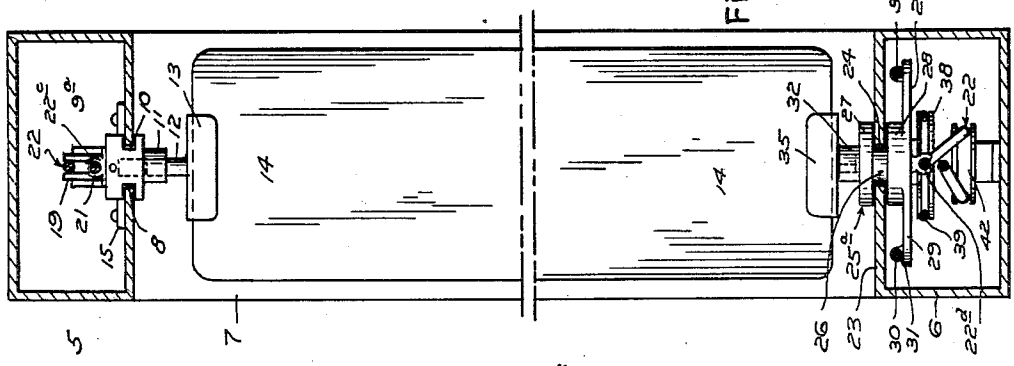
March 18, 1958 G. M. GRAHAM 2,827,113

TILTING AND SHIFTABLE SLATTED CLOSURE DEVICE

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Fig. 2.



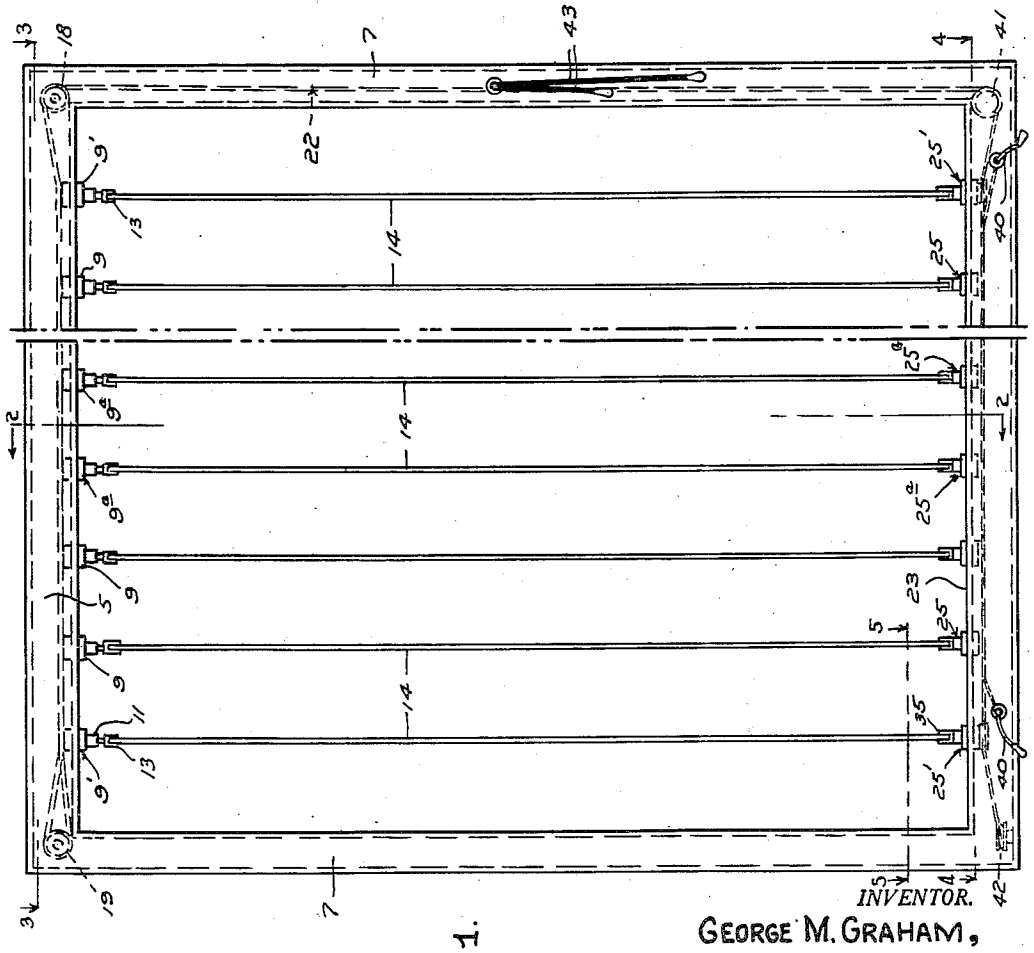


Fig. 1.

