Jan. 5, 1937. J. J. SPENGLER 2,067,004.

REFRIGERATING APPARATUS

Filed May 13, 1935

Fig. 1

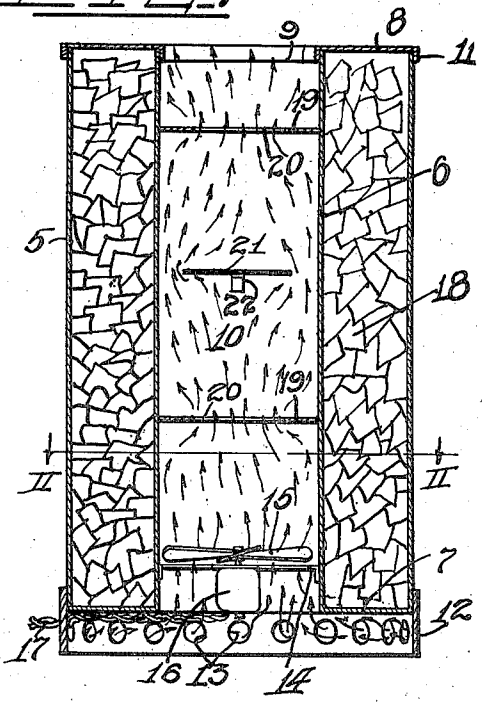


Fig. 2

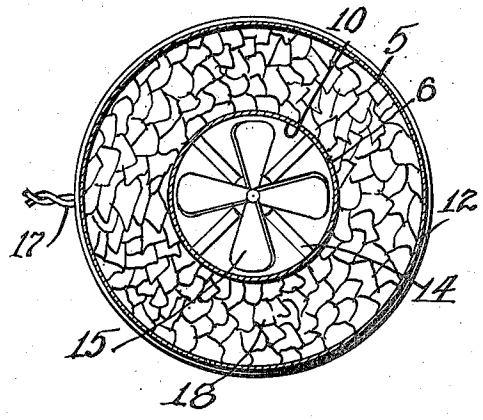


Fig. 4

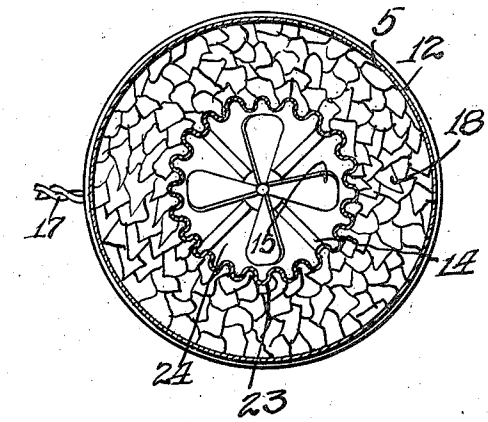
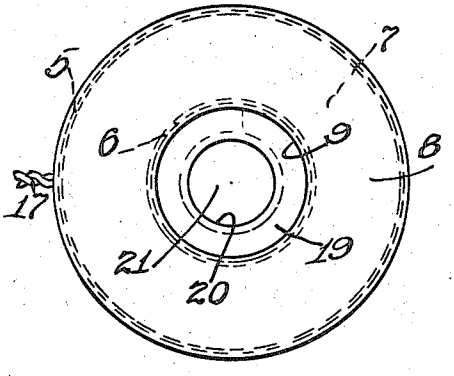


Fig. 3



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REFRIGERATING APPARATUS

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9 Claims. (Cl. 257—202)

This invention relates to improvements in refrigerating apparatus, and more particularly to that type of refrigerating apparatus desirable for use in the body of an automotive truck to maintain a sufficiently low temperature within the truck body for the proper preservation of the products or commodities being transported, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the transportation or delivery by automotive trucks of food products, such as meats, milk, and similar commodities which must be kept at a relatively low temperature for their preservation, difficulty has heretofore been experienced in maintaining a sufficiently low temperature in the body of a truck. In most cases, milk, for example, has been placed in hand carriers for delivery and pieces of cracked ice scattered through the carriers between the bottles. Such a method is clumsy and very laborious. In other cases, trucks have been mainly refrigerated merely by placing a drum of cracked ice and salt inside the truck body, depending upon the heat extraction of the melting ice to maintain a sufficiently low temperature within the truck. Such a device is found very inefficient in that the low temperature will be concentrated in a substantially small area immediately around the ice drum. Of course, fans have been provided in connection with some refrigerating devices for creating a draft of air, but all such devices, insofar as I am aware, were cumbersome affairs designed for permanent disposition in a show case or in refrigerating cars of the type used on railroads.

