

They are to be built of Douglas fir, all timber in keel, keelsons, stem, apron, stern post, frames, deadwoods, ceiling, deck beams, stanchions, pointers, breast hooks, etc., to be no. 1 merchantable; planking, bulwarks, rails and rail stringers, waterways, coamings and all timber above deck, to be no. 1 select, and the deck is to be clear vertical grain, no. 2 grade. The ceiling from floor to clamps to average 40 ft. lengths, also the clamps, planking above the bilge to deck, and waterways, while the rail is to be in lengths of not less than 40 ft, and the planking and bottom on bilges to average 35 ft. Keel, sided 18 in., moulded 12 in. net; shoe, sided 12 in., moulded 3 in. net; frames, half sided 8 in., moulded 20 in. at keel, 14 in. at bilge, 8 in. at head, spaced 27 in. centers. From the break of the bridge deck aft, and the forecastle deck forward, the frames to run up to rail double, and between these points the frames to be single from deck to rail. Stem, sided 18 in., moulded about 24 in., and connected to keel with a natural crook fir knee, or in other approved manner. Apron, sided 18 in., moulded 18 in.; deadwood, sided 18 in.; stern post, sided 18 in. at keel, moulded 24 in., and connected to keel with fir knee. Rudder trunk to be bolted securely to stern post. The main and sister keelsons to be sided 16 in. and moulded 14 in.; first and second rider keelsons to be sided 16 in. and moulded 14 in.; first and second rider sister keelsons to be sided 14 in. and moulded 14 in. From sister keelsons to main deckhouse, the ceiling to be 8 by 11 in.; the 'tween deck ceiling to be 4 in. thick, butted and spike fastened; main ceiling to be scarphed from the turn of the bilge to the main deck beams, and edge bolted in each frame space. No scarphs allowed on the same frame without at least 3 strakes between. Beams at the hatches to be moulded 12 in. and sided 14 in.; sided 12 in. and crowned 6 in. Chocks to be fitted between deck beams, securely fastened to frames, leaving proper air space, and beams to be spaced 36 in. center to center. There is to be one 12 x 14

in. beam in the lower hold, placed directly over every other main deck beam; these, however, to be omitted in the way of machinery, and compensating fore and aft members added. There are to be 3 sets of pointers at each end of vessel, to be sided 12 in. and moulded 10 in. at top and at least 14 in. at bottom, and run diagonally from the center of deadwoods, aprons, etc., well up to the upper deck beams. These pointers to be connected at the lower ends across the deadwood with fir knees 12 in. thick and at least 4 ft. arms. There are to be stanchions 12 x 12 in. under every beam and under the hatch corners, and at each side of the stanchion heads there is to be a 5 x 10 in. plate; chocks to be fitted between the stanchions on top of rider keelson, and top of stanchion to have hardwood cap; rods 1½ in. upset to 2 in. turnbuckle to be placed between the beams, with ¾ x 6 in. plate washer on the outer ends let into the frame. The rudder stock to be in one piece of iron bark, 18 in. diam., the balance of the rudder to be fir. The bulkheads, as may be required in peaks and forward and aft machinery spaces, to be of two thicknesses of 3 x 6 in. tongued and grooved stock, finished down to about 2¼ x 5¼ in. face laid diagonally in opposite directions, and canvas laid in white lead paint to be laid between the two thicknesses. Beams so arranged that one m.d. and one t.d. beam are secured to face of bulkhead.

The 2 masts and 6 cargo booms are to be of Oregon pine, of suitable diameter and strength for handling cargo equal to about a 3 ton lift. The general accommodation and quarters, include wheel house and chart room, berths, mess rooms, pantry, galley, store rooms and ice house, lavatories, etc. Each vessel is to be equipped with two lifeboats 20 x 6 x 2½ ft., with swinging davits. All anchors to be of the stockless type.

