

No. 890,626.

O. M. EDWARDS.  
WINDOW.

PATENTED JUNE 16, 1908.

APPLICATION FILED JAN. 16, 1903.

3 SHEETS—SHEET 1.

Fig.1

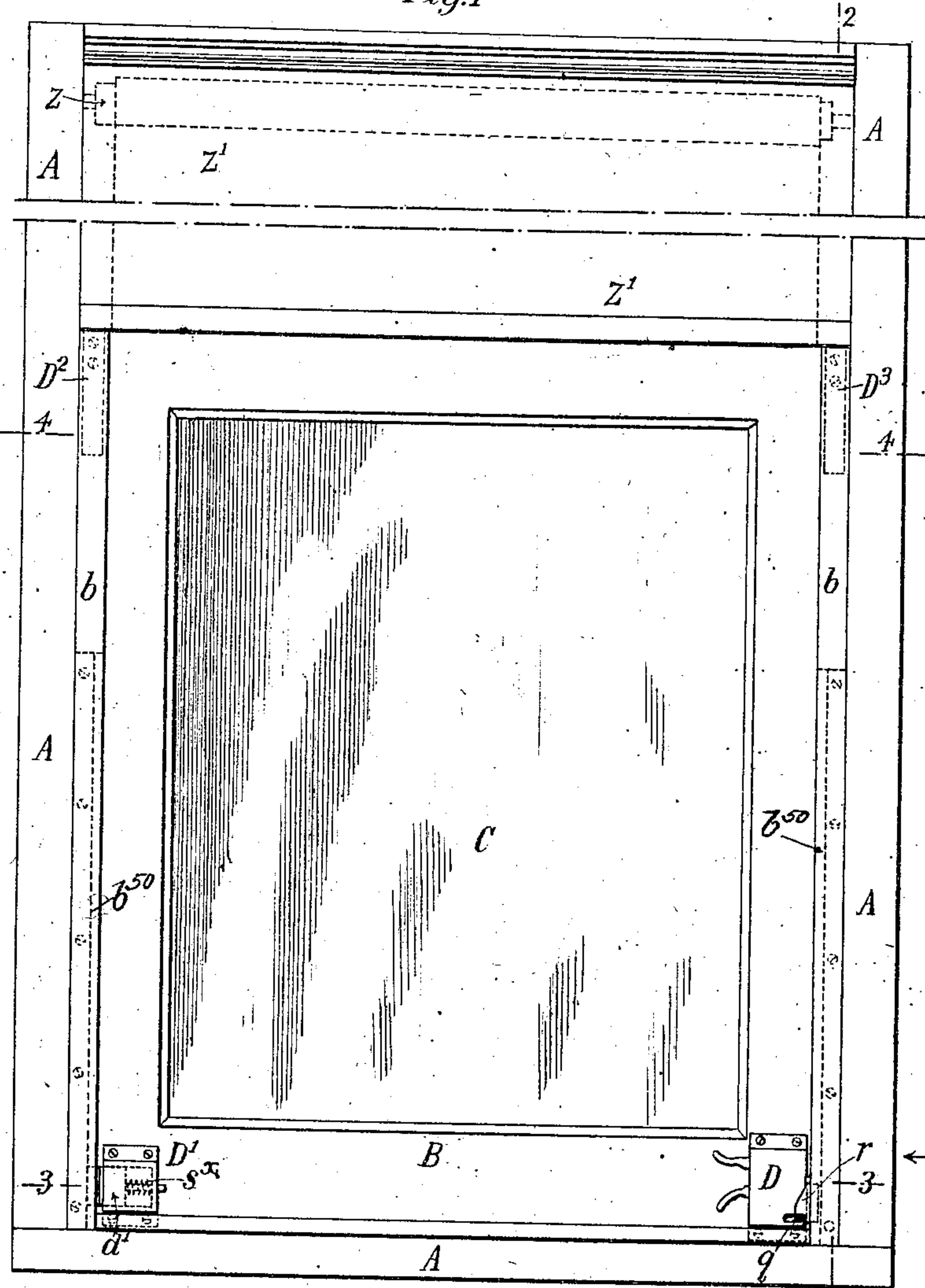


Fig.2

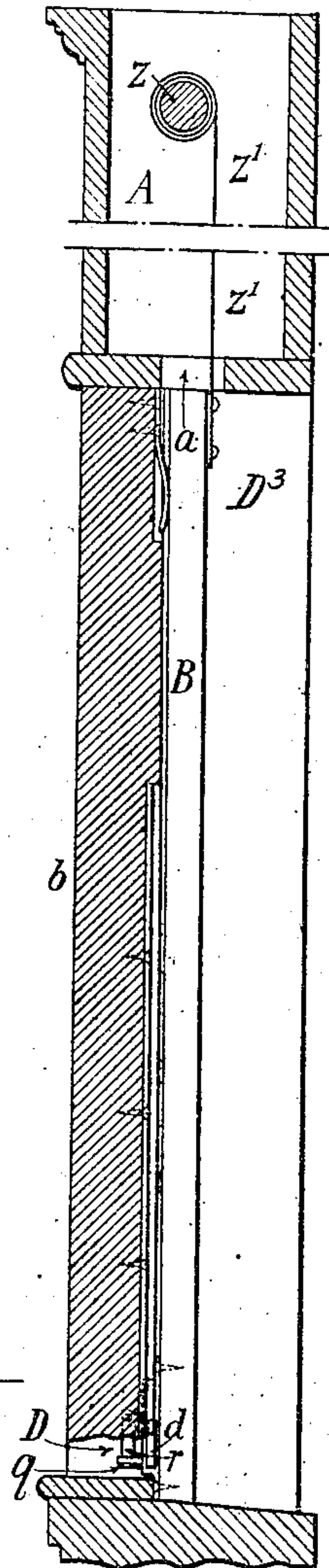


Fig.3

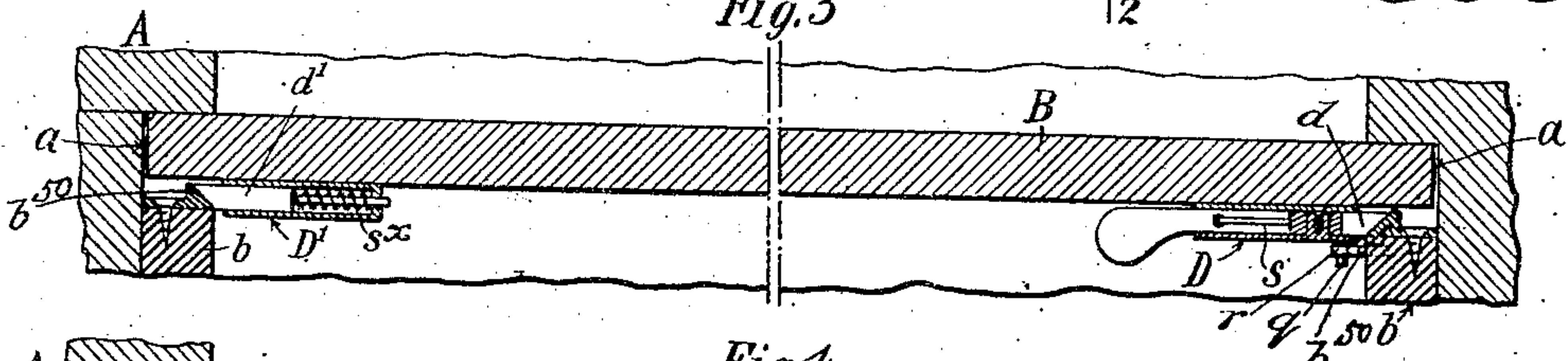
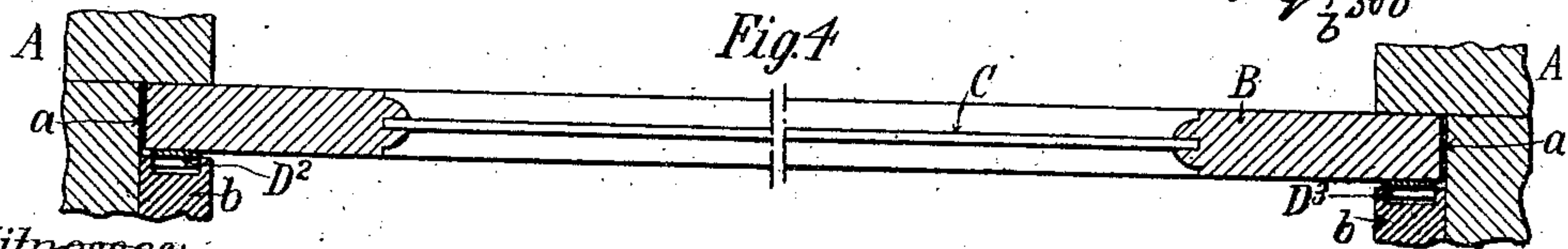


