Jan. 1, 1952 H. G. LARSON 2,580,933

SASH MOUNTING

Filed May 3, 1950 2 SHEETS—SHEET 1

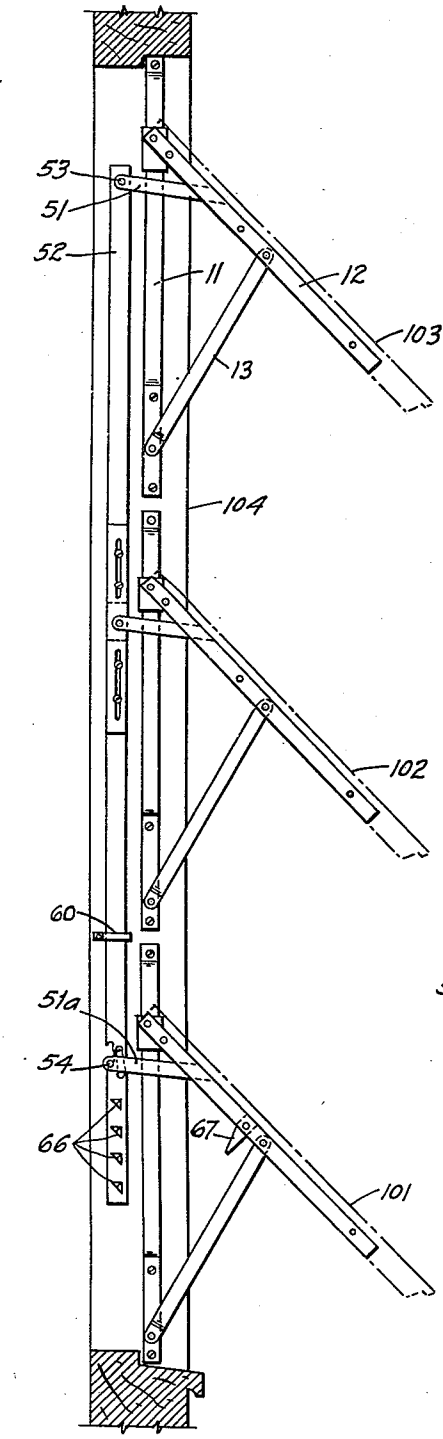


Fig. 1

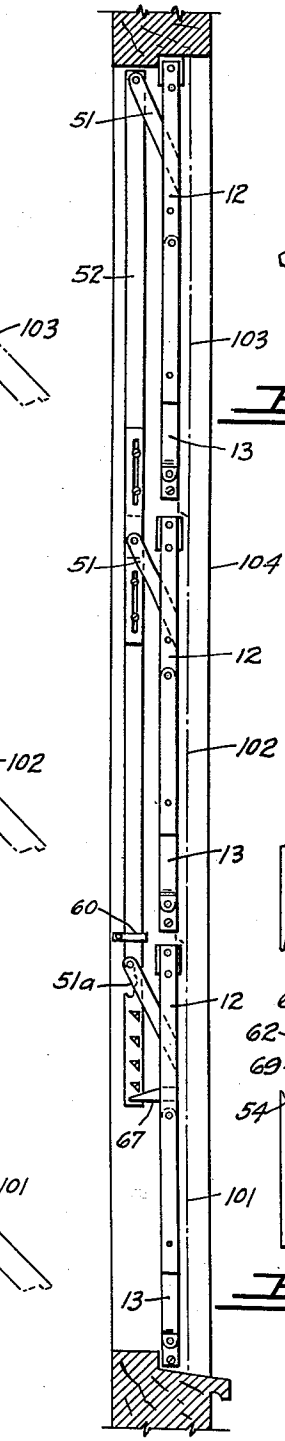


Fig. 2

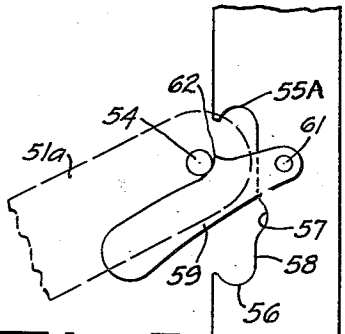


Fig. 3

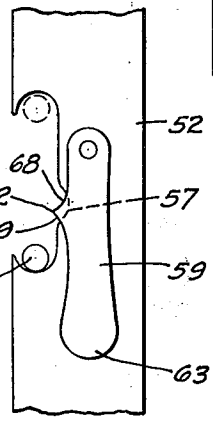


Fig. 4

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Jan. 1, 1952 H. G. LARSON 2,580,933

