May 26, 1953 E. F. WILEY 2,639,474

CONTROL MECHANISM FOR AWNING TYPE WINDOWS

Filed Aug. 14, 1950

2 Sheets-Sheet 1

FIG. 1

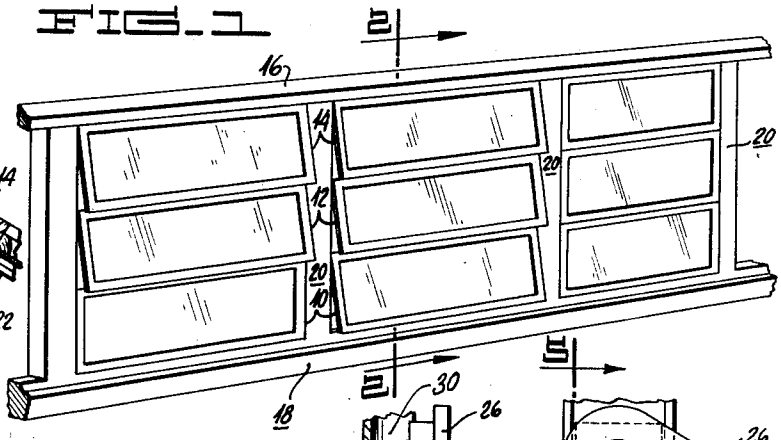


FIG. 3

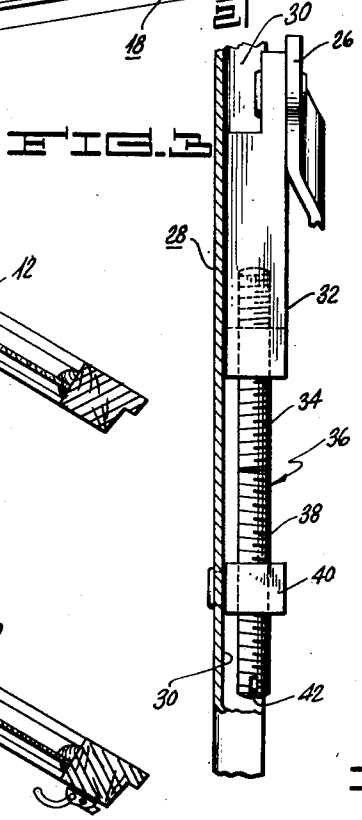


FIG. 4

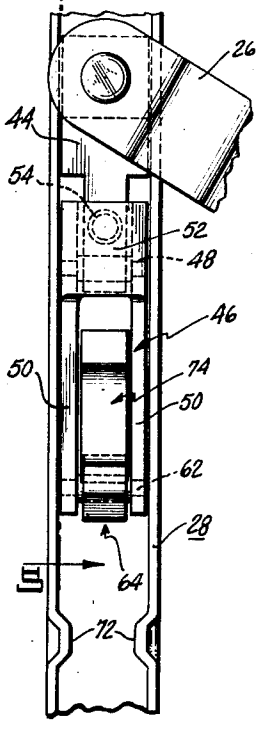
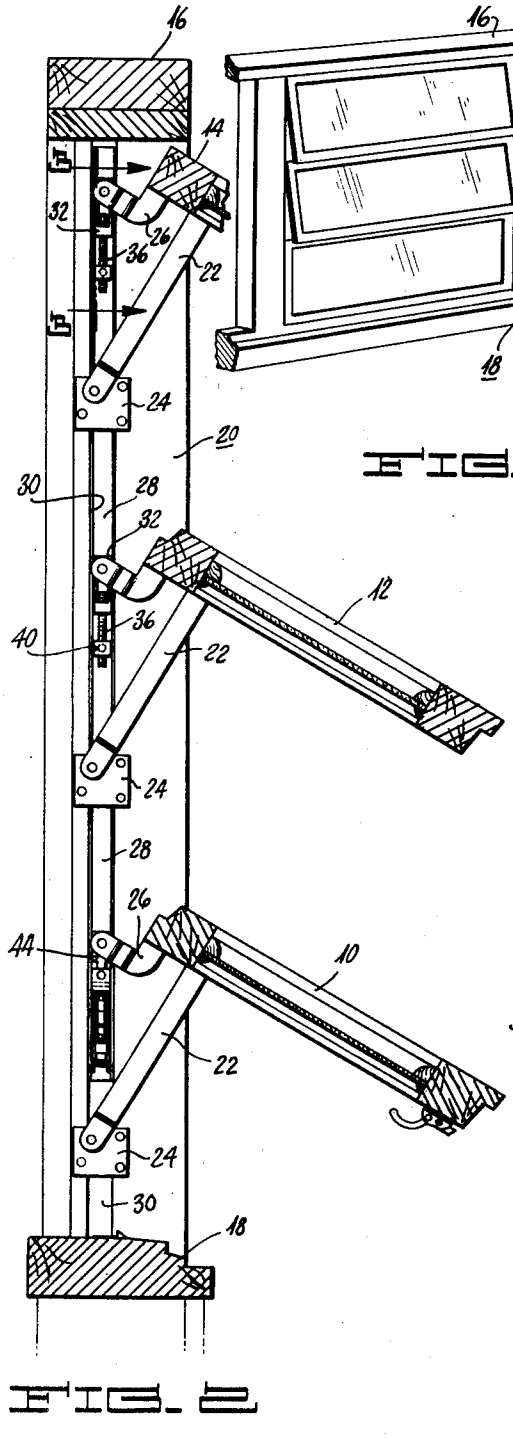


