Aug. 29, 1944. A. J. HIGGINS 2,356,844

HEAT DISSIPATOR FOR MARINE ENGINES

Filed May 11, 1942

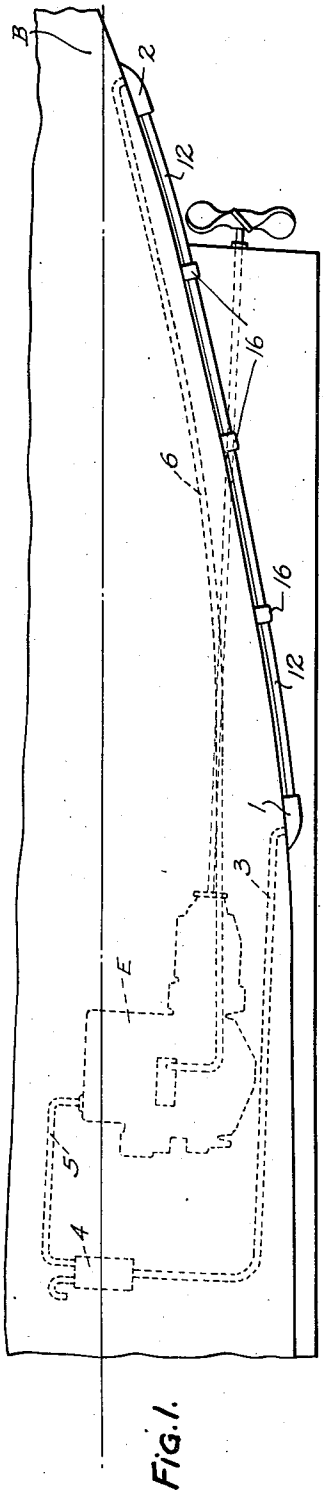


Fig. 1.

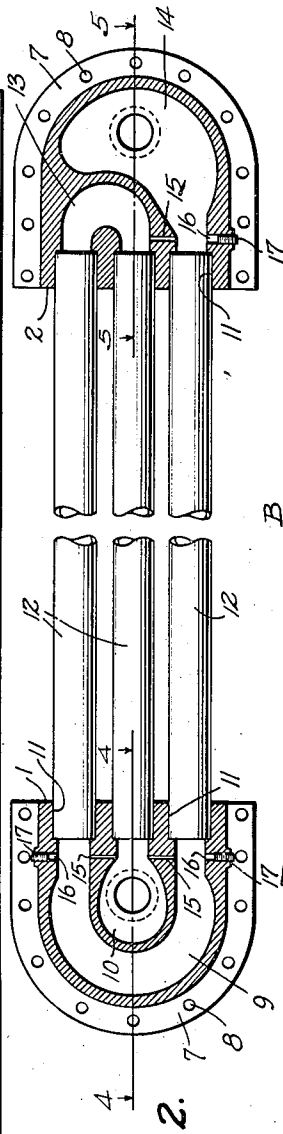


Fig. 2.

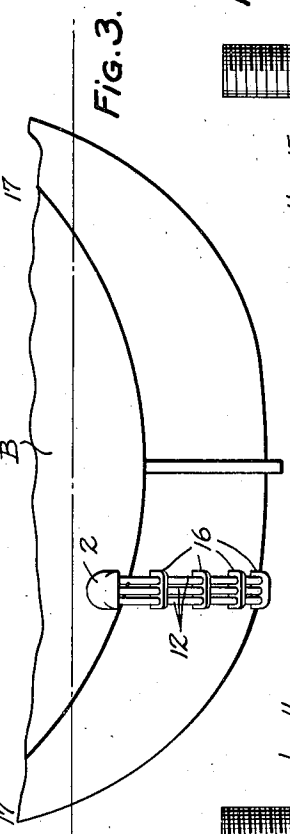


Fig. 3.

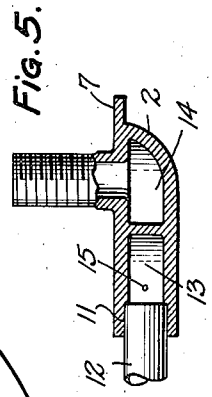


Fig. 5.

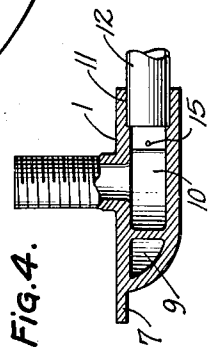


Fig. 4.

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Patented Aug. 29, 1944

2,356,844

UNITED STATES PATENT OFFICE

2,356,844

HEAT DISSIPATOR FOR MARINE ENGINES

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Application May 11, 1942, Serial No. 442,526

1 Claim. (Cl. 257—124)

This invention relates to heat dissipators and more particularly to heat dissipators for the cooling system of internal combustion engines used in connection with vessels operating in salt water where a closed fresh water cooling system is utilized.