SASH MOUNTING

Filed May 3, 1950 2 SHEETS—SHEET 2

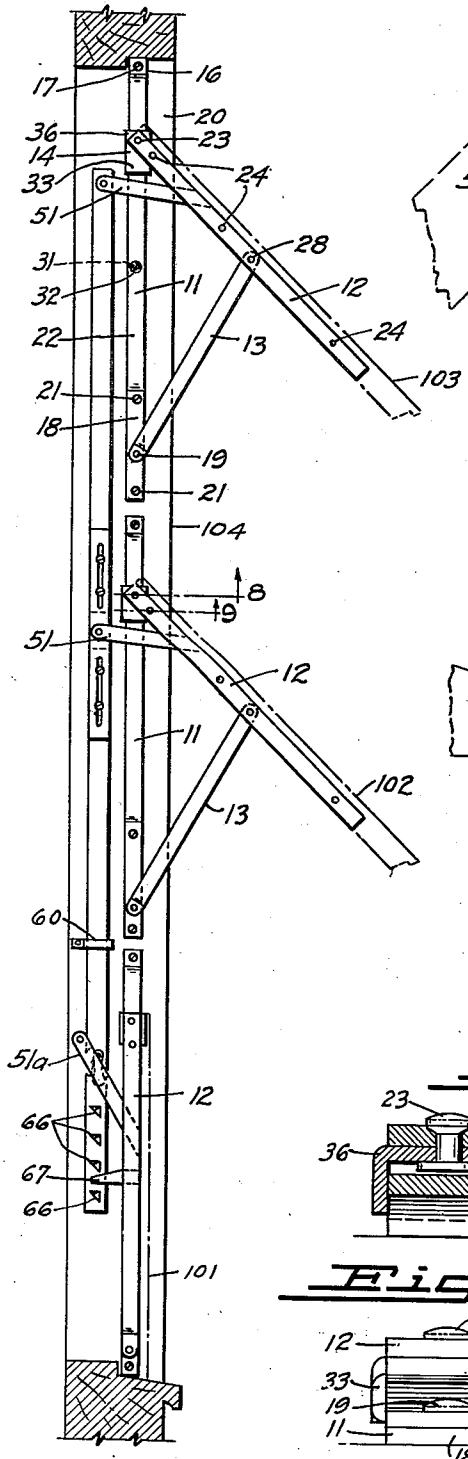


Fig. 5

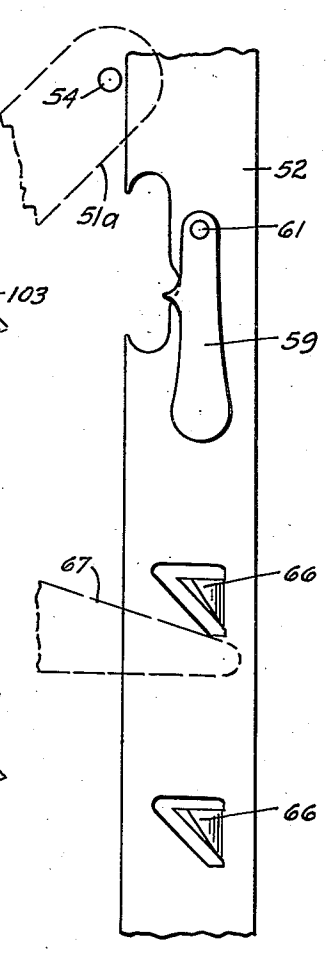


Fig. 6

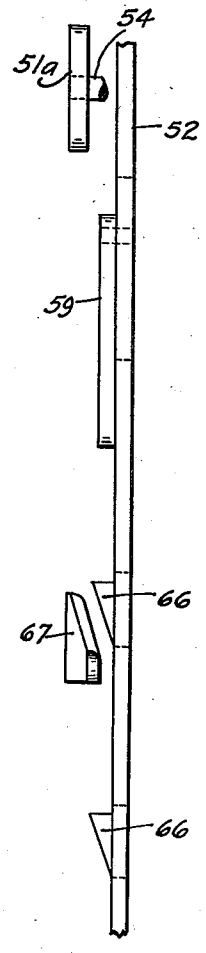


Fig. 7

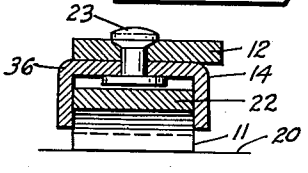


Fig. 8

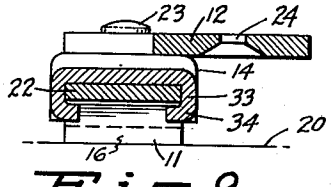


Fig. 9

Fig. 10

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2,580,933

UNITED STATES PATENT OFFICE

2,580,933

SASH MOUNTING

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5 Claims. (Cl. 20—42)

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This invention relates to windows of the multiple sash type in which one sash is employed as a manipulating and control sash such as are shown in my prior Patent 2,313,827 of March 16, 1943. Sashes of this general type are well-known and have been widely employed. However, as commercially made and installed, they have been subject to certain disadvantages and failings; more particularly, they have been relatively expensive due to complex and intricate construction details; the windows have been difficult to install, requiring special fittings and considerable labor on each installation.

