Sept. 30, 1930. R. E. KOLBE 1,777,094

APPARATUS FOR FREEZING MATERIALS

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Fig. 1.

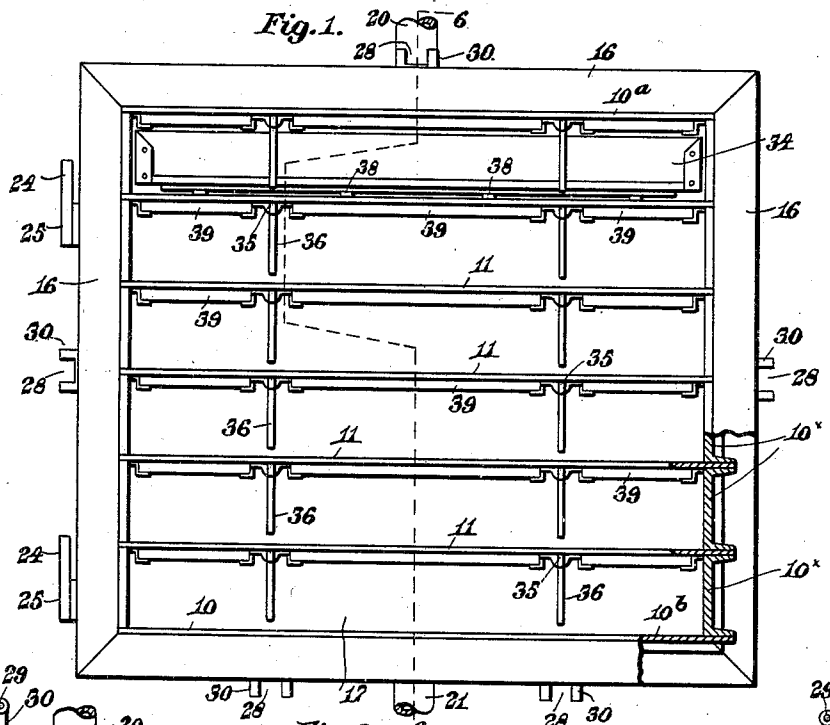
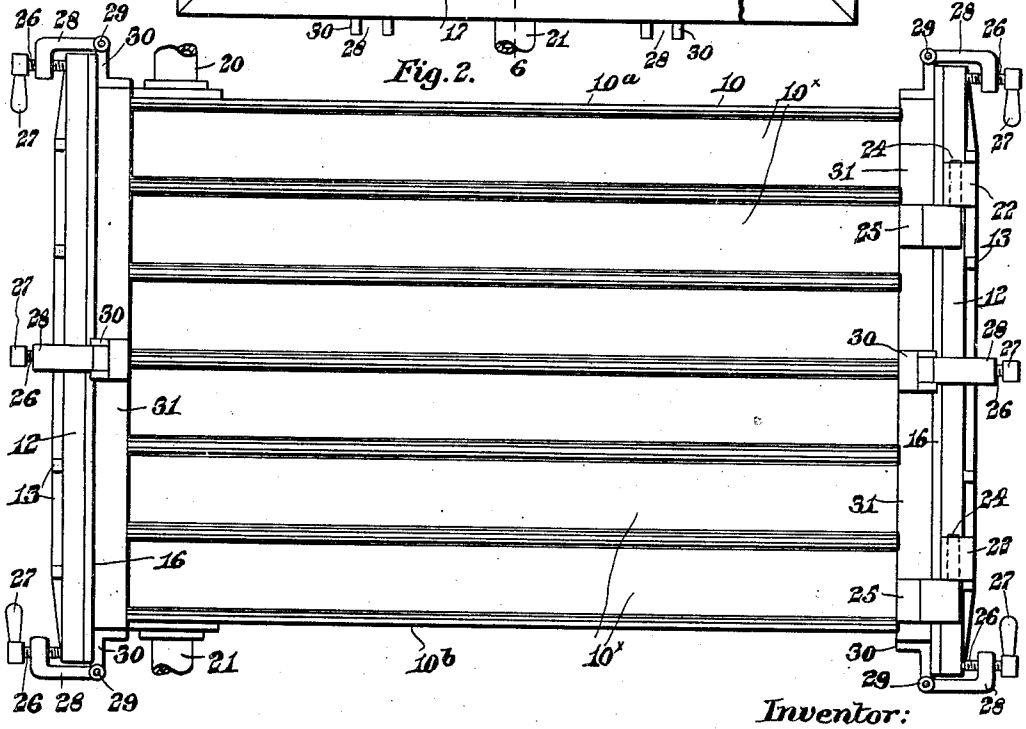


Fig. 2.



