Dec. 22, 1936. F. G. HANSON 2,064,830

WINDOW FASTENER STRUCTURE

Filed July 28, 1934

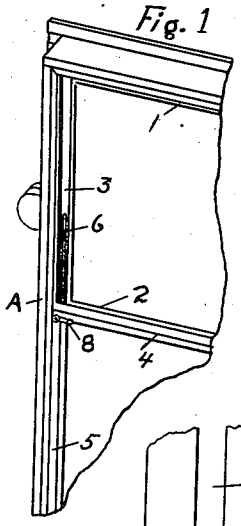


Fig. 1

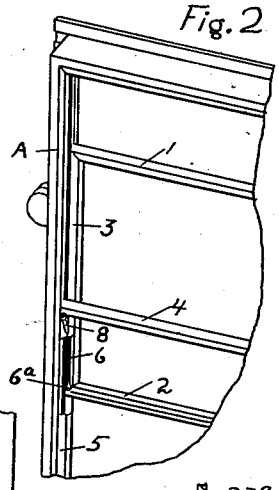


Fig. 2

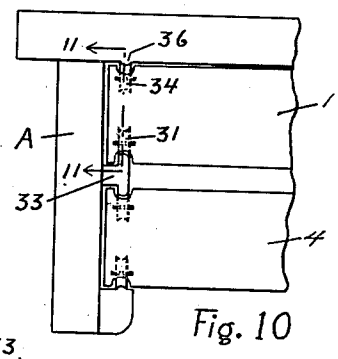


Fig. 10

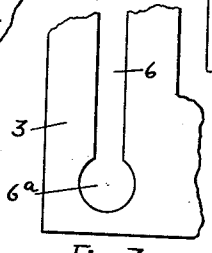


Fig. 3

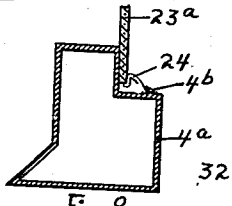


Fig. 8

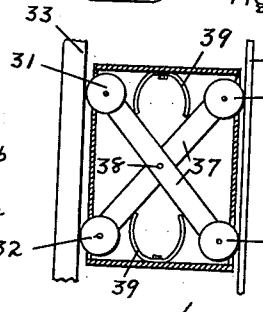


Fig. 11

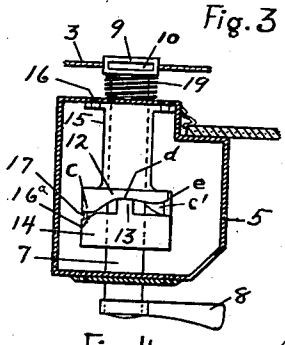


Fig. 4

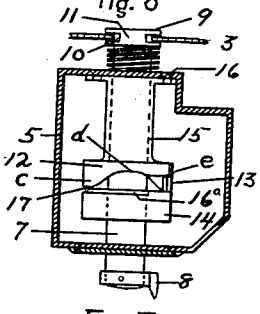


Fig. 5

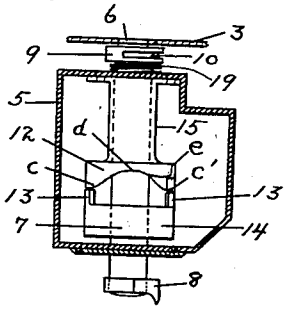


Fig. 6

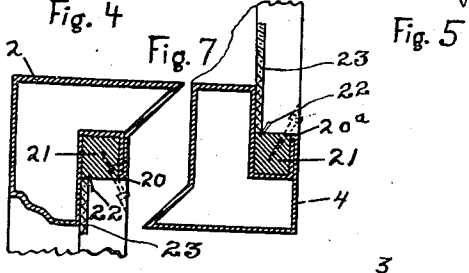


Fig. 7

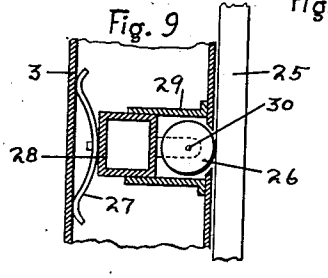


Fig. 9

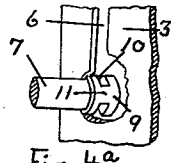


Fig. 4a

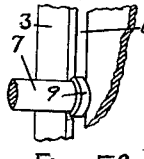


Fig. 5a

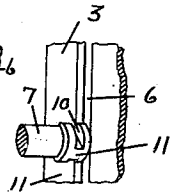


Fig. 6a

FRANCIS G. HANSON, INVENTOR.

BY Samuel E. Foulds

ATTORNEY

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WINDOW FASTENER STRUCTURE

Francis G. Hanson, Los Angeles, Calif.