The propelling machinery to consist of 2 vertical inverted direct acting compound surface condensing engines, with cylinders 12 x 24 in. diam. by about 16 in. stroke, turning outboard when going

ahead, capable of developing 275 i.h.p. with no live steam in the receivers, at not more than 175 r.p.m. Steam is to be supplied by either one return tube, 3 furnace, single ended Scotch boiler, with a total heating surface of 1,800 sq. ft., or one water tube boiler with heating surface of not less than 2,000 sq. ft. The propellers are to be solid, 3 bladed cast iron. There is to be one main condenser independent of the main engine, one main circulating pump of centrifugal pump with 6 in. suction and discharge; main air pump, vertical single acting beam type, 7½ x 14 x 10 in.; 2 main and auxiliary feed pumps of vertical simplex type, 7½ x 4 x 10 in.; general service pump, horizontal duplex type, 7½ x 4½ x 10 in.; fire, bilge and general service pump, horizontal duplex type, 7½ x 4½ x 10 in.; sanitary pump, 5¼ x 4¾ x 5 in., and evaporator feed pump or centrifugal pump with 6 in. suction ejector is to be provided, operated by water from fire, bilge and general service pump. Feed water heater of approved type to be of sufficient capacity to heat 12,000 lb. feed water an hour from 80 to 212 deg., using exhaust steam at 5 lb. a sq. in. Feed and filter tank of 325 gall. to be placed in convenient location in the engine room.

The deck machinery is to include a spur geared windlass with horizontal engine and 2 gypsy heads aft, 12 in. diam.; vertical steam winches; steam and hand steering gear of approved type with about 6 x 6 in. double cylinder engine; steam capstan with engine in the base. The electric lighting system to consist of 10 k.w. marine type generating set, driven by vertical self oiling engine of approved make for 150 lb. steam pressure; dynamo to be compound wound of the multipolar type. There are also to be provided, mechanical telegraphs, water tanks, donkey boiler, etc.

When completed, the vessels are to have endurance trials, under conditions and with results satisfactory to the owners. The propelling machinery and auxiliaries are to be designed for a speed of 9½ knots under light load.

The Deputy Minister of Marine's Report on Shipbuilding, Etc.

The Deputy Minister of Marine, Alex. Johnston, in his report to the minister for the year ended Mar. 31, 1918, issued recently, says that "the question of supreme moment, not only in the shipbuilding world, but in the world at large, is the relation of shipbuilding to ship sinking, for on this may hinge the issue of the war." Considerable space is devoted to weekly particulars of British sinkings, sailings and arrivals, from April 1, 1917, to April 1, 1918, the totals being as follows:—

Sinkings over 1,600 tons.....	896
Sinkings under 1,600 tons.....	334
Sailings and arrivals.....	289,127

The total number of ships sailing to and from British ports during the fiscal year 1917-1918, exclusive of fishing vessels, was, as above stated, 289,127, and the total losses due to war causes were 2,230, or 1.425%.

Details are given of the losses and building of allied and neutral shipping from Aug., 1914, to June 1, 1918, but as these are, of course, now out of date, it would not be of interest to reproduce them. Following are extracts from the report:—

Canada and Sea Transport.—Prior to the war, and for sometime after, there

were 10 large ship companies operating between Canadian and British and continental ports; owing, however, to the increasing toll of British, Allied and neutral shipping taken by mine and submarine and the shortage resulting, the demand for ships grew more insistent, and a number of vessels were taken from the Canadian and transferred to the Mediterranean and other routes wherever the need was most pressing; so that the conditions facing Canada today are, that whereas a few years ago there were 10 companies operating at full capacity between Canadian and British and foreign ports, there are now only about half that number, with less than half the previous number of ships, operating intermittently.

In the reconstruction period after the war there will be an increased demand for Canadian raw material and foodstuffs, and very possibly for manufactured articles as well, Canada being now a very much better known and more widely advertised country, and as British shipping to this country has been cut down by half and is not likely to be re-established for some years, owing to the lack of shipping everywhere and the need of shipping on all routes, it is apparent that if Canada is to have the required transportation,

she must acquire the necessary ships.

Government Shipbuilding Programme.—There are three ways of establishing a merchant marine: by purchase outright, by placing orders with foreign shipyards for delivery at a stated time, or by building in home shipyards. Australia during the first years of the war, feeling the pinch of lack of transport, bought 16 cargo steamships, which not only relieved the congestion of her own export trade, but were of service in the general carrying trade of the Empire.

The great advantage of outright purchase is that the earning power of the ships, and payment of dividends on their outlay, begin at once; the deadweight price of freighters just now for immediate or prompt delivery is abnormally high, about \$200 a ton, and indeed it is doubtful if any considerable number could now be obtainable at that or almost any price, as shipyards all over the world, including the Japanese, are being worked to their full capacity to supply ships for their own merchant marine, in anticipation of the tremendous demands that will be made on ocean tonnage in the period following the war. Taking these factors into account, the Canadian Government has decided to build annually 200,000 tons