April 18, 1933. R. L. BANGS ET AL 1,904,400

BOX

Filed July 24, 1931

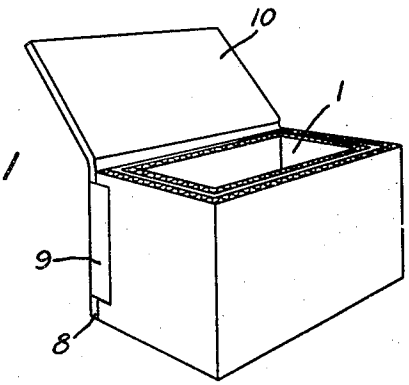


Fig. 1

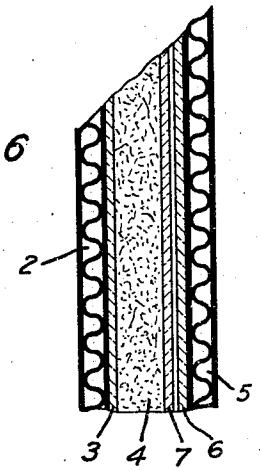


Fig. 6

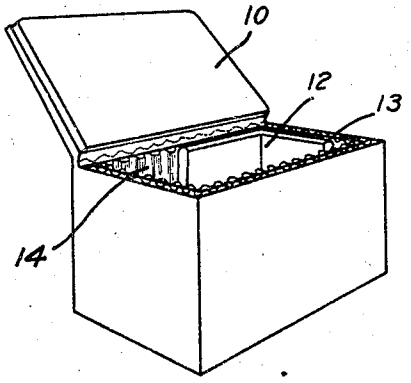


Fig. 2

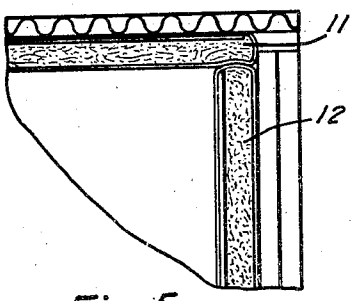


Fig. 5

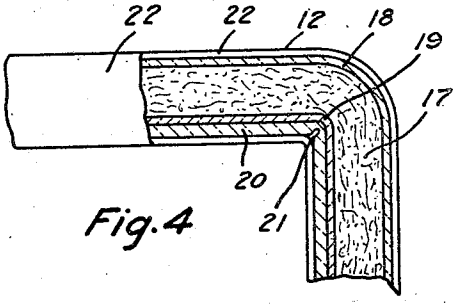


Fig. 4

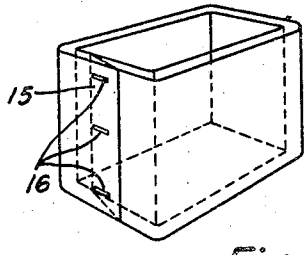


Fig. 3

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UNITED STATES PATENT OFFICE

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BOX

Application filed July 24, 1931. Serial No. 552,943.

The present invention relates to boxes, and more particularly boxes which are to maintain constant temperature. Little attention has been paid in the past to the method of insulating boxes and the means generally employed are crude and unstandardized.

In the present invention, the object is to provide a well insulated box which is not bulky and which may as well be knocked down or folded for shipment in quantities if desired. The construction of the box is such that it is firmly sealed and tends to prevent leakage of cold or hot air from the box. In this manner if such methods of keeping cool by using a refrigerant is employed the cold gas of the refrigerant may be kept inside the box.

The box is provided with a liner and may be used that way to maintain an even greater efficiency in maintaining original temperatures. Another feature of the construction is the provision of vertical fluting in the internal walls whereby the cold and warm gases may travel in columns up and down the box and provide internal circulation to maintain constant and even temperature throughout the entire container.

Other objects and aims of the invention will be understood from the following description of an embodiment of the invention in connection with the drawing in which:

Figure 1 shows a perspective view of the box opened.

Figure 2 shows a modification with the liner partially broken away.

Figure 3 shows the lining element.

Figure 4 shows in part the lining element and a part section therethrough.

Figure 5 shows a detail of the box construction to provide a seal.

Figure 6 shows a section through the wall of the box of Figure 1.

In Figure 1, the box 1 may be of any desired shape, and is composed preferably of an outer corrugated cardboard 2, next to which is placed a kraft paper 3, and then one or more layers 4, of batting or webs of a composite of absorbent cotton fibres, rubberized fibres and jute, joined together with a great amount of dead air spaces between. On the inside there may be a corrugated layer 5, and both kraft paper 6 and asphaltum 7, if necessary.

The box may be joined at one corner 8 by a binding strip 9. The top 10, of the box may also be bound to the body of the box at the hinging edge in such a manner that the inside top of the box extends downwards from the top edge of the side walls. The top of the box may be a simple corrugated cover as shown in Figure 5, but may also be constructed as the sides indicated in Figure 6. In either case a top pad 11, may be used as shown in Figure 5, composed of the same material and in the same manner as the liner 12 which will presently be described. The top of the box and likewise the bottom which is constructed in the same way, is hinged closely at its external edge to the side of the box so that when closed the internal edge brings pressure to bear upon the liner 12 of the box which extends up as high or nearly as high as the sides of the box itself, thus sealing the cold or hot air enclosed in the box and preventing its escape. This is shown in Figure 5 where the edge of the liner 12 dents in the top pad 11.

In Figure 2 the removable liner 12 is shown partially broken away, and it will be noted that here the walls 13 are composed of a corrugated cardboard lined on both sides of the corrugation and an internal extended corrugation 14 which is unlined or uncovered and which has the flutings thereof, extending up and down in the box. These flutings provide a passage and column to promote circulation of the cold air or CO_2 where so called dry ice is used.

In Figure 3 is shown the liner which may be employed. This liner is lapped at 15 and riveted by rivets or brads 16, 16. The construction of the liner is shown in Figure 4 and comprises an inner batting 17 as described above, two outer covers 18 and 19 of suitable paper, an inner heavier paper 20, or cardboard which is scored at the corners 21, so that the rectangular shape may be obtained, and a paper bag cover 22 which is drawn over the whole strip before riveting. The inner cardboard serves as a surface

whereby the rectangular form may be obtained without buckling or change of shape of the batting of the liner.

While we have used batting in many cases, a wadding of the same composition as the batting, but having a top and bottom sheet formed by a sizing impregnating the top and bottom fibres may be used. In place of making the batting or wadding as described above, the insulating material may be of cellulose wood pulp made in sheets having a soft nap and layed together or the wood pulp may be shredded in fibre form and made as batting or wadding.

Having now described our invention, we claim:

1. A box adapted to contain articles and keep them in a warm or cold state, comprising a casing of insulated walls composed of corrugated cardboard with an insulating batting between and removable insulating liner having a layer of insulating batting.

2. A box adapted to contain articles and keep them in a warm or cold state comprising corrugated walls having insulating means therebetween, an insulating liner approximately the same height as the walls and lining the same, top and bottom pads resting on the edge of the said liner and top and bottom covers hinged at the external side whereby the pads may bring pressure on the liner edge and effectively seal the same.

3. A box adapted to contain articles and keep them in a warm or cold state comprising an insulating liner approximately the same height as the walls and lining the same, top and bottom pads resting on the edge of said liner, and top and bottom covers hinged at the external side whereby the pads may bring pressure on the liner edge and effectively seal the same.

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