Fig.4



Witnesses:  
*Raphael Ketter*  
*C. D. Morrill*

Oliver M. Edwards, Inventor  
*H. L. Newbury* Att'y  
by



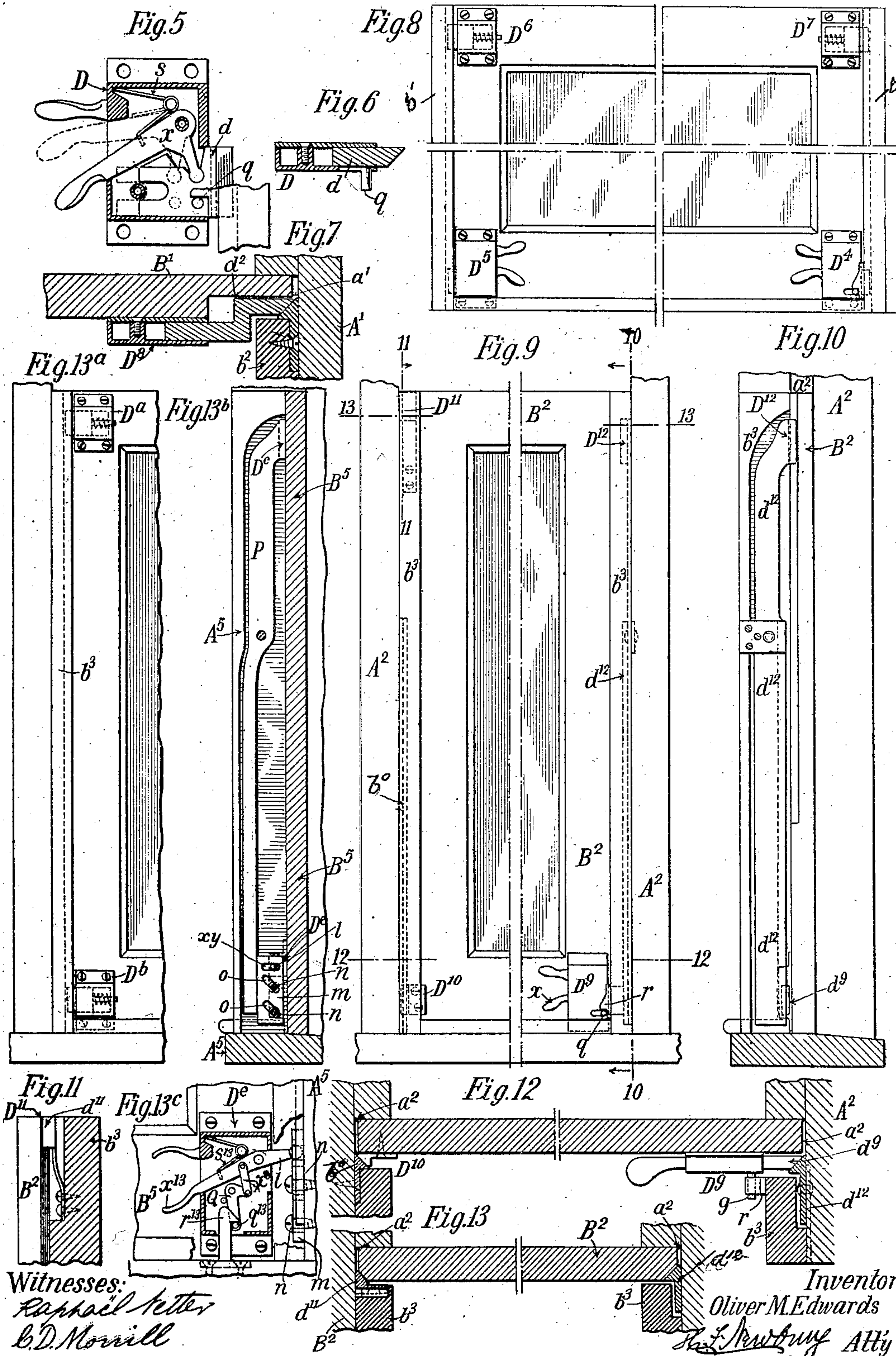
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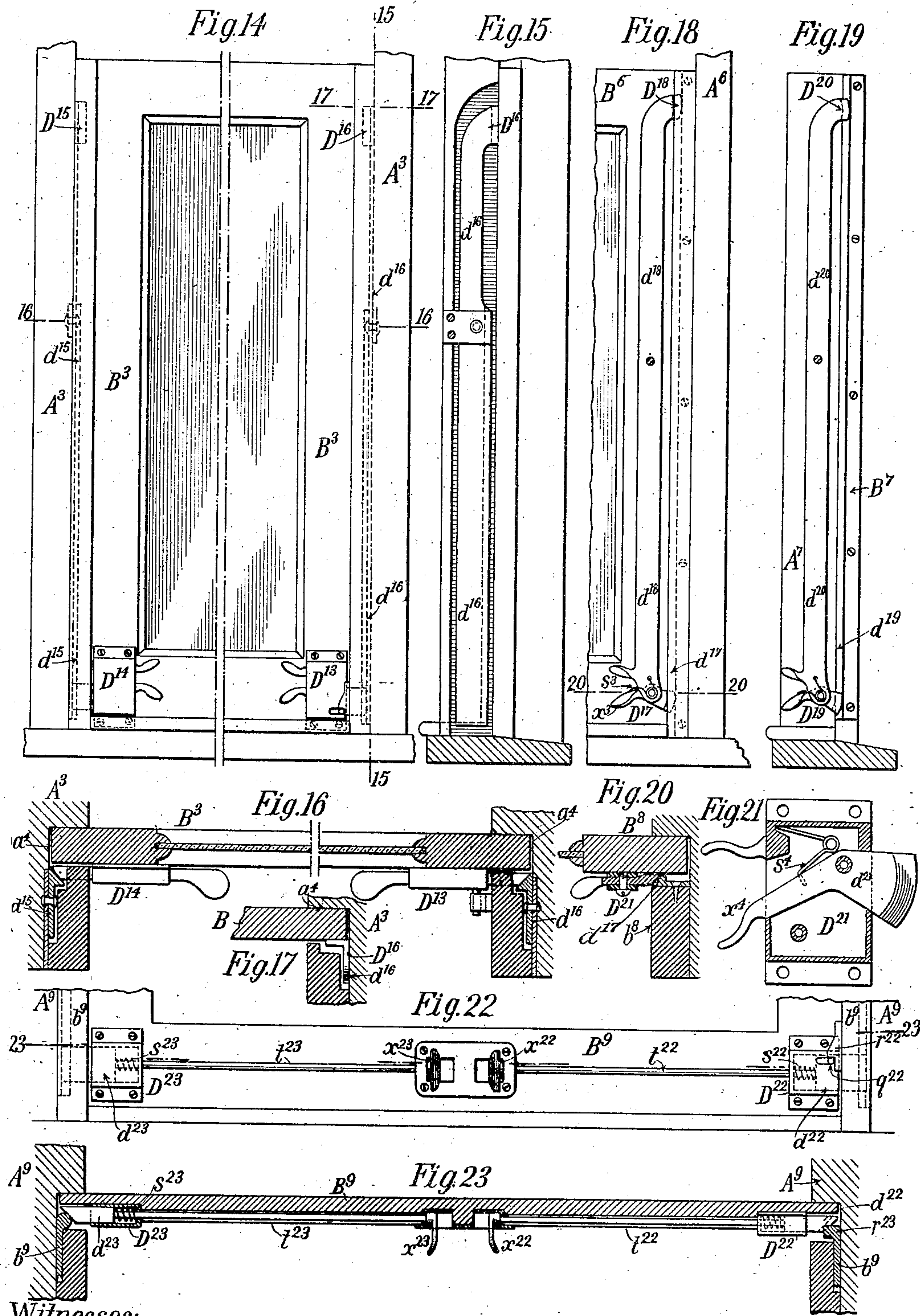
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3 SHEETS—SHEET 2.







Witnesses:  
Raphael Ketter  
C. D. Morrill

by

Oliver M. Edwards, Inventor  
H. L. Newbury, Att'y



# UNITED STATES PATENT OFFICE.

OLIVER M. EDWARDS, OF SYRACUSE, NEW YORK.