FIG. 2



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CONTROL MECHANISM FOR AWNING TYPE WINDOWS

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2 Sheets-Sheet 2

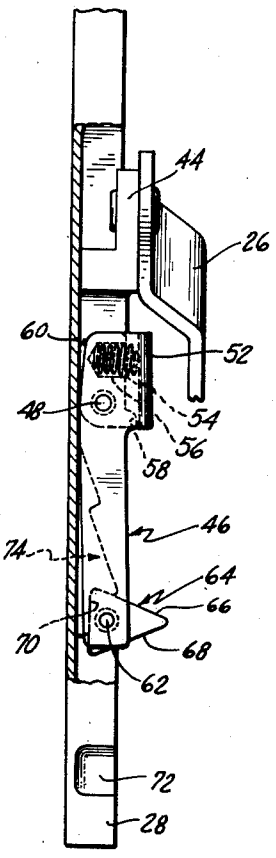


FIG. 5

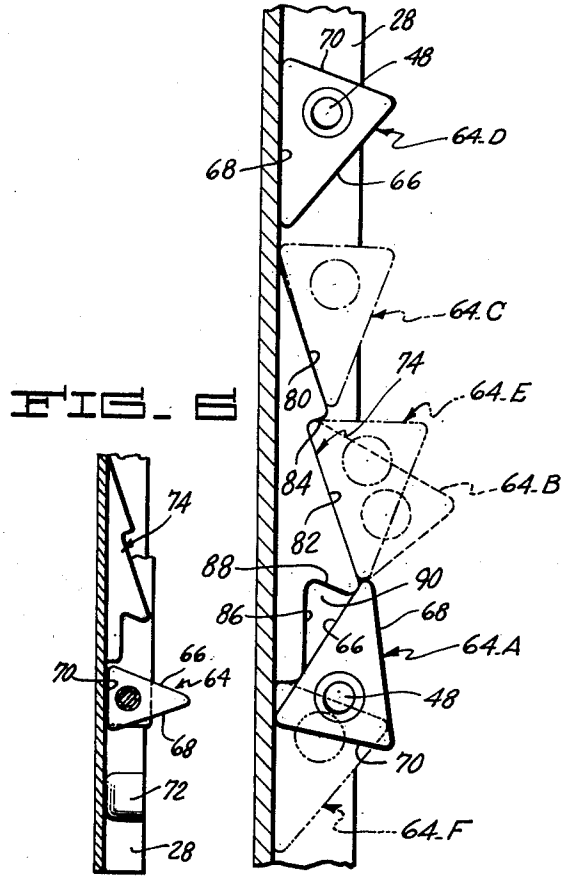


FIG. 6

FIG. 7

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CONTROL MECHANISM FOR AWNING TYPE WINDOWS

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3 Claims. (Cl. 20—42)

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This invention relates to awning type window sashes, and more particularly to improvements in the control mechanism therefor, whereby a plurality of vertically disposed and outwardly swingable sashes may have their movements controlled by movement of the lower or control sash of the set.

