July 5, 1927. 1,634,985

H. DONATH

WINDOW

Filed March 2, 1926 3 Sheets-Sheet 1

Fig. 1.

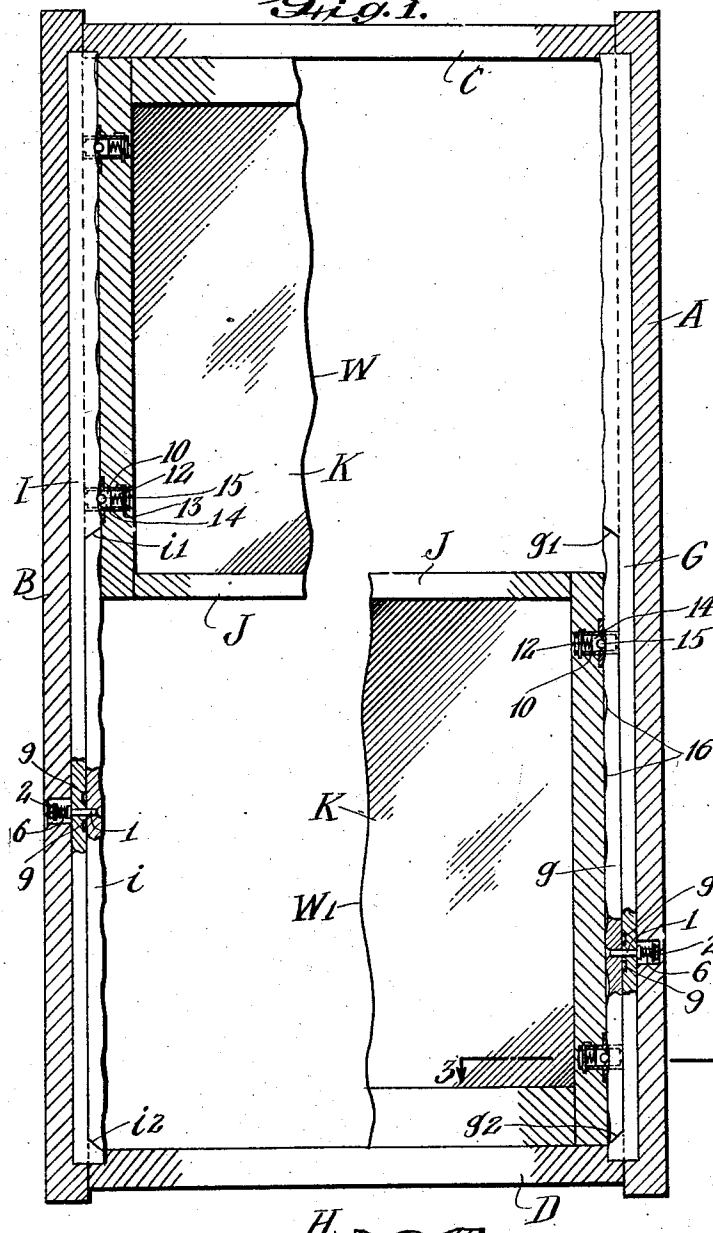


Fig. 2.

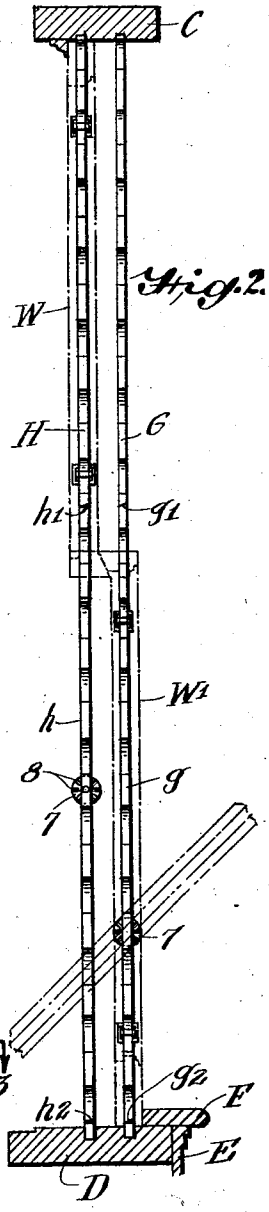
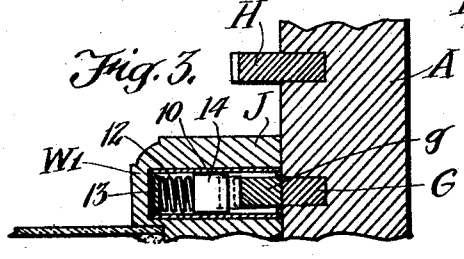


Fig. 3.



