March 16, 1937. M. H. ACKERMAN 2,073,955

CABINET AND COUNTER STRUCTURE

Original Filed Jan. 3, 1933 4 Sheets-Sheet 1

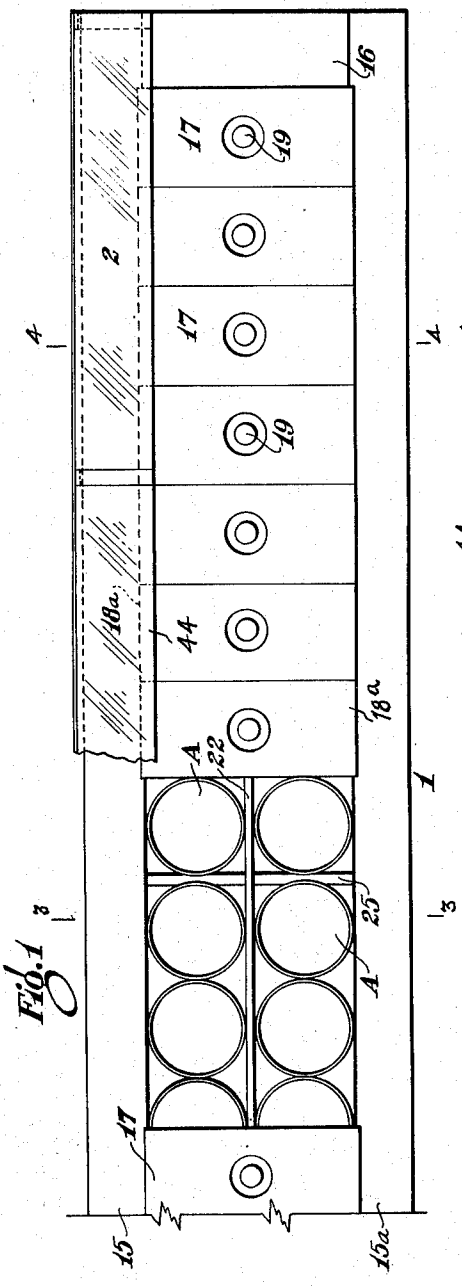


Fig. 1

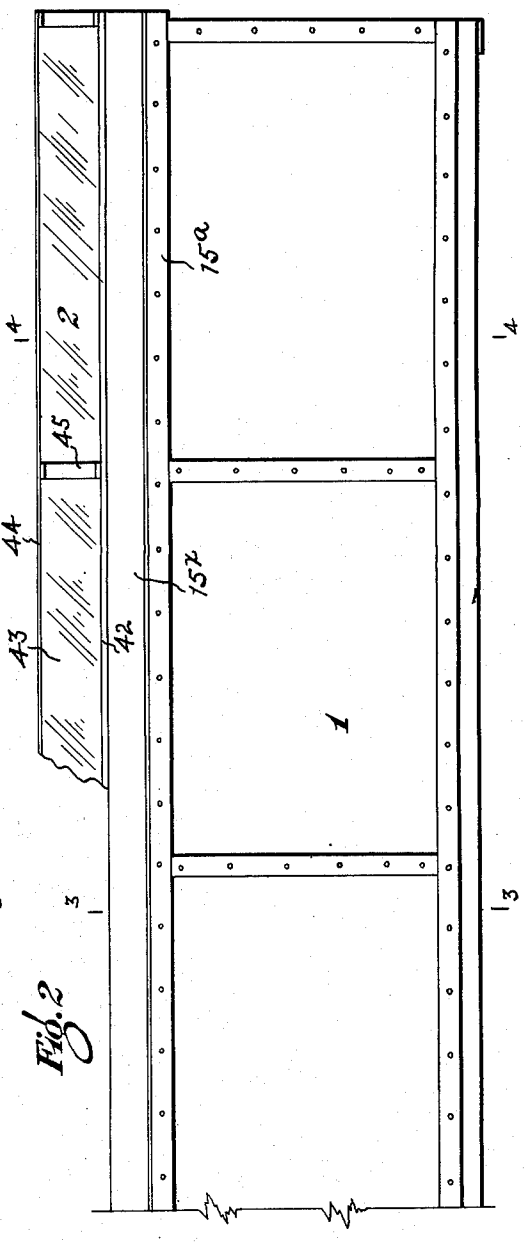


Fig. 2

