

March 7, 1961

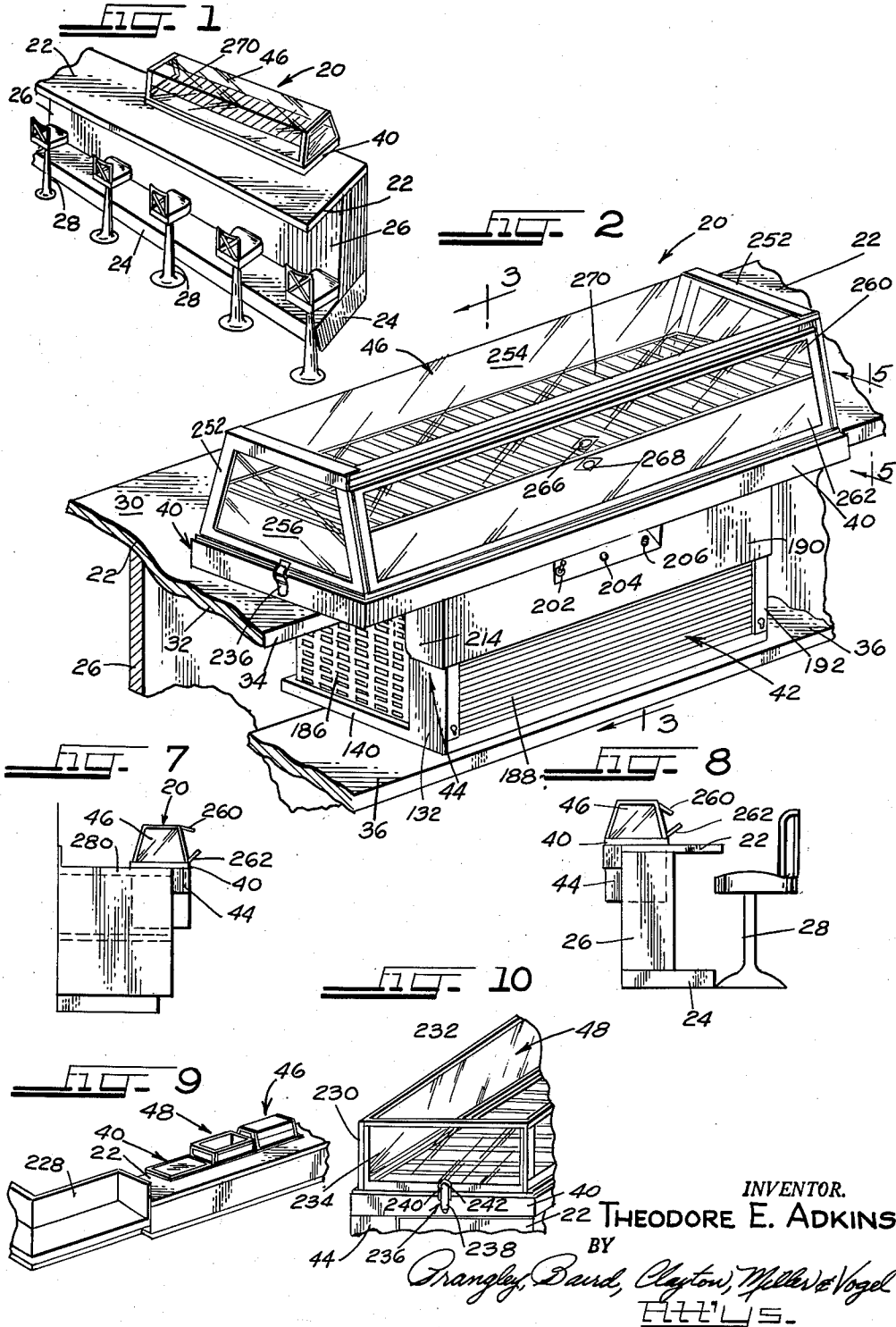
T. E. ADKINS

2,973,631

REFRIGERATED DISPLAY UNIT

Filed July 22, 1959

3 Sheets-Sheet 1



INVENTOR.

THEODORE E. ADKINS

BY

Trangley, Baird, Clayton, Miller & Vogel
ATTYS.