Application July 28, 1934, Serial No. 737,422

2 Claims. (Cl. 292—60)

This invention relates to windows or similar structures for closing openings in the walls of buildings, the same comprising a plurality of slidable members which are capable of relative movement to open the window more or less to admit light and air. As specifically disclosed herein, the slidable members are a pair of glazed sashes, the same being provided with a means for locking them together immovably when in their fully closed positions, unlocking them so that neither can interfere with the movement of the other, or attaching one to the other so that either or both may be moved to an extent sufficient for ventilation but not far enough to permit surreptitious entry of a person through the window.

The primary object of the invention is, therefore, the production of a window and the locking means therefor having the characteristics just set forth. A further object is the production of a hollow, metal sash within which the principal operative parts of the lock are embodied. A further object is the provision of a lock which, while set to permit opening of the window sufficiently for ventilation, cannot be changed to unlock the sashes until the latter have been fully closed. Other objects of the invention will be set forth in the following specification which is a description of the structure at present preferred. The claims hereunto appended are not intended to be limited to the details of the structure shown and described any further than their specific terms make necessary.

In the drawing, Fig. 1 is a perspective view of a portion of a window having my invention embodied therein, the sashes being closed and locked together; Fig. 2 is a similar view in which the upper sash is partially lowered but is locked to the lower sash; Fig. 3 is an elevation of the lower left-hand corner of the upper sash showing the lower end of the slot therein; Fig. 4 is a transverse section taken through the upper rail of the lower sash showing the locking means in the position of Fig. 1; Fig. 4*a* is a perspective view showing the inner end of the lock-bolt in the position of Fig. 4 and a part of the upper sash which is slotted to receive and cooperate with the end of the lock-bolt; Fig. 5 is a view similar to Fig. 4 showing the lock-bolt turned as when the window is partially opened, the sashes being locked together; Fig. 5*a* is a view similar to Fig. 4*a* showing the lock-bolt engaged slidably within the slot of the upper sash; Fig. 6 is a view similar to Figs. 4 and 5 showing the lock in its inoperative position so that the sashes may be moved freely and independently; Fig. 6*a* is a view similar to Figs. 5*a* and 4*a* showing the lock-bolt withdrawn from the slotted upper sash; Fig. 7 is a transverse section taken through the upper rail of the lower sash and the lower rail of the upper sash, showing the hollow, metallic structure of the sashes and the preferred means for holding the glass in place; Fig. 8 is a transverse section through the lower rail of the upper sash and showing a modified structure; Fig. 9 is a section taken vertically through one of the side stiles of a sash and showing the resiliently-mounted anti-friction roller therein and the track upon which it rolls; Fig. 10 is a plan view of one of the ends of the sash rails showing a modified arrangement of anti-friction rollers and rails, and Fig. 11 is a section through one of the rails taken on the line 11—11 of Fig. 10.

Taking up a detailed description of the invention as illustrated in the drawing, A represents the frame or casement of a window as seen from within the building, the same being provided with grooves or ways within which a pair of sashes slide vertically. The upper sash comprises the upper and lower rails 1 and 2, respectively, and the stiles 3, but one of the latter being shown. The upper rail and the stile of the lower sash are designated 4 and 5 respectively. As shown in various figures, particularly Figs. 3, 6, and 8, the sash rails and stiles are metallic and hollow, being made of relatively light sheet metal, galvanized or otherwise treated to render them rust-proof. Many of the advantages of my invention would be realized if the sashes were made of wood; but the hollow metal structure renders the sashes strong, rigid and light and is preferred. Moreover, such sashes are not subject to swelling in damp weather or to shrinkage when it is dry. In adopting the metallic structure, however, the rails and stiles conform to standard dimensions used, so that the sashes are capable of use in conventional wooden window frames. That is to say, the thickness of the sash is preferably 1⅜ inches, as is customary.

One of the stiles 3 of the upper sash is provided with a slot 6 extending vertically through its inner face, the slot terminating at its lower end in an enlargement 6ª, as best shown in Fig. 3, the enlargement being in substantially the central horizontal plane of the rails 2 and 4 when the sashes are fully closed. Extending fore and aft through the stile 5 of the lower sash, and registering with the enlargement 6ª when the sashes are closed, is a lock-bolt 7, the same having an operating lever 8 on its forward end and a head 9 on its rear end. The lever 8 is inside the lower sash so that it can normally be reached only from within the building. The

