June 2, 1931. W. C. WHITCHER 1,808,443

REFRIGERATED COUNTER

Filed Dec. 5, 1927

Fig. 1.

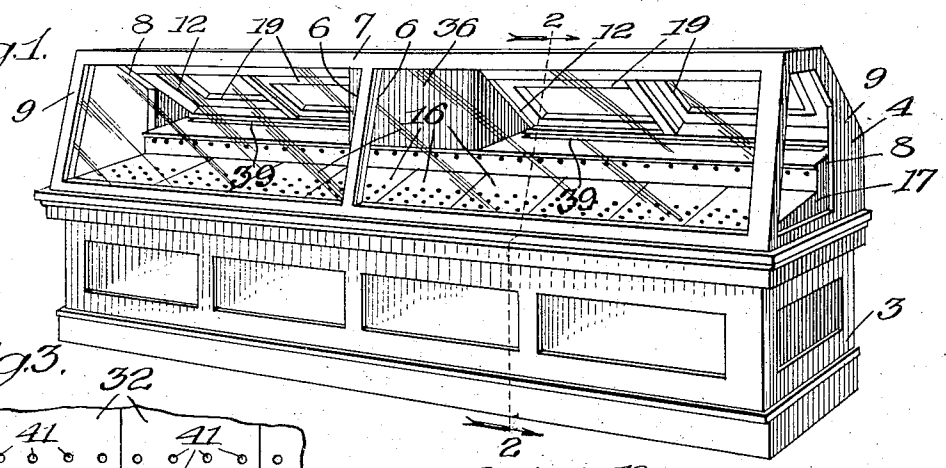


Fig. 3.

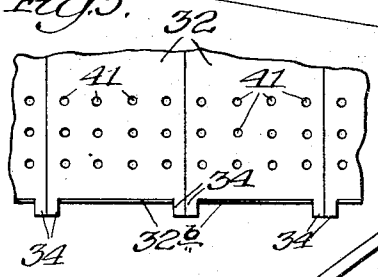


Fig. 2.

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UNITED STATES PATENT OFFICE

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REFRIGERATED COUNTER

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My primary objects are to provide a construction of refrigerated counter, or cabinet, whereby such a circulation of cooling air is produced therein as will prevent the deposition of moisture on the glass portion of the front wall of the counter; to provide for substantially uniform circulation of the cooling air throughout the space to be refrigerated with resultant equalization of the temperature therein; to increase the efficiency of the refrigerating medium employed; to provide a construction which shall be devoid of air-trapping pockets; to provide for the accomplishment of the purposes stated in a construction in which the refrigerating medium is within the space in the counter through which the cooled air is caused to circulate; and other objects as will be manifest from the following description.

Referring to the accompanying drawings:—

Figure 1 is a perspective view of a counter construction constructed in accordance with my invention. Figure 2 is an enlarged sectional view taken through the counter of Fig. 1, the section being taken at the line 2—2 on Fig. 1 and viewed in the direction of the arrows; and Figure 3, a broken plan view of a portion of the bottom-forming structure of the compartment to be refrigerated.

The particular illustrated embodiment of my invention comprises a base, compartment, portion 3 forming a support for a counter portion 4 to be refrigerated.

The counter portion 4 is formed of a framework 5 which, if desired, may be formed of double walls spaced apart with insulating material interposed therebetween, the frame 5 being shown as provided with openings 6 along its rearwardly and upwardly inclined front portion 7, openings 8 at opposite ends 9 thereof, openings 10 (one only of which is shown,) along its top wall 11, and openings 12 in the upwardly and forwardly inclined upper portion 13 of the rear wall 14 of the counter, the lower portion of which latter and represented at 15, is substantially vertical. The openings 6, 8 and 12 are glazed, as represented at 16, 17 and 18, respectively, the glazing at each of said openings comprising a plurality of parallel panes of glass spaced apart to provide air spaces therebetween, in accordance with the common practice in constructing glazed refrigerator structures.

The openings 10 are provided for receiving sliding doors 19 the opposed longitudinal edges of each of these openings containing tongues 20 in which a pair of glazed doors offset from each other are slidably confined at metal lined grooves 20ª therein, these doors permitting of access to the interior of the counter.

The inner surfaces of the rear wall portion 14 and the bottom portion 21 of the counter, are lined by sheeting 22, as for example of metal, the rear substantially horizontal portion 23 of the sheeting 22 being located in a plane slightly lower than the front portion 24 thereof, with an intervening upwardly extending connecting portion 25 forming a shoulder, extending at the juncture of these relatively offset portions of the sheeting and extending lengthwise of the counter.

