours and Book of Sailing Directions	8	0
*England to the Texel, from Beachy Head to River Humber and Boulogne to the New Amsterdam Canal and the Texel, and Book of Sailing Directions	10	0
*Texel to the River Hever, including R. Elbe to Hamburg, the Ems, Jahde, Weser, and R. Eider, up to Toningen (from whence the Canal runs to Rendsburg and Kiel), with Plans and Book of Sailing Directions	8	0

* These two Charts show the Navigation from the English Channel to Hamburg on a large and uniform scale.

England and Holland, Dungeness to Flamboro' Head, and Cape Grisnez, to Hamburg, River Eider, &c., with Plans of Harbours and Book of Sailing Directions	10	0
Fishing Banks of the North Sea. This Chart will continue the Navigation of the above, from the River Humber to Peterhead, and the Naze of Norway. The soundings on this Chart are from the observations of the North Sea Fishermen.	8	0

NORWAY, SWEDEN, AND NORTHERN COAST.

North Sea, General Chart, from the Thames to the Shetlands, and to entrance of Cattegat, including Bergen on the West Coast of Norway, with Plans of Harbours and Book of Sailing Directions	8	0
Norway Coast, with Plans of Harbours; a useful General Chart for Vessels going Northwards, showing Jan Mayen Island, Bear or Cherie Island, North Cape, &c., and Book of Sailing Directions	10	0
Skager Rak or Sleeve, from the Naze to Christiania, Gothenburg, &c., with Plans of Harbours and Book of Sailing Directions ...	8	0
Cattegat, &c., from the Scaw and Gothenburg, to the Baltic, with Plans and Book of Sailing Directions (continuation of above)	8	0
The Sound, large scale, with Plan of Elsinore... ..	4	0

BALTIC SEA, ON A LARGE SCALE, IN TWO PARTS.

The Northern Part, from Kalmar Sound to the Gulf of Finland, and Book of Sailing Directions	10	0
The Southern Part, from the Sound to Bornholm, Carlskrona, Kalmar Sound, &c.; Stettin, Danzig, Memel, &c., to Steinort; Stolpemunde, Danzig Channel to Konigsberg, Libau, and Memel, and Book of Sailing Directions	10	0

Prices for Baltic Harbour Charts, on application.

COASTS OF WESTERN EUROPE.

Bay of Biscay, large scale, Ushant to Cape Finisterre, with Plans of Entrance to Brest, the R. Loire, and R. Gironde (Bordeaux), &c., and Book of Sailing Directions	10	0
Spain and Portugal, large scale, Cape Penas, and Santander to Gibraltar, with Harbour Plans and Book of Sailing Directions	8	0

*Prices for Harbour Plans of West Coast of France; also Spain
and Portugal; also for General Charts and Harbour Plans of the
Mediterranean, &c., &c., on application.*

A SPECIAL LIST OF BOOKS

INTERESTING TO YACHTSMEN.

NOTE.—We shall be pleased to procure for customers and forward any of the following works. Orders to be addressed to the Secretary of the “Kingdon” Yacht, Launch, and Engineering Company, Limited, 181, Queen Victoria Street, E.C., and to be accompanied with remittance for the amount and sufficient to cover postage. If too much is remitted the balance will be returned.

Yachtsman's Handy Book; a brief but concise Guide to Navigation, How to use the Chart, Sextant, &c., &c., with Questions on Seamanship, &c., &c. Post free	3	9
The Corinthian Yachtsman; or, Hints on Yachting. Illustrated. Post free	4	4
Amateur Sailing in Open and Half-Decked Boats. Illustrated. Post free	3	9
Amateur Yacht Designing; Hints to Beginners in, with various Designs. Post free	2	8
Model Yacht Building and Sailing; a Treatise on the Construction and Handling of Model Yachts, Boats, &c. Post free	4	3
Practical Canoeing; a Treatise on the Management and Handling of Sea and River Canoes. Post free	5	3
Yachting Under Statute; the principal provisions of the Maritime Law applicable to pleasure Yachts. By R. A. B. PRESTON, Esquire, Barrister-at-Law. Post free	4	3
Cruises in Small Yachts and Big Canoes, with many practical hints and useful information. Post free... ..	5	3
Abstract Log Book, for Owners	2	0
Book of Knots	2	6
British Navy. 5 vols. Brassey		
Cruise of the Steam-Yacht “Marchesa”	42	0
Daily Assistant, Seaman's, &c.	5	0
Elementary Meteorology. R. H. Scott	5	0
Engineer's Log Books	3/- &	6 0
Engineer's Private Log Book	1	6
English Channel Ports. Clark Russell... ..	1	0
Flag Book of All Nations. Splendid work, published at £5 5s.	30	0
Flag Book of All Nations. By authority of the Admiralty	50	0
Flags and Funnels of Steamship Owners. Edited by Lloyds	21	0
Flags, House Flags and Funnels	7	6
Fore and Aft Seamanship for Yachtsmen, with Names of Ropes, Spars, and Sails in a Cutter, Yawl, or Schooner	1	0
Glossary of Navigation. Harbord	7	6
Hints on Boat Sailing and Racing	2	6

