Feb. 6, 1940. E. E. HALL 2,189,142

SASH WINDOW CONSTRUCTION

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Fig. 1

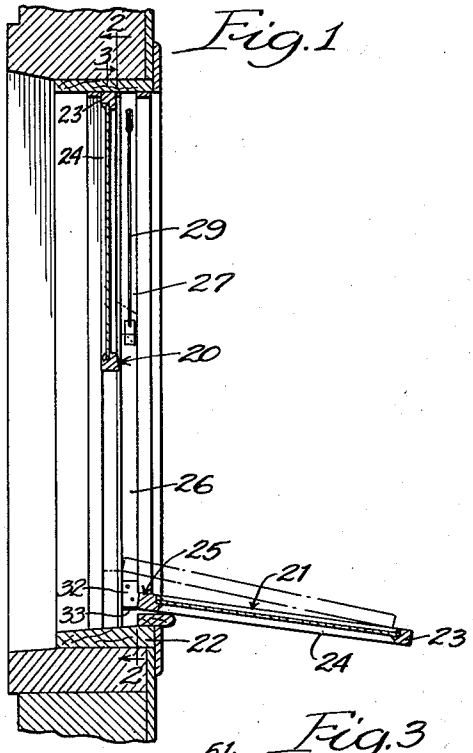


Fig. 2

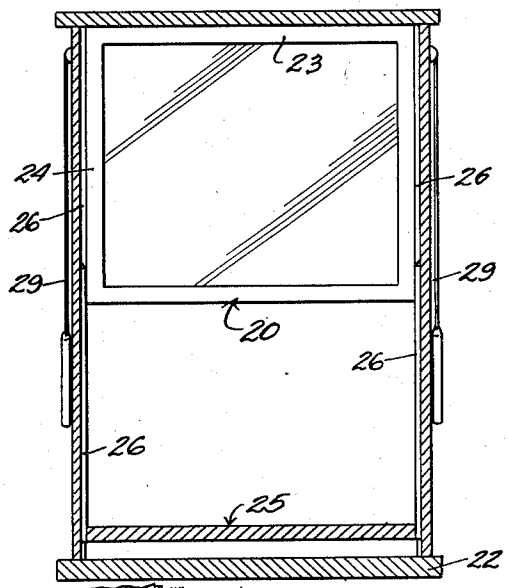


Fig. 3

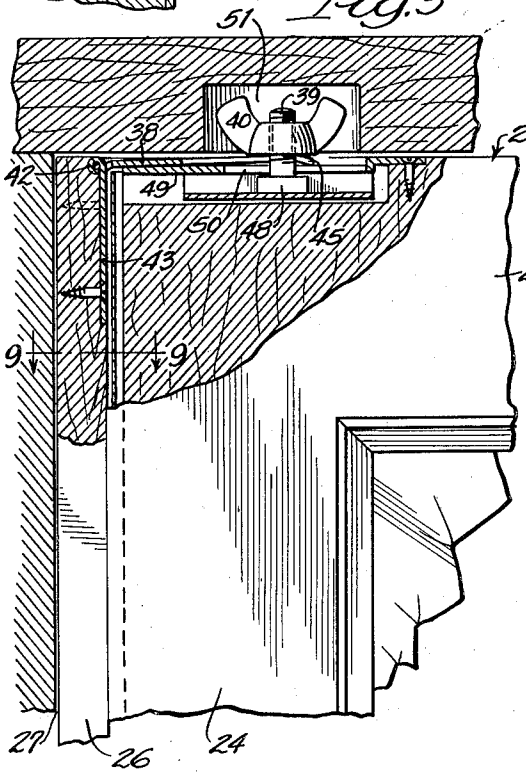
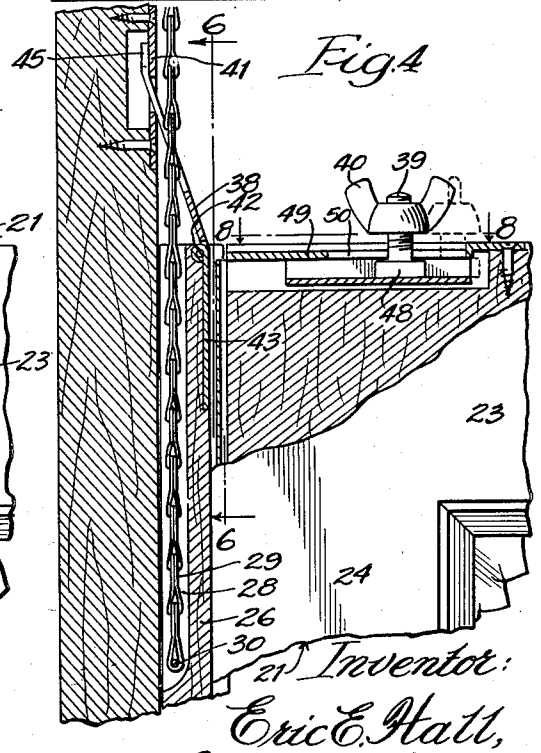