The counter also contains, in vertically spaced relation to the sheeting 22, a partition-forming plate portion which divides the space within the counter into an upper compartment 26 to receive the articles to be displayed and refrigerated and a lower compartment 27 in which the refrigerating medium hereinafter referred to, is located. The partition structure referred to is shown as comprising plate portions 28 supported at their rear edges on brackets 29 secured to the upwardly extending rear portion of the sheeting 22 and at their front edges on a vertically disposed plate portion 30, also forming a part of the partition-forming structure and located substantially in vertical alignment with the shoulder 25 and supported at its lower edge on an angle iron 31 secured in any suitable way to the ends of the frame 5 of the counter. The partition-forming structure also comprises a plate portion 32 which preferably inclines forwardly and downwardly this plate por-

tion resting at its rear edge upon an outwardly turned flange 33 on the lower edge of the plate portion 30 and at its forward edge on an angle iron 35 secured to the one of the members of the frame 5 which extends along the lower edge of the counter at the front portion thereof.

In the particular arrangement shown the plate portion 32 is formed of a series of plate sections arranged side by side, as represented in Figs. 1 and 3, each of these plate sections at its forward edge being notched, or recessed, between its ends as represented at 34, its ends being downwardly flanged as represented at 32^a at which flanges these plate sections rest upon the angle iron 35, each plate section having an upwardly extending flange 32^b at the base of the recess 34.

All of the plate portions above described and comprising the partition-forming structure, extend throughout the length of the counter except, in the particular construction shown, the plate portions 28 which reach short of each other at their inner ends to form an opening which is boxed as indicated at 36 and opens upwardly through the wall portion 13 of the counter to permit of access to the refrigerating compartment and which opening would be provided with a removable cover.

The partition-forming structure described, in combination with the lower, sheet-equipped floor portion of the counter causes the compartment 27 to present the relatively high compartment-space 37 for housing the refrigerating medium and the relatively shallow forwardly tapering compartment-portion 38 which opens at its rear end into the compartment-portion 37, this partition-forming structure, in accordance with the preferred illustrated embodiment of my invention containing, in addition to the series of openings 34 at its forward edge, a servies of openings 40 located in the upper edge portion of the plate 30, and elongated openings 39 in the rear edge portions of the plates 28. The plate portion 32 is also shown as containing a series of openings 41, the series extending lengthwise of the counter, one series being located substantially midway between the front and rear edges of the plate portion 32 and the other series in front thereof as shown.

Any suitable refrigerating means may be employed, those shown comprising a tank 42 located in the compartment-portion 37 and in spaced relation to the walls of the latter, as shown. The tank 42 is represented as supported on angle irons 43 secured to the ends of the frame of the counter, its top portion being open and its front and rear sides perforated as indicated at 44. The refrigerating medium is disposed in the tank 42 and may, by way of example, be ice charged into this tank, in which case the tank becomes in effect an ice-bunker, though if desired, the cooling pipes of an artificial refrigerating apparatus, if such be used, may be located in this tank.

The operation of the counter is as follows: The air cooled in the compartment-portion 37 by the refrigerating medium therein, gravitates in this compartment portion and flows outwardly therefrom into the compartment-portion 38 from which it passes upwardly through the various apertures therein, into the compartment 26 to be refrigerated, the cold air being drawn upwardly, and in this operation, across the inner side of the front of the counter and thence passing backwardly and downwardly and returning to the compartment-portion 37 through the openings 39 and 40, to again become refrigerated therein for circulation through the refrigerating-compartment 26.

It will be noted that by reason of the provision of the compartment-portion 38, the cooled air is conducted to such a point, adjacent the front wall of the counter, that circulation of the air across the rear face of the glazed portions of the front wall of the counter is effected thereby preventing the condensing of moisture on these glazed portions, the provision of the series of openings 41, in conjunction with the openings 34, 39 and 40, ensuring the substantially uniform distribution of the cooled air in the compartment 26. The efficiency of the construction is augmented by providing the compartment-portion 38 of forwardly tapering form, inasmuch as thereby the velocity of the cooled air in passing through this compartment, for subsequent discharge into the compartment 26, is increased resulting in very actively circulating the air through the compartment 26.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent is:

1. A refrigerator structure comprising a compartment for the articles to be refrigerated, a second compartment extending along the underside of said first-named compartment with its forward portion vertically constructed, a refrigerating medium located in the rear portion of said second compartment below said first-named compartment and spaced from walls of said compartment, the top of said second compartment being apertured at its front and rear portions to afford communication between said compartments.

2. A refrigerator structure comprising an enclosing structure, a partition in said struc-

ture and spaced from the bottom thereof and dividing the space within said enclosing structure into an upper compartment for the articles to be refrigerated and a lower compartment, the rear portion of said partition forming a shelf within said upper compartment, said partition containing openings adjacent its rear edge portion and its forward edge portion, and a refrigerating medium in the rear portion of said lower compartment.