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WINDOW

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Fig. 4.

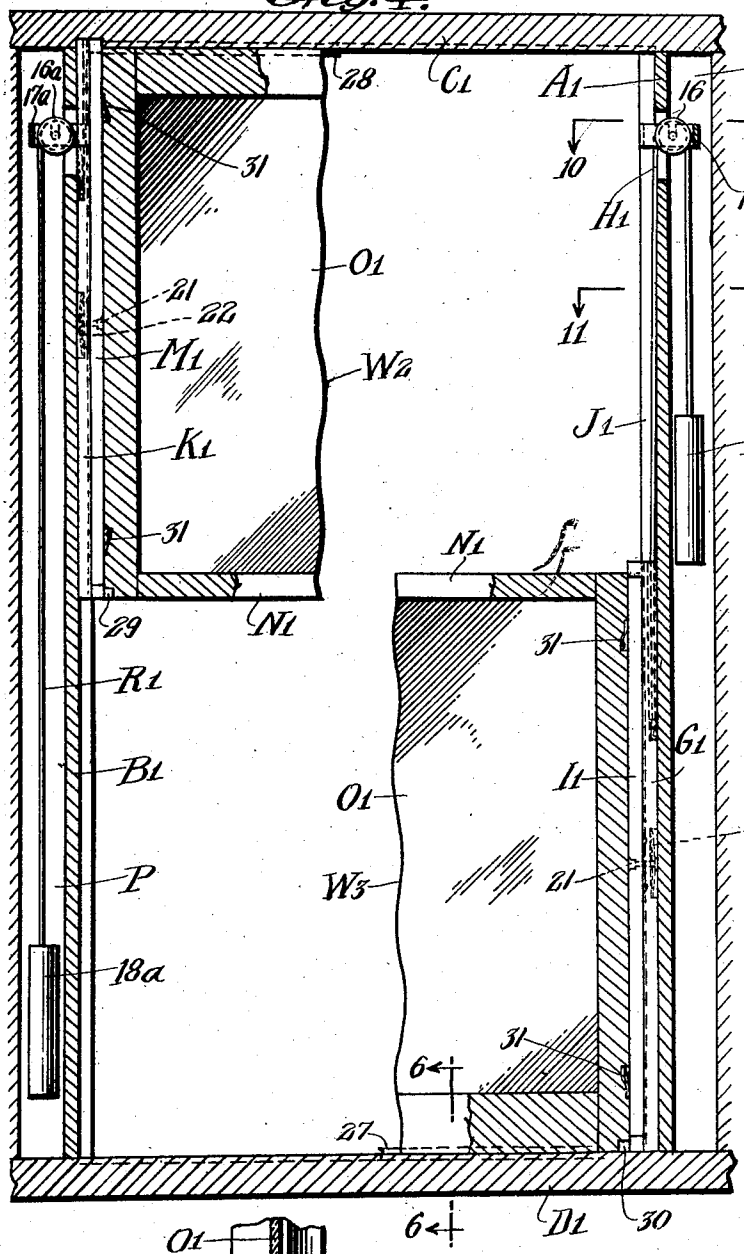


Fig. 5.

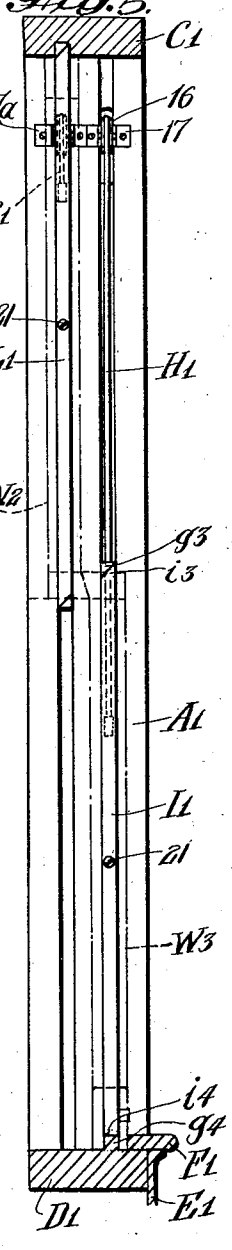
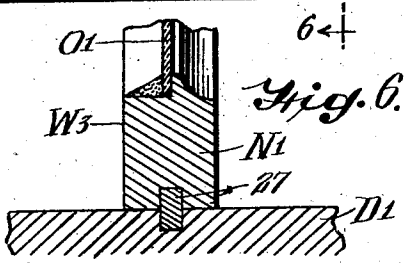


Fig. 6.



