Sept. 11, 1962 T. R. EWING 3,052,931

WINDOW HINGE STRUCTURE

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FIG. 1

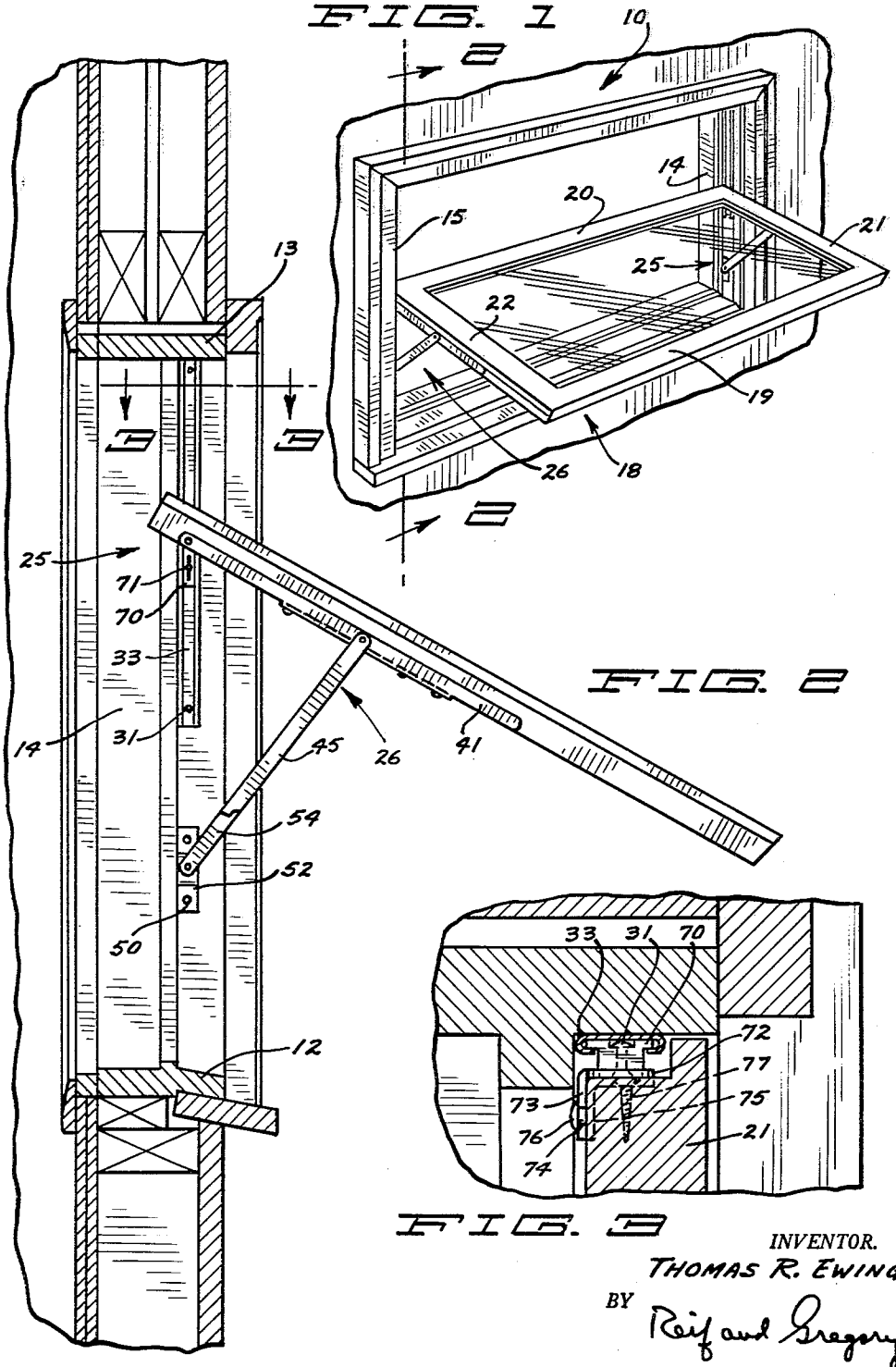


FIG. 2

FIG. 3

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FIG. 4

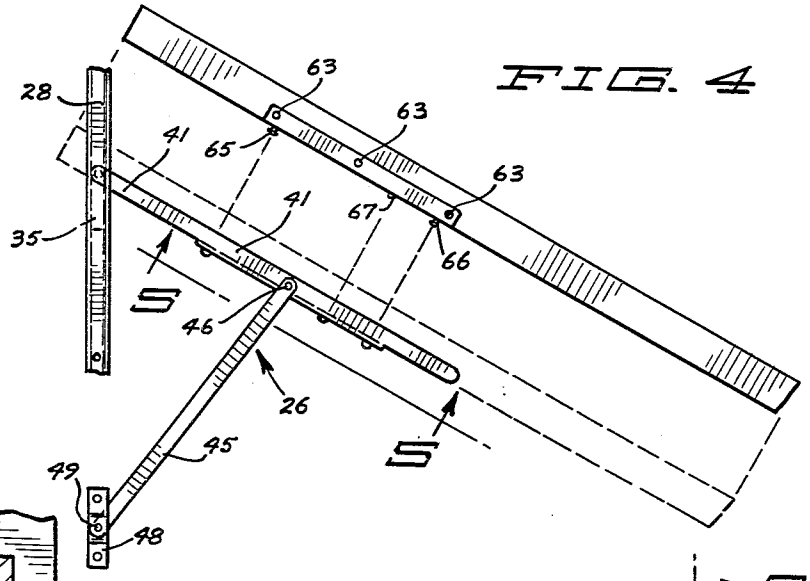