INVENTOR.
GEORGE M. GRAHAM,
BY James N. Pyles
ATTORNEY

March 18, 1958 G. M. GRAHAM 2,827,113

TILTING AND SHIFTABLE SLATTED CLOSURE DEVICE

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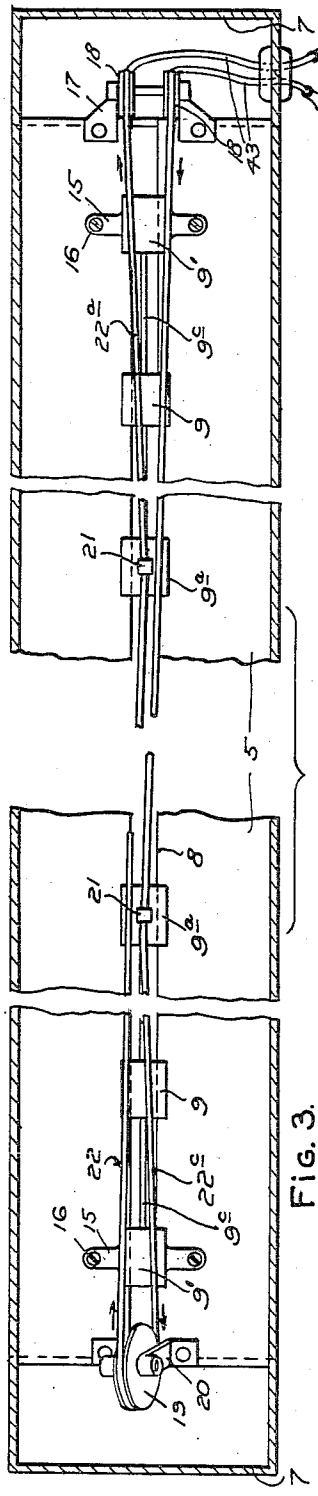


Fig. 3.

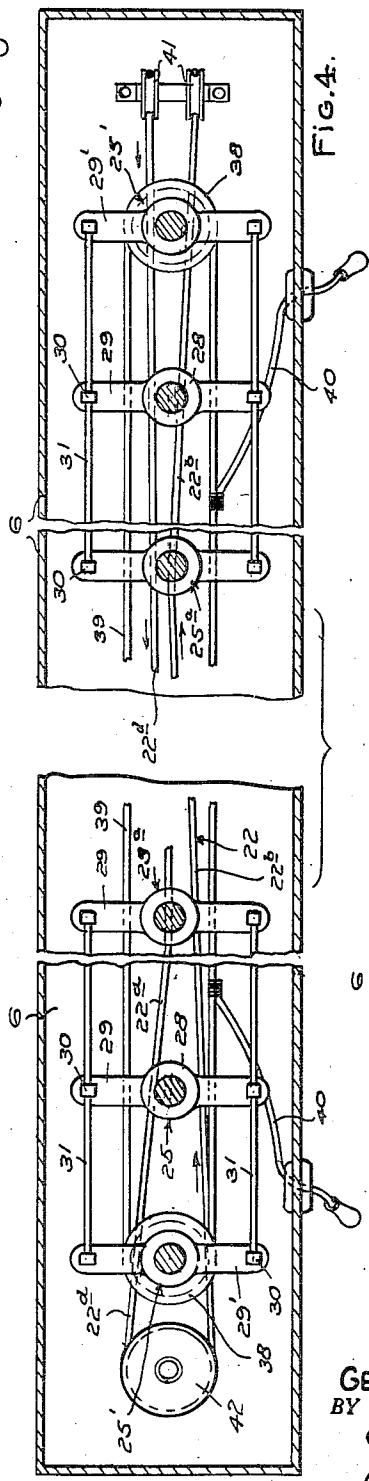


Fig. 4.

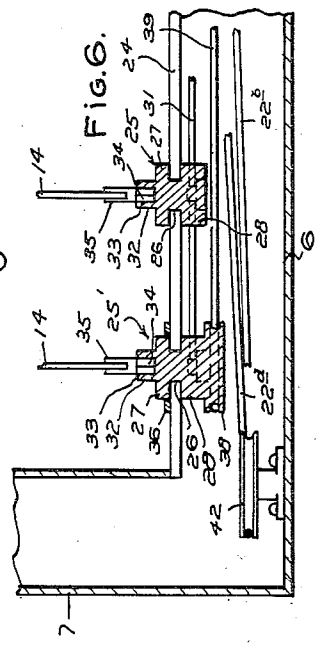


Fig. 6.

