Aug. 20, 1935. C. E. RORRER ET AL 2,011,731

REFRIGERATED SHOW CASE

Filed Oct. 17, 1932 2 Sheets-Sheet 1

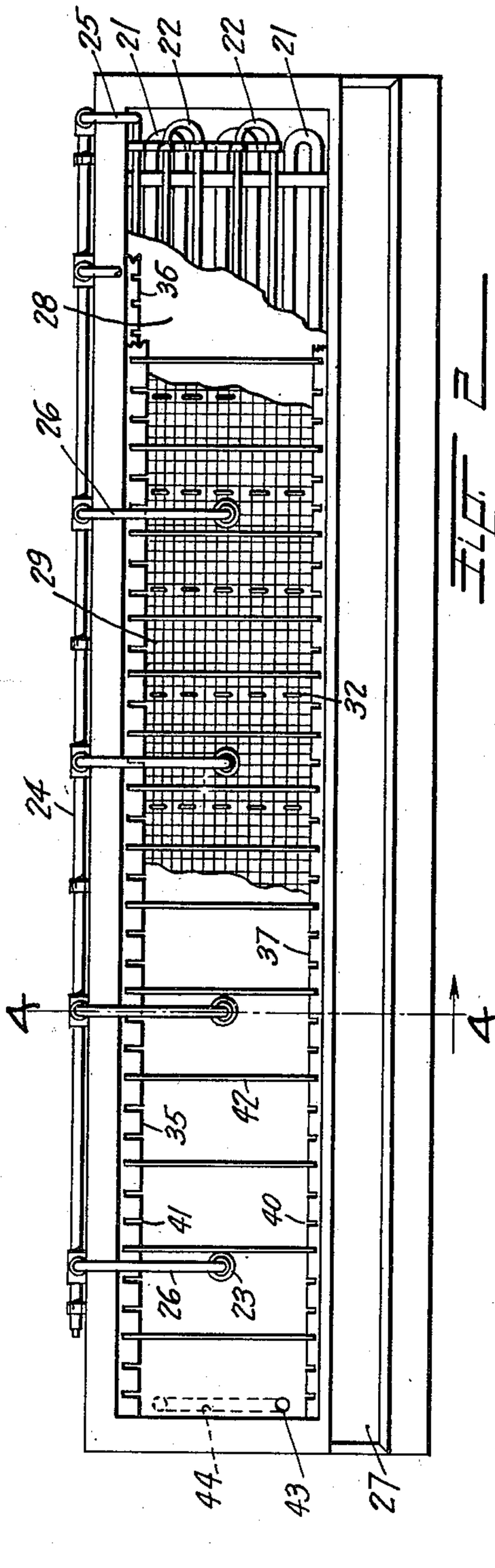