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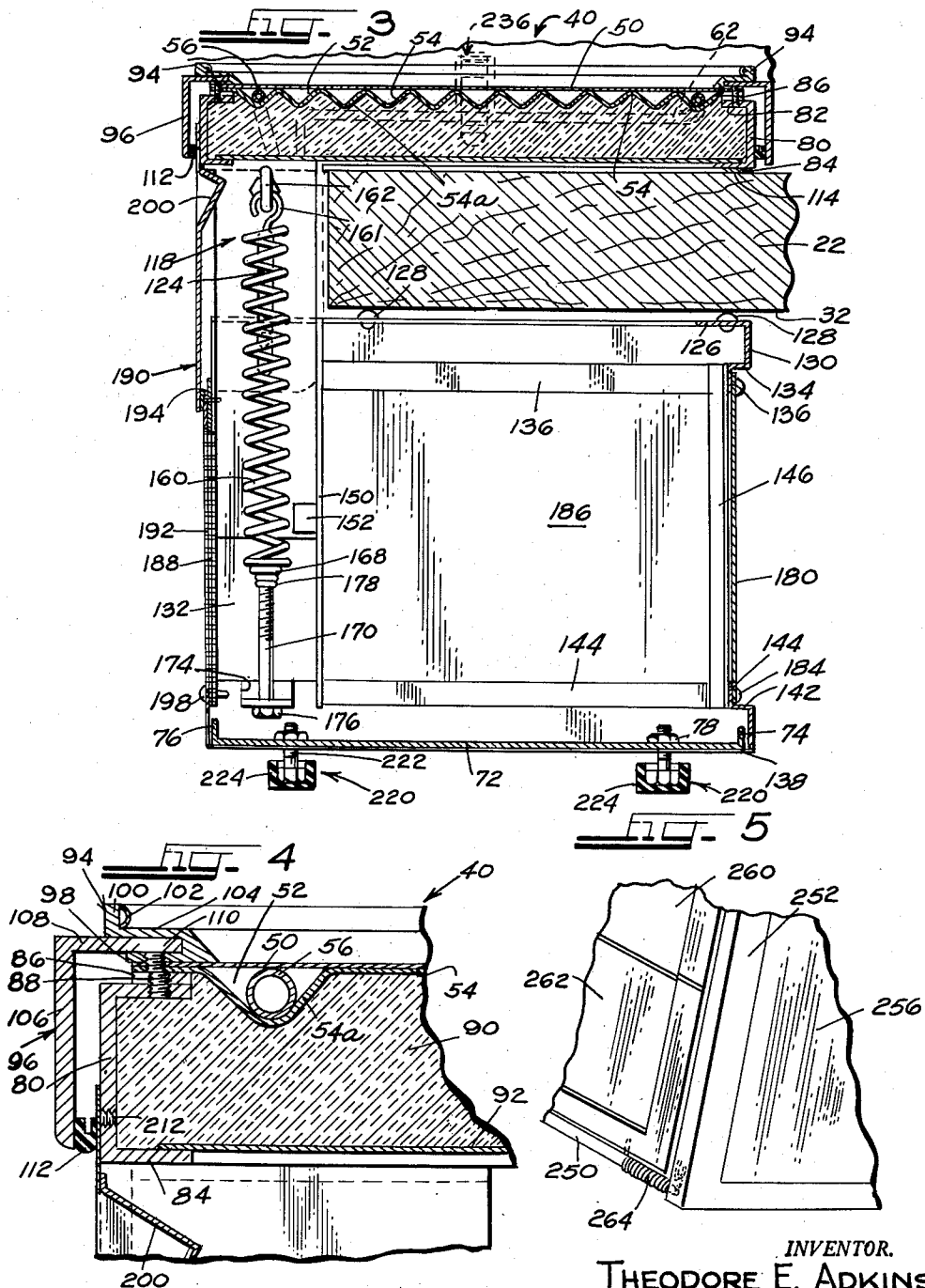
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3 Sheets-Sheet 2



INVENTOR.

THEODORE E. ADKINS

BY

Prangley, Baird, Clayton, Miller & Vogel
ATTORNEYS.

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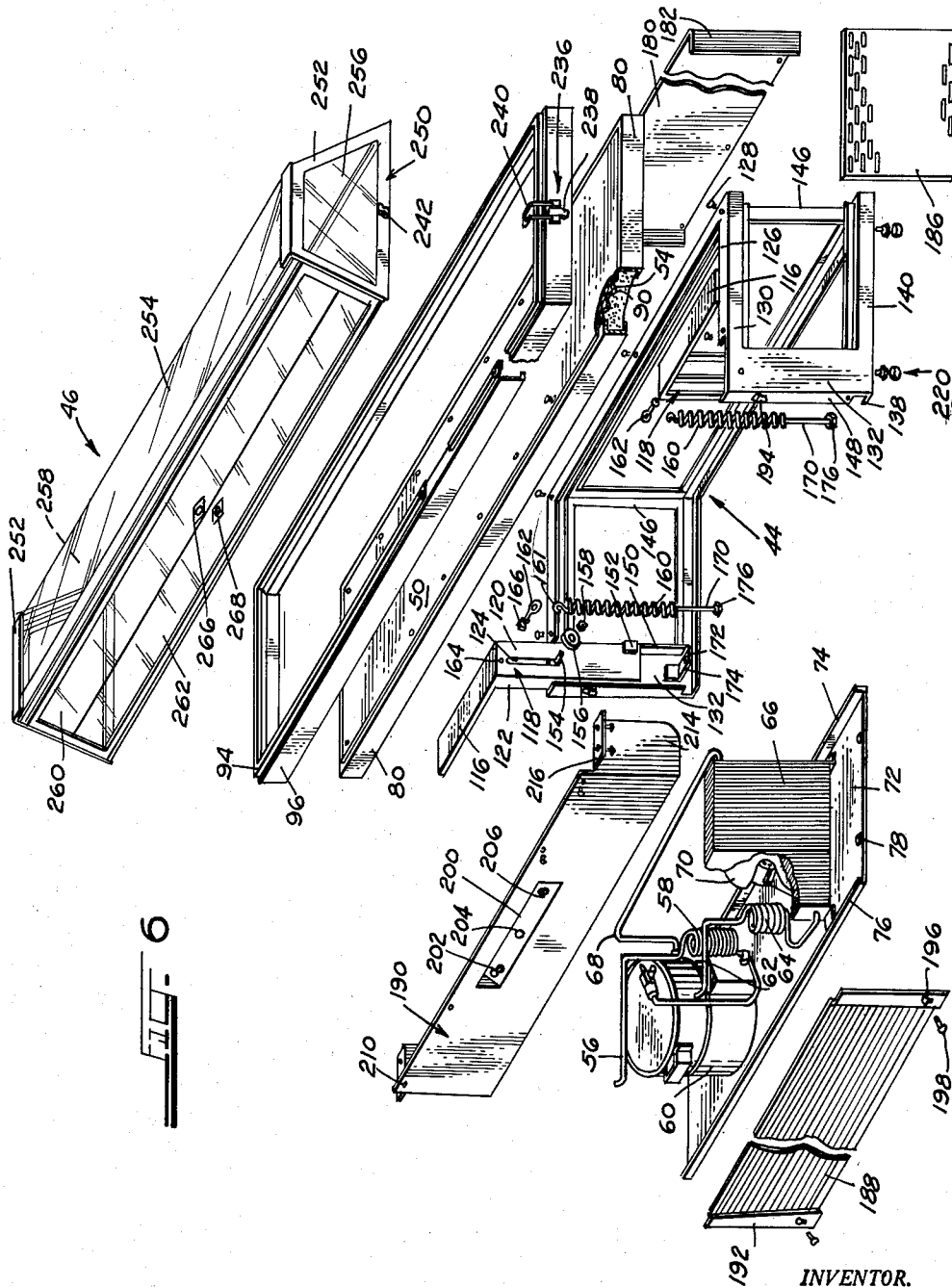
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3 Sheets-Sheet 3



INVENTOR.
THEODORE E. ADKINS
BY

Prangley, Baird, Clayton, Miller & Vogel
ATTORNEYS

1

2,973,631

REFRIGERATED DISPLAY UNIT

Theodore E. Adkins, 1315 Huber Lane, Glenview, Ill.