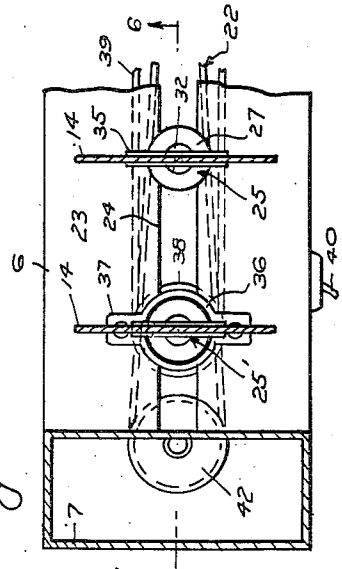


Fig. 5.

INVENTOR.
GEORGE M. GRAHAM,
BY
James M. Ryle
ATTORNEY.

March 18, 1958 G. M. GRAHAM 2,827,113

TILTING AND SHIFTABLE SLATTED CLOSURE DEVICE

Filed July 25, 1955 3 Sheets-Sheet 3

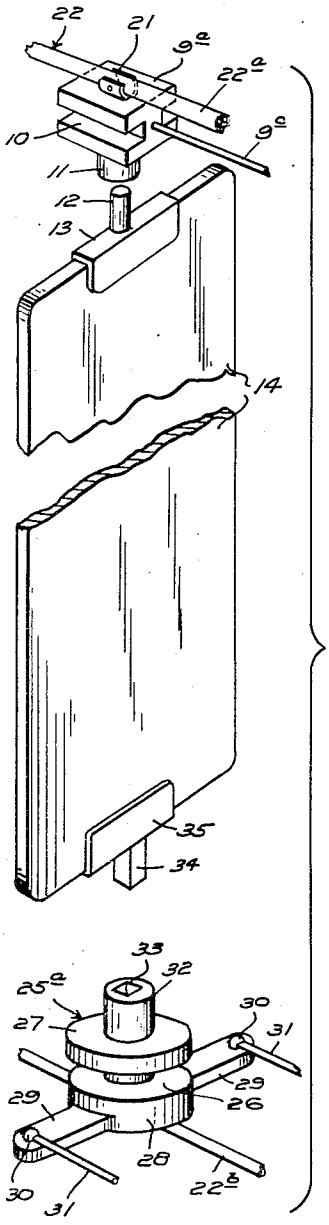


Fig.7.

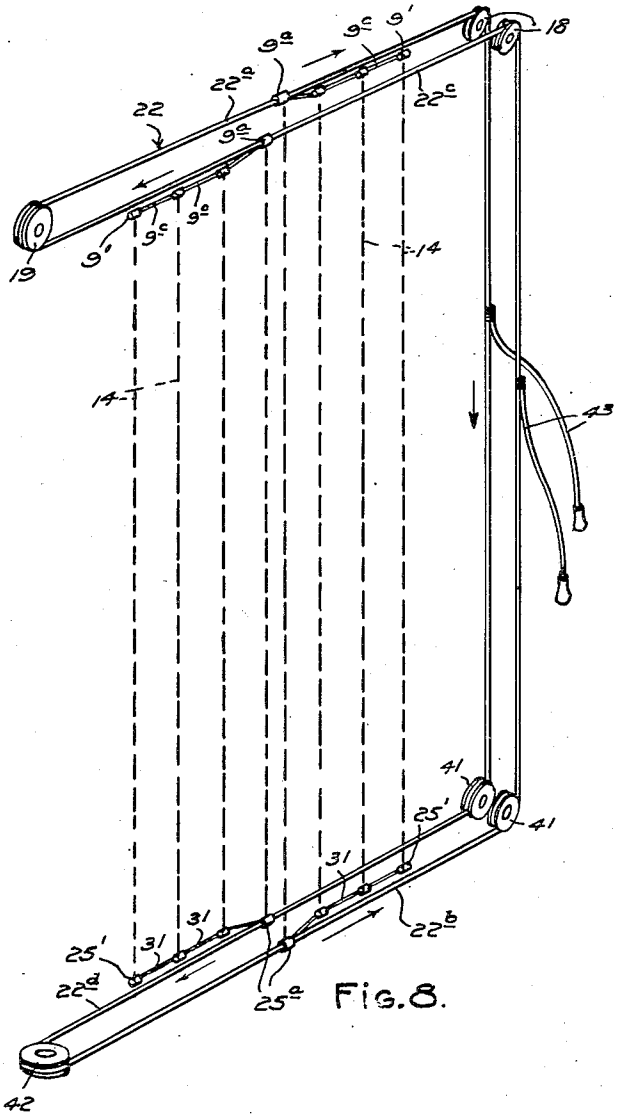


Fig.8.