Fig. 4



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Fig. 5

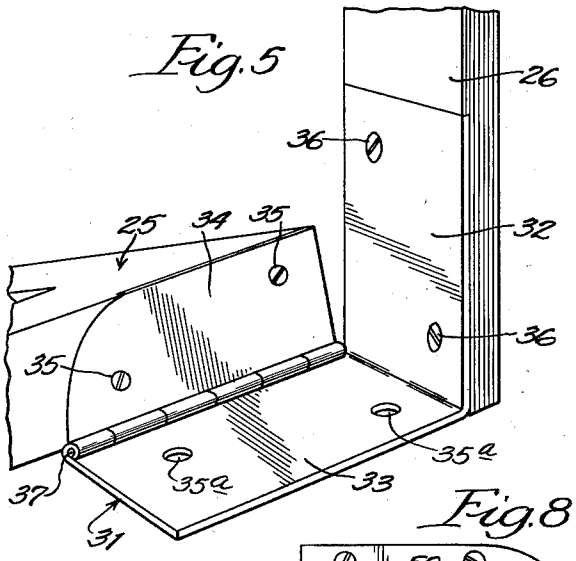


Fig. 6

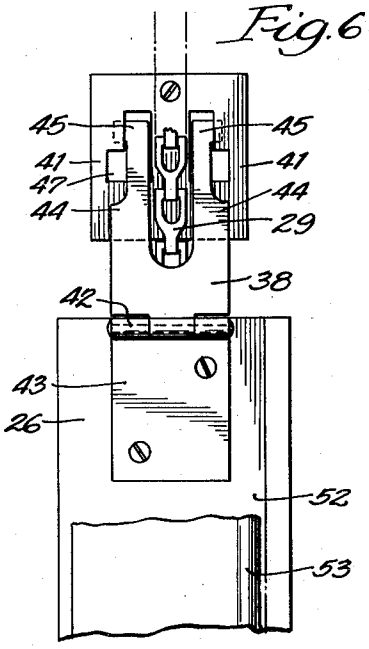


Fig. 8

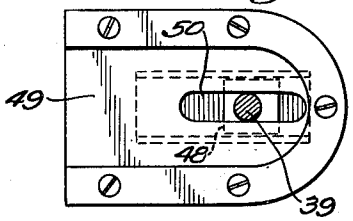


Fig. 7

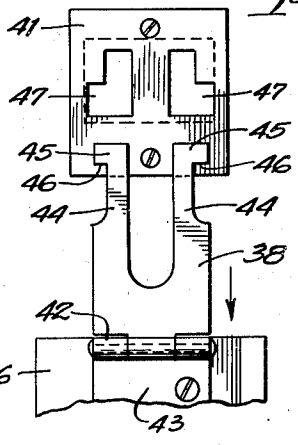


Fig. 9

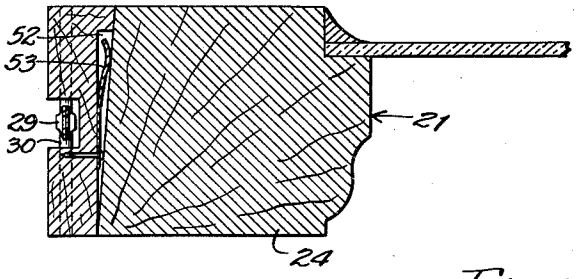


Fig. 10

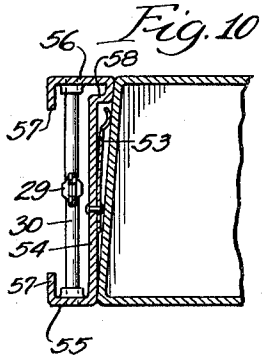
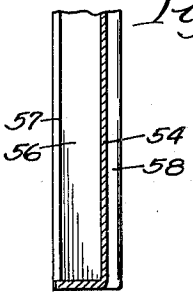


Fig. 11



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Patented Feb. 6, 1940 2,189,142

UNITED STATES PATENT OFFICE

2,189,142

SASH WINDOW CONSTRUCTION

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Application September 11, 1937, Serial No. 163,462

3 Claims. (Cl. 20—49)

The device of the present invention is designed to facilitate the cleaning of sash windows by hinging each sash between slides or stiles which travel vertically within the guide channels in the window frame, so that, when unlocked, the sash may be swung inwardly in position to expose the exterior surface of the sash for the purpose of cleaning, painting, puttying, glazing, or the like.