## WINDOW.

No. 890,626.

Specification of Letters Patent.

Patented June 16, 1903.

Application filed January 16, 1903. Serial No. 139,288.

*To all whom it may concern:*

Be it known that I, OLIVER M. EDWARDS, a citizen of the United States, residing at Syracuse, in the county of Onondaga, State of New York, have invented certain new and useful Improvements in Windows, (Case B,) of which the following is a full, clear, and exact description, reference being had to the drawings accompanying the same.

My invention relates to devices by which the sashes of windows may be held in close relation to the guideways in which they move and more or less released therefrom; means for locking the sash in desired positions; and actuating means by which the sash holding devices are more or less released and the sash is permitted to move in its guideway.

One object of my invention is to provide a window with devices which are simple in construction and easy to apply, and which tend to normally hold the sash in its guideway at different points thereof.

Another object is to provide a window with holding devices which tend to normally hold the sash in its guideway at different points thereof with a wedging action upon opposite edges of the sash.

Another object is to provide a window with holding devices which tend to normally hold the sash in its guideway with a yielding and more or less wedging action.

Another object is to provide and arrange such devices relatively to the sash and its guideway that the wedging action thereof is substantially the same when the sash moves in either of two directions.

Other objects will appear from the descriptions hereinafter given; and my invention consists in the combinations of parts or devices hereinafter set forth and particularly pointed out in the claims, which form a part of this specification.

I have shown in the drawings different embodiments of my invention, but it is to be understood that the invention may take on other forms or embodiments than those shown.

Like letters of reference, wherever they occur, indicate corresponding parts in the several figures of the drawings.

The accompanying three sheets of drawings illustrate certain forms in which my invention may be carried out.

Figure 1 is a front view of a window containing my invention in one form applied to a car window, as seen from the interior of the

car, with automatic or counterbalancing means indicated, and with the holding devices partly attached to the sash and partly to the frame of the window. As thus shown only one of the holding devices is provided with means by which the stress of its spring can be overcome to a greater or less extent to release the sash from the holding action of such device, the parts being so constructed and arranged as to give the sash both an edgewise and sidewise movement in its guideway, as set forth in Letters Patent No. 562,935, granted to me upon application of John E. Sweet, June 30, 1896. Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1, as seen from the direction indicated by the arrow head thereon. Fig. 3 is a horizontal sectional view on line 3—3, near the bottom of Fig. 1, showing the beveled holding surfaces in engagement one with another, as when the sash is normally held in position by the yielding wedging action of such devices. Fig. 4 is a horizontal sectional view on line 4—4, nearly midway of Fig. 1, showing the positions of the yielding holding devices near the top of the sash, when the window is closed. Fig. 5 is a front view of the holding device provided with actuating means seen in Fig. 1, but on an enlarged scale, with the outside casing partly in section, showing, in full lines the positions of the parts when holding the sash in place, and in dotted lines when the movable parts of the device have been actuated to a considerable extent to release the sash. A portion only of the guideway is shown and this illustrates the relations of the parts and to an abutment attached to the frame adjacent to the guideway. Fig. 6 shows a sectional view of some of the parts seen in Fig. 5. Fig. 7 shows a modification in the arrangement of the parts seen in some of the preceding figures. Fig. 8 illustrates another modification wherein four holding devices, each of which is provided with a spring pressed sliding part having a beveled holding surface, and two of which are provided with actuating means to move such parts against the stress of their springs, the other two being unprovided with such means. Certain portions of the window are broken away to better show the parts mentioned. Fig. 9 illustrates another form of the invention wherein those portions of the window which contain the sash are seen in front view with the remaining portions broken away. As here shown the parts are



somewhat differently constructed and arranged from what is the case in preceding figures, but the edgewise and sidewise movement of the sash in its guideway may take place, as set forth in said patent of June 30, 1896, and in addition the movement of one of the holding devices may lessen the holding action of each of the other holding devices. Fig. 10 shows in vertical section on line 10—10 of Fig. 9, the parts there seen from the right. Fig. 11 shows in vertical section, on line 11—11, near the upper left hand portion of Fig. 9, the parts there shown. Fig. 12 shows in horizontal section on line 12—12 of Fig. 9, the parts there illustrated. Fig. 13 shows in horizontal section on line 13—13 of Fig. 9, the parts as there shown. Fig. 13<sup>a</sup> shows a portion of a window provided with one form of holding devices applied thereto. Fig. 13<sup>b</sup> shows a portion of a window, with the sash in section having another form of holding devices applied thereon. Fig. 13<sup>c</sup> shows in front elevation, with a portion of the casing removed, the holding device attached to the lower portion of the sash seen in Fig. 13<sup>b</sup> and with a modified form of locking detent and abutment. Fig. 14 shows in front elevation a portion of a window, with vertical central portion broken away, wherein the movement of one holding device may lessen the holding action of the remaining devices. Fig. 15 shows in vertical section, on line 15—15 of Fig. 14 the parts there shown from the right. Fig. 16 shows in horizontal section on line 16—16 of Fig. 14, the parts there shown. Fig. 17 shows in horizontal section on line 17—17, near upper right hand portion of Fig. 14, the parts there seen. Fig. 18 shows in front elevation a portion of a sash with a holding device pivotally mounted upon the sash and movable therewith and relatively to the guideway. Fig. 19 shows a somewhat similar device pivotally mounted to the window frame. Fig. 20 shows in cross section on lines 20—20 of Fig. 18, the parts there seen. Fig. 21 shows a modified form of the holding device seen in Fig. 5, with the casing partly in section. Fig. 22 shows in front elevation a modified form of actuating means and so arranged as to be within the grasp of a single hand of the operator, the same being applied to the lower portion of a window, and with a locking detent and fixed abutting surface. Fig. 23 shows in horizontal section, on line 23—23 of Fig. 22, the parts there seen.

In Figs. 1 to 4 inclusive A is the window frame, provided with a guideway for the sash B, and in which it may move in the opening and closing direction, as well as to a slight degree edgewise and sidewise when unrestrained by the holding devices, which are designed to movably bear against the sash at different points thereon. C is the glass set in the sash, B, and D, D', D<sup>2</sup> and D<sup>3</sup>

are the holding devices which normally bear against the sash and hold it pressed towards the exterior of the window.

As here shown the window may form a part of a passenger car, such as may be many times seen in use on railroads, but the window may, if desired, form a part of any kind of a structure. Also, as here shown, the sash is provided with spring counterbalancing or automatic raising means, such as are many times seen in railway cars at the present time, but it is to be understood that such means form no necessary part of my present invention and are shown as a convenient means used in connection with window sashes at the present day. Such means consist of a spring roller mounted in brackets a suitable distance from the sash and connected thereto by some flexible material which will wind upon the roller. The spring is suitably adjusted to either partially or wholly counterbalance the weight of the sash, or to wholly overcome such weight, when the sash is more or less free to move in the opening direction, so that when the sash is released from its holding devices it will quickly rise into the open position, as desired. This roller is designated as Z and the band or web of cloth, one end of which is secured to the roller and the other to the sash, as Z'.

As here shown the guideway *a* is partly formed by stationary or fixed parts of the window frame A and partly by removable parts, as is customary many times with windows. These removable parts, as here shown, consist of the usual stop beads which are removably secured to the window frame in the usual way. These stop beads are designated as *b*. For a suitable distance from the bottom of the window, as indicated in Figs. 1 and 2, a part, as *b*<sup>50</sup>, having a beveled or wedge shaped surface is secured to each of the stop beads *b*, *b*. These parts *b*<sup>50</sup> do not extend throughout the entire length of the stop beads, as shown. To the upper ends of these stop beads spring holding devices D<sup>2</sup> and D<sup>3</sup> are arranged, one at one edge of the sash or side of the frame and one at the other. These holding devices D<sup>2</sup>, D<sup>3</sup> are in the form of flat bent springs and each is secured to its stop bead *b*, as shown, and the stress of each spring causes the free end to bear against the sash and press such portion of the sash away from its stop bead *b* and towards that portion of the guideway with which the exterior portion of the sash engages.

