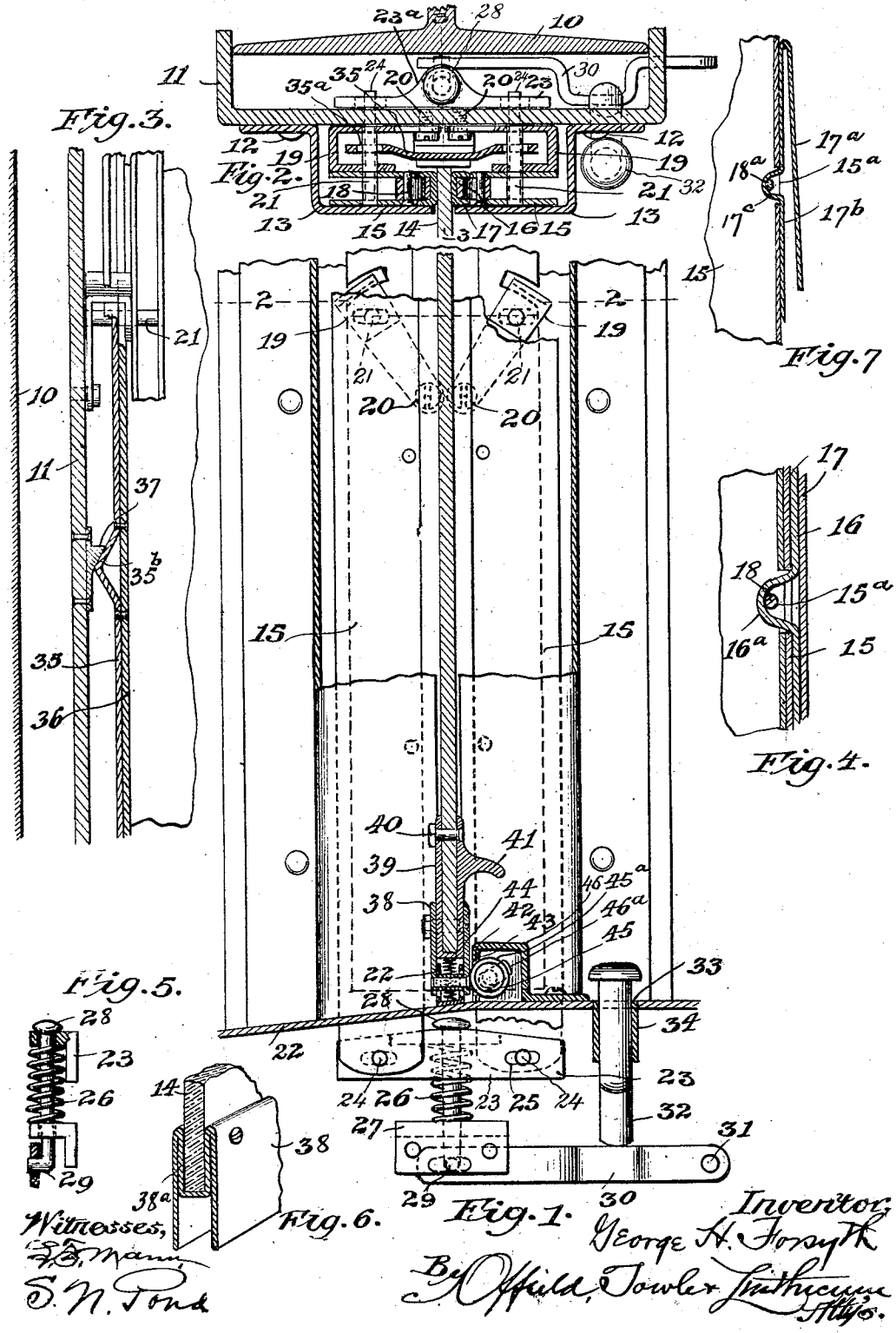
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WINDOW CONSTRUCTION.

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1,086,317. Patented Feb. 3, 1914.



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To all whom it may concern:

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Window Constructions, of which the following is a specification.

This invention relates to window constructions, and has for its main object to provide means, preferably automatic, for insuring close and substantially air and dust-proof contact between the window closure, which may be a plate of glass, a curtain of metal or any other suitable material, and its guide, which means may be capable of retraction out of substantial frictional holding engagement with said plate or curtain when the latter is to be raised or lowered.

In the preferred and most complete form of the invention, I provide retractable means for engaging the marginal portions of the plate or curtain laterally and also retractable means for engaging said plate or curtain on its edges; although it should be understood that either engaging means may be used alone to effect the object of the invention. The immediate contacting surfaces engaging the plate are preferably yieldable, consisting of such material as felt, leather, or other suitable materials, or a spring substance, such as rubber or elastic metal, which will readily adapt itself to variations in the plate with respect both to thickness and also to variations from the true plane of the plate and preferably without scratching the latter. These contacting devices are also preferably rendered detachable from the main backing strips to operate to bring them into contact with the plate. The contacting strips also, aside from producing a snug and practical air and dust-proof guide for the plate, also operate automatically to adjust the plate to variations in its guide or guides.