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Fig. 3.

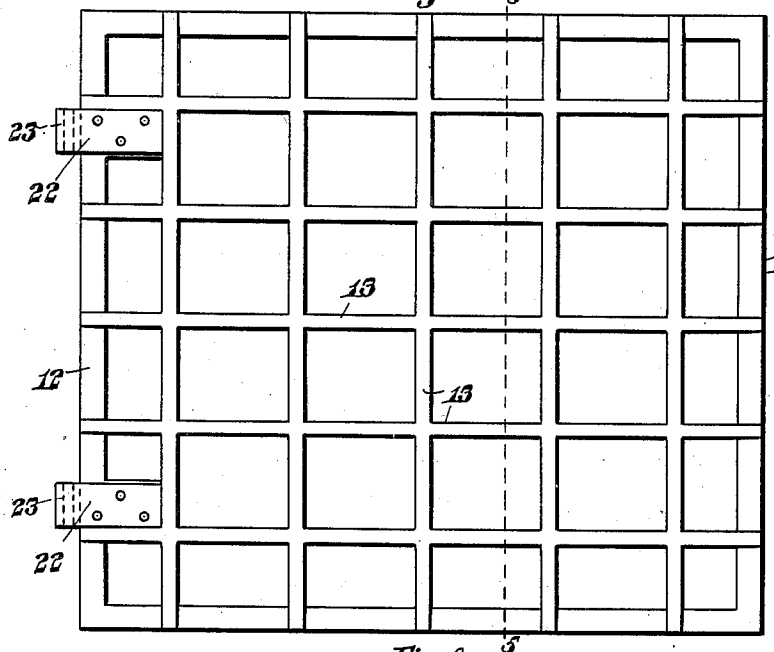


Fig. 5.

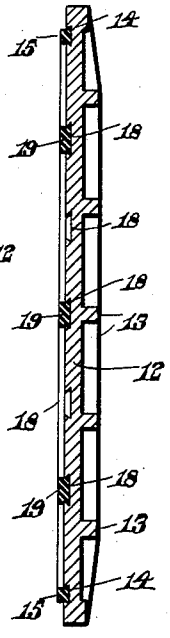
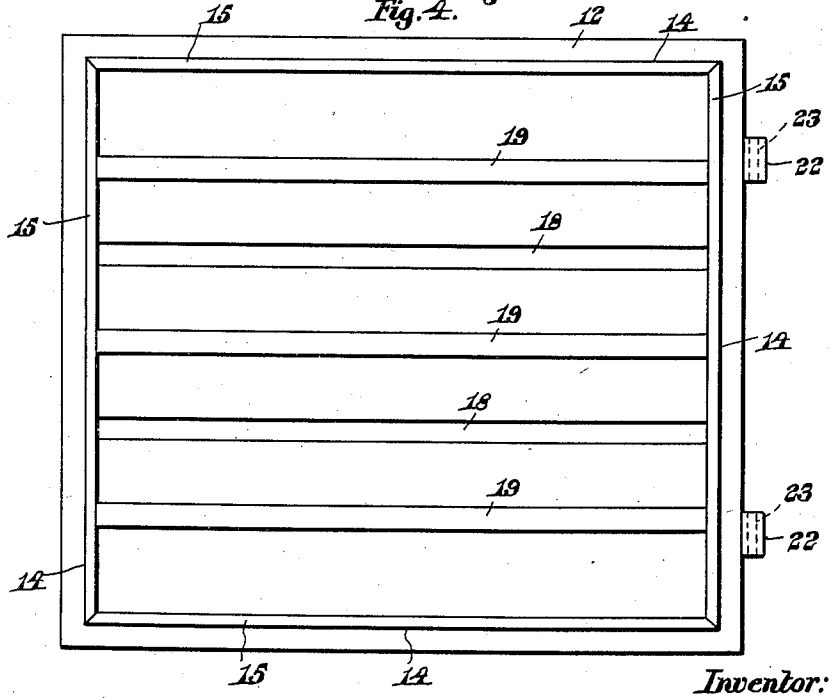


Fig. 4.



