She is a full-rigged four-masted ship, 332 ft. long, 45½ ft. beam, 26 ft. moulded depth, gross tonnage 3292, and intended to carry 1,500,000 gallons of oil in cases of 10 gallons each from the United States to Shanghai, returning with cargoes of sugar, hemp, &c. The masts and yards of this vessel, as well as the hull, are of steel. The five- masted German barque “ Potosi,” built in 1895, which is 366 ft. long, has a gross tonnage of 4027 and a dead-weight capacity of 6200 tons; she has a splendid record of quick passages, one reducing the record from Portland Bill to Iquique to 62 days. In 1902 the five-masted ship-rigged vessel “ Preussen," of 5081 tons gross, was built in Germany (wrecked at Dover in November 1910), followed in 1906 by the five-masted barque “ R. C. Rickmers ” of 5548 tons gross, 441 ft. long over all, 53 ft. 8 in. beam, 30 ft. 5 in. depth of hold; her displacement when loaded is about 11,400 tons, of which 8000 tons are cargo. She carries 50,000 sq. ft. of canvas, and on her first voyage reached a speed of 15¾ knots for a short time under sail alone, maintaining 13 knots for long periods. Although fitted with auxiliary steam power the “ R. C. Rickmers ” usually trusts wholly to canvas on her ocean voyages, and may thus be considered the largest sailing vessel afloat in 1910.

As instances of the times occupied on the voyages of modern sailing ships the following may be given: 66 days from Iquique in Chile to the English Channel by the British ship “ Maxwell,” gross tonnage 1856; 29 days from Newcastle, New South Wales, to Valparaiso by the British four-masted ship “ Wendur,” 2046 gross tonnage; 30 days from the Lizard to Rio de Janeiro by the British ship "Salamanca,” of gross tonnage 1233; and 78 days from Dover to Sydney for the same ship; 153 sailing days for a voyage round the world, made up of 50 days from Cardiff to Algoa Bay, 28 days from Algoa Bay to Lyttleton, and 74 days from Lyttleton to the Lizard, by the British ship “ Talavera,” gross tonnage 1796; 59 days from Cape Town to Iquique by the British ship “ Edenballymore,” of gross tonnage 1726; 88 days from San Francisco to Queenstown by the British four-masted barque “ Falls of Garry,” of gross tonnage 2102; and 69 days from Scilly to Calcutta by the “ Coriolanus,” gross tonnage 1074. Amongst the voyages recorded recently by German ships the following may be enumerated: 58 days from the English Channel to Valparaiso by the four-masted barque “ Placilla,” gross tonnage 2845; 71 days from the English Channel to Melbourne by the barque “Selene,” gross tonnage 1319; and 69 days from the English Channel to Adelaide by the four-masted barque “ Hebe,” of gross tonnage 2722.

Although alterations in the rigs of ships have not caused much difference in their appearance over a very long period, a number of changes have been made, mostly for the purpose of saving labour. The mechanical reefing of topsails and top-gallant sails was introduced about 1858, but only remained in favour for a few years; double topsails, on the other hand, first used in the four-masted American shipentine clipper “ Great Republic,” have held their own, and double top-gallant sails have since been adopted. Until about 1875 almost all ships carried studding- sails, but since this date they have been gradually discontinued, and at present are usually only to be found in training vessels, and now and again in square-rigged yachts. As already stated, wire rope has been adopted for standing rigging, and deadeyes and lanyards have given place almost universally to rigging screws. Masts and the heavier yards have been made of iron for many years, and more recently of steel, and the lower masts and top masts have in a number of eases been made in one length; when constructed in this manner the mast is termed a pole mast. This arrangement is very common in America, where the latest steel sailing ships are so fitted. Most large sailing ships carry a steam boiler or boilers, and engines are provided for all sorts of purposes, for which hand labour used to be commonly em- ployed. The result of this and other labour-saving arrangements has been to effect a very considerable reduction in the number of hands carried. As indicating the nature of the change which has taken place, it may be mentioned that whereas a 1000-ton ship of the East India Company in the middle of last century had a crew of 80 all told, a modern four-masted barque of 2500 tons has a total complement of 33 only.