The invention in particular relates to the parts or fittings which are employed for firmly hinging the sash between the stiles and the fittings which are employed for locking the free or unhinged edge of the sash to the stile, so that when locked the parts will travel vertically as a unit in the raising and lowering of the sash.

In devices of this general character it is essential that the means provided for hinging an ordinary sash window between vertically slidable stiles shall be of extremely simple and at the same time rugged construction, so that ordinary sash windows may be easily transformed into windows of the hinged character in question without the employment of special tools or appliances, and without the provision of parts which may become jammed or inoperative by reason of bending, warping, or accidental displacement. Heretofore the effort to popularize the use of hinge connections for sash windows has been in a large measure thwarted by reason of the complexity of the devices employed and the difficulties in installation.

The present invention is intended to so simplify the structure as a whole that a suitable hinging arrangement may be employed without danger of cramping or jamming of the parts and without necessitating the use of complicated connections which render the installation expensive and otherwise objectionable.

Further objects and details of the invention will appear from the description thereof in conjunction with the accompanying drawings, wherein—

Figure 1 is a cross sectional elevation of a sash window embodying the features of the present invention;

Fig. 2 is a front elevation of the upper sash looking outwardly from the inside of the room and taken on line 2—2 of Fig. 1, showing the window casing and part of the lower sash in section;

Fig. 3 is an enlarged sectional detail taken on line 3 of Fig. 1, showing one of the lower stiles in locked relation to the sash with which it is associated;

Fig. 4 is a similar view showing the parts in unlocked relation to permit inward swinging of the sash;

Fig. 5 is a perspective view of one of the hinges for hinging the lower edge of the sash between the associated stiles;

Fig. 6 is a detail showing the locking plate and keeper for the upper or unhinged edge of the sash with the parts in locked relation;

Fig. 7 is a similar view of the same parts in unlocked relation;

Fig. 8 is a face view taken on line 8—8 of Fig. 4 of the plate for retaining the locking bolt which engages the locking plate of Figs. 6 and 7;

Fig. 9 is a cross sectional detail of a portion of the sash rail and stile taken on line 9—9 of Fig. 3, showing the use of a weather strip secured to the stile; and

Figs. 10 and 11 are sectional details showing a modified type of metallic sash and stile in lieu of the wooden structures illustrated in the preceding figures.

The present invention is illustrated as applied to a window having an upper sash 20 and a lower sash 21 mounted within a window casing 22, but it will be understood that the fittings employed on each of the sashes to provide for the hinging and locking thereof are the same in each case, so that a description of one will suffice for both.

It will also be understood that the fittings are adapted for use in connection with a window consisting of a single sash, and that the particular arrangement shown in Fig. 1 serves primarily for purposes of illustrating the invention in its most commonly employed relationship in connection with double sash windows of the customary type.

For purposes of clarity, the features of the present invention will be described as applicable to the lower sash 21, which comprises the usual upper rail 23, side rails 24, and the base rail 25. The sash is mounted between sliding stiles 26 which are guided within channels 27 which are customarily provided for the retention of ordinary sash windows of the conventional type. Each of the stiles 26 is provided with a groove 28 on its upper outer face to receive the chain or metal tape 29 commonly employed for counterbalancing the sash, which is anchored at its lower end to a cross pin 30.

The lower rail of the sash is hinged between the companion stiles by a hinge fitting 31, best illustrated in Fig. 5, which comprises an angle plate having a vertical leg 32, and a horizontal leg 33 which carries the hinge plate 34, which is countersunk and secured by screws 35 to the under face of the lower rail of the sash. The

vertical leg 32 is likewise countersunk into the surface of the stile and secured by screws 36. The horizontal leg is provided with apertures 35a which when the hinge is closed register with the screw holes for the screws 35 so that the screws may be driven in while the sash is held in position between the stiles, thus insuring an accurate positioning of the parts. The hinge plate 34 is hinged to the leg 33 by a pintle 37, which arrangement permits the sash to be swung inwardly upon the hinges thus provided, while at the same time the angle plate construction of the fitting is one which affords a rigid hinge mounting and abundantly reinforces the lower ends of the stiles to support the weight of the sash when swung down inwardly, as shown in Fig. 1.