An object of the present invention is to provide a new and improved clutch structure constituting means for connecting and disconnecting the lower or control sash to the vertically movable travel members to which the other sashes are connected so that all of the sashes may be moved in unison or the lower sash moved independently of the remainder of the sashes.

A further object of the invention is the provision in an awning type window system of the multi-sash type of new and improved means for variably adjusting the hinge points of the sashes with respect to each other, whereby unitary traveling members forming the connectors between the sashes may be utilized.

These, and other objects and advantages of the invention, will be apparent from the following description taken in conjunction with the drawings forming part of this specification, and in which:

Figure 1 is a view in perspective of a plurality of sets of multi-sash awning type windows, with each set being shown in a different operational position;

Figure 2 is a view in vertical transverse section of a multi-sash awning type window embodying the improvements of the invention, and showing the sashes in an open position;

Figure 3 is an enlarged detail view taken along lines 3—3 of Figure 2;

Figure 4 is an enlarged detail view of the improved clutch structure forming the detachable connection between the lower or control sash and the vertically slidable traveling member to which the other sashes are hingedly connected;

Figure 5 is a view taken along lines 5—5 of Figure 4;

Figure 6 is a view with the side of the traveling member broken away to disclose in side elevation the tumbler and strike elements of the clutch structure; and

Figure 7 is an enlarged view along the lines of Figure 6, illustrating the various positions of orientation of the tumbler with respect to the strike element of the clutch structure.

Referring to the drawings for more specific details of the invention, the multi-sash awning type window set comprised of the lower or control

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sash 10 and upper sashes 12 and 14 is supported within a frame comprising head member 16, sill 18, and oppositely disposed jambs 20 by links 22 pivotally connected at their upper ends to the respective sashes and at their lower ends to plates 24 fixedly secured in equi-spaced arrangement to jambs 20. Each of the sashes 12 and 14 is further connected by hinge brackets 26 to vertically slidable channel-shaped traveling members 28 carried within vertical grooves 30 in the jambs 20, with the hinge brackets 26 for sash 10 being selectively connectable, in effect, to traveling members 28 by clutch means to be described. From the foregoing it will be clear that when the hinge brackets for the lower control sash are connected to the traveling members 28 the movement of the lower sash 10 in a direction to open the window will cause the sash to be pivoted about its points of connection with links 22 to thus move traveling members 28 downwardly in grooves 30 of the jambs 20, thereby causing a concurrent and parallel opening movement of upper sashes 12 and 14 due to the connection between the respective hinge brackets 26 therefor and traveling members 28.

The preferred means for connecting the hinge brackets 26 of sashes 12 and 14 to traveling members 28 comprises shoes 32 carried in the channels of traveling members 28 and having pivotally secured thereto the hinge bracket 26. The shoes 32 are in turn threadably engaged with upper threaded portions 34 of adjustment studs 36, while the lower threaded portions 38 of studs 36, which portions are of the opposite hand thread to portions 34 are in threaded engagement with fixture posts 40 fixedly secured to the traveling members 28. The studs 36 are provided at their lower ends with slots 42 for the insertion therein of a screw driver, or the like, to adjustably position the shoes 32 with respect to the posts 40. Rotation of any of the studs 36 in one direction will move the shoe 32 associated therewith toward its respective post 40 while rotation of the stud in the opposite direction will move the shoe away from the post. In this manner, simple and efficient means are provided for adjusting the hinge points of the upper sashes with respect to the hinge points of the lower sash so that the sashes may be accurately adjusted to maintain them in parallelism after initial installation. It will be particularly noted that the adjustment means described for this purpose enables the utilization of unitary traveling members 28 for the multi-sash awning window set.