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16 Claims. (Cl. 62—246)

This invention relates to a refrigerated display unit and more particularly a refrigerated display unit which is portable and which can be mounted on a counter having accessible upper and lower surfaces joined by a free edge.

In restaurants, lunch rooms, bakeries, drug stores, variety stores, and the like which have counters for serving groceries, meals, snacks, etc., it often is desirable to provide a display case for foods of the type which must be kept refrigerated. For example, sales of cream pies, jello, pastries, desserts, salads and similar perishable foods are materially increased if these foods can be displayed at a point near the buyer and more specifically if the foods can be displayed on the counter itself so that a customer can inspect the food personally and at short range. Display units of this type which have been provided heretofore have occupied valuable serving counter space or have been so bulky as to prevent service around the units, have either been permanent installations which cannot be readily moved and interchanged, or have been positioned upon the back counter away from the customer whereby to diminish the sales value of the display.

Accordingly, it is an important object of the present invention to provide a portable refrigerated display unit which can be readily mounted upon and removed from a service counter of the type found in restaurants, lunch rooms, bakeries, drug stores, variety stores, and the like, whereby to display refrigerated articles on top of the counter immediately in front of the prospective customers.

In connection with the foregoing object, it is another object of the invention to provide a refrigerated display unit in which the refrigerated plate and the refrigerating equipment are structurally interconnected and the refrigerated plate for supporting the perishable foods is mounted on top of an associated counter and the associated refrigerating equipment therefor is mounted immediately beneath the counter out of sight of the customer.

Still another object of the invention is to provide a refrigerated display unit of the type set forth which occupies a very small portion of the depth of a serving counter whereby to permit use of the counter for service of customers, the refrigerated display unit having a height such that items can be readily served thereover to customers sitting in front of the refrigerated display unit.

Yet another object of the invention is to provide a refrigerated display unit of the type set forth in which a frame is provided which readily permits mounting of the refrigerated plate on the top of the counter and the refrigerating equipment beneath the counter, the refrigerated display and the refrigerated equipment being connected only by a small frame member and conduits for the refrigerant, all components of the refrigerated display unit being supported only by the counter.

In connection with the foregoing object, it is another object of the invention to provide in a refrigerated display unit of the type set forth, a frame construction which can accommodate varying thicknesses of counters, the frame construction including means resiliently urging the refrigerating equipment upwardly toward the lower sur-

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face of the counter and urging the refrigerated plate downwardly tightly upon the upper surface of the counter.

Another object of the invention is to provide in a refrigerated display unit of the type set forth an improved display case for mounting upon the refrigerated plate, the display case being detachably mounted upon the refrigerated plate to permit removal thereof for cleaning.

In connection with the foregoing object, another object of the invention is to provide a display case which is completely enclosed and is provided with improved doors for access thereto, the display case being mountable upon the associated refrigerated plate to permit access only by the waitress behind the counter or to permit access to the customer sitting in front of the counter.

Still another object of the invention is to provide in a refrigerated display unit a display case which is detachably mounted upon the refrigerated plate of the display unit and which is open at the top to permit ready access to materials disposed upon the refrigerated plate within the display case.

Further features of the invention pertain to the particular arrangement of the elements of the apparatus, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view of a top service counter with stools of the type used in restaurants, taverns, drug stores, variety stores and the like, with a refrigerated display unit mounted thereon in display position, the display unit being made in accordance with and embodying the principles of the present invention;

Fig. 2 is a perspective view from the rear of the refrigerated display unit of Fig. 1 on an enlarged scale and illustrating the mounting thereof upon the counter;

Fig. 3 is a further enlarged view in vertical section through the refrigerated display unit of Fig. 2 as seen in the direction of the arrows along the line 3—3 thereof, the refrigerating apparatus having been removed therefrom;

Fig. 4 is a still further enlarged view of the upper left-hand corner portion of the refrigerated display unit as viewed in Fig. 3;

Fig. 5 is an enlarged perspective view of the lower right-hand corner of the removable display case substantially as seen in the direction of the arrows along the line 5—5 of Fig. 2;

Fig. 6 is an exploded view in perspective of the refrigerated display unit of Fig. 2;

Fig. 7 is an end view on a reduced scale illustrating the refrigerated display unit of the present invention mounted upon a back counter;

Fig. 8 is an end view of the refrigerated display unit mounted on a service counter with the display case arranged to permit self-service by the customer;

Fig. 9 is a perspective view from the front showing three refrigerated display units of the present invention mounted on a counter and illustrating the use thereof as a refrigerated plate, as an open top case for displaying packaged items, and as a completely enclosed refrigerated display case; and

Fig. 10 is a partial enlarged perspective view of the open top case for displaying packaged items illustrated in Fig. 9 of the drawings.

There is shown in Fig. 1 of the drawings a refrigerated display unit generally designated by the numeral 20 made in accordance with and embodying the principles of the present invention. The display unit 20 has been shown mounted upon a service counter 22 which

is in turn mounted upon a base 24 by an upstanding front wall 26. Several stools 28 are positioned preferably equidistantly in front of the service counter 22 so that customers can sit thereon and eat upon the counter 22. Such an arrangement of the counter 22 and the stools 28 is commonly found in restaurants, drug stores, lunch counters, variety stores, and the like.