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Fig. 7.

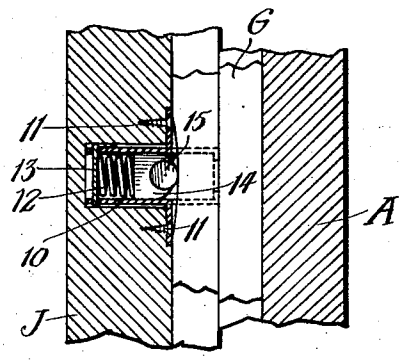


Fig. 8.

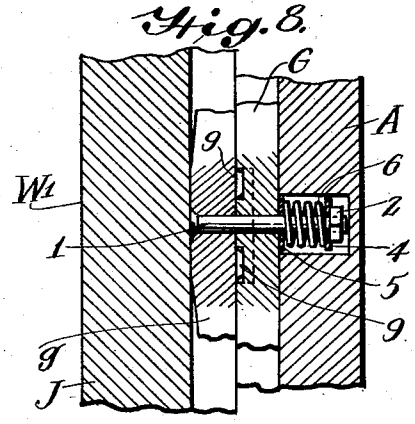


Fig. 9.

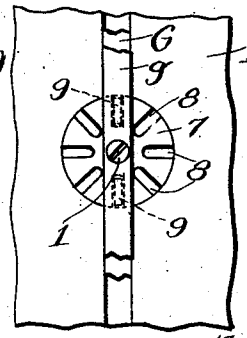


Fig. 10.

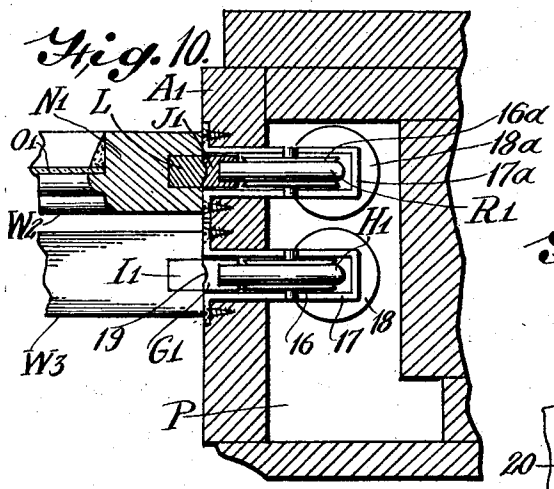


Fig. 11.

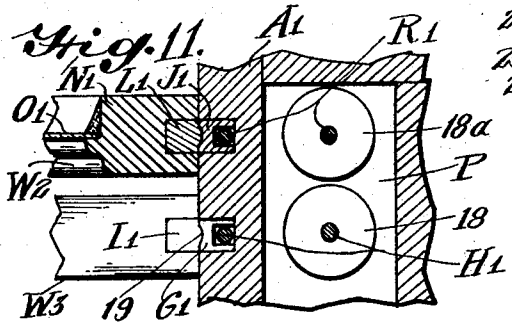


Fig. 12.

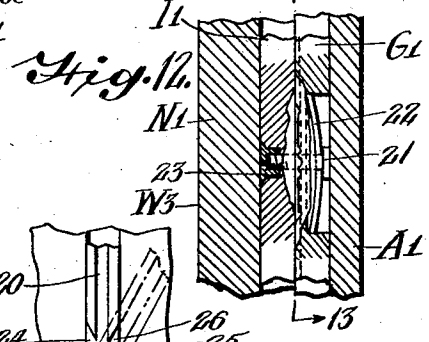
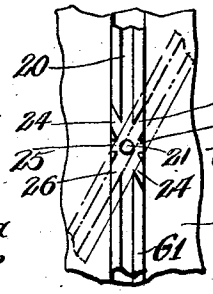


Fig. 13.