FIG. 2

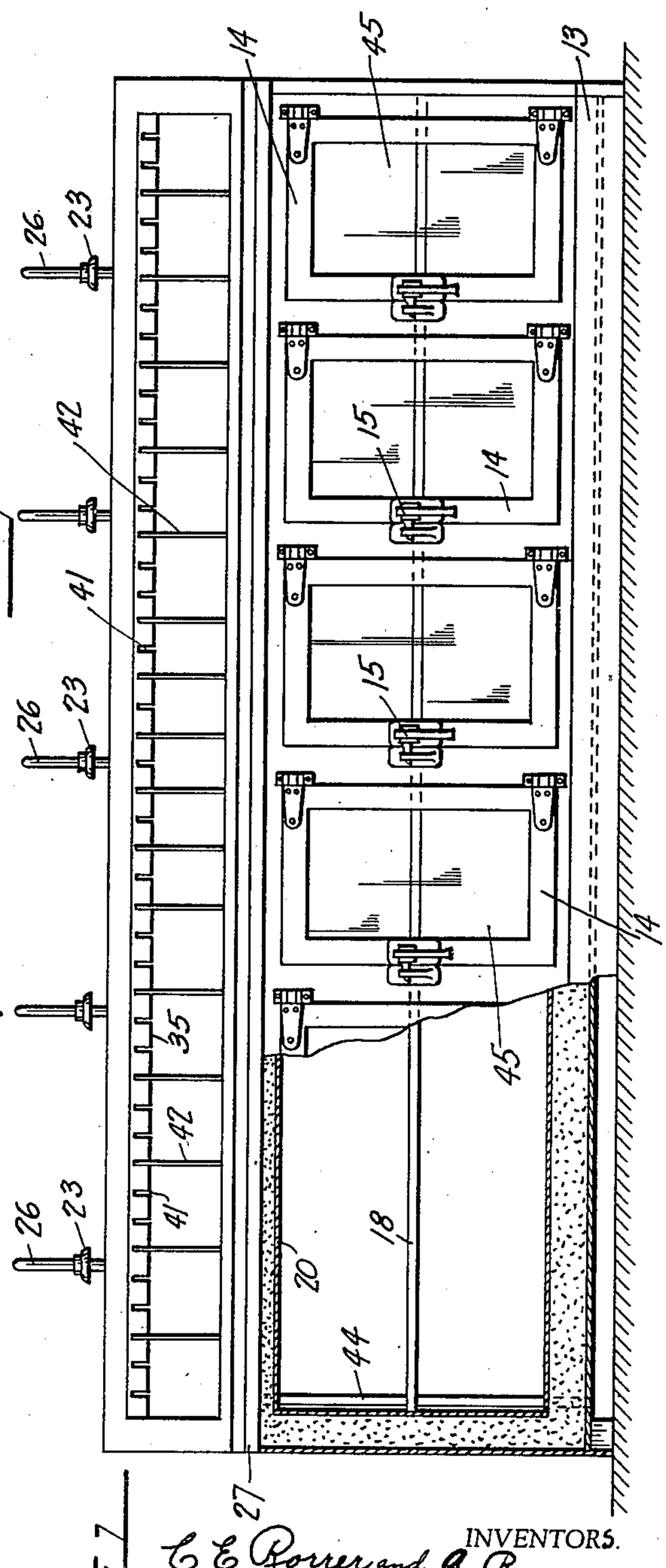

FIG. 1

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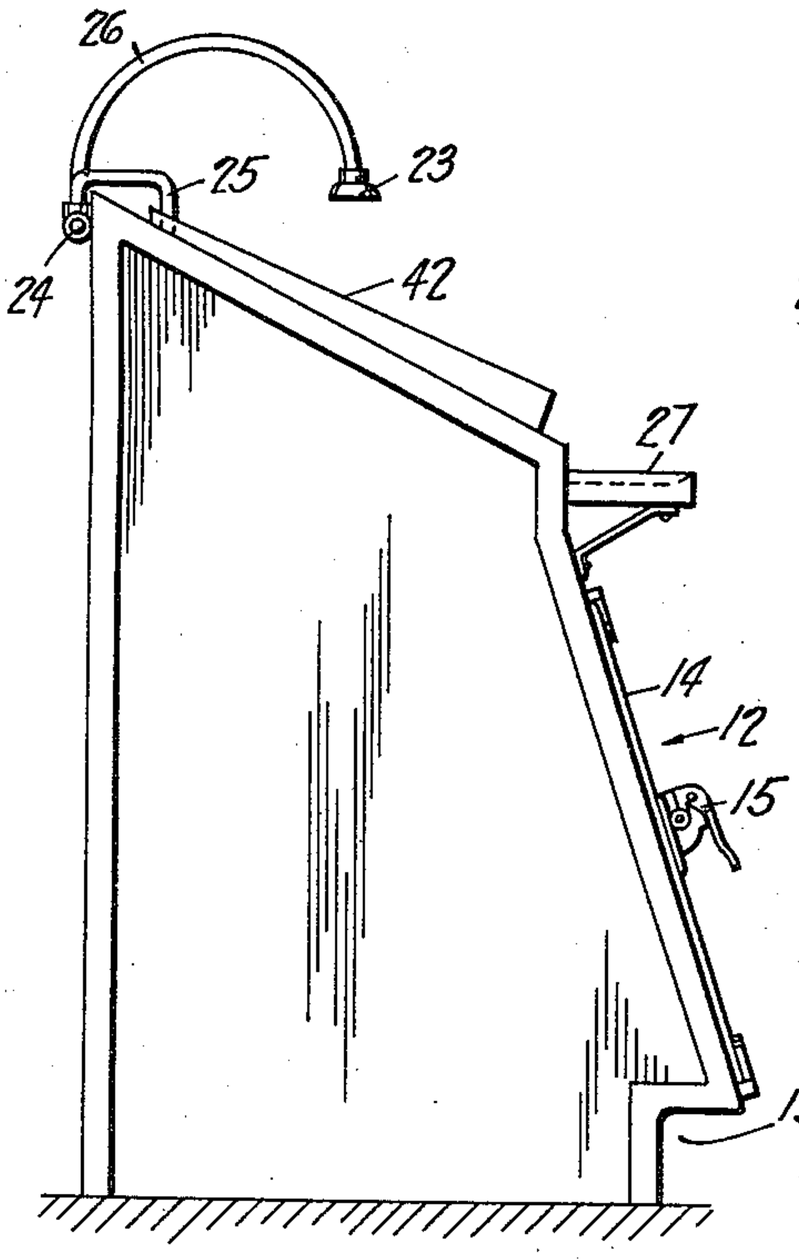