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Fig.6.

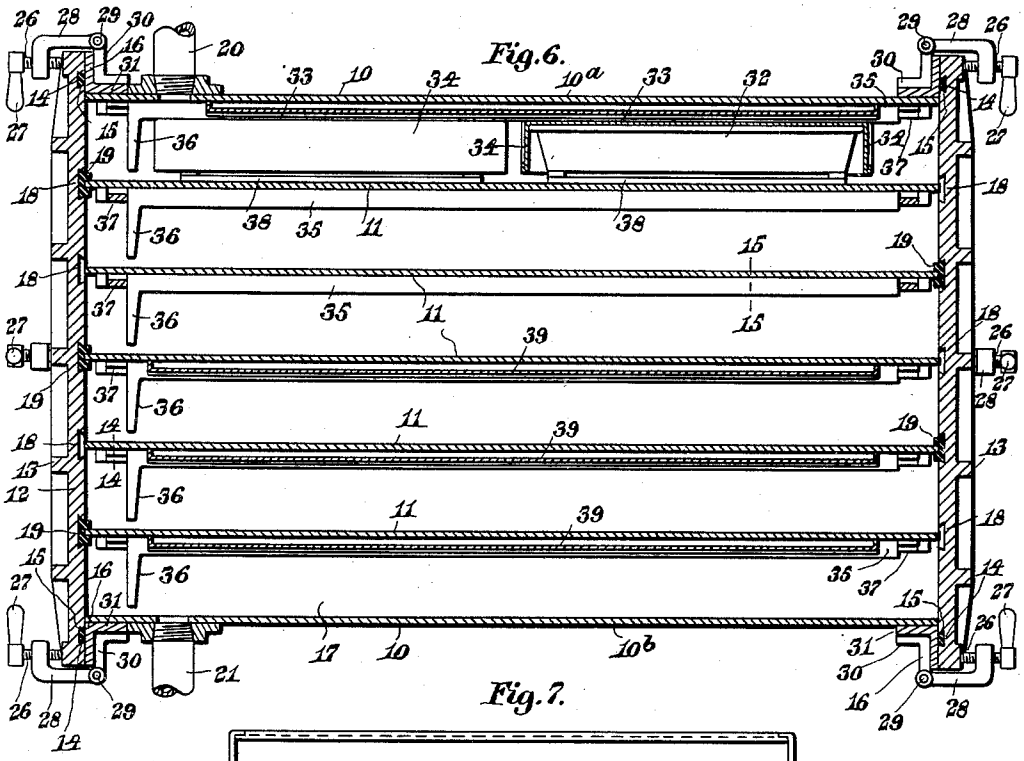


Fig.7.

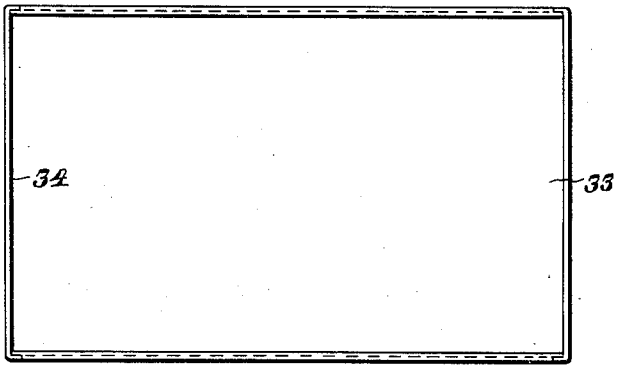


Fig.8.

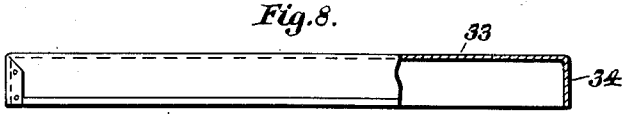
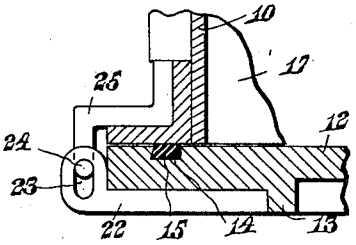


Fig.9.



