

July 15, 1969

L. J. BAIRD

3,455,057

MOVEABLE LOUVERED SHUTTER

Filed July 24, 1967

3 Sheets-Sheet 1

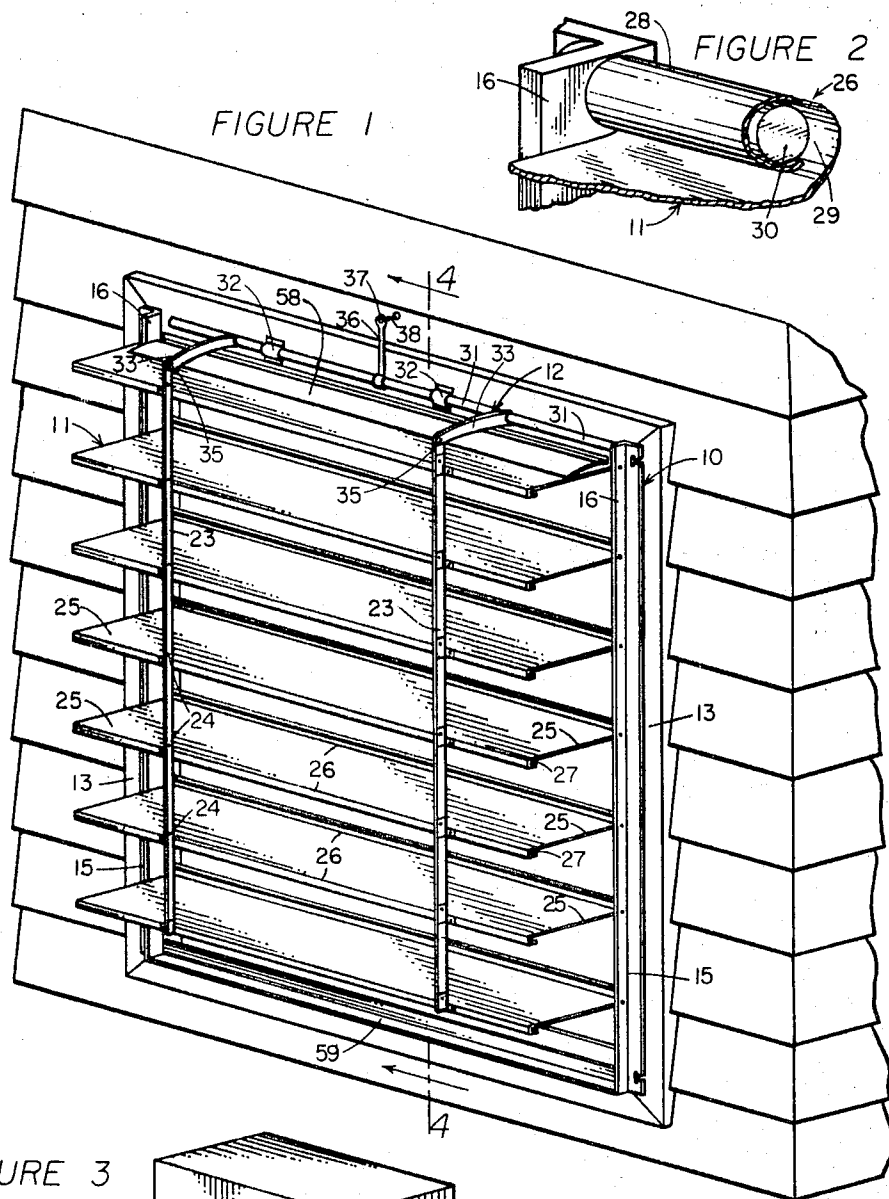
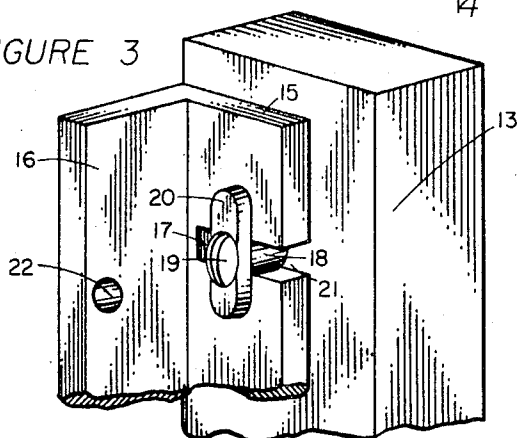