With the sash thus swung inwardly, the stiles will be unsupported by the sash, and in order to prevent inward displacement of the stiles when the parts are thus adjusted, provision is made for locking the upper ends of the stiles within the guideways in the window frame and at the same time for holding the parts against vertical sliding movement while the sash is lowered.

The locking device of the present invention provides means for locking the sash between the stiles when in the position of adjustment shown in Fig. 3, and for locking the associated stile itself against displacement when the parts are adjusted as in Figs. 4 and 6.

The locking device comprises a locking plate 38 which in the sash locking position cooperates with a bolt 39 and a wing nut 40 on the sash, and when freed from the sash is adapted to cooperate with a keeper plate 41 for preventing displacement of the associated stile when freed from confinement by the swinging down of the sash into the horizontal position.

The locking plate 38 is hinged upon a pintle 42 carried by a plate 43 countersunk into the front face of the associated stile near the upper end thereof, which arrangement permits the locking plate to be swung downwardly as in Fig. 3, to engage the locking bolt 39, or upwardly as in Fig. 4, to engage with the keeper 41. The locking plate is bifurcated in its outer end to provide separated fingers 44 which are bent outwardly at their tip ends 45 (see Fig. 4), which tip ends also extend laterally to afford undercut shoulders 46 (see Fig. 7).

The shouldered tip ends of the fingers coact with L-shaped apertures 47 in the keeper 41, which apertures are extended laterally at their lower ends and are of reduced diameter at their upper ends, so that when the locking plate 38 is swung upwardly into the position indicated in Fig. 7, the fingers 44 will be aligned with but below the L-shaped slots 47 in the keeper, so that thereafter, when the sash is slightly elevated to the position shown in Figs. 4 and 6, and the locking plate 38 is pressed backwardly, the shouldered fingers will slip into the enlarged lower ends of the apertures 47 and will thereafter be moved upwardly to bring the tips of the fingers into facewise engagement with the inner surface of the keeper, as in Fig. 4, the fingers meanwhile straddling the counterweight chain 29. With the parts adjusted as in Fig. 4, the forwardly bent tips of the fingers will be forced tightly against the inner face of the keeper, thereby exerting sufficient pressure and friction to hold the stiles against either inward or vertical movement during the swinging down of the sash into its lowered position. The arrangement, however, is one which permits the easy release of the locking plate by the application of moderate force sufficient to draw down the locking plate from its engaging position.

The locking plate 38 when lowered is adapted to straddle the upstanding bolt 39, which is provided with an inverted head 48 which is retained in place by a plate 49 countersunk in the upper face of the upper rail of the sash, which plate is provided with a slot 50 through which the bolt projects. The bolt 39 carries a wing nut 40, and the slot is sufficiently elongated to permit the bolt to be drawn back sufficiently to release the fingers of the locking plate after the wing nut has been unscrewed sufficiently to permit such release.

With the locking plate occupying the position shown in Fig. 3, the sash will be rigidly secured on each side between the associated stiles, so that with the parts thus locked the window will operate as an ordinary sash window.

In order to provide clearance for the wing nut 40 when the sash is raised to its highest position, the top of the window casing is provided with a recess 51, as shown in Fig. 3, and of course in applying the locking plate and keeper, the wood of the parts will be recessed sufficiently to afford clearance for the operation of the parts hereinbefore described.

It is preferred to provide a weather strip for sealing the space between the sash and the stiles between which it is mounted, and for this purpose the inner face of each of the stiles is preferably provided with a recess 52 as shown in Fig. 9. The outer end of the sash is preferably beveled as shown, and the coacting face of the stile conforms to this beveling at the inner and outer edges of the stile, such contact, however, being interrupted across the intermediate portion of the stile face by reason of the recess 52. The recess serves as a mounting for a corrugated weather strip 53 which presses outwardly against the face of the sash, and this in conjunction with the edge contacts afforded between the sash and the stile serves to prevent the ingress of air or moisture at these points.

In Figs. 10 and 11 I have shown a modification in which the sash and stile are made of metal plate, which, however, presents the same general configuration as that hereinbefore described. The stile in this case comprises a metal face plate 54 which is bent to afford side walls 55 and 56 respectively, the edges of the side walls being inturned to provide aligned flanges 57 which fit within the guideway in the window casing. In this case the face plate 54 is provided with a shoulder 58 which affords the recessed configuration comparable with that previously described, and provides a space for the housing of the weather strip 53.