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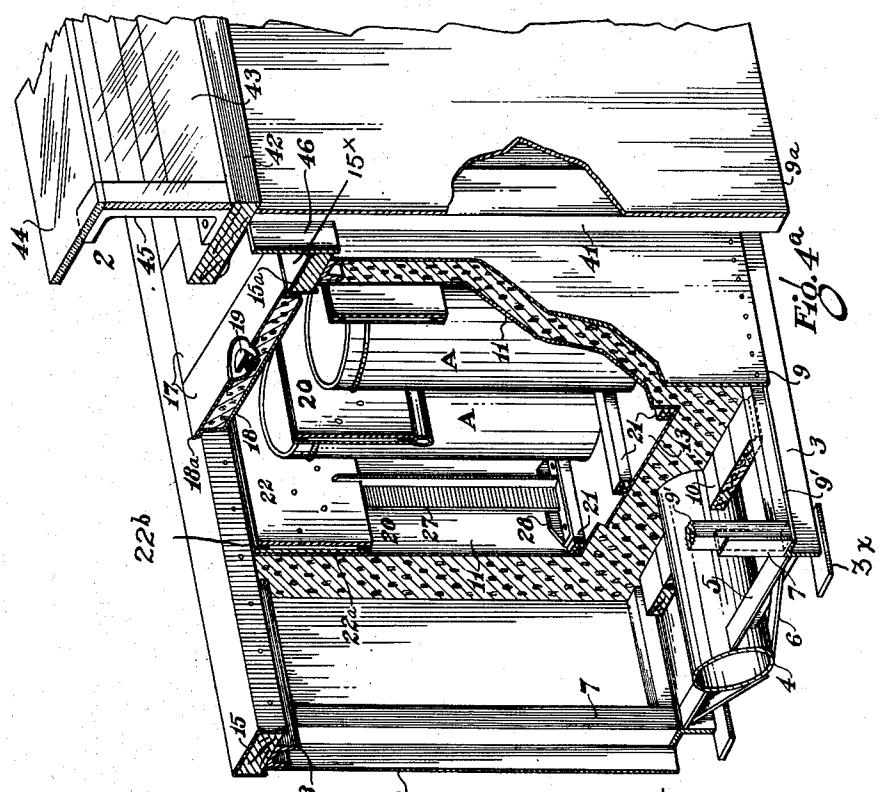


Fig. 4a

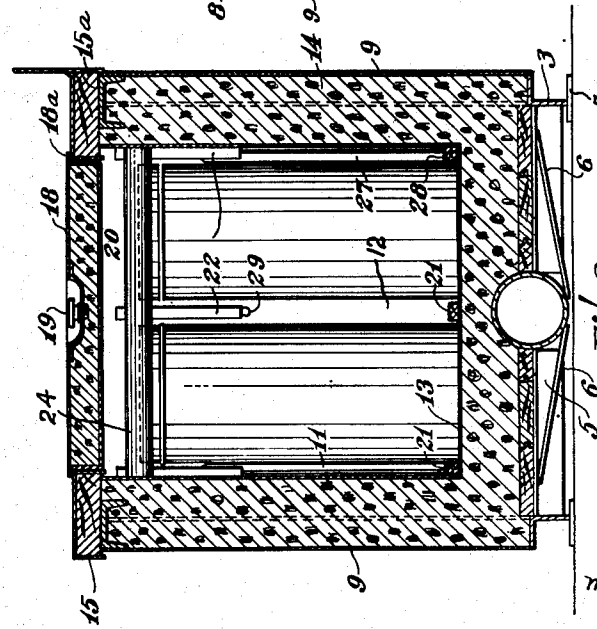


Fig. 3

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CABINET AND COUNTER STRUCTURE