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APPARATUS FOR FREEZING MATERIALS

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Fig. 10.

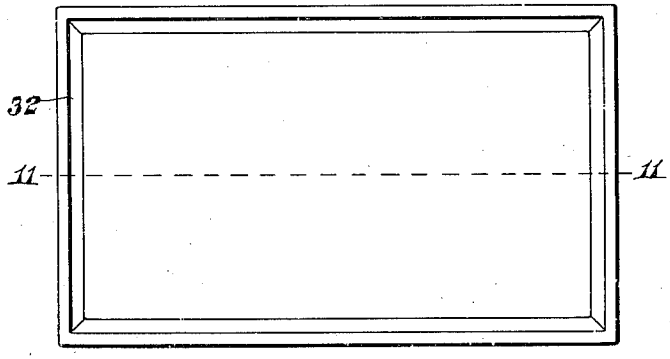


Fig. 11.

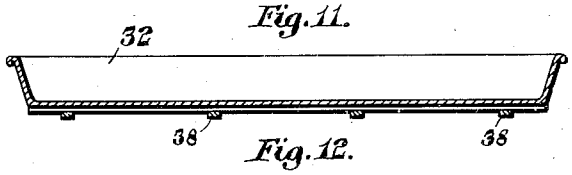


Fig. 12.

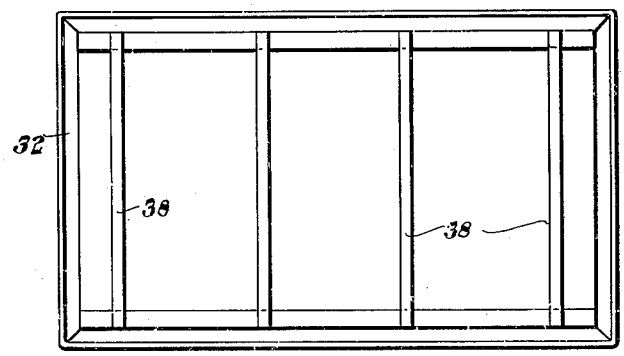


Fig. 13.

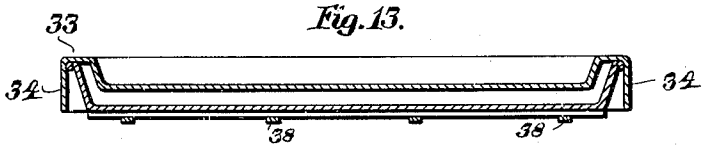


Fig. 14.

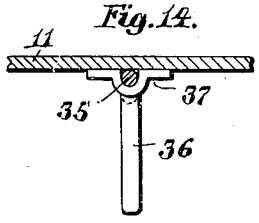
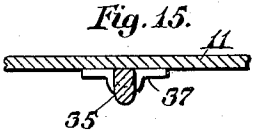


Fig. 15.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR FREEZING MATERIALS

Application filed August 12, 1929. Serial No. 385,137.

This invention relates to apparatus for freezing materials such as fish, meats, and the like, whereby said materials may be quickly frozen, the object of the invention being to provide a simple means for obtaining this result.

This desired object is attained by the mechanism illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a front elevation of an apparatus embodying the principles of the present invention, the doors thereof being removed therefrom.

Figure 2 represents a side elevation of the same, and showing the doors thereof closed.

Figure 3 represents an elevation of the outer side of one of the closed doors.

Figure 4 represents an elevation of the inside face of said door.

Figure 5 represents a section of said door on line 5, 5, on Fig. 3.

Figure 6 represents a longitudinal section of the apparatus with the doors closed, the cutting plane being on line 6, 6, on Fig. 1.

Figure 7 represents an inverted plan of the cover to a pan adapted to contain the fish or other material to be frozen.

Figure 8 represents an elevation of said cover partially in section.

Figure 9 represents a sectional detail showing the hinge connection between the door and the casing.

Figure 10 represents a plan of one of the pans in which the material to be frozen is placed.

Figure 11 represents a longitudinal section of same on line 11, 11 on Fig. 10.