head is grooved or slotted transversely at 10 on its diametrically opposite sides, leaving between the grooves a neck 11 which corresponds in thickness to the width of the slot 6 in the upper sash. The diameter of the head 9 is but slightly less than that of the enlargement 6a and is materially greater than the width of the slot 6. When, therefore, the sashes are closed and the bolt is moved inwardly to its normal position, as shown in Fig. 4, the head projects into the said enlargement; and, the bolt being turned until the grooves 10 extend transversely of the slot, the head cannot enter the latter and neither sash can be moved. The window is thus locked in its closed position. When the bolt is moved outwardly to its maximum extent, as in Fig. 6, the head is completely withdrawn from the enlargement 6a and the sashes are freed from each other and may be moved independently to open the window to its fullest extent. When the bolt is given a quarter turn, or substantially that, from the position of Fig. 4, and the grooves 10 extend vertically, the neck 11 registers with the groove 6 and may be moved therein as one or both of the sashes is opened, which movement may be continued until the neck reaches the upper end of the slot. This movement is sufficient for ventilation but is insufficient to allow either sash to be opened wide enough to permit a person to crawl through the window. While he may easily reach through the partially opened sash and grasp the lever 8, he cannot turn it to unlock the sashes for the reason that the neck 11 cannot be turned in the slot 6. Before the lever can be turned the sashes must be completely closed, which means that the arm of the outsider will have to be withdrawn from the window before the latter can be opened far enough to admit his entire body. The sashes can, therefore, be unlocked only from the inside of the window. The slot 6 may be of any desired length.

The position of the bolt 7 with respect to the slot 6 is clearly indicated in Figs. 4a, 5a, and 6a. In the first position the head 9 is within the enlargement 6a and the neck 11 extends transversely of the slot so that it cannot enter. The sashes are thus locked together and cannot move. In the second position, the neck of the bolt-head is within the slot and one or both sashes may be moved until stopped by the upper end of the slot. In the third position the head is withdrawn from the sash 3 and the sashes may be freely moved.

Means are provided for moving the bolt lengthwise as it is rotated. This comprises a stationary cam 12 against which a lug 13, on a member 14 which is non-rotatively mounted on the bolt 7, impinges as the bolt is rotated. The cam may be mounted anywhere along the bolt, even, if desired, on the outside of the sash; but I prefer to place it inside the stile 5, as shown, since it is then out of sight and where it cannot be tampered with. Moreover, there is but little change in the appearance of the sash. The cam is carried upon the forward end of a sleeve 15 within with the bolt is journaled and which is rigidly secured within the sash, as by screws 16. As shown in Fig. 6, there are two of the lugs 13 at diametrically opposite points on the member 14; and it may here be stated that that half of the cam 12 which appears in Figs. 4, 5, and 6 is duplicated on its opposite half. That is to say, each point of the cam edge against which one of the lugs impinges on one side of the bolt is duplicated on the opposite side against which the other lug simultaneously impinges, so that any resistance to the rotation of the bolt due to the engagement of one lug with the cam will be balanced by an equal resistance on the opposite side of the bolt due to the engagement of the other lug with the cam.

The lever 8 is adapted to rest in any one of three positions. Figs. 5 and 6 show it in its extreme positions, between which it turns through an arc of substantially ninety degrees. Fig. 4 shows the lever in its midposition. The bolt 7 and the lever may be arrested at the ends of their rotative movements by various arrangements of stops, that shown consisting of a slot or groove 16a in the member 14 within which projects a pin 17 from the cam 12. The groove extends substantially a fourth of the way about the member and the pin arrests the rotative movement by engaging with the shoulder or wall at the ends of the groove.

The operative face or edge of the cam 12 is, of course, irregular in shape, projecting more or less forwardly, or toward the lever 8. At *c* it projects farthest; and when one of the lugs 13 engages the cam at that point, the bolt is moved forwardly, as shown in Fig. 6, until the bolt-head 9 clears the upper sash. Opposite the point *c* is a corresponding point *c'* with which the other lug 13 is also in engagement. At the point *d* the cam face recedes farthest from the lever 8, and when the lug 13 contacts at that point, as in Fig. 4, the bolt is moved inwardly until its head is within the enlargement 6a of the slot 6 and is so turned that it cannot pass into the slot. When in that position the sashes are immovable, being locked together. The point *e* is on substantially the same level as the point *d* so that, when the lug 13 rests on the point *e*, as in Fig. 5, the head 9 is in substantially the same position as is shown in Fig. 4 but is turned so that the neck 11 of the bolt-head may enter the slot 6. The lugs 13 are held against the cam face by a spring which may be of various forms and in various locations. As shown, it is a helical spring 19 which surrounds the bolt and is compressed between the bolt-head and the window sash.

Fig. 7 is a cross sectional view taken transversely through the sash rails 2 and 4 when the sashes are closed. It shows the hollow shell-like formation of the sash members, the relation of the sash rails when the window is closed, and particularly the preferred means for holding the panes in position. It will be noted that the sheet-metal is doubled back upon itself at 20 and 20a to provide grooves or pockets for strips 21 of wood or similar material. Into these strips the glazier's points 22 may be inserted to hold the glass panes 23 in position prior to the application of putty in the usual manner. The surfaces of the strips are bare or uncovered at and adjacent the panes and the putting adheres to the strips as is usual in wooden sashes.

