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E. F. BRILL ET AL
REFRIGERATED DISPLAY CASE

2,499,089

Filed March 29, 1947

2 Sheets-Sheet 1

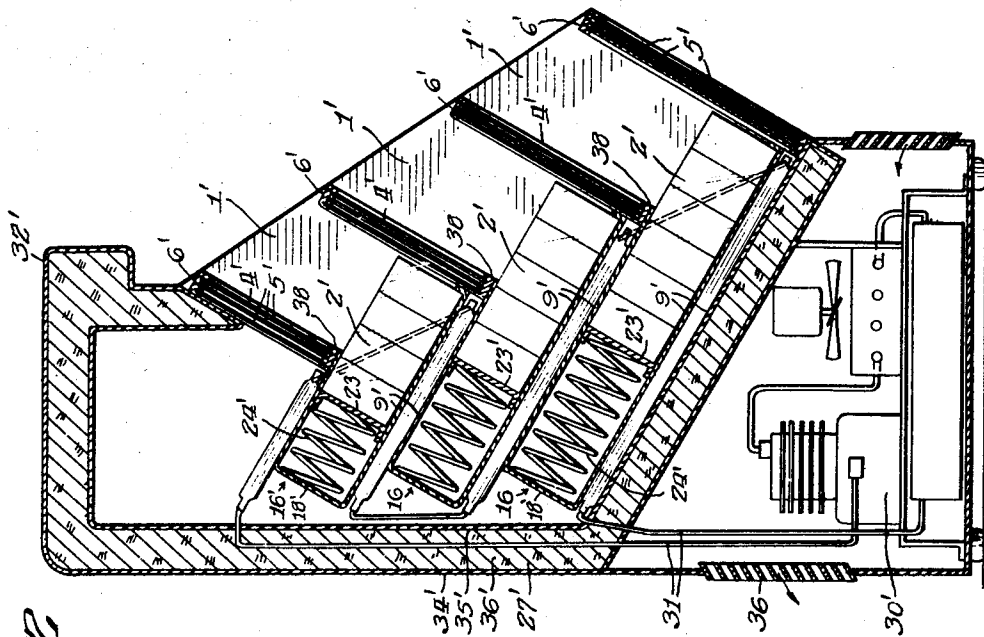


Fig. 2