Fig. 3.

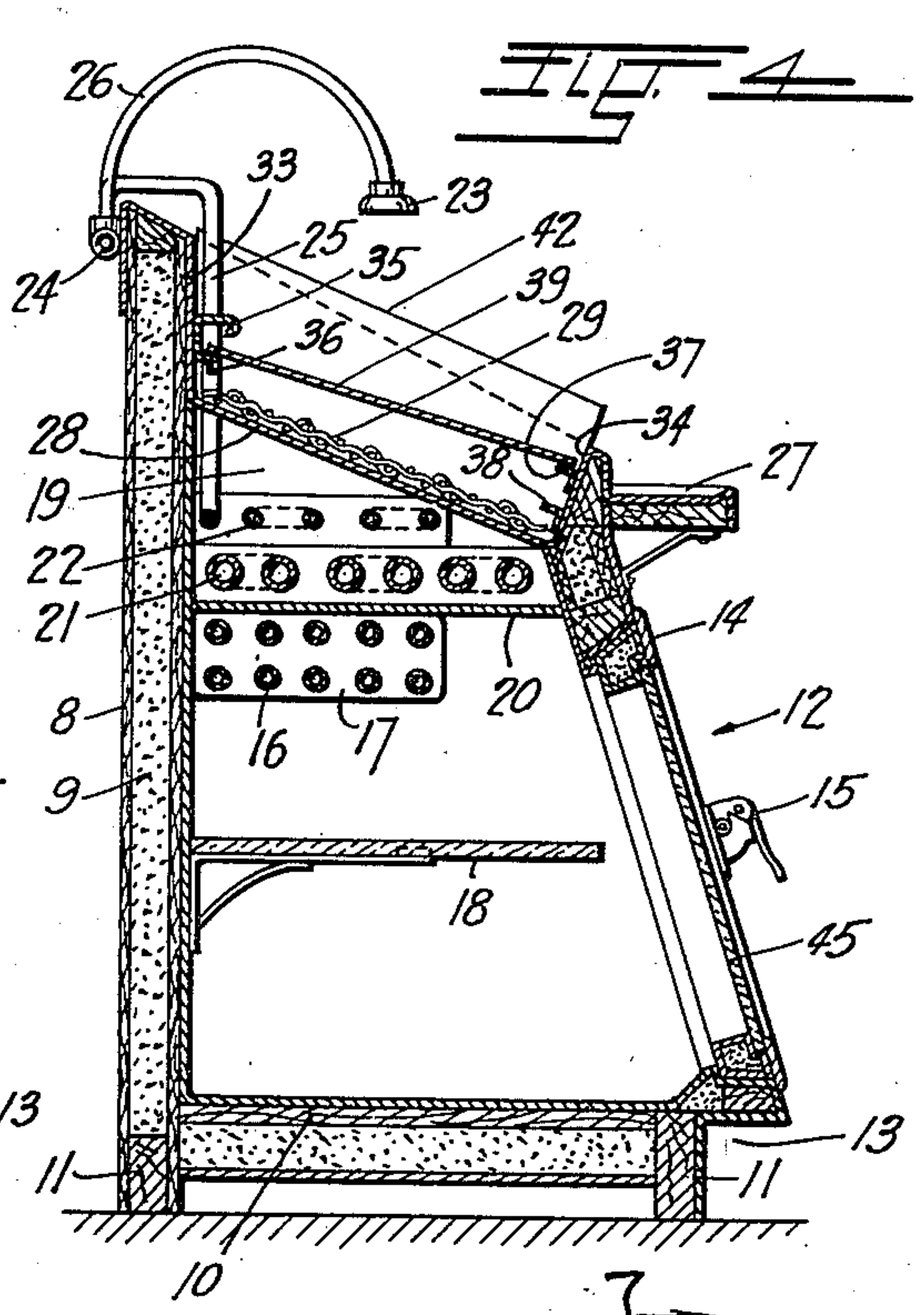

