No. 676,159. Patented June 11, 1901.

J. STUMPF.

WINDOW SASH AND FRAME AND FITTINGS THEREFOR.

(Application filed Sept. 15, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 3.

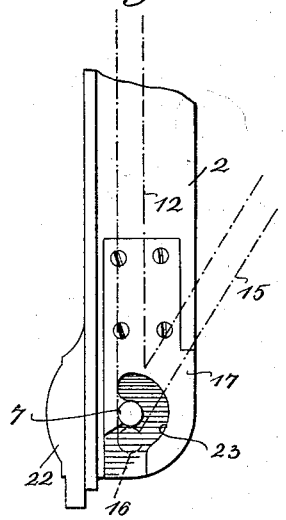


Fig. 1.

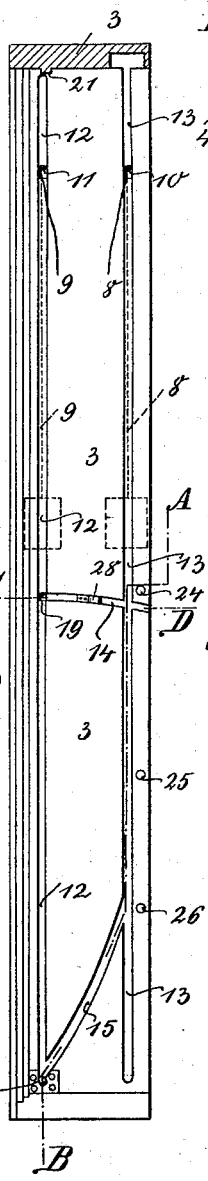


Fig. 2.

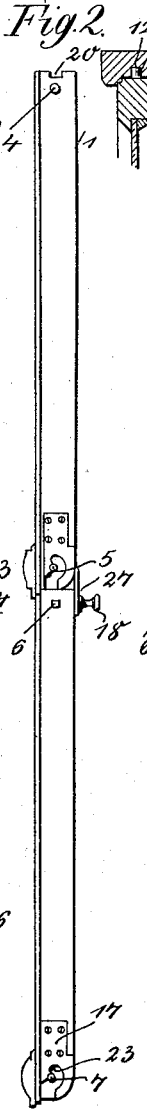
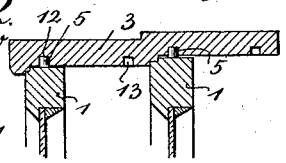


Fig. 5.



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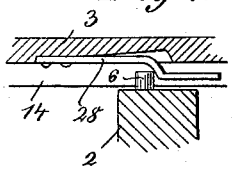


Fig. 6.

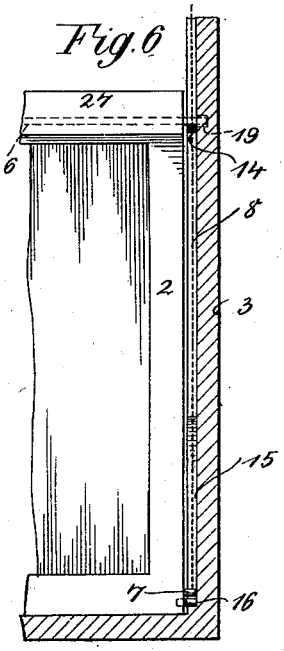
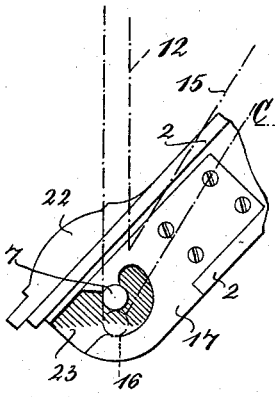


Fig. 4.



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Attorney.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 8.

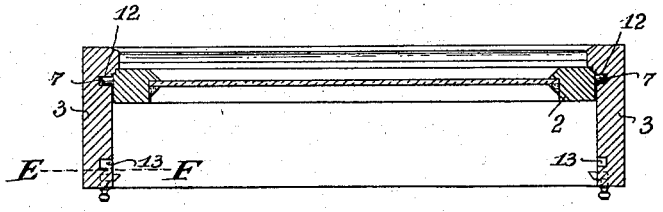


Fig. 9.