Hints to Sea-going Engineers	...	...	...	...	...	2	0
Hints on Yacht Building	...	...	...	...	...	2	0
History of American Yachting	...	...	...	...	...	6	0
Holland; Map of Canals, Rivers and Friesland Meres, in 4 sheets						8	6
How to Make Knots, Bends & Splices as Used at Sea. Enlarged edition						1	0
Hunt's Yacht List, with Racing Flags	...	...	...	...	...	6	0
International Code of Signals, Used by Yachts	...	...	...	...	...	12	0
Do. do. do. do explained	...	...	...	...	...	1	0
Law of Storms, considered practically. Rosser	...	...	...	...	...	5	0
Law of Storms. Abridged Edition	...	...	...	...	...	1	6
Lloyd's Yacht Register	...	...	...	...	...	15	0
Log Book for Sailing Yachts	...	...	...	...	3/- and	6	0
Do. for Steamers	...	...	...	...	3/- and	6	0
Macrow's Naval Architects and Shipbuilder's Pocket Book	...	...	...	...	...	12	6
Manual of Shipping, containing List of Canals and Mileage in U.K.						1	0
Manual of Yacht and Boat Sailing. Dixon Kemp	...	...	...	...	...	25	0
Murray's Marine Engines	...	...	...	...	...	4	6
Model Yacht Building and Sailing. Biddle	...	...	...	...	...	4	0
Names of Yachts, &c., explained	...	...	...	...	...	5	0
Nautical Album, for Photographs	...	...	...	...	...	25	0
N. E. Ports and Bristol Channel	...	...	...	...	...	1	0
New Rule of the Road at Sea, illustrated by Diagrams; and Remarks on the Tides round the British Isles and to the Mediterranean.							
New and Useful work	...	...	...	...	...	2	0
Norie's Complete Epitome of Navigation, with Tables; New and Improved Edition	...	...	...	...	...	16	0
Practical Boat Sailing, 5/-; Building, 2/6. The two in 1 Vol.	...	...	...	...	...	7	6
Practical Guide to Use of Marine Steam Machinery. J. Donaldson	...	...	...	...	...	4	0
Rule of the Road at Sea	...	...	...	...	...	2	0
Sailing Boat, The, and Management of Yachts. Folkard	...	...	...	...	...	14	0
Sailor's Hand Book	...	...	...	...	...	10	6
Sailor's Language; a Collection of Sea Terms and their Definitions	...	...	...	...	...	3	6
Sailor's Pocket Book	...	...	...	...	...	7	6
Seaman's Daily Assistant	...	...	...	...	...	5	0
Sea Terms and Phrases, English and French. Pornain	...	...	...	...	...	4	0
Seaton's Manual of Marine Engineering. New Edition	...	...	...	...	...	18	0
Sextant, The. By Major Wilberforce Clarke	...	...	...	...	...	2	6
Ships of the Royal Navy. 2 Vols. of Portraits	...	...	...	...	...	60	0
Small Yachts, Their Design and Construction. C. B. Kunhardt	...	...	...	...	...	35	0
Steam Boilers, Their Management, &c.	...	...	...	...	...	12	0
Stellar Navigation, with New A B and C Tables	...	...	...	...	...	3	6
Thames, Dictionary of the. Dickens	...	...	...	...	...	2	0
Thames to the Tamar. L'Estrange	...	...	...	...	...	6	0

Through France and Belgium by River and Canal, in the Steam Yacht "Ytene." Moens, 15/-. Secondhand copies	7	6
Varieties of Sailing Vessels, and Use of Mariner's Compass	1	0
White's Naval Architecture	24	0
Wrinkles in Navigation. Lecky	15	0
Yacht Designing. Dixon Kemp	63	0
Yacht Architecture. Dixon Kemp	42	0
Yachts' Jibs. How to Make a new Jib that stands flat	2	0
Yachting Album, containing 12 Portraits of celebrated Yachts	63	0
Yachts and Yachting. Vanderdecken	21	0
Yachting under Statute	4	0
Yachtman's Handy Book... ..	3	6
Yachts, Boats and Canoes. G. E. Hicks	10	6
Yachts and Yachting, an American Work. By F. Cozens	6	0

MURRAY'S HANDBOOKS AS FOLLOWS:

