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L. N. LUCAS

2,201,696

DISPLAY SHOWCASE

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Fig. 2.

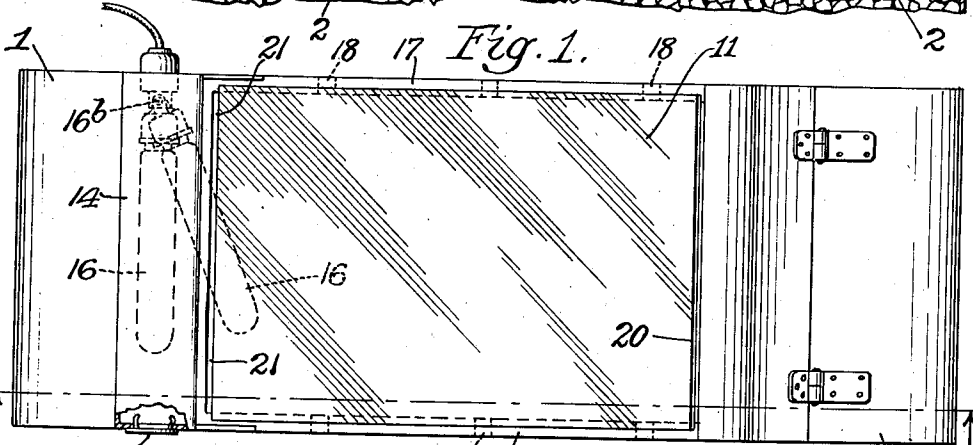
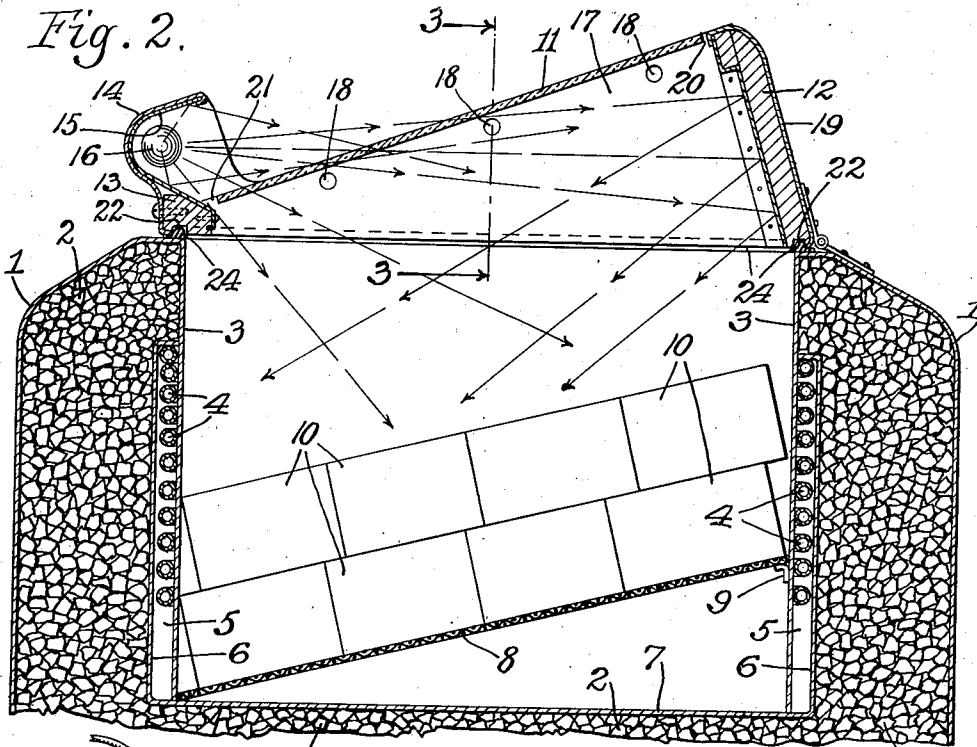


Fig. 3.

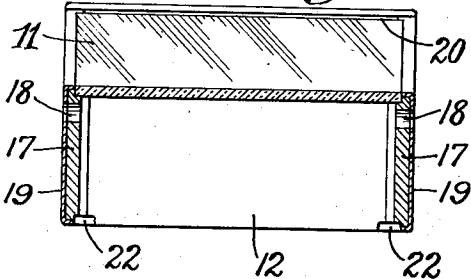
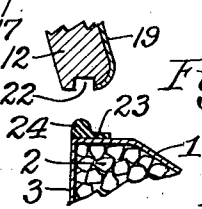


Fig. 4.



