

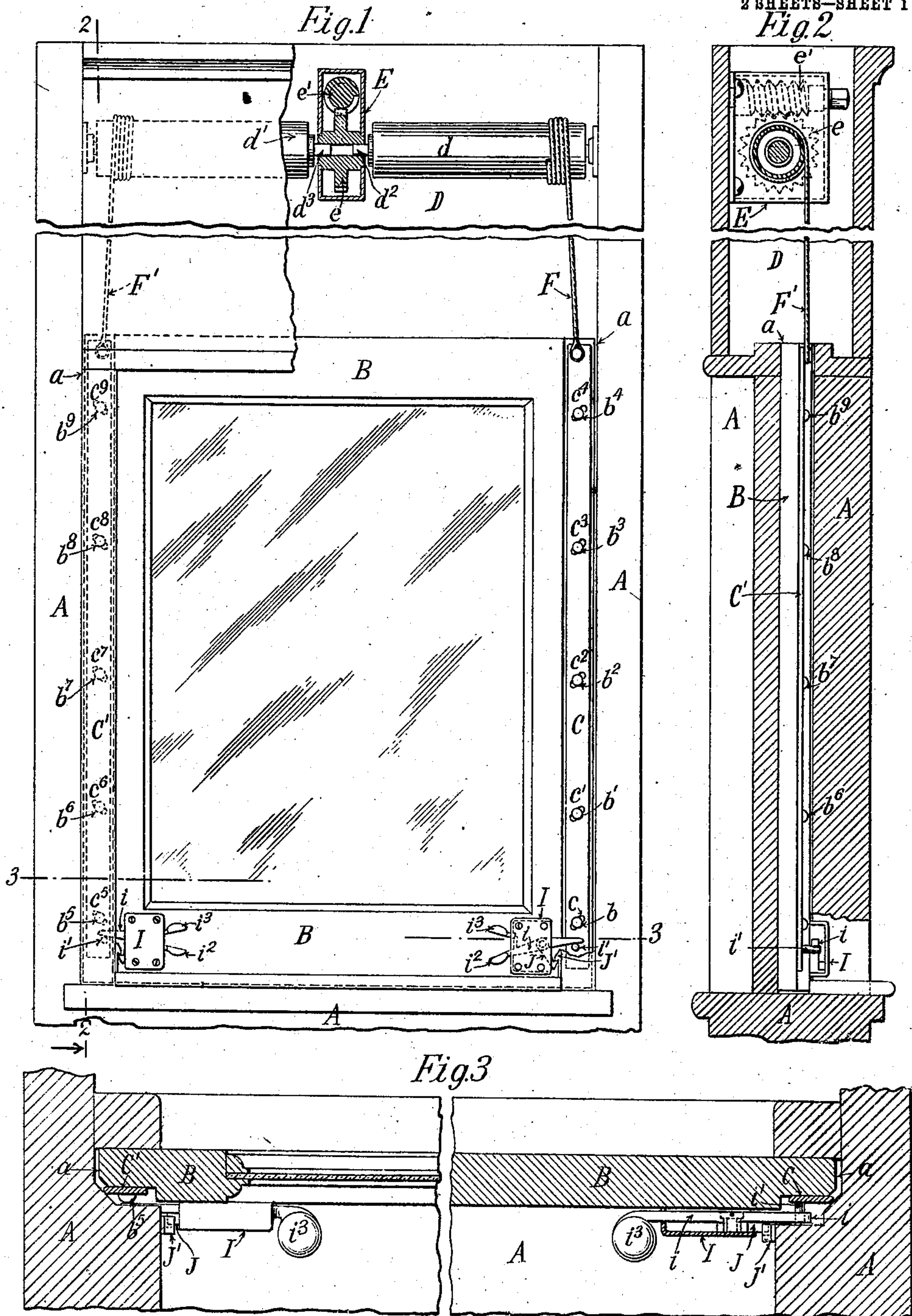
No. 854,988.

PATENTED MAY 28, 1907.

O. M. EDWARDS.  
WINDOW.

APPLICATION FILED APR. 5, 1905.

2 SHEETS—SHEET 1



Witnesses  
Raphaël Ketter  
C. D. Morrill

Inventor  
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By *H. F. Kneeling* Atty.