FIGURE 3



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July 15, 1969

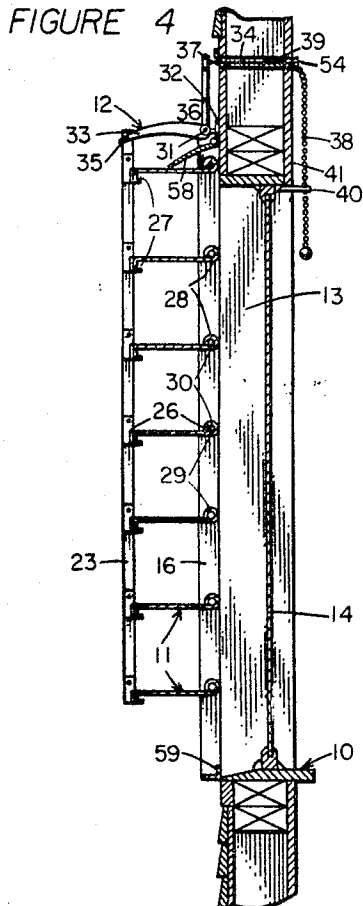
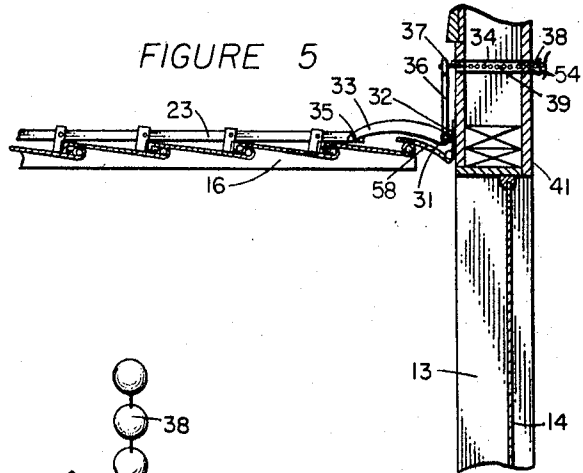
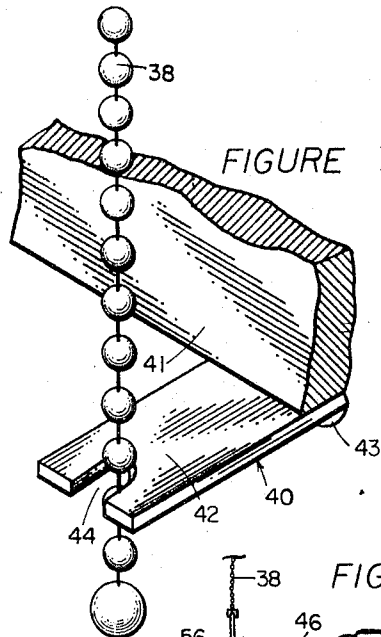
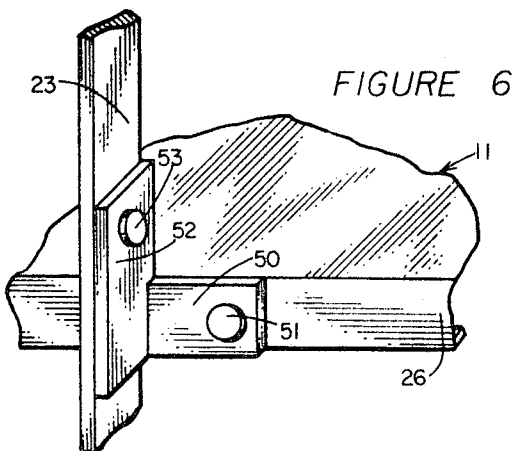
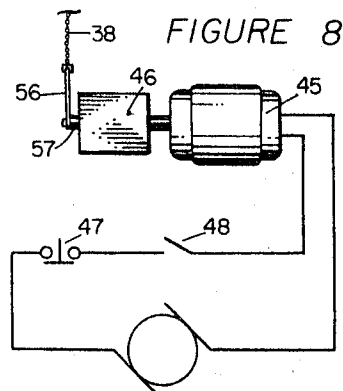
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3,455,057