Fig. 4.

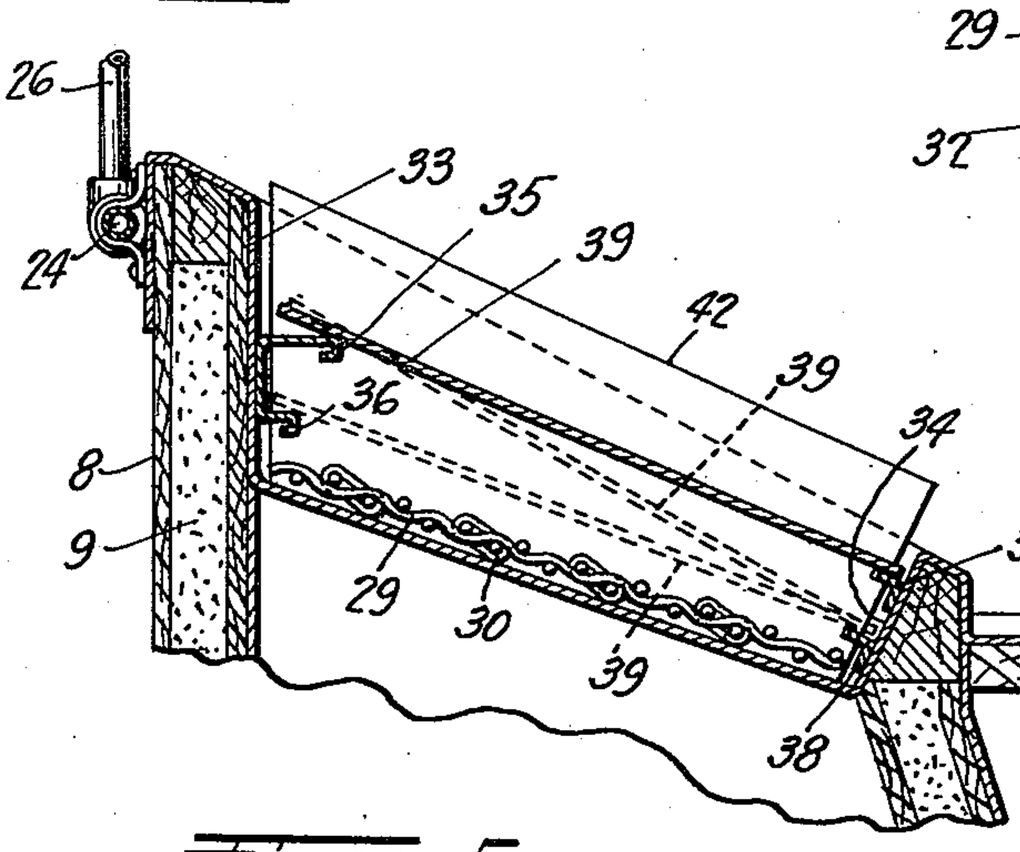

Fig. 5.