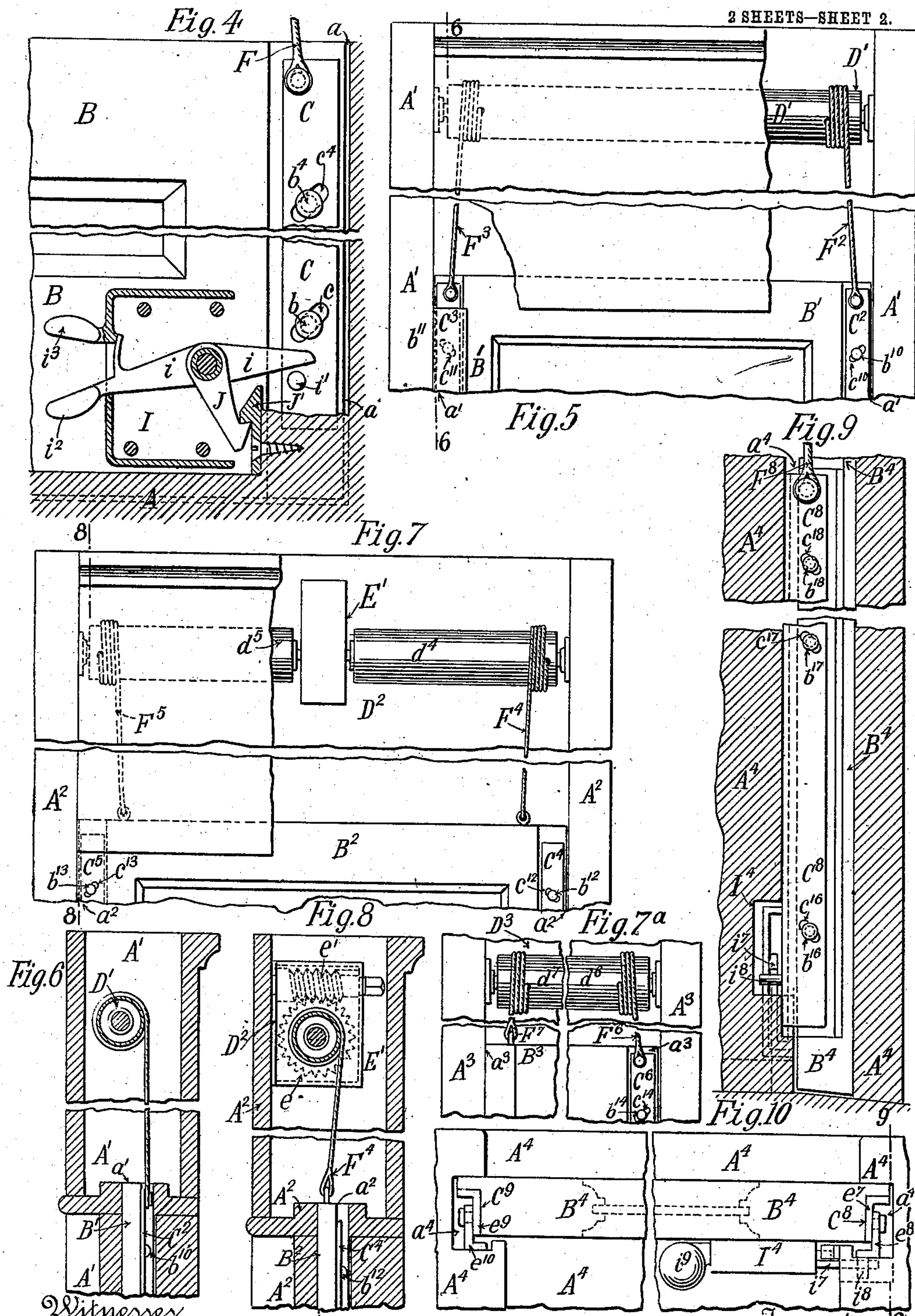
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Witnesses  
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# UNITED STATES PATENT OFFICE.

OLIVER M. EDWARDS, OF SYRACUSE, NEW YORK.

## WINDOW.

No. 854,988.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed April 5, 1905. Serial No. 254,050.

*To all whom it may concern:*

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

My invention relates generally to windows of that class wherein a sash is provided with means, a portion or portions of which are movable relatively thereto for holding the sash in its guideway and releasing it from such holding action and such sash is also connected with means adapted to counterbalance or otherwise control, more or less the movement of it in its guideway; and it has for one of its objects to provide the sash at each of its edges, (engageable with its guideway,) with holding means having a movable portion or portions which are adapted, when moved relatively to the sash, to more or less release it at both of its engaging edges and to connect the movable portion or portions of such holding means direct to the counterbalancing or automatically moving means without otherwise connecting such movable portions of the holding means together; another object is to provide the sash at each of its edges, (engageable with its guideway,) with holding means having a movable portion or portions which are adapted, when such portions of both means are moved relatively to the sash, to release the same and to connect the movable portion or portions of such holding means direct to the counterbalancing or automatically moving means without otherwise connecting such movable portions of the holding means together; another object is to provide the sash with holding means having a movable portion or portions adapted to release the sash and to connect such movable portion or portions of such holding means and the sash at widely separated points, as for instance, adjacent to the opposite edges of the sash, to counterbalancing or automatically moving means; another object is to provide the sash at each of its edges with holding means having a movable portion or portions adapted to release the sash and to connect such movable portion or portions of each of such holding means to separately operable counterbalancing or automatically moving means, which are connected with adjusting means, where-

by both of such moving means are adjusted as a single operation; another object is to provide the sash with a plurality of counterbalancing or automatically moving means which are connected together by adjusting means through which the action of such moving means on the sash is more or less controlled; 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 hereunto annexed, which form a part of this specification.