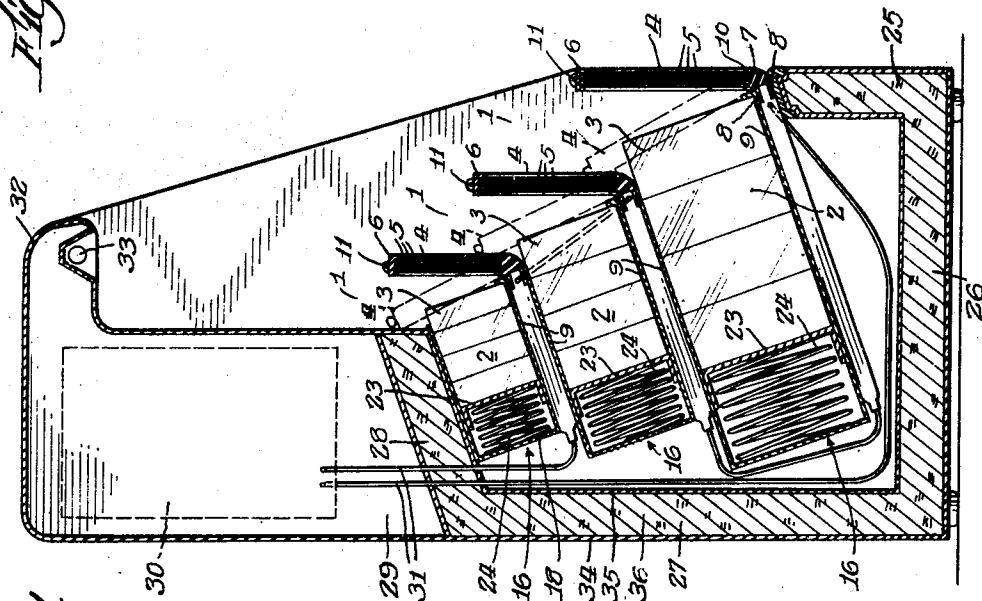


Fig. 1

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2 Sheets-Sheet 2

Fig. 2

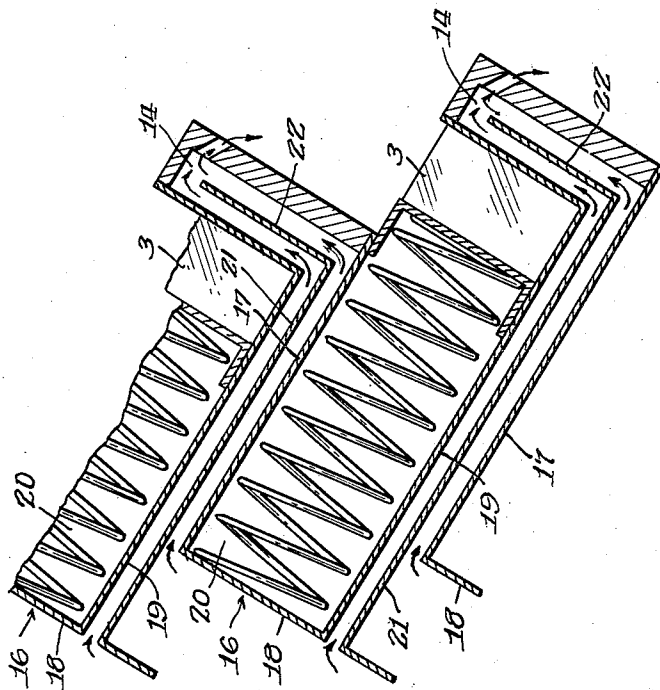
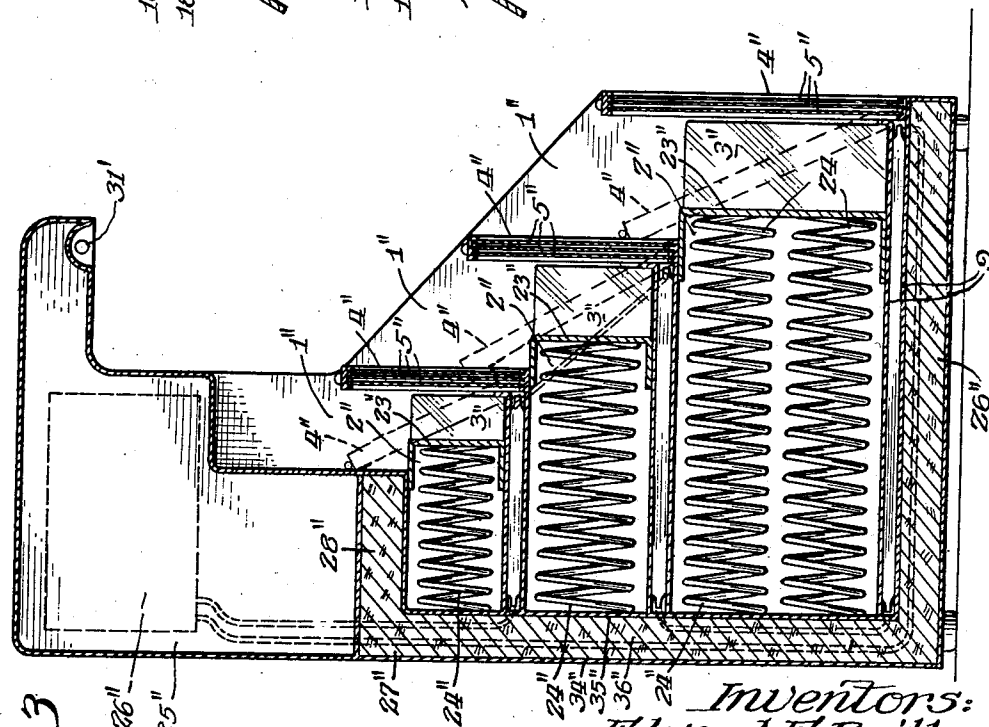