In Fig. 8 I have shown a sash-rail 4a corresponding to rail 4; but the rail 4a has no wooden strip and the usual glazier's points are not used. In lieu of such points I employ spring clips 24 which bear against the glass pane 23a. One end of the clip is extended beneath a lip 4b on the sash. From that end the clip bows outwardly and toward the pane until the latter is reached when it turns back toward the edge of the pane and lies against the side of the latter. The end of the clip opposite the lip 4b is hooked behind the edge of the pane. The clips, being resilient, can readily be applied by inserting the ends under the lip 4b and then pressing them down until

they snap back of the edge of the pane, as will be understood. When the putty is applied the clips will be embedded therein and will be concealed.

It is desirable that the sashes move in the window frame with as little friction as possible. To secure this ease of movement the frame is provided with a suitable track **25**, as indicated in Fig. 9, upon which bears an anti-friction roller **26**. As many of these rollers will be provided as may be deemed desirable. Usually two are employed in the outer edges of the sashes, one near the top and the other near the bottom rail. Preferably, the rollers are spring-pressed toward their respective tracks. This operation may be secured by various specific structures, that shown comprising a semi-elliptical leaf-spring **27** which bears at or adjacent its ends upon the interior of the sash opposite the roller and at its center upon the roller mounting, to which it is attached. As shown, this mounting is in the form of a hollow piston **28** which extends within a cylinder **29**, the latter being attached to the sash. The roller is journaled on a pin or axle **30** which extends between ears on the piston member **28**. The sash is, of course, slotted to permit the rim of the roller to project into contact with the track as shown.

While the structure shown in Fig. 9 prevents friction and binding between the edge of the sash and the window frame or casement, it is frequently the friction between the side edges of the sashes and the sides of the grooves in the casement that causes trouble. In Figs. 10 and 11 I have shown a modified structure that is designed to overcome that trouble. In it, the rollers engage tracks at the sides of the sashes rather than at the ends. Thus, as shown in Fig. 11, the rollers **31** and **32** extend through one side of the sash into contact with a track formed on the corresponding side of the parting-strip **33**, while similar rollers **34** and **35** extend through the opposite side of the sash into contact with a track **36** which is formed on the casement. Fig. 10 is a plan view showing the two sashes with the side-bearing rollers, the sashes being separated by the parting-strip **33**, the latter having the tracks on its opposite sides. The rollers are journaled on the outer ends of arms **37** which are pivoted at **38** and which are pressed apart by spring **39**. These are preferably leaf springs which are secured at their centers to inner walls of the sash and bear with their ends against the arms, as shown.

Having thus described my invention, I claim:

1. A latching construction for sliding sashes comprising a slidable and rotatable bolt mounted on a lower sash to cooperate with a keeper disposed on the upper sash, said keeper having an enlarged opening communicating with an elongated slot extending in the direction of movement of the lower sash, spring means normally urging said bolt toward said keeper, an enlarged head on said bolt adapted for partial passage through said keeper opening, said head having a reduced portion adapted to be presented to said keeper to engage the edges thereof which define said slot, whereby said lower sash may have limited movement relative to said keeper, and means for imparting predetermined movement to said bolt including cooperating elements which, upon selective rotation of said bolt, will reciprocate said bolt to cause it to coact with said keeper in non-sliding relation to retain the sash secured against sliding movement, to interconnect said bolt and said keeper to provide for limited relative movement of said lower sash and said keeper, or to be disposed free of said keeper to allow unrestricted movement of said lower sash and said keeper.

2. A latching construction for sliding sashes comprising a slidable and rotatable bolt mounted on one of the sashes to cooperate with a keeper on the other sash, said keeper having an enlarged opening communicating with an elongated slot extending in the direction of movement of the sash on which the bolt is mounted, spring means normally urging said bolt toward said keeper, an enlarged head on said bolt adapted for partial passage through said keeper opening, said head having a reduced portion adapted to be presented to said keeper to engage the edges thereof which define said slot, whereby the sash on which the bolt is mounted may have limited movement relative to said keeper, and cooperating means for imparting predetermined movement to said bolt, said means comprising a fixed sleeve supported in the sash on which the bolt is mounted and having a cam face thereon, a cooperating collar carried by said bolt and engaging said cam face, the contour of said cam face being such as to reciprocate said bolt as it is rotated, selective rotation of said bolt causing it to coact with said keeper in non-sliding relation to retain the sash against sliding movement, to interconnect said bolt and said keeper to provide for limited relative movement of the sash upon which said bolt is mounted and said keeper, or to be disposed free of said keeper to allow unrestricted movement of said keeper and the sash upon which said bolt is mounted.

FRANCIS G. HANSON.