No. 742,869. PATENTED NOV. 3, 1903.

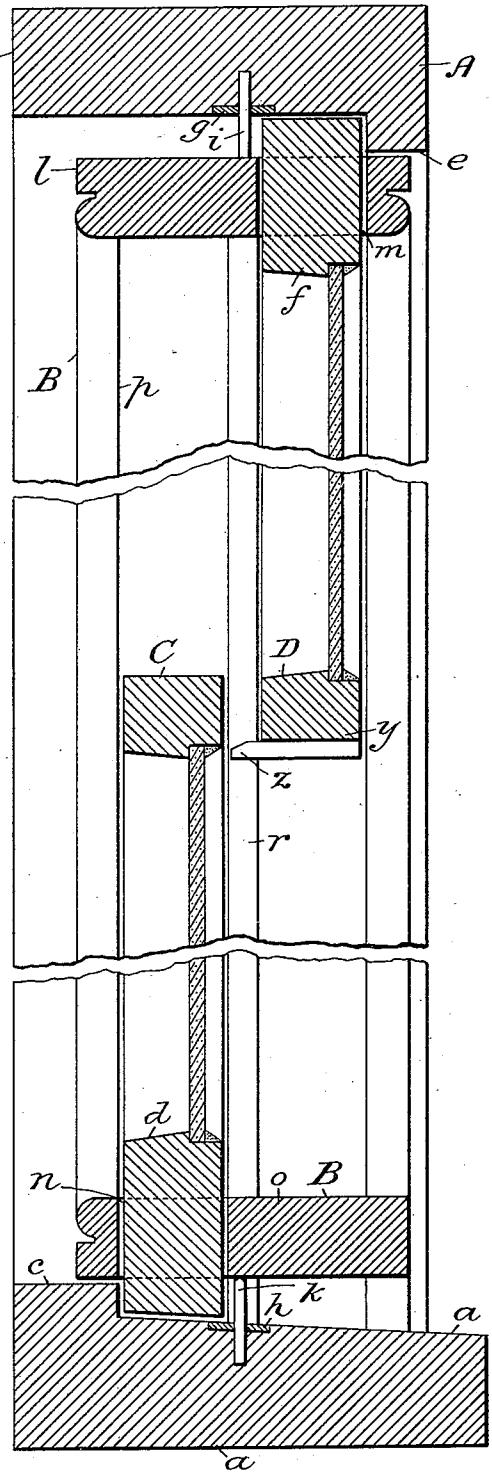
G. HAYES.

SLIDING AND SWINGING SASH WINDOW.