Fig. 3

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UNITED STATES PATENT OFFICE

2,499,089

REFRIGERATED DISPLAY CASE

Edward F. Brill and Orval Schroeder, Milwaukee,
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Application March 29, 1947, Serial No. 738,181

9 Claims. (Cl. 62—89.5)

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This invention relates, in general, to refrigerated display cases and has particular relation to improvements in refrigerated display cases which are adapted to contain and display articles of merchandise, such as frozen foods and the like, and to keep the merchandise in a cool and refrigerated condition and at the same time permit free and convenient access to the same by the customers.

In one prior scheme, the articles or packages of frozen food or other merchandise have been placed in relatively low position in a cabinet open at the top, with the thought that the entry or circulation of warm air into the place where the frozen foods are located will be reduced. Cases of this sort have been of relatively limited capacity and have not effectively displayed the articles of merchandise. Usually an entire stock of articles other than those in the compartment or well from which the articles are withdrawn by the customer has been set up for display and correlated with the other articles so that the customer may make the desired selection by viewing the displayed articles and then withdrawing an article from position related to the position of the display article.

The prior scheme above described has the additional objection of requiring structure beyond that necessary for holding and refrigerating the articles available to the customer; also the further objection that the customer cannot by looking at the position where the articles are displayed tell whether such articles are actually available to him, and the objection that where the articles are stacked upon one another in such a well or cabinet difficulty is encountered in maintaining them in the desired uniformly refrigerated condition.

One of the main objects of the present invention is to provide an improved form of self-service refrigerated display case in which the problems previously presented are overcome.

Another object of the invention is to provide an improved form of refrigerated display case in which the articles of merchandise are supported in low position relative to the opening through which they are withdrawn by the customer and in which the articles are displayed in such manner that the customer may have a complete view or survey of the articles actually available to him, for example, from the front of the case, and without requiring a group of related articles for display purposes only.

Another object of the invention is to provide in a case of the character described a plurality of

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generally upwardly opening wells for holding articles of merchandise, with the wells disposed at successively higher levels and rearwardly of one another from the front of the case, and means for maintaining the articles of merchandise in the wells in refrigerated condition.

Another object of the invention is to provide the wells with window means disposed at successively higher levels and rearwardly of one another from the front of the case through which the articles of merchandise in the respective wells are visible to the customer from the front of the case.

Another object of the invention is to provide front walls for the wells which are normally positioned generally vertically and are pivoted adjacent to the lower portions thereof for swinging movement rearwardly to close the wells.

Another object of the invention is to provide a case of the character described wherein the window means in the front walls of the wells comprise a plurality of spaced transparent sheets so as to provide heat insulation against heat conduction therethrough.

Another object of the invention is to provide wells having generally upwardly directed first well parts opening generally upwardly, and second well parts extending generally rearwardly from the bottom of the first well parts to provide wells of angular form and increased capacity, with means for maintaining the articles of merchandise in the wells in refrigerated condition.

Another object of the invention is to provide in a case of the character described refrigerating means which comprises means for circulating a refrigerating medium between the rearwardly extending parts of the wells; also, if desired, beneath the bottom of the lowermost rearwardly extending well part and over the top of the uppermost rearwardly extending well part.

Another object of the invention is to provide wells of the character described wherein the upwardly opening parts of the wells are disposed substantially vertically, and the rearwardly extending parts of the wells are declined downwardly from the bottom portions of the wells.

Another object of the invention is to provide wells of the character described wherein the upwardly opening parts of the wells are disposed substantially vertically and the rearwardly extending parts of the wells extend horizontally from the bottom portions of the wells.

Another object of the invention is to provide wells of the character described wherein the upwardly opening parts of the wells are disposed

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substantially vertically and the rearwardly extending parts of the wells are inclined upwardly from the bottom portions of the wells.