As may be best seen in Fig. 2 of the drawings, the refrigerated display unit 20 is mounted upon the rear of the counter 22, and is particularly adapted to be mounted upon the type of counter illustrated therein. More specifically, the counter 22 has a substantially flat upper surface 30 and a parallel lower surface 32 which are joined in the rear by a vertically extending free edge 34. Usually a service shelf 36 is mounted on the front wall 26 therebehind and below and spaced from the lower surface 32 of the counter 22.

The refrigerated display unit 20 generally comprises a cold plate 40, a refrigerating unit 42 and a frame 44 interconnecting the cold plate 40 and the refrigerating unit 42. In a typical installation, the cold plate 40 is positioned upon the upper surface 30 of the counter 22 and the refrigerating unit 42 is mounted below the counter 22 and is urged upwardly against the lower surface 32 of the counter 22, the cold plate 40 and the refrigerating unit 42 being held in this position by the frame 44, the interconnecting portion of the frame 44 being disposed to the rear of the free edge 34 of the counter 22. The cold plate 40 may be used with no display case thereon as is illustrated to the left in Fig. 9 of the drawings, or may be provided with a fully closed display case 46 as is illustrated in Figs. 2, 7 and 8 and to the right in Fig. 9, or may be provided with an open top case 48 as is illustrated in the center in Fig. 9 and in Fig. 10, all as will be described more fully hereinafter.

The construction of the cold plate 40 will now be described with particular reference to Figs. 3, 4 and 6 of the drawings. The cold plate 40 includes a freezing plate 50 which is formed substantially flat and of metal and has positioned against the underside thereof a plate 54 having a plurality of bends 54a formed therein spaced from the plate 50 to provide a space therebetween for the flow of refrigerant through the channel 52 formed thereby. Preferably the plate 54 is attached to the plate 50 by welding and the channel 52 is disposed in a sinuous path. The inlet end of the refrigerant channel 52 is connected to a conduit 56 (see Fig. 6) which is connected through a spring coil section 58 to a compressor 60, the spring coil section 58 being provided for a purpose which will be explained more fully hereafter. The outlet of the refrigerant channel 52 is connected to a conduit 62 and through a spring coil section 64 to the input to the condenser 66. The usual motor is provided to drive the compressor 60 and a second motor is provided to drive a fan 70 which blows air from the surroundings across the condenser 66 to remove heat from the refrigerant contained therein in the usual manner. The usual accumulator strainer, capillary tube and temperature control are provided. The compressor 60 and the motor therefor, the condenser 66, and the fan 70 and the motor therefor are all mounted upon a pan 72 which may be preferably formed of metal and is provided with upturned front and rear flanges 74 and 76 and leg support nuts 78 welded to the upper surface thereof for a purpose which will be explained hereafter. The pan 72 and the parts contained thereon can be removed from and disposed upon the frame 44 for convenience in installation and servicing.

It is to be understood that there are other available forms and constructions of freezing plates which may be utilized in the place of the freezing plate 50 described above and it is intended to encompass in this specification all such forms and constructions within the term "freezing plate."

The freezing plate 50 is mounted upon a channel iron

frame 80 which is generally rectangular in plan view and is provided with an inwardly extending upper flange 82 extending completely therearound and an inwardly extending lower flange 84 also extending completely therearound. Disposed upon the upper flange 82 is a suitable gasket 86 made for example of hard rubber and extending completely around the periphery of the frame 80 and receiving thereon the freezing plate 50, flat head screws 88 also being disposed around the periphery of the frame 80 and securing the freezing plate 50 and the gasket 86 and the flange 82 together as is best illustrated in Fig. 4 of the drawings. The gasket 86 provides thermal insulation between the freezing plate 50 and the frame 80 and also deadens transfer of sound therebetween so that noise from the refrigerating machinery is not transmitted to the freezing plate 50 and, conversely, so that noise of articles being placed upon the freezing plate 50 is dampened and muffled. Further to provide insulating of the freezing plate 50, packed insulation 90 such as glass fibers or the like is provided beneath the freezing plate 50 and particularly the plate 54 thereof, the insulation 90 being supported upon a bottom plate 92 which is disposed within the frame 80 upon the lower flange 84 thereof and suitably secured thereto as by welding.

In order to improve the appearance of the cold plate 40 and to facilitate the mounting thereon of the display cases 46 and 48, a gasket 94 is provided around the periphery of the freezing plate 50 and is held in position thereon by a gasket retaining frame 96. The details of construction of the gasket 94 and the frame 96 can be best seen from Fig. 4 of the drawings wherein it will be seen that the gasket 94 includes a base portion 98 which extends around the periphery of the freezing plate 50. Extending upwardly from the base portion 98 is an upstanding side flange 100 also extending completely around the periphery of the freezing plate 50 and including on the inwardly disposed surface thereof a hollow part-cylindrical and readily deformable portion 102. The bottom edges of the display cases 46 and 48 are adapted to be set within the upstanding flange 100 or the gasket 94 and to compress the portion 102 to form a tight seal therebetween, the bottom of the case resting upon the gasket surface 104.

The gasket retaining frame 96 includes a vertical flange 106 extending completely around the periphery of the cold plate 40 and having formed on the upper edge thereof an inwardly directed flange 108 also extending completely around the periphery of the cold plate 40 and having apertures therein to receive therethrough flat head screws 110 which also pass through apertures in the gasket base 98 and into threaded apertures in the freezing plate 50 whereby securely to mount the gasket 94 and the retaining frame 96 thereon. A resilient seal 112 preferably formed of rubber is also provided between the lower portion of the flange 106 and around the periphery thereof to seal the space between the frame 80 and the flange 106. Preferably a suitable adhesive or mastic is provided between the seal 112 and the flange 106 to mount the seal 112 thereon.

The cold plate 40 is adapted to rest directly upon the upper surface 30 of the counter 22 and in order to prevent marring of the surface 30 and to absorb vibrations, a flat gasket 114 is secured to the underside of the flange 84 completely along the portion of the flange 84 disposed over the counter 22. The gasket 114 may be made for example of rubber and may be 1/8" thick.

