Sept. 25, 1962 H. M. RIEGELMAN 3,055,064

SLIDING CLOSURE LOCK

Filed Sept. 26, 1960

Fig. 2

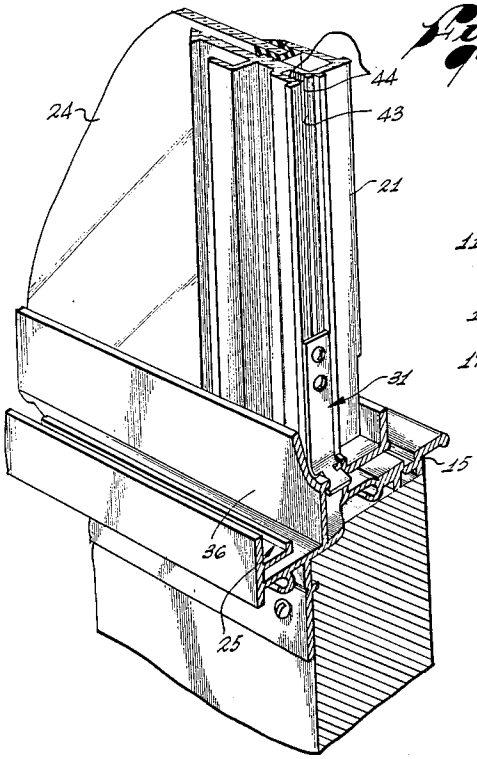


Fig. 1

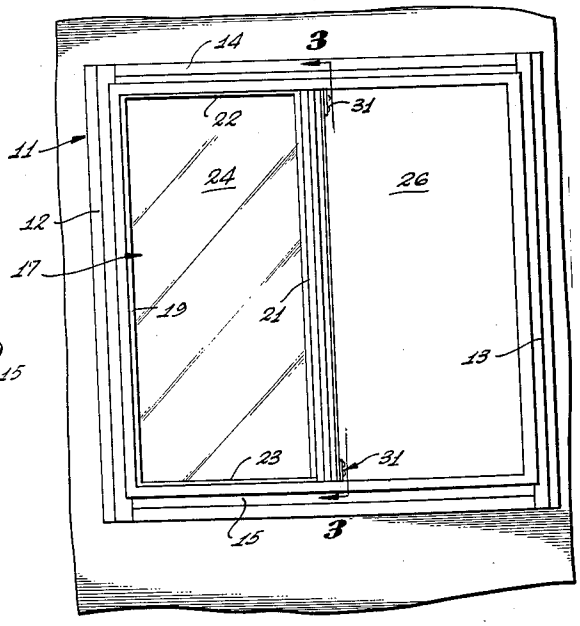


Fig. 4

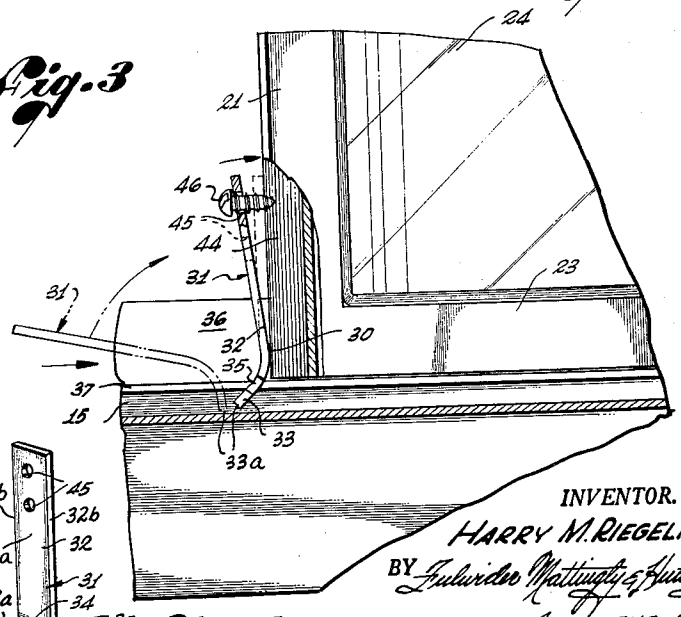


Fig. 3

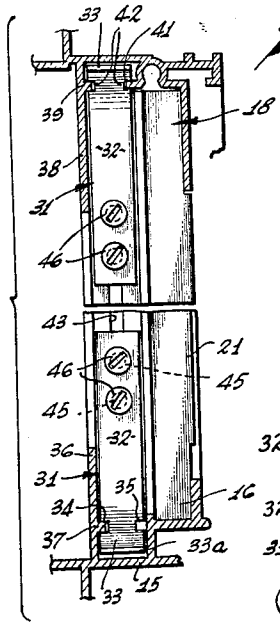


Fig. 5

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SLIDING CLOSURE LOCK

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This invention relates generally to sliding closures and more particularly to means for locking or clamping a normally slidable panel or sash in stationary position.