Figure 12 represents an inverted plan of said pan.

Figure 13 represents a section of said pan and a modified form of cover.

Figure 14 represents a section on line 14, 14, on Fig. 6, and

Figure 15 represents a section on line 15, 15, on Fig. 6.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a metal casing open at both ends and having a plurality of shelves 11 at different levels extending the entire length thereof.

To each end of said casing 10 is hinged a door 12 reenforced on the outside by a plurality of ribs 13 while the inner face of the door has a plurality of recesses 14 formed therein which recesses are wider at the bottom than at the top.

The casing 10 is made up of a plurality of channel bars 10^x for side walls and top and bottom plates 10^a and 10^b all welded together with the shelves interposed between the members 10^x.

In these recesses 14 are embedded strips 15 of resilient material extending beyond the faces of the doors.

These strips 15 are adapted to be forced against the flanges 16 at the opposite ends of the casing 10 in order to provide a liquid tight compartment 17 within the casing 10.

Each door 12 has other horizontal recesses 18 formed therein opposite the edges of the shelves 11 and resilient strips 19 are embedded in alternate recesses, the strips 19 in one door being opposite the recesses 18 in the other door which have no strips therein.

The strips 19 impinge upon the opposite edges of the shelves 11 and prevent the passage of liquid at these points while the edges of the shelves opposite the empty recesses do not extend into said recesses or close the same, so that when a freezing medium is admitted to the compartment 17 it will move in a zigzag path from either the upper end of the compartment 17 to the bottom thereof or vice versa.

A pipe 20 communicates with the compart-

ment 17 at the top thereof while another pipe 21 communicates with the bottom thereof.

Either of these pipes may be used to admit the freezing medium to the compartment while the other pipe is being used as an outlet from the compartment.

By this means a constant circulation of freezing medium may be insured passing back and forth in the spaces between the various shelves 11.

Each hinge leaf 22 secured to a door 12 has an elongated hole 23 therein through which extends the cylindrical hinge pin 24 on the leaf 25 secured to a flange 16 on the casing 10. This provides a means whereby the doors 12 may be swung upon the hinge pins 24 and also be forced toward the flanges 16 to make the compartment 17 liquid tight.

The strips 15 in the doors are forced against these flanges 16 by means of the screws 26 provided with turning handles 27 and threaded to members 28 hinged at 29 to supports 30 secured to the part 31 of flanges 16.

When the doors are to be opened the screws 26 are freed therefrom and then moved about the hinge pins 29 out of the path of the doors 12.

Pans 32 are provided to receive the material to be frozen, these pans being provided with covers 33 which have downturned flanges 34 separated from the side walls of the pans 32 and forming air seals in the spaces between the flanges 34 and the pan walls which prevent the admission of any freezing material into said pans.

The fish or other material to be frozen is placed in the pans 32 extending above the upper edge of said pan and then the covers 33 are placed thereon.

The covered pans 32 containing the fish are then placed upon the shelves 11 and the cam bars 35 are then turned to force the covers 33 downwardly to compress the fish.

The cam bars 35 are elongated at points above the pans 32 and have handles 36 by which they may be turned in fixed bearings 37 in order that their longest axes may be moved into either horizontal or vertical position as desired.

The pans 32 have runners 38 secured to the bottoms thereof which cause the pans to be elevated above the shelves 11 to permit the freezing material to contact with the bottom thereof.

To the under side of the shelves 11 and upper wall of casing 10 are secured a plurality of blocks or other members 39 which will restrict the passage of the freezing material flowing between two shelves, thus insuring better contact of said freezing material with the pan 32 and cover 33 thereof.

After the pans 32 filled with fish have been placed upon the shelves with the covers 33 thereof forced downwardly by the cam bars 35, the doors 12 are closed and forced against the flanges 16 and the edges of the shelves 11, thus hermetically sealing the compartment 17.

A freezing medium is then admitted to the compartment 17 and contacts with the exterior of the pans 32 and covers 33 thereby quickly freezing the fish or other material contained within said pans.

When the material has been sufficiently frozen both doors 12 may be opened and the frozen material removed from one end of the casing 10, while another supply of pans with fresh fish is being inserted into the other end of said casing.