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UNITED STATES PATENT OFFICE.

HARRY DONATH, OF PHILADELPHIA, PENNSYLVANIA.

WINDOW.

Application filed March 2, 1926. Serial No. 91,664.

My invention relates to features of construction whereby an aperture or opening, as in a wall, may be closed by a closure member, panel, window or the like, hereinafter generically termed a "window" so mounted as to be readily removed from the aperture or opening, to the end that articles of large size may be passed therethrough or for any other desired purpose.

In accordance with my invention, a window normally occupying a position in a predetermined plane for closing an aperture or opening, as aforesaid, may be removed bodily therefrom after effecting rotation thereof into another plane, and, more particularly, a window, as aforesaid, is slidably or reciprocatorily mounted in said predetermined plane, out of which it may be swung and then removed or separated from its supporting structure.

Further in accordance with my inventon, a pair of tracks, ribs or the like supporting a window for sliding or reciprocating movement are so mounted in the frame or sill structure defining the window opening as to prevent passage between the window and the respective jambs of any substantial amount of air, rain, snow or the like, and, more particularly, portions of the track or rib structure aforesaid may be freely swung to an angular position whereby the window may be bodily withdrawn therefrom.

For an illustration of some of the forms that my invention may take, reference is to be had to the accompanying drawings in which:

Fig. 1 is an elevational view, partly in section, showing a portion of a front window at the bottom thereof and a portion of a rear window at the top thereof.

Fig. 2 is a side elevational view, partly in section, looking in the direction of the grooved faces of the track structures shown at the right of Fig. 1.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 corresponds generally with Fig. 1 and illustrates another form of my invention.

Fig. 5 corresponds generally with Fig. 2 and illustrates in side elevation the track structures shown at the right of Fig. 4.

Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 4.

Fig. 7 is an enlarged sectional view showing a form of pawl structure for retaining a window in an adjusted position.

Fig. 8 is an enlarged sectional view showing a form of co-acting lug and recess structure for holding a window and its guiding rib in a selected position.

Fig. 9 is a side elevational view of the structure illustrated in Fig. 8.

Fig. 10 is a horizontal sectional view taken on the line 10—10 of Fig. 4.

Fig. 11 is a horizontal sectional view taken on the line 11—11 of Fig. 4.

Fig. 12 is an enlarged sectional view showing a modified form of structure for holding a window and its guiding rib in a selected position.

Fig. 13 is a side elevational view taken on the line 13—13 of Fig. 12.

Referring to Figs. 1 and 2, there are illustrated the parallel spaced jambs A and B extending preferably vertically and joined at their upper ends by the header C and at their lower ends by the sill D, the latter having secured thereto in suitable manner the apron E and stool F.

Disposed in spaced relation in suitable channels or grooves in jamb A are the parallel guiding tracks or ribs G and H. Located in suitable channels on the opposite jamb B are similar guiding members in transverse alignment, respectively, with said members G and H. At the left of Fig. 1 the guiding member last mentioned in transverse alignment with member H is indicated at I, while to the front thereof and not shown in Fig. 1 lies the guiding rib or member in transverse alignment with member G. The guiding members aforesaid may be constructed of any suitable material, as wood, metal, either solid or hollow frame construction, or the like, preferably, however, of rustless metal.

The front guiding rib or member G comprises a main stationary section and in its portion lying outwardly of its receiving channel the member or section *g* mounted for pivotal movement in any suitable manner. To this end, and as indicated in Figs. 1, 2, 8 and 9, section *g* may be mounted on a pivot pin 1 or the like, passing through the stationary section of guiding rib G into a recess in the jamb A, the pin 1 carrying at

its end within said recess the nut 2 or similar member which, with the washers or disks 4 and 5, confine a coiled spring 6, or the like, on pin 1, which passes centrally of a circular member or disk 7 provided preferably with the regularly spaced slots or grooves 8, opposite aligned pairs of which, at times, receive the lugs or projections 9 on member *g*. Due to this construction, spring 6 biases pin 1 toward the right, Figs. 1 and 8, to hold projections 9 in a pair of the grooves 8.