Even though it may later be desired to hold a window or door panel against movement, it is often preferred to have such a panel initially slidable both for ease of installation, where the frame is put in place first and the sliding sections inserted thereafter, and for interchangeability of the stationary and sliding sections from one end of the track to the other.

Heretofore, when it was desired to prevent movement of a normally slidable panel or sash in a window or door, obstructing screws, lugs or similar elements have been attached directly to the tracks in which the panel is slidably mounted. This often resulted in conflict between attachment openings which might be made if the position of the panel were to be changed along the track, for example, from one end of the track of the window or door to the other. Furthermore, the obstructing means did not positively prevent tilting or other movements of the panel which might result in objectionable vibration and noise.

According to the present invention, the window or door sliding panel which it is desired to maintain in a stationary position is locked or clamped by a clip having a leg mounted to the top and/or bottom of the stile of the sliding panel, and means extending from the leg for exerting pressure on a stationary flange provided at the top and/or bottom of the frame. The pressure thus exerted positively locks the panel in stationary position and positively prevents tilting and other undesired movements thereof. The mounting of the clip is accomplished without the use of screw holes or slots in either the sill track or the top track in which the panel is mounted so that the panel may be positively locked in any desired position along the tracks.

It is, therefore, a major object of the present invention to provide a new and improved means for locking or clamping a slidable closure panel of a door or window.

Another object of the invention is the provision of an improved closure for a door or window comprising a plurality of slidable panels and a novel clamping means for positively locking one or more of said panels in stationary position.

A further object of the invention is the provision of a new and improved closure for a door or window employing a pair of normally slidable panels and having a novel clamping means for positively holding one or the other slidable panels in stationary position, said clamping means eliminating the need for attachment openings in either the sill or the top rail of the closure frame.

Still another object of the present invention is to provide, in a window or door having a plurality of sliding panels, a novel clamping means mounted on one of said sliding panels adapted to exert a positive pressure on the top and/or bottom track of the window or door frame, whereby to positively retain said sliding panel with respect to its frame and eliminate noise, vibration, and drafts due to loose or improper positioning.

The foregoing and other objects and features of the invention will be readily apparent to those skilled in the art from the following specification and the annexed drawing in which:

FIGURE 1 is a front elevational view of the closure of the invention;

FIGURE 2 is a perspective view, partly in section and partly in elevation, including a vertical section through the frame sill and a horizontal section through the vertical stile of a panel or sash that is locked in place;

FIGURE 3 is an enlarged sectional view, in elevation, through a portion of the frame sill and top track, showing a pair of locking clips mounted onto a panel stile;

FIGURE 4 is a detailed elevational view, partly in section, illustrating the manner in which the clamping clip is mounted in locking position; and

FIGURE 5 is a perspective view of the clamping clip of the invention.

The closure of this invention and the clamping and locking means therefor have been shown in the drawings as specifically applied to a window opening, but it will be readily apparent that the closure, with its sliding panel and locking means, is equally applicable to a door opening and the invention is to be so construed in this specification and claims with the words "door" and "window" used interchangeably. It will also be understood that while a 2-panel window is shown and described, a 3-panel, or more, window may also be employed, in which case the locking means of the invention may be used to lock one, or more, panels of the window.

Referring first to FIGURE 1, there is shown a window opening in which is mounted a closure having an exterior frame **11** formed from parallel side jambs **12** and **13** connected by an upper horizontal track or rail **14** and a parallel lower horizontal track or sill track **15**. The sill track **15** is provided with guide means within which a panel or sash **17** is normally slidably mounted. The top frame track or rail **14** is provided with a trackway **18** receiving the upper edge of the panel **17**.

The panel **17** includes an outer rectangular frame formed by side vertical stiles **19** and **21** connected by top and bottom horizontal rails **22** and **23** and is provided with a glass pane **24**.

The elements forming the outer closure frame **11** and the panel frame of panel **17** are joined together at their corners in any desired manner, for example, as shown in my co-pending application Serial No. 27,829 filed May 9, 1960 for Roller Means for Slidable Closure Member.

The sill **15** is also provided with a trackway indicated generally at **25** and the upper track or rail **14** is provided with a complementary trackway for the reception of another slidable panel, similar to the panel **17**, but not shown in the drawing. This other panel, in its closed position, fills the window opening indicated at **26**.

While both the sash **17** and the sash filling window opening **26** are initially slidable (for ease of installation and interchangeability of panels), one of the sashes is maintained stationary and the other slidable during normal operation of the window. For the purpose of the following discussion, panel **17** is the panel that is to be locked by means of my invention.

The panel or sash **17** is shown in FIGURE 1 of the drawing in its extreme left hand position. The positive clamping or locking means, provided by this invention, and shown in perspective in FIGURE 5, is mounted on the end wall of the vertical stile **21** forming a part of the panel frame. The locking means, referred to herein as a clip, and indicated generally by the numeral **31**, has an elongated leg **32** and an integral, angularly extending foot **33** provided with a pair of notches or slots **34** and **35** in its opposite side edges. The leg **32** has a planar surface **32***a* and a pair of longitudinal edges **32***b*.

The leg **32** of the clip **31** is mounted to the stile **21** and the foot **33** to the tracks **14** and/or **16** to positively lock the panel **17**, as will now be described.

The sill track **15** includes a vertically extending wall

36 provided with an integral, inwardly directed and horizontally extending flange 37. Similarly, the upper track or rail 14 includes a depending vertical wall 38 having an integral, inwardly directed and horizontally extending flange 39. The track 14 is also provided with a horizontally extending flange 41 opposed to the flange 39 and providing a slot 42 therebetween. The flanges 37, 39, and 41 preferably extend continuously along the tracks 14 and 15 because of convenience in the manufacture of the tracks in this form.

The end wall of the stile 21 is provided with a vertically extending slot 43, the opposite side walls of which are provided with a plurality of vertically extending teeth or serrations 44, as shown in FIGURES 2 and 4.

The upper end of the vertical leg 32 of the clip 31 is provided with a pair of screw openings 45 for the reception of self tapping screws 46 which thread into the slot 43 and the serrated side walls thereof to firmly mount the clips onto the end wall of the stile 21 in clamping and locking relation with the frame flanges 37, 39, and 41.

The clip 31 is composed of substantially rigid corrosion resistant material such as a heat treated stainless steel so that the foot 33 will not bend out of its preset angular relation to the leg 32 and so that the corners of the edges defining the slots 34 and 35 will deform and bite into the flanges on the frame sill and track, these latter elements being preferably formed of relatively soft material, such as extruded aluminum.

The manner of assembling a pair of locking clips 31 to positively retain the panel 17 will be explained in connection with the showing of FIGURE 4. The notch or slot 34 in the clip 31 freely receives the frame flange 37 when the foot 33 of the clip is in a near vertical position, as shown in dotted lines in FIGURE 4. To reach this position, the clip 31 is first inserted into the side track 15 with the toe 33*a* of the foot 33 extending beneath the flange 37 so as to register the slot 34 with the flange. This initial insertion is made with the clip 31 rotated about a vertical axis from the phantom position of FIGURE 4 so that its opposite faces extend at other than right angles to the sill track 15. Thereafter, the clip 31 is rotated about a vertical axis back into substantially the position shown in phantom outline of FIGURE 4 where its opposite faces are at right angles to the sill. The clip is then slid to the right, as viewed in FIGURE 4, until the heel 30 of the foot 33 engages the end wall of the stile 21. The leg 32 of the clip is then rotated about a horizontal axis located at the heel 30 into the position shown in full lines in FIGURE 4 in which the edges of the slot 34 have just engaged the opposite faces of the flange 37 and the leg 32 approaches the end wall of the stile 21. Thereafter, a screw or screws 46 are inserted through the openings 45 into threaded engagement with the serrations 44 in the opposite side walls of the slot 43 and the leg 32 of the clip 31 is drawn tight against the end wall of the stile 21. This final movement also rotates the foot 33 of the clip 31 about the heel pivoting point 30 in a clockwise direction from the position shown in full lines in FIGURE 4 and the corners of the edges defining the slot 34 deform and/or bite into the opposite faces of the flange 37 to securely lock panel 17 to the outer frame 11 under positive pressure.

Another clip 31 is also preferably mounted to the top of the panel 17. This upper clip 31 is mounted in locking engagement with the flanges 39 and 41 by engagement of its opposite edge slots therewith in the same manner as described in the mounting of FIGURE 4 and the panel 17 is thus held rigidly in its adjusted stationary position. To move the panel to another selected position within the frame 11, the clips 31 are loosened in the reverse of their assembly steps and the panel slid to its new position, whereupon the clips are relocked with the frame flanges, as described above. Or, if the panel 17 is to become the normally sliding panel and the other sash member the stationary panel, then the clips 31 are removed from panel 17 and mounted onto the other sash member,

in a manner identical to that just described. It will be noted that no attachment openings will remain in the sill track 15 or the upper track 14, as would be the case in the usual method of retaining a panel.

The outer frame 11 has, in FIGURE 3, been shown with a pair of opposed locking flanges 39 and 41 at the top and a single locking flange 37 at the bottom. It will be understood that a pair of flanges may also be used at the bottom or vice versa; also, a single locking flange may be used at the top, as well as at the bottom. In either case, the clips 31 are preferably provided with both of the edge slots 34 and 35, since even where a single flange is used in both top and bottom tracks, it is desired that the same form of clip be interchangeably usable at either location.

It will be seen that with the clamping and locking means of this invention, a normally slidable panel in a window or door closure is positively locked against sliding movement without the use of attachment openings in the sill or top tracks. The panel may thus be securely locked under positive pressure in any selected position within the frame without requiring such attachment openings in the frame and without conflict in the attachment or securing of the locking means in the various adjusted or selected positions of the panel. At the same time, the panel is rigidly mounted within the frame against not only sliding, but also tilting and transverse movements, so that vibration and noise from undesired panel movements is prevented.

While certain preferred embodiments of the invention have been specifically shown and described, it is understood that the invention is not limited thereto, as many variations will be apparent to those skilled in the art and the invention is to be given its broadest interpretation within the terms of the following claims.

I claim:

1. A closure structure comprising: a frame; top and bottom horizontal trackways on said frame; a panel mounted in said trackways for sliding movement relative to the frame; a vertical stile at the side of said panel; and means for positively holding said panel in stationary relation to the frame including a horizontal flange on one of said trackways and a clip having a leg portion mounted on the wall of said stile and a foot portion extending at an angle thereto, said foot portion having a slot therethrough at an edge thereof freely receiving said flange when the leg portion is inclined to the side of the stile, said slot being sufficiently narrow so that the edges thereof engage the flange in clamping and locking relation when the leg portion of the clip is tightened against the wall of the stile to positively lock said panel in stationary position.

2. The structure of claim 1 having a pair of said clamping flanges one on each of said top and bottom trackways, a pair of said clips mounted on the wall of the stile adjacent to the top and bottom thereof and each individually engaging the adjacent flange in clamping relation.

3. A closure structure comprising: a frame; top and bottom horizontal trackways on said frame; a panel mounted in said trackways for sliding movement relative to the frame; a vertical stile at the side of said panel; and means for positively holding said panel in stationary relation to the frame including a horizontal flange on one of said trackways and a clip having a leg portion mounted on the wall of said stile and a foot portion extending at an angle thereto, said foot portion having a slot therethrough at an edge thereof freely receiving said flange when the leg portion is inclined to the side of the stile, said slot being sufficiently narrow so that the edges thereof engage the flange in clamping and locking relation when the leg portion of the clip is tightened against the wall of the stile to positively lock said panel in stationary position, said clip being formed of a substantially hard and rigid material so that the corners of the slot

edges bite into the surfaces of the flange in locking relation.

4. A closure structure comprising: a frame; top and bottom horizontal trackways on said frame; a panel mounted in said trackways for sliding movement relative to the frame; a vertical stile at the side of said panel; and means for positively holding said panel in stationary relation to the frame including a pair of horizontal clamping flanges adjacent to both the top and bottom of the frame and a pair of clamping clips mounted on the wall of the stile adjacent to the top and bottom thereof and each individually engaging the adjacent flange in clamping relation, said clips each having a leg portion mounted onto said stile and a foot portion extending at an angle thereto, each of said clips having aligned slots in the opposite edges of each of their foot portions so that they may be interchangeably mounted adjacent either the top or bottom of the stile to engage either said top or bottom clamping flanges.

5. A closure structure comprising: a frame; a pair of parallel trackways on said frame; a panel mounted in said trackways for sliding movement relative to the frame; a stile at the side of said panel; and means for positively holding said panel in stationary relation to the frame including a flange on one of said trackways and a clip having a leg portion mounted on the wall of said stile and a foot portion extending at an angle thereto, said

foot portion having a slot therethrough at an edge thereof freely receiving said flange when the leg portion is inclined to the side of the stile, positive-acting attachment means forcing said leg portion against the wall of said stile, the force exerted by said attachment means on said leg portion being transmitted to at least one edge of said slot about a stile-engaging axis, said axis being formed by engagement of a portion of said clip with said stile, to thereby force said slot edge into locking engagement with said flange, the distance between the attachment means and the stile-engaging axis being substantially greater than the distance between the engaging slot edge and the stile-engaging axis.

6. The closure structure of claim 5 wherein said foot portion extends at an angle of substantially less than 90° with respect to said leg portion.

References Cited in the file of this patent

UNITED STATES PATENTS

1,035,910	Rogers	Aug. 20, 1912
1,358,872	Parker	Nov. 16, 1920
1,459,613	Carrier	June 19, 1923
2,735,521	Amerding	Feb. 21, 1956
2,781,876	Van Fleet	Feb. 19, 1957
2,918,708	Sharpe et al.	Dec. 29, 1959