Original Filed Jan. 3, 1933 4 Sheets-Sheet 3

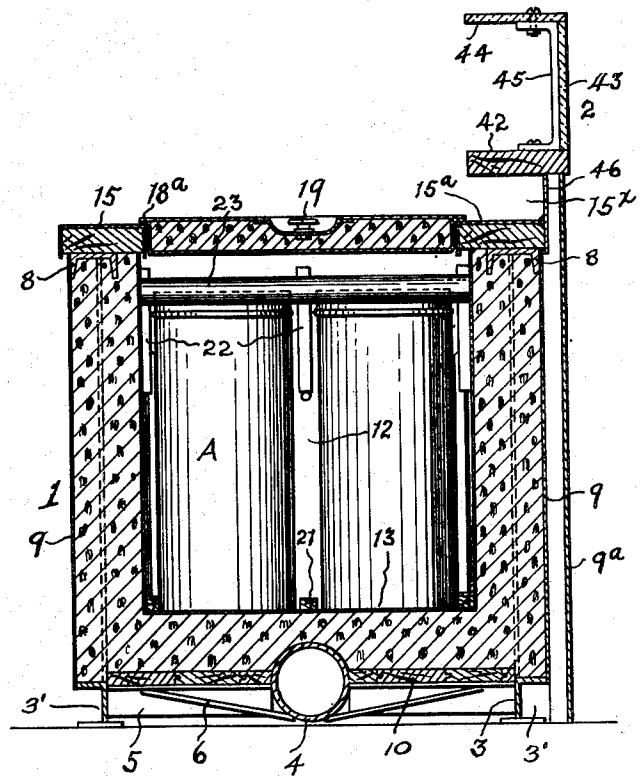


Fig 4

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CABINET AND COUNTER STRUCTURE