The lower portion of the sash is provided with two holding devices D, D', each of which is provided with a spring pressed sliding part or bolt having a beveled or wedge shaped bearing surface, as seen in Fig. 3. Holding device D has its sliding part or bolt *d* arranged so that its beveled bearing surface bears against the beveled or wedge shaped



part, as  $b^{50}$ , which is secured to the lower portion of the stop bead  $b$  at that side of the window and holding device  $D'$  has it sliding part or bolt  $d'$  arranged for its bearing surface to bear against the corresponding surface on that side of the window, the springs  $s$  and  $s^x$ , respectively, being arranged for their stress to force the bearing surfaces of these sliding bolts or parts  $d$  and  $d'$  against the beveled or wedge shaped parts mounted upon the stop beads  $b$ . These holding devices  $D$  and  $D'$ , as shown, are held in position on the sash by any suitable means so that as these holding bolts or parts  $d$  and  $d'$  press against the wedge shaped parts mounted on the stop beads, the springs  $s$  and  $s^x$  exert their force to press or push the sash toward the exterior of the window and at the same time such wedge shaped bolts tend to move the sash outwards in the guideway so that each spring exerts substantially an equal force in moving the sash exteriorly. Holding device  $D$  is provided with means by which the stress of this spring  $s$  may be overcome and the bolt or part  $d$  move in a direction away from the beveled or wedge shaped part mounted on the stop bead at that side of the window. This holding device and the means by which the sliding part  $d$  is thus moved away from the beveled part  $b^{50}$  is seen on an enlarged scale in Fig. 5 where the greater portion of the outer casing is removed. These means consist of a bent lever  $x$ , one end of which engages with the bolt  $d'$ , as shown, and the other extends out of the casing and is provided with a finger or thumb portion by which it may be actuated. When lever  $x$  is moved from the position seen in full lines in Fig. 5 to that seen in dotted lines bolt  $d$  is released from its holding action of device  $D'$ , as the distance this bolt  $d'$  can move out of the casing is limited by any suitable means desired. When lever  $x$  is in the position seen in dotted lines the sash can be raised by roller  $Z$ , or by applying force thereto in the proper direction, as it is free to move in the guideway except for the stress of the spring holding devices  $D^2$  and  $D^3$  and the friction they cause, which is not sufficiently great to wholly impede the raising of the sash although sufficient to hold that portion against its guideway, under normal circumstances. Upon releasing the lever  $x$  at any portion of the movement of the sash in the opening direction the spring  $s$  causes the lever and bolt  $d$  to move so as to bring its beveled bearing surface into forcible contact with the beveled surface of the part  $b^{50}$ , mounted on the stop bead  $b$  with which it normally engages. This also causes the sash to move edgewise so as to cause the bearing surface of bolt  $d'$  and holding device  $D'$  to bear against the beveled surface mounted on stop bead  $b$  at that side of the window and to compress its spring  $s^x$ , and at the same time force the lower portion

of the sash away from the stop beads,  $b$ ,  $b$  holding the sash tightly against the outward portion of its guideway, thus excluding cold and dirt and preventing the sash from rattling.

It will be observed that holding device  $D$  is provided with a movable part  $d$  having a beveled portion, and actuating means, which beveled portion frictionally bears against the beveled surface of the part, as  $b^{50}$ , mounted on the stop bead adjacent thereto, which part is beveled in substantially the direction the sash moves in opening and closing.

If desired two holding devices, similar to device  $D$  may be employed at the lower portion of the sash, one at each side of the window, the only difference being that the lever will be arranged as indicated in the lower portion of Fig. 8, wherein the stop beads  $b'$ ,  $b'$ , corresponding to the stop beads  $b$ ,  $b$ , in Figs. 1 to 4, have their beveled portions, which are mounted thereon, extend the whole length of the sash, and two holding devices  $D^4$   $D^5$ , similar to holding device  $D$ , are employed for the lower portion of the window, and two holding devices  $D^6$  and  $D^7$ , similar to holding device  $D'$ , are employed for the upper portion of the window.

Also, if desired holding device  $D$  or  $D^4$  may be provided with a locking detent  $q$ , which, if desired, may be conveniently secured or attached to sliding bolt  $d$ , as in Figs. 1, 2, 5 and 6, or otherwise, so that such detent may be moved into and out of locking position by the same means that actuate the bolts. This locking detent  $q$  may engage, when the sash is in the closed position, with an abutting surface  $r$ , as seen in Figs. 1 and 2, secured to the frame of the window or to part  $b-b'$  adjacent to the guideway, and in position to prevent any substantial upward movement of the sash when arranged to hold the sash closed, as shown in Figs. 1 and 2, and also as indicated in Figs. 8, 9, 12, 14, 16 and 22.

If desired the holding device, as  $D^8$ , shown in horizontal section in Fig. 7, may be employed in place of the holding device  $D$  or  $D^4$ , the beveled surface of which may coact with the adjacent parts in the manner indicated in this Fig. 7. The operation and manner of using the holding device, as  $D^8$ , is similar to that of using the holding device  $D$ , and this action on the sash is also similar. The sash in this Fig. 7 is designated as  $B'$ , the sliding bolt as  $d^2$ , the guideway as  $a'$  and the stop beads as  $b^2$ . These holding devices  $D$  to  $D^8$ , inclusive, exert a holding action upon the sash to hold it in the guideway, each device having its own individual point of bearing, which point is different from the points at which other holding devices bear, and, hence, each device has its own individual portion of the sash to bear against in holding the sash in the guideway.



As shown in Figs. 1 to 8 some of the individual holding devices serve to, in a measure, control and yet to permit the movement of the sash in the guideway, while other of such devices partially release the sash upon manipulating the actuating means provided, so that the sash may be manually moved to open and close the window and yet have its movement more or less controlled under the action of gravity or other force tending to move the sash in one direction. Thus the sash is partially held and partially released by the action of these individual holding devices. It is to be observed that the holding devices  $D^2$  and  $D^3$  seen in Fig. 1 do not interfere with the edgewise movement of the sash under the action of the holding devices  $D$  and  $D'$ . Also that these devices  $D^2$  and  $D^3$  bear against the sash with a yielding force so as to act thereon and yet to move slightly to accommodate themselves to inequalities in the sash, as it moves in opening and closing the window. These individual holding devices which partially hold and thereby control more or less the movement of the sash in opening and closing the window serve an important purpose in the combinations of which they form a part. As a result of this partial holding of the sash the danger of injury to passengers caused by falling sashes is largely if not wholly eliminated. It is a well known fact that sashes weighing between 30 and 40 pounds are now commonly used in windows of railway cars. It can be readily seen that the unobstructed falling of such weights upon the hands and arms of passengers will cause injury thereto of a serious nature. These holding devices  $D^2$   $D^3$  not only serve the above purpose but they co-act with the other holding devices with which they are combined in forming a tight, noiseless and readily movable sash under the well known varying circumstances of use, such as the swelling and shrinking of the wood of which the sash and its frame are composed, the twisting action of the car body caused by varying changes in the track and road bed, &c.

In Figs. 9 to 13 inclusive, somewhat different forms of holding devices are employed, but with substantially the same action upon the sash, except that the holding action of each device upon the sash may be lessened by the movement of a part of one of the holding devices.  $A^2$  is the frame,  $B^2$  the sash,  $a^2$  the guideway in the frame in which the sash may move in opening and closing the window.  $D^9$ ,  $D^{10}$ ,  $D^{11}$  and  $D^{12}$  are the holding devices. The devices  $D^9$  and  $D^{10}$  are mounted in a fixed relation to the sash and bear against it at two points, one where  $D^9$  is secured to the sash and the other where  $D^{10}$  is so secured; and devices  $D^{11}$  and  $D^{12}$  are mounted in a fixed relation to the guideway, so far as the movement of the sash in the

opening and closing structure is concerned. The stop bead  $b^3$  of the guideway at the left of these figures is provided, for a portion of its height, at least equal to the extent of movement of the sash in the opening direction, with a piece of material as  $b^6$  as seen at the left of Fig. 12. The sash is also provided with suitable beveled co-acting surfaces at its opposite edges for a sufficient portion of its height for the holding devices  $D^{11}$  and  $D^{12}$  to bear against, as the sash moves in opening and closing the window. The holding device  $D^{10}$  as shown at the left of Figs. 9 and 12 has its beveled engaging surface in contact with the beveled piece of material  $b^6$ , which is attached to the frame of the window. Holding device  $D^{11}$ , mounted upon the stop bead  $b^3$ , bears against the beveled portion of the sash  $B^2$  as seen at the left upper corner of Fig. 9 and at the left of Fig. 13. One stop bead  $b^3$ , seen in Figs. 9 and 10 simply covers the pivoted lever  $d^{12}$ . Holding device  $D^9$  engages with the lower portion of this lever  $d^{12}$  so as to force the holding device as  $D^{12}$ , carried at its upper end into engagement with the beveled portion of the sash  $B^2$ . The portion of this lever  $d^{12}$  below the pivotal point is beveled so that the beveled end of the bolt or movable part of holding device  $D^9$  may engage therewith, as seen at the right of Fig. 12. This holding device  $D^9$  is secured to the sash and moves therewith and the beveled edge of this lever  $D^{12}$  is beveled for at least the desired distance that the sash moves in opening the window. Each of these holding devices  $D^9$ ,  $D^{10}$ ,  $D^{11}$  and  $D^{12}$  bear against the sash at separate and somewhat widely differing points so that each presses or pushes its respective upper and lower corners of the sash into close and intimate contact with the exterior portion of the window frame, when the sash is in the closed position, and, therefore, because of this co-action of these holding devices with the sash and window frame each device tends to hold its own individual corner portion of the sash tightly in position so as to thereby exclude dust and drafts of air. Each of these individual holding devices  $D^9$ ,  $D^{10}$ ,  $D^{11}$  and  $D^{12}$  coact with the sash and window frame in substantially the same manner in pressing or forcing such sash toward the exterior of the window frame.