MOVEABLE LOUVERED SHUTTER

Filed July 24, 1967

3 Sheets-Sheet 2



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MOVEABLE LOUVERED SHUTTER

Filed July 24, 1967

3 Sheets-Sheet 3

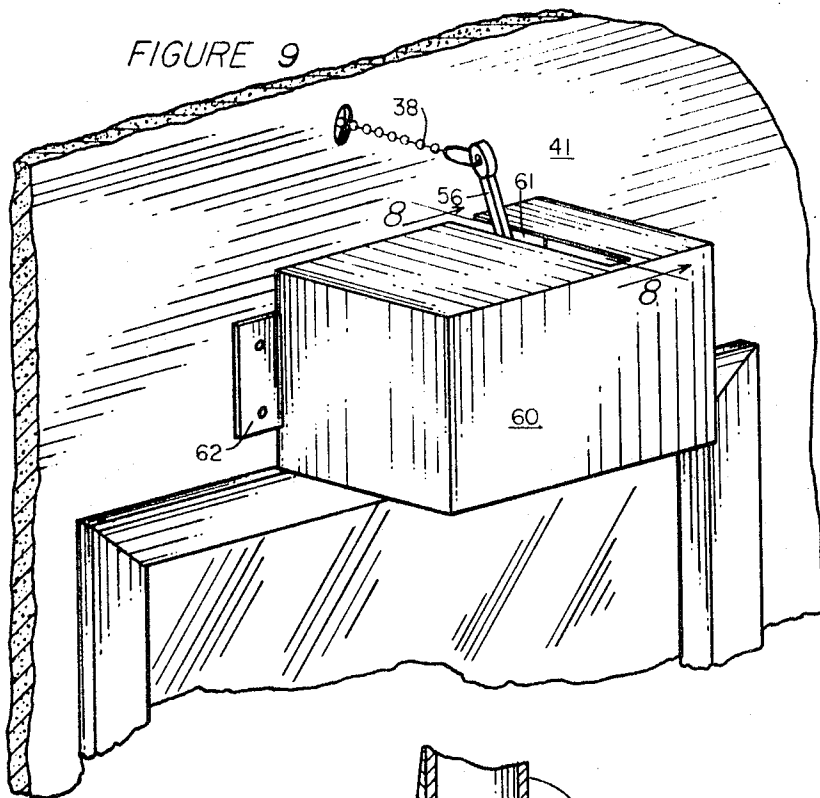
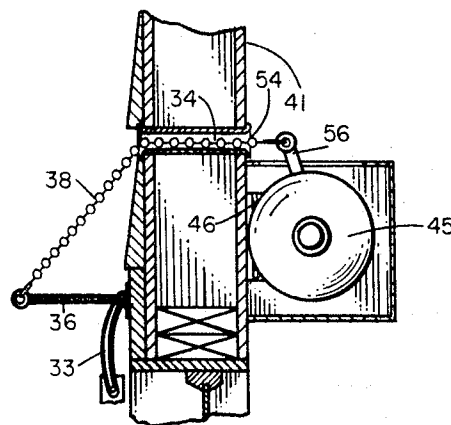


FIGURE 10

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3,455,057

MOVEABLE LOUVERED SHUTTER

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Filed July 24, 1967, Ser. No. 655,522

Int. Cl. E06b 7/08; E05f 17/00

U.S. Cl. 49—64

1 Claim

ABSTRACT OF THE DISCLOSURE

An external, moveable louver shutter having plural spaced horizontal louvers pivotably mounted by plural cooperating vertical supports, part of said supports being adapted to releasably attach the shutter to the outer frame of a window. The attaching supports are releasably fastened on the window frame to allow pivotal raising of a substantial part of the shutter from a window to allow work upon the window. Part of the vertical supports are moveable from inside a window to regulate angular orientation of the slats relative the window.

BACKGROUND OF INVENTION

Related applications

There are no applications related hereto filed in this or any foreign countries.

Field of invention

This invention relates generally to external window shutters and more particularly to an improved shutter having a plurality of horizontal, pivotally mounted slats communicating between plural vertically disposed supports adapted to regulate the angularity of slats, fasten the blind to an associated window, and allow the pivotal removal of the blind from this window.