Original Filed Jan. 3, 1933 4 Sheets-Sheet 4

Fig. 7

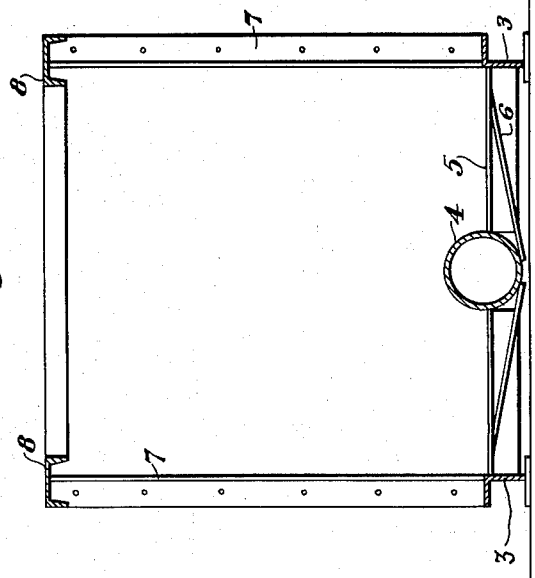


Fig. 6

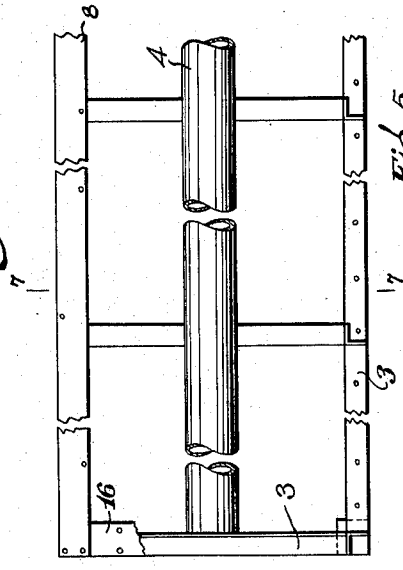
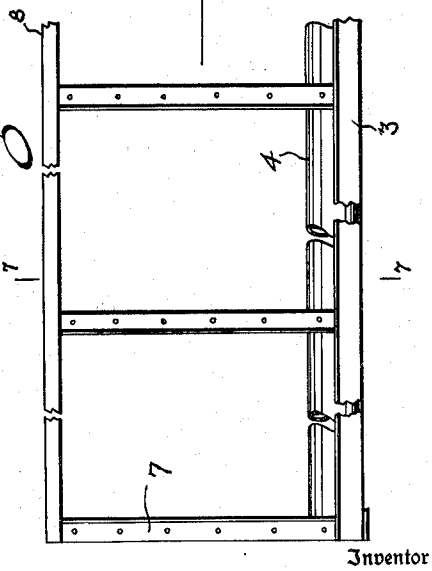


Fig. 5



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Patented Mar. 16, 1937 2,073,955

UNITED STATES PATENT OFFICE

2,073,955

CABINET AND COUNTER STRUCTURE

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Original application January 3, 1933, Serial No. 649,888, now Patent No. 1,968,813, dated August 7, 1934. Divided and this application January 29, 1934, Serial No. 708,854

4 Claims. (Cl. 312—116)

This invention relates to an improved refrigerated apparatus for storing products or materials to be dispensed and consumed and in which the display and dispensing of such materials and various other edibles are greatly facilitated, more particularly the invention relates to a structure or apparatus providing an improved storing and display arrangement for frozen products (such as ice cream, ices and the like) and display arrangement for other products, both arrangements being combined and incorporated to provide for and permit effective display and dispensing of both products.

This application is a division of my original application filed January 3, 1933, Ser. No. 649,888, now Letters Patent No. 1,968,813.

One object of the invention is to provide an improved combined material storing, displaying and dispensing cabinet in which portions or the entire stock of flavored materials may be displayed and readily dispensed under sanitary conditions.

Another object of the invention is to provide an improved combined storage casing for frozen products and serving counter in which the refrigerating means and storing receptacles for the products are related for display purposes and the serving counter is associated with the casing in a manner to permit at all times vision of the displayed refrigerating means and products.

Another object of the invention is to provide an improved combined counter and display and storing apparatus in which provision is made for displaying goods and dispensing the same and the stored materials without obstructing the purchaser's vision and for conveniently storing cleaning cloths and dispensing utensils out of sight of the purchasers.

Another object of the invention is to provide a casing having a recess extending along its operating side adjacent the floor, permitting the forepart of the clerk's feet to extend under the casing, thereby shortening the reach or effort required to dip and serve the ice cream and other materials.

Another object of the invention is to provide a casing having improved closure means comprising a plurality of separable lids (*a*) adapted to entirely close the casing; (*b*) slidable on and removable from the casing, whereby upon the removal of one or more lids, the remaining lids may be slid singly or in groups to open a small or large portion of the casing or separated portions thereof simultaneously; and (*c*) having upper and lower surfaces devoid of projections, whereby the lids may be piled or stacked when not in use.

Another object of the invention is to provide a casing having improved closure means comprising a plurality of separable lids slidable on and removable from the casing and provided with countersunk lifting devices, whereby the lids, when removed, may be readily and compactly stored.

Another object of the invention is to provide an apparatus of this character which may be readily and economically fabricated of any desired length and width and cheaply operated to refrigerate the materials in a large number of containers.

Another object of this invention is to provide an improved combined refrigerated storage cabinet and specialty sales display counter having glass guards.

Another object of the invention is to provide an improved combined storage cabinet and specialty sales counter having incorporated in the structure a sanitary recess out of the line of vision of purchasers, adapted to receive cleaning cloths and serving tools.

Other objects of the invention will be apparent to those skilled in the art to which my invention relates from the following description taken in connection with the accompanying drawings and wherein

Fig. 1 is a plan view of a portion of a cabinet embodying my invention.