Holding device  $D^9$  may be the same as shown in Fig. 5, with its sliding bolt to engage with the beveled co-acting surface on a lever pivotally mounted on the window, as seen at the right of Fig. 12, and it may also be provided with actuating means similar to what is shown in Fig. 5 or otherwise, as desired. If of the same construction, as seen in Fig. 5, it may be provided with a similar locking detent and abutting surface, as indicated, or it may be provided with some other form, as for instance, that seen in Fig. 13<sup>c</sup>, as desired.



Holding device  $D^{10}$  may have a fixed or non sliding bolt with a beveled bearing surface, as shown at the left of Fig. 12, which is, shown, fixedly attached to the sash: Holding device  $D^{11}$  consists of a spring mounted bearing block  $d^{11}$ , attached to removable part  $b^3$  at the left of Fig. 9, and more clearly seen in Fig. 11, which block is provided with a beveled bearing or co-acting surface to bear against a beveled edge of the sash,  $B^2$ , as more clearly seen at the left of Fig. 13.

Holding device  $D^{12}$ , as here shown, consists of a lever  $d^{12}$  pivoted to the frame of the window, as seen at the right of Fig. 9, and more clearly seen in Figs. 10 and 12. This lever  $d^{12}$  extends, as shown, throughout nearly the height of the sash and for the lower portion of its height it is provided with a co-acting or beveled surface, as indicated in Fig. 12 at the right-hand thereof, with which the beveled or co-acting surface of the bolt of device  $D^9$  may frictionally bear. This bolt is so arranged relatively to the beveled co-acting surface on the lower portion of lever  $d^{12}$  that as the bolt is forced towards and against the lever it forces its lower portion away from the sash, causing such lever to rock on its pivotal connection to the frame and moving the upper end of such lever towards the sash. This upper end of lever  $d^{12}$  is provided with a projecting beveled portion, as seen in Figs. 9, 10 and 13 which engages with the beveled surface on the sash, when such upper end is forced sufficiently towards the upper portion of the sash, as shown at the right of Fig. 13, causing the sash to move slightly edgewise and sidewise, so as to firmly hold it to its guideway, as shown, this movement taking place throughout the height of the sash, although it may vary in extent at different portions thereof. When the sliding bolt of device  $D^9$  is actuated so as to move out of frictional contact with the co-acting surface of lever  $d^{12}$  the sash can then move edgewise and sidewise slightly and the beveled surface on devices  $D^{10}$  and  $D^{11}$  will not bear so hard upon their co-acting surface as before and in this way the sash will be more or less relieved from the holding action of all of the holding devices, as the movement of the movable bolt of device  $D^9$  permits lever  $d^{12}$  to rock on its pivot and release the sash from the holding action of device  $D^{12}$ . The pivoted lever  $d^{12}$  forms a connection, or connecting means between the holding device  $D^9$  arranged at the lower portion of the sash and holding device  $D^{12}$  carried at the upper end of such lever and arranged to bear against the upper portion of the sash.

It will be observed that the movement of the movable bolt towards and against the lower portion of lever  $d^{12}$  causes the holding action of each and all of the devices  $D^9$ ,  $D^{10}$ ,  $D^{11}$ , and  $D^{12}$  to be increased, and this is done to substantially the same extent with

all four owing to the rocking movement of lever  $d^{12}$  and the edgewise and sidewise movement of the sash by reason of the several beveled surfaces.

If desired the left hand portion of the window seen in Fig. 9 may be constructed as shown in Fig. 13<sup>a</sup>, wherein two holding devices like  $D'$  of Fig. 1 and  $D^6$  of Fig. 8 are employed, the same being constructed and arranged in connection with a beveled surface formed on the guideway at that part of the window as devices  $D'$  and  $D^6$  are arranged, and acting thereon in a similar manner to force the sash edgewise to the right and sidewise toward the exterior of the car. Also a pivotally mounted holding device, as shown in Fig. 13<sup>b</sup> may be employed at the right hand portion of the window and applied in a similar manner to that which the similarly mounted device is applied in Fig. 9. If this latter be done then a holding device as shown in front view in Fig. 13<sup>c</sup> with its casing partly removed, may be employed to co-act with the pivotally mounted portion of the device shown in Fig. 13<sup>b</sup>. In such a case the devices  $D^a$  and  $D^b$ , seen in Fig. 13<sup>a</sup>, would, as before explained, have movable parts adapted to move transversely to the direction in which the sash moves in opening and closing, and all of the devices would yield relatively to the sash, also as before explained, although some would yield somewhat differently from what others would.

Holding device  $D^c$  in Fig. 13<sup>b</sup> is pivotally mounted on the window frame  $A^5$ , as seen in Fig. 9, and it is provided with a bearing or co-acting surface substantially parallel with the interior surface of sash  $B^5$  and, when in holding position tends to force the sash towards the exterior of the car, as the end in contact with the movable part or plate  $m$  of holding device  $D^c$  mounted on the sash is moved away from the sash by the upward movement of said part or plate  $m$ . As shown this movable part or plate  $m$  is slidably mounted on the casing of the holding device by means of two studs  $n$ ,  $n$  and inclined slots  $o$ ,  $o$ , the latter being formed in the movable part or plate  $m$ , so that as this movable part or plate moves upward or towards the top of the sash the lower end of the lever  $P$  of the holding device  $D^c$  will be forced away from the sash and its opposite end will be forced toward the sash, as is the case with the holding device  $D^{12}$  and lever  $d^{12}$  in Figs. 9 to 13, notwithstanding the absence of beveled surfaces for holding devices  $D^c$  and  $D^e$  to bear against.

Holding device  $D^c$  differs from preceding devices in that it is unprovided with a beveled surface to co-act with a beveled portion of the window, beveled in substantially the direction the sash moves in opening and closing, and also in the means by which this device  $D^c$  is made to move into the holding



position against the sash, when the same is mounted as shown in Fig. 13<sup>b</sup>.

Holding device D<sup>e</sup> is provided with a movable part or plate *m* mounted, as above explained, which is provided with actuating means somewhat similar to what is seen in Fig. 5, except the pivoted lever *x*<sup>13</sup> is made to connect with such movable part or plate *m* by a portion *l*, so as to move it downwardly instead of moving it horizontally, as the bolt *d* in Fig. 5 moves and the spring *s*<sup>13</sup> is arranged to press this movable part or plate *m* upwardly and not horizontally.

An abutting surface *r*<sup>13</sup> to engage a locking detent *q*<sup>13</sup> mounted on one arm of an elbow lever Q, is secured to the sill of the window frame. The lever Q is pivoted in position for its other arm to connect with lever *x*<sup>13</sup> by link *x*<sup>0</sup> and be moved so as to move out of engagement with the abutting surface *r*<sup>13</sup> when actuating lever *x*<sup>13</sup> is actuated to release the sash from the holding action of devices D<sup>c</sup> and D<sup>e</sup>. While the locking detent and abutting surface in Fig. 13<sup>c</sup> is different in form, construction and manner of connecting with the movable part or bolt *m* it serves the same function in the same way as in preceding figures, and is combined with such part so as to move therewith in substantially the same manner as is the case in such preceding constructions.

In Figs. 14, 15, 16 and 17, pivotally mounted holding devices are shown of the general form of those seen in Figs. 9 to 13, but two are shown as used, one at each side of the window, and having bearing surfaces at the upper ends of the levers substantially parallel with the plane of the interior surface of the sash against which they bear. In these figures A<sup>3</sup> is the frame of the window, B<sup>3</sup> the sash, *a*<sup>4</sup> the guideway and D<sup>13</sup>, D<sup>14</sup>, D<sup>15</sup> and D<sup>16</sup> the holding devices.