Suitable structure is provided for preventing pivotal movement of member *g* in one direction. To this end, and as one manner of so doing and as indicated in Fig. 2, said member may be provided with the upper and lower beveled surfaces g^1 and g^2 engaging corresponding beveled surfaces on the member G. As a result, member *g* may be rotated in but one direction, namely clockwise, as viewed in Fig. 2 and when forcibly swung on its pivot 1 in that direction, spring 6 is compressed and the projections 9 caused to ride out of the vertically positioned grooves 8 into an angularly disposed pair thereof determined by the degree of angular movement of member *g*.

It shall be understood that the front guiding rib or member, not shown, but lying at the left of Fig. 1 in transverse alignment with rib G comprises a section terminating in beveled ends having structure permitting pivotal movement and for holding the pivotal section in a desired angular position. Preferably, such structure is of the same character as that described above for utilization with pivotal section *g*. It shall also be understood that the pivot upon which this member is mounted is spaced upwardly, as viewed in Fig. 1, the same distance and in the same direction from sill D as is the pivot 1 upon which member *g* is mounted.

The rear stationary portions of guiding ribs or members H and I comprise, respectively, in their portions lying outwardly of their respective receiving channels the pivotal members or sections *h* and *i* preferably of substantially the same length as the pivotal section *g*. Rotary movement of members *h* and *i* in one direction may be prevented in any suitable manner, as by utilization of beveled surfaces indicated on member *h* at h^1 and h^2 and on member *i* at i^1 and i^2. The distance from sill D of the pivot pins for members *h* and *i* should be greater or less than the distance from said sill of the pivot pin for the pivotal member *g* comprised in the front guiding member G. Preferably, and as herein shown, the pivot pins 1 for the respective rear pivotal sections *h* and *i* lie upwardly and in transverse alignment one with the other as viewed in Figs. 1 and 2 greater distances from sill D than does the pivot pin for the pivotal member *g*. The rear members *h* and *i* are also provided, respectively, with suitable structure for retaining them in desired adjusted positions on their respective pivotal axes. Preferably, such structures are duplicates of that described above and comprise the pivot pin 1, coiled spring 6, etc., shown in detail in Fig. 8.

Jambs A and B, header C and sill D define a rectangular opening in a wall or other structure closed by an upper window W and a lower window W^1, each comprising a frame J supporting in the example shown a sheetlike member or pane K, as glass or the like. The side edges of each frame J, as viewed in Fig. 1 are provided with vertically extending channels or grooves, those of window W receiving and sliding freely upon the rear guiding ribs or members H and I and those of window W^1 receiving and sliding upon the corresponding front guiding ribs or members.

With window W^1 in its lower region and when supported only by pivotal member *g* of rib G and the corresponding pivotal member, not shown, but lying at the left of Fig. 1 in front of pivotal section *i*, the window and said pivotal sections may be swung in a clockwise direction as viewed in Fig. 2 to the desired extent, as, for example, to the position indicated by broken lines in said figure, and will be so retained by the clutching engagement effected by lugs 9 and a pair of the angularly disposed recesses 8. When thus positioned, window W^1 may be readily slid from the pivotal members aforesaid and removed from the window opening.

Window W likewise may be moved downwardly, as viewed in Figs. 1 and 2, to a position where the side edges thereof overlie only the pivotal members *h* and *i* of the rear guiding ribs H and I, whereupon said window and the pivotally mounted members supporting the same may be swung in the same direction as window W^1, aforesaid, after which window W may be removed, the pivotally mounted sections meanwhile remaining in their adjusted position due to the clutching engagement effected by the coacting bugs and recesses of the respective pivotal supporting structures.

If desirable, either or both of the windows W and W^1 may be provided with suitable structure tending to retain them, respectively, in adjusted positions on their supporting and guiding ribs. To this end, and as one manner of so doing, I provide in a side of a frame J a recess opening toward the guiding rib G, this recess receiving a housing or receptacle 10 whose flanged edge is suitably secured to said edge of frame J, as by the screws 11, Fig. 7. A coil spring 12, or equivalent, resting against a laterally slidable and removable plate 13, biases a supporting member 14 having an aperture receiving a roller 15 or the like toward the

guiding rib G. Each guiding rib is suitably formed to provide serrations, notches or the like for the reception of roller 15 and which co-act therewith to maintain the window in a desired adjusted position. Preferably, however, such notches take the form of arcuate grooves 16 drawn within a radius of substantial length whereby the depth of the grooves is relatively small.