FIG. 5

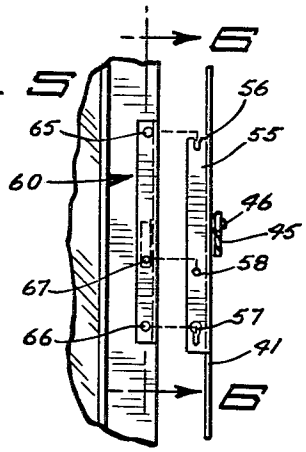


FIG. 6

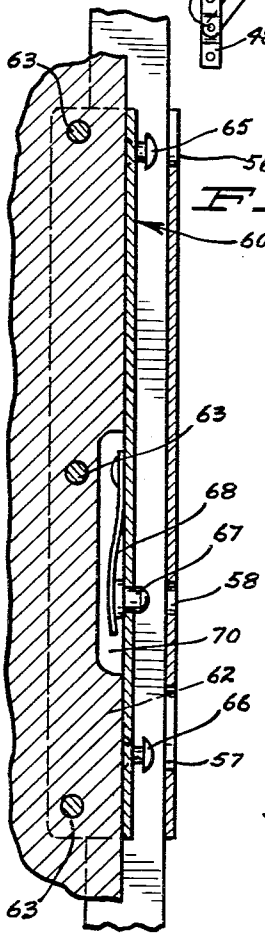


FIG. 7

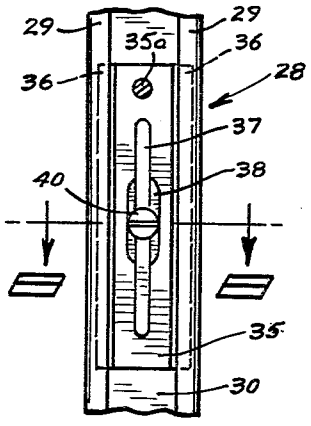


FIG. 9

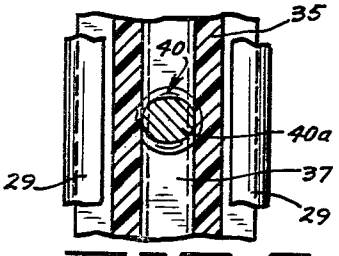
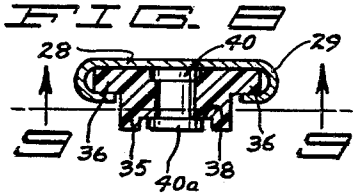