Mounted on the underside of the refrigerated plate 40 are two support plates 116 (see Fig. 6) spaced from each other and disposed at the rear of the refrigerated plate 40 and toward the ends thereof. Fixedly secured to the inner end of each of the support plates 116 is a channel 118 having a central web 120 and a pair of outwardly facing flanges 122 extending in the same direction as the support plate 116. Formed in the upper portion of the

web 120 is an elongated vertically oriented slot 124 adapted to receive a stud as will be described more fully hereafter.

The channels 118 are received within the support frame 44 which will now be described with particular reference to Figs. 3 and 6 of the drawings. The frame 44 has a unitary construction and includes an upper horizontally disposed flange 126 which is U-shaped in plan including a longer portion having shorter portions integral with each end thereof. Several apertures are provided in the flange 126 to receive therein bumpers 128 which may be formed of rubber or some other resilient material, the bumpers 128 being adapted to be disposed against the lower surface 32 of the counter 22 when the display unit 20 is in operative position. A wall 130 depends downwardly on the outer periphery of the flange 126 and extends completely therearound and on the ends merges with a vertically extending wall 132 which extends downwardly therefrom, the wall 132 being provided at each end of the frame 44. The wall 130 has a second inwardly directed flange 134 formed thereon and having an extent substantially equal to that of the flange 126. The flange 134 in turn has a depending wall 136 formed thereon and having a peripheral extent substantially equal to that of the flange 134.

The vertical walls 132 are formed integral with a bottom support flange 138 which extends completely around the frame 44. Formed integral with each wall 132 and the flange 138 is a wall 140 which has an extent equal to that of the wall 130 described above and is spaced therefrom. The upper edge of the wall 140 has an inwardly directed flange 142 formed integral therewith and the inner edge of the flange 142 has an upstanding wall 144 thereon, the flange 142 and the wall 144 having a peripheral extent substantially equal to that of the corresponding wall 134 and the flange 136 described above. The walls 136 and 144 are joined at the two corners thereof by angular braces 146 whereby to complete the rigid unitary frame 44.

The above described construction of the frame 44 results in a rigid structure which will support the heavy refrigerating equipment thereon. More specifically, the pan 72 supporting the compressor 60, the condenser 66, the fan 70 and the associated parts is received in the frame 44 and is supported thereby upon the lower U-shaped flange 138, the flange 138 providing support for each end of the pan 72 and for the edge thereof connected to the flange 74. By this construction the pan 72 can be readily mounted on the frame 44 by sliding the pan along the flange 138 and can likewise be readily removed therefrom for servicing.

As has been mentioned before, the channels 118 are slidably received by the frame 44. More specifically, each of the vertical walls 132 is provided with a rear inwardly directed flange 148 on the rearmost edge thereof and is provided with a cooperating and inwardly directed flange 150 on the other free edge thereof. The flange 150 is further provided with a rearwardly directed tongue 152 so that the channel 118 can be received between the flanges 148 and 150 and can be held against the vertical wall 132 by the tongue 152, whereby the channels 118 are slidably and telescopically received by the frame 44 but can have no lateral movement with respect thereto, the only permissible movement being in the vertical direction.

When the refrigerated plate 40 is in operative position upon a counter 22, the channels 118 depend downwardly behind the counter and below the counter and receive thereon the frame 44 whereby to permit vertical movement of the frame 44 with respect to the channels 118. Although the tongues 152 to a certain extent prevent lateral separation of the channels 118 with respect to the frame 44, further positive connection is provided by studs 154, one of which is mounted on each of the walls 132 and extends through the elongated slot 124 in the

associated channel 118, the outer end of the stud being threaded and receiving thereon a washer 156 held in position by a nut 158 threadedly engaging the stud 154. By this construction the frame 44 is also mounted so that it will not fall from the channels 118 but will be held thereon when the studs 154 are in engagement with the lower ends of the associated slots 124.

Means is provided to urge the frame 44 and all parts mounted thereon upwardly against the undersurface of an associated counter. More specifically, a pair of heavy coil springs 160 is provided, one of the springs 160 cooperating with an associated channel 118. The upper end of each spring 160 is fixedly mounted on the associated channel 118 by means of an integral hook 161 thereon engaging an eye bolt 162 having a shank passing through an aperture 164 in the channel web 120 and mounted thereon by a pair of nuts 166. The lower end of each spring 160 is provided with a nut 168 fixedly secured thereto and threadedly engaging a bolt 170. The bolt 170 passes through an aperture 172 in the bracket 174 mounted on the channel web 120 and the lower end of the bolt 170 is provided with a head 176 bearing against the underside of the bracket 174. A pair of lock nuts 178 holds the bolt 170 and the nut 168 in the desired position with respect to each other, the position of the nut 168 upon the bolt 170 being adjustable whereby to adjust the operating tension in the support spring 160.

The springs 160 are sufficiently strong that they can urge the frame 44 and all parts carried thereon including the refrigerating equipment upwardly toward the lower side 32 of the counter 22 whereby to press the bumpers 128 thereagainst. This arrangement permits the mounting of the refrigerated display unit 20 upon counters having widely different thickness. In a preferred constructional example of the unit 20, the unit may be mounted upon a counter having a thickness of from about 1" or less to about 3" or even greater if desired. Accordingly, the refrigerated display unit 20 can be mounted on substantially any counter now in use provided it has the upper and lower surfaces connected by a free edge described heretofore. In order to accommodate this relative movement between the refrigerated plate 40 and the refrigerating equipment including the compressor 60 and the condenser 66, the extensible coiled conduit sections 58 and 64 described heretofore have been provided so that no connections need be made or broken when installing the refrigerated display unit 20 upon a counter or when removing it from one counter to another.