Control means are provided so that the lower

or control sash may be connected and disconnected with respect to the traveling members 28 to thereby enable the following operational sequence: movement of the lower sash from the closed position to an open position to thereby move the upper sashes in parallelism therewith; movement of the lower sash to or toward a closed position independently of the upper sashes; movement of the lower sash outwardly to an open position in substantial parallelism with the upper sashes; and subsequent movement of the lower sash to or toward a closed position to cause a similar and simultaneous movement of the upper sashes. The control means for this purpose is carried in part by the lower sash and in part by the traveling members 28. That portion of the control means carried by the sash comprises hinge shoes 44, having pivotally connected thereto hinge brackets 26, and brackets, generally indicated at 46, pivotally secured to shoes 44 by journal pins 48. Brackets 46 are comprised of spaced apart leg members 50 interconnected at their upper ends by web 52, said webs serving as reaction members for compression springs 54 carried therebeneath by shoes 44 in bores 56. Springs 54 serve to urge the lower ends of leg members 50 of bracket 46 toward the bottom walls of traveling members 28. The shoes 44 are provided at their lower ends with lips 58 serving to limit the degree of pivotal action of the brackets 46 under the action of springs 54 and thus maintain the springs captive in the control means assemblies before the latter are placed within the traveling members 28. Brackets 46 are provided with bevelled portions 60 enabling a rocking motion of the brackets in the traveling members 28. Journaled between the lower ends of leg members 50 of the brackets 46, as by pins 62 are tumblers, indicated generally at 64, each of said tumblers being in the form of an isosceles triangle provided with sides 66 and 68 of equal length and a base 70 which is shorter than the sides 66 and 68.

That portion of the control means carried by the traveling members 28 comprises pairs of inwardly directed lugs or protuberances 72 consisting of pinched in portions of the side walls of the traveling members, and tumbler strikes, indicated generally at 74, fixedly secured to the bottom walls of the traveling members 28. The strikes 74 are characterized by lower end surfaces 76 extending substantially normal to the bottom surfaces of the traveling members 28, parallel face surfaces 80 and 82 offset to define therebetween shoulders 84, and surfaces 86 and 88 forming recesses 90 complementary to the base apexes of tumblers 64. All of the apexes of the tumblers 64 as well as the various edges or corners of strikes 74 are rounded or beveled in form to enable a smooth interaction between the tumblers and strikes in the manner hereinafter described.

With the sashes in the closed position, in which position the tumblers 64 are within recesses 90 of the strikes 74, as indicated in Figure 5, a complete cycle of operation of the multi-sash assembly takes place in the following manner. A slight movement of the lower or control sash toward an open position causes the control shoes associated therewith to be moved downwardly in traveling members 28 to bring the lower ends of brackets 46 into engagement with the protuberances or lugs 72 of the traveling members. During this movement the tumblers 64 are moved out of strike recesses 90 but are still positioned with their bases 70 adjacent the bottom wall of the traveling members 28. Further movement of the control sash

10 produces a proportionate downward movement of traveling members 28 due to the one-way connection between the control sash and the traveling members constituted by the control shoes and lugs 72. Movement of the traveling members downwardly causes the upper sashes 12 and 14 to be pivoted about the ends of their links 22 to produce a swinging movement outwardly of the upper sashes simultaneously with the movement of the lower sash and in parallelism therewith. Outward swinging movement of the control sash 10 may be stopped at any desired point.

With the sashes in the open position, the control sash may be moved toward or to a closed position independently of the upper sashes 12 and 14. As this closing motion of lower sash 10 takes place, the control shoes comprising the tumbler-carrying brackets 46 are moved upwardly within the traveling members 28, which members remain stationary. Movement of the lower sash to the closed position causes the tumblers 64 to be moved over and past the strikes 74, with this action being possible due to yielding movement outwardly of the brackets 46 about pivots 48 against the action of springs 54. During this movement of the tumblers over and past the strikes, the tumblers pass through the following positional stages with respect to the strikes: upon engaging the lower ends 76 of the strikes, the tumblers are tipped or pivoted into the position indicated at 64A in Figure 7, in which position the long side 66 of each tumbler bridges the mouth of strike recess 90; further movement of the tumblers upwardly brings them into the position indicated at 64B, in which position the long side 66 of each tumbler is in engagement with surface 82 of a strike, with the upper apex of the tumbler being engaged with the shoulder surface 84 of the strike; further movement of the tumblers upwardly causes them to be rotated by the holding action of strike shoulders 84 at the upper apexes of the tumblers to bring the long sides 68 of the tumblers into engagement with surfaces 80 of the strikes and to then bring the tumblers into the position indicated at 64C; and further movement upwardly of the tumblers brings them to the position of 64D.