FIG. 8



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United States Patent Office 3,052,931 Patented Sept. 11, 1962

3,052,931

WINDOW HINGE STRUCTURE

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Filed June 21, 1960, Ser. No. 37,695
4 Claims. (Cl. 20—42)

This invention relates to a window hinge structure for awning for hopper type of window sash. Such window sash are of a type which are supported to swing outwardly and slide downwardly to permit movement of air through both the upper and lower open portions of the window frame and to tend to prevent the entrance of rain through said window frame. In being installed, the hinges for supporting and carrying such a sash generally are of such a construction that fastening means such as screws are required to be removed from either the window frame or the window sash for the removal of the sash as for painting or repairing the same.

In connection with such a hinge and sash, it is desirable to have a hinge so constructed that the portion of the hinge fastened to the sash is easily disengageable from the remainder of the hinge for a ready and easy removal of the sash. It is also desirable to have such a hinge which has a very simply operated positive locking means for locking the sash in any certain opened position.

It is an object of this invention therefore to provide a hinge for an awning or hopper type of window having a detachable portion for a ready and easy removal of said sash.

It is another object of this invention to provide a hinge such as above indicated having a locking means for a ready and easy positive locking thereof in any certain open position.

It is a further object of this invention to provide a hinge such as indicated comprising a portion secured to a window having a cooperating portion carried by the sash frame whereby said portions have a readily detachable locking engagement.

It is a more specific object of this invention to provide a hinge such as indicated comprising a vertical track, a resilient shoe movable in said track, the arm portions of said hinge having an operative pivotal association with said shoe, means for readily causing said shoe to have positive engagement with said track at any certain point thereon, and an arm portion of said hinge having an associated portion carried by the sash whereby said portions are readily engaged or disengaged.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a view in perspective on a reduced scale showing applicant's device in operating position;

FIG. 2 is a view in vertical section taken on line 2—2 of FIG. 1, as indicated by the arrows, and showing applicant's device in side elevation;

FIG. 3 is a view in horizontal section on an enlarged scale taken on line 3—3 of FIG. 2, as indicated by the arrows, with the window shown in closed position;

FIG. 4 is a fragmentary view showing applicant's device in elevation from a side opposite that shown in FIG. 2;

FIG. 5 is an exploded fragmentary view in bottom plan taken on line 5—5 of FIG. 4 as indicated by the arrows;

FIG. 6 is a fragmentary view in vertical section on an enlarged scale taken on line 6—6 of FIG. 5 as indicated by the arrows;

FIG. 7 is a fragmentary view on an enlarged scale of a portion of applicant's device in front elevation;

FIG. 8 is a view in horizontal section taken on line 8—8 of FIG. 7 as indicated by the arrows; and

FIG. 9 is a view in horizontal section taken on line 9—9 of FIG. 8 as indicated by the arrows.

Referring to the drawings, a window frame 10 is shown comprising a sill 12, a cap strip 13 and jambs 14 and 15. The supporting structure for said frame, as indicated particularly in FIGS. 2 and 3, is of commonly known construction forming no part of the present invention and is not here described.

Mounted in said frame 10 is a window sash 18 comprising a lower rail 19, an upper rail 20, and forming either side thereof are stiles 21 and 22.

Applicant's device comprises a pair of hinge structures or hinges disposed at either side of said sash 18. Said hinges as is obvious from the drawings are mirror copies of one another. One of said hinges is indicated generally by the character 25 and the other by the character 26. For purposes of simplicity and to avoid duplication, neither of the hinges is shown in complete detail. Reference will be had to both to describe a composite hinge structure with the greater portion of the detail being described in connection with the hinge 26.