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

Figure 1 shows in front elevation one embodiment of my invention, with portions broken away to better illustrate some of the working parts. Fig. 2 is a vertical sectional view, on line 2—2 of Fig. 1. Fig. 3 is a cross-sectional view on line 3—3 of Fig. 1, with the central portion thereof broken away, showing the connections of the hand operating devices with the sash holding devices of the window. Fig. 4 shows, on an enlarged scale, the sash locking and holding device operating means at the lower right hand corner of Fig. 1, with the upper portion of the sash holding device partly shown near the bottom of this Fig. 4, the remaining portions of the window being broken away. Fig. 5 shows in front elevation a similar construction of sash holding devices (mostly broken away) which are connected with a single roller which acts to counterbalance or otherwise control the movement of the sash in its guideway generally as the sash is controlled in the construction seen in Figs. 1 and 2, where the sash is given both a side-wise and edgewise movement by each of the holding devices by reason of the particular construction and arrangement of parts therein shown. Fig. 6 shows in vertical section, on line 6—6 of Fig. 5, that which is seen therein. Fig. 7 shows in front elevation the separately operable counterbalancing or controlling means seen in Figs. 1 and 2, but connected with the sash in a somewhat different manner from what such means are connected in said Figs. 1 and 2. Fig. 7<sup>a</sup> shows a modified manner of connecting the counterbalancing or controlling means to the sash. Fig. 8 shows in vertical section that which is seen in Fig. 7. Fig. 9 shows



one of a somewhat different form and arrangement of sash holding devices from what is shown in preceding figures, the same being seen in vertical section on line 9—9 of Fig. 10, when looking from right to left, or in the direction indicated by the arrow head, in such Fig. 10. Fig. 10 shows in cross section two of this form and arrangement of sash holding devices seen in Fig. 9, one of which is attached to one edge of the sash and the other is attached to the other or opposite edge thereof, there being shown a form of hand operating means at the right hand portion of this Fig. 10 somewhat similar to those seen in Figs. 1 to 4, inclusive, the operating means being omitted from the left hand portion for clearness of illustration.

In Figs. 1 to 4, inclusive, A represents the frame of the window in which the guideway *a* is formed wherein the sash B moves up and down to open and close the window, but the sash is permitted to have a limited movement therein both in a sidewise and an edgewise direction, as seen in Fig. 3. This guideway *a* may be formed in the window frame in any desired manner known in the art and which is deemed most convenient. The sash B is provided, at each of its edges, with a holding device, as C and C', which may be of the construction shown, or of any other desired construction, which is adapted to give to the sash both a sidewise and edgewise movement in its guideway to the desired extent, so as to have the mode of operation of the specific construction here shown in respect to movement of the sash in its guideway. The holding device C is provided with inclined slots forming inclined or wedging holding faces, as *c*, *c'*, *c*<sup>2</sup>, &c., and holding device C' is likewise provided with similar slots forming wedging holding faces, as *c*<sup>5</sup>, *c*<sup>6</sup>, *c*<sup>7</sup>, &c. These holding faces *c*, *c'*, *c*<sup>2</sup>, &c., and *c*<sup>5</sup>, *c*<sup>6</sup>, *c*<sup>7</sup>, &c., coact with studs, as *b*, *b'*, *b*<sup>2</sup>, &c., and *b*<sup>5</sup>, *b*<sup>6</sup>, *b*<sup>7</sup>, &c., respectively, to move the holding devices C and C' edgewise of the sash to firmly hold or wedge it in the guideway and to permit the sash to be released from such wedging action and move freely therein, somewhat in the manner that the sash holding devices set forth in Letters Patent No. 739,404, granted me Sept. 22, 1903, coact to hold and release the sash. These holding devices C and C' are arranged to coact with the beveled surfaces of the guideway *a* as seen in Fig. 3 which surfaces are adjacent to the edges of the sash and in doing so these devices move edgewise to and from such surfaces and the sash is held in the guideway or released from the holding action of such devices by such edgewise movements. The movement of each device, as C or C', tends to give the sash a movement in two directions, that is, the movement of device, as C, into contact with the inclined or beveled portion of guideway *a* tends to move that portion of the sash B side-

wise or toward the opposite portion of the guideway adjacent to that edge of the sash and also tends to move such sash bodily in an edgewise direction. Hence the movement of either holding device, as C or C', in the holding direction tends to thus move the sash and cause it to be firmly held in its guideway, and likewise the movement of either device in the sash releasing direction tends to correspondingly release the sash by reason of this tendency for these devices to give the sash this sidewise and edgewise movement, relatively to its guideway. By reason of this the edgewise movement of the sash is in proportion to the extent of movement of one of such holding devices over that of the other and the movements of each of such holding devices relatively to the sash may be such that the movement of only one of such devices may either release the sash or firmly hold it in its guideway. Hence, the holding and releasing action of these devices upon the guideway is in proportion to the sum or aggregate amount of movement of both of such devices and the sash is held at its opposite edges equally, and also it is released equally at both of its edges, which is advantageous when the counterbalancing or controlling means are connected and operable, as shown in Figs. 1 and 2.