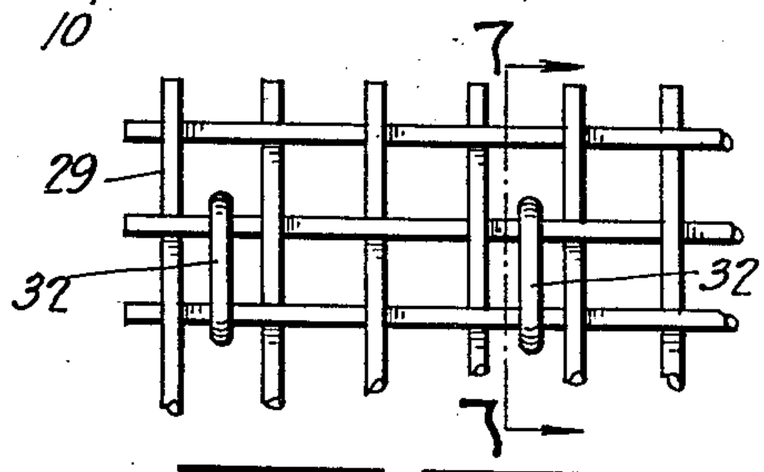

Fig. 6.

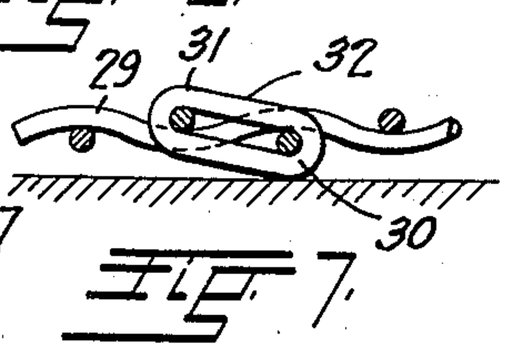

Fig. 7.

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Patented Aug. 20, 1935

2,011,731

UNITED STATES PATENT OFFICE

2,011,731

REFRIGERATED SHOW CASE

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Application October 17, 1932, Serial No. 638,052

17 Claims. (Cl. 62—89.5)

Our invention relates to refrigerators and particularly to refrigerated show cases. An important use of the invention is the display of vegetables and other perishable merchandise in a store.

Another object of the invention is to keep vegetables or other merchandise cool, even though exposed to the atmosphere. Still another object is to cool the vegetables with water spray that has been artificially cooled.

A further object is to provide an open bin for vegetables, the side walls of which are cooled plates and the bottom of which is conductively connected with artificial cooling means.

A still further object resides in providing means whereby merchandise in the interior of a refrigerated show case may be easily seen by a customer standing directly in front of the case.

Other objects reside in details of construction, such as novel means whereby supports for and partitions between sections of the merchandise are rendered adjustable and means whereby merchandise may be effectively cooled but not frozen. Still other objects reside in novel combinations and arrangements of parts, which will appear in the course of the following description.

In the drawings, like reference characters designate similar parts in the several views.

Figure 1 is a broken front elevation of an embodiment of my invention.

Figure 2 is a broken plan view of same.

Figure 3 is an end elevation of the same.

Figure 4 is a section taken on the line 4—4 of Figure 2.

Figure 5 is an enlarged, broken section, similar to the upper portion of Figure 4.

Figure 6 is an enlarged fragment of a wire grating comprised in the invention.

Figure 7 is a section taken on the line 7—7 of Figure 6.

Referring more in detail to the drawings, the reference character 8 designates the back of the embodiment shown in the drawings. Insulation 9 is embedded in the back. An insulated bottom 10 is supported on legs 11. The front of the case slopes downwardly and outwardly, as shown at 12. The sloping front does not extend to the floor, however, but is offset at 13 to provide foot room beneath the sloping front. Doors 14, provided with windows 45, close openings in said front. Conventional latches 15 fasten the doors closed. The sloping front causes the doors to close by gravity, which is of value in a store, where customers are apt to leave the doors ajar carelessly.

The doors and front of the case are also insulated. Since such insulation per se forms no part of the present invention, further description appears unnecessary.

The interior of the case is cooled by coils 16 carrying preferably very thin fins 17, and a shelf is provided at 18. Above said interior is a brine, cooling chamber 19 for cooling the top of the case. As can be seen, separate cooling means are provided for the interior and for the top of the case, although only a conductive metal wall 20 is used between the two cooling means, which equalizes and transmits the coolness at opposite sides of said wall. The brine chamber contains a cooling coil 21.

A water coil 22 in the brine chamber supplies cool water that is sprayed on to vegetables on top of the case by means of nozzles 23. A cold water header 24 is connected with the coil 22 by a pipe 25. Arched pipes 26 support the nozzles 23 and connect with the header.