The forward side of the frame 44 is closed by a solid back plate 180 having a vertical extent sufficient to fill the space between the walls 136 and 144 and having a horizontal extent to cover the forward opening in the frame 44 so that the flanges 182 provided on each end of the plate 180 extend rearwardly along the sides of the frame 44. A plurality of metal screws 184 serves to mount and to hold the plate 180 on the walls 136 and 144.

The ends of the frame 44 are closed by removable perforated grills 186 which have a vertical extent to fill the space between the walls 136 and 144 and having a horizontal extent such that they fill the space between the wall 132 and the back plate flange 182. Any suitable means such as clips or screws may be used to hold the grills 186 in operative position. The perforated character of the grills 186 insures that a current of air can be pulled from the left as viewed in Figs. 2 and 6 across the compressor 60 by the fan 70 and then through the condenser 66 and out to the right.

The rear of the frame 44 is closed by a grill 188 and a cover panel 190. The grill 188 is of the ventilator type and is mounted to give ready access to the refrigerating equipment for service purposes. More specifically, the grill 188 is provided with a pair of flanges 192 which are offset rearwardly and are received by retaining clips 194 mounted on the flanges 148. Keyhole apertures 196 are

formed in the lower portion of the flanges 192 and receive therethrough screws 198 which cooperate with apertures in the flanges 148.

The cover panel 190 is mounted upon the refrigerated plate 40 and overhangs the rear of the frame 44 to cover the space between the refrigerated plate 40 and the upper portion of the frame 44 regardless of the adjusted position of the frame 44 with respect to the refrigerated plate 40. The various operating controls for the refrigerated display unit 20 are mounted on a recessed control panel 200 on the cover panel 190, the control panel 200 being inclined upwardly and forwardly whereby to recess the control knobs. Mounted on the control panel 200 are the main power switch 202, an "Off-On" pilot light 204 and a screw driver "Cold Adjust" 206. Suitable connections are made from the various controls to the parts to be operated by conduits and conductors having sufficient length to permit adjustment of the frame 44 with respect to the refrigerated plate 40 to accommodate different thicknesses of the counter 22. In order to mount the cover panel 190 on the refrigerated plate 40, a plurality of apertures 210 is provided along the upper edge of the panel 190 to receive therethrough flat headed screws 212 (see particularly Fig. 4). The ends of the panel 190 are bent rearwardly to provide flanges 214 which wrap around the ends of the frame 44 and the flanges 214 are provided with horizontally disposed flanges 216 having apertures therein to receive additional screws 212 further to secure the panel 190 to the cold plate 40.

One of the principal objects of the present invention is to provide a unit which can be readily mounted upon and removed from an associated counter 22. In order to prevent scarring of any surface upon which the unit is rested, the frame 44 is provided with four depending feet 220, each foot 220 including a bolt 222 having a threaded shank passing through an aperture in the pan 72 and engaging in the aligned one of the nuts 78 welded to the pan 72. The head of each bolt 222 is provided with a cap 224 which is preferably formed of rubber, plastic or some other material which will not scar surfaces coming in contact therewith.

In certain installations the refrigerated plate with no display case thereon is adequate and perfectly satisfactory. Such an installation is particularly useful for displaying and selling packaged items such as milk, butter, eggs, cream, dispensed drinks, and the like. Such a unit is also useful in kitchen areas or at the counter for food preparation or processing such as in the preparation of salads, desserts, meats, etc. Such an installation is shown to the left in Fig. 9 of the drawings wherein the refrigerated plate 40 is shown provided with no case and mounted directly upon the counter 22 adjacent to a display case 228.

In many installations, however, it is desirable to have a display case associated with the refrigerated plate 40. In certain cases the display case may be an open top case such as the case 48 shown in the center of Fig. 9 and in Fig. 10 of the drawings. Such a case is useful for displaying and selling packaged items such as milk, butter, eggs, cream and the like and also for loose bulk items such as fruits, vegetables, etc. Such a display case is also useful for displaying prepared salads, desserts, hors d'oeuvres, etc. The display case 48 includes essentially a frame 230 to support four upstanding rectangular pieces of glass, two pieces 232 of the glass being shaped to have a length equal to the length of the refrigerated plate 40 and two pieces 234 of the glass being shaped to have a length equal to the width of the refrigerated plate 40. The display case 48 is removably secured to the refrigerated plate 40 by means of latches 236, a latch 236 being positioned at each end of the refrigerated plate 40. Each latch 236 includes an operator 238 hinged to the refrigerated plate 40 and a bail 240 pivotally mounted thereon and engageable with a keeper 242 mounted on the frame 230 of the display case 48. The frame 230 fits

within the gasket 94 (see Figs. 3 and 4) and bears against the portion 102 to form a tight seal therewith and rests upon the base 104. By the use of the latches 236, the display case 48 can be readily removed for cleaning and servicing or for conversion of the refrigerated display unit to some other use such as the open plate or for substitution of the display case 46 thereon.

In most counter installations, it will be desirable to use the completely enclosed display case 46. The display case 46 is thus illustrated in Figs. 2, 5, 6, 7 and 8 of the drawings wherein it will be seen that the display case has a substantially rectangular base defined by a frame 250 having upstanding integral end frames 252 which are formed as trapezoids. The end frames 252 support therebetween a top 254 which may be formed of glass, plastic or similar suitable material which is transparent so that the goods within the display case 46 can be seen by prospective purchasers. The ends of the display case are closed by end plates 256 which are also preferably formed of glass, plastic or similar transparent material and one of the sides is filled by an upwardly slanting side wall 258 similarly formed of glass, plastic or the like. The other side of the display case 46 is closed by a pair of hinged doors 260 and 262, the upper door 260 being hingedly supported along the upper edge thereof on the end frames 256 and being urged downwardly by gravity to a closed position against the end frames 252. The lower door 262 is hinged on the lower end thereof and is urged upwardly into closed position by a coiled spring 264 (see Fig. 5). Preferably the doors 260 and 262 are formed of plastic and are provided with handles 266 and 268, respectively. By forming the doors 260 and 262 of plastic, there is less likelihood of breakage during use and a lighter opening weight is provided for easy use by waitresses and customers.

