May 13, 1930. C. A. BOYD 1,758,495

CONDENSER CONSTRUCTION

Filed April 18, 1925 2 Sheets-Sheet 1

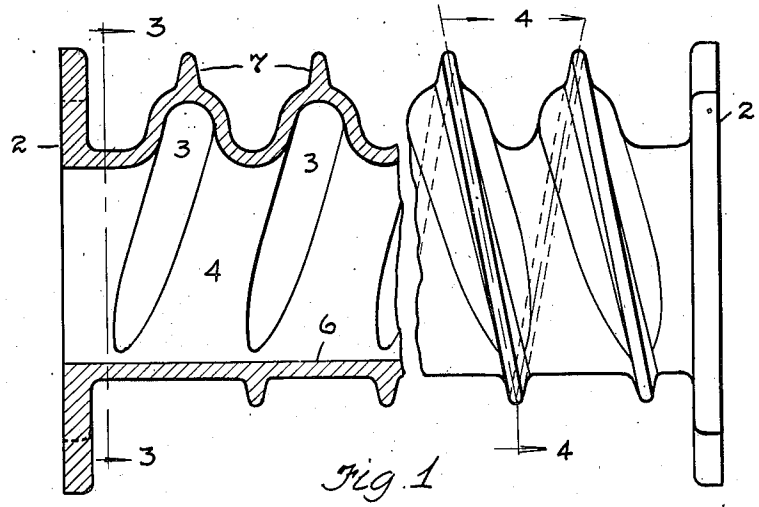


Fig. 1

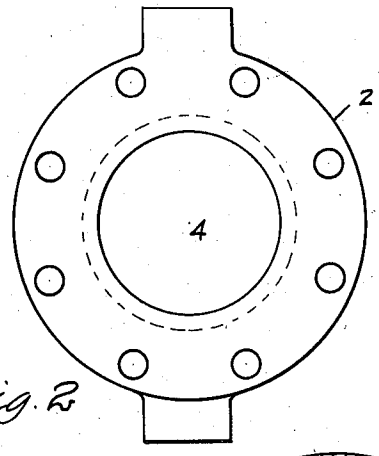


Fig. 2

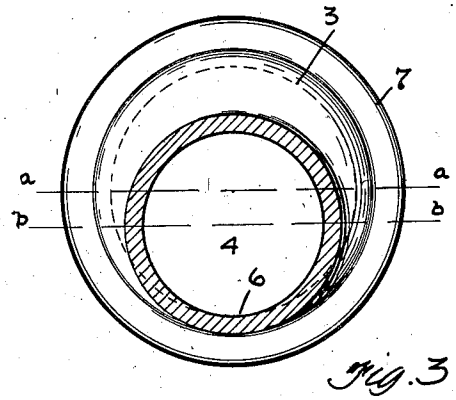


Fig. 3

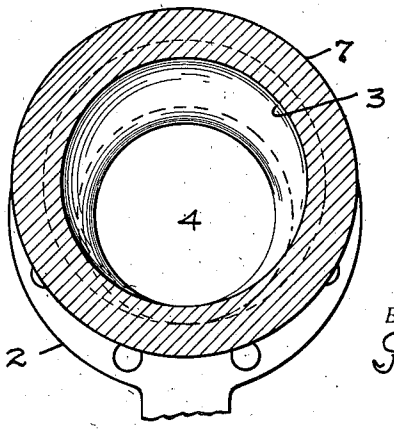


Fig. 4

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CONDENSER CONSTRUCTION

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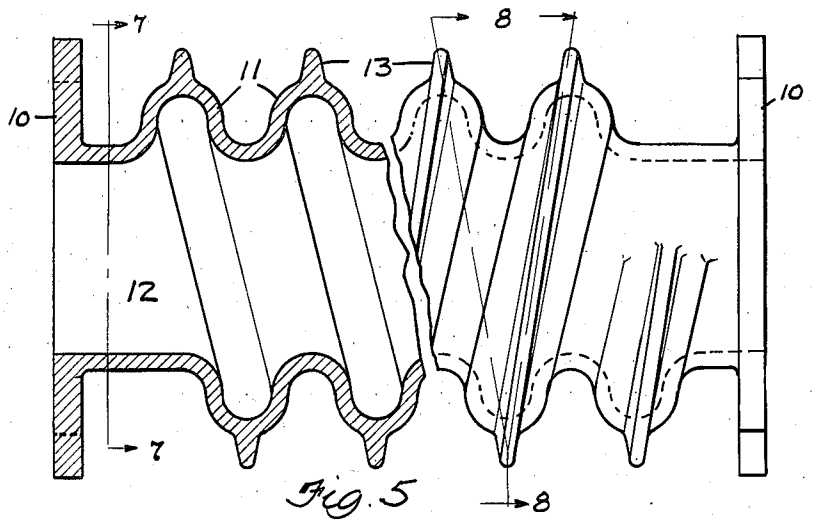


Fig. 5

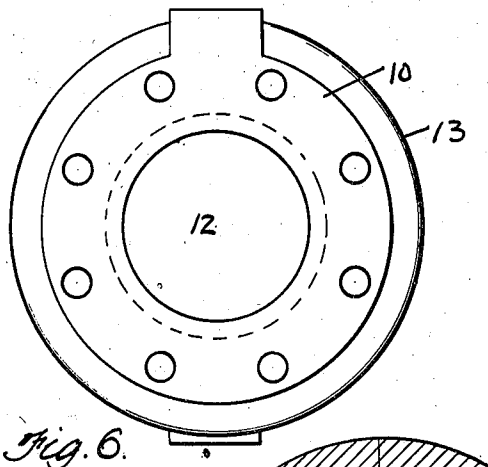


Fig. 6.