Fig. 2 is a front elevation of the parts shown in Fig. 1.

Fig. 3 is a section on the line 3—3 of Figs. 1 and 2, the refrigeration means being shown in elevation.

Fig. 4 is a section on the line 4—4 of Figs. 1 and 2, the refrigeration means being shown in elevation.

Fig. 4*a* is a cross sectional view, in perspective.

Fig. 5 is a fragmentary side view of a portion of the cabinet frame.

Fig. 6 is a plan view of parts shown in Fig. 5.

Fig. 7 is a section on the line 7—7 of Figs. 5 and 6.

The apparatus comprises a casing indicated as an entirety at 1 and a frame, indicated as an entirety at 2, mounted on and rigidly secured to the walls of the casing 1. The purpose of the frame 2 will be later set forth.

The casing 1 herein shown is approximately 20 feet long and capable of receiving two longitudinal rows of containers A preferably of standard size and shape, each adapted to hold 5 gallons of

material. The casing 1 includes a skeleton frame structure as follows:

3 indicates a pair of spaced angle bars extending from end to end of the casing (Fig. 5). It will be noted that one wall of each bar extends vertically and the other wall thereof extends horizontally outwardly, its outer edge being alined with the lower edge of the rear facing wall 9. This arrangement provides recesses 3' inwardly from the sides of the casing throughout its length. The walls of the angles close the recesses 3' with respect to the interior of the casing 1; and as the vertical wall of the angle extends down to the floor, dirt is kept from getting below the cabinet, mice and the like are prevented from getting below or into the interior of the casing walls. In the drawings, the angles are shown mounted on thin pads but these may be omitted or the angle walls cut away to accommodate them. The recess 3' at and along the front of the casing 1 may be closed by extending the front exterior wall 9a downwardly to the floor (see Figs. 4 and 4a), but the recess 3' at the rear is left open from end to end of the casing and thus permits the operator or dispenser to position his or her feet under the casing, thereby greatly facilitating access to the containers, without making it necessary for the operator to twist or turn the feet laterally in order to get close to the casing, when dipping material from a container A. It will thus be seen that the recess 3' along the rear wall or operating side of the casing is metal lined and the walls thereof with the floor form an inwardly extending closed space.

The numeral 4 indicates an elongated tubular reinforcing member, and the numeral 5 indicates angle bars connecting the reinforcing member 4 and bars 3 and braced by members 6. 7 indicates a plurality of upright angle bars mounted on the bars 3. 8 indicates a pair of channel bars disposed in an inverted position and mounted on the upper ends of the uprights 7 along the sides and ends of the structure. The parts just referred to may be connected by welding or other suitable means. As will be understood from Fig. 7, the outer edge portions of the uprights 7, adjacent their upper ends are cut away to receive the adjacent or outer flanges of the channel bars 8, so that the outer sides thereof may be flush with the longitudinal edges of the uprights to receive the front and rear walls 9, which are nailed or screwed to wood strips 9' (see Fig. 4a). 10 indicates a suitable flooring resting on the bars 5.

The inner walls of the casing comprise sides 11, ends 12 and a bottom 13, formed of sheet metal sections suitably seamed, by soldering or welding, to form a substantially liquid and air or gas tight storing chamber or compartment for the containers A. The sheet metal may be formed of sheet steel or stainless sheet steel, or aluminum alloy, but preferably a non-corrodible material having high heat conductivity.

As shown in Figs. 3, 4, and 4a, the sides 11, ends 12 and bottom 13 are spaced from the walls 9 and flooring 10 to accommodate a suitable non-heat conducting material 14, such as hair, felt, cork and the like.

15, 15a, indicate top rails or bars extending along the sides of the casing and related to end rails or bars 16. These rails or bars are preferably formed of wood and are rigidly (but removably) mounted in any suitable manner on the channel bars 8. The upper ends of the sides 11 and ends 12 engage the sills 15, 15a, 16, to close the space for the insulating material 14. Each rail is of such width that its lateral sides extend beyond the walls 9 and 11.

