

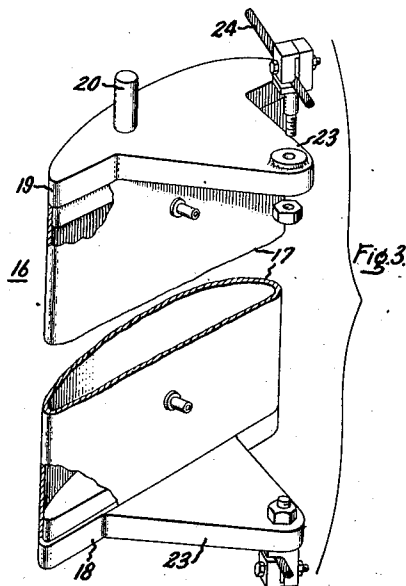
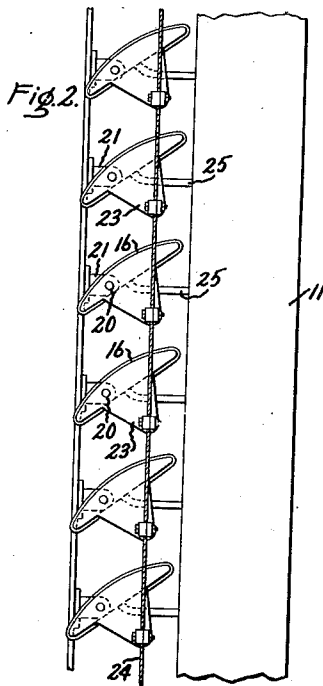
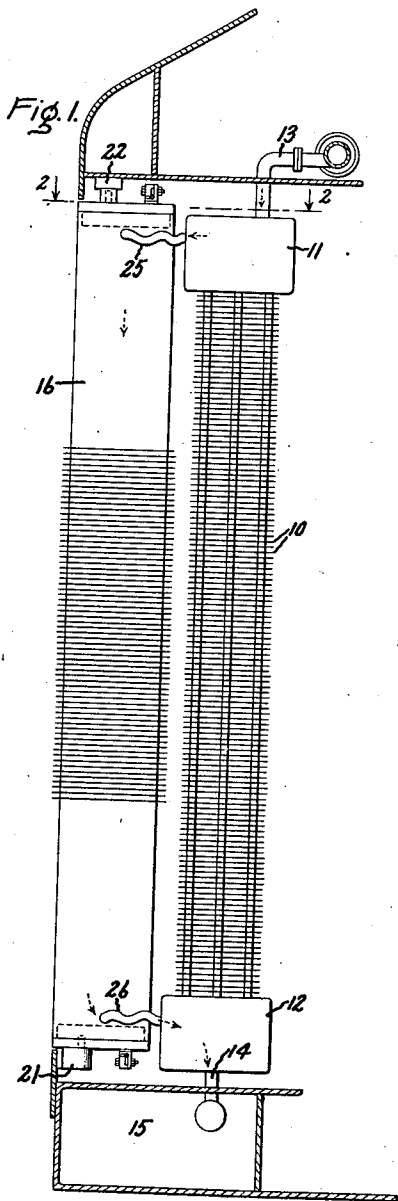
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SURFACE TYPE HEAT EXCHANGER

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SURFACE TYPE HEAT EXCHANGER

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2 Claims. (Cl. 257-132)

The present invention relates to surface type heat exchangers including a plurality of tubes or channels connected between inlet and outlet headers and means for directing air or like medium across the tubes to effect heat exchange between the air and a fluid flowing through the tubes. The invention is of particular significance in connection with elastic fluid condenser arrangements such as are used on locomotives for condensing steam or like elastic fluid discharged from turbines. The condensation of the elastic fluid in such heat exchangers usually is effected by a stream of air forced across the tubes by means of fans or blowers. The airflow through the passages formed between the condenser tubes in this kind of arrangement may be controlled by means of louvers suitably supported on the locomotive.

The object of my invention is to provide an improved construction and arrangement of heat exchangers of the type above specified which is economical and may be produced at comparatively low cost.

