The invention relates to boxes for freezing materials. One object of the invention is to provide an improved box adapted to be placed in a refrigerator for freezing materials, such as foods, which is simple in construction and efficient in operation.

Another object of the invention is to provide a box with an effective seal between the cover and the body. Another object is to provide a box of this type which will not be overloaded with contents, to prevent the expansion of the material during freezing from displacing the cover.

Other objects will appear from the detailed description.

The invention consists in the several novel features hereinafter described and more particularly pointed out in the claims at the conclusion hereof.

In the drawings:

Fig. 1 is a perspective view of a box embodying the invention;

Fig. 2 is a vertical transverse section of the box without any contents;

Fig. 3 is an inverted plan of a portion of the cover;

Fig. 4 is a section illustrating the body containing a column of fluid with an excess of contents before the cover has discharged the excess from the box;

Fig. 5 is a section of the box after the cover is lowered to sealing position and has discharged any excess of material;

Fig. 6 is a partial perspective view of the body illustrating the line of sight for indicating the minimum loading;

Fig. 7 is a section illustrating the inverted cover after it has been removed from the body with the material frozen therein;

Fig. 8 is a section illustrating bodies of the boxes stacked for storage or shipment.

The invention is exemplified in a generally rectangular box with round corners. The box comprises a one-piece body and a one-piece cover formed of heat conductive sheet metal, such as aluminum, for efficient heat transfer in refrigeration. The body comprises a flat bottom 7 with integral upstanding surrounding sides. The lower portions 8 of the body-sides are flared upwardly from the bottom 7 and their upper portions 9 are substantially straight and terminate in an upwardly facing flared or convex edge or rim portion 10 which forms a seat for the cover. An inward offset 11 is provided between the upwardly flared portions 8 and straight portions 9 of the sides. The cover comprises a top 14, a surrounding hollow bead 15, a skirt 16 and a downwardly facing concavely curved portion 17 between skirt 16 and bead 15. The contour of skirt 16 is rectangular with round corners and conforms substantially to the sides of the body. The downwardly facing concavely curved portion 17 conforms in cross-section to the upper face of the rim 10 on the sides of the box.

The corner portions 18 of skirt 16 conform to and snugly fit the contiguous curved corner portions 19 between the body-sides. The sides of skirt 16 have indented portions 20 to provide clearances between the body and the cover for the escape of any excess fluid from the body during placement of the cover on the body. The top 10 of the cover is provided with an inwardly facing flange 21 which conforms in contour to the bottom 7 of the body and forms a pocket in which the bottom of the superposed box may be supported against horizontal displacement.

In the use of boxes for freezing foods such as, for example, puddings and ice creams, it is necessary to provide for expansion of the material while being frozen and it is desirable to keep the cover sealed on the box. The materials, usually in a fluid state, are poured into the box body. If the body is loaded with an excess of material, its expansion during freezing may force the cover off the body. For sealing purposes, it is desirable to have the column of material not less than a predetermined height. In the construction described, the cover is adapted, when an excess is placed in the body, to discharge any excess during placement of the cover in sealing position on the box body. Lines 23 are impressed in the inner faces of one or more of the body-sides to indicate the minimum level of the material for providing the desired seal between the body and the cover.

When an excess of fluid material is poured into the body, as illustrated in Fig. 4, the cover is pressed downwardly into position to close the box, the lower end of the skirt 16 will pass into the fluid and trap or confine a body of air in the space between the top of the box and the skirt 16 and top 14 of the cover. As the cover is pressed towards its sealing position, the trapped body of air will force the excess fluid through the clearances at the indentations 20 between the skirt and the body-sides and over the convex seat 13 until the excess of material has been discharged from the body and the column of fluid remaining in the box is lowered, as illustrated in Fig. 5. When the cover is in its closed position, its seat 17 will engage the convex edge portion 13 of the body sides and the lower end of skirt 16 will be submerged in the material, and the air space between the fluid and the cover will permit expansion of the material during the freezing operation. The snugly fitting corner portions 18 of the cover will frictionally engage the conforming cover portions 19 of the sides of the box body and aid in retaining the cover on the body.