INVENTOR.
GEORGE M. GRAHAM,
BY
James H. Ryles
ATTORNEY

United States Patent Office 2,827,113 Patented Mar. 18, 1958

2,827,113

TILTING AND SHIFTABLE SLATTED CLOSURE DEVICE

George M. Graham, Fort Lauderdale, Fla.

Application July 25, 1955, Serial No. 524,138

3 Claims. (Cl. 160—172)

This invention relates to an improvement in closure devices and has particular reference to a closure device wherein a plurality of vertically disposed slats are supported within a frame in a manner whereby the slats may be shifted upon their axes to a close overlapping position and with the slats being in groups whereby the groups are simultaneously shiftable toward the opposite ends of the frame in a manner to substantially expose the major openings of the frame.

The invention embodies upper and lower parallel header and sill sections that are connected by parallel jamb sections and with the several sections constituting a rigid frame that is supported in a wall opening whereby the several slats serve to control the entry of light and air.

Another object of the invention resides in upper and lower header and sill sections that are slotted throughout their lengths whereby to support slat mounting elements and with the elements constituting both pivotal and sliding supports for the several slats.

The invention further contemplates novel actuating means whereby the several slats are simultaneously rotatable to overlapping closure position and additional means connected with the several mounting means whereby the groups of slats are controllable from a single endless cable in a manner to shift the groups of slats toward or from the opposite sides of the frame.

Novel features of construction and operation of the device will be more clearly apparent during the course of the following description, reference being had to the accompanying drawings wherein has been illustrated a prefered form of the device and wherein like characters of reference are employed to denote like parts throughout the several figures.

In the drawings:

Figure 1 is a side elevation of a frame and a plurality of pivotally supported and shiftable slats constructed in accordance with the invention,

Figure 2 is an enlarged vertical section taken substantially on line 2—2 of Figure 1,

Figure 3 is a horizontal section through a header device of the frame, taken substantially on line 3—3 of Figure 1,

Figure 4 is a horizontal section through a lower sill member, taken substantially on line 4—4 of Figure 1,

Figure 5 is a fragmentary horizontal section taken substantially on line 5—5 of Figure 1,

Figure 6 is a section taken on line 6—6 of Figure 5,

Figure 7 is an exploded perspective view of a closure slat and its associated upper and lower pivotal and slidable mountings,

Figure 8 is a perspective view illustrating an endless cable for the slidable shifting movement of the separate groups of slats.

In the drawings, the numeral 5 designates a tubular and preferably metallic header and 6 designates a lower tubular and preferably metallic sill member. The header 5 and the sill 6 are rigidly connected by tubular jamb

members, and with the jamb members being connected to the header and sill in any well known and desirable manner. The several members 5, 6 and 7 constitute a rigid open frame that is disposed in a wall opening to either constitute a single closure device or to constitute a closure device that may be disposed adjacent a conventional window structure. It is contemplated that the frame shall be constructed in various sizes in accordance with the recognized standard wall openings and may be varied in height in accordance with the degree of protective coverage desired with respect to a previously installed window structure. It is further contemplated that the device shall be substituted for the conventional "Venetian blind."