Said hinge structure 26 comprises a vertically disposed frame member 28 which may be variously formed and is here shown as a channel forming frame member having inwardly bent side portions 29 forming a track 30 therein. Said channel member will be disposed on the jamb 15 of said window frame 10 and will be suitably secured as by screws 31 indicated as securing the channel member 33 of the hinge portion 25.

Slidable in said track 30 is a shoe 35. Said shoe is here disclosed in one embodiment as being formed of a resilient material, such as of nylon of Teflon, formed as an elongated block having side portions 36 of reduced vertical dimension forming runners disposed under the sides 29 of said channel frame member 28. Formed centrally longitudinally of said shoe 35 is a slot 37 having a central enlarged offset recessed portion 38. Disposed in said offset portion 38 is a means for causing a pressure engagement of said shoe with said channel formed here as a cam or lock pin 40 having a slotted head portion. The head portion of said pin seats in said portion 38 to be flush with the upper surface of said shoe, and the shank 40*a* of said pin is oval-shaped in horizontal cross section whereby said pin may be turned as indicated in FIG. 9 to bear against the sides of said slot 37 to press outwardly the central portions of said shoe to cause frictional engagement between said runners 36 of said shoe and the sides 29 of said channel member 28.

Referring to FIG. 4, an arm 41 formed as a flat bar has its upper end portion pivoted to said shoe 35 through the aperture 35*a* therein. A second arm 45 similar to said arm 41 has its upper end portion pivoted to said first arm 41 centrally thereof by a rivet 46. The lower end of said arm 45 is pivoted to a plate bracket 48 by a rivet 49. Said plate bracket will be secured to said jamb 15 in vertical alignment with said member 28 by screws 50 as shown in connection with the plate bracket 52 of said hinge portion 25 as in FIG. 2. Pivoted at its lower end portion to said bracket 52 is an arm 54 of said hinge 25, and said arm is identical to said arm 45.

Said arm 41 has a central right-angled flange portion 55, as indicated in FIG. 5, having an open-ended key slot 56 at its upper end, a key slot 57 adjacent its lower end and a lock pin aperture 58 spaced between said slots. Said slots and said aperture will be in alignment longitudinally of said flange.

With reference of FIGS. 4–6, a right-angled plate member 69 is provided having a side 61 secured to an inner corner portion of stile 22 of sash 18 by screws 63 and

having its sides 62 mate with and have an operative association with said flange 55.

Extending outwardly of said side 62 are hanger pins 65 and 66 to be spaced apart to be disposed into said key slots 56 and 57 respectively. Said side 62 carries a lock pin 67 disposable through the lock pin aperture 57. A plate spring 68 is mounted on the underside of said side 62 to press said pin 67 outwardly. Said sash 18 will have a recessed portion 70 directly beneath said spring 68 into which space said pin 67 may be depressed.

With reference to FIG. 3, portions of said hinge portion 25 are indicated comprising the channel frame member 33 having slidable therein a shoe 70 having a cam pin 71 with said shoe being pivoted to an arm 72 with said arm having a right-angled flange portion 73 having therein as here shown a key slot 74. Removably secured to said flange portion 73 is an angled plate 75 having a hanger pin 76 removably disposed through said slot 74 and said plate being secured to said sash 18 by screws 77. Only the portions shown have been mentioned. The hinge portion 25 with all of its parts is identical in detail with those of the hinge portion 26 with one being a mirror copy of the other.