A shelf 27 is arranged along the front of the case upon which to slide a merchandise carrier.

The brine chamber is closed by a depressed top 28, which is at the same time a bottom for bins at the top of the case, and will be referred to as such. A conductive grating 29, shown enlarged in Figure 6, is supported on legs resting on the bottom 28. The grating keeps vegetables and other merchandise on top of the case from coming directly in contact with the bottom 28. Direct contact with member 28 would freeze vegetables, which would be objectionable. The space between the grating and the bottom 28 also affords a drainage space for the spray water.

To conductively connect the grating 29 with the bottom 28, wire loops or legs 30 of copper wire are formed of continuous bands passed around adjacent weft wires of the grating. These loops or legs rest directly on the bottom 28. The top and bottom strands of the bands are shown at 31 and 32 respectively. These bands afford close contact with the grating, and by reason of their conductivity convey the cool temperature of the bottom 28 to the grating 29.

The front and rear walls of the bins on top of the case are conductive plates, as indicated at 33 and 34 respectively. Projecting from these walls are upper and lower brackets 35 and 36 on the rear wall 33 and upper and lower brackets 37 and 38 on the front wall 34. Shelves 39 are supported by the brackets either in the full line positions of Figures 4 or 5, or in the broken line positions of Figure 5, or of course may rest directly on the grating 29.

The brackets on the front and rear walls are slotted, as shown in Figures 1 and 2, at **40** and **41** respectively. Partitions **42**, formed of plates, are disposed in alined pairs of these slots. The partitions preferably rest on the grating, and are laterally adjustable by being moved to other pairs of alined slots in the brackets.

A drain outlet for spray water is shown at **43**. A drain pipe connecting with the outlet is indicated at **44**.

In the use of the present invention, the coils **16** and **21** are connected with compressors in a closed refrigerating circuit, in the well known arrangement for electric refrigeration. Since such arrangement per se forms no part of the present invention, it does not need further illustration or description. The chamber **19** is filled with brine since it may be cooled to a lower temperature than water without freezing.

The water coils **22** will cool the spray water for the merchandise on top. At the same time, if the merchandise rests directly on the grating, it is cooled by conduction between the chilled bottom **28** and the grating **29**, through the intermediary of the very conductive copper wire legs **30**. When it is desired that the merchandise shall not be kept so cold, it may be placed on the shelves **39**. The shelves are kept cool by the cooled air space under the shelves.

It will be noticed that by means of the plate-like front and rear walls **33** and **34** and the plate-like partitions **42**, coolness is conducted all around the bins that are disposed at the top of the case. Thus all the vegetables or other merchandise will be directly in contact with or very close to a cooled surface, no matter where they are in the bin. In this way, the vegetables themselves become conductors and can be maintained at temperatures sufficiently low to cause condensation of moisture from the warm air contacting their exposed surfaces. The vegetables may thus be kept in the bins for extended periods without appreciable loss of weight and without losing their fresh appearance.

The shelves **39** and partitions **42** may of course be placed in the desired positions, as the use of the case demands.

It is to be understood that changes may be made in the details and in the combination and arrangement of parts from that shown and described, without departing from the spirit and scope of the present invention.

What we claim and desire to secure by Letters Patent is:

1. A refrigerated show case having a conductive top, cooling means for the top, a nozzle arranged to spray water on merchandise on the top, and a conduit to supply water to the nozzle, said conduit being exposed to the influence of the cooling means, whereby to cool said spray water.

2. A refrigerated show case having a conductive top, cooling means for the top, brackets above said top disposed at different elevations, and a shelf adapted to be placed on the brackets at different selected angles adjacent to the top.

3. A refrigeration method for preserving vegetables and other perishable products that are exposed to the atmosphere, consisting in subjecting them to a cooling influence, while exposed to the atmosphere at ordinary temperatures, and at the same time sprinkling the exposed side of the products with cooled water.

4. A display stand having a space for perishable products exposed to the atmosphere, refrigerating means disposed to cool said space, a nozzle disposed to spray water on the merchandise in said space, and a conduit to supply water to the nozzle, exposed to the influence of the refrigerating means, whereby water in the conduit will be cooled.