Holding devices D<sup>13</sup> may be similar to that shown in Figs. 1 to 6, if desired, or it may be of the form shown in Figs. 20 and 21, or any other desired, which also may be the case with device D<sup>14</sup>. As here shown these devices are indicated as being of the construction in the lower part of Fig. 8 and Figs. 1 to 6, as such is a convenient form to represent. Each device D<sup>13</sup> and D<sup>14</sup> is provided with a movable sliding bolt having a beveled bearing surface adapted to bear upon a beveled coacting surface, as in the case with device D<sup>9</sup> in connection with the beveled surface on the lower portion of lever *d*<sup>12</sup>.

Holding devices D<sup>13</sup> and D<sup>14</sup> are provided with actuating means, a portion of which is a spring which exerts its stress to force the bolts of such devices into frictional bearing with the levers of devices D<sup>15</sup> and D<sup>16</sup>. D<sup>13</sup> is provided with a locking detent and abutting surface as in Figs. 1 to 5, while D<sup>14</sup> is not so provided. Both may be so provided if desired.

Holding devices D<sup>15</sup> and D<sup>16</sup> are each pro-

vided with a lever *d*<sup>15</sup> and *d*<sup>16</sup> respectively, which levers are pivotally mounted to the window frame as in the case of lever *d*<sup>12</sup> heretofore described, and as shown in Figs. 14, 15 and 16, Fig. 16 being taken on the line of the pivots as shown. At the upper ends of these levers there is a bearing block or part adapted to bear against the sash as seen in Figs. 15 and 17, in the latter figure the block, at the upper right hand portion of the sash, being shown, the opposite one being quite similar. The operation of the holding devices shown in these Figs. 14 to 17 is similar to those in Figs. 9 to 13, except that there is no necessary edgewise movement of the upper portion of the sash when holding devices D<sup>15</sup> and D<sup>16</sup> are forced into holding position, while there may be such edgewise movement of the lower portion of the sash.

It will be observed that in Fig. 1 the holding devices are adapted to yield relatively to the sash and guideway. Devices D and D' yield with the sash as it yields under force, and the sliding bolts *d* and *d'* yield relatively to the casings of the devices and also relatively to the beveled surfaces mounted on the stop beads *b*, *b*. Devices D<sup>2</sup> and D<sup>3</sup> are in the form of flat bent springs and consequently yield relatively to and with the sash and guideway. It will also be observed that devices D and D' have a holding portion, the sliding bolts *d* and *d'*, movable transversely to the direction in which the sash moves in its guideway. The sliding bolts of devices D<sup>4</sup>, D<sup>5</sup>, D<sup>6</sup> and D<sup>7</sup> of Fig. 8 are also movable transversely to the direction in which the sash moves, and each one is also adapted to yield relatively to the guideway and sash. This is also true of the holding devices shown in Figs. 9, 14, 18, 19, 22 and 23. In each case the holding devices can yield as the sash yields, when in the holding position, whether each individual device has a spring pressed part or not. For instance the device D<sup>10</sup> in Fig. 9 is fixedly attached to the sash and yet by reason of the beveled co-acting surfaces and the spring pressed part or sliding bolt in device D<sup>9</sup>, D<sup>10</sup> and the sash can yield as force is applied to that portion of the sash to which D<sup>10</sup> is attached, in a direction to cause the sash to move edgewise and sidewise, and then, when such force is removed, the sash and device may again yield and move edgewise and sidewise, and so on, the sash being held in its guideway with a yielding pressure, this being the case in each of the embodiments herein shown.

A somewhat modified form of pivotally mounted holding device, or devices are shown in Figs. 18 and 19. In Fig. 18 such devices are pivotally mounted on the sash and move with the sash as it moves in the opening and closing direction, while in Fig. 19 the devices are mounted on the frame of the window or a part secured thereto.



In Fig. 18 holding device  $D^{17}$  is pivotally attached at or near one end of a lever  $d^{18}$  which is in turn pivotally mounted on the sash  $B^6$  mounted in frame  $A^6$  provided with a beveled surface  $d^{17}$  which extends in the direction in which the sash moves for substantially the distance it is desired that either one or both of such devices should exert their holding action by being forced against such surface, that is so as to hold the sash in the desired position in its guideway by the frictional holding action of the device upon such surface. As here shown the lever  $d^{18}$  is provided with a fixed finger or thumb piece and  $D^{17}$  is provided with actuating means consisting of a spring  $s^3$  to move the device into holding position and a finger or hand piece  $x^3$ , by which it can be moved in the other direction and against the stress of spring  $s^3$ . As the spring  $s^3$  forces the beveled surface of  $D^{17}$  into co-acting relation to the beveled surface  $d^{17}$  on the frame it causes lever  $d^{18}$  to rock on its pivot and force that portion of  $D^{18}$ , at its upper end, into forcible contact with the same beveled surface, thus causing the sash to move both sidewise and edgewise, if it is not in contact with its guideway at its opposite edge. It will be observed that the upper end of device  $D^{18}$  moves so nearly in a direction transversely to the direction in which the sash moves that it may be said to substantially so move.

In Fig. 19 holding devices  $D^{19}$  and  $D^{20}$  are substantially the same as in Figs. 18 only in Fig. 19 such devices, as before explained, are mounted upon the window frame. Device  $D^{19}$  is pivotally attached to lever  $d^{20}$ , which is pivotally mounted on frame  $A^7$ , the sash  $B^7$  being provided with a beveled surface  $d^{19}$ . The actuating means for device  $D^{19}$  may be the same as for device  $D^{17}$  or different, as desired. The operation of the devices in Fig. 19 are similar to those in Fig. 18.

Fig. 20 shows in cross section a modified form of holding device, somewhat differently applied from those heretofore described. Holding device  $D^{21}$  is attached to the sash  $B^8$  and the beveled surface, beveled in substantially the direction in which the sash moves, is formed of a piece  $d^{17}$  mounted on the stop bead  $b^8$ . In Fig. 21 this holding device is shown on an enlarged scale and in front elevation with a portion of the casing removed to expose the movable parts to view. The removable bolt  $d^{21}$  is pivotally mounted in the casing instead of sliding therein as seen in some of the preceding figures. A spring  $s^4$  is arranged in the casing so that its stress is exerted on bolt  $d^{21}$  in a direction to force and hold it in holding contact with the beveled surface of the piece  $d^{17}$  secured to the stop bead  $b^8$ , and in this way tends to force or press the sash both edgewise and sidewise in its guideway, as is the case in preceding figures. This forcing or

pressing of the sash both edgewise and sidewise as herein shown results in forcing or pressing the sash towards the exterior of the window. A thumb or finger piece  $x^4$  is provided for the pivoted bolt  $d^{21}$  and with a spring  $s^4$  forms actuating means therefor. As here shown a fixed finger or thumb piece is formed on the casing to aid in operating the pivoted bolt  $d^{21}$ .

A modified form of actuating means are shown in Figs. 22 and 23, and these means are so arranged relatively to the holding devices that a portion of the means for one device is in somewhat close proximity to a corresponding portion of another device, and thus arranged to be operated by a single hand of the operator. Device  $D^{22}$  is provided with a sliding bolt  $d^{22}$  sliding transversely to the direction in which the sash  $B^9$  moves in opening and closing, which sash moves in the guideway formed in frame  $A^9$ . This movable or sliding bolt or part  $d^{22}$ , if desired may be made to engage with an abutting surface formed by the shoulder  $r^{23}$  formed on the co-acting surface on  $b^9$ , as indicated at the right of Fig. 23. This surface is cut away so as to permit bolt  $d^{22}$  to move in further towards the frame at this point than elsewhere and there is thus formed a shoulder against which the upper edge of the movable or sliding bolt or part  $d^{22}$  abuts and locks the sash as in Fig. 22 and preceding figures. In Fig. 22 sliding bolt  $d^{22}$  is provided with a locking detent  $q^{22}$ , which as in some of the preceding figures, engages with an abutting surface  $r^{22}$ , to lock the sash in the closed position. The action of the shoulder  $r^{23}$ , on the co-acting surface formed on  $b^9$  in locking the sash in the closed position is the same as is that of the detent  $q^{22}$  and abutting surface  $r^{22}$  of Fig. 22, the only difference being that sliding bolt  $d^{22}$  moves further towards the frame of the window when in the locking position in Fig. 23 than is the case in Fig. 22, and some of the preceding figures. Movable bolts  $d^{22}$  and  $d^{23}$  have beveled bearing surfaces and they are movable in opposite directions to be disengaged from their respective co-acting surfaces formed on the parts  $b^9$   $b^9$ . Each bolt is provided with a rod extending toward its companion bolt and on the ends of these rods  $t^{22}$  and  $t^{23}$  finger or thumb pieces  $x^{22}$  and  $x^{23}$  are placed and are so arranged, relatively to each other, that both may be grasped by the hand of the operator and the rods moved endwise, moving the movable bolts with them and transversely to the direction in which the sash moves, and towards each other, and moving the beveled surfaces out of contact with the co-acting beveled surfaces on the parts  $b^9$   $b^9$ . The co-acting surfaces on parts  $b^9$  and  $b^9$  are here shown as of different shape from those heretofore shown but they perform the same functions in connection with the sliding bolts or movable