The header 5 is slotted upon its under face as indicated at 8 for the slidable reception of a plurality of slides 9 that constitute the upper mounting means for the slats, to be described. The slides 9 are grooved upon their opposite edges as at 10 whereby to receive the opposite margin edges of the groove 8. The slides 9 are each provided with a depending cylindrical boss that is provided with an axial cylindrical opening for the pivotal support of a cylindrical stud 12 formed upon a U-shaped clip 13 carried by the upper end of the slats 14. The clips 13 are adapted to have a frictional engagement with the upper ends of the slats. The several slides 9, see particularly Figure 3, are preferably arranged in groups of equal number and with the outermost slides 9' being held against shifting movement by suitable wings 15 that are attached to the upper surface of the lower wall portion of the header 5 by screws 16. The slats are arranged in two groups and the innermost slats of each group are connected to controlled slides 9^a for a purpose to be presently described. Rigidly connected at one end of the header 5, as by brackets 17, are a pair of grooved pulleys 18 and with the pulleys 18 being positioned to overlie the opening of the adjacent jamb 7. At its opposite end, the header is provided with a single grooved pulley 19, supported with respect to the header by bracket arms 20. Each of the slides 9^a upon their upper surface are provided with suitable clip connectors 21 for connection with an endless flexible cable 22. The several slides 9, 9' and 9^a of each group are connected together by flexible cables or chains 9^c of equal length and whereby the several slides are equidistantly spaced when in the covering position, yet will permit the several slides and their associated slats to be closely accumulated at opposite sides of the frame.

The upper wall 23 of the sill 6 is slotted throughout its length as at 24 for the rotatable and sliding reception of a plurality of lower mounting elements 25. Each of the elements 25 are cylindrical and circumferentially grooved as at 26 for slidable and rotatable support upon the marginal areas of the slot 24. The elements 25 include upper and lower disc-like members 27 and 28 that overlie and underlie the wall 23. The members 28 are each provided with oppositely extending arms 29 that are provided at their outer ends with connectors 30 for connecting engagement with flexible cables or chains 31 and through the medium of which the several members 25 of each group are rotatable upon their vertical axis. Each of the members 27 are provided with centrally arranged upstanding cylindrical bosses 32 that are axially apertured to form non-cylindrical recesses 33 for the reception of non-cylindrical studs 34 formed upon U-shaped clips 35 that engage frictionally with the lower end portions of the slats 14. The outermost members 25' are anchored against sliding engagement by collars 36 having oppositely extending wings 37 that are screwed or otherwise attached to the upper surface of the wall 23 and in a position to be co-axial with the slides 9'. The spacing of each of the members 25 are such as to dispose

them coaxial with the several slides 9 whereby the several slats will be supported in a perpendicular manner. Each of the members 25' are provided with grooved pulleys 38 for the reception of an endless flexible cable 39 and whereby the cable 39 may be actuated by a pair of cords 40 that are connected to one flight of the cable and that extend through openings formed in the forward wall of the sill 6 and through the medium of which the cable 39 may be shifted in opposite directions. The cable 39 when shifted under the influence of the cords 40, imparts rotation to the outer members 25' and through the medium of the arms 29', causes the several members 25 in both groups to rotate upon their vertical axes to shift the slats 14 upon their vertical axes to and from a point of overlapping engagement and whereby the several slats may be simultaneously controlled to any degree of closure.

Rotatively supported at one end of the sill 6 and substantially underlying the pulleys 18, are a pair of grooved pulleys 41 while at the opposite end of the sill 6 is rotatably supported a grooved pulley 42. The cable 22 as before stated is endless and is trained over the several pulleys 18, 19, 41 and 42 thus establishing a continuous cable that traverses both the header 5 and the sill 6 and passing upwardly through one jamb 7. One flight 22^a within the header 5 and one flight 22^b in the sill 6 are connected to one slide 9^a and one control element 25^a. The other flight 22^c within the header 5 is connected to the other slide 9^a, while the flight 22^d within the sill is connected to the other control element 25^a.

The vertical flights of the cable 22 traversing the jamb 7, are provided with pull cords 43, passing through an opening in the forward wall of the jamb, where their terminal ends are provided with knobs. Thus, the cords 43 provide a means whereby the cable may be easily shifted in either direction for extending the slats to a covering position or to accumulate the slats of each group at the sides of the frame. With the groups fully extended, all of the slats will be equidistantly spaced, at which time the operator may simultaneously rotate the slats to any degree of angularity by pulling upon either of the cords 40. It will be clearly apparent, that the extending movement of the slats to covering position will be limited by the non-sliding members 9' and the non-sliding elements 25' and the connecting cables 9^c and 31.