One of the major items of expense involved in a window of this type is the operating mechanism. These have heretofore been complicated in nature; in fact, one window of this type is so constructed that painting of the window frequently renders it inoperative.

In accordance with this invention, it is generally the object to provide an improved multiple window sash construction of a simple and inexpensive nature.

The invention includes other objects and features of advantage, some of which, together with the foregoing, will appear hereinafter wherein the present preferred form of multiple sash and the multiple sash operator construction of this invention are disclosed.

In the drawing accompanying and forming a part hereof, Figure 1 is a side elevation through a window embodying the present invention, showing the sash in open position.

Figure 2 is a view similar to Figure 1 but with the multiple sash in closed position.

Figure 3 is an enlarged view illustrating one position of a portion of the operating mechanism during opening movement of the sash.

Figure 4 is a fragmentary side elevation of a portion of the operating mechanism.

Figure 5 is a side elevation, partly in section, showing the upper sashes open and locked by the closed lowest sash.

Figure 6 is an enlarged side elevation illustrating details of the sash operator, the several upper sashes being in closed position and the lower sash being closed.

Figure 7 is another enlarged view showing the parts in Figure 6 in end elevation.

Figures 8 and 9 are, respectively, sections taken along the lines 8—8 and 9—9 in Figure 5.

Figure 10 is an end elevation of one of the sash supports.

In accordance with this invention, I provide a plurality of sashes 101, 102 and 103 in a suitable

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window frame 104. The several sashes can be made of wood or metal as is desired, 101 being the lowermost and manipulating sash, the others being the following sash and including sash 102, the intermediate sash, and sash 103, the uppermost sash. The invention can be applied to any number of sashes and for convenience, I have illustrated three.

In accordance with this invention, each sash is mounted directly in the window frame 104 by a relatively simple hinge mechanism which is more particularly disclosed in my application Serial No. 684,971, filed July 19, 1946, now Patent 2,554,862. For convenience, this mechanism will be briefly described here, but the disclosure of that application is incorporated herein by reference. A hinge mounting is provided on each side of a sash and includes a first member 11, a second strap member 12 which is usually secured to the side of the sash as by screws inserted in holes 24, a third strap member 13 and a shoe 14 slidably mounted upon the first strap member 11.

The first strap member 11 includes a first sash engaging portion 16 at one end thereof having a suitable aperture therein for insertion of a screw 17 to attach the member to a frame 20. At its other end, the first strap member includes another or second sash engaging portion 18, this portion being relatively longer than the first sash engaging portion 16 to permit of the hinge mounting of the third strap member 13 by a pin or rivet 19. The second sash engaging portion 18 of the first strap member also includes several spaced apertures in which screws 21 can be inserted to attach the first member to the window frame 20. Intermediate the sash engaging portions 16 and 18, the first strap member includes a raised portion 22, this portion extending generally parallel to the adjacent window frame and providing a track along which shoe 14 rides.

The second strap member 12 is hinged at one end by a pin or rivet 23 to the slidable shoe 14. The second strap member also includes a plurality of apertures 24 through which are inserted suitable wood screws or the like to attach the second strap members as to a rabbeted portion on a sash. The other end of the third lever 13 is hinged by a pin or rivet 28 to the second strap member 12 intermediate the ends of the second strap member. This mounting permits the windows to be moved toward and away from the frame to provide an opening of a desired extent or to entirely close the frame.

It will be observed, upon examining Figure 10, that the third member 13 is secured to the second

member 12 on the under side thereof and that the second member is hingedly mounted upon a raised portion provided upon the top of shoe 14, as appears in Figure 8. This permits the third member to move freely over the top of the first member 11 so that the second member 12 can be positioned immediately over the first strap member 11 to place the sash in closed position.