As shown in Figs. 1 and 2 the counterbalancing or controlling means D, (by which the weight of the sash is counterbalanced in whole or in part, or is overbalanced so as to automatically move in the opening direction or otherwise, as desired, when once the sash is released from the action of the holding devices,) are in the form of spring rollers, which are well known in the art, there being as shown two of these rollers, as *d* and *d'*, the spindles of which, *d*<sup>2</sup> and *d*<sup>3</sup>, respectively, engage with a common device E by which the tension of the springs of both rollers is adjusted at the same time. This connecting together of the spindles *d*<sup>2</sup> and *d*<sup>3</sup> does not interfere with the movements of the body portions of the rollers and each roller is left free to be operated by its own spring in its own way regardless of the movement or movements of the other roller. Thus the rollers are separately operable in their counterbalancing or controlling action upon the sash, that is, each acts thereon without regard to the other, both acting simultaneously, according to the stress of their individual springs, so far as their connection with the sash will permit them to do so. The spindles *d*<sup>2</sup> and *d*<sup>3</sup> of the rollers *d* and *d'* are here shown as connected with the hollow shaft of a worm gear wheel *e* of the common device E, which is provided with a rectangular opening preferably extending clear through the shaft of such gear wheel, as shown in Fig. 1, where this worm gear and some other portions of this common device are broken away for



clearness of illustration. This worm gear wheel *e* engages with a worm, as *e'*, in a well known manner, so that as the worm is rotated the gear wheel is also rotated to either  
 5 increase or diminish the tension of the springs of the rollers, *d* and *d'*. These spindles, as *d*<sup>2</sup> and *d*<sup>3</sup>, are of any desired or known form and construction to adapt them for use in the manner herein shown, and the rollers *d* and *d'*  
 10 are also of any desired form so long as they are adapted to do the work herein set forth. As here shown the rollers *d* and *d'* of the counterbalancing or controlling means *D* are each connected direct, by any desired flexible  
 15 means, such as cords, chains or other material, as *F* and *F'*, with the sash holding devices *C* and *C'*, respectively, and then connected with the sash through the medium of the inclined slots, their wedging faces, as *c*, *c'*,  
 20 *c*<sup>2</sup>, &c., and *c*<sup>5</sup>, *c*<sup>6</sup>, *c*<sup>7</sup>, &c., and studs, as *b*, *b'*, *b*<sup>2</sup>, &c., and *b*<sup>5</sup>, *b*<sup>6</sup>, *b*<sup>7</sup>, &c. These chains or cords, as *F* and *F'*, are connected at one end to the rollers and at their other ends with the sash holding devices, as *C* and *C'*, as shown,  
 25 so as to wind upon the body of each roller as the sash is moved in an upward direction, as indicated in Fig. 1.

When the counterbalancing or controlling means, as *D*, are thus connected direct to the  
 30 sash holding devices and such devices are connected with the sash as here shown such means exert their force first upon such devices and second upon the sash through such devices and the sash is held in the guideway  
 35 by its own weight, or by the force the counterbalancing means exerts on the sash holding devices, or the two combined, as the case may be.

When the counterbalancing or controlling means, as *D*, are separately operable, as here  
 40 shown, each of the rollers exerts a substantially equal force on each of the two opposite edges of the sash at all times, so that it may move evenly in its guideway, when both  
 45 edges thereof are released to substantially the same extent, as when the holding devices herein shown are arranged in the manner herein described. Furthermore, if one holding device is moved to a greater extent than  
 50 the other in releasing the sash there is no substantial change made in the controlling action of either roller on the sash and each portion of the separately operable means acts to substantially the same extent, and consequently  
 55 there is no substantial tendency for the sash to move at one edge to a greater extent than at the other, as there might be if a single roller was used in the place of the two shown in Fig. 1.

When counterbalancing or controlling means which are separately operable, as  
 60 shown in Figs. 1 and 2, are combined with sash holding devices constructed and arranged as there shown each device and each  
 65 roller, as *d* and *d'* cooperate, one with the

other, in causing the sash to be firmly held in the guideway and in being released from the holding action of such devices, and also in causing the sash to move evenly and freely in such guideway, when so released.