In the use of the device, the several slides 9, 9' and 9^a are engaged with the slot 8 of the header. Similarly, the elements 25, 25' and 25^a are assembled within the slot 24 of the sill. Connections of the several cables are made in any convenient manner and the frame then assembled and installed within the wall opening, either as a closure device or as a light and air control means in combination with a conventional window. The operator then, by pulling upon a selected cord 43, causes all of the slats in each group to be extended across the frame opening in equidistantly spaced relation, with each group moving in opposed relation under the influence of the cable 22. With the several slats then being extended, a pull upon either of the cords 40, causes the several slats of both groups to be tilted to a desired angularity by the cable 31 and in the maximum tilting, the slats are overlapping to substantially close the frame opening. When the groups are to be accumulated at the opposite sides of the frame, the selected cord 40 is then pulled to cause the several slats to pivot to their full open position, after which a pull upon a selected cord 43, causes each group to be retracted or accumulated toward each side of the frame. The slats may be easily and quickly installed or removed from their respective upper and lower pivotal supports, by merely lifting the slat upwardly to disengage the lower stud 34, after which the slat can be swung outwardly and the upper stud 12 disengaged from its respective socket. This assembly method of the slats has been disclosed in my United States Patent No. 2,700,803, issued February 1, 1955.

It will thus be apparent, that a very novel arrangement of closure slats has been provided whereby the several slats of each group may be tilted on their vertical axis or when desired, the groups of slats may be easily shifted to be accumulated at the sides of the frame. The novel supporting means, including the upper slides 9 and the lower elements 25 greatly facilitate the mounting and operative engagement within slots formed in preferably extruded metal frame members and greatly simplifies the assembly of the several parts with the frame members prior to assembly of the frame members. While the frame members have been shown as being tubular, it will be apparent that they could be of channel formation, thus further simplifying the attachment of the cables with their respective operators. The structure is such that it may be manufactured and sold in knockdown form for assembly by the user. The several operators, including the slides 9 and the members 25 may be formed substantially identical and the attaching means for the slides 9^a and the cable pulleys for the members 25' attached in any convenient manner, thus greatly simplifying the manufacture of the parts.

It is to be understood, that while a preferred form of the device has been illustrated and described, changes are contemplated as readily fall within the spirit of the invention as shall be determined by the scope of the subjoined claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A slatted closure device that includes a rigid open frame having a header, a sill and connecting jambs, the members of the frame being tubular and with the header and the sill having flat opposed faces that are longitudinally and centrally slotted for their full length, a plurality of slide devices engaged with the slot of the header and a plurality of slide devices engaged with the slot of the sill, the several slide devices of the header and sill being co-axial, the outermost slide devices of the header and the sill being anchored against sliding movement, sockets formed in the upper slide devices and sockets formed in the lower slide devices, a plurality of vertically arranged closure slats disposed within the frame opening and with the slats being provided with studs at their opposite ends for engagement with the sockets of the upper and lower slides, the upper studs being rotatable in the sockets of the upper slides and non-rotatable with respect to the sockets of the lower slides, the lower slides being rotatable in the slot for imparting a tilting movement to the slats, the slats and their slide devices being arranged in two groups, the anchored slide devices of the sill being provided with a pulley and an endless belt engaging the pulleys whereby the anchored slides adjacent each jamb are simultaneously rotated, flexible connecting means between the lower slides of each group whereby the slats of each group are identically tilted when the anchored slides are rotated, flexible connecting means between the slides of the upper groups, the said flexible connecting means limiting the extending movement of the slats within the frame to an equidistantly spaced relation, an endless cable traversing the header, the sill and one jamb, means for connecting the cable to the innermost slides of each group whereby actuation of the cable in one direction causes the several slides in each group and their respective slats to accumulate at opposite sides of the frame opening the said cable when activated in the opposite direction causing the groups to shift in opposed relation for shifting the groups of slats to a covering position in the frame.

2. The structure as recited in claim 1, wherein the slats are individually removable from their respective upper and lower slide devices.

3. A closure device that includes an open rigid frame having a header, a sill and connecting jambs, the header and the sill having opposed flat faces that are slotted throughout their length, a plurality of vertically arranged

slats disposed within the frame in parallel relation, pivoted supports for the upper and lower ends of each slat and with certain of the supports being slideable in the slots, means associated with the lower pivoted supports whereby all of the slats may be simultaneously tilted to a maximum position of overlapping engagement, the slats being divided into two groups, an endless cable that traverses the header, the sill and one jamb and with the cable being connected to the upper and lower pivotal supports of an innermost slat of each group, means whereby the cable may be manually shifted to cause the slats of each group to be simultaneously accumulated at the sides of the frame opening and means between the slides of each group whereby the slats are equidistantly spaced within the opening when the cable is reversed to move the slats to a covering position in the

frame, one upper and one lower pivotal support of each group being fixed against sliding, and a common endless belt between the non-sliding lower pivotal supports whereby the several slats in each group are simultaneously tilted.

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