Another feature of the present invention is that the hinge mounting described permits of adjustment of the tension placed upon each sash and the degree of frictional control maintained on the window so that its opening and closing movement is opposed by a frictional force such that slamming of a window can be avoided. This is effected by providing a hole 31 intermediate the ends of the raised portion 22 in the first strap member and by providing a simple, tapered, conventional screw 32 in this hole to extend into engagement with the adjacent frame. When the screw is driven into the frame with an ordinary screw-driver, the raised portion 22 bows and is drawn toward the sash frame. It is obvious that the simple screw 32 could be replaced by any other suitable member so long as it is adapted, when passed through said hole 31 and engaged with said sash frame 20, to draw the raised portion 22 toward the sash frame and hold it in any desired tensioned or bowed position. By reducing the space between the raised portion 22 on the first strap member and the sash frame 20, one is able to tension the other portions of the hinge mounting and so provide a desired degree of frictional control between the shoes 14 and the raised portions 22. To this end, shoe 14 is so fashioned that it will pass the element 32. To effect this, the shoe is preferably made in the shape of a U, as appears in Figure 8. However, a portion 33 of the U member is fashioned to fit the first strap member snugly, ends 34 being crimped over to engage portion 22 snugly with a sliding fit while the other portion 36 of the U member is spaced above the portion 22, as will be apparent upon comparing Figures 8 and 9. The range of adjustment of strip 11 is that permitted by the spacing between the bottom surfaces of crimped ends 34 of shoe 14 which rides along raised portion 22, and the adjacent supporting surface of sash frame 20.

Each second strap 12 on the following sash includes an arm 51 fixed thereto between the hinge pin 23 and hinge 28 and extending therefrom, being each joined by a pin 53 in a hinge engagement with a travel bar 52 extending vertically in the sash frame 104; each travel bar 52 is adjustable as to length to accommodate the spacing of the several upper sash. A clamp or guide 60 holds the lower free end of the bar in a spaced position in the frame although the end of the bar can flex, as will appear. A like arm 51*a*, provided on the lower sash, has a pin 54 thereon cooperatively adjacent a slot generally indicated at 55, arm 51*a* being slightly longer than the other arms and slot 55 being provided on the inside edge of each travel bar. The slot includes a semi-circular terminus 55A and 56 at opposite ends and an arcuate indentation 57 in the inside face 58. A cam member 59 is hinged on each travel bar by a pin 61. The cam member includes an arcuate tooth 62 projecting therefrom and normally overlying the arcuate indentation 57, as is shown in Figure 4, and having an upper cam surface 68 and a lower cam surface 69 on each side of the tooth. The lower end 63 of the cam member 59 is enlarged so that the member is biased by gravity toward that position in which it is shown in Figure 4.

To lock the travel bar in any selected position by means of the lower sash, the end of the travel bar is provided with several spaced lateral projections 66. A locking arm 67 is fixed on the strap 12 on the lowest sash to fit within the projections, as is shown in Figure 5. With the lowest sash closed and locked (locking of the lowest sash is effected by any suitable and conventional means), the sash will be in that position in which they appear in Figure 5 and the locking means will be generally as is shown in Figures 6 and 7. A sudden gust of wind, for example, may impart a closing force to the upper sash, thereby moving the travel bar until one of the projections 66 engages the stationary arm 67 and so holds the travel bar and sash against further movement.

To manipulate the sash from the closed position in which these are shown in Figure 2, it is only necessary to unlock the usual sash fastening means utilized upon the lowermost sash (this lock is not shown in the drawing, being a conventional part of the sash). The lower sash is then moved outwardly; the initial movement of the lower sash brings the pin 54 on the arm 51*a* into engagement with the lower semi-circular terminus 56. Further outward movement of the lower sash moves the travel bar and the upper sash. The sash can remain in the open position of Figure 1, the frictional engagement of the various shoes with the supporting strap members being sufficient to retain the sash in this position. If it is desired to close the lower sash, this can be achieved independently of the upper sash, a condition frequently desired, particularly since the sash are adapted to use in school rooms, auditoriums and the like. In this instance, the lower sash is merely returned from its open position to a closed position, pin 54 moving upwardly along the depending and free end of the travel bar, as will be explained, into the position in which it is shown in Figure 5. In this position, the lower sash is effective to lock the travel bar against further movement, the locking arm 67 on the lower sash extending between two of the spaced lateral projections 66, as appears in Figures 5, 6 and 7.

