March 5, 1940. H. D. KING 2,192,519

REFRIGERATOR DOOR

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Fig. 1.

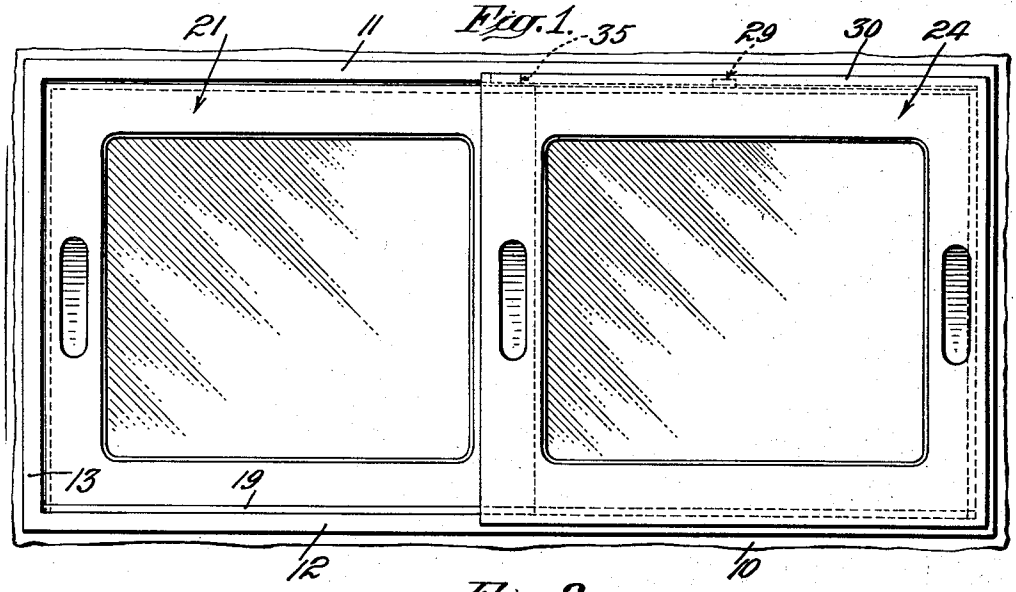


Fig. 2.

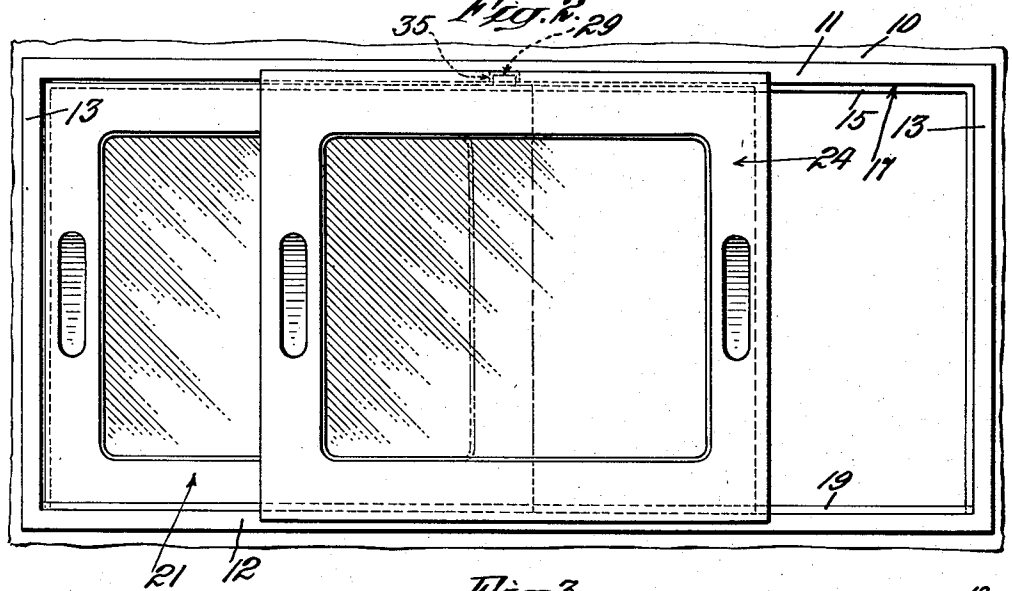
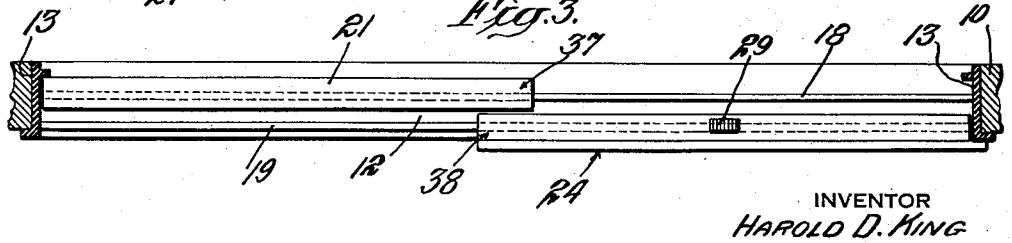


Fig. 3.