Applicant's window hinge device is adapted for use in connection with a sash of the type indicated in the drawings whereby the sash is opened by being inclined outwardly with the upper portion being lowered as the window is extended outwardly providing for a free circulation of air both above and below the window. The hinges will be mounted in a window frame, as indicated in FIGS. 1–3, and the method of mounting is quite obvious and well within the common knowledge of any workman in the art. The right-angled plate members 60 and 75 will be respectively secured at either side of the sash 18 at the inner corners thereof whereby the sides of said right-angled plate members carrying hanger pins will be positioned to become operatively associated with the flange portion 55 of the hinge 25 and a corresponding portion of the hinge 26. As clearly shown in FIGS. 5 and 6, said hanger pins are disposed through aligned key slots and are held removably locked in position by the lock pin 67 of the hinge portion 25 and a corresponding lock pin of the hinge portion 26. Thus the sash 18 by means of the angled plate members 60 and 75 with their associated relationship with the flange portions 55 and 73 is very readily mounted in position in a window frame or very quickly removed therefrom by merely depressing the locking pins and disengaging the hanger pins.

When mounted in the sash frame, said window is very nicely and positively secured in any desired position by means of the resilient shoes 35 and 70. The cam pins 40 and 71 in said shoes will be rotated 90 degrees to either cause the shoes to grippingly engage their associated frame members or to be freely slidable therein. A small tool such as a small screw driver will be used to rotate said pins 40 and 71 with said pins in the embodiment of the invention here disclosed being provided with slotted heads. Hence said shoes provide for positively locking the sash in closed position or by holding it open at any desired angle.

Thus applicant has provided a very convenient hinge structure for a hopper or awning type of sash which gives a complete operating control of the sash either as to locking it at any certain desired open position and providing for the removal of said window by simple disengagement of associated parts without requiring the removal of any screws or other fixed mounting means.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which, generally stated consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A hinge structure in connection with a window frame having an awning type window sash for allowing the sash to slide and swing comprising a track attached to a side portion of said window frame, a shoe slidable in said track, an arm having its upper end pivoted to said shoe, a second arm having its upper end portion pivoted to said first arm, a bracket secured to said window frame below said track, said second arm having its lower end portion pivoted to said bracket, said first arm having a right-angled flange at the inner side of said arm, said flange having longitudinally spaced key hole slots therein, an aperture in said flange intermediate said key hole slots, a plate member secured to a side of said sash adjacent said first arm to have mating engagement with said flange of said arm, a pair of longitudinally spaced hanger pins carried by said plate member to be disposed through said key hole slots, and a spring loaded lock pin carried by said plate member to be disposed through said aperture in said flange to releasably lock said flange to said plate member.

2. The structure set forth in claim 1, said shoe being formed of a resilient material, a longitudinal slot in said shoe, a lock pin carried in said shoe, said lock pin having a cam formed shank whereby on being rotated ninety degrees said shank expands the slot in said shoe to cause said shoe to grippingly engage the walls of said track.

3. A hinge structure in connection with a window frame having an awning type window sash for allowing the sash to slide and swing comprising a track attached to a side portion in said window frame, a shoe slidable in said track, an arm having its upper end pivoted to said shoe, a second arm having its upper end portion pivoted to said first arm and having its lower end portion pivoted to said side portion of said window frame, said arm having a portion having longitudinally spaced key hole slots therein, an aperture in said portion spaced between said key hole slots, a plate member secured to the side of said sash adjacent said first arm to have mating engagement with said mentioned portion of said first arm, a pair of longitudinally spaced hanger pins carried by said plate member disposed through said key hole slots, and a spring loaded lock pin carried by said plate member disposed through said aperture to releasably lock said first arm to said plate member.

4. A hinge structure in connection with a window frame having an awning type of window sash for allowing said sash to slide and swing comprising a track attached to a side portion of said window frame, a shoe slidable in said track, a linkage connecting said shoe and said side portion of said window frame, a flange carried by a portion of said linkage adjacent said sash, said flange having longitudinally spaced key hole slots therein, an aperture in said flange spaced between said key hole slots, a plate member on said sash mating with said flange, a pair of longitudinally spaced hanger pins carried by said plate member disposed through said key hole slots, and a spring loaded lock pin carried by said plate member disposed through said aperture in said flange to releasably lock said flange to said plate member.

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