Sash holding devices of the construction and arrangement here shown may be combined with other forms of counterbalancing or controlling means than what are seen in  
 70 Figs. 1 and 2, whether separately operable or not, such for instance as are seen in Figs. 5 and 6, where only a single roller, as *D'*, is employed.

When counterbalancing or controlling means are connected with the sash holding  
 80 devices, as herein shown, each device has to be moved relatively to the sash in order to release it from the holding action of such devices upon the guideway. This may be done by any desired means, such for instance as is  
 85 seen in Figs. 1 to 4, inclusive, or of some other form or construction. Two of these operating means, as *I*, are preferably employed, one for each holding device, and each operable independently of the other, but this is not  
 90 necessary, as is obvious to those skilled in the art of windows. Such operating means may be combined with sash locking means, if desired, as for instance as seen at the lower right hand corner of Fig. 1 and in Fig. 4, such  
 95 means being shown on a different and enlarged scale in Fig. 4 from that of Fig. 1. As here seen a lever *i* is pivoted in such a manner as to engage with a pin or projection *i'* attached to or formed on holding device, as *C*,  
 100 Fig. 4, which acts as a fulcrum, as it were, for lever *i* to move the sash relatively to the holding device *C* upon the hand of the operator grasping the hand portion *i*<sup>2</sup> of lever *i* and the fixed hand piece *i*<sup>3</sup> attached to the sash  
 105 through the casing of the operating means, as *I*, or otherwise, as desired. As the hand portions *i*<sup>2</sup> and *i*<sup>3</sup> are brought nearer together upon being grasped by the hand of the operator the sash is moved relatively to the  
 110 holding device or vice versa and the inclined or wedging faces of the holding devices on the studs or other fixed devices with which such faces coact cause the bearing edge or surface  
 115 or surfaces of such holding device or devices to move out of holding action, and if such hand portions approach one another to the full extent provided for them, upon a further application of force in a direction tending to  
 120 move the sash in the direction that hand portion, as *i*<sup>2</sup>, moves, as for instance to open the window, such sash will be moved in its guideway after it has been sufficiently released to permit its so doing. Then upon  
 125 removing the hand the weight of the sash becomes operative to return the lever, as *i*, and the holding device, as *C*, to the holding position.

If desired a locking detent, as *J*, may be so connected with lever *i* of the operating  
 130



means, as I, (Fig. 4,) as to move whenever the lever moves. This detent, as J, may engage with a fixed abutment or detent, as J', so as to hold the sash in the closed position.

5 When the parts are arranged, as here shown, the sash may be locked in the closed position by pushing down on the fixed hand portion, as  $i^3$ , until movable detent, as J, is brought into the position shown.

10 Any desired form of locking means may be employed and made operable in any desired manner, if it be thought best to employ such means. The locking and operating means, as here shown, may be substantial duplicates  
15 of each other, except that they are made to act at opposite edges of the sash.

If desired counterbalancing or controlling means which are not separately operable may be employed in connection with sash  
20 holding devices of the general character of those seen in Figs. 1 to 4, such for instance as are shown in Figs. 5 and 6, wherein a single spring roller, as D', is connected by means of chains or other flexible material, as F<sup>2</sup> and  
25 F<sup>3</sup>, as shown, with the holding devices, as C<sup>2</sup> and C<sup>3</sup>, in substantially the manner that the separately operable means of Figs. 1 and 2 are connected with the holding devices, as C and C'. These devices C<sup>2</sup> and C<sup>3</sup> are of similar construction and they are connected with  
30 the sash B' in a similar manner to those seen in Figs. 1 to 4, and hence only a small portion of each is shown. The sash B' is movable in the guideway a', formed in frame A', as in  
35 the construction shown in preceding figures of the drawings. These devices, as C<sup>2</sup> and C<sup>3</sup>, are also provided with inclined slots, as  $c^{10}$  and  $c^{11}$ , which correspond to the slots, as c, c', &c. and  $c^5$ ,  $c^6$ , &c., respectively, which co-  
40 act with studs, as  $b^{10}$  and  $b^{11}$  as do the slots shown in Fig. 1.

Instead of connecting the counterbalancing or controlling means directly with the sash holding devices, as in preceding figures,  
45 such means may if desired be otherwise connected to the sash, and especially so, if the means be separately operable, as is the case with those shown in Figs. 1 and 2, as for instance in the manner shown in Figs. 7 and 8.  
50 As thus connected the means, as D<sup>2</sup>, consist of two rollers, as  $d^4$  and  $d^5$ , the spindles of which connect with a common device, as E', similar to what is seen in Figs. 1 and 2, by which the tension of the springs of both of such  
55 rollers is adjusted at the same time, as before explained. These rollers, as  $d^4$  and  $d^5$  are connected directly to the sash B<sup>2</sup> by chains or other flexible material, as F<sup>4</sup>, F<sup>5</sup>, as shown, and such counterbalancing or controlling  
60 means, as D or D', when thus connected to the sash exert a substantially uniform force upon the opposite edges of the sash, without the use of any equalizing means being employed, between such chains and the sash, as  
65 has heretofore been used to enable the sash

to move in its guideway without a cramping action therein.