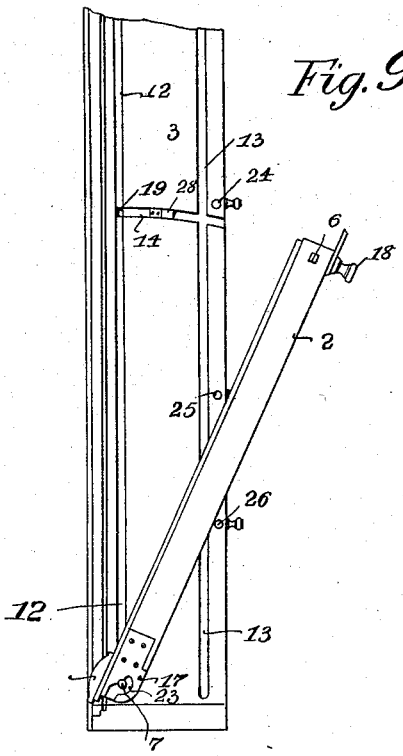


Fig. 10.

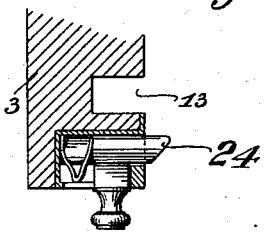
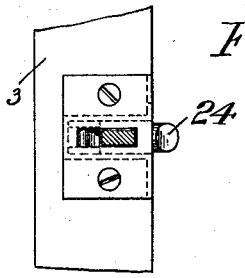


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHANNES STUMPF, OF BERLIN, GERMANY.

WINDOW SASH AND FRAME AND FITTINGS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 676,159, dated June 11, 1901.

Application filed September 15, 1900. Serial No. 30,200. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES STUMPF, engineer, a subject of the German Emperor, residing at Berlin, in the German Empire, have invented new and useful Improvements in Window Sashes and Frames and in Fittings Therefor, of which the following is a specification.

The present invention relates to certain new and useful improvements in window sashes and frames and in fittings therefor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of the sash-frame with the sashes removed and showing the grooves or races in which the sashes are movable. Fig. 2 is a side elevation of the two sashes in their normal position situated one above the other. Fig. 3 illustrates, on an enlarged scale and in a side elevation, the lower end of the sash with its fittings, the sash being situated vertically in the grooves or races in the sash-frame, indicated in dotted lines. Fig. 4 is a view similar to that of Fig. 3, the sash being shown swung inwardly. Fig. 5 is a horizontal section through a sash-frame constructed to accommodate two pairs of sashes, one in front of the other. Fig. 6 represents a vertical section on line A B of Fig. 1, and Fig. 7 represents a section on line C D of Fig. 1. Fig. 8 is a horizontal section through the sash-frame with the lower sash in its closed position. Fig. 9 represents in side elevation the lower end of the sash-frame with the lower sash being swung inwardly. Fig. 10 shows on an enlarged scale in section on line E F of Fig. 8 a spring-button in top view, which is shown in Fig. 11 in side elevation.

My invention relates to the construction of windows and window-sash attachments of that class in which two normally-superposed sashes suitably balanced and guided in grooves or races in the sash-frame are adapted to be swung inwardly or removed from the frame for the purpose of cleaning them.

The objects aimed at in the present invention are to insure the sashes being air-tightly closed when in their normal superposed positions, to prevent accidental opening of the sashes by the sash-weights attached to them, and to render more efficient, durable, and serviceable in operation this class of sash-windows, while at the same time aiming at simplicity in the construction of the window. The provision of the grooves or races in the sash-frame or the pulley-stiles of the latter, respectively, which grooves converge into one at their lower extremities, enables the two sashes to assume a position one behind the other either at the upper or lower part of the window.