The sides and top of each rail 15, 15a, 16, are sheathed with suitable sheet metal preferably of a character (or having a finish) which provides a neat appearance without danger of corroding. The inner opposing sides of the rails 15, 15a, form guides for a series of covers 17 which are individually removable and also slidable on the rails longitudinally thereof. The covers 17 are of uniform size and each may be formed of wood and preferably sheathed with suitable non-corrodible sheet metal 18. The sheet metal along the opposite ends of each cover is extended, as shown at 18a, to form flanges that engage with and slide on the tops of the rails 15, 15a. The covers 17 serve to close the storing chamber for the containers at night and during those hours of the day when no dispensing is taking place.

When dispensing of the materials is required, one or more covers are moved and then one or more of the remaining covers may be moved on the rails 15, 15a, if necessary, to permit access to the desired container. By preference, several covers are removed, as shown in Fig. 1, when dispensing is to take place or during busy hours, the purpose being to expose to view of the customer several differently flavored materials, so that the customer can make a satisfying selection as well as become better informed on the variety of flavors available. The handles 19 on the covers 17 are preferably countersunk to eliminate projections above the top surfaces thereof, as well as to permit them, when removed, to be set in piles.

The bottom 13 of the storing chamber is preferably provided with guides or spacers for the lower ends of the containers A, so that when each thereof is lowered into the chamber it may be properly positioned with respect to the sides 11 and portions of the refrigerating means, indicated as an entirety at 20, to be later described. The guides or spacers comprise wooden strips 21, one being disposed on the bottom 13 in and extending along each corner and one being disposed on the bottom 13, midway between the sides 11. The storing chamber is of such width that the strips 21, when positioned in this manner, are spaced sufficiently to readily receive between them the lower ends of the containers.

The refrigerating means 20 comprises a plurality of circulation members 22 for a liquid refrigerant having a relatively low boiling point, such as liquid ammonia. The circulation members 22 are of a shape which permits them to be positioned longitudinally in the spaces between the rows of containers and between the latter and the sides 11 and to extend vertically from a plane above the open ends of the containers to a point approximately 8 inches below such ends.

By preference, the container storing chamber is of such width that the outer circulation members 22 are in contact with the side walls 11 and these members and the inner member 22 engage the container side walls (or the cover engaging bead thereon), so that these walls may serve as heat conductors to refrigerate that portion of the materials in the containers below the circulation members. Referring to Figs. 1, 3, 4, and 4a, each circulation member 22 comprises a horizontally disposed conduit extending from end to end of the refrigerating chamber and elongated vertically to permit its mounting in one of the spaces referred to and at the same time provide

for heat transfer above the containers A. The members 22 are rigidly connected in spaced relation by manifolds 23, 24, arranged at their respective, corresponding ends and by intermediate piping 25, which permits the refrigerant to flow from one member 22 to the other members 22 to insure equalization of levels therein should the quantity of liquid in one member become reduced due to generation of gas or vapor therein.

The manifolds 23, 24, and piping 25, connect the members 22 together so that the refrigerating means or circulation system 20 may be handled as a unitary structure and removably mounted within the casing 1, preferably on a plurality of legs or uprights 27. The upper ends of the legs 27 are cut away, as shown in Figs. 3, 4, and 4a, to form shoulders on which the outer members 22 rest. The legs are preferably welded to the walls of these members 22. The lower ends of the legs 27 are provided with feet 28, adapted to rest on the guide strips 21. The refrigerant is supplied by a pipe (not shown) to the manifold 23, the pipe leading from a suitable source of supply (not shown) and discharged into the manifold 24.

It will be understood that the liquid refrigerant may be caused to circulate through the members 22 and out through the manifold 24, in which arrangement the resulting vapors will be carried along with the discharged liquid, or a predetermined quantity of liquid may be maintained in the members 22 by a float operated, valved supply mechanism, in which event the manifold 24 will be connected to the suction side of a suitable compressor.