Many times sashes are of a weight between 40 and 60 pounds and in many instances exceed four feet in width. In such cases it is  
70 desirable that the connections of the counterbalancing or controlling means shall be made with the opposite engaging edges of the sash, so that each edge thereof shall be acted upon with substantially the same  
75 amount of force and with the least cramping action of the sash, as it is moved in its guideway; that the space between the opposite edges of the sash and over or above the same shall be to a large extent open and unob-  
80 structed; also that the connections be made in a simple and positive manner, with the least danger of getting out of order in use. Also in such a case two rollers of an ordinary size and comparatively cheap construction  
85 may be made to do the work of a very much larger roller, which is very much more expensive to construct than are ordinary rollers.

When the counterbalancing or controlling means are connected directly to the sash, as  
90 shown in Figs. 7 and 8, the holding devices, (if such be used,) which are employed to hold the sash in its guideway against rattling or to exclude dirt and air may be of any desired construction and arrangement. As  
95 shown in Figs. 7 and 8 the sash B<sup>2</sup>, which is movable in guideway a<sup>2</sup> of frame A<sup>2</sup>, is provided with similar holding devices to those heretofore shown, which are also mounted on the sash in a similar manner to those seen in  
100 Figs. 1 and 2, but the inclined slots are arranged at substantially right angles in devices C<sup>4</sup> and C<sup>5</sup> to what the corresponding slots in devices C and C' are shown in  
105 Figs. 1 and 2. As a result the devices C<sup>4</sup> and C<sup>5</sup>, as shown, are moved upwardly to release the sash in its guideway after the manner that the sash holding devices are moved which is seen at the right hand side  
110 of Figs. 1 and 2, of Letters Patent No. 739,404, granted me Sept. 22, 1903. In the construction shown in this patent the sash holding devices are applied to only one edge of the sash, but it is in the construction  
115 shown in Figs. 7 and 8, preferred to apply such devices to both or opposite edges of the sash, so that either may be operated, as heretofore explained in connection with that which is shown in Figs. 1 and 2. Such  
120 devices may be applied to the sash as shown in said patent, if one desires to do so, and any desired form of operating means may be employed in connection therewith to release the sash from their holding action. If  
125 one desires to use only one of the sash holding devices or means seen in Figs. 1 and 2 and that applied to one edge of the sash, as seen therein, and as shown in said patent, this can be done and counterbalancing or controlling means, such for instance as is seen in  
130



these Figs. 1 and 2 may be connected with the sash with an advantageous result, by connecting the same, as shown in Fig. 7<sup>a</sup>, that is, connecting the separately operable portion  $d^6$  of the means  $D^3$  with the sash holding device  $C^6$ , by chain or cord  $F^6$ , as therein indicated, and connecting the other portion  $d^7$  of such means, by chain  $F^7$ , directly with the sash, as  $B^3$ , also as is indicated in this Fig. 7<sup>a</sup>. If desired, other forms of controlling or counterbalancing means can be connected with the sash and its holding device after the manner shown in this Fig. 7<sup>a</sup>, as will be obvious to those skilled in this art.

Instead of employing the form of sash holding devices seen in preceding figures such as are shown in Figs. 9 and 10 may be used, if desired, in place thereof and the separately operable counterbalancing or controlling means shown in Figs. 1, 2, 7 and 8 may be connected therewith in substantially the manner disclosed therein, but when this is done each of the devices seen in Figs. 9 and 10 do not co-operate, one with the other, as do those seen in Figs. 1 to 4, hence each should be moved, relatively to the sash, as before explained, to about the same extent in order to fully release the holding action of such devices upon the guideway in which the sash moves.

The separately operable controlling or counterbalancing means shown in Figs. 1, 2, 7 and 8, when connected to the sash holding devices, shown in Figs. 9 and 10, in the manner shown in such figures, each separately operable portion acts upon the edge of the sash with which it is connected with substantially equal force, but if one holding device is moved relatively to the sash, so as to release its holding action thereon and the other one is not so moved the sash, upon applying force to its opposite edge portions to substantially the same extent, would naturally be given a tilting movement in its guideway which would tend to cause it to cramp therein. In this respect the operation of the construction shown in Figs. 9 and 10 differs from that seen in Figs. 1, 2, 7 and 8.