It is desirable that the side edges of each of the windows W and W¹ be provided with one or more detachable structures of the character described above, for example, two along each edge of a window and spaced substantially equidistantly from the top and bottom thereof whereby each spring pressed roller will either lie within an arcuate groove or without the same. Obviously, as a window is moved either up or down, as viewed in Fig. 1, to a position such that the various spring pressed rollers thereon lie within adjacent arcuate grooves, there is a decided tendency for the window to remain in such position and not descend under the influence of gravity.

It will be observed that the various guiding ribs or members aforesaid, besides serving the useful purposes described above, are of a character and are so located as to substantially prevent passage of air, moisture, or the like, in either direction thereby removing a serious objection often raised against the usual type of window-mounting found in the prior art. It will also be observed that ordinarily the guiding ribs aforesaid need not be secured in place within their respective channels or grooves, due, primarily, to the presence of the spring-pressed rollers along the edges of the various windows which have the function, in addition to that described above, of tending to force the various guiding ribs into proper position in their respective grooves.

Referring to Figs. 4 and 5, there is illustrated another form of my invention wherein the parallel spaced jambs A¹ and B¹ form closures for passages P, into which extend window-balancing weights, as hereinafter described. Jambs A¹ and B¹ are joined at their upper ends by the header C¹ and at their lower ends by the sill D¹, the latter having secured thereto in suitable manner the apron E¹ and stool F¹.

Disposed in a channel or groove extending vertically in jamb A¹ between the header C¹ and sill D¹, as viewed in Fig. 1, is a slidable member or runner G¹, Figs. 4 and 11, slotted to receive the end of a rope, chain or equivalent H¹, hereinafter termed a "rope," suitably secured thereto which passes upwardly over a pulley 16 or the like rotatably secured in a bracket 17 carried by jamb A¹ and then extends downwardly in passage P to support a weight 18.

Runner G¹, exteriorly of the channel receiving the same, comprises a companion member I¹ of corresponding length, having a longitudinal rib 19 normally lying within a longitudinal passage or groove 20 in runner G¹, Figs. 10, 11 and 13. A bolt 21 or the like, passing through runner G¹ and its companion member I¹ midway between their ends, confines a bowed spring 22, or equivalent, in a suitable recess in runner G¹, the spring biasing bolt 21 and the nut 23 carried thereby toward the right, Fig. 12, to maintain runner G¹ and its companion member I¹ in engagement and rib 19 within groove 20.

Runner G¹, in the region thereof through which the bolt 21 passes, is provided, in addition to groove 20, with a variable number of grooves 24, 25 and 26, all intersecting in a common region, namely, that occupied by bolt 21, and angularly related one with respect to another. It results, therefore, that upon application of a force to member I¹ sufficient to overcome the influence of spring 22, said member I¹ may be swung angularly with respect to runner G¹, rib 19 riding out of groove 20 and into another of the grooves 24, 25 or 26, depending upon the degree of angular movement given to said member I¹, whereby the last-mentioned member is held in a desired angular position with respect to runner G¹.

It shall be understood that the jamb B¹ at the left of Fig. 4 comprises a groove, not shown, slidably receiving a runner, not shown, in transverse alignment with runner G¹, the former connected by a rope to a weight occupying the front of the passage P closed by jamb B¹. This runner comprises a companion member corresponding with member I¹ pivoted thereto and preferably maintained in a desired angular position by co-acting rib and groove structure of the character described above.

Jambs A¹ and B¹ at the rear thereof and parallel with the grooves at the front thereof are provided with grooves or passages receiving, respectively, the runners J¹ and K¹ comprising, respectively, the companion members L¹ and M¹ corresponding with member I¹ described above. Members L¹ and M¹ are pivoted to the respective runners J¹ and K¹ midway between their ends and preferably are maintained in desired angular positions with respect thereto by co-acting rib and groove structures of the character described above.

As herein shown at the left of Fig. 4, runner K¹ on its surface adjacent jamb B¹ is slotted to receive the end of a rope K¹ suitably secured thereto which passes upwardly over a pulley 16ª rotatably secured in a bracket 17ª carried by jamb B¹ and then extends downwardly in the passage P to support a weight 18ª. Although not herein shown in detail, it shall be understood that

runner J^1 has secured thereto in similar manner a rope passing over a pulley in the upper part of jamb A^1 and thence passing downwardly to support a window-balancing weight.