In order to again place the upper sashes under the control of the lower sash, the latter is again moved to the open position to move the control shoes and tumblers carried thereby downwardly over and past the strikes so that the tumblers will be in position to become lockingly engaged with the strikes upon consequent closing of the lower sash, which closing serves to then move the traveling members 28 upwardly and simultaneously move the upper sashes to the closed position. The tumblers pass through the following positional stages during the opening of the lower sash to a position where it can again control the upper cashes: the tumblers are moved downwardly from positions 64D to bring their long sides 68 into engagement with strike surfaces 80, as indicated at 64C; further downward movement of the tumblers causes them to slide on their sides 68 to position 64E, in which position the tumbler sides 68 are in engagement with strike surfaces 82; and further downward movement of the tumblers caused by continued opening movement of the control sash slides the tumblers across the mouths of strike recesses 90 and past the lower ends 76 of the strikes to position 64F. The tumblers are then in position to place the traveling members 28 and the upper sashes attached

thereto under the control of the lower sash upon the closing of the latter.

The closing of the lower sash from its open position represented by tumbler position 64F causes the tumblers to be rocked into strike recesses 90 about the pivot points defined by strike ends 76 and tumbler apexes in engagement therewith. The tumblers are then in one-way locking engagement with the strikes and the closing of the control sash imparts an upward movement to the traveling members 28 and consequent proportionate closing of the upper sashes 12 and 14, so that all of the sashes simultaneously reach the closed position.

While a preferred embodiment of the invention has been shown and described, it is to be understood that all substantial equivalents of said embodiment are within the scope of the invention.

What I claim as new and desire to secure by Letters Patent is:

1. In an awning type window having a control sash and a controlled sash supported to swing between open and closed positions and having means including a vertically slidable travel member to connect the sashes for simultaneous operation, releasable clutch means between the control sash and the travel member to permit independent operation of the control sash comprising, a strike member fixed to the travel member with a stepped surface presenting spaced projections, a shoe slidable on the travel member and passing the strike member upon swinging movement of the control sash, and a tumbler of elongated triangular form supported for pivotal movement on the shoe, the lengths of the sides of the tumblers and the distances between the steps on the strike member being so related to each other as to cause the tumbler to pass over said projections with a combination of rotating and sliding motions upon initial closing and second opening of the control sash and to enter a driving engagement with a projection on said strike upon the second closing movement of the control sash.

2. In an awning type window having a control sash and a controlled sash supported to swing between open and closed positions and having means including a vertically slidable travel member to connect the sashes for simultaneous operation, releasable clutch means between the control sash and the travel member to permit independent operation of the control sash comprising, a strike member fixed to the travel member

with a stepped surface presenting spaced projections, a shoe slidable on the travel member and passing the strike member upon swinging movement of the control sash, and a tumbler of elongated triangular form supported for pivotal movement on the shoe, the lengths of the sides of the tumblers and the distances between the steps on the strike member being so related to each other as to cause the tumbler to pass over said projections with a combination of rotating and sliding motions upon initial closing and second opening of the control sash and to enter a driving engagement with a projection on said strike upon the second closing movement of the control sash and a fixed stop on the travel member engageable by the shoe on the initial opening movement of the control sash to effect opening of the controlled sash.

3. In an awning type window having a control sash and a controlled sash supported to swing between open and closed positions and having means including a vertically slidable travel member to connect the sashes for simultaneous operation, releasable clutch means between the control sash and the travel member to permit independent operation of the control sash comprising, a strike member fixed to the travel member with a stepped surface presenting spaced projections, a shoe slidable on the travel member and passing the strike member upon swinging movement of the control sash, and a tumbler of elongated triangular form supported for pivotal movement on the shoe, the lengths of the sides of the tumblers and the distances between the steps on the strike member being so related to each other as to cause the tumbler to pass over said projections with a combination of rotating and sliding motions upon initial closing and second opening of the control sash and to enter a driving engagement with a projection on said strike upon the second closing movement of the control sash and resilient means engageable with the shoe to urge the shoe and the tumbler toward the stepped surface of the strike member.

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