APPLICATION FILED SEPT. 10, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

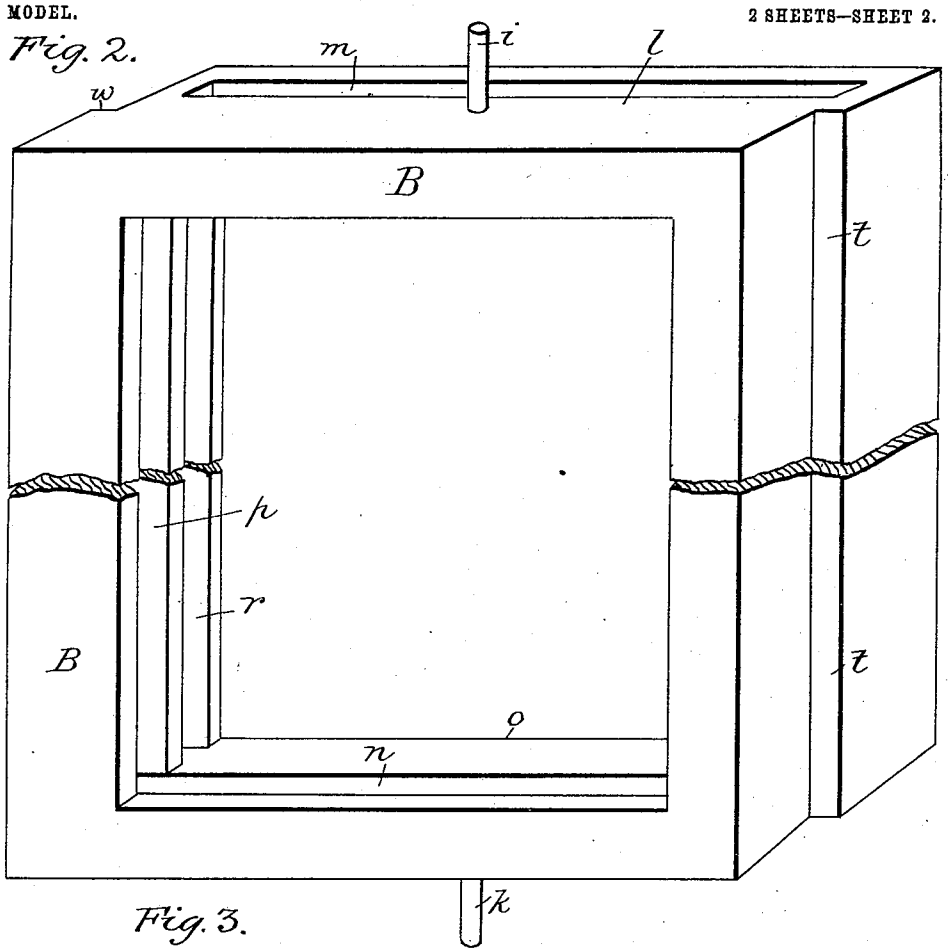
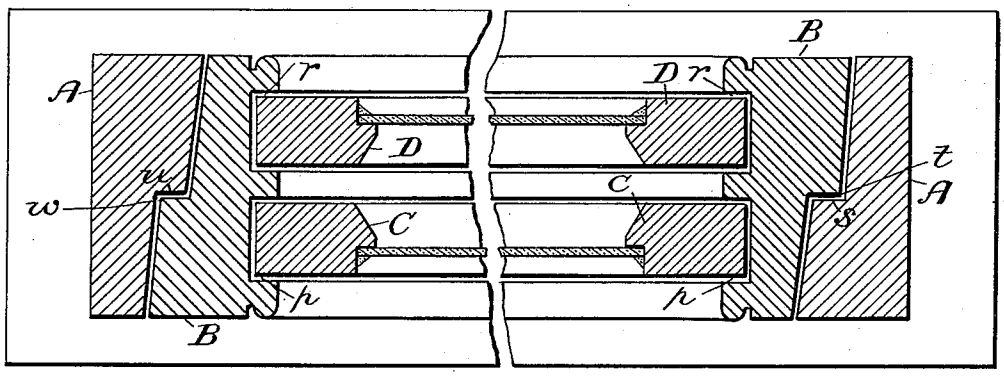


Fig. 3.



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No. 742,869. Patented November 3, 1903.

UNITED STATES PATENT OFFICE.

GEORGE HAYES, OF MOUNT VERNON, NEW YORK.

SLIDING AND SWINGING SASH-WINDOW.

SPECIFICATION forming part of Letters Patent No. 742,869, dated November 3, 1903.

Application filed September 10, 1902. Serial No. 122,804. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HAYES, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Sliding and Swinging Sash-Windows, of which the following is a specification.

This invention relates to a reversible window having the ordinary lower sash and upper sash, each sliding vertically in its grooves; and the object of the invention is to form an efficient weather-tight joint at the top and also at the bottom of such a window.

In the carrying out of the invention I interpose a secondary frame between the ordinary frame and the sashes, fitting it loosely to and within the ordinary frame and attaching it thereto either by side hinges or centrally-placed top and bottom pivots, according to the situation and surroundings of the window, so that it may be swung into the room or reversed by turning it upon the pivots. In this swinging or reversible frame I place the sashes, so that they may swing in or reverse with it; but they are so fitted to this carrying-frame that when the window is closed they respectively pass beyond the top and bottom rails of the carrying-frame to a weather-tight junction with the primary frame along its top rail and its sill.