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Fig. 4.

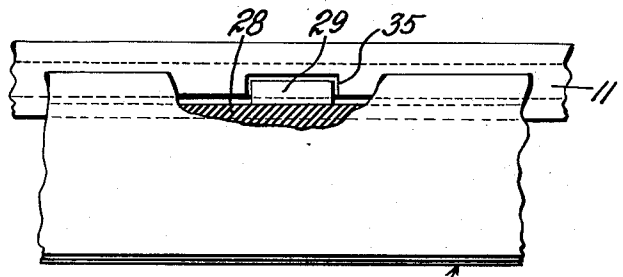


Fig. 5.

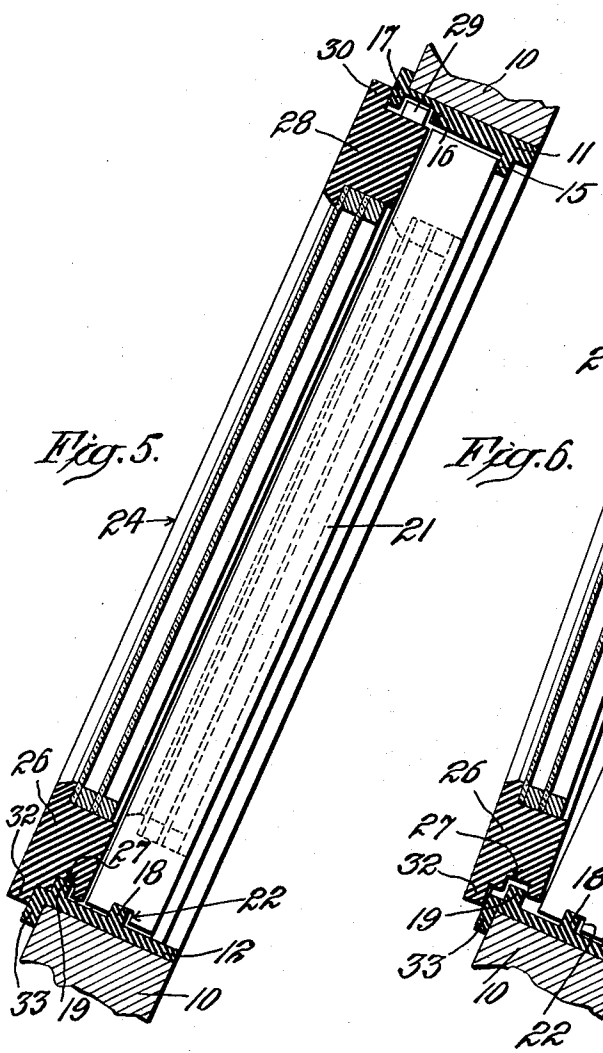
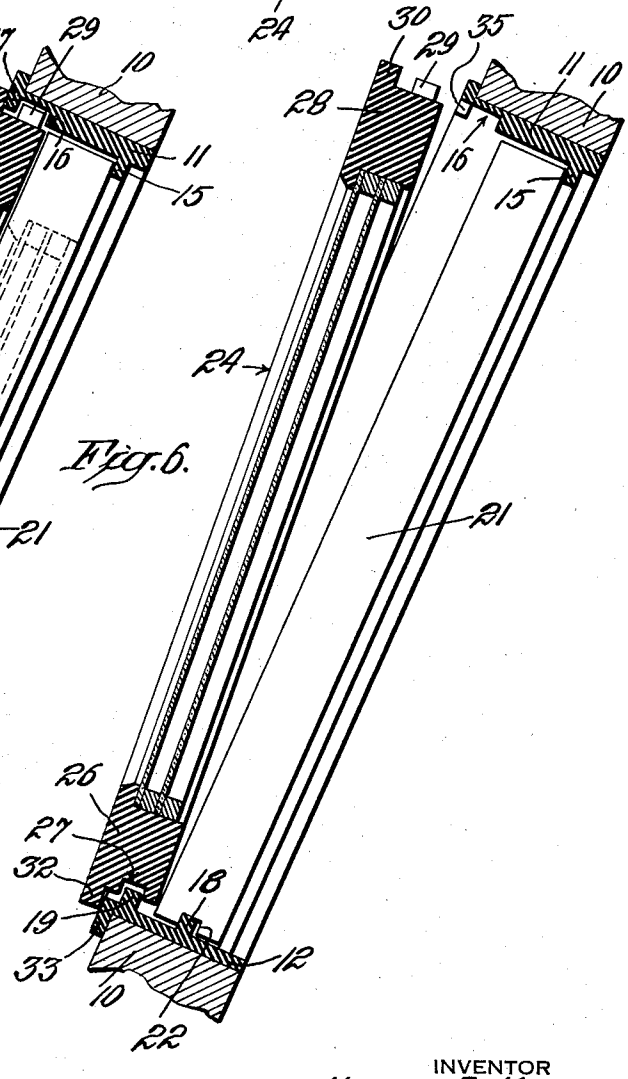


Fig. 6.