In nearly every instance, it is desirable to adequately refrigerate a truck for a day's usage, and the refrigerating mechanism or device should be simple in construction so that a refrigerant may be replaced simply and quickly. There is, accordingly, a definite need for means which may be simply handled and which will efficiently, economically and adequately refrigerate a truck body.

It is, therefore, a primary object of the present invention to provide a simple, economical and readily portable refrigerating device capable of adequately refrigerating the interior of a truck body.

Another object of this invention is the provision of a portable refrigerating device which may be easily placed in any desirable location within the body of a truck or other space to be refrigerated, and which may be dumped and refilled in a very simple and expeditious manner.

It is also an object of this invention to provide a refrigerating device which is unitary in character, portable, and which embodies both a refrigerant containing chamber and means for creating a forced draft over a chilled surface of the container.

Still another object of this invention is the provision of a refrigerating device embodying a refrigerant container and having means for creating a forced draft over a wall of the container, there being baffle means associated with the wall to augment the contact of the air draft with the chilled wall surface.

It is also an object of this invention to provide a refrigerating device in the form of a unitary refrigerant containing drum having a wall formation arranged to provide an air passage through the drum with means associated with the drum for creating a forced draft through said air passage, and other means associated with the wall of the passage for increasing or offsetting the contact of draft air with the chilled surface of said wall.

Still another object of the invention is the provision of a unitary refrigerating device having a corrugated or finned wall defining an air passage with the refrigerant in contact with the opposite side of said wall, and means for creating a forced draft over the wall through said passage.

Still a further object of the invention is the provision of a refrigerating device substantially in the form of a double-walled refrigerant container having a central air passage therethrough and mounted upon a base which holds the container in erect position elevated from the floor, the base also having air openings therein so that air may circulate through the openings in the base and upwardly through the air passage.

While hereinabove, the invention has been mentioned as being highly desirable for use in connection with the refrigerating of truck bodies and the like, it will be apparent that the invention might also be placed with equal facility in substantially any confined space for the adequate refrigeration of that space.

While some of the more salient features, characteristics and advantages of the present invention have been above pointed out, others will become apparent from the following disclosures.

The invention includes these and other features of construction and combinations of parts

hereinafter described and shown in two forms in the drawing, as more particularly indicated by the claims.

On the drawing:

Figure 1 is a fragmentary central vertical sectional view of a refrigerating device embodying principles of the present invention, showing the device in operative position and indicating the operation thereof.

Figure 2 is a transverse plan sectional view taken substantially as indicated by the line II—II of Figure 1, looking in the direction of the arrows.

Figure 3 is a top plan view of the structure seen in Figure 1.

Figure 4 is a plan sectional view of a modified form of structure, the section being taken in substantially the same location as the section of Figure 2.

As shown on the drawing:

In the illustrated embodiment of the present invention, there is shown a double-walled refrigerant container, including an outer wall **5**, an inner wall **6**, and the container being bottomed as at **7** between the walls. In the present instance, the container is shown in the form of a double-walled cylinder, but it is obvious that it may be of any desired shape, but the double-walled construction is preferable. The container is preferably made of sheet metal having relatively high heat conductivity.

The upper end of the container is open, but is closed when in use by a removable cover **8** which is ring-like in character to provide a central aperture **9** in communication with an air passage **10** defined by the inner wall **6** of the container. The cover **8** is downwardly flanged as indicated at **11** on both the outer and inner edges thereof to effect a better seal over the top of the container.

A base in the form of a ring flange **12** is secured to the lower portion of the container in any desired manner, such as brazing, welding, riveting or the equivalent. This base flange **12**, as seen clearly in Figure 1, supports the container in erect position but elevated above the floor, and the base flange is provided with a plurality of air openings **13** through which air may enter and circulate upwardly through the air passage **10** as indicated by the arrows in this figure.

Means are provided to create a forced draft through the passage **10** in contact with the inner wall **6** of the drum or container. In order to render the construction completely unified in character, it is preferable to dispose these means near the lower end of the passage **10**. In this instance, a cross bar **14** secured to the inner wall **6** in any suitable manner supports a fan **15** driven by a relatively light motor **16** which may be energized through conductors **17** from any suitable source of electrical energy. In the event the refrigerating device is used in the body of a truck, the fan and motor are of such light construction as not to impose an excessive burden upon the battery of the vehicle. If so desired, however, an extra battery may be utilized in a convenient location for driving the fan motor.

With the annular drum filled with a refrigerant **18** in the form of dry ice, cracked ice and salt, or other suitable substance, and the forced draft created by the fan **15** passing over the chilled inner wall **6** through the passage **10**, an adequate circulation of refrigerated air is provided capable of adequately refrigerating the inside of a truck or other space, as the case may be. Of course, the chilled outer wall **5** also aids in establishing the desired low temperature.