The sash holding devices shown in these Figs. 9 and 10 differ from those seen in Figs. 1 and 2 both in form and manner of mounting them upon the sash, as will be readily seen upon reference to Fig. 10, where such devices are seen in plan view. As thus shown each device is composed of two angle bars, which are connected together in reverse positions by the studs and inclined slots forming the holding or wedging faces which coact with the studs, as do the corresponding studs and wedge faces of the holding devices seen in preceding figures. One of these angle bars is secured to the edge of the sash and it is provided with studs or parts, which coact with the holding or wedge surfaces of the in-

clined slots, as in preceding figures. The wedge faces or holding surfaces are formed in or on the other bar, either by making inclined slots, as shown, or otherwise as is thought best. When these sash holding devices, as  $C^8$  and  $C^9$ , are mounted on the sash, as seen in Figs. 9 and 10, there is no edgewise movement given to the sash in operating the sash holding devices and also there is no co-operation between the devices on opposite edges of the sash as is the case with the devices seen in preceding figures of the drawings; hence, in the construction seen in Figs. 9 and 10 both of the holding devices have to be sufficiently released in order that the sash may be freely moved in its guideway. That is, the releasing of one of these devices, as  $C^8$  or  $C^9$ , does not tend to release the sash from the holding action of the other device, as is the case in Figs. 1 to 4, for instance.

In Figs. 9 and 10  $A^4$  represents the window frame in which the guideway  $a^4$  is formed and in which the sash  $B^4$  moves, in opening and closing the window. At the edges of the sash  $B^4$  holding devices, as  $C^8$  and  $C^9$  are secured as shown. Holding device  $C^8$  is preferably formed of angle bars  $e^7$  and  $e^8$ , as shown, which are mounted in reverse order, one relatively to the other, the bar  $e^7$  carrying studs or projections, as  $b^{16}$ ,  $b^{17}$  and  $b^{18}$ , Fig. 9, which coact with the holding surfaces or wedge faces formed in constructing the inclined slots, as  $c^{16}$ ,  $c^{17}$  and  $c^{18}$ , Fig. 9, in substantially the manner that the corresponding studs and surfaces coact in the constructions shown in preceding figures, where the holding devices are mounted on the sash and a portion thereof is made movable relatively thereto. Holding device  $C^9$  is substantially, as shown, a duplicate of device  $C^8$ , and its bars  $e^9$  and  $e^{10}$  are provided with studs and wedge surfaces as is the case with bars or portions  $e^7$  and  $e^8$  of holding device  $C^8$ , just described: These movable bars, as  $e^8$  and  $e^{10}$ , may be connected with counterbalancing or controlling means as hereinbefore described by means of chains, cords or other flexible material, as  $F^8$ , Fig. 9, and with like effect, so far as concerns such means being separately connected thereto without the employment of any means to otherwise connect such holding devices together, and also so far as concerns the holding of the sash in its guideway against rattling and excluding dirt and air. These movable bars,  $e^8$  and  $e^{10}$ , or movable portions, of these sash holding devices  $C^8$  and  $C^9$  are movable relatively to the sash, upon which they are carried, the same as is the case with the corresponding portions seen in Figs. 1 to 4, inclusive, and each portion may be actuated by means similar to what is shown in these Figs. 1 to 4, such for instance as is indicated in Figs. 9 and 10, wherein one of these hand operating means  $I^4$  is shown



which is operated by one hand of the operator, as is the case in Figs. 1 to 4. Upon operating these means  $I^4$  as means I are operated a pivoted lever, as  $i^7$ , is moved and made  
 5 to act on a pin or stud  $i^8$  attached to the movable bar or portion  $e^8$  and the sash or portion move, one relatively to the other, substantially as in the construction seen in Figs. 1 to 4, and to an extent to release that edge  
 10 of the sash from frictional holding contact with the guideway. This operation is repeated at the opposite edge of the sash and the movable bar or portion  $e^{10}$  is likewise operated to release that edge of the sash from  
 15 the holding action of the holding device at that edge of the sash.

The movable portions of the sash holding devices herein shown are each operable and movable relatively to the sash upon which  
 20 they are carried independently of the other, and any two of such portions which may be mounted at the opposite edges of a sash may be operated, to release such sash, by the operator using both of his hands at the same  
 25 time, one at one operating means and the other at the other means, after the manner, where simple locking devices are employed at the opposite edges of large sash, as is quite common in many of the railway cars of the  
 30 present day. With these heavy sash, as a rule, both hands have to be used in opening and closing the windows. Hand operating means for actuating these movable portions of the holding devices as here shown are convenient to use on any width of sash and they  
 35 at the same time afford convenient means for moving the sash in the guideway by applying force thereto through the hands of the operator. Where the sash is substantially counterbalanced it requires but comparatively  
 40 little force to move even the heaviest sash in the guideway, when the holding device or devices are moved, so as to fully free the sash from its or their holding action. It will be  
 45 clearly obvious to those skilled in the art that any desired form of operating means may be employed to move such movable portions of the holding means in the place of the specific form of means shown herein and that the  
 50 mode of operation of such portions and the counterbalancing or controlling means will remain the same, so far as concerns the cooperation of such portion or portions and means with the sash and guideway, one with  
 55 the other, and as a whole. I wish it to be understood that I do not desire to be limited to the details of construction and arrangement of the same which are herein shown and described, for obvious modifications will  
 60 occur to a person skilled in the art.