In connection with such systems it has been found that under heavy duty conditions steam is apt to develop in the water cooling system and where such steam does develop it is likely to form steam pockets in the condenser unit especially where such units include as usual a circuitous passage to increase the effective length of the cooling tubes and such steam pockets when they do develop, choke the circulatory system and prevent the functioning thereof.

The object of the present invention is to provide an improved construction and arrangement of the heat dissipator unit whereby the formation of such steam pockets is effectively prevented and the general efficiency of the device improved.

The invention consists in the novel construction, arrangement and combinations of parts as hereinafter more particularly described and claimed.

One sheet of drawings accompanies this specification in which like reference characters indicate like parts throughout:

Figure 1 is a fragmentary side elevation of the stern portion of a vessel showing the application of the present invention;

Figure 2 is a horizontal cross section through a heat dissipator unit;

Figure 3 is a fragmentary end view looking forward of the showing in Figure 1;

Figure 4 is a vertical longitudinal cross section on the lower header taken on line 4—4 of Figure 2; and

Figure 5 is a vertical longitudinal cross section taken through the upper header and on line 5—5 of Figure 2.

Referring to the drawing, B represents the stern portion of a vessel in which E indicates the internal combustion engine.

The heat dissipator unit comprises a lower header 1 and an upper header 2, the lower header being connected as by a pipe 3 with a reservoir 4 for fresh water which in turn is connected by pipe 5 with the circulatory cooling system of the engine E. The engine cooling system is further connected by pipe 6 with the upper header 2 and the headers 1 and 2 are connected by cooling pipes 12.

Each of the headers 1 and 2 comprises a main body portion having an externally directed flange 7 provided with a plurality of holes 8 through which bolts or lag screws can be passed to secure the header to the bottom of the vessel. The body portion of each header is provided with a plurality of channels so arranged as to provide in conjunction with the connecting pipes 12 a circuitous passage for the cooling medium.

In the embodiment herein illustrated the lower header 1 is connected centrally with the pipe 3 which communicates with a central passage 10 in the header which central passage is surrounded by an annular passage 9. Both of the passages 9 and 10 communicate with the exterior of the header through slightly enlarged sockets 11 adapted to receive and seat the ends of pipes 12. The upper header 2 is similarly provided with a plurality of passages 13 and 14, the openings of which are similarly provided with sockets 11 for the pipes 12. In the case of the upper header 2 the passages 13 and 14 are arranged side by side so that the cooling medium which enters the central passage 10 of the lower header will normally flow through the middle tube 12 and enter passage 13 of the upper header from whence it will pass through the upper tube 12 and enter the passage 9 of the lower header and from there will pass through the lower tube 12 and be delivered into the passage 14 which communicates with the pipe 6 and thence to the engine.

In operation, the heat dissipator as thus described and which, up to this point, is more or less conventional will under heavy service or abnormal duty be likely to form steam pockets especially in the passage 10 of the lower header where the hottest steam is delivered and in the passage 13 of the upper header where it is calculated to flow by reason of the upward inclination of the cooling pipes. The pressure in such steam pockets is greatly in excess of the pressure in the chambers 9 and 14 of the headers which contain the relatively cooler water having traversed a substantial portion of the condenser tubes.

To prevent the accumulation of steam in the chambers 10 and 13 the present invention contemplates the provision of relatively small bleeder passages 15 positioned in the walls separating chambers 9 and 10 of the lower header and 13 and 14 of the upper header. Such bleeder passages 15 can be readily provided in such header units which are normally formed as castings by drilling passages 16 in the outer wall to admit a drill and then after the passages 15 have been drilled in the inner walls threading the passages 16 and plugging same with screw plugs 17.

The provision of the bleeder passages 15 will not interfere with the normal circulation of the

cooling medium by reason of their relatively small size, but will upon new increase of pressure in chambers 10 or 13 by reason of the formation and delivery of steam thereto permit the bleeding of such excess pressure into the chambers 9 and 14, respectively, thus assuring a substantially equalized pressure between the chambers 9 and 10 of the lower header and 13 and 14 of the upper header and the effective prevention of the formation of steam pockets.

Where the condenser tubes 12 are of substantial length it is usual to provide supporting brackets 16 intermediate the headers but these are not related to the present invention.

Various modifications and the precise arrangement and construction of the headers and the means of providing the bleeder passage will readily suggest themselves, to those skilled in the art, but all within the scope of the present invention as claimed.

What I claim is:

Heat dissipator for the cooling medium of a marine combustion engine, comprising headers, each formed with a chamber having a port adapted to be connected with the engine circulatory cooling system and an arcuate chamber adjacent the ported chamber, the ported chambers and the ends of the arcuate chambers communicating by parallel pipes to form a continuous serpentine passage from port to port, with bleeder vents communicating the chambers in each header, as specified.

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