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UNITED STATES PATENT OFFICE

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REFRIGERATOR DOOR

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Application June 22, 1938, Serial No. 215,137

2 Claims. (Cl. 20—19)

The invention relates to an improvement in sliding doors and casements for display cases and cabinets, and more particularly to an improvement in sliding doors for display cases used as refrigerators.

Refrigerator display cases as commonly constructed are provided on their front side with a fixed transparent panel, usually of glass, and on their rear side with a rectangular opening closed by a pair of sliding doors which overlap each other when moved longitudinally of the case and also slightly overlap each other at their inner ends when in closed position. The difficulty in constructing these sliding doors and the cooperating parts of the sills in the door casing or casement to prevent ingress of the room air into the case and egress of cold air from the case has called forth numerous patented efforts to provide a construction not only satisfactory with respect to air leakage but also simple and cheap to manufacture. The object of the present invention is to provide a sliding door structure for display cases which will satisfactorily prevent ingress of warm air into the case and egress of cold air therefrom and which is more simple in construction than the sliding doors for display cases heretofore produced and consequently much cheaper to manufacture. To this end the invention consists in the improved refrigerator display case hereinafter fully described and particularly pointed out in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Fig. 1 is a side elevation of the improved sliding door structure in a display case with the doors shown in closed position; Fig. 2 is a view similar to Fig. 1 but with the outer door shown partly open and in position for disengagement from the display case; Fig. 3 is a longitudinal section of the display case with the upper sill removed to show the two sliding doors in top plan; Fig. 4 is an enlarged detail illustrating the position of the interlocking means for the outer door when the latter is in position to be removed from the display case; Fig. 5 is an enlarged vertical section through the outer door and the adjacent parts of the upper and lower sills, with the door in normal sliding position, the inner door being indicated in end elevation; and Fig. 6 is a view similar to Fig. 5, showing the upper part of the outer door swung outwardly from the upper sill so that the door may be lifted from the lower sill.

The improved refrigerator display case and sliding door structure comprises the usual form of display case, the portions of which around the doors are indicated at 10 and may be constructed from any suitable material. The rear side of the case has a rectangular opening provided on its inner edges with an upper sill 11, a lower sill 12 and side sills 13. These sills are preferably composed of hard rubber, but may be composed of any other suitable material.

The upper sill is provided throughout its length on the rear part of its under surface with a downwardly extending tongue 15, and on its front part with a longitudinally-extending groove 16. The outer portion 17 of the upper sill constitutes a downwardly-extending lip or flange defining the outer wall of the groove 16. The upper part of the flange 17 overlaps the front edge of the adjacent part of the display case. The rear part of the upper surface of the lower sill 12 is provided with a rear track 18 extending longitudinally throughout the length of the sill and the front part is provided with a front track 19 extending parallelly with the track 18 throughout the length of the lower sill.

The rear sliding door, indicated generally at 21, may be of usual rectangular construction, glass panelled, and provided medially in its lower edge with a groove 22 adapted to slide on the track 18, the clearance between the track 18 and the groove 22 being only sufficient for sliding purposes. The rear edge of the upper part of the rear door 21 bears against the front surface of the tongue 15, and in this connection it will be noted, by reference to Figs. 5 and 6, that the rear part of the display case is inclined, and that therefore, the upper part of the rear door 21 rests against the tongue 15 by gravity. Although it is not necessary to provide the rear sliding door 21 and the sill 12 with the interlocking track and groove arrangement, for the proper sliding movements of the rear door, this arrangement has been found convenient for preventing accidental displacement of the door.

The front sliding door, indicated generally at 24, and its cooperating parts of the upper and lower sills embody the novel features of the invention. The lower frame member 26 of the front door is provided in its under surface with a longitudinally-extending groove 27 arranged to slide upon the front track 19. The upper surface of the upper frame member 28 of the front door is provided about midway of its length with a block 29 which is arranged to slide in the groove 16 in the front part of the upper sill 11, the clearance between the block and the groove being mechanical only. The forward edge of the upper frame member 28 is extended upwardly as a

flange 38 arranged to overlap the flange 17 of the upper sill and to bear thereon to form a tight sliding joint. In like manner the front edge of the lower frame member 26 of the front door is extended downwardly as a flange 32 arranged to overlap and bear upon flange 33 extending downwardly from the front portion of the lower sill 12. The positions of the various parts thus far described and the relation of the rear surface of the front door to the front surface of the rear door, when the doors are in normal sliding position, are clearly shown in Fig. 5, and it will be noted that there is only a working clearance between the parts so that ingress of warm air into the display case and egress of cold air therefrom are effectually prevented.

