

Nov. 22, 1938.

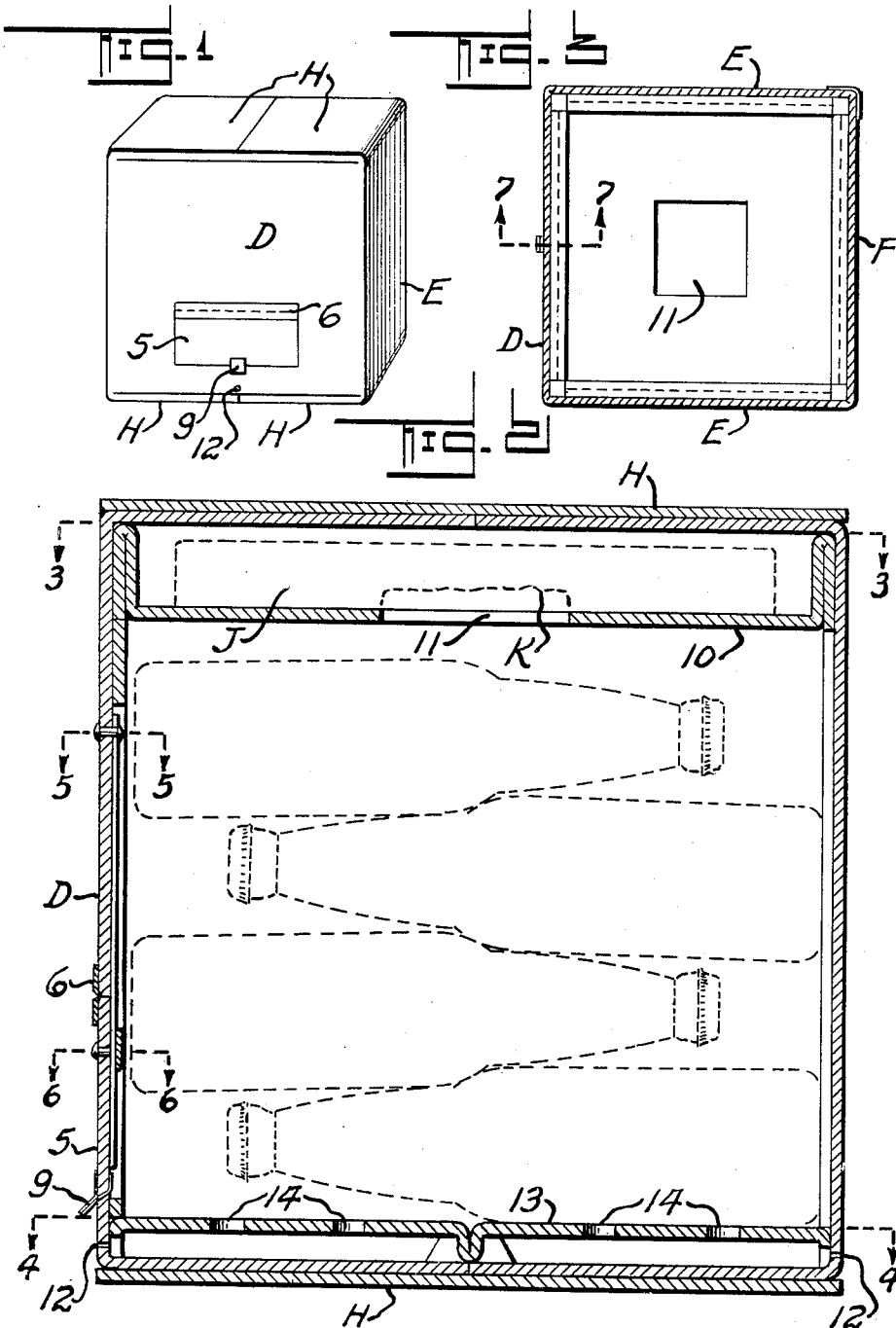
C. L. TIEFRY

2,137,705

PORTABLE REFRIGERATOR OR COOLER

Filed April 20, 1936

2 Sheets-Sheet 1



INVENTOR:
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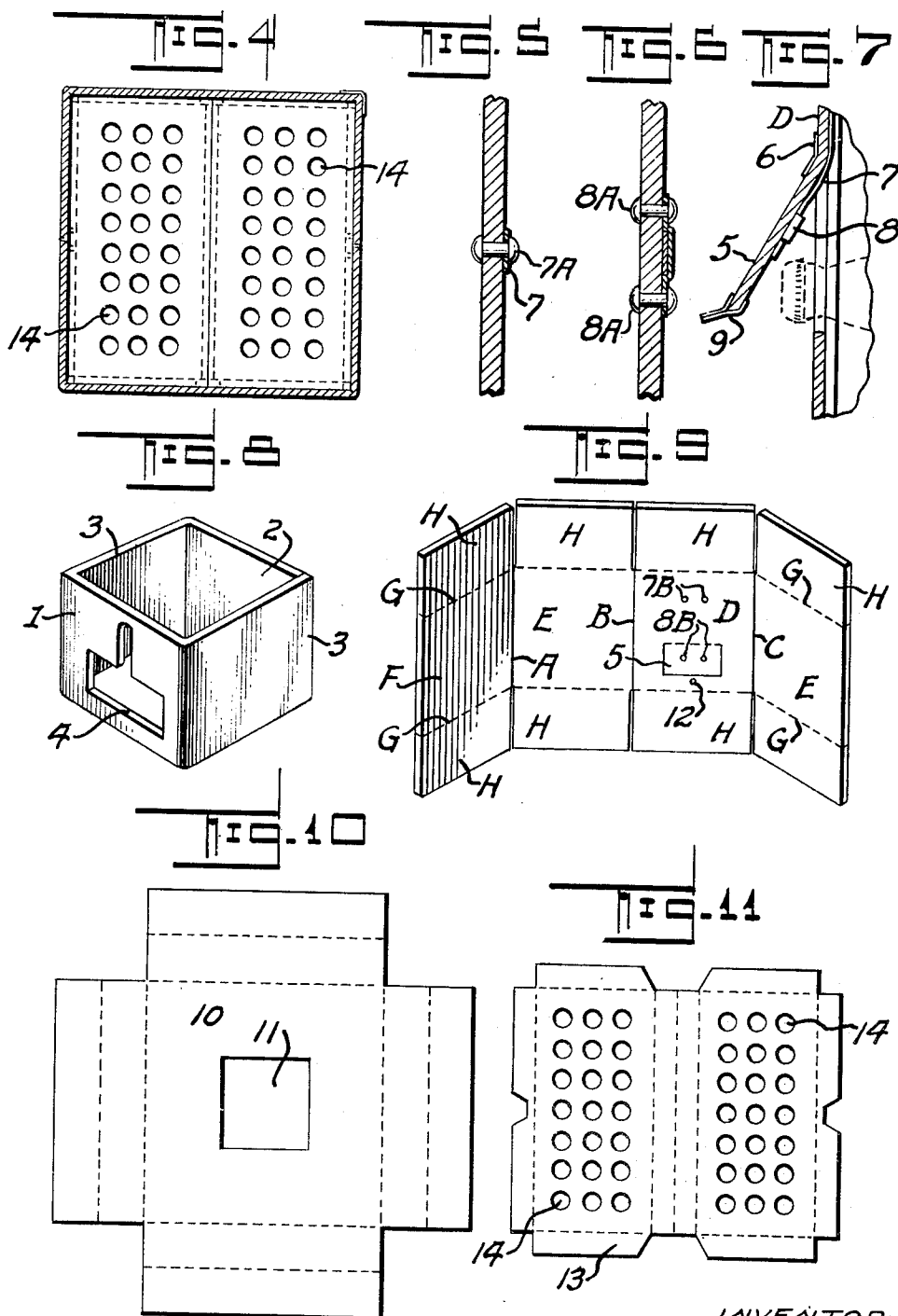
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UNITED STATES PATENT OFFICE

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PORTABLE REFRIGERATOR OR COOLER

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3 Claims. (Cl. 62—91.5)

This invention relates to improvements in the art of refrigeration and the principal object thereof is to provide a certain box structure for the purpose of keeping bottled beverages at the desired temperature, particularly beer during transportation and while waiting to be consumed. The duration of this period will be adequate for the accommodation of pleasure outings and the like. Protection from light and air for the beverages is also a feature of the invention.

Other advantages of the invention are; inexpensive to operate; to provide a means of refrigeration comprising solid carbon dioxide known as dry ice or CO₂, when absorbing heat effects a circulating pressure within the confined limits that is subject to control so as to maintain the required temperature; to provide an arrangement whereby the bottles may be individually removed from the container without disturbing the refrigerant or affecting the temperature therein; to provide a means whereby the temperature may be retained below 48 degrees F., for a period of from 12 to 18 hours, depending upon the existing outside temperature; to provide a container for this purpose having certain improvements coordinated with a beer or beverage case of standard proportions.

Additional advantages of the invention will appear concurrently with the following detailed description, illustrated throughout the drawings, and more fully pointed out in the appended claims.

In further presenting the invention it is to be understood that certain elements associated therewith but not a part thereof, will be designated by consecutive alphabetical letters, while the invention proper will be characterized by the customary reference numerals.

With reference to the drawings:

Figure 1 is a perspective view of the complete invention and clearly showing the trap door thereof.

Figure 2 is a greatly enlarged transverse sectional assembly.

Figure 3 is a reduced section taken directly upon line 3—3 of Figure 2.

Figure 4 is a reduced section upon line 4—4 of Figure 2.

Figure 5 is an enlarged section upon line 5—5 of Figure 2; and Figure 6 is a similar view upon line 6—6 of Figure 2.