5. A display stand having a space for perishable products exposed to the atmosphere, refrigerating means disposed to cool said space, notched brackets arranged in said space, a shelf for merchandise to be kept cool, supported by the brackets and partitions inserted in the notches of the brackets, to divide said space.

6. In a refrigerated show case, a chamber having a conductive top, a cooling element within the chamber, a conductive grating for the support of merchandise and conductive means distributed over the area encompassed by the grating effective to space the grating from the top and to establish contact between the grating and the top.

7. A refrigerated show case comprising a conductive top, means for cooling said top, a conductive grating, and conductive means carried by said grating for maintaining said grating in spaced relation to the top.

8. A refrigerated show case comprising a conductive top, means for cooling said top, an open display compartment above said top, and removably adjustable, conductive partitions dividing the compartment into bins, the partitions being connected with the top for the interchange of temperature variations.

9. A refrigerated show case comprising a conductive top, means for cooling said top, and an open display compartment above the top, having its bottom in spaced relation thereto, said bottom consisting of a removably adjustable, conductive grating, and conductive partitions dividing the compartment into bins, the top, grating and partitions being connected for the interchange of temperature variations.

10. The method of preserving perishable merchandise exposed to the atmosphere, comprising maintaining a confined zone of intense cold, confining separate articles of merchandise in close association with each other and in cold-conducting relation to the intense cold zone, with portions of said articles exposed to the atmosphere, providing for the circulation of atmospheric air, subjected to the influence of the intense cold zone, and the articles, and effecting a condensation of moisture on said articles by the contact of their exposed surfaces with the atmosphere.

11. A refrigerated show case comprising a chamber having a conductive top, a cooling element in the chamber, a nozzle for spraying a cooling fluid over merchandise on the top and a conduit for the supply of fluid to the nozzle, disposed relative to the cooling element for its cooling influence upon the fluid prior to its discharge through the nozzle.

12. A refrigerated show case comprising an open bin for the display of perishable merchandise continuously exposed to the atmosphere, a conductive plate beneath the bin, a refrigerating element in heat-conducting relation to the plate, and a conductive support for the merchandise, in direct heat-transmitting communication with the plate, said plate and merchandise support being arranged and positioned to facilitate circulation of atmospheric air in contact with the merchandise.

13. A refrigerated show case comprising an open bin for the display of perishable merchan-

dise continuously exposed to the atmosphere, a conductive plate beneath the bin, a refrigerating element in heat-conducting relation to the plate, and a conductive support for the merchandise, spaced from the plate in direct heat-transmitting communication therewith to provide a path for the circulation of atmospheric air, said plate and conductive support being arranged and positioned to facilitate circulation of atmospheric air in contact with the merchandise.

14. A refrigerated show case comprising an open bin for the display of perishable merchandise continuously exposed to the atmosphere, a conductive plate disposed beneath the bin in an inclined position, a refrigerating element in heat-conducting relation to the plate, and a conductive support for the merchandise spaced from the plate in substantially parallel relation thereto, and in direct heat-transmitting connection therewith to provide a path for the circulation of atmospheric air, said plate and conductive support being arranged and positioned to facilitate circulation of atmospheric air in contact with the merchandise.

15. In a refrigerated show case, a partition dividing the case into a storage space in its lower portion, and an open bin above the same for the display of perishable merchandise continuously exposed to the atmosphere, in an inclined position, a refrigerating element on the upper surface of the partition, and a conductive plate in the bottom of the bin, in heat-conducting proximity to the element, said refrigerating element and conductive plate being arranged and positioned to facilitate circulation of atmospheric air in contact with the merchandise.

16. In a refrigerated show case, a partition dividing the case into a storage space in its lower portion and an open bin above the same for the display of perishable merchandise continuously exposed to the atmosphere, a refrigerating element on the upper surface of the partition, and a foraminous bottom for the bin, in heat-conducting proximity to the element, said refrigerating element and foraminous bottom being arranged and positioned to facilitate circulation of atmospheric air on contact with the merchandise.

17. In a refrigerating show case, a conduit for the discharge of a cooling fluid over merchandise upon the case, and a refrigerating element disposed in heat-conducting relation to the conduit, to mechanically cool the fluid in the conduit prior to its discharge.

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