As to the employment of sailing ships, there can at the present day be seen at most large shipping ports a number of sailing ships of various types and sizes. Some of the largest ships are employed in the jute trade of India, the grain trade of California, British Columbia, &c., the nickel ore trade from New Caledonia and the nitrate trade of Chile. From Great Britain they usually take out coal, which, however low freights may be, may in nearly all cases be relied on.

Sailing ships are sometimes provided with *auxiliary steam*

*propelling machinery* of low power to save cost of tugs in getting in and out of harbour, to make headway when becalmed, and to increase the safety of the vessel. In the early days of steam, all sea-going vessels retained their rig, and the machinery fitted was only regarded as auxiliary. In the “ Savannah ”—the first steam vessel to cross the Atlantic—the paddle wheels were portable; they were removed and packed up on board in case of bad weather or when attempting a long voyage, but were replaced and used for getting into port after crossing the Atlantic. The screw propeller was found preferable in such cases, as it offered less obstruction than paddle wheels when the sails were set and the engines stationary; but the resistance offered by the screw when not in use led to various devices for either lifting it completely out of the water, or for “ feathering ” the blades and fixing them fore and aft, so as to offer less obstruction in going through the water. Auxiliary power is of great advantage to vessels engaged in seal or whale fishing as it enables them to avoid ice floes, and to proceed through open channels in the ice as opportunity offers. In 1902, six such vessels—all barque rigged, and one fitted with a lifting propeller—hailed from Dundee, and a few others hailed from Norway, from Newfoundland and from New Bedford, U.S.A. Several navies have employed vessels fitted with auxiliary steam power for training purposes, such as the Chilean training ship “ General Baquendo ” built in 1899 of steel, sheathed with teak and coppered; she is 240 ft. long, 45¾ ft. broad, and of 2500 tons displacement on a mean draught of 18 ft.; she has a large spread of canvas, and under steam alone is equal to a speed of 13 knots. In recent years the *internal com­bustion motor* has been adopted in some cases in place of the steam engine as a source of auxiliary power, especially in the smaller classes of sailing ships, and in many cases it has made the employment of such vessels remunerative once more. Should the heavy oil engines introduced in 1910 prove sufficiently simple and reliable for auxiliary power in the larger vessels, vessels so fitted might compete successfully with tramp steamers in certain trades.

*Steamships.—*Of merchant steamships, vessels of all sizes are to be met with, from a small launch to the stately Atlantic liner of over 3o,ooo tons gross and 25 to 26 knots speed, and the huge cargo ship of over 20,000 tons gross and 15 knots speed. They are employed on every service for which sailing ships are used, and upon others for which sailing ships are not employed, and they monopolize nearly the whole of the passenger traffic of the world. The passenger vessel is provided with airy and spacious accommodation for her living freight above water, while the upper part of the cargo vessel is cut down as much as possible consistent with due provision for safe naviga­tion at sea. The passenger ship thus becomes a lofty vessel, especially amidships, while the cargo ship appears long and low lying. Apart from this broad difference, the various sizes of merchant steamships have in general no bold characteristic features like sailing ships; they possess different deck structures and certain differences in form, but, to the ordinary eye, a photograph of a vessel of, say, 1000 tons, apart from details of known size that may serve to fix the scale, may often be taken to represent a vessel of even *ten* or *twenty* times the size.

*Types of Steamships.—*A steam vessel may be little more than an open boat with the boiler and engines placed amidships if intended for river use, and may be of any shape necessary to suit local conditions and fulfil the services required. Vessels which proceed to sea must be decked over to prevent them from being “ swamped ” and built of a suitable form to make them otherwise seaworthy; the height of the deck above water, or the *freeboard,* will be increased, and the sides carried up above the deck; these *topsides* meet at the extremity of the vessel, and as the size of the vessel increases or larger seas have to be encountered the topsides are covered in forward and aft to further improve the sea-keeping qualities of the vessel. If only a short portion is so covered in, the covering is often rounded off along its sides and is then termed a *turtle back,* or *monkey forecastle*, when fitted forward, and a *turtle back,* or *hood,* when fitted aft; if made larger and of sufficient height above the upper deck to be serviceable for accommodation forward it is called a *top gallant forecastle,* and aft a *poop.* It is frequently desirable to build up cabins or other accommo­dation across the middle of the ship beneath the bridge, forming