When desirable and suitable, the ends of the pivotal companion members of the various runners may be beveled, whereby when said members are in vertical positions, the ends thereof will be in engagement with corresponding beveled surfaces of the respective runners. As an example of such construction, and referring to Fig. 5, the ends of member I^1 are shown as beveled at i^3 and i^4, and such beveled surfaces co-act with corresponding beveled surfaces g^3 and g^4 formed on portions of runner G^1 extending laterally thereof.

In a manner similar to that described above with respect to Figs. 1, 2, et seq., jambs A^1 and B^1, header C^1 and sill D^1 define a rectangular opening in a wall or other structure closed by an upper window W^2 and a lower window W^3, as aforesaid, each window comprising a frame N^1 supporting and retaining a sheet-like member or pane O^1 of glass or the like. The side edges of each frame N^1, as viewed in Fig. 4, are provided with vertically extending channels or grooves, those along opposite edges of window W^2 receiving and overlying, respectively, the pivotally mounted companion members L^1 and M^1 of runners J^1 and K^1, and those along opposite edges of window W^3 receiving and overlying the pivotally mounted companion member I^1 of runner G^1 and the corresponding member on the runner slidable in a groove in jamb B^1 in transverse alignment with runner G^1.

The lower horizontal part of frame N^1 of window W^3, as viewed in Fig. 4, may be provided with a horizontally extending groove receiving a rib 27 adapted, with window W^3 in its lower position, to enter a mating passage in the sill D^1. If desired, the upper horizontal portion of frame N^1 of window W^2 may be provided with a similar rib 28 received, when said window is in its uppermost region, by a mating groove in the header C^1.

In accordance with my invention, window W^2, together with runners J^1 and K^1, move upwardly or downwardly, as the case may be, as a unitary structure, and in so doing the weights aforesaid are correspondingly lowered or raised. For preventing downward movement of window W^2, as, for example, by the influence of gravity, relative to runners J^1 and K^1, their pivotal companion members L^1 and M^1 may be provided with a lug or projection 29 fitting into a groove or perforation in the frame N^1 of said window. In like manner, the pivotal companion members received by opposite sides of frame N^1 of window W^3 may each provide with a lug or projection 30 received in a perforation in the lower part of said frame member.

If desired, leaf springs or the like 31 may be so disposed and mounted in suitable recesses in the edges of frames N^1 as to co-act with the faces of the various pivotally mounted members, as L^1, M^1, etc., whereby the respective runners secured thereto are maintained well within their respective grooves or channels within which they slide in the jambs A^1 and B^1.

Window W^3 together with its runners may be moved upwardly or downwardly as desired, the pair of weights maintaining the combined structure in any desired position. When occupying any region, said window and the pivotally mounted members comprised in its runners may be swung in a clockwise direction, Fig. 5, whereupon ribs 19 on the companion members will drop into one of the grooves 24, 25 or 26 on the runners to maintain the structure in the desired angular position. Thereupon, window W^3 may be slid upwardly out of the runner structure leaving one-half of the window opening entirely free and unobstructed.

In a similar manner, window W^2 may be removed from its runner structure to entirely open the aperture normally closed by the windows. However, if utilizing ribs 27 and 28 at the respective bottom and top surfaces of the windows it will be necessary to slightly raise and lower said windows before they may be swung on their respective pivotal axes, and if the pivotal member L^1 of runner J^1 is extended into a groove in the header C^1, Fig. 5, it will be necessary to slightly lower the upper window W^2 even though rib 28 is not utilized.

What I claim is:

1. The combination with the parallel spaced jambs defining a window opening, of a runner mounted for reciprocatory movement on one of said jambs and comprising a rib, a window in said opening slidable on said rib, means for balancing said runner and window, and means for tilting said window and rib to an angular position with respect to said jamb.

2. The combination with the parallel spaced jambs defining a window opening, of a runner mounted for reciprocatory movement on one of said jambs and comprising a rib, a window in said opening slidable on said rib, means for balancing said runner and window, means for tilting said window and rib to an angular position with respect to said jamb, and a coacting rib and groove for releasably securing said first-named rib in window-sliding position.

3. The combination with the parallel spaced jambs defining a window opening, of a runner mounted for reciprocatory movement on one of said jambs and comprising

a rib, a window in said opening slidable on said rib, means comprising a weight connected to said runner for balancing the window, and means for tilting the window and rib to an angular position with respect to said jamb.