In use, when it is desired to obtain access to the exterior of one or both of the sashes, the sash (or sashes) with the stiles locked thereto, is moved to the proper position to bring the locking plates 38 to a point below the associated keeper plates, after which the locking plates are unlocked from the sash by unscrewing the wing nuts sufficiently to permit inward retraction of the locking bolts to the extent necessary to permit the locking plates to clear the wing nuts and be swung upwardly into position to bring their fingers 44 into register with the L-shaped apertures in the associated keeper plate. Thereafter, by slightly elevating the sash and stiles, the outwardly bent tip ends of the fingers will slip through the apertures and continued upward

movement will cause them to forcibly impinge against the inner face of the associated keeper plate, so that the stiles will be held both against an inward tilting movement and against falling, with sufficient force to prevent displacement while the sash is swung down inwardly upon its hinges, for the purposes of washing, painting, glazing, repairs, or the like. Both of the sashes are adjustable in the manner described, and if both are simultaneously lowered will lie one upon the other as indicated in the drawings.

The hinges provided for securing the sash to the lower ends of the associated stiles are of sufficiently rigid and rugged formation to strengthen the lower ends of the stiles and hold them in place and afford sufficient reinforcement to withstand the leverage action of the sash while it is being lowered.

The device as a whole is of extremely simple construction, and the fittings provided are of such nature as to permit an ordinary sash to be transformed into the sash of the present invention by the use of ordinary carpenter's tools, and if desired the sashes can be furnished completely glazed at the mill and suitaby recessed to receive the fittings provided therefor.

The fittings, being countersunk and of simple construction, are not at all conspicuous, so that the sash of the present invention will closely resemble in appearance a sash of the conventional character. Moreover, the locking devices employed are of simplified construction, so that they may be readily manipulated without the use of tools or appliances, which enables the occupant of the house to readily manipulate the locking devices and secure access to the exterior of the window for the purpose of cleaning, or otherwise, as occasion may require.

Although the invention has been described with particularity as to detail, it is not the intention, unless otherwise indicated in the claims, to limit the invention to the form shown, since modifications may be made therein without departing from the spirit of the invention.

I claim:

1. In sash window construction, in combination with a window casing, a pair of stiles adapted to slide within the window casing, a sash hinged between said stiles, locking plates pivoted one to each of the stiles and adapted to be swung downwardly to overlie the upper edge of the sash and adapted to be swung upwardly into proximate relation to the window casing, locking devices on the sash for engaging the respective locking plates when swung downwardly to overlie the sash, and a keeper for each of the locking plates, secured to the window casing and adapted to have the associated locking plate engaged therewith when the plate is swung upwardly, each locking plate terminating in separated tongues, and each of the keepers being provided with apertures adapted to receive the associated tongues, the parts being configured to cause the tongues to forcibly bear against the inner face of the keeper when the parts are engaged, and a counterbalancing member secured to each stile and passing upwardly between the tongues.

2. In sash window construction, in combination with a window casing, a pair of stiles adapted to slide within the window casing, a sash hinged between the stiles, locking plates pivoted one to each of the stiles and adapted to be swung downwardly to overlie the upper edge of the sash and adapted to be swung upwardly into proximate relation to the window casing, locking devices on the sash for engaging the respective locking plates when swung downwardly to overlie the sash, and a keeper for each of the locking plates, secured to the window casing and adapted to have the associated locking plate engaged therewith when the plate is swung upwardly, each locking plate terminating in separated tongues having their tip ends extended laterally to afford undercut shoulders, and the keeper being provided with L-shaped apertures adapted to receive the tips of the tongues therethrough, and the parts being configured to thereafter permit the tips of the tongues to bear forcibly against the inner face of the keeper to hold the stiles against displacement when the window is swung on its hinges.

3. In sash window construction, in combination with a window casing, a pair of stiles adapted to slide within the window casing, a sash hinged between said stiles, locking plates pivoted one to each of the stiles and adapted to be swung downwardly to overlie the upper edge of the sash and adapted to be swung upwardly into proximate relation to the window casing, locking devices on the sash for engaging the respective locking plates when swung downwardly to overlie the sash, and a keeper for each of the locking plates, secured to the window casing and adapted to have the associated locking plate engaged therewith when the plate is swung upwardly, each locking plate terminating in separated tongues having their tip ends extended laterally to afford undercut shoulders and each of the tongues being bent outwardly at its tip end, and the keeper being provided with L-shaped apertures adapted to receive the tips of the tongues therethrough, and the parts being configured to thereafter permit the tips of the tongues to bear forcibly against the inner face of the keeper to hold the stiles against displacement when the window is swung on its hinges.

ERIC E. HALL.