Each member 22 is formed of two plates 22a spaced by a section of wire or rods 22b extending along its sides and end walls, the wire or rods and marginal portions of the plates being preferably secured together in a liquid and gas tight manner by welding. In this arrangement the plates 22a form an elongated liquid holding space, but as the plates are relatively wide vertically and extend from end to end of the chamber within the casing 1, ample volume of refrigerating medium is provided for.

It will be noted that in my construction the circulation members for the refrigerant are arranged at the sides of and adjacent the upper ends of the containers A, and extend above such ends. In this arrangement the refrigerating or heat transfer means are arranged in position to counteract in-flow of warm air when one or more containers are exposed by the closure devices 17. Also, such arrangement produces a refrigerated atmosphere above the upper ends of the containers so that the latter need not be (and by preference are not) provided with individual lids or covers. In this connection, it will be seen that the covers 17 form with the side walls 11 a substantially closed chamber. As the circulation members extend above the open ends of the containers A, they provide a stratum of refrigerated atmosphere thereabove, so that as many covers as desired may be removed. Also, this arrangement permits the containers to be completely filled before they are positioned in the receiving chamber of the casing.

In my arrangement of refrigerating means I have found that adequate refrigerating effect, due to convection currents of the atmosphere within the receiving chamber and conduction of heat through the walls of the containers A and side walls 11 is provided to maintain the entire mass of material in each container at a desirable temperature and viscosity, which permits ready dispensing and consumption and that such condition of the material is maintained until each container is entirely emptied or dispensed. It will therefore be seen that the refrigerating means is arranged at that point (a) where the material in each container is directly exposed to outside atmosphere, when access to the container takes place, and (b) where the normal tendency of cold air currents to descend may be advantageously applied to refrigerate the materials in the containers below the refrigerating means. This arrangement produces a number of advantages; for example, it permits the direct application of the refrigerant to maintain the stored materials at the desired temperature, instead of by indirect application by means of brine or other refrigerated medium; it eliminates the necessity for tanks for brine and receivers in the tanks for the containers and permits the casing 1 to be relatively light and easily constructed; it leaves a large area in the receiving chamber around the containers for the storage of other materials to be consumed; it enables the containers to be readily inserted in and removed from the casing; it enables the entire space within the casing to be utilized for containers; it simplifies the construction of the refrigerating means and assembly thereof; and it requires merely two liquid connections to and from the casing.

The frame 2 is incorporated with the casing 1 in any desirable manner so as to overhang and be disposed above the outer sill 15a. By preference, the front wall 9 of the casing is faced with the wall or panels 9a having an attractive finish, such walls being secured to supports 41. The supports 41 are connected to the casing in any desired manner and are preferably utilized to support the frame 2 above the sill 15a. The frame 2 comprises a lower horizontal display member 42, a front vertical panel 43 disposed in the plane of the front edge of the member 42 and adapted to serve as a guard and an upper horizontal counter member 44. A bracket 45 supports the panel 43 and upper member 44. The support or display member 42 is formed of opaque material, preferably wood. The member 42 is disposed above but extends inwardly over the sill 15a, to form a space 15x. The space 15x is closed along its outer end between the sill 15a and display member 42 by a wall 46. The wall 46 may be connected in a liquid tight manner to or formed integrally with the sheathing for the sill 15a so that the sill and wall may be readily kept in sanitary condition and water or other liquid, which may accumulate on the sill, is prevented from flowing into or between the adjacent side wall and causing damage thereto. In this arrangement, the sill 15a serves as a place for storing wet cloths and utensils. As the sill 15a is behind the wall 46 and immediately below the member 42, such articles as may be kept on the sill 15a are hidden from the view of persons or customers in front of the casing, whereas the panel 43 and member 44 are made of transparent material so that various edibles (sandwiches, pastry and the like) may be displayed on the member 42 and full, unobstructed view thereof and of the containers A maintained. The member 44 may be used as a serving counter. It will be understood that the frame 2 may extend from end to end of the casing 1.