As the lower sash is moved inwardly, the pin 54 rides up the inside face 58 on the slot 55 until it fits within the indentation 57 and is in engagement with the lower cam surface 69 on the cam member 59. Continued upward movement of pin 54 results in the positive engagement of the pin 54 with such lower cam surface whereby the cam member 59 is caused to rock about pin 61 into that position in which it is shown in Figure 3. In this position, the pin 54 is moved up to engage the side of the travel bar, as appears in Figure 6, the cam member 59 rocking back under the pull of gravity about pin 61 into that position in which it appears in Figures 5 and 6.

Upon opening of the lower sash subsequently, the pin 54 merely moves downwardly into engagement with the slot 55 immediately below the terminus 55A and the lower sash is again connected with the travel bar for positive movement of the latter. If one moves the lower sash too far outwardly, then the pin will slip into the indentation 57. This serves as a warning. The closing movement of the lower sash then closes all the sash.

From the foregoing, I believe it will be apparent that I have provided a relatively novel and simple form of sash.

I claim:

1. In a window having a frame, at least two sashes mounted in said frame one above the other to provide an upper sash and a lower sash; individual and separate means supporting each of said sash in said frame adjacent the opposite ends of the individual sash supported thereby including a first strap member secured to each side of said frame, a shoe slidable on said strap member, a second strap member hinged on said shoe and attached along a side of a sash, and a third strap member hinged at one end on said first member and at its other end on said second strap member intermediate the ends thereof; a travel bar extending vertically in said frame; a first arm extending from each second strap member secured to said upper sash and hinged on said travel bar; a second arm extending from each second strap member on said lower sash to an end beyond that vertical face on said travel bar spaced furtherest from said lower sash; a pin secured to said arm end; said travel bar having a slot therein opening into said vertical face for receiving said pin.

2. In a window having a frame, at least two sashes mounted in said frame one above the other to provide an upper sash and a lower sash; individual and separate means supporting each of said sash in said frame adjacent the opposite ends of the individual sash supported thereby including a first strap member secured to each side of said frame, a shoe slidable on said strap member, a second strap member hinged on said shoe and attached along a side of a sash, and a third strap member hinged at one end on said first member and at its other end on said second strap member intermediate the ends thereof; a travel bar extending vertically in said frame; a first arm extending from each second strap member secured to said upper sash and hinged on said travel bar; a second arm extending from each second strap member on said lower sash to an end beyond that vertical face on said travel bar spaced furtherest from said lower sash; a pin secured to said arm end; said travel bar having a slot therein opening into said vertical face for receiving said pin; said slot having an indentation in a side thereof; and a cam member hinged on said travel bar and having a tooth projecting across said indentation.

3. In a window having a frame, at least two sashes mounted in said frame one above the other to provide an upper sash and a lower sash; individual and separate means supporting each of said sash in said frame adjacent the opposite ends of the individual sash supported thereby including a first strap member secured to each side of said frame, a shoe slidable on said strap member, a second strap member hinged on said shoe and attached along a side of a sash, and a third strap member hinged at one end on said first member and at its other end on said second strap member intermediate the ends thereof; a

travel bar extending vertically in said frame; a first arm extending from each second strap member secured to said upper sash and hinged on said travel bar; a second arm extending from each second strap member on said lower sash to an end beyond that vertical face on said travel bar spaced furtherest from said lower sash; a pin secured to said arm end; said travel bar having a slot therein opening into said vertical face for receiving said pin; a plurality of projections on said travel bar below said slot; and a third arm on said second strap member on said lower sash adapted to project between two of said projections when the upper sash is in an open position and the lower sash is in a closed position.

4. In a window having a frame, at least two sashes mounted in said frame one above the other to provide an upper sash and a lower sash; individual and separate means supporting each of said sash in said frame adjacent the opposite ends of the individual sash supported thereby including a first strap member secured to each side of said frame, a shoe slidable on said strap member, a second strap member hinged on said shoe and attached along a side of a sash, and a third strap member hinged at one end on said first member and at its other end on said second strap member intermediate the ends thereof; a travel bar extending vertically in said frame; a first arm extending from each second strap member secured to said upper sash and hinged on said travel bar; a second arm extending from each second strap member on said lower sash to an end beyond that vertical face on said travel bar spaced furtherest from said lower sash; a pin secured to said arm end; said travel bar having a slot therein opening into said vertical face for receiving said pin; said slot having an identation in a side thereof; and a cam member hinged on said travel bar and having a tooth projecting across said indentation; a plurality of projections on said travel bar below said slot; and a third arm on said second strap member on said lower sash adapted to project between two of said projections when the upper sash is in an open position and the lower sash is in a closed position.

5. A structure as in claim 1 wherein means are provided for drawing each first strap member on a sash in toward the window frame to tension the sash.

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The following references are of record in the file of this patent:

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