When the box with the cover in the position illustrated in Fig. 5 is placed in a freezer, the initial freezing of the material will occur around the sides of the box and the lower edge of the skirt 16 and the material will freeze progressively toward the center of the box. The initial freezing around the submerged edge of skirt 16 and to the adjacent portions of the body occurs quickly before there is a substantial degree of expansion of the material into the air space between the material and the cover. This initial freezing quickly forms a solid seal between the skirt on the cover and the box-body. As a result, during the continuance of the freezing process the cover will remain firmly sealed on the box, while the central portion of the mass of material in the box will bulge upwardly and reduce the area of the air space between the frozen material and the cover.

After the contents of the box are frozen to substantially solid form and conform to the inside of the box-body and it is desired to remove the block of frozen food, the box is usually inverted and flooded with water to release the frozen block from the box. This floating softens the frozen material around the lower edge of the skirt 16 of the cover so that the inverted body can be removed and the frozen block thereon will be retained in the cover, as illustrated in Fig. 6. The cover will then serve as a tray for serving or holding the frozen block of material. The location of the lower edge of the skirt 16 close to the in-
ward offset 11, causes water flowing over the inverted body to quickly melt the adjacent frozen material so that the block of material and any drippings may pass into the inverted cover.

The box bodies can be nested or stacked for shipment or storage, as illustrated in Fig. 8. The inward offsets 11 when the bodies are stacked rest on the rims of subjacent bodies and support the boxes so they can be freely separated.

The upward flare on the sides 8 facilitates the removal of the block from the body. The formation of the box of sheet metal adapts it for flooding to release the frozen block. The inverted cover serves as a tray for the supporting frozen block. The hollow bead on the cover facilitates cleaning. In many instances it is desirable to stack the boxes in a refrigerator. The pocket formed by recess 22 in the top is adapted to retain a superposed box against lateral movement on a subjacent box.

The invention exemplifies a metallic box for freezing materials which is efficient in operation, can be economically produced, which discharges any excess of material therein from the box so that there is provision for expansion of the material without likelihood of forcing the cover off the body.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A box for freezing materials, comprising, a one-piece polygonal body of heat conductive sheet metal for retaining a measured column of fluid material which is adapted to be frozen; and a one-piece cover of like metal; the body including a bottom, surrounding sides having upwardly flared lower portions and vertical upper portions terminating in an outwardly and upwardly flared continuous rim, which forms a seat, the cover including a top wall, a continuous marginal bead having its under face flared conformably to the upwardly flared rim on the body for forming a continuous seal between the body and the cover, a vertical skirt depending from the flared seat on the bead frictionally fitting the inner face of the vertical side portions of the body, and having its lower edge terminating a sufficient distance below the seat on the cover to be submerged in the column of fluid of predetermined height in the body, said skirt being provided with inward offsets below the seat on the cover, and extending upwardly from the lower edge of the skirt to a point below said seat, to form passages between the skirt of the cover and the inner face of the vertical side-portions of the box for the escape of excess fluid until the cover during its placement on the body passes into sealing engagement with the body.

2. A box for freezing materials, comprising: a one-piece polygonal body of heat conductive sheet metal for retaining a measured column of fluid material which is adapted to be frozen; and a one-piece cover of like metal; the body including a bottom, surrounding sides having upwardly flared lower portions and vertical upper portions terminating in an outwardly and upwardly flared continuous rim which forms a seat; the cover including a top wall, a continuous marginal bead having its under face flared to seat on the upwardly flared rim on the body for forming a continuous seal between the body and the cover, a vertical skirt, depending from the flared seat on the bead, frictionally fitting the inner faces of the vertical side-portions of the body, and having its lower edge terminating a sufficient distance below the seat on the cover so it will be submerged in the column of fluid of predetermined height in the body, said skirt being provided with inward offsets below the seat on the cover, and extending upwardly from the lower edge of the skirt to a point below said seat, to form passages between the skirt of the cover and the inner faces of the vertical side-portions of the body for the escape of excess fluid from the body until the cover, during its placement on the body, passes into sealing engagement with the body, and a marker on the inner face of one of the vertical side-portions of the body for indicating the height of the column necessary for submergence of the lower edge of the skirt.

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