Description of prior art

A shutter, including plural slats in an open spaced relationship, has been found desirable from time immemorial to protect window openings, and later windows, from physical damage; from the entry of unwanted light, direct rays from the sun or physical matter, from the observation of persons on the outside of the structure, and other similar purposes. Many such shutters have embodied fixedly mounted slats, but it also has been known for a long period, to provide a moveable mounting of the slats. Both aesthetic and structural considerations have generally made it desirable to position all slats with the same relative angular orientation.

The moveable mounting of slats has generally been accomplished by a "venetian blind" type structure that does not rigidly affix the shutter to a window frame or by a device of the mechanical lever type communicating between the slats, commonly in a scissors like fashion, at their ends. The first category of shutters—of the venetian blind type—are not generally fastened, or at least substantially fastened, to a window and as a result have not proven durable under normal environmental forces and provide much potential wind noise. The second category of shutters have either not been removeable from the window to allow cleaning, or if removeable, have had an operation that has been complex, making them costly of manufacture and delicate of use.

The instant invention differs from this art in that the slat mounting structure is simple and rigid but yet allows a substantial part of the shutter to be pivotally raised from an associated window to allow work on the window and also on the blind, and yet provides a structure that may be rigidly attached to the window frame, to prevent wind noise and damage from the elements. The pivotal

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mounting of slats in the instant invention upon unitary vertically disposed supports provides such a rigid structure that is yet readily moveable to allow variable angular disposition of the horizontal slat elements. The bell-crank type mechanism that provides means of adjusting the angular orientation of all slats in similar fashion relative the window provides support for the blind on the associated window when raised, but yet is operable from inside the window carrying structure.

SUMMARY OF INVENTION

The instant invention provides a shutter, for use on the external surface of a window, having plural spaced horizontal slats pivotably carried by plural vertically disposed rigid supports. Part of the plurality of supports releasably communicates with the external window frame, in such fashion that the shutters may be released and moved as a rigid unit pivotably upward away from the mounting window to allow work upon the window or inner blind surface. Novel brackets to pivotably mount the slats on the vertical supports are provided to allow construction of the slats from bulk stock with subsequent positioning of vertical supports at any lateral position to allow the unit to be readily adapted for use on various sized windows.

A bell-crank adjustment device, positioned at the top of the shutter communicates with the vertical supports to allow angular positioning of the slats by pivotable motion of the bell-crank. This bell-crank motion may be provided from within a structure embodying the window.

The inner or window facing edges of the plural slats are maintained in a spaced relationship to the window by the rear supports, while the outer supports may be moved vertically by the bell-crank to obtain a continuously variable angular positioning of the slats, with the rearward mounting point as a radius. The adjacent edges of the adjacent slats are so formed that when the slats are in a downward or closed position the shutter presents a rigid, substantially planar vertical surface over the associated window.

The purposes in providing such a structure are:

To provide an external shutter having plural, spaced, horizontally oriented, pivotally mounted slats carried between opposed structurally rigid vertical supports, part of said vertical supports being adapted to releasably mount the structure upon the external frame of a window and yet allow adjustably variable angular orientation of said slats.

To provide such a structure with vertical supports releasably mounted upon a window frame to allow the shutter to be pivoted upward and away from supporting window to allow access to the window and the inner shutter surface.

To provide such a structure that has a bell-crank type mechanism associated with the upper portion of the shutter, and communication from within the structure serviced by the window, to allow adjustable angular positioning of the shutter slats from inside the window carrying structure.

To provide a shutter having all parts substantially, though movably joined to prevent or substantially lessen noise caused by the structure when acting in response to natural forces, especially wind.

To provide such a structure that is closeable in such fashion that edges of adjacent slats overlap each other to present a vertical surface impervious to water presented thereto in a substantially vertical fashion and one constituting a solid barrier protecting the external surface of the window against physical forces and objects.

To provide such a device that may be adjustably regulated as to slat orientation by either manual or mechanical means.

To provide such a device that may be configured to appear substantially similar to siding, especially of the horizontal beveled type, thereabout.

To provide such a device that is of new and novel design, of sturdy and durable nature, of simple and economic manufacture and one that is otherwise well adapted to the uses and purposes for which it is intended.