In combined cabinets and serving counters or

frames built by me, I have provided a storing chamber having the capacity of 40 or more five-gallon cans of frozen products, each can containing a different flavor of ice cream, ice or sherbet. As these flavors have different colors and the refrigerating members **22**, being coated with frost and extend above the can tops and therefore providing a substantially white background for the cans, the contrasting color display and arrangement is effective to produce sales appeal. The frame **2** is therefore incorporated with the storing and display arrangement for the frozen products to permit full vision of these products and is itself so constructed that it constitutes a serving counter and provides for the display behind guards of other products. As shown, the frame **2** is spaced above the sill **15***a* and extends inwardly thereover to a plane substantially coinciding with the inner edge of the sill **15***a*. In this arrangement a storing space **15***x* for cloths and dispensing tools is provided out of the line of vision of purchasers, without obstructing the display of the frozen products and refrigerating elements associated therewith. As the bottom and rear wall of the space **15***x* is formed of metal, these walls may be readily kept clean.

To those skilled in the art to which my invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope thereof. My disclosures herein are purely illustrative and are not intended to be in any sense limiting.

What I claim is:

1. A casing for holding in side by side relation containers filled with materials to be dispensed and open at their tops, comprising a bottom, on which the containers are supported, side and end walls forming with said bottom a chamber having an opening at its upper end between said side and end walls, the upper ends of said side walls being disposed in the same horizontal plane above the tops of the containers and having portions shaped to provide guides extending along either side of said chamber opening from end to end thereof, and a plurality of separable lids for closing said chamber opening to enclose the containers therein, said lids being provided along their opposite ends with means for slidably and removably engaging said guides and adapted to be arranged in substantially side edge to side edge relation, whereby the chamber opening may be closed, and when one or more lids are removed the remaining lids may be slid along said guides to expose any desired container.

2. A dispensing casing for holding in side by side relation containers filled with materials to be dispensed and open at their tops, comprising a bottom and insulated front and rear side and end walls forming with said bottom a chamber having an opening at its upper end between said side and end walls, the upper ends of said side walls being disposed in the same horizontal plane above the tops of the containers and having portions shaped to provide guides extending along either side of said chamber opening from end to end thereof, a plurality of separable lids provided along their opposite ends with means for slidably and removably engaging said guides, the upper end of said front side wall being relatively wide to form a shelf, and an upwardly extending wall along the outer edge of said front side wall and co-extensive with and secured in a liquid-tight manner to said side wall to prevent flow of water or liquid into the interior of said adjacent side wall.

3. In apparatus of the class described, the combination of a casing having a bottom and side and end walls forming a chamber having an opening at its upper end and adapted to hold material holding containers open at their tops in side by side relation, the upper ends of said side walls forming guides from end to end of the opening into said chamber opening, and a plurality of separable lids having flanges at their opposite ends slidably and removably engaging said guides and adapted to be arranged side edge to side edge to close said chamber opening, said lids being of uniform size and each having a length longitudinally of said chamber equal to that of each container in the same direction, whereby said containers are independently accessible and upon removal of one lid the remaining lids may be slid longitudinally of said chamber opening and any desired container may be made accessible.

4. In apparatus of the class described, the combination of a casing having a bottom and side and end walls forming a chamber having an opening at its upper end and adapted to receive material holding containers open at their tops to permit dispensing of the material, the upper ends of said side walls forming guides from end to end of the opening into said chamber, a plurality of separable lids adapted to be arranged side edge to side edge for closing said chamber opening, said lids having flanges at their opposite ends slidably and removably engaging said side walls, whereby upon removal of one or more lids the remaining lids may be slid on said side walls, countersunk lifting devices in the upper surface of said lids, said lids being otherwise flat on their upper and lower surfaces whereby they may be stacked when removed.

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