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DISPLAY SHOWCASE

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11 Claims. (Cl. 62—89.5)

This invention relates to showcases and particularly to display showcases. It has for one object to provide a transparent cover or closure for an opening in a showcase irrespective of the location or positioning of the opening. In the particular form here shown the opening is in the top of the showcase and the cover is, therefore, arranged to close an opening so located. The opening might be otherwise positioned. Another object is to provide a closure for an open-topped container so arranged that the closure and the contents of the container are lighted. Another object is to provide in connection with a transparent cover a receptacle means for heating a part of the cover to reduce or eliminate condensation. Another object is to provide an open-topped refrigerated container so arranged and proportioned that proper temperature conditions are maintained within the container without the use of an insulated or insulating top or cover. Another object is to provide in connection with an open-topped refrigerated container means for eliminating condensation and fogging upon a transparent cover for said container.

Other objects will appear from time to time throughout the specification and the claims.

The invention is illustrated more or less diagrammatically in the accompanying drawing, wherein:

Figure 1 is a plan view of one form of the device;

Figure 2 is a transverse vertical cross section taken at line 2—2 of Figure 1;

Figure 3 is a transverse vertical sectional detail taken at line 3—3 of Figure 2;

Figure 4 is a vertical sectional enlarged detail showing the edge construction of the container.

Like parts are designated by like characters throughout the specification and the drawing.

1 indicates generally the outer shell or covering of the body of a refrigerated receptacle. 2 is a body of insulating material which may be of any desired type and may be arranged in any desired manner. 3 indicates the inside lining member of the device which encloses the storage and display space. Refrigerating means 4 are provided and they may be contained in the space 5, which is bounded by the inner wall 3 and by an additional outer wall member 6. Any desired sort of refrigerating means may be provided, and the one shown is merely diagrammatic and indicative of the fact that refrigerating means are contemplated as a part of the device to which the invention may be applied. A bottom wall 7 defines the bottom of the display and storage space.

Any desired sort of goods supporting mechanism may be used. As shown, a woven or

mesh wire shelf 8 is positioned with one edge at the bottom of the storage space and with its other edge supported upon a bracket or supporting member 9. The goods are illustrated diagrammatically by the packages 10, but any form of goods may be displayed whether in packages or not.

As shown, the cover comprises generally a sheet of glass and a frame or housing for it. The sheet of glass 11 is carried in a frame which includes one end member 12 and in the present form a lower end member 13, upon which is mounted a housing 14 having a reflecting lining 15. Within the housing is positioned a light source 16. A removable end plug 16a may be provided to permit the positioning of the light in either end of the housing 14. The light bulb socket, itself, may, if desired, be hinged as at 16b. The frame or housing for the glass includes also side members 17, which, if desired, may be provided with perforations 18. As shown, the glass housing is made of wood or analogous material and is provided with a casing 19 of metal or other finishing material. The invention is, of course, not limited to these details of construction.

If desired, the perforations 18 may be omitted and the glass 11 is so positioned in its frame or housing that clearances 20 and 21 are provided. These clearances are positioned respectively at the upper and of the housing and at the lower or lighted end.

As a matter of convenience the closure assembly may be positioned upon the container in any desired manner. It may be hinged, as shown, or merely removably placed upon the device or grooves and guides might be arranged so that it could slide into place. The invention is not limited to any particular means of applying, positioning or attaching the closure.

As shown, the various elements which make up the walls of the closure assembly are provided with grooves 22, and a sealing or positioning member 23 is positioned about the opening in the container. It may have upwardly extending bead 24 to fit into the grooves 22. It is convenient for many purposes to form the member 23, 24 of rubber, but it may be of any desired material, and, of course, the sealing member might be placed on the closure and the groove formed in the body of the container.

Although I have shown an operative form of my device, it will be understood that many changes in the form, shape and arrangement of parts might be made without departing from the spirit of my invention, and I wish that my showing be taken as in a sense diagrammatic. In particular, the transparent material of the sheet 11 might be made of glass or any other desired material, and the invention is not limited to any particular material in this respect. Whatever

material is used, it might be used in a single sheet or in a laminated sheet, and the invention is not limited, therefore, to the use of a single sheet of material. Also, the position and means of mounting the shelf 8 might be varied to suit the particular installation and conditions of use. The invention is not limited to any particular arrangement or material of shelves or supporting devices. For some purposes, there might even be no shelves.