In the drawings the numerals 1 and 2 indicate the two sashes, which are adapted to move in grooves or races running the entire length of the pulley-stiles of the sash-frame 3 and converging into one at their lower extremities. The upper sash 1 has its vertical stiles fitted with studs 4 at the upper end and studs 5 at the lower end, while the lower sash 2 is fitted with the studs 6 and 7, respectively. To the studs 5 of the upper sash and to the studs 7 of the lower sash lines are attached, which, in the usual manner, are in connection with the sash-weights located in the window-frame. The sash-line 8 for the lower sash 2 runs through a bore 10, and the sash-line 9 for the upper sash 2 runs through a bore 11 in the pulley-stiles, behind which they are connected to the sash-weights in the customary manner.

The numeral 12 indicates the vertical guide groove or race for the upper sash, and 13 the guide-groove for the lower sash. About the middle of the window-frame a horizontal or somewhat inclined or curved groove 14 leads from the guide-groove 12 and, crossing the guide-groove 13, terminates at the inner edge of the window-frame. From the bottom end of the groove 12 a groove 15 starts, which, running in upwardly-inclined direction, terminates in the vertical groove 13. At the bottom end of the groove 12 a stud 16 is provided, which facilitates the swinging inwardly of the sashes, so that the latter may ultimately assume a horizontal position. The metal plates 17, embedded at the lower ends of the vertical stiles of the two sashes, serve for the same purpose, as will be more fully explained later on.

The top horizontal stile 27 of the lower sash 2 is provided with the before-mentioned studs or shooting-bolts 6, which are adapted to be

actuated by the button 18 in such a manner that when the window is closed they may be projected from the sash far enough to enter holes 19 in the vertical pulley-stiles of the window-frame, and thus lock the window in its closed position. Normally these shooting-bolts 6 project sufficiently far from the sash to serve as guide-studs in combination with the hereinbefore-mentioned studs 7 when moving the sash in the grooves or races provided in the pulley-stiles, as set out above.

The top horizontal stile of the upper sash 1 is provided in its full length with a groove 20, to which corresponds a projecting head 21 in connection with the top stile of the window-frame.

The sashes are externally fitted with weather-beads and with grooves and corresponding projections to insure a draft-proof closing of the window in the customary manner.

The metal plates 17, embedded at the lower ends of the vertical stiles of the sashes, so as to be flush with same, are provided with a partly-circular incision around the studs 7 and 5, respectively, which is continued to the bottom edge of the vertical rail, for a purpose to be explained later on.

The vertical stiles of the window-frame 3 are fitted in front of the vertical guide-groove 13 with the spring-buttons 24 25 26, of any suitable number and arranged at suitable distances apart, for the purpose of affording a stop or rest for the sash, which is swung inwardly to the desired extent. By pressing the buttons into the pulley-stiles the sash can be caused to rest on the next lower set of spring-buttons, and so on. Tapering the buttons at their lower faces enables the sash on same rising toward the vertical position to press the buttons into their recesses in the pulley-stiles without auxiliary help.

The operation of my invention is as follows: When the window is closed, the meeting-rail or stile of the upper sash rests firmly on the meeting-rail of the lower sash and the guide studs and bolts rest in vertical groove 12 and, more particularly, the guide-studs 7 at the bottom end of the lower sash 2 rest on the studs 16 at the lower end of said vertical groove 12, while these studs 16 engage the incision 23 in the metal plates 17 in connection with the vertical stiles of the sash.

In order to open and elevate the lower sash 2, the turn-button 18 has to be actuated so as to retract the bolts 6 from the recesses 19 in the pulley-stiles, whereupon these bolts engage the cross-grooves 14 and passing through same enter the vertical grooves 13, so that the lower sash 2 is able to be raised in these grooves 13 behind the upper sash 1, its bottom end running to the grooves 15, guided by the studs 7, sliding in these grooves, or, if required to be swung inwardly, until it rests at the desired angle on the spring-buttons 25 or 26. The sash may be swung inwardly until its position is horizontal, or approximately so, for cleaning or repairing purposes. During this turning inward of the sashes the studs 16, on which normally rest the guide-studs 7, prevent the latter from running up the guide-grooves under the influence of the sash-weights when the sash has taken up an inclined or horizontal position. Said studs 16, which enter the incisions 23 of the plates 17 on turning the sash inwardly, move in the circular groove around the stud 7 when turning the lower sash 2 until arriving at the end of the groove, when they will be situated at the side of the studs 7 farthest from the mouth of the incision 23.