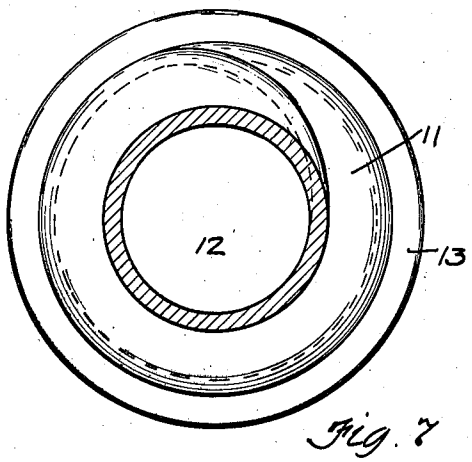


Fig. 7

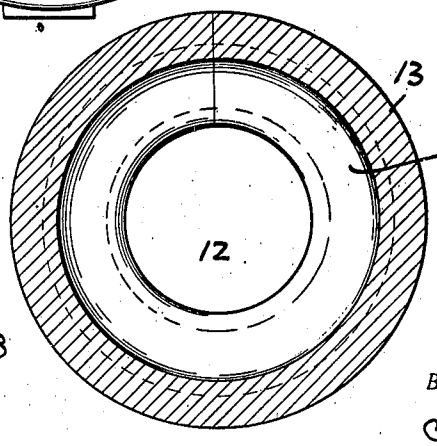


Fig. 8

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Patented May 13, 1930 1,758,495

UNITED STATES PATENT OFFICE

CHARLES A. BOYD OF CLEVELAND, OHIO, ASSIGNOR TO THE OIL CONSERVATION ENGINEERING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

CONDENSER CONSTRUCTION

Application filed April 18, 1925. Serial No. 24,031.

The present invention relates to heat exchangers and more particularly to the construction of heat exchanger or condenser units which are particularly adapted for cooling the condensing vapors and for cooling the condensate. The present type of condenser units provides a large cooling surface both interiorly and exteriorly, the walls of the unit being formed in convolutions so as to provide as great a cooling surface as possible but the construction is such as to reduce the accumulation of dirt or the like in the unit and to allow for the easy cleaning thereof. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—

Fig. 1 is an elevational view partially in section; Fig. 2 is an end elevational view of the unit; Figs. 3 and 4 are sectional views on the lines 3—3 and 4—4 respectively of Fig. 1; Fig. 5 is a view similar to Fig. 1 but showing a modified form of unit; Fig. 6 is an end elevational view of the form shown in Fig. 5; and Figs. 7 and 8 are sectional views on the lines 7—7 and 8—8 respectively of Fig. 5.

In the preferred form as shown in Fig. 1, the present heat exchanger consists of a hollow unit, preferably of casting or a formed pipe having end flanges 2 or other suitable connecting type of ends by which it may be attached to the usual headers or connecting pipes or other units. The body of the unit has a longitudinal passageway 4 therethrough and the unit is formed with a series of convolutions 3 which are in the form of a substantially continuous helix. The center line *a*—*a* of the interior of the helix is offset above the center line *b*—*b* of the passage 4 and thus the convolutions of the helix terminate tangent to the bottom of the unit forming a substantially smooth bottom floor 6 for the condensed liquid to flow over.

The convolutions are each provided on the outside with a rib 7 or like cooling flange and these ribs form a continuous external helix around the casing unit. Thus the passage 4 from the ends provides a circular opening through the unit with a series of helically arranged grooves which increase the cooling surface but which may easily be cleaned as a brush or the like centered on the line *a*—*a* will follow the convolutions as well as clean the entire interior of the unit.

In the form shown in Figs. 5 to 8, the body of the unit is provided with the end flanges 10 and in this form the center line of the convolutions 11 or helix is the same as the center line of the passage 12. A rib 13 is provided on the outside of the convolutions to increase the cooling surface. In this form a wire brush or the like may be forced in and the unit cleaned but the unit does not provide the smooth bottom or floor for the flow of liquid. However, the unit may be rotated on its axis so as to change the top and bottom and this is advantageous under certain conditions where the vapors being condensed cause corrosion. The corrosion is most rapid at the top of the unit and by changing the position about the center axis, the corrosion can be equalized and the unit used the longest possible time.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A condenser unit consisting of a hollow casting having a substantially continuous helical groove forming a series of convolutions exteriorly and interiorly of the casting, the axis of the hollow passage and the axis of the helical convolutions lying on spaced parallel lines so as to make the convolutions merge with the wall of the casing along one side of the casing.

2. A condenser unit consisting of a hollow casting having a substantially continuous helical groove forming a series of convolutions exteriorly and interiorly of the casting, the axis of the hollow passage and the axis of the helical convolutions lying on spaced parallel lines so as to make the convolutions merge with the wall of the casing along the bottom of the casing thus forming a substantially flat floor for the passage of liquid.

Signed by me this 15th day of April, 1925.

CHARLES A. BOYD.