If so desired, the contact of the air draft through the passage **10** with the wall **6** may be augmented or increased by the use of baffles. In this instance, upper and lower baffles **19** are provided, each having a central aperture **20**. These baffles may be secured to the wall **6** in any suitable manner, and the apertures **20** are of materially less size than the passage **10**. Between the baffles **19**, a solid baffle **21** of less size than the passage **10** but of greater size than the apertures **20** is held in position by a bracket **22** or in any other desirable manner. Thus, a tortuous path for the air draft is provided, somewhat retarding the draft and increasing the contact of the air draft with the wall **6**.

The entire refrigerating device is, of course, sized in accordance with the area to be refrigerated. For trucks and similar vehicles, the device is made in a portable size which may be handled readily by one man, and it is a simple expedient to remove the cover **8** and fill the drum with a refrigerant. It is equally as simple to position the device in an advantageous location. After a length of time consistent with the refrigerant used, the cover **8** may be removed and the container as a whole may be dumped to remove the melted refrigerant, without injury to the fan **15**.

In Figure 4, I have shown a slightly modified form of construction differing from that previously described only in the provision of a corrugated or finned inner wall **23** defining a central air passage **24**. The corrugating or finning of the inner wall provides more wall surface for contact by the air draft. With the exception of the tortuous formation of the wall **23** providing added surface for contact with the air draft, the operation of the device shown in Figure 4 is the same as that previously described.

It, of course, will be understood that the device may be used with a smooth inner wall and without the baffles, with a tortuous inner wall and without the baffles, or with either wall and with the baffles, as may be deemed most feasible.

From the foregoing, it is apparent that I have provided a simple and economical refrigerating device, readily disposable in substantially any desirable location. The device may be easily filled with a refrigerant, and just as easily emptied of used refrigerant. It is also apparent that the device is highly efficient in character, durable, simple in construction and economical to make and use.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than is necessitated by the prior art.

I claim as my invention:

1. In a refrigerating device, a double-walled member defining an annular chamber to hold a refrigerant, said chamber being closed at the top and bottom thereof with the central space defined by the inner wall open at both ends, a base support for holding said member having air openings therein, and means disposed in said central space providing a forced draft through said central space.

2. In a refrigerating device, a double-walled member bottomed between the walls to provide a chamber for a refrigerant, a removable cap closing the upper part of said chamber and having an aperture to leave free the central passage de-

fined by the inner wall of said member, and a base flange having air openings therein secured to said member to hold the member upright and elevated from the floor.

3. In a refrigerating device, a double-walled member bottomed between the walls to provide a chamber for a refrigerant, a removable cap closing the upper part of said chamber and having an aperture to leave free the central passage defined by the inner wall of said member, a base flange having air openings therein secured to said member to hold the member upright and elevated from the floor, and a fan adjacent said base for creating a forced draft through said openings and upwardly through said passage.

4. As an article of manufacture, a metallic refrigerant container including a double-walled cylinder bottomed between the walls to provide a chamber for refrigerant and with the central space defined by the inner wall left open, a centrally apertured cover for closing the upper end of said chamber, and a base flange secured to said cylinder to support the same spaced from the floor, said flange having air openings therein in communication with said central space.

5. In a refrigerating device, a double-walled annular container for refrigerant with the central space defined by the inner wall left open, means having air openings therein holding said container from the floor, fan means to create a forced draft through said central space, and baffle means in said space to retard the draft.

6. In a refrigerating device, a double-walled annular container for refrigerant, the inner wall being finned and the space defined thereby being open at the ends, fan means arranged to create a forced air draft through said space, and baffle means in said space to augment the contact of the draft air with said finned wall.

7. In a refrigerating device, a double-walled annular container for refrigerant, the inner wall being finned and the space defined thereby being open at the ends, fan means arranged to create a forced air draft through said space, baffle means in said space to augment the contact of the draft air with said finned wall, and a base for said container arranged to hold the container above the floor, said base having an air opening therein through which intake air is caused to pass by said fan means before entering said space.

8. In a refrigerating device, a double-walled member bottomed at one end and capped at the other between the walls to provide a chamber for a refrigerant, the inner wall of said member defining a passage through said member, and a vertically extending transversely apertured base flange secured to said member and arranged to seat on a floor and hold the member upright and elevated from the floor.

9. In a refrigerating device, a refrigerant container having a walled passage therethrough open at each end, a base flange having an air opening therein secured to said container to hold the same upright and elevated from the floor, and fan means protected by said base flange arranged to create a forced draft through said passage.

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