When the lower sash is situated in the top portion of the vertical guide-grooves 13, the top sash can be pulled down in the vertical guide-grooves 12 in the usual manner. When the top sash is pulled down to its fullest extent, the studs 16 hereinbefore mentioned have entered the channels or incisions in the plates 17 in connection with this sash. The upper guide-studs 4 are then situated opposite the cross guide-grooves 14, thus enabling the upper sash to be brought into a horizontal position in a manner similar to that described with regard to the lower sash. After having elevated a sash its removal from the window-frame 3 is enabled by pulling it toward the interior of the room, so that the guide-studs at the lower end of the sash separate from the grooves in the pulley-stiles by passing out of the cross-groove 14, whereupon a similar operation is performed to separate the two guide-studs from the window-frame. In this manner both the sashes can be separated from and reinserted into the window-frame.

Double windows are constructed by simply duplicating the arrangements hereinbefore described. An instance of this is indicated in Fig. 5.

The vertical grooves or races 13 extending over the entire length of the pulley-stile, it is possible to place the two sashes one behind the other in the lower half of the window.

In the cross-grooves 14 the provision of a rectangularly-bent flat spring 28 may be advantageous to serve as a stop for the movable rods 6 in their passage through said grooves.

The advantages of my invention will be apparent to those skilled in the art, since the sashes may quickly and easily be swung inwardly without the removal of stops, beads, or strips or any other tedious or cumbersome manipulation, while their ordinary operation is not hindered. The advantage of being enabled to remove the sashes from the window-frame is also very appreciable, and the whole construction is simple and durable.

It will be understood that the invention can easily be applied to counterbalancing-sashes, and many other changes may be made in the form and arrangements of the parts without departing from the scope of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the stiles of a window-frame having the sashes situated in aline-

ment when the window is closed, of a plurality of guide-grooves for the sashes, the two vertical ones of equal length connected together at the bottom end by an upwardly-inclined groove and a third one leading from the center of the outer vertical guide-groove across the second vertical guide-groove to the inner edge of the stile, substantially as and for the purpose set forth.

2. The combination with the stiles of a window-frame having the sashes situated in alinement when the window is closed, of a plurality of guide-grooves for the sashes, the two vertical ones of equal length connected together at the bottom end by an upwardly-inclined groove and a third one leading from the center of the outer vertical guide-groove across the second vertical guide-groove to the inner edge of the stile and a stud at the bottom end of the outer vertical guide-groove and at the end of the communicating groove, said stud projecting from the surface of the pulley-stile, substantially as and for the purpose set forth.

3. In combination with the bottom end of the side rails of window-sashes and in combination with the projecting stud at the lower end of the two converging grooves in a pulley-stile a plate having a partly-circular incision and a center piece for the purpose of preventing the inclined sash from traveling up the guide-grooves by the stud projecting from the bottom end of the latter entering said circular incision, substantially as and for the purpose set forth.

4. In a window having the sashes situated in alinement when closed, in combination; a plurality of guide-grooves in the window-frame stiles; studs projecting from the latter at the bottom end of the converging guide-grooves; the sashes movable in the aforesaid guide-grooves, and provided with guide-pins at the top and bottom of the side rails; a metal plate having a partly-circular incision and a center piece at the bottom end of the said side rails; the top guide-pins retractable into recesses to permit the sashes being swung inward around the lower guide-pins which constitute the center in the circular incisions and means for retaining the sashes in an inclined position, substantially as described and for the purpose specified.

5. In combination with the bottom end of the side rails of window-sashes, and in combination with a circular stud situated at the bottom of the meeting-point of the vertical guide-grooves in the window-frame, a metal plate inserted in said rails so as to be flush with same, said metal plate provided with an incision which continues a groove to the edge of the rail so as to receive the aforesaid circular stud and prevent the ascent of the inwardly-swung sash in the unoccupied vertical guide-grooves, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHANNES STUMPF.

Witnesses:
MARIE SCHULZ,
ERNST LEHMANN.