Feb. 11, 1930. E. L. BARNES 1,746,922

BOILER OR COOLING UNIT FOR REFRIGERATING APPARATUS

Filed July 23, 1926 2 Sheets-Sheet 1

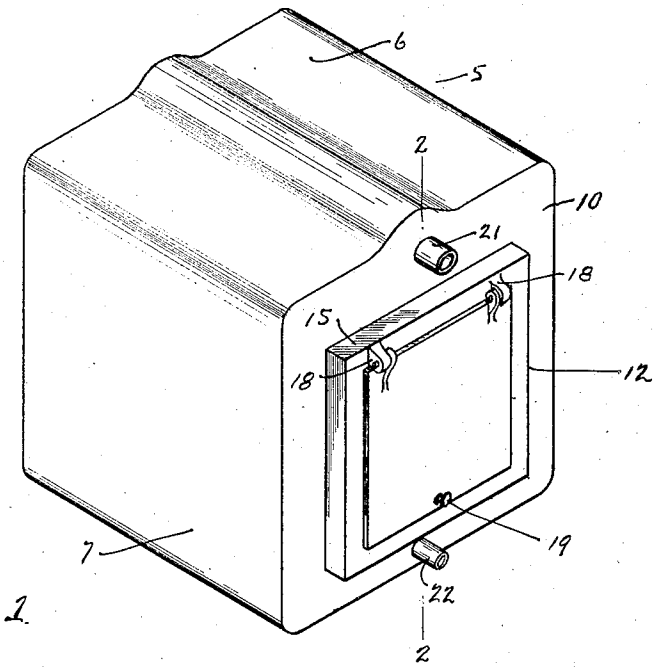

Fig. 1.

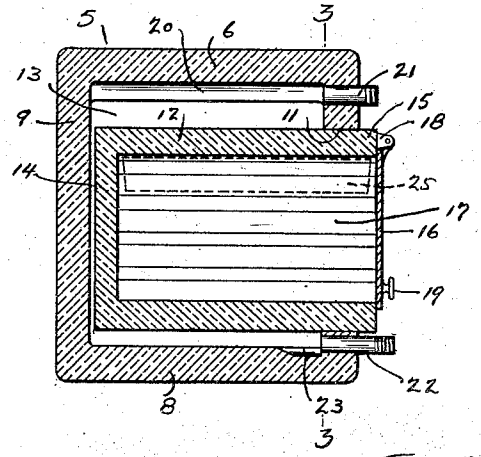

Fig. 2.

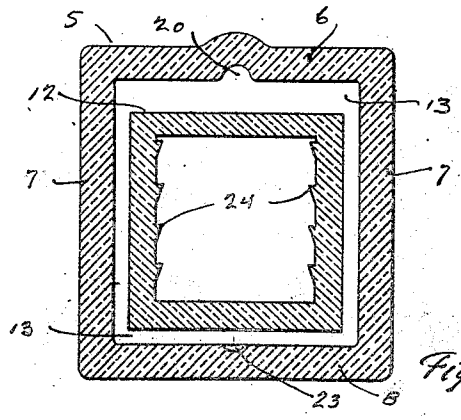

Fig. 3.

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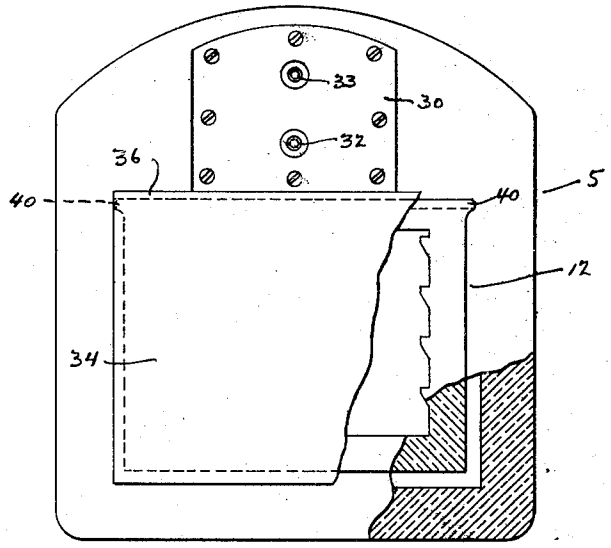