Where I have spoken of the depth of cold air and the height of the walls of the cabinet as determining that depth, I mean that the walls are of such size and the depth of the container compartment is such that sufficient quantity and depth of cold air is retained, and I recognize that the depth of the cold air is largely determined by the position of the refrigerating walls and that the mere depth of the compartment alone will not suffice. There must be both adequate depth and adequate cooling, and properly positioned cooling. In general, the dimensions and the cooling arrangements must be such that a sufficient body of cold air is trapped and retained.

The use and operation of the invention are as follows:

The device is primarily applicable where the cooling temperatures are relatively low such as, for example, in the case of frozen foods, where the food itself must be retained at a low temperature. It is also important to arrange the goods so that they are visible to a customer.

In the past, attempts have been made to solve this problem by providing multiple glass panes separated from each other. This has required removal of moisture from between the panes, otherwise condensation and cloudiness occurs. In the present invention this has been found to be unnecessary. If the housing is so arranged that the cold air cannot "spill out" and if it is so proportioned that a sufficient depth of cold air is retained, then it is unnecessary to have an insulated cover. The cold air stays in the housing because it falls of its own weight and the housing is so proportioned that an adequate depth of cold air is dropped and retained. Experiment has shown that this air will remain adequately cold, even though the air in the top most portion of the chamber approaches room temperature, no harm results.

Since an insulated transparent cover is not essential the structure of the present invention uses preferably a single piece of glass. Means are provided to permit movement of air about the glass. This means may include the clearances 20 and 21 or the opening 18 or other means, but it is preferable to have some passages or openings through which air may move past the glass and by means of which, moisture laden air from below may escape. This has one important principle namely that it prevents the deposit of moisture on the undersurface of the glass. In order to prevent the deposit of moisture on the glass it has been found advantageous to heat the glass somewhat and this may be done in any desirable way, but it is economical to accomplish it as here shown, by the means which illuminates the cabinet. Since the present invention involves mainly a display showcase, it must be lighted and it is convenient to arrange the light source so that it also furnishes the necessary heat. For that purpose the light housing is given a highly reflective lining 15 and some of the light is reflected from this lining and some passes directly from the light. The relation of

the reflector and the lining and frame member 12 is preferably such as to cause the light to follow the path indicated by the arrows of Figure 2. This insures adequate illumination of the case and its contents and also furnishes sufficient heat along the sheet of transparent material and in the upper part of the cabinet to prevent an accumulation of moisture on the glass.

It will be realized that, whereas I have described and illustrated a practical and operative device, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawing to be taken as in a broad sense illustrative or diagrammatic, rather than limiting me to my precise showing.

I claim:

1. In combination in a refrigerated display case, an insulated housing member, means for cooling it, an opening in the housing member to permit access to and inspection of the contents of said housing, the opening to said housing being so positioned that the housing provides a cold air trap having walls and a bottom, the height of said walls being such as to retain by gravity a sufficient depth of cold air within the housing irrespective of any closure for the opening, a removable closure for said opening including a non-insulating transparent member and means defining ventilating passages adjacent the edges of said transparent member.

2. In combination in a refrigerating display case, a housing member, means for cooling it, said housing member having insulated walls and bottom, an opening in the housing member to permit access to and inspection of the contents of said housing, the opening to said housing being so positioned that the housing provides a cold air trap having walls and a bottom, the height of said walls being such as to retain by gravity a sufficient depth of cold air within the housing irrespective of any closure for the opening, a removable, uninsulated closure for said opening, said closure including an uninsulated sheet formed of a single unitary piece of transparent material, a supporting structure for said sheet, means for heating said sheet there being ventilating openings freely open to the interior of said housing member and past said sheet of transparent material.

3. In combination in a refrigerating display case, a housing member, means for cooling it, an opening in the housing member to permit access to and inspection of the contents of said housing, the opening to said housing being so positioned that the housing provides a cold air trap having insulated walls and an insulated bottom, the height of said walls being such as to retain by gravity a sufficient depth of cold air within the housing, irrespective of any closure for the opening, a removable, uninsulated closure for said opening, said closure including a single sheet of transparent material, a supporting structure for said sheet, means for illuminating said sheet and ventilating openings from the exterior to the interior of said housing member past said sheet of material.