4. The combination with the parallel spaced jambs defining a window opening, of a runner mounted for reciprocatory movement on one of said jambs and comprising a rib, a window in said opening slidable on said rib, means for balancing said runner and window, means for tilting said window and rib to an angular position with respect to said jamb, and a coacting rib and groove comprised in said runner and of corresponding length for releasably locking said first-named rib in window-sliding position.

5. The combination with the parallel spaced jambs defining a window opening, of runner structure comprising a rib mounted for reciprocatory movement on one of said jambs, a window in said opening slidable on said rib, means comprised in said runner structure for preventing movement of said window in one direction, means for balancing said runner and window, and means for tilting said window and rib to an angular position with respect to said jamb.

6. The combination with the parallel spaced jambs defining a window opening, of runner structure comprising a rib mounted for reciprocatory movement on one of said jambs, a window in said opening slidable on said rib, means comprising a lug extending laterally of said runner structure for preventing movement of said window in one direction, means for balancing said runner and window, and means for tilting said window and rib to an angular position with respect to said jamb.

7. The combination with a pair of parallel spaced jambs defining a window opening, of runner structures mounted, respectively, on said jambs and comprising, respectively, pivotally mounted ribs upon which a window is slidably mounted, each runner structure comprising a portion preventing pivotal movement in one direction of the rib comprised therein and upon which said window is also slidable.

8. The combination with a pair of parallel spaced jambs having channels opening toward each other and disposed in a common plane, of runner structures reciprocatorily mounted, respectively, in said channels and comprising, respectively, ribs lying outwardly of said channels and upon which a window is slidably mounted, means for supporting the window upon said ribs, means for tilting said ribs and window to an angular position with respect to said jambs, and weight structure for balancing said ribs and window.

9. The combination with a pair of parallel spaced jambs having channels opening toward each other and disposed in a common plane, of runner structures comprising, respectively, a member slidable in a channel and a rib lying outwardly thereof, a pivot for each rib disposed in the member adjacent thereto substantially mid way of its ends, means for preventing pivotal movement of said ribs in one direction with respect to said members while permitting movement in the reverse direction, means for holding said ribs in a selected position when moved in said reverse direction, and weight structure for balancing said runner structures and the window slidable on said ribs.

10. The combination with the parallel spaced vertical jambs defining a window opening, of oppositely disposed vertical ribs upon which a window is freely slidable, and means for pivoting each rib intermediate its ends for movement to angular positions with respect to said jambs whereby the window may be moved past the normal upper end portions of the ribs when removing the same from the window opening.

11. The combination with the parallel spaced vertical jambs defining a window opening, of oppositely disposed vertical ribs upon which a window is freely slidable, means for pivoting each rib intermediate its ends for movement to angular positions with respect to said jambs whereby the window may be moved past the normal upper end portions of the ribs when removing the same from the window opening, and means extending longitudinally of a rib for holding the same in window-sliding position.

12. The combination with the parallel spaced vertical jambs defining a window opening, of oppositely disposed vertical ribs upon which a window is freely slidable, means for pivoting each rib intermediate its ends for movement to angular positions with respect to said jambs whereby the window may be moved past the normal upper end portions of the ribs when removing the same from the window opening, and means coacting with each rib at its ends for limiting rotative movement thereof in one direction.

13. In combination, reciprocatory window-supporting structures, a window slidable on one of said structures, a second window spaced from said first-mentioned window and slidable on another of said structures in a direction parallel with the path of said first-mentioned window, means for balancing said structures, and means for tilting said windows and parts of their supporting structures whereby said windows may be bodily removed therefrom.

14. In combination, reciprocatory window-supporting structures, a window slidable on one of said structures, a second window spaced from said first-mentioned window and slidable on another of said struc-

tures in a direction parallel with the path of said first-mentioned window, means for balancing said structures, means comprised in said structures for limiting downward movement of said windows, and means for tilting said windows and parts of their supporting structures while in approximately their lowest positions whereby said windows may be bodily removed therefrom.

15. The combination with a pair of parallel spaced jambs defining a window opening, of runner structures mounted respectively on said jambs and comprising, respectively, pivotally mounted ribs upon which a window is slidably mounted, and projections extending laterally of said ribs for limiting downward movement of the window.

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