In the accompanying drawings, wherein the same letters indicate always the same parts, Figure 1 is a vertical crosswise section taken from the right and giving an interior view of the left-hand section of the window fitted as a centrally-pivoted window with the sashes passed at top and bottom through the carrying-frame into contact with the outer frame, thus closing the window. Fig. 2 is a front perspective of the carrying-frame adapted to the central-pivot mode of reversing the sashes separated from the outer frame and the sashes, the view being taken from above and at the right; and Fig. 3 is a horizontal lengthwise section of an entire window, the bottom of the view corresponding with the front or interior face of the window.

Though it is immaterial to the invention whether the inner frame be swingingly attached to the outer frame by side hinges or by central vertical pivots, I will describe it in detail in the latter way, because, other circumstances being equal, the central pivotal attachment will in practice be preferred to that by side hinges unless for very narrow windows.

A is the outer frame, intended to be rigidly attached to a window-aperture in the wall of a building or to the casing or trim often fitted to and within such an aperture to give the window a better finish. The inner and front part of its right side is enlarged into a shoulder *s* to make a weather-tight junction with the inner frame on that side, and the inner and rear part of its left side is enlarged into a shoulder *u* for the like purpose on that side. At bottom its sill *a* preferably has the customary slope outward to shed water. The front of the sill is extended upward to form an overlap *c* for a weatherproof junction with the lower sash when closed down, and a socket *h* is formed in the sill to receive the bottom pivot of the inner frame. The top rail *b* of this outer frame has a socket *g* for the top pivot of the inner frame, and the rear part of that rail is extended downward to form an overlap *e* for a weatherproof junction with the upper sash when closed.

B is the inner frame, fitted within the outer frame, but loosely enough at top, bottom, and sides to permit it to turn therein without catching or binding, and *i* is its top pivot and *k* its bottom pivot, respectively fitting into the aforesaid sockets in the outer frame. At the right-hand side the exterior and rear part is enlarged into a shoulder *t* in correspondence with the shoulder *s* of the outer frame, and at the left-hand side the exterior and front part is enlarged into a shoulder *w* to correspond with the shoulder *u* of the outer frame on that side of the window. In each of the two sides is a vertical groove *p* toward the front, the two grooves forming a pair for the reception and sliding of the lower sash. Behind them is a like pair of grooves *r* for the reception and sliding of the upper sash. In the top rail *l* is a long vertical recess or slot *m* in correspondence with the grooves *r*, and in the bottom rail *o* is a long vertical recess or slot *n* in correspondence with the grooves *p*, so that the sashes can be passed through those slots, respectively, into their respective pairs of grooves, which may

therefore be sunk in the solid sides of the frame without occasion for detachable beading of any kind to enable the sashes to be placed, retained in, or removed from the frame, and whenever the outer and the inner frame are vertically parallel the upper sash may be pushed up in its grooves and through the recess or slot *m* into a weather-tight junction with the top rail of the outer frame and the lower sash be pushed down in its grooves and through the recess of slot *n* into a weather-tight junction with the sill of the outer frame.

C is the lower sash, slidingly fitted into the grooves *p* of the inner frame and with its bottom rail *d* passed down through and below the recess or slot *n* whenever that sash is closed.

D is the upper sash, slidingly fitted into the grooves *r* of the inner frame and with its top rail *f* passed up through and above the recess or slot *m* whenever that sash is closed.

Whenever the upper sash is lowered and the lower sash raised, so that they respectively clear the overlaps at top and bottom of the outer frame, the inner frame may be turned upon its pivots to bring the exterior faces of the sashes into the room.