4. In combination in a refrigerating display case, an insulated housing member, means for cooling it, an opening in the top part of said housing member to permit access to and inspection of the contents of said housing, the opening to said housing being so positioned that the housing provides a cold air trap having walls and a

bottom the height of said walls being such as to retain by gravity a sufficient depth of cold air within the housing irrespective of any closure for said opening, said closure including a sheet of transparent, non-insulating material, a supporting structure for said sheet, and ventilating openings from the exterior to the interior of said housing member past said sheet of material and through the supporting structure.

5. In combination in a refrigerating display case, an insulated housing member, means for cooling it, an opening in the housing member to permit access to and inspection of the contents of said housing, the opening to said housing being so positioned that the housing provides a cold air trap having walls and a bottom the height of said walls being such as to retain by gravity a sufficient depth of cold air within the housing irrespective of any closure for said opening, said closure including a sheet of transparent material, a supporting structure of said sheet, means for illuminating and heating said sheet, and ventilating openings past said sheet of material and through the supporting structure.

6. In combination in a display refrigerating container, insulated, non-transparent wall means defining a chamber, an opening to said chamber, refrigerating means for said chamber, a movable closure for said opening, said container proportioned to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure comprising a sheet of transparent material, a supporting structure therefor and means for lighting said closure, and means for circulating air from below along said sheet of transparent material, and thereafter discharging said air to the exterior past said sheet of transparent material.

7. In combination in a display refrigerating container, insulated wall means defining a chamber, an opening in the top part of said chamber, refrigerating means for said chamber, a movable closure for said opening, said container being of sufficient depth and proportioned to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure comprising an upwardly inclined single sheet of un-insulated, transparent material, a supporting structure therefor and means for lighting said closure, and for illuminating the interior of said chamber, said last mentioned means being positioned adjacent the lower end of said transparent sheet and being adapted to heat said sheet to create a circulation of air upwardly along the inner face of said sheet whereby to prevent formation of condensation thereon.

8. In combination in a display refrigerating container, insulated, non-transparent wall means defining a chamber, an opening in the top part of said chamber, refrigerating means for said chamber, a movable closure for said opening, said container being of sufficient depth and proportioned to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure being un-insulated and comprising a sheet of transparent material, a supporting structure therefor and means for lighting said closure, and for illuminating the interior of said chamber, said last mentioned means adapted also to heat said sheet of transparent material and means for circulating

air from below along said sheet of material, and for thereafter discharging it to the exterior.

9. In combination in a display refrigerating container, insulated wall means defining a chamber, an opening in the upper part of said chamber, refrigerating means for said chamber, and a movable closure for said opening, said container being of sufficient depth below the margins of the said opening to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure comprising a removable supporting structure of approximately the size of said opening, and including frame members having perforations formed in them, and including, also, a transparent, un-insulated sheet-like member forming one wall of said closure, said supporting structure being, also, un-insulated, and lighting means positioned on said supporting structure to move with it for illuminating the interior of said chamber, and adapted to heat said transparent material.

10. In combination in a display refrigerating container, insulated wall means defining a chamber, an opening in the upper part of said chamber, refrigerating means for said chamber, and a movable closure for said opening, said container being of sufficient depth below the margins of the said opening to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure comprising a removable supporting structure of approximately the size of said opening, and including frame members having perforations formed in them, and including, also, a transparent, un-insulated sheet-like member forming one wall of said closure, said supporting structure being, also, un-insulated, and lighting means positioned on said supporting structure to move with it for illuminating the interior of said chamber, and adapted to heat said transparent material, said transparent sheet of material being positioned at an inclination with respect to the horizontal, and being out of contact with the supporting structure at its upper and lower edges.

11. In combination in a display refrigerating container, insulated wall means defining a chamber, an opening in the upper part of said chamber, refrigerating means for said chamber, and a movable closure for said opening, said container being of sufficient depth below the margins of the said opening to retain cold air to a depth necessary to accomplish adequate refrigeration irrespective of the position of said closure, said closure comprising a removable supporting structure of approximately the size of said opening, and including frame members having perforations formed in them, and including, also, a transparent, un-insulated sheet-like member forming one wall of said closure, said supporting structure being, also, un-insulated, and lighting means positioned on said supporting structure to move with it for illuminating the interior of said chamber, and adapted to heat said transparent material, said transparent sheet of material being positioned at an inclination with respect to the horizontal, and being out of contact with the supporting structure at its upper and lower edges, said lighting means being positioned adjacent the lower edge of said inclined sheet of transparent material.