I use the term "counterbalancing means" in the claims hereunto annexed as including not only such as are technically known as "counterbalancing" devices but all such as

may either under or over balance the weight 65 of the sash as desired.

It will be observed that in each of the constructions herein described and shown the "counterbalancing means" are connected to the sash holding devices, or to the sash or to  
 70 both at widely separated points, the movable portion of each holding means being separately connected thereto, and that there are no means employed to connect the movable portions of the sash holding devices together,  
 75 except such counterbalancing means, and also that no equalizing means are employed in order that the sash may have substantially an equal amount of force applied to each of its opposite edges. 80

What I claim as new is:—

1. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, holding means arranged at each edge of the sash and engage-  
 85 able with the guideway, each of which holding means is provided with a movable portion, movable relatively to the sash, each holding means being movable independently of the other holding means in holding the  
 90 sash in the guideway, counterbalancing means connectible to each of the movable portions of the holding means, and means connecting such counterbalancing means directly to each of the movable portions of the  
 95 sash holding means, whereby each of such movable portions may be moved relatively to the sash and independently of each other and the space between the sash, counterbalancing means and such connecting means are  
 100 left substantially unobstructed.

2. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, holding means arranged at each edge of the sash, each means being  
 105 adapted to move the sash both edgewise and sidewise in the guideway and each means being provided with a movable portion adapted to move relatively to the sash, counterbalancing means adapted to be connected di-  
 110 rectly to the movable portions of the holding means, and connecting means, separately connecting such counterbalancing means directly to the movable portions of the holding means, whereby the sash may be moved in  
 115 both sidewise and edgewise directions by the action of the counterbalancing means upon the movable portions of the holding means.

3. In a window the combination, substantially as set forth, of a guideway, a sash  
 120 adapted to move therein, holding means a portion of which is arranged at one edge of the sash and is movable relatively thereto to move the sash both edgewise and sidewise in its guideway, and counterbalancing means  
 125 having a plurality of separately operable parts one of which is connected with the movable portion of the holding means and acts



thereon independently of the other operable part in holding the sash in its guideway.

4. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, holding means mounted on the sash, a portion of which is movable relatively thereto, counterbalancing means having a plurality of separately operable parts, connectible with the movable portion of the holding means to hold the sash in the guideway, and adjusting means connecting with such plurality of separately operable parts and adapted to simultaneously adjust the force which the counterbalancing means exerts on the sash through such movable portion of the holding means.

5. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, holding means mounted at each edge of the sash, a portion of each holding means being movable relatively to the sash, a plurality of spring rollers a portion of each of which is movable independently of the other portion, and connecting means, connecting the movable portion of each of such rollers directly with the movable portion of the sash holding means, whereby each movable portion of the sash holding means is independently movable by its respective spring roller to hold the sash in the guideway.

6. In a window the combination, substantially as set forth, of a guideway, a sash adapted to move therein, holding means mounted at each edge of the sash, a portion of which is movable relatively to the sash, a plurality of spring rollers, the shell portions of which are movable independently of each other and each is connectible with a movable portion of the sash holding means, adjusting means for each roller adapted to engage with and simultaneously adjust the tension of the springs thereof, and connecting means connecting each shell portion of the rollers and

each of the movable portions of the sash holding means, whereby each shell portion and connected movable part of the sash holding means may move independently of the other shell portion and its connected portion of such holding means.

7. In a window the combination, substantially as set forth of a guideway, a sash adapted to move therein, holding means mounted at each edge of the sash, a portion of which holding means is movable relatively to the sash, a plurality of spring rollers, the shell portions of which are movable independently of each other and each portion is connectible with a movable portion of the sash holding means, each roller being provided with a spindle which is engageable with adjusting means, adjusting means, adapted to engage with each of such spindles, and connecting means connecting each of the shell portions of the rollers with one of the movable portions of the sash holding means, whereby the tension of the springs of the plurality of rollers are adjusted simultaneously and the movable portions of the sash holding means are movable independently of each other.

8. In a window the combination substantially as set forth, of a guideway, a sash adapted to move and be held therein, holding means carried by each edge of the sash and provided with a movable portion, and counterbalancing means composed of a plurality of separately acting parts, each of which is connected with the sash through such movable portions of the sash holding means and their connections therewith, whereby either of such movable portions can be moved relatively to the sash without disturbing any other separately acting part.

OLIVER M. EDWARDS.

Witnesses:

C. L. SOLDAR,  
JAS. E. SIMONS.