Algeria and Tunis: Algiers, Constantine, Gran, Atlas Range, &c. Maps and Plans	10	0
Central Italy: Florence, Tuscany, &c. Map	10	0
Denmark, Sleswig Holstein, Copenhagen, Jutland, Iceland. Map... ..	6	0
Dictionary in English, French, and German, for Travellers	6	0
Egypt: Description of the Course of the Nile, Suez Canal. Two Parts. Map	15	0
France, Part 1.: Normandy, Brittany, the Seine and Loire, Bordeaux, the Garonne, Pyrenees, &c. Maps	7	6
France, Part 2.: Central France, Auvergne, Burgundy, the Rhone and Saone, Provence, Marseilles, French Alps, &c. Maps	7	6
Greece, Ionian Islands, Continental Greece, Islands of Ægean Sea. Maps. Two Parts	24	0
Holland and Belgium Handbook. Map	6	0
Holy Land, Syria, Palestine, Jerusalem, &c. Maps	20	0
Mediterranean Islands, Handbook: Coasts of Africa, Spain, Italy, Dalmatia, Greece, Asia Minor, Corsica, Sardinia, Sicily, Malta, Balearic Islands, Crete, Rhodes, Cyprus, &c. 50 Maps... ..	20	0
North Italy, Handbook: Turin, Milan, Italian Lakes, Venice, Piacenza, Genoa, and the Riviera, and Off-lying Islands, &c. Maps	10	0
Norway, Christiania, Bergen, Trondhjem, the Fjelds and Fjords. Map	9	0
Paris and its Environs. Maps and Plans	3	6
Portugal, Handbook: Lisbon, Oporto, &c. Map	12	0
Rhine and North Germany, The. With Map and Plan	10	0
Rome and Environs. 50 Maps and Plans	10	0
Russia, St. Petersburg, Moscow, Finland, &c. Maps	18	0
Spain, Handbook: The Balearic Islands, &c. Maps... ..	20	0

Switzerland and Italian Lakes. Maps. 2 Parts	...	...	...	10	0
South Germany, Austria, and the Danube, from Ulm to the Black Sea.					
Map	...	...	...	10	0
South Italy, Naples, and Environs, Vesuvius, Sorrento, Capri, &c. ;					
Taranto, Bari, Brindisi, and Roads from Rome to Naples. Maps				10	0
Sweden, Stockholm, Upsala, Gothenburg, and Shores of the Baltic, &c.				6	0
Travel Talk ; English, French, German, and Italian	...	...	...	3	6
Travelling Map of Palestine. In a case.	...	...	...	12	0
Turkey in Asia, Constantinople, Bosphorus, Dardanelles, Crete,					
Cyprus, Smyrna, Coasts of Black Sea, Armenia, Mesopotamia, &c.					
Maps and Plans	...	...	...	15	0



To
The "Kingdon" Yacht, Launch & Engineering Co., Ltd.

**Enquiry for
Steam Launch.**

Registered Offices—

181, QUEEN VICTORIA STREET,

LONDON, E.C. _____ 189

Name of Client _____

Address (in full) _____

New or Secondhand _____

For what purpose is it required (business or pleasure) _____

Where to be used _____

Sea or River use _____

Length _____

Breadth _____

Depth _____

Draft (maximum when loaded) _____

Approximate Speed required _____

*Boat to be built of (Steel, Iron, Mahogany, Teak, Cedar, Pine
or Delta Metal)* _____

What Cabin accommodation required (if any) _____

What other accommodation (if any) _____

When to be delivered _____

Approximate amount the buyer will pay _____

Price to include delivery at _____

General Remarks _____

N.B.—The Buyer is respectfully requested to give the particulars enumerated above as fully as possible, for the sake of facilitating a prompt and accurate estimate. A rough sketch will also be extremely useful.

To
The "Kingdon" Yacht, Launch & Engineering Co., Ltd.

Enquiry for
Machinery.

Registered Offices—

181, QUEEN VICTORIA STREET,

LONDON, E.C. 189

Name of Client _____

Address (in full) _____

New or Second Hand _____

For what purpose is it required _____

What duty has it to perform _____

Where to be used _____

Dimensions _____

When to be delivered _____

Price to include delivery at _____

Approximate price buyer will pay _____

General Remarks _____

N.B.—The Buyer is respectfully requested to give the particulars enumerated above as fully as possible, for the sake of facilitating a prompt and reliable estimate. A rough sketch of space available will also be extremely useful.

REGISTERED TRADE MARK



THE "KINGDON" MACHINERY



London - 1885

Liverpool, 1886



Parana, 1887

Paris 1889



Plymouth - - 1890.



IT HAS BEEN ADOPTED BY

THE LORDS OF THE ADMIRALTY.

THE WAR OFFICE.

THE CROWN AGENTS FOR THE
COLONIES.

THE THAMES CONSERVANCY.

THE P. & O. CO.

THE RUSSIAN GOVERNMENT.

THE ITALIAN „

THE SPANISH „

THE BRAZILIAN „

THE NEW SOUTH WALES
GOVERNMENT.

H.I.H. THE GRAND DUKE ALEXANDER OF RUSSIA.

H.I.H. PRINCE HENRY OF PRUSSIA.

AND FIRMS AND YACHT OWNERS IN ALL PARTS OF THE WORLD.