Another object of the invention is to provide in a case of the character described a plurality of merchandise holding wells opening generally upwardly, means for supporting articles of merchandise in rows, with one row extending generally laterally from the bottom of each well, and means for feeding the articles of merchandise from said rows into the bottoms of the respective wells for withdrawal by the customer upwardly through the tops of the wells; also means for keeping the articles of merchandise in said rows and in said wells in a refrigerated condition.

Another object of the invention is to provide a display case of the character described having a generally L-shaped refrigerated compartment, with one leg adapted for supporting a row of articles of merchandise and the other leg opening generally upwardly for withdrawal of the articles of merchandise therefrom.

Another object of the invention is to provide a refrigerated self-service display case of the character described, having various features of novelty and advantages, and which is particularly characterized by its simplicity in construction, its economy in manufacture, and its effectiveness in use.

Further objects and advantages of the invention will appear from the following detailed description, taken in connection with the accompanying drawings which illustrate the manner of constructing, operating, and using illustrative embodiments of the present invention.

In the drawings:

Figure 1 is a vertical transverse and more or less schematic sectional view of a refrigerated display case embodying the present invention;

Figure 2 is a vertical sectional view similar to Figure 1, showing another form of case embodying the invention;

Figure 3 is a vertical sectional view similar to Figure 1, showing a further form of case embodying the invention; and Figure 4 is a fragmentary vertical sectional view showing a further form of the invention.

Referring first to the embodiment of the invention shown more or less schematically in Figure 1, this form of case comprises a plurality of merchandise holding wells, three of such wells being shown in the drawing.

Each well has a vertically disposed and upwardly opening well part 1 and a second well part 2 extending generally rearwardly from the bottom portion of the well part 1. This provides a nested group of wells of angular form, and increases the capacity of each rearwardly extending well part for a given depth horizontally. The generally upwardly opening well parts 1 are disposed at successively higher levels and rearwardly of one another from the front of the case. This is highly advantageous in providing a compact and effective display of all of the articles of merchandise 3 available to the customer. In Figure 1, the generally rearwardly extending well parts 2 are shown declined downwardly from the bottom portions of the well parts 1. This may vary widely as will hereinafter appear.

The front wall 4 of each well part 2 has window means through which the articles of merchandise 3 in the respective wells are visible to the customer from the front of the case. Each window preferably comprises a plurality of spaced

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transparent panes 5 so as to provide heat insulation against heat conduction therethrough. The panes 5 may be mounted, for example, in frames 6 which are preferably formed of non-frosting material, such as semi-hard rubber, wood, plastic material or the like.

If desired, the lower ends of the front walls 4 or windows may be hinged, pivoted, or mounted so that these walls may be swung rearwardly to the positions shown in dotted lines in Figure 1 to close the respective wells. One suitable such mounting comprises flexible pieces 7 of rubber, rubber-like or other non-frosting material secured at 8 to the front ends of the shelves 9 and, at 10, to the adjacent lower ends of the walls or windows 4. End catches 11 may be provided for holding the walls 4 in their vertical positions. End catches (not shown) may be provided for holding the walls 4 in their closed positions.

One shelf 9 constitutes the bottom of the rearwardly extending part 2 of the lower well. Similar shelves 9 are positioned between the rearwardly extending parts 2 of the other wells and constitute the bottom walls thereof. The shelves 9 may comprise cold plates with internally contained coils through which the refrigerating medium is circulated, as in the copending application of Edward F. Brill, Serial No. 662,396, filed April 15, 1946, or they may comprise walls through which refrigerated air is circulated, as in our copending application Serial No. 738,180, filed March 29, 1947.

Where the shelves 9 are in the form of walls through which cold or refrigerated air is circulated, they may have discharge ducts 14 at the forward ends thereof through which portions of the cold or refrigerated air are discharged, as shown fragmentarily in Figure 4, for circulation down over the articles or packages of merchandise 3 in the respective wells. This prevents the accumulation of moisture on the articles or packages and frosting thereof.

