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APPARATUS FOR OBTAINING FRESH WATER FOR SHIPS' USE.

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ALL persons connected with Marine Engineering are aware that since the introduction of Quadruple and Tri. Compound Engines necessitating steam pressures of from 150 to 180 lb. per square inch, it is no longer safe to use sea water for the supplementary feed, and the majority of steamers fitted with this class of machinery have to carry large quantities of fresh water for this purpose. This is unquestionably a very expensive method, as it involves the construction of the necessary tanks, reduces the carrying capacity of the vessel and the cost of the water, in consequence engineers have for some time past been devising schemes which would be less costly. Among others one might be mentioned that has been adopted in some of the Orient Company's steamers, where the steam on its way from the high pressure to the intermediate cylinder passes round a vessel containing sea water which is thus made to boil, and the resulting steam is then taken into the condenser. This method is open to two serious objections, viz.:— the extraction of valuable heat from the steam before having completed its work, and the difficulty of keeping the evaporating chamber free from salt.

There is another difficulty we have to contend with which has been brought about in the endeavour to reduce the quantity of supplementary feed required to a minimum by taking all drain and auxiliary engines exhaust pipes into the condenser, thus any oil or grease passing from them is delivered into the boilers, where it becomes even more dangerous than salt. I can quote instances,

but you are no doubt familiar with them, of furnaces collapsing in consequence of there being a thin deposit of grease on them.

To this important subject I have devoted considerable attention, and have lately designed and patented the apparatus illustrated (Plate II.) and which I will now briefly describe: M is a marine boiler, with uptake N, and funnel O, in the interior of which a small pipe C is fixed, and its upper end enters one of larger diameter D, the upper and lower extremities of the pipe D are connected to the pipes G and E respectively, and the lower end of the former is connected to surface condenser L, through the cock H, the lower ends of the pipes C and F are taken into the tank A, which is supplied with water from the circulating water discharge pipe J, through the cock K, and pipe S, the surplus water overflowing into the bilge through the pipe B. The height from surface of the water in the tank to the point P must be such that with the greatest obtainable vacuum and allowance for reduction in its vertical distance due to the rolling of the vessel it shall not be possible for water to pass into the pipe G, say from thirty-five to thirty-six feet.

The action of the apparatus is as follows:—the tank being full of water, and a vacuum in the condenser, on opening the cock H, the water will rise in the pipes C and D to a height dependent on vacuum and atmospheric pressure, and will be raised to boiling point by the temperature of the waste gases passing up the funnel, the vapour passing into the condenser by the pipe G, and is there condensed.

The evaporative power of the apparatus can be increased to meet any requirements, by increasing the diameters of the pipes C and D or their number, or they can also be arranged in coils.

To prevent the possibility of the pipes salting up, the pipe E is added which ensures a rapid circulation of the water due to the difference of temperature between it and the evaporating pipes; and is capable of adjustment by the cock F.

In conclusion, I wish to draw your attention to the following points: Firstly.—The great simplicity and inexpensiveness of the

arrangement. Secondly.—It is possible to fit it to any steamer which has a vertical height of about thirty-six feet from the stokehold floor to the top of the funnel. Thirdly.—Only waste heat is utilised for the evaporation of the water. Fourthly.—It is self cleaning, there being no possibility of the pipes salting up, as the boiling point of the water, being in a vacuum, is low and the circulation good.