Figure 7 is an enlarged section upon line 7—7 of Figure 3, showing the trap door open and how the bottles are individually removed from the case.

Figure 8 is a reduced perspective view of the liner showing same completely folded and ready to be normally inserted in the case.

Figure 9 is a view of the cooler wall being folded so as to form the case.

Figure 10 is an unfolded blank of the tray; and Figure 11 is an unfolded blank of the inner bottom.

The invention is designed so as to improve a box structure being composed of a single piece of suitable card board or the like indicated in Figure 9 and foldable upon lines A, B and C, forming front D, sides E and back F. The material is then deflected inwardly upon dotted lines G forming ends H, thereby completing the box or case.

The invention comprises a liner being formed of a single piece of suitable card board or the like in the manner as indicated in Figure 8. For the liner are front 1, back 2, sides 3, and the bottom and top thereof being open as shown.

The liner is adapted to be detachably inserted in the case before ends H thereof are folded over in the position for sealing the same.

A decidedly important feature of the invention is the special provision for removing the individual bottle from the case as they are being consumed, and this feature consists of trap door 5 which is a part of front D of the case and is hingedly supported thereto by strip 6 where indicated. Door 5 is automatically closed by means of elongated spring 7, one end of which is permanently secured to the rear of front D by rivet 7A, and apertures 7B are for this purpose. The opposite end portion of spring 7 is adapted to slidably engage cleat 8 which is secured to door 5 by rivets 8A, and apertures 8B are for this purpose. The last-named end of spring 7 is free to slide through cleat 8 as door 5 is opened, and it is obvious that said spring will be adequate for retaining said door securely sealed when closed. It is also observed that double flap 9 is provided and is secured to door 5 where shown in Figure 7, also the dotted lines in this view show a portion of one of the bottles being removed from the case. Opening 4 is provided where indicated in the liner for the accommodation of door 5 and spring 7 therefor.

Referring more particularly to Figure 2 it is observed that tray 10 is provided and is inserted into the case and directly upon the open top of the liner, and is for the purpose of accommodating a quantity of dry ice J, and said tray having orifice 11 therethrough where shown so as to control the flow of frigid air from said ice through the orifice. Dotted line K indicates that the ice

will be dissipated proportionately to the size of the orifice 11 until at such time as it would require for consuming the entire volume of ice, depending upon the period the container is in use after being packed with the contents of beverage and ice and consistent with the outside temperature in which the case is being exposed.

5 The gas expelled from ice J as previously described supplies the proper amount of refrigerant within the case which consistently flows downwardly for the reason as follows:

First, cold air being heavy in comparison to warm air naturally flows downwardly.

Secondly, pressure released from dry ice (CO₂) forces cold gas downwardly and due to vents 12 within the lower portion of the container, a path of least resistance is thereby provided, and which has a tendency to create a circulation effected by carbon dioxide resultant from the gas expelled from ice J to the vents aforesaid.

20 Inner bottom 13 upon which the bottles are adapted to rest, is provided and is inserted into the case as clearly indicated in Figure 2, and the blank for said bottom being indicated in Figure 11, and it is clear in the latter view that a plurality of uniformly spaced apertures 14 is provided in bottom 13 so as to permit the cold air to circulate, and in so doing, will completely surround the bottles in the case.

30 It is obvious that due to the fact that the frigid air is forced downwardly and vents 12 being confined to a rather small proportion, causing thereby a pressure that is exerted within the case so long as there remains CO₂ gas therein, which naturally distributes same uniformly to every point within the case.

Having thus fully described my invention, what I claim as new is:

40 1. In a box structure adapted for bottled beverages having front, back, sides, bottom and top,

a liner foldable and adapted to be inserted into said box and having the bottom and top thereof open, an inner bottom for said box, same being foldable and adapted to be inserted therein and spaced from the bottom of the box, a pair of oppositely disposed vents within said box and entering the space aforesaid, a plurality of apertures within said bottom for circulation of the frigid air within the box by said vents surrounding bottles adapted to rest upon said bottom and means for providing the frigid air within the box aforesaid.

2. In a box structure adapted for bottled beverages, means for providing frigid air within said box comprising a tray positioned within the upper portion of the box and being adapted to accommodate a quantity of carbon dioxide ice, means for removing the individual bottle from said box consisting of a trap door hingedly engaging the same, also an elongated spring secured to the inner surface of one of the ends of the box and adapted to slidably engage said door and to retain the same in a closed or sealed position.

3. In combination with a box structure adapted for bottled beverages, interlining means for said box, means for supporting dry ice above the first-named means and coacting aperture means for gradually dissipating said ice downwardly therefrom, vent means within the lower portion of said box and the resistance caused thereby creating a circulation, thus facilitating a complete circulation surrounding the bottled contents within the box, means for individually removing the bottles from the box comprising a trap door hingedly supported by the front thereof, also spring means for said door for retaining the same sealed at all times until same is opened.

CHARLES LINCOLN TIEFRY.