In Figure 4, the articles or packages 3 of frozen food or other merchandise in each well are enclosed within a box-like container or vessel 16. Each vessel 16 may be formed, for example, of sheet metal and has a top wall 17, rear wall 18, bottom wall 19 and end or side walls 20. The vessels 16 are preferably sealed except for the opening at the front of each vessel through which the articles or packages 3 are inserted into the vessel and withdrawn by the customer, as desired. The vessel 16 may be supported, for example, by lugs (not shown) struck in from the inner shelves of the opposite side or end walls of the case, preferably without piercing the same. This is more fully disclosed in our previously identified copending application.

The spaces between the vessels 16 may be divided by partitions 21, the forward ends of which are turned up at 22 and spaced rearwardly of the front walls 4. The circulation of the cold or refrigerated air through the ducts formed between the vessels 16 by the partitions 21 follows the arrows shown in Figure 4.

In Figure 1 the rearwardly extending parts 2 of the wells are shown of relatively great depth, and means is provided for yieldingly forcing the packages or articles 3 to the forward parts of the wells for withdrawal by the customer through the open tops of the wells. This means is shown in the form of a follower 23 within each vessel 16, with a coiled spring 24 interposed between the follower and the inner side of the rear wall 18 of

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the vessel 16. This provides a case having a relatively large capacity for the frozen foods or other articles of merchandise.

It is to be understood that the springs 24 may be omitted and the rearwardly extending parts 2 of the wells may be made relatively shallow, i. e., of a depth to permit the customer to reach all articles or packages 3 in each well through the upwardly opening top of the part 1 of the well and without the springs 24 or other means for forcing the articles 3 toward the front parts of the wells.

In order to remove the packages 3 the customer reaches down through the upwardly directed well part from the top, grasps the front of the package, and withdraws it forwardly from the rearwardly extending well part, and then upwardly through the upwardly directed well part. Where there is sufficient looseness of the packages in the rearwardly extending well part, the customer reaches down through the upwardly directed well part from the top, grasps the front of the package, rocks the top of the package forwardly to clear it of the top of the rearwardly extending well part, and then lifts the package upwardly through the upwardly extending well part and from the case.

The outer walls of the case shown in Figure 1 may vary widely. In the drawing there is a vertical front wall 25 beneath the forward wall having the window means 5, a bottom wall 26, a rear wall 27, a top wall 28 and a top compartment at 29 which houses the refrigerating apparatus shown diagrammatically in dotted lines at 30. The refrigerating apparatus may be of any suitable or preferred type well known in the art and commonly referred to as a refrigerating condenser unit. It may be positioned in the case otherwise than at the top, as shown in Figure 1.

Where the shelves 9 are in the form of cold plates with refrigerant coils (not shown) within the plates, the coils may be connected in series and with the refrigerating apparatus 30 by suitable tubes, as more fully disclosed in the previously identified copending application of Edward F. Brill, or otherwise as desired. Suffice it to state that tubes 31 connect the refrigerating apparatus 30 with the refrigerant inlet of the upper cold plate 9, the outlet of this plate 9 with the inlet of the next lower plate, the outlet of the next plate with the inlet of the next plate, the outlet of the latter plate with the inlet of the bottom plate 9, and the outlet of the bottom plate 9 with the refrigerating apparatus 30. A dual or multiple compressor arrangement may also be employed, as more fully disclosed in our copending application Serial No. 738,182, filed March 29, 1947. A heat exchanger and expansion valve (not shown) may be provided as suitable or desired.

In Figure 1 the top of the case is shown provided with an overhanging part 32. A fluorescent tube or other source of illumination is shown at 33. This may, of course, vary widely.

The outer walls of the case are preferably heat insulated, for example, by forming them of suitable metallic outer and inner shells 34 and 35 with suitable heat insulating material 36 filling the space between these shells.

In the embodiment of the invention shown in Figure 2, the upwardly opening parts 1' of the respective wells, instead of being vertically disposed as in the preceding embodiment of the invention, are inclined forwardly, and the rearwardly extending well parts 2' are inclined up-

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wardly to the rear of the case. In this form of the invention the refrigerating apparatus 30' is housed within the bottom of the case. Louvers 36 are provided for circulation of air through the bottom of the case over the refrigerating apparatus. Otherwise the form of the invention shown in Figure 2 is similar, in general, to the form of the invention previously described, and like or similar parts are designated by primed reference characters corresponding with the reference characters used in connection with the preceding embodiment of the invention.