Fig. 4

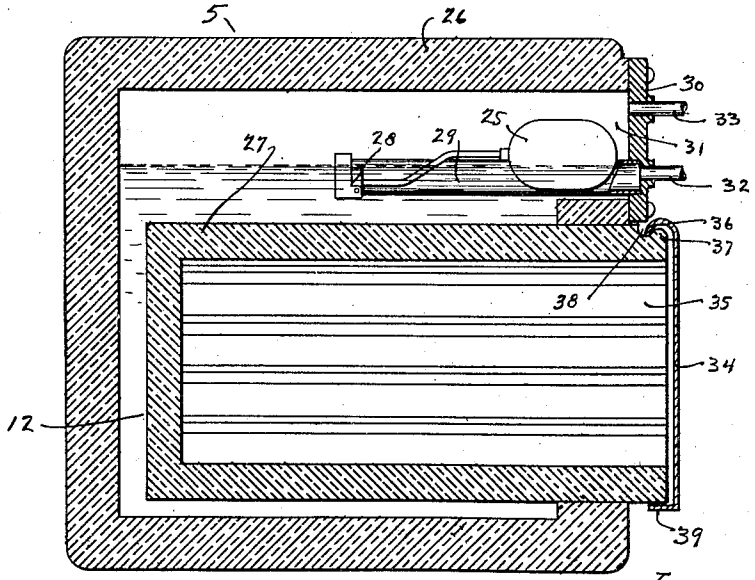

Fig 5.

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UNITED STATES PATENT OFFICE

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BOILER OR COOLING UNIT FOR REFRIGERATING APPARATUS

Application filed July 23, 1926. Serial No. 124,384.

It is well known to those skilled in the art, that boilers or cooling units of refrigerating apparatus, of the present day art, are of two general types; namely, those made of pipe coils or short lengths of pipe connected with headers, and those made of cast metal. The great objection to the first type is that there are numerous joints which must be made tight when the device is being manufactured, and which are susceptible to leakage and necessary repairs during the use of the device. The objection to the second type is that the finished cast unit is not only heavy but is expensive because a large percentage of such castings, particularly if of aluminum, is unsound and porous and, therefore, unsuitable for the purpose. Furthermore, all such castings, if of material other than aluminum, require some sort of protecting coat to prevent corrosion or rusting, and experience has proved that any such coating will quickly disintegrate in the presence of frost.

The principal object of my invention has been to provide a device which shall have comparatively few joints and have all the advantages of the pipe coil type as well as the molded type.

Another object has been to provide a device having walls of ceramic or other suitable non-metallic material such as porcelain, glass, or the like.

Furthermore, my device, when made of porcelain or glass, has a permanently glazed surface and is easily cleaned and sanitary. It may be made white so as to blend with the white walls of the refrigerator.

Moreover, it is not possible for my boiler to develop leaks, since it is hermetically sealed and is, in effect, an integral structure. Furthermore, my boiler is efficient in operation and durable in construction.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a perspective view of the exterior of my boiler.

Fig. 2 is a longitudinal, sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a transverse, sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a front elevation of a modified form of structure, showing portions thereof broken away.

Fig. 5 is a longitudinal, sectional elevation of the form of device shown in Fig. 4.

My device comprises in general an outer casing 5, and an inner casing 12. The walls of these casings are made of a non-metallic material such as glass, porcelain, earthenware, or other non-metallic and acid-resisting material which may be molded.

Referring to the form of device shown in Figs. 1 to 3, the outer casing comprises a top 6, side walls 7, a bottom 8, a rear wall 9, and a front wall 10.

The front wall 10 of the outer casing is provided with an aperture 11 in which the inner casing 12 is held. The inner casing 12 extends inwardly within the chamber 13 of the outer casing, and its inner wall 14 extends to within, preferably, a short distance of the inner face of the rear wall 9 of the outer casing. The size of the inner casing is such that the chamber 13 extends around the inner casing 12 and preferably around all sides thereof except the front side. The forward end 15 of the inner casing extends some distance beyond the forward face of the front wall 10 of the outer casing where a door 16 is provided for closing the inner compartment 17 of the inner casing. The door is preferably hinged to lugs 18 carried by the inner casing, and a handle 19 is provided for opening and closing the door.