The frame 250 is provided with a catch 242 on each end thereof on the lower portion to cooperate with the latch 236 formed on the refrigerated plate 40, the latch 236 having been explained above with respect to the display case 48. The display case 46 may be mounted as illustrated in Figs. 1 and 2 of the drawings so that only the waitress or someone behind the counter 22 can have access to the interior of the display case 46. If it is desired to provide self-service, whereby the customer helps himself to the items displayed within the case 46, then the display case 46 may be reversed upon the refrigerated plate 40 and placed as illustrated in Fig. 8, the doors opening outwardly toward the front to a customer on the front of the counter 22. The latch 236 and the keepers 242 are mounted symmetrically so that the display case 46 can be so reversed without changing the operating parts thereof. A removable wire rack 270 may also be provided within the display case 46 on suitable supports therein to increase the effective display area within the case 46.

Before installation, the refrigerated display unit 20 is assembled as shown in Figs. 2, 3 and 4 of the drawings with the refrigerating equipment positioned within the frame 44. Prior to application to a counter, the frame 44 is urged upwardly by the springs 160 toward the refrigerated plate 40 to the maximum extent and more specifically, the studs 154 move upwardly to the upper ends of the slots 124 in the support channels 118. The refrigerating equipment can be checked at this time to be sure that it is operating correctly and that it is properly adjusted while the unit is still at the factory or in storage and before transportation to the point of installation. After the unit has been thoroughly checked and is ready to be installed, it can be transported to the point of installation and installation is accomplished simply by forcing the refrigerated plate 40 and the frame 44 away from each other against the action of the support springs 160 after which the counter 22 can be positioned between the refrigerated plate 40 and the frame

44. Ordinarily the tension of the springs 160 will be sufficient firmly to mount the unit in operative position. If the tension does not seem to be sufficient, the tension can be adjusted by means of the bolt 170 and the nut 168. The upper surface of the counter 22 will not be marred since the resilient gasket 114 will protect that surface. Likewise the undersurface of the counter 22 will not be marred because of the bumpers 128 carried by the frame 44.

It will be seen that the refrigerated plate 40 is in position on top of the counter to be viewed by prospective customers. All of the refrigerating equipment and the frame 44 are disposed beneath the counter and are suspended in effect from the refrigerated plate in cantilever fashion, the counter 22 supporting the weight of the entire unit. As a result no floor space is utilized for refrigerating equipment or other auxiliaries and the only space required is that commensurate with the display surface of the refrigerated plate 40. The unit is self-contained and requires only a standard electrical outlet (not shown) connected to a source of power to receive a power plug on a cord (not shown) for the compressor and the fan motor. No unsightly piping or drains or special installation is required for mounting and operation of the refrigerated display unit 20. All refrigerant connections are contained within the unit and need not be connected or otherwise adjusted at the point of installation since the conduit sections 58 and 64 will accommodate any necessary movement of the frame 44 with respect to the refrigerated plate 40 to effect installation of the unit upon the counter 22.

The refrigerated display unit 20 may be preferably mounted upon the rear of the front service counter 22 as is illustrated in Figs. 1, 2, and 8-10 of the drawings. Such an installation places the refrigerated plate 40 in position to be viewed readily by prospective customers of food items stored and displayed thereon. The refrigerated display unit 20 when so installed occupies less than half of the depth of the usual service counter 22 and its height is such that items can be served over the top of it whereby there is no loss of counter space.

In certain cases, however, it may be desirable to mount the refrigerated display unit 20 on a back counter such as the back counter 280 illustrated in Fig. 7 of the drawings. Such an installation of the unit 20 can be readily accomplished provided that the back counter 280 has free upper and lower surfaces joined by a free outer edge as is the case with the rear of the front counter 22.

After installation of the refrigerated display unit 20 upon a suitable counter, the refrigerated plate 40 may be used with or without an associated display case. Should it be desired to utilize a display case, either the display case 46 or the display case 48 or some similar display case may be utilized. Since the display cases are mounted upon the refrigerated plate 40 by means of the quickly operable latches 236, the display cases can be readily removed for cleaning or interchange of one display case for another. When utilizing the display case 46, it may be arranged with the doors 260 and 262 disposed to the rear so that only the waitress can have access to the interior of the display case 46 or alternatively the doors can be arranged to the front as illustrated in Fig. 8 so that the customer can serve himself therefrom.

It will be seen that there has been provided a refrigerated display unit which fulfills all of the objects and advantages set forth above. Although certain preferred forms of the invention have been illustrated and described, it is to be understood that various changes and modifications can be made therein without departing from the spirit and scope of the invention. Accordingly, the invention is intended to cover all modifications encompassed in the following claims.

I claim:

1. A refrigerated display unit for mounting on a

counter having accessible upper and lower surfaces joined by a free edge, comprising a refrigerated display member for supporting articles to be displayed and refrigerated, said refrigerated display member being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a frame mounted on said refrigerated display member to extend downwardly therefrom past the free edge of the associated counter and below the lower surface thereof, said frame including a portion adapted to extend below the associated counter and being adjustable toward and away from said refrigerated display member and against the underside of the associated counter to accommodate different thicknesses of counters therebetween and refrigerating equipment for said refrigerated display member mounted on said frame below the associated counter and supported thereby.

2. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a refrigerated display member for supporting articles to be displayed and refrigerated, said refrigerated display member being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said refrigerated display member and extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the counter and to extend under the counter, means interconnecting said frame members to mount said second frame member against the lower surface of the associated counter, said interconnecting means being adjustable to permit adjustment of the position of said frame members with respect to each other thereby to accommodate different thicknesses of counters between said refrigerated display member and said second frame member, and refrigerating equipment for said refrigerated display member mounted on said second frame member below the associated counter and supported thereby.

3. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the counter and to extend under the counter, means interconnecting said frame members and resiliently urging said second frame member upwardly against the lower surface of the associated counter, and refrigerating equipment for said cold plate mounted on said second frame member below the associated counter and supported thereby.

4. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and including a channel member extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the associated counter and to extend under the counter, means formed on said second frame member to receive said channel member, a spring member connected between said frame members and urging said second frame member upwardly against the lower surface of the associated counter whereby to accommodate different thicknesses of counters therebetween, and refrigerating equipment for said cold plate

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mounted on said second frame member below the associated counter and supported thereby.

5. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and including a first channel member extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the associated counter and to extend under the counter and including a second channel member, said channel members being slidably interconnected and including means to limit the separation between said frame members, a spring member connected between said frame member and urging said second frame member upwardly against the lower surface of the associated counter whereby to accommodate different thickness of counters therebetween, and refrigerating equipment for said cold plate mounted on said second frame member below the associated counter and supported thereby.

6. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a refrigerated display member for supporting articles to be displayed and refrigerated, said refrigerated display member being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said refrigerated display member adjacent to the edge thereof adapted to be positioned toward the free edge of the associated counter, said first frame member extending downwardly from said refrigerated display member past the free edge of the associated counter and below the lower surface thereof, a second frame member adapted to be disposed below the lower surface of the counter and to extend thereunder, means adjustably interconnecting said frame members to mount said second frame member on said first frame member with said second frame member extending therefrom in the same direction as said refrigerated display member and supported in cantilever fashion, and refrigerating equipment for said refrigerated display member mounted on said second frame member below the associated counter and supported thereby.

7. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the associated counter and to extend under the counter, means adjustably interconnecting said frame members to accommodate therebetween counters of different thicknesses, refrigerating equipment mounted on said second frame member below the counter and supported thereby, and refrigerant conduits interconnecting said refrigerating equipment and said cold plate, said refrigerant conduits including extensible sections to accommodate relative movement between said frame members.

8. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and

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extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the counter and to extend under the counter, means adjustably interconnecting said frame members to accommodate therebetween counters of different thicknesses, a pan slidably mounted upon said second frame member, and refrigerating equipment for said cold plate mounted on said pan and adapted to be positioned below the associated counter and removable from thereunder to facilitate servicing.

9. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the associated counter and to extend under the counter, means adjustably interconnecting said frame members to accommodate therebetween counters of different thicknesses, a pan slidably mounted upon said second frame member, refrigerating equipment mounted on said pan for movement therewith and support thereby, and refrigerant conduits including extensible sections interconnecting said refrigerating equipment and said cold plate, said extensible sections accommodating relative movement between said frame members and withdrawal of said pan to facilitate servicing of said refrigerating equipment.

10. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a first frame member mounted on said cold plate and including a first mounting member extending downwardly therefrom past the free edge of the associated counter, a second frame member adapted to be disposed below the lower surface of the associated counter and extending thereunder and having a second mounting member thereon, means slidably interconnecting said mounting members to permit relative movement between said frame members, a spring member connected between said frame members and urging said second frame member upwardly against the lower surface of the associated counter whereby to accommodate different thicknesses of counters therebetween, a cover panel mounted on said first frame member and extending downwardly therefrom and behind said mounting members to cover the joint therebetween in all adjusted positions thereof, and refrigerating equipment for said cold plate mounted on said second frame member below the counter and supported thereby.

11. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a gasket mounted on the bottom of said cold plate around the periphery thereof and adapted to be disposed between said cold plate and the associated counter surface to prevent marring thereof, a frame member mounted on said cold plate and extending downwardly therefrom past the free edge of the associated counter, a second frame member including portions adapted to be disposed below the lower surface of the associated counter and to extend under the counter, bumpers mounted on the upper surface of said portions in position to come into contact with the lower surface

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of the associated counter, means interconnecting said frame members to urge said second frame member toward the lower surface of the associated counter and said bumpers thereagainst, and refrigerating equipment for said cold plate mounted on said second frame member below the associated counter and supported thereby.

12. A refrigerated display unit for mounting on a counter having accessible upper and lower surfaces joined by a free edge, comprising a cold plate for supporting articles to be displayed and refrigerated, said cold plate being adapted to be positioned upon the upper surface of an associated counter adjacent to the free edge thereof, a display case removably mounted upon said cold plate to protect the articles thereon, a first frame mounted on said cold plate to extend downwardly therefrom past the free edge of the associated counter and below the lower surface thereof, a second frame including portions adapted to be disposed below the lower surface of the counter and to extend under the counter, means adjustably interconnecting said frames to position said second frame against the lower surface of the associated counter to accommodate different thicknesses of counters between said cold plate and said second frame, and refrigerating equipment for said cold plate mounted on said second frame below the associated counter and supported thereby.

13. A refrigerated display unit as set forth in claim 12, wherein a latch mechanism is provided removably to mount said display case upon said cold plate.

14. A refrigerated display unit as set forth in claim 12,

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wherein said display case completely surrounds said cold plate and is open at the top to permit ready access to articles on said cold plate.

15. A refrigerated display unit as set forth in claim 12, wherein said display case is completely enclosed and is provided on one side thereof with a door to permit access to the interior of said display case and to articles disposed on said cold plate.

16. A display case for use on a refrigerated cold plate comprising a frame defining four side walls and a top transparent material mounted in said frame to form three of said side walls and said top, a pair of doors mounted to close the fourth wall, the upper of said doors being hinged on the upper edge thereof whereby said upper door is returned to its closed position by gravity, said lower door being hinged along the lower edge thereof, spring means normally urging said lower door toward the closed position thereof, and latch mechanism mounted on said frame and adapted to cooperate with latch mechanism on the associated cold plate removably to mount said display case on the associated cold plate.

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UNITED STATES PATENT OFFICE
CERTIFICATION OF CORRECTION

Patent No. 2,973,631

March 7, 1961

Theodore E. Adkins

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 34, for "thickness" read -- thicknesses
--; column 11, line 18, for "member" read -- members --.

Signed and sealed this 5th day of September 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents