

July 7, 1931.

L. T. WARD

1,813,474

CLOSURE FOR WINDOWS

Filed Jan. 3, 1931

3 Sheets-Sheet 1

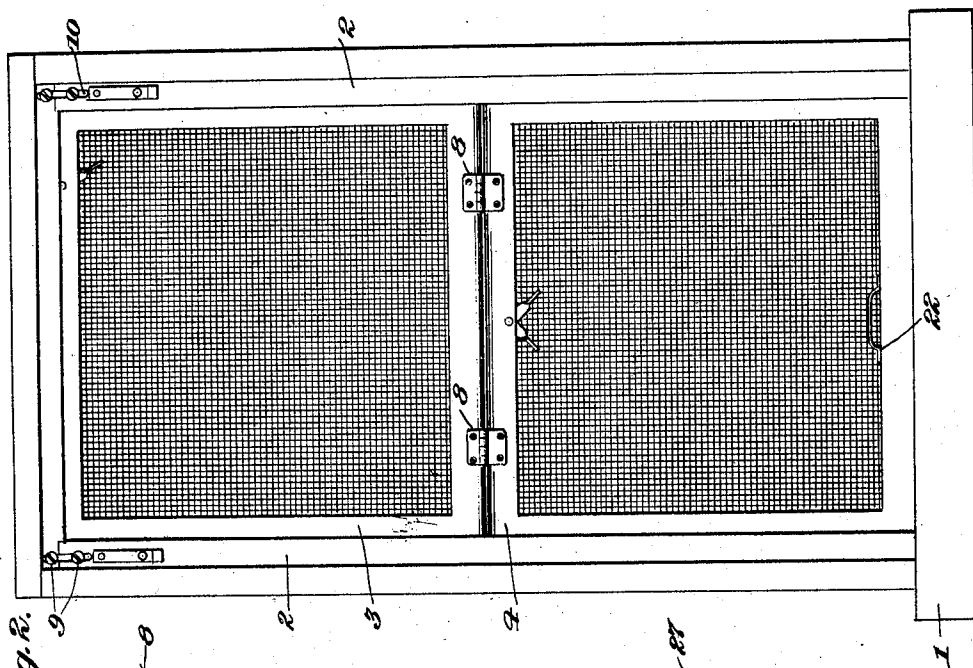


Fig. 2.

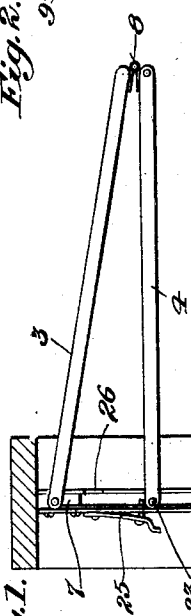


Fig. 3.

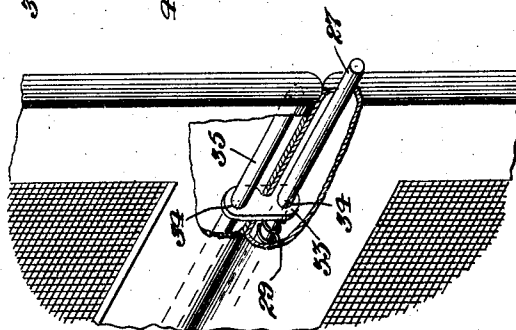


Fig. 1.

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Fig. 6.

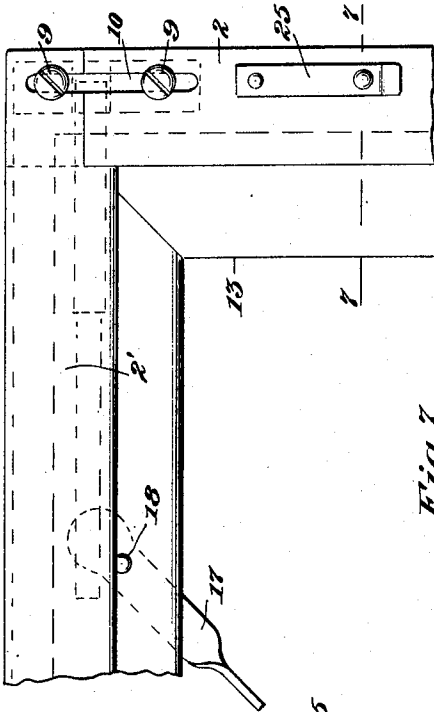


Fig. 7.

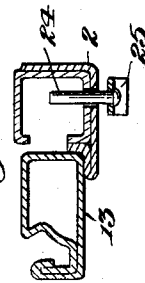


Fig. 8.

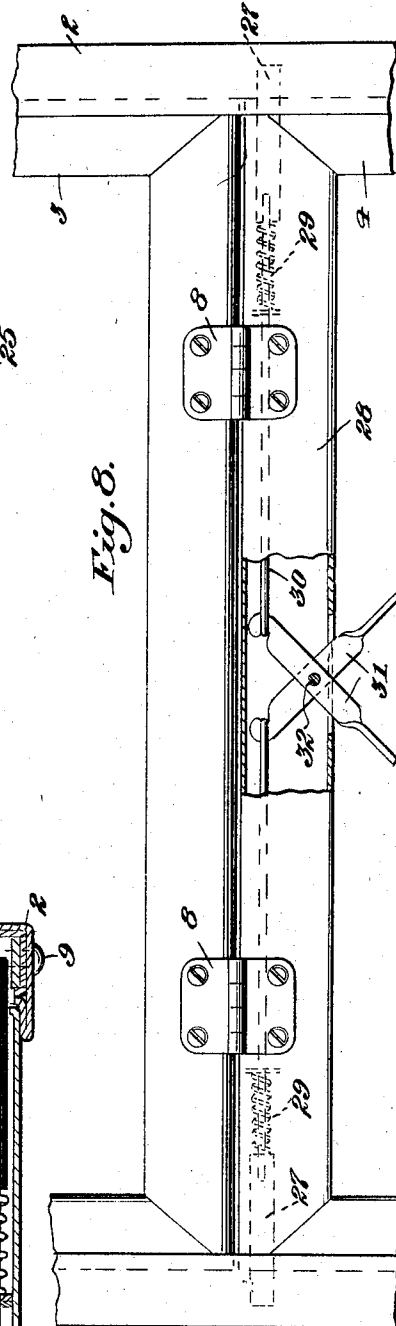


Fig. 9.

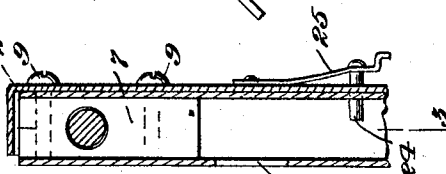


Fig. 10.

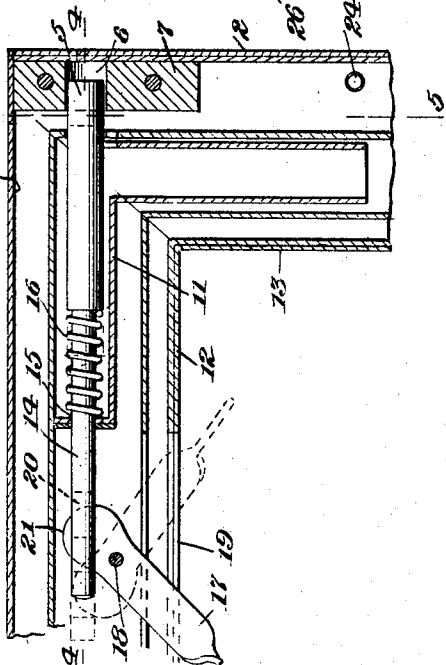
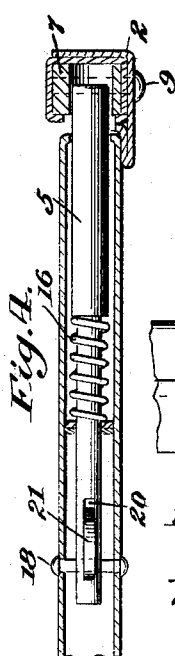


Fig. 11.



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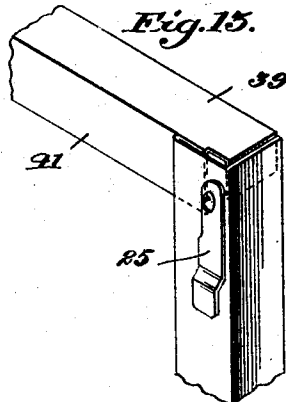
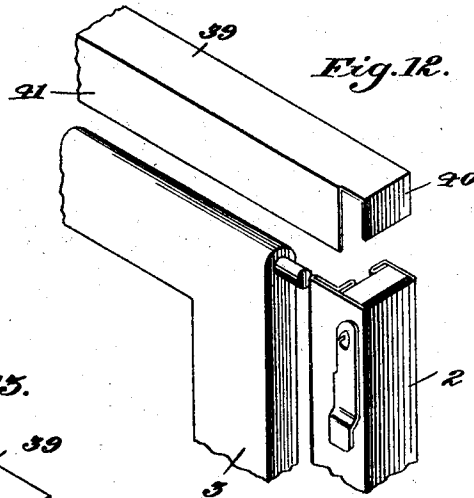
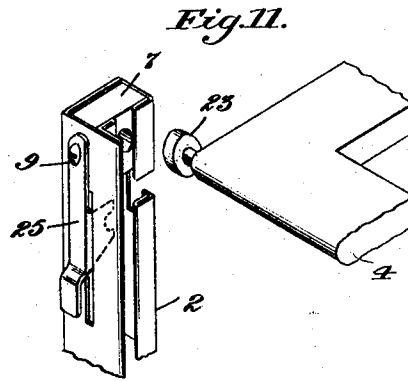
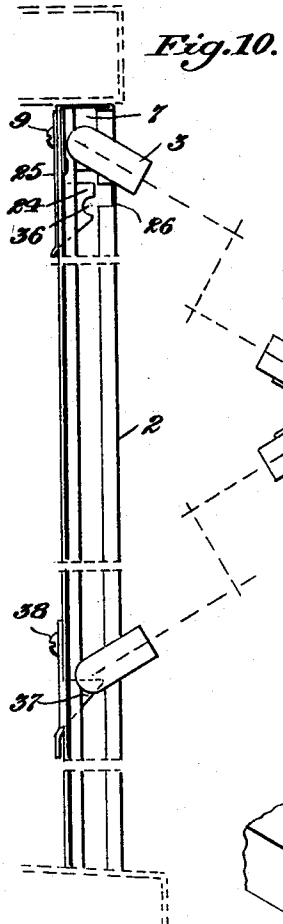
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CLOSURE FOR WINDOWS

Application filed January 3, 1931. Serial No. 506,438.

My invention relates to closures for windows, and more particularly to a closure in the nature of a screen and has for its principal object to provide a closure which is compact and neat in form, economical to manufacture, easy to install and simple to operate while in use.

Another object is to provide a closure of the pivoted type which is adapted on opening to swing to an elevated position to afford a maximum of opening and to be held in such position by the force of gravity through overhang, but which may be moved quickly and easily to a closed position closely adjacent vertical guide rails to provide an effective insect tight seal.

Another object is to provide a closure that can be applied to and removed from its supports from the interior of a room through the upper half of the sash and which may be operated to a fully open position through the lower opened sash to give a maximum of opening for access to awnings, etc., or for window cleaning.

Another object is to provide a plurality of safety and locking devices that will prevent the closure from jumping from its guides during operation or from separating itself entirely from its supports unintentionally in any position.

A further object is to provide a plurality of pivot bearings that may be adjusted to compensate for variations in dimensions of window frames.

Another object is to provide a locking means for a closure which is located at a most effective point and which cannot be operated from the outside.

Other objects will become apparent from the detailed description which follows.

In the drawings,—

Figure 1 shows a side elevation, partly in section; and Fig. 2 shows a front view of a window screen constructed according to my invention;

Fig. 3 is a view in cross section showing a novel screen supporting pivot and adjustable bearing therefor;

Figs. 4 and 5 are sectional views along lines 4—4 and 5—5 in Fig. 3;

Fig. 6 is a front view showing details of a safety stop and adjustable pivot bearing;

Fig. 7 is a sectional view on line 7—7 in Fig. 6;

Fig. 8 is a view partly in section showing details of a hinge construction and sliding lock;

Fig. 9 shows a modified hinge construction, and

Figs. 10 to 13 show details of a modification.

Referring to the drawings in detail, wherein similar ordinals indicate the same element, I have shown in conventional form a window frame 1. The essential features of my invention comprise a pair of guide rails 2 and a pair of pivotally connected closures or screens 3 and 4 together with novel associated features to be described. The guide rails 2 are shown as mounted firmly upon the inner faces of the vertical side members of the frame 1. The upper screen 3 is pivotally mounted between the guide rails by means of a pair of pivots 5 adapted to engage recesses 6 formed in a pair of bearings 7. As shown in Figs. 2 and 8, the lower screen 4 is pivotally supported on the upper screen 3 by means of hinges 8. Each bearing 7 is adjustably mounted within a related guide rail by means of screws 9 which extend through slots 10 formed in each rail. The bearings may be retained in any desired position by engagement of the screw heads against the adjacent rail.

To provide for quickly and easily mounting or de-mounting the screens as a unit, one of the pivots 5 is supported in a manner to be retracted within the screen frame and free of its bearing. As shown in detail in Figs. 3 and 4, an angular channel section pivot support 11 is mounted within the adjacent ends of the top member 12 and side member 13 of the frame 3. I prefer to mount the vertical portion of support 11 firmly within side member 13 whereby when the members 12 and 13 are abutted, the horizontal portion of support 11 will slide into position within member 12. The outer end of pivot 5 is supported within an opening formed in side member 13 and its inner re-

duced end 14 is slidably supported within an opening 15 formed in support 11. A spring 16 surrounds the end 14 and exerts a force tending to retain the pivot 5 within its bearing 7. A means is provided to withdraw the pivot 5 against the tension of spring 16 and comprises a lever 17 pivotally mounted on a pin 18 to oscillate in a slot 19 formed in member 12. The upper end of the lever 17 is cam shaped and engages a slot 20 formed in the pivot 5. The cam end 21 is so shaped that it will retain the pivot 5 retracted after it has been moved to its extreme left hand position.

The lower screen 4 is provided with a handle 22 at a central point and a roller 23 adjacent each lower corner. The rollers 23, in operation, are confined within the guides 2 whereby to limit motion of the lower end of the screen 4 to a vertical path in each direction of operation. In the normal operation of the screens, the rollers may be moved vertically upwardly until they contact with safety stops 24 which are mounted upon leaf spring supports 25 adjacent the upper ends of the guides and extend through openings in the guides to a position within the guides. Each guide 2 is provided with a notch 26 near the upper end of such width to permit a roller 23 to pass therethrough when the screens are attached to or removed from their supports in a manner hereinafter described.

Referring to Fig. 8, laterally movable transverse locking bolts 27 are provided within the upper frame member 28 and are adapted to be pressed outwardly by springs 29 which may be arranged in a manner similar to that of the springs 16 in Fig. 3. The outer ends of the bolts 27 normally engage within the guides 2 to lock the screens firmly adjacent the line of the hinges 8. The bolts 27 are connected by rods or the like 30 to operating levers 31 which are pivotally mounted on a pin 32.

A modified form of hinge is shown in Fig. 9 and comprises a link 33 which is provided with upper and lower openings 34. A pivot pin 35 passes through the upper opening 34 and the laterally sliding bolt 27 extends through the lower opening 34. The bolt 27 therefor serves the double purpose of locking the screens and affording a pivot support for the link 33. A link type of hinge as shown and described is simple, durable, and economical to construct.

As shown in Figs. 3, 5, and 6, a weathering angle 2' is attached at its opposite ends to the upper ends of the guides 2 by means of the upper screws 8. A laterally extending flange on the angle 2' is arranged to overlie the guides 2 and the upper screen 3 when the latter is in a vertical position. The angle 2' serves not only as a weather strip but also as an insect tight seal and a finish strip.

In Figs. 10 and 11, I have shown a modified form of safety stop 25. It will be noted that a single screw 9 is provided which serves the double purpose of retaining both the stop 25 and bearing 7 in position upon the respective guide. The stop portion 24 is provided with a recess 36 and, if desired, the projection or pin which supports the roller 23 may be engaged in the recess to more securely retain the closure sections in a raised position. An intermediate stop 37 is shown in Fig. 10 as attached to the guide by a screw 38. The intermediate stop is formed with its lower edge at an angle to the vertical whereby the roller 23 may pass thereby to a position above or upon the stop and the latter is positioned to retain the closure in an intermediate or partly raised position.

As shown in Figs. 12 and 13, I provide a modified form of weathering angle 39 with a lip 40 at each end thereof and a depending flange 41 along one side. The angle 39 engages and extends between the upper ends of the guides 2. The angle is retained in position solely by means of the lips 40 which fit between the bearings 7 and the adjacent guide 2. The flange is arranged to fit against and just inside of the wider side flanges formed on the guides 2. Such construction provides a simple, effective, and economical support for the weathering angle.

In the operation of my improved closure, the sections thereof may be moved to a folded and elevated position after retraction of the bolts 27 by means of lifting the lower section through the handle 22. If the closure is applied to a window frame, the raising of the closure may be accomplished by first raising the lower sash of the window. When the lower section is raised until further upward movement of the rollers 23 is prevented by the stops 24, it will be noted from Fig. 1 that the lower section 4 is substantially in a horizontal position. Due to overhang, a portion of the weight of both sections is transferred through the rollers to the guides and is exerted thereon at right angles thereto. In this position, there will be no tendency for the rollers to move downwardly and the closure will remain in its elevated position in a stable equilibrium. When it is desired to lower the closure, it is necessary merely to exert a slight pull downwardly, for example, on the handle 22 and the sections will drop to their original aligned position and the lock bolts 27 may be engaged with the respective guides. By locating the lock bolts at a point closely adjacent the hinges 8, their locking action is most effective since their position relative to the two closure sections corresponds to what might be termed the center of a toggle. A small retaining force in such position acts to prevent a breaking of the toggle sections.

An important feature of my closure re-

lates to the facility and ease with which the closure may be applied to or removed from a frame, for example, a window frame, from a point within a room. In applying the closure, the sections thereof are first folded and passed, hinged end first, through the opening above a lowered upper sash. The pivots are engaged in their respective bearings and the rollers 23 are passed inwardly through the notches 26 and moved downwardly within the guides against the stops 24. When it is desired to remove the closure from its support, similar steps are performed in the reverse order.

A closure constructed according to my invention is economical to manufacture, easy to install and simple to operate. It may be installed on existing window frames or in other wall openings and may be applied thereto or removed therefrom by a person from within the room. Its construction provides a maximum of safety since there is no possibility of unintentional disengagement from the supporting guides at any time, particularly during its movements to and from an open position.

While I have shown a closure in Fig. 2 in the form of a screen, the broad aspects of my invention are illustrated in Fig. 1. My novel closure may take the form of a solid or slatted closure or may even be made in the form of a window. I have shown and described a preferred form of my invention for the purpose of illustration but it is to be understood that various modifications thereof are contemplated as may fall within the broadest scope of my claims which follow.

What I claim is:—

1. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, means for removably and pivotally supporting said upper section at a point adjacent the upper end of said guides, projections on said lower section closely adjacent the lower corners thereof for engaging said guides, and means on said guides adjacent the upper end only thereof permitting said projections to be engaged within said guides while said sections are in their collapsed and raised position.

2. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, bearings within said guides, means for adjusting said bearings lengthwise of said guides, means for pivotally mounting said closure on said bearings, and means on said lower section for engaging said guides.

3. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, bearings within said guides, said upper section being provided with pivots for engaging said bearings, one of said pivots being

slidably mounted on said upper section for disengagement from its bearing, means on said lower section for engaging said guides and means for adjusting said bearings lengthwise of said guides.

4. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, bearings associated with said guides, said upper section being provided with pivots for engaging said bearings, each of said guides being provided adjacent its upper end only with a notch, and projections on said lower section closely adjacent the lower corners thereof for engaging said guides, said notches permitting passage therethrough of said projections during removal of said closure from the guides while said sections are in their collapsed and raised position.

5. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, said closure being pivotally mounted adjacent the upper ends of said guides, each of said guides being provided adjacent its upper end with a notch, projections on said lower section for engaging said guides, said notches permitting passage therethrough of said projections during removal of said closure from the guides while said sections are in their collapsed and raised position, a safety stop on one of said guides below a corresponding notch for contacting one of said projections when the closure is in a normal raised position.

6. In combination, a closure comprising pivotally connected sections, guides for said closure, bearings associated with said guides, pivots on the upper end of one of said sections and engaging said bearings, one of said pivots being slidably mounted for disengagement from its bearing, projections on another of said sections slidably engaging said guides, a lateral flange on each of said guides, each flange being provided with a notch adjacent its upper end and below said bearings, said notches permitting passage of said projections therethrough only after said sections are moved upwardly to a folded position.

7. In combination, a closure for a frame, said closure comprising pivotally connected sections, guides for said sections, said sections adapted to be folded toward each other to a position adjacent one end of said guides, one of said sections being pivotally and removably mounted adjacent one end of said guides, projections on said other section closely adjacent the lower corners thereof for engaging said guide, each guide being provided with a notch adjacent said last named end whereby to permit passage of said projections therethrough for removal of said closure from said guides in folded position.

8. In combination, a closure for a frame, said closure comprising upper and lower

pivotally connected sections, guides for said closure, means for pivotally mounting said closure adjacent the upper ends of said guides, projections on said lower section
 5 slidably engaging said guides, each guide being provided with a notch adjacent its upper end, stops on said guides below said notches in position to prevent further upward movement of said projections when said
 10 sections are folded to a normal elevated position with said lower section extending substantially horizontally from said guides said stops being manually retractible to permit said projection to pass thereby.

15 9. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, means for pivotally mounting said closure adjacent the upper ends of said
 20 guides, projections on said lower section slidably engaging said guides, stops on said guides in position to prevent further movement of said projections when said sections are folded to a normal elevated position with
 25 said lower section extending substantially horizontally from said guides, each of said guides being provided with a notch, said stops being movable to a position to permit said projections to pass thereby and enter
 30 said notches.

10. In combination, a closure for a frame, said closure comprising pivotally connected sections, a locking bolt slidably mounted on one of said sections adjacent the pivotal
 35 connection between said sections, the means connecting said sections comprising a link pivoted at one end to one section, the other end of said link provided with an opening, said locking bolt passing through said opening
 40 to provide a pivot for said other end of said link.

11. In a closure for windows, guides for said closure, a bearing associated with each guide adjacent the upper end thereof, said
 45 closure being pivoted to said bearings, a weathering angle strip, the opposite ends of said angle strip overlapping the upper ends of said guides.

12. In a closure for windows, guides for
 50 said closure, a bearing associated with each guide adjacent the upper end thereof, said closure being pivoted to said bearings, a weathering angle strip, the upper end of said closure being positioned within the space be-
 55 tween the sides of said angle.

13. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, a bearing associated with each of
 60 said guides, said closure being supported on said bearings, means on one of said sections slidably engaging said guides, a stop on each guide adjacent said bearing, and a single means for attaching said stop and said bear-
 65 ing to an associated guide.

14. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for opposite sides of said closure, pivots for supporting said upper section at a point adjacent the
 70 upper ends of said guides, bearings for said pivots, one of said pivots being slidably mounted within the upper end of said upper section in position to detachably engage a related bearing, the upper end only of each
 75 guide being provided with a notch, a projection extending laterally adjacent each lower corner of said lower section and slidably engaging a respective guide, whereby said closure is removable from said guides only when
 80 said sections have been moved to their folded raised position at right angles to said guides adjacent the upper ends thereof, said projections being adapted to pass through said notches only when in said raised position.
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15. In combination, a closure for a frame, said closure comprising upper and lower pivotally connected sections, guides for said closure, said guides comprising a pair of spaced laterally extending flanges, a bearing
 90 on each guide adjacent the upper end thereof, a flange of each guide being provided with a slot, means engaging each slot and a related bearing to provide for adjustment of said bearings along said guides, said upper
 95 section being provided with pivots in engagement with said bearings.

In testimony whereof I affix my signature.

LAWRENCE THOMAS WARD.

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