The inner casing 12 after being assembled in the opening 11 of the outer casing is secured to the outer casing preferably by fusing the materials of the two casings together by a baking operation, whereby they become one part and are, therefore, free from any possible leakage of the refrigerant within the chamber 13. The portion of the chamber 13 above the inner casing 12 is preferably slightly larger than the portion of the chamber below this casing so as to take care of the boiling of the refrigerant. The top 6 of the outer casing is preferably provided with a longitudinal groove 20 for the accumulation of vapors of the refrigerant, and an outlet pipe 21 is passed through the front wall 10 and in

registration with the groove 20, whereby vapors of the refrigerant will be conducted away from the boiler. An inlet pipe 22 is arranged in the front wall 10 of the outer casing and is in communication with the portion of the chamber 13 which is below the inner casing. The bottom 8 of the outer wall is slightly recessed at 23, which recess is in registration with the inlet pipe 22. The outlet pipe 21 and inlet pipe 22 are secured into the front wall 10, so as to prevent leakage of the refrigerant and so as to hermetically seal the boiler at these points.

The inner casing 12 is preferably provided with lugs or ridges 24 for supporting trays, one of which is shown in dotted lines at 25 in Fig. 2.

From the foregoing it will be clear that the refrigerant is supplied to the boiler by means of the inlet pipe 22 and that vapors are taken from the boiler through the outlet pipe 21 in a manner which is customary and well known in refrigerating apparatus.

In the invention shown in Figs. 4 and 5, I provide a float 25 in the space between the upper wall 26 of the outer casing 5 and the upper wall 27 of the inner casing 12. This float controls an inlet valve 28 whereby the liquid refrigerant in the boiler is maintained at a constant level as is customary in refrigerating apparatus. The valve 28 is carried at the inner end of a freezing tube 29, in which any water contained in the refrigerant will be taken out by condensation and freezing. The forward end of the freezing tube is carried by a cover plate 30. This cover plate closes an opening 31 formed in the front wall of the outer casing 5. An inlet pipe 32 is provided in the cover and is arranged opposite the forward end of the freezing tube 29. An outlet pipe 33 for the vapors is also carried by the cover. The cover is secured to the casing in any suitable way so that the joint between it and the casing may be effectually sealed.

The inner casing 12 is mounted within the outer casing 26, as in the other form of invention, and the two casings are suitably secured together, preferably by fusing, so that they will be, in effect, one piece of material without any joints. The forward end of the inner casing 12 extends beyond the front face of the outer casing 5, and a cover 34 is provided for closing the freezing compartment 35 of the inner casing. This cover is preferably hung from the top by an inwardly curved portion 36 which fits loosely over a bead 37 formed along the upper edge of the inner casing 12. A groove 38 is formed back of the bead 37, and the inturned edge 36 of the cover rests in this groove. The cover is provided on the other three sides with an inwardly extending flange 39. The cover and the flange 39 are so proportioned that the flanges will not touch the surfaces of the front end of the inner casing 12, thus doing away with the possibility of the cover freezing in its closed position. The bead 37 has a projecting end 40 at each side, so as to keep the flanges 39 at the sides in interspaced relation with the sides of the outwardly projecting end of the inner casing. The inturned end 36 of the cover 34 will hold the cover in interspaced relation with the face of the inner casing, as shown in Fig. 5.

While I have shown the inner walls of the inner chambers as slightly separated from the rear walls of the outer chambers so as to permit circulation of the refrigerant, it is obvious that the inner chambers may extend to and be carried by the rear walls of the outer chambers if desired. However, more efficient results are obtained by providing the space as shown.

It is obvious that if desired, the non-metallic walls of the inner and outer casings may be reinforced with suitable metallic reinforcing so as to add to their strength and prevent breakage.

In the appended claims where I mention ceramic material, I include in the term glass or other molded material, which, so far as my invention is concerned, has characteristics similar to porcelain.

Obviously, some modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims, and I do not, therefore, wish to be limited to the exact embodiment herein shown and described, the form shown being merely a preferred embodiment thereof.

Having thus described my invention, what I claim is:

1. A boiler for a refrigerating apparatus, comprising an outer casing of ceramic material, an inner casing of ceramic material mounted within the outer casing and having some of its outer walls in interspaced relation with the inner walls of the outer casing, thus providing a refrigerant chamber, and means for securely fastening the inner and outer casings together and hermetically sealing them.

2. A boiler for a refrigerating apparatus, comprising an outer casing of ceramic material having an opening therein, and an inner casing of ceramic material mounted within the opening and extending into the outer casing and having some of its outer walls in interspaced relation with the inner walls of the outer casing, the contacting surfaces of the inner and outer walls being fused together.

In testimony whereof, I have hereunto signed my name.

EUGENE L. BARNES.