Other and further objects of my invention will appear from the following specification and accompanying drawings which form a part of this application. In carrying out the objects of my invention, however, it is to be understood that its essential features are susceptible of change in design and structural arrangement with only one preferred, practical embodiment being illustrated in the accompanying drawings, as is required.

BRIEF DESCRIPTION OF DRAWINGS

In the accompanying drawings, wherein like numbers of reference refer to similar parts throughout:

FIGURE 1 is an isometric view of my invention in place upon the external frame of a window in the wall of a structure.

FIGURE 2 is an enlarged isometric view of the rearward lateral portion of a slat, showing the method of pivotal joinder of vertical support member to rearward slat edge.

FIGURE 3 is an enlarged isometric view of a device to releasably fasten the rearward vertical supports to the frame of the associated window.

FIGURE 4 is an orthographic, cross-sectional view on a vertical plane through the shutter of FIGURE 1, taken on the line 4—4 thereon in the direction of the arrows, showing particularly the cross-sectional configuration and pivotable mounting of the slats.

FIGURE 5 is an orthographic view of my invention in a raised position relative the associated window.

FIGURE 6 is an isometric view of the forward bracket pivotably mounting a forward slat edge on a forward vertical support.

FIGURE 7 is an isometric view of a particular chain type catch that may be used to adjust the angular position of the slats of my invention.

FIGURE 8 is a semi-diagrammatic illustration of a particular mechanized drive for my invention.

FIGURE 9 is an isometric surface view of the mechanized drive of FIGURE 8.

FIGURE 10 is a cross-sectional view of the mechanized drive of FIGURE 9 taken on the line 10—10 thereon in the direction indicated by the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in more detail and particularly to that of FIGURE 1, it will there be seen that my shutter comprises generally vertically disposed supports 10 providing means for releasable fastening to a window frame and pivotably carrying a plurality of horizontal slats 11 communicating with positioning means 12 to angularly orientate the slats.

The structure is adapted to be mounted upon external frame 13 of window 14 of ordinary light frame construction. Window frame 13 must present an outer surface, preferably substantially flat, adapted for the mounting of the frame of my invention. The invention may be used with most standard window frames of commerce as heretofore existent, with no particular adaptation and no requirements other than as aforesaid.

Vertical supports 10 and slats 11 are pivotably joined to form a relatively moveable, structurally cooperating unit:

Rearward vertical supports are elongate structures of L-shaped cross-section having fastening leg 15 adapted to fit against the vertical sides of external window frame 13 and slat leg 16 projecting perpendicularly outward from the window frame to allow mounting of the shutter slats

thereon. This member is of such length as to extend from the medial part of the upper, horizontal window frame element to a similar part of the lower horizontal frame element. One of these rearward supports is positioned on each side of the shutter in cooperating position at the lateralmost extension of the slats carried thereby; and the upward extension is limited somewhat below the axis of the bell-crank to allow pivotable motion of the shutter thereabout.

As shown particularly in the detail of FIGURE 3, fastening leg 15 of the rearward vertical support is fastened to window frame 13 by means of screws 17, threadedly engaged in the window frame and pivotally carrying on their shanks 18 inwardly of heads 19 elongate fastening elements 20 adapted to pass through elongate slots 21 in fastening leg 15 when appropriately rotated but at other times adapted to be rotatable into the position illustrated to releasably fasten the leg to the window frame. Such fastening elements are well known in the window arts.

Appropriate spaced holes 22 are provided in slat legs 16 to receive the rearward slat bolts in a pivotable fashion.

Forward vertical supports 23 are elongate elements of structurally rigid band-like material of a length substantially equal to that of the rearward vertical supports. Plural spaced slat bracket holes 24 are provided in grouped fashion in all forward supports to accept slat bracket connectors communicating with the forward edges of the brackets. Preferably at least two such forward supports are provided in each shutter, but any number will serve the purposes of my invention.