The means for preventing the outer door from being removed from its place between the upper and lower sills except when it is in a predetermined position is the block 29, which if the upper part of the front door is moved outwardly contacts with the inner surface of the flange 17 of the upper sill thereby preventing the outward movement of the upper part of the front door. Moreover, the block 29 by contact with the upper surface of the groove 16 in the upper sill prevents upward movement of the front door so that the lower frame member 26 cannot be disengaged from the front track 19 while the front door is in any normal longitudinal position. To permit the front door to be placed in operative position between the lower and upper sills and to permit it to be removed therefrom, the flange 17 is provided at substantially its middle part with a notch 35 wider than the length of the block 29, as best shown in Fig. 4, and extending upwardly slightly beyond the upper surface of the block 29 so that when in the sliding movements of the front door the block 29 is in register with the notch 35, as shown in Figs. 2 and 4, the upper part of the front door may be swung outwardly, as shown in Fig. 6, thereby disengaging it from the upper sill. The construction at the lower edge of the lower frame member 26 of the outer door and the corresponding parts of the lower sill 12 permits the outward movement of the upper part of the front door without imposing any strain on the cooperating parts of the lower frame member 26 and the corresponding parts of the lower sill, but permits these parts to separate slightly as shown in Fig. 6. The outer door is now in position to be lifted free of the lower sill. To replace the door in operative position it is only necessary to rest the lower frame member 26 on the outer part of the lower sill 12, as shown in Fig. 6, register the block 29 with the notch 35 and then swing the upper part of the outer door inwardly into the position shown in Fig. 5, and thereafter slide it longitudinally. In assembling the doors with the display case, it will be understood that the rear door 21 is first placed into position, this being simply done by engaging the groove 22 in the lower part of the door with the track 18 and resting the upper part of the door against the tongue 15. To remove the rear door it is of course necessary to first remove the outer door.

The length of the block 29 is such that it is less than the overlap of the outer and inner doors, as clearly indicated in Fig. 1, and also in Fig. 3 where the inner end of the rear door is marked 37 and the inner end of the outer door is marked 38. Thus the front surfaces of the improved sliding doors for refrigerator display cases of the present invention give no indication of the improved locking means covered by the doors, and so present a finished appearance.

I claim:

1. A display case having a door opening including a lower sill provided on its upper surface with a longitudinally-extending track, an upper sill provided on its under surface with a longitudinally-extending groove, the outer portion of the upper sill constituting a downwardly-extending flange defining the outer wall of the groove, and a sliding door having a lower frame member the lower edge of which is provided with a longitudinally-extending groove adapted to slide on the track, and an upper frame member having on its front face an upwardly extending flange arranged to slide on the flange of the upper sill, a block mounted on the upper edge of the upper frame member adapted to slide in the groove in the upper sill, the engagement of said block with the bottom of the groove preventing upward movement of the door in all longitudinal positions thereof and the engagement of said block with the inner surface of the flange of the upper sill preventing outward movement of the upper part of the door except in a certain position, said flange on the upper sill being provided with a notch slightly longer than the block and with which the block is adapted to register so that the upper part of the door may be moved outwardly to permit the lifting of the door from the track, the flange of the upper frame covering the notch in all positions of the door.

2. A display case having a door opening including a lower sill the upper surface of which is provided with a front and a rear longitudinally-extending parallel track, an upper sill the rear part of the under surface of which is provided with a longitudinally-extending tongue and the front part of which is provided with a longitudinally-extending groove, the outer portion of the upper sill constituting a downwardly-extending flange defining the outer wall of the groove, a rear sliding door the lower part of which is provided with a longitudinally-extending groove adapted to bear on the rear track, the rear edge of the upper part of said door being adapted to rest against the tongue, and an outer door having a lower frame member the lower edge of which is provided with a groove adapted to slide on the outer track, and an upper frame member having a flange arranged to slide over the flange of the upper sill, a block mounted on the upper edge of the upper frame member adapted to slide in the groove in the upper sill, the engagement of the block with the bottom of the groove in the upper sill preventing upward movement of the outer door in all longitudinal positions thereof, and the engagement of the block with the inner surface of the flange of the upper sill preventing outward movement of the upper part of the outer door except in a certain position, and the flange being provided with a notch slightly longer than the block and with which the block is adapted to register to permit the upper part of the outer door to be moved outwardly so that the outer door may be lifted from the outer track, the flange of the upper frame covering the notch in all positions of the door.

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