3. A refrigerator structure comprising an enclosing structure, a partition in said structure and spaced from the bottom thereof and dividing the space within said enclosing structure into an upper compartment for the articles to be refrigerated and a lower compartment, said upper compartment having a rear wall portion and a top portion, said top portion extending upwardly and forwardly from the upper portion of said rear wall portion, said partition having a front portion, a rear portion in a plane above said front portion and an intermediate upwardly extending portion, the said rear portion of said partition forming a shelf extending beneath said top portion, said partition containing openings adjacent its rear edge portion and in its said intermediate portion, and a refrigerating medium in the rear portion of said lower compartment and beneath said shelf.

4. A display counter refrigerator having a food compartment and a refrigerant compartment below the same and laterally substantially coextensive therewith, a partition between said compartments permitting communication between the same adjacent the front and rear, and refrigerating means in the lower compartment around which the air circulates, said partition having a portion extending downwardly and forwardly so that the refrigerant space will be constricted at the front to increase the velocity of flow of air through the refrigerant compartment.

5. A display counter refrigerator having a food compartment and a refrigerant compartment below the same and laterally substantially coextensive therewith, a partition between said compartments permitting communication between the same adjacent the front and rear, and refrigerating means in the lower compartment around which the air circulates, said partition having a portion extending downwardly and forwardly so that the refrigerant space will be constricted at the front to increase the velocity of flow of air through the refrigerant compartment, said refrigerating means extending above said portion, and said partition having an offset portion spaced from the refrigerating means and extending from the first mentioned portion to the rear wall of the refrigerator.

6. A display counter refrigerator having a food compartment, a refrigerant compartment below the same and substantially coextensive therewith, the rear wall of the refrigerator at said compartments having an upright portion and a forwardly sloping portion extending therefrom toward the top of the refrigerator, a partition between said compartments having a downwardly and forwardly inclined portion and an upwardly offset portion in the rear of the first mentioned portion, said partition having openings therethrough adjacent the front and rear edges whereby the compartments may communicate, and a refrigerating means within the refrigerant compartment and below said offset portion.

7. A display counter refrigerator having side walls enclosing a food compartment and a refrigerant compartment, said compartments being in communication adjacent said side walls, and the refrigerant compartment being constricted adjacent the front side wall so as to increase the velocity of circulation of air through the refrigerant compartment.

8. A display counter refrigerator having side walls enclosing a food compartment and a refrigerant compartment, said compartments being in communication adjacent said side walls, and the refrigerant compartment being constricted adjacent the front side wall so as to increase the velocity of circulation of air through the refrigerant compartment, a refrigerating means within the refrigerant compartment spaced from the bottom and rear of the latter.

9. A refrigerator structure comprising a compartment for the articles to be refrigerated, a second compartment extending along the underside of said first-named compartment with its forward portion vertically constricted so as to increase the velocity of circulation of air through the refrigerant compartment, and refrigerating means located in the rear portion of said second compartment and spaced from walls of said second compartment, the top of said second compartment being apertured at its front and rear portions to afford communication between said compartments.

10. A refrigerating structure comprising a compartment for the articles to be refrigerated, a second compartment extending along the underside of said first-named compartment with its rear portion of greater height than the remaining portion thereof and having a top plate portion forming a support for food within said first-named compartment, and refrigerating means in the rear portion of said second compartment of greater height, said means being so positioned as to permit of the flow of air downwardly in the rear portion of said second compartment, said structure containing ap-

ertures for communication of said second compartment at its forward end with said first-named compartment and for communication of said first-named compartment with the upper part of the rear portion of said second compartment.

11. A refrigerating structure comprising a compartment for the articles to be refrigerated, a second compartment extending along the underside of said first-named compartment with its rear portion of greater height than the remaining portion thereof and having an apertured top plate portion forming a support for food within said first-named compartment, and refrigerating means in the rear part of said second compartment of greater height, said means being so positioned as to permit of the flow of air downwardly in the rear portion of said second compartment, said structure being apertured for communication of said second compartment at its forward end with said first-named compartment.

12. A refrigerator structure having a compartment for the articles to be refrigerated, a second compartment, said second compartment having a top extending along the under side of said first named compartment, said top having a forward portion and a rear portion elevated with respect to the forward portion, and an upwardly extending wall connecting said portions, a refrigerating medium located in said second compartment in the rear of said wall, said forward and elevated portions and said wall having apertures placing the compartments in communication.

13. A refrigerator structure having a compartment for the articles to be refrigerated, a second compartment, said second compartment having a top extending along the under side of said first named compartment, said top having a forward portion and a rear display shelf portion elevated with respect to the forward portion, a refrigerating medium located in the second compartment below the rear display shelf portion, and said compartments being in communication with the air entrance to the second compartment being in the rear of the elevated display shelf portion so that descending air will pass to the rear of the entire refrigerating medium.

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