The slats themselves are elongate rectangular elements having shorter ends 25 and formed sides 26 defining forward channel 27 and rearward rolled edge 28 adapted to receive and support the slat bolts. The size of slats 11 must be such as to allow them to cover the width of the window and yet allow positioning of the rearward vertical support members on the opposed sides of the window frame. The depth of the slats (dimension in an outward direction from the window) is not critical to my invention and may be adjusted as desired for particular purposes. It is usually desirable that this outward extension should be at least equal to the vertical spacing between slats to allow overlapping in a closed position and to prevent most angled sun rays from entering the window when the slats be in a substantially horizontal extended position; it also is often desirable that this dimension be the same as the vertical exposure of siding thereabout for aesthetic conformity.

As shown particularly in the detail of FIGURE 2, the rearward slat edge 29 is a rolled cylindrical structure having central cylindrical channel 29 adapted to threadedly engage bolts 30, communicating through appropriate holes in the rearward vertical supports to the rearward slat channels 29 to pivotably mount these elements relative each other.

As shown particularly in FIGURE 6, the forward slat bracket is a generally L-shaped structure with slat arm 50 communicating with the forward edge of a slat by rivet 51 and perpendicular support arm 52 pivotably communicating with a forward vertical support by headed pin 53 communicating through appropriate holes therebetween. This shape of bracket allows variable angular orientation of the slats with reference to the forward vertical supports while providing a simple communicating structure and permitting positioning of the forward vertical supports medially of the ends of the slats.

These various structures of my invention may be formed from any structurally rigid, reasonably durable material. At present I prefer to form both the vertical support parts and the slats from relatively thin metal, but undoubtedly plastics or other rigid formable materials would serve the purposes of my invention, if not so well.

Slat positioning means 12 of my invention is shown in gross in FIGURE 1 and in more detail in FIGURES 4

and 5, where it is seen to include elongate bell-crank rod 31, of length just less than the distance between paired opposed rearward vertical supports, pivotably mounted in a horizontal position substantially parallel to slats 11 by brackets 32 positioned on the upper element of window frame 13. The bell-crank rod has paired opposed irrotatably communicating slat arms 33 projecting outwardly from each of its end parts. Each of these arms in their end parts pivotably communicate with the forward vertical supports in its uppermost extension by means of a pin 35 extending therebetween through appropriate holes. In its central part the bell-crank rod 31 irrotatably carries moving arm 36 projecting upwardly therefrom, substantially perpendicularly to the bell-crank rod and the slat arms. The bell-crank rod is so positioned in mounting that the slat rods extend substantially horizontally outward from the window while the moving arm extends upwardly when the shutter is open as in FIGURE 1.

Moving arm 36 carries chain attaching structure 37 in its outermost end part to aid in attachment of flexible chain type linkage 38 communicating therewith. With this structure then, it is seen that the angling rod 31 constitutes a bell-crank of sorts, and that rotary motion of moving arm 36 will correspondingly move slat arms 33 to move forward vertical supports 23 upwardly or downwardly and thus determine the angular position of the slats, relative each other and the frame element, to allow the shutter to be opened or closed as desired.

Flexible linkage 38 is preferably a chain communicating through the structure wall by means of channel 39, preferably defined by casement 34, to the inside of the structure embodying the window, from whence provision is made for moving the chain to ultimately regulate slat angle. Flared ends 54 are provided in casement 34 to allow and aid in proper motion of the chain through channel 39 in response to a vertical motion of the lower portion of the chain. The means of moving the linkage 38 may be manual, as illustrated in FIGURE 7, or mechanical, as illustrated in FIGURE 8 et seq.

The manual regulation of linkage 38 requires only catch 40 on the inner wall 41 of the structure in proximity to the internal orifice of channel 39, preferably on the edge of the upper window casement. The particular catch shown in FIGURE 7 provides elongated body 42 fastened to the wall by screws 43. The outermost part 42 is provided with the key-hole like channel 44 allowing the releasable vertical positioning of chain 38 at any desired link.

The mechanical moving means of FIGURE 8 et seq. provides electric motor 45 mechanically communicating with gearbox 46 to appropriately slow the rotary speed of the motor. The gear box in turn communicates with flexible linkage 38 by arm 56 carried by output shaft 57. The motor may be operated to move linkage 38, and thusly, ultimately, the forward support members, by means of control switch 47; this motion is limited in its downward extent by electrically parallel, normally closed limit switch 48 physically associated with moving arm 36 to limit its rotary motion toward the window frame to prevent mechanical damage to the structure. Internal friction in the mechanism will maintain the chain in its resultant position upon deactivation of the motor. A cover 60 having arm slat 61 and fastening flanges 62 is preferably provided to cover the mechanical linkage and protect it.