Where the sashes are operated by ordinary weighted cords passing over pulleys, the meeting-rails of the two sashes when both are closed can be made near enough together to cause the customary beveling of the meeting-rails along their contact-surfaces to answer all weatherproof purposes along that line of junction; but in costly and modern buildings the tendency is marked to use later and improved modes of balancing and sliding the sashes, and some of these methods do not permit a junction of the so-called "meeting-rails" of the sashes. In Fig. 1 therefore I have shown a beading *z*, projected inwardly from and along the bottom of the lower rail *y* of the upper sash, which may be extended so far as necessary to close any interval between the two sashes.

The construction thus described, wherein the sashes are passed through or beyond the ends of their carrying-frame primarily to make weatherproof junction along the top and bottom of the window, also gives to the closed window a unity and rigor unattainable where the sashes are confined within the limits of the inner frame. This locking together of frames and sashes makes the construction particularly suitable to fireproof windows of metal wherein even the glazing is fortified, for such windows are much in demand for tall buildings, and it is necessary at such great heights that the windows should be strong and firm.

It will be noticed in the drawings that the meeting edges of the sides of the outer and inner frames are slanted in the horizontal plane, the slants at either side being in such a direction and correspondence as will enable the inner frame to turn upon its pivots without a catching or binding of the exterior surfaces of its sides against the proximate surfaces of the sides of the outer frame. This correspondence slanting of the sides of the two frames enables a closer junction to be made between them than if their proximate surfaces were strictly rectangular. In practice the slants may be as emphatic as a good clearance of the outer by the inner frame in turning may require, and the need for clearance will never be so great as to interfere with the utility of the shoulders as weatherproof junctions for the two frames.

Whenever it is intended, in the application of my invention, that the inner frame shall swing inwardly upon side hinges, the sockets *g* and *h* and the pivots *i* and *k* will be omitted, of course, and the inner frame hung to the outer frame in any suitable manner. In that case there will be no actual need to slant the proximate faces of the sides of the two frames at the hinged side of the window; but side-hung sashes and frames are so common that ordinary skill and judgment are enough for any such construction or arrangement.

Having thus fully described the invention, I claim as follows:

1. The combination of an outer fixed frame, shouldered at each side, with an overlap along its sill and a lengthwise overlap in or along the under face of its top rail; an inner frame, swingingly fitted within the outer frame and shouldered at each side in correspondence therewith, and having vertical lengthwise passages through its top and bottom rails, in correspondence with vertical grooves in its sides; a lower sash, slidingly fitted in the front side grooves of the inner frame and adapted to pass beyond and through the bottom passage thereof to a junction with the overlapping sill of the outer frame, and an upper sash, slidingly fitted in the rear side grooves of the inner frame, and adapted to pass beyond and upwardly through the top passage thereof to a junction with the overlap-provided top rail of the outer frame; all substantially as hereinbefore fully described.

2. The combination of an outer fixed frame, with an overlap along its sill and a lengthwise overlap in or along the under face of its top rail; an inner frame, swingingly fitted within the outer frame and vertically slotted at top and bottom in correspondence with vertical grooves in its sides; a lower sash, slidingly fitted in the front side grooves of the inner frame and adapted to pass beyond the bottom slot thereof to a junction with the overlapping sill of the outer frame, and an upper sash, slidingly fitted in the rear side grooves of the inner frame, and adapted to pass beyond the top slot thereof to a junction with the overlap-provided top rail of the outer frame; with means to pivotally attach the inner to the outer frame; all substantially as hereinbefore fully described.

3. The combination of a frame, vertically

slotted at top and bottom in correspondence with vertical grooves in its sides; a lower window-sash, slidingly fitted in the front side grooves of said frame and adapted to pass below the bottom slot thereof, and an upper window-sash, slidingly fitted in the rear side grooves of said frame and adapted to pass above the top slot thereof; the said frame provided with suitable pivots adapted to swingingly attach it to a window-aperture; all substantially as hereinbefore fully described.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. HAYES.

Witnesses:
ARTHUR HAYES,
GEORGE SCHUMACHER.