This makes a very effective method of freezing material and apparatus for carrying out said method.

Having thus described my invention, I claim:

1. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves; and means for circulating a freezing medium in said compartment in contact with said receptacles.

2. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves; and means for circulating a freezing medium in a zigzag path through said compartment in contact with said receptacles.

3. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles having bottom runners supported on said shelves; and means for circulating a freezing medium in said compartment in contact with said receptacles.

4. In an apparatus for freezing materials, a casing provided with a plurality of shelves: air-trapping receptacles supported on said shelves; a door hinged to one end of said casing provided with a plurality of resilient strips adapted to contact with the edges of the walls of said casing; and means for circulating a freezing medium within said casing in contact with said receptacles.

5. In an apparatus for freezing materials, a casing provided with a plurality of shelves; air-trapping receptacles supported on said shelves; a door hinged to one end of said casing provided with a plurality of resilient strips adapted to contact with the edges of the walls of said casing; means for clamping said door to said casing; and means for circulating a freezing medium within said casing in contact with said receptacles.

6. In an apparatus for freezing materials, a casing provided with a plurality of shelves and open at both ends; air-trapping receptacles supported on said shelves; a door hinged to each end of said casing provided with a plurality of resilient strips adapted to con-

tact with the edges of the walls of said casing; and means for circulating a freezing medium within said casing in contact with said receptacles.

7. In an apparatus for freezing materials, a casing provided with a plurality of shelves; air-trapping receptacles supported on said shelves; a door hinged to one end of said casing provided with a plurality of resilient strips adapted to contact with the edges of the walls of said casing and other strips adapted to contact with the edges of said shelves; and means for circulating a freezing medium within said casing in contact with said receptacles.

8. In an apparatus for freezing materials, a casing provided with a pluality of shelves extending the entire length thereof; a door clamped to each end of said casing having recesses in its inner faces opposite said shelves; resilient strips in alternate recesses bearing against one edge of each of said shelves; means for circulating a freezing medium through the spaces between said shelves; and air-trapping receptacles disposed on said shelves in the path of said freezing material.

9. In an apparatus for freezing materials, a casing provided with a plurality of shelves extending the entire length thereof; a hinged door clamped to each end of said casing having recesses in its inner faces opposite said shelves; resilient strips in alternate recesses bearing against one edge of each of said shelves; means for circulating a freezing medium through the spaces between said shelves; and air-trapping receptacles disposed on said shelves in the path of said freezing material.

10. In an apparatus for freezing materials, a casing provided with a plurality of shelves extending the entire length thereof; a door clamped to each end of said casing having recesses in its inner faces opposite said shelves; resilient strips in alternate recesses bearing against one edge of each of said shelves, the strips in one door being opposite the unfilled recesses of the other door; means for circulating a freezing medium through the spaces between said shelves; and air-trapping receptacles disposed on said shelves in the path of said freezing material.

11. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves and each receptacle including a cover; means for circulating a freezing medium in said compartment in contact with said receptacles; and means within said compartment for forcing said covers downwardly.

12. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves and each receptacle including a cover; means for circulating a freezing medium in said compartment in contact with said receptacles; and cam members within said compartment for forcing said covers downwardly.

13. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves and each receptacle including a cover; means for circulating a freezing medium in said compartment in contact with said receptacles; and oscillating cam bars within said compartment for forcing said covers downwardly.

14. In an apparatus for freezing materials, a liquid-tight compartment provided with a plurality of shelves; air-trapping receptacles supported on said shelves and each receptacle including a cover; means for circulating a freezing medium in said compartment in contact with said receptacles; oscillating cam bars within said compartment for forcing said covers downwardly; and a handle for actuating each cam bar.

15. In an apparatus for freezing materials, a casing provided with a plurality of shelves; air-trapping receptacles supported on said shelves; a door hinged to one end of said casing provided with a plurality of resilient strips adapted to contact with the edges of the walls of said casing; means for clamping said door to said casing; means for circulating a freezing medium within said casing in contact with said receptacles; and means restricting the passage of freezing material above said receptacles.

Signed by me at 294 Washington St., Boston, Massachusetts, this 7th day of August, 1929.

ROBERT E. KOLBE.