This is accomplished in accordance with my invention by the provision of a heat exchanger including a louver having a set of hollow louver blades or like elements for conducting or controlling the flow of a medium across the passages formed between the tubes or channels of the heat exchanger with the hollow passages formed by the louver blades connected between the inlet and outlet of the heat exchanger. Thus, in a steam condenser the louver blades for conducting air across the steam-condensing tubes are connected between the inlet and the outlet of the condenser to form an additional row of condenser tubes. This permits the construction of a condenser with fewer rows of tubes. From another viewpoint, a row of condenser tubes according to my invention is constructed and arranged to direct the flow of air or like medium through the passages formed between the other condenser tubes and thus to act as louver blades. In a preferred embodiment the fluid-directing row of condenser tubes is adjustably supported to permit variation of the flow of air or like medium through the condenser and the ends of the fluid-directing tubes are flexibly connected to the inlet and outlet of the condenser.

For a better understanding of what I believe to be novel and my invention, attention is directed to the following description and the claims appended thereto in connection with the accompanying drawing.

In the drawing Fig. 1 illustrates a locomotive

condenser embodying my invention; Fig. 2 is a top view along line 2-2 of Fig. 1; and Fig. 3 is a perspective view of a part of Fig. 1.

The heat exchanger or elastic fluid locomotive condenser shown in the drawing comprises a plurality of rows of finned tubes 10 vertically arranged with their upper or inlet ends connected to an inlet header 11 and their lower or outlet ends connected to an outlet header 12. The upper header 11 has an inlet conduit 13 for receiving elastic fluid to be condensed and the lower header 12 has an outlet conduit 14 for conducting condensate to a hot well 15.

The condenser may be arranged along one side of the locomotive, as more fully described in the patent to Anderson et al. No. 2,153,359, issued April 4, 1939, and assigned to the same assignee as the present application. The flow of air or cooling medium across the passages formed between the condenser tubes may be directed and controlled by a louver having a set of hollow louver blades 16 arranged along the outside of the locomotive. Each louver blade (Fig. 3) has a hollow finned body 17 secured to lower and upper end plates 18 and 19 respectively. The end plates are provided with supporting pins 20 pivotally held on lower bearings 21 and upper bearings 22. The latter are supported on the body of the locomotive. To permit equal adjustment of the various louver blades each end plate 18, 19 is provided with an arm 23 secured to a control cable 24, as more fully described in the aforementioned patent.

The hollow louver blades 16 in accordance with my invention are arranged to form a part of the condensing tubes. To this end the upper end of each louver blade is connected to the inlet or upper header 11 by a flexible tube 25 and the lower end of each louver blade is connected to the outlet header 12 by means of a flexible tube 26.

During operation a part of the elastic fluid conducted to the upper header 11 flows through the tubes 10 and another part flows through the louver blades 16 and is condensed therein and discharged from the lower ends thereof to the outlet header 12. Thus, a condenser or surface type heat exchanger according to my invention includes a plurality of rows of tubes of which one row is flat, preferably air foil shaped, in cross-section and in addition to condensing elastic fluid acts as a louver or means for directing cooling medium across the other rows of tubes.

Having described the method of operation of my invention, together with the apparatus which I now consider to represent the best embodiment

thereof, I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A heat exchanger for locomotives comprising inlet and outlet headers, a plurality of round tubes connected between the headers, a row of other tubes substantially air foil shaped in cross-section for directing the flow of cooling fluid across the passages formed between the round tubes, means pivotally supporting the other tubes, and conduit means flexibly connecting the other tubes between the inlet and outlet headers to

conduct fluid from the inlet header through the other tubes to the outlet header.

2. A surface type heat exchanger comprising inlet and outlet headers, a plurality of rows of tubes circular in cross-section and connected between the headers, a plurality of other tubes airfoil-shaped in cross-section and connected to communicate with the inlet and outlet headers, and means for pivotally supporting and adjusting the other tubes to vary the flow of cooling medium through the passages formed between the first mentioned tubes.

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