With this structure, then, either manual or mechanical means may be used to raise the forward vertical slat supports to the position illustrated in FIGURE 1, and if the means be relieved, gravity will act on the pivotally communicating elements to cause the entire member to move to a closed position as shown in the partial cross-sectional view FIGURE 5.

If it be desired to clean the window or gain access to it or the inner surface of the shutter, the rearward vertical supports may be released from the associated

window frame and pivoted upwardly about the bell-crank as shown in FIGURE 5.

If desired an ancillary fastening means (not shown) may be associated with the shutter to maintain it in various raised positions to aid operation upon the window.

An upper flashing type cover 58 is preferably attached to the upper element of the associated window frame and configures to extend outwardly, and downwardly to prevent water from running under the upper portion of the shutter. Preferably, a similar flashing 59 is provided at the lowermost slat extension to aid in sealing this area when the shutter be closed.

From the foregoing description of the structure of my invention, its operation may now be understood.

Firstly the unit is formed according to the teachings aforesaid and established in operative position on the external frame of a window, as illustrated particularly in FIGURE 1. Channel 39 is established through the structure wall to allow operable passage of flexible linkage 38 and either manual or mechanical means are established on the inside of the structure to provide for variable positioning of the flexible linkage. In this condition the structure is now potentially operative.

When unsupported, the shutter will be in a downward or closed position, that is, with the forward vertical supports 23 in their lowermost position, supported from further downward motion by the bell-crank and slats. This condition is brought about by action of gravity upon the structure. To raise the forward edge of the slats to any desired intermediate angular position it is only necessary to move the flexible linkage 38 downward on the inside of the structure to pivotably move bell-crank 31 appropriately to ultimately move the slats to a desired position, and then maintain this position as aforesaid. To raise the blind away from the window it is merely necessary to release the rearward vertical supports from the window frame and manually pivot the shutter as a unit away from the window. The structure will pivot about the axle through pins 35 joining the forward vertical supports and the slat arms of the bell-crank.

It is to be particularly noted that by reason of the configuration of the slats, the outer edge of an upper slat will fit against the inner edge of a lower slat when the blind is in a closed position, as shown especially in FIGURE 5, to form a substantially solid barrier barring physical access to the glass window. In this condition the structure serves admirably as a protective shutter.

It is further to be noted that the particular structure of my invention is well adapted to the formation of parts in mass with only a minimum of individual assembly and sizing required to adapt the unit to fit any particularly dimensioned window.

The foregoing description of my invention is necessarily of a detailed nature so that a specific embodiment of it might be set forth as required, but it is to be understood that various modifications of detail and rearrangement and multiplication of parts may be resorted to without departing from its spirit, essence or scope.

Having thusly described my invention, what I desire to protect by Letters Patent, and what I claim is:

1. A shutter of the nature aforesaid, comprising, in combination:

a plurality of spaced horizontal slats having means for pivotable attachment to vertical supports;

paired opposed similar rearward vertical supports positioned immediately laterally of said slats, said supports each having a relatively flat, fastening flange with elongate slots therein and associated screws pivotably carrying elongate fastening elements adapted to pass through the elongate slots in only certain angular orientations, means for releasable attachment to an associated window frame, and each support cooperating to pivotably support the rearward edge of each of the plural horizontal slats extending therebetween;

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at least one forward vertical support pivotably communicating with the forward edge of each of the plural horizontal slats to allow variable angular positioning of the slats from a downwardmost closed position to at least a substantially horizontal open position; and 5

means of adjustably regulating the vertical position of said forward vertical support to determine the similar angular orientation of the plurality of slats relative the rearward vertical supports comprising a bell-crank having a body pivotably supported by the frame of the associated window immediately above the forward vertical support, the bell-crank having at least one slat arm extending perpendicularly to the axis of the body to pivotably communicate with the uppermost extension of the forward vertical support and a second movement arm perpendicular to the axis of the body and angled from the slat arm; and 10

means communicating with the movement arm to cause 20

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adjustable pivotable motion thereof to ultimately regulate the angular orientation of the plural slats.

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U.S. Cl. X.R.

49—74