In Figure 2, the front walls having the window means 5' are shown rigidly fixed at 38 to the adjacent ends of the shelves 9', but they may, of course, be hinged or pivoted thereto, as in the preceding embodiment of the invention, or otherwise as desired.

In the embodiment of the invention shown in Figure 3, the upwardly opening parts 1'' of the respective wells are disposed vertically, as in Figure 1. The rearwardly extending parts 2'' of the wells in this case are positioned horizontally instead of declining rearwardly as in Figure 1. Otherwise the form of the invention shown in Figure 3 is similar, in general, to the form of the invention previously described, and like or similar parts are designated by double primed reference characters corresponding with the reference characters used in connection with the preceding embodiments of the invention. In Figure 3 the refrigerating apparatus 26'' is shown within a compartment 25'' at the top of the case, and a fluorescent tube or other source of illumination is shown at 31'. This, of course, may vary.

The embodiments of the invention shown in the drawings are for illustrative purposes only, and it is to be expressly understood that said drawings and the accompanying specification are not to be construed as a definition of the limits or scope of the invention, reference being had to the appended claims for that purpose.

We claim:

1. In a device of the class described, in combination, a case having a plurality of wells for holding articles of merchandise, each of said wells having a generally upwardly directed first well part opening generally upwardly and a second well part extending generally rearwardly from the lower portion of said first well part to provide wells of angular form and increased capacity, the generally upwardly opening parts of said wells being disposed at successively higher levels and rearwardly of one another from the front of the case, with the rearwardly extending parts of the wells overlying one another upwardly from the bottom of the case, and means for maintaining the articles of merchandise in said wells in refrigerated condition.

2. In a device of the class described, in combination, a case having a plurality of wells for holding articles of merchandise, each of said wells having a generally upwardly directed first well part opening generally upwardly and a second well part extending generally rearwardly from the lower portion of said first well part to provide wells of angular form and increased capacity, the generally upwardly opening parts of said wells being disposed at successively higher levels and rearwardly of one another from the front of the case, with the rearwardly extending parts of the wells overlying one another upwardly from the bottom of the case, means for maintaining the articles of merchandise in said wells in re-

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frigerated condition, and front walls for the upwardly opening parts of said wells having window means disposed at succeeding higher levels and rearwardly of one another from the front of the case through which the articles of merchandise in the respective wells are visible to the customer from the front of the case.

3. A refrigerated display case according to claim 2 wherein the refrigerating means comprises means for circulating a refrigerating medium between the rearwardly extending parts of said wells.

4. A refrigerated display case according to claim 2 wherein the refrigerating means comprises means for circulating a refrigerating medium between the rearwardly extending parts of said wells; also beneath the bottom of the lowermost rearwardly extending well part and over the top of the uppermost rearwardly extending well part.

5. A refrigerated display case according to claim 2 wherein said window means comprises a plurality of spaced transparent sheets so as to provide heat insulation against heat conduction therethrough.

6. A refrigerated display case according to claim 2 wherein said window means comprises a plurality of spaced transparent sheets so as to provide heat insulation against heat conduction therethrough and wherein said front walls are normally positioned generally vertically and are hinged adjacent their lower portions for swinging movement rearwardly to close the wells.

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7. A refrigerated display case according to claim 2 wherein the upwardly opening parts of said wells are disposed substantially vertically and the rearwardly extending parts of the wells are declined downwardly from the bottoms of said wells.

8. A refrigerated display case according to claim 2 wherein the upwardly opening parts of said wells are disposed substantially vertically and the rearwardly extending parts of the wells extend horizontally from the bottoms of said wells.

9. A refrigerated display case according to claim 2 wherein the upwardly opening parts of said wells are disposed substantially vertically and the rearwardly extending parts of the wells are inclined upwardly from the bottoms of said wells.

EDWARD F. BRILL,
ORVAL SCHROEDER.

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