parts  $d^{22}$  and  $d^{23}$  as do the other forms, so far as concern the edgewise and sidewise movement of the sash relatively to the guideway. Other forms of co-acting surfaces may be employed which serve these functions in substantially the same way. Many forms of co-acting surfaces have been herein shown and described and these will naturally suggest to those skilled in the art other forms of co-acting surfaces which may be employed in place of those herein shown and described, and which serve the functions served by those herein shown and described in substantially the same way, therefore, the particular shape of the co-acting surfaces is not of the essence of the present invention, so long as such surfaces serve the functions served by those herein specifically shown and described. The operation of the actuating means in these figures is similar to those in other figures in that the sash may be yieldingly held in its guideway and may also be given a sidewise and edgewise movement more or less, as desired, by reason of the beveled surfaces provided. It will be manifest that the holding devices shown in Figs. 22 and 23 may be used in place of other holding devices attached to the sash shown in preceding figures with similar effect; and also that this is true with regard to the actuating means here shown.

In each of the different embodiments of the invention herein shown each holding device is arranged to bear against the sash at a point corresponding to the location of each individual device. In Figs. 1 to 7 the device D forms an individual holding device, bearing against the sash at its lower right hand corner, as seen in Fig. 1, and at a point somewhat distant from the point where any other individual holding device, as for instance the devices  $D'$ ,  $D^2$  or  $D^3$ , bear against the sash. Each device has a given point at which it bears against the sash. This is also true of the other embodiments shown and described, whether the holding devices are provided with movable parts or not, or whether the movable parts be provided with actuating means by which each individual movable part may be actuated or not. These holding devices are not positively connected together, so that the movable part of one, if it has such a part, must necessarily partake of or respond to all of the movements of the movable part of some other device, but they are so arranged, relatively to one another, that the movable part of one device may at times move independently of the movable part or parts of other devices, and also in different directions. For instance in the construction shown in Fig. 1 there is no connection whatever between the several movable parts of the holding devices by which the movement of one part can in any way compel the movement of any other part.

In each figure the holding devices are so

combined together that the movement of the movable part of one of the devices provided with a beveled surface may, upon its movement modify or change the action of some other holding device in holding the sash in its guideway, and they all tend to move the sash sidewise against a given portion of such guideway. In Fig. 1 the movement of the movable part  $d$ , of device D, modifies the holding action of holding device  $D'$  on the sash. In Fig. 8 the movement of the movable part of either holding device  $D^4$ , or of  $D^5$ , modifies the holding action of the other device upon the sash. In Fig. 9 the movement of the movable part  $d^9$  of device  $D^9$ , modifies the holding action of each of the other holding devices  $D^{10}$ ,  $D^{11}$ ,  $D^{12}$  shown therein, as before explained.

It is to be observed that in Fig. 9 actuating means for only a single movable part is shown and the movement of this movable part  $d^9$  of device  $D^9$ , practically releases the holding action of all four holding devices, there shown, upon the sash, and when such part is moved in the other direction the holding action of all four devices is put upon the sash, notwithstanding the fact that no two of such holding devices are alike in construction and specific manner of producing a holding action upon the sash. It is also to be observed that all four of these holding devices are arranged to bear against the sash in a direction which tends to move it sidewise and yieldingly hold it against corresponding portions of the guideway, so that the sash is held against rattling and cinders, dust, &c. are excluded.

When the individual holding devices are arranged, as shown more particularly in Figs. 1, 9, 14, &c., with a portion mounted upon and carried by the sash and another portion is mounted adjacent thereto, the sash is, when released, free to move in the guideway in the opening and closing directions without forming openings in the frame over the sash for the holding devices which bear against the upper portion of the sash to pass through, because such holding devices are not attached to the sash and do not move with it. If these uppermost holding devices are arranged as seen in Fig. 1, so as to always bear upon the sash they hold the sash in the guideway and assist in guiding it in its opening and closing directions, and the active portion of the guideway itself need not be as long as if such devices were carried by the sash. Also when a portion of such holding devices are mounted adjacent to the sash, instead of upon it, such adjacent portion may be readily concealed in the window frame leaving the sash intact and, therefore, unweakened, and whether applied, as seen in Fig. 1 or a similar manner these holding devices may be applied without materially cutting and weakening the sash, which is desirable.



With holding devices of the character of those here shown, each device exerts its own individual holding action on the sash and tends to hold it against its guideway and against its warping and twisting therein to a greater extent than do some other forms of devices, which, under some circumstances are adapted to exert a holding action to a similar extent. Also the holding action of each device may be made such as is desired, and the holding action of one or more may vary in extent from that of others as desired, without such holding action materially changing in use.

It has been found in practice that individual holding devices, having one point of bearing for each device can be more cheaply and satisfactorily applied by the ordinary workman now largely employed than can holding devices having a point of bearing extending over a space served by two or more of these individual holding devices.

It is to be understood that other forms and constructions of holding devices, and also other arrangements of such devices than those here shown may be employed and yet have the structures embody the combinations particularly pointed out in the claims annexed hereto and forming a part of this specification, hence I do not wish to be limited to such forms or embodiments of the invention herein illustrated, but wish to include all combinations which embody the principles or modes of operation herein set forth and wherein the several parts are combined together in substantially the manner herein described.

The pivotally mounted holding device is not broadly claimed herein, as it forms the subject matter of another application filed January 16, 1903, Serial Number 139,287, and is claimed herein in combination with beveled co-acting surfaces, as pointed out in the claims hereunto annexed.

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

1. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway to open and close the window, a series of individual holding devices, each of which is adapted to bear at a separate point to hold the sash in the guideway, a portion of which series is adapted to control the sash by retarding its movement in the closing direction and another portion of such series is provided with actuating means by which the holding action of this latter portion is sufficiently released to permit the sash to move in opening and closing the window.

2. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway to open and close the window, a series of individual holding devices, each of which is adapted to

bear at a separate point to hold the sash in the guideway, a portion of which series is adapted to bear with substantially equal force in either direction of movement of the sash and another portion of such series is provided with actuating means by which the holding action of this latter portion may be partially released to permit the sash to move in opening and closing the window.

3. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, more than two individual holding devices adapted to bear against the sash at different points, one point of bearing for each device, one of which devices is provided with a movable part having a beveled surface and actuating means therefor, and a co-acting portion arranged substantially in the direction the sash moves, with which such movable part may frictionally bear, whereby the sash may be released from the holding action of more than two holding devices when such movable part is moved by the actuating means in one direction.

4. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway to open and close the window, a series of individual holding devices each of which is adapted to bear at a separate point to hold the sash in the guideway a portion of such series being mounted upon and carried by the sash and another portion is mounted adjacent thereto, both portions of such series tending to move the sash sidewise in the guideway, one portion having actuating means by which the holding action of such portion of the series of holding devices may be partially released to permit the sash to move in opening and closing the window.

5. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway to open and close the window, a series of individual holding devices each of which is adapted to bear at a separate point to hold the sash in the guideway, a portion of such series being mounted upon and carried by the sash and another portion is mounted adjacent to the sash, both portions tending to move the sash sidewise in the guideway and are provided with beveled bearing surfaces, actuating means, and coacting portions arranged substantially in the direction the sash moves, whereby a portion of such series of holding devices may be released upon the movement of the actuating means and the movement of the sash in the guideway controlled in the closing direction.

6. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, a series of individual holding devices, each of which is adapted to bear at a separate point to hold



the sash in the guideway, a portion of which series is provided with beveled bearing surfaces, one of which is upon a movable part and is provided with actuating means, and  
5 coacting portions arranged substantially in the direction in which the sash moves with which such movable part may frictionally bear, whereby the sash may be released from the holding action of such movable part  
10 when the actuating means are actuated in one direction.

7. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, a series of  
15 individual holding devices each of which is adapted to bear at a separate point to hold the sash in the guideway, a plurality of the holding devices of such series being provided with movable parts having beveled bearing  
20 surfaces, one of which parts is provided with actuating means, coacting portions arranged in substantially the direction in which the sash moves with which the movable parts of the holding devices may frictionally bear,  
25 whereby the sash may be released from the holding action of the movable part provided with actuating means when such means are actuated in one direction.

8. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, a series of  
30 individual holding devices each of which is adapted to bear at a separate point to hold the sash in the guideway, such series of holding devices being adapted to bear against the sash and to yield in directions transversely  
35 to the direction in which the sash moves, one of such series of devices being provided with a movable part and actuating means, whereby the sash may be partially released to permit the same to open and close the window.

9. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual  
45 holding devices adapted to bear against the sash at different points one point of bearing for each device, and to yield in directions transversely to the direction in which the sash moves, a plurality of which are provided with movable parts having beveled bearing  
50 surfaces and actuating means for one of such movable parts, and coacting portions of the window arranged substantially in the direction the sash moves, with which the beveled  
55 portions of such movable parts may frictionally bear, whereby the sash may be released from the holding action of such movable part when the actuating means are actuated in one direction.

10. In a window, the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the  
60 sash at different points one point of bearing for each device, and to yield in directions

transversely to the direction in which the sash moves, a plurality of which are provided with movable parts, one of which is provided with a beveled bearing surface and actuating means therefor, and a coacting portion of the  
70 window, arranged substantially in the direction in which the sash moves with which the beveled surface of such movable part may frictionally bear and increase the holding action of more holding devices than the  
75 one provided with such beveled surface, whereby the sash may be released from the holding action of such movable part when the actuating means therefor are actuated in one direction.

11. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the  
80 sash at different points, one point of bearing for each device, a plurality of which devices are provided with movable parts, spring actuated in the holding direction, one of which is provided with a beveled bearing surface and  
85 actuating means therefor to move such parts against the stress of their springs, and a coacting portion, arranged substantially in the direction the sash moves, with which the beveled surface of the movable part may  
90 frictionally bear and increase the holding action of more holding devices than the one provided with such beveled surface, whereby the sash may be released from the holding action of such movable part when the actuating means therefor are actuated.

12. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the  
100 sash at different points, one point of bearing for each device one of which devices is pivotally mounted in holding position relatively to the sash and another of which is mounted in coacting relation thereto, one of which is provided with a movable part having a beveled bearing surface and actuating means  
105 therefor, and a coacting portion arranged substantially in the direction the sash moves, with which the beveled surface of the movable part may frictionally bear, whereby the beveled bearing surfaces may increase the holding action of the pivotally mounted holding device.

13. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the  
120 sash at different points, one point of bearing for each device, one of which devices is pivotally mounted in holding position relatively to the sash and is provided with a beveled bearing surface and another of which devices is mounted in coacting relation to that pivotally mounted, one of which two devices is provided with a movable part having a beveled  
125 bearing surface and another of which devices is mounted in coacting relation to that pivotally mounted, one of which two devices is provided with a movable part having a beveled  
130 bearing surface and another of which devices is mounted in coacting relation to that pivotally mounted, one of which two devices is provided with a movable part having a beveled



eled bearing surface and actuating means, and beveled portions with which such beveled bearing surfaces of such two devices may frictionally bear, whereby the movement of the movable part may increase the holding action of both devices when moved into holding position and move the sash both edgewise and sidewise.

14. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device a plurality of which devices are provided with movable parts which yield in directions transversely to the direction in which the sash moves, two of which are provided with movable parts, movable in different directions when moving into holding positions, and having beveled bearing surfaces, actuating means for such parts, and beveled portions against which the beveled bearing surfaces may engage, the several beveled surfaces being so arranged relatively to one another that the movable parts tend to move the sash edgewise in two directions, whereby the sash may be released from the holding action of such movable parts when the actuating means therefor are actuated in one direction.

15. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, a portion of which bear with substantially equal force in either direction of movement of the sash, one point of bearing for each device, a plurality of which devices are provided with movable parts yieldingly bearing against the sash, each of which is actuatable, actuating means for such parts, and coacting portions for the holding devices, a portion being arranged substantially in the direction the sash moves with which the bearing surfaces of the holding devices may frictionally bear and hold the sash in the guideway.

16. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device a plurality of which devices are provided with movable parts, spring actuated in one direction and actuating means for actuating such parts in another direction, one of which devices is mounted at one edge of the sash and another is mounted at the other edge thereof, each of which is provided with a beveled bearing surface, a locking detent connected with the actuating means of one of such movable parts, a locking abutment mounted adjacent to the guideway, and coacting portions, arranged substantially in the direction the sash moves,

with which the bearing surfaces of the movable parts may frictionally bear, whereby the sash may be released from the locking action of the detent upon manipulating the actuating means with which such detent is connected.

17. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device one of which devices is provided with a movable part having a beveled bearing surface and a locking surface, the latter being adapted to engage with a locking abutment mounted in locking relation thereto and actuating means therefor, and a coacting portion, arranged substantially in the direction the sash moves, with which such beveled surface may frictionally bear, whereby the sash may be released from the locking action of the locking and abutting surfaces when the actuating means are actuated in one direction.

18. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device a plurality of which devices are provided with movable parts, spring actuated in one direction and actuating means for actuating such parts in another direction, one of which devices is mounted at one edge of the sash and another is mounted at the other edge thereof, each of which is provided with a beveled bearing surface, a locking detent connected with the actuating means of each movable part, a locking abutment mounted in locking relation to each locking detent and beveled portions, beveled substantially in the direction the sash moves, with which the bearing surfaces of the movable parts may frictionally bear, the actuating means being arranged in such relation to each other as to be within the grasp of one hand of the operator, whereby the sash may be released from the locking detents and holding action of the bearing surfaces by manipulating the actuating means of one hand of the operator.

19. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, a portion of which bear with substantially equal force in either direction of movement of the sash, one point of bearing for each device, a plurality of which devices are provided with movable parts yieldingly bearing against the sash, each of which is actuatable to partially release the sash, one of such parts being mounted at one edge of the sash and another at the other edge thereof, actuating means for the two



parts thus mounted, a portion of each of which means is arranged adjacent to a portion of the other within the grasp of one hand of the operator, and coacting portions for the holding devices, a portion being arranged substantially in the direction the sash moves with which the bearing surfaces of the holding devices may frictionally bear and hold the sash in the guideway.

20. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device, one of which devices is provided with a movable part adapted to be moved to release the sash from the holding action of such device while another of such devices retains a holding action thereon, whereby the sash is partially released and is partially held and its movement in the guideway is permitted by such holding devices.

21. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device, one of which devices is provided with a movable part arranged near one corner of the sash and is adapted to be moved to release the sash from the holding action of such device, while another of such devices retains a holding action thereon, whereby the sash is partially released and is partially held and its movement in the guideway is permitted by such holding devices.

22. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device, one of which devices is provided with a movable part adapted to be moved to release the sash from the holding action of such devices, while another of such devices retains a holding action thereon, and actuating means for such movable part adapted to actuate such part and to serve as a hand piece for use in moving the sash in the guideway, whereby the sash is partially released and is partially held by the holding devices and the movable part is actuated by the actuating means and the sash is permitted to move in the guideway.

23. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move in the guideway, individual holding devices adapted to bear against the sash at different points, one point of bearing for each device, two of which devices, one at each of the opposite edges of the sash, are provided with movable parts, each part adapted to be moved to release the sash from the holding action of such devices, while another device retains a holding action thereon, whereby the sash is partially released and partially held and its movement in the guideway is permitted by such holding devices.

24. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, and a series of individual holding devices mounted to engage with the sash at different points one point of engagement for each device, a portion of each series is provided with actuating means adapted to release the sash from the holding action of such portion, while another portion of such series remains in engagement with the sash in its movement in the guideway.

25. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, and a series of individual holding devices mounted to engage with the sash at different points, one point of engagement for each device, a portion of which series is mounted on the sash and is provided with actuating means adapted to partially release the sash during its movement in opening and closing the window while another portion of such series is adapted to remain in engagement with such sash and partially obstruct its movement in the guideway.

26. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, and a series of spring actuated individual holding devices, a portion of which series is provided with means to partially release the sash and another portion of such series is unprovided with such means and is adapted to bear against the sash in its movement to open and close the window and partially hold it in its guideway.

OLIVER M. EDWARDS.

Witnesses:

CHAS. M. HANRAHAN,  
RUBY A. HUGHES.