My invention also further includes a novel device for procuring tight and dust-excluding engagement between the lower horizontal margin of the plate and the window opening closed thereby, said means comprising a member having telescopic engagement with the lower margin of the plate and means for normally forcing said telescoping member into snug engagement with the sill of the window opening. Further means for excluding air and dust may also be employed, consisting of a rotatable member, which may be mounted along the top as well as the bottom of the plate, and which is so mounted as to be capable of outward and inward bodily movement relative to the plate. Preferably this rotatable member is pivotally mounted at its ends in inclined guides which, coöperating with the action of gravity, normally tend to hold the member in snug contact with the plate along the horizontal margin thereof.

Another feature of the invention resides in the provision of a hollow post constituting an element of the casing and guide, within which hollow post parts of the actuating mechanism of the engaging devices of the plate are housed.

My invention and the novel operative principle thereof, will be readily understood when considered in connection with the accompanying drawings illustrating a mechanical embodiment of the same, in which—

Figure 1 is an elevational view in vertical transverse section through the plate and sealing roller and in similar vertical section in another plane through the plate guide. Fig. 2 is a cross-sectional view on the offset line 2—2 of Fig. 1, looking downwardly, and showing the guide and plate-engaging parts in full. Fig. 3 is a vertical section on the line 3—3 of Fig. 2. Fig. 4 is a detail vertical section through one of the friction strips and its backing strip illustrating the means of mounting the former on the latter. Fig. 5 is an edge view of the parts shown at the lower end of Fig. 1. Fig. 6 is a perspective detail illustrating the manner of mounting the finishing strip on the lower horizontal edge of the plate. Fig. 7 is a view similar to Fig. 4, showing a modified form of plate-contacting spring.

Referring to the drawings, 10 designates a portion of an upright frame member, such as an I-beam of a wall structure such, for instance, as the side wall of a railway car, to which is fitted a shallow channel-shaped upright 11, the members 10 and 11 together constituting a hollow jamb-post forming one side of a window or a similar opening. To the outer face of the member 11 is secured, as by screws 12, a pair of upright guide-strips 13 together forming a hollow guide, the adjacent inner margins of the guide-strips 13 being separated sufficiently to freely admit therebetween the marginal por-

tion of a plate 14, which may be a plain plate of glass, or a plate or curtain of metal or other material, or any other analogous member designed to close the opening. Within the hollow guide formed by the guide-strips 13 are located, on opposite sides of the plate 14, a pair of backing strips 15, herein shown as of narrow channel form with their closed edges lying inwardly or toward the plate 14. Secured to said closed edges of the backing strips 15 are a pair of contact strips, which I so term by reason of the fact that they constitute the immediate contacting members for the opposite sides of the plate 14. Each of these contact strips, in the form shown in Figs. 1 and 2, consists of a narrow upright strip 16 surrounded by a tube or covering 17 of yielding or flexible material, such as felt, leather, rubber, or the like, this latter directly engaging the side of the plate adjacent to its margin, as shown in Fig. 2. The contact strips may be secured to the backing strips by any suitable means, a convenient method for this purpose consisting in cutting and displacing from the strip 16 an outwardly extending curved tongue 16^a (Fig. 4) projecting the same through the slot 15^a formed in the transverse wall of the backing strip 15, and securing the same by means of a cross-pin 18 extending between the side walls of the backing strip. This pin 18 may be headed into the outer wall of the backing strip, the contact of said outer wall with the guide-strip 13 confining the same against displacement, and this construction permitting ready removal of the pins 18 when worn or broken.

The backing strips 15 are thus supported by one or more pairs of inclined links 19, which latter are bent to a substantially U-shape at their outer ends and at their inner lower ends are pivoted to the member 11, as shown at 20. Pins 21 extending transversely through the backing strips 15 and the U-shaped ends of the links 19 constitute the means for supporting said backing strips from said links. The lower ends of the backing strips 15 are transversely connected by a horizontal piece 23 through the agency of laterally projecting pins 24 in the strips 15 engaging horizontal slots 25 in the piece 23; this form of connection permitting the requisite lateral movement of the backing strips 15 in operation. The strips 15 are normally pressed upwardly by a compressing spring 26 resting on a fixed stop 27 secured to the member 11 and at its upper end thrusting against a horizontally projecting central ledge or shoulder 23^a of the piece 23. This ledge or shoulder is apertured to receive a headed pin 28 that extends downwardly through the spring 26 and stop 27 and has a pin-and-slot connection shown at 29 with a lever 30 pivoted at 31 to a fixed member of the casing, said lever 30 being adapted to be depressed by a vertical thumb-bolt 32 extending through an aperture 33 in the sill 22 and a depending guide 34, the lower end of said thumb-bolt 32 being laterally offset to meet and engage a correspondingly offset portion of the lever 30, as best shown in Fig. 2. From the foregoing it will be apparent that the normal tendency of the spring 26 is to force the backing strips 15 upwardly, and the connection of the latter through the inclined links 19 with the fixed pivots 20 lying inwardly of said backing strips imparts to said strips a tendency to move inwardly, thereby causing the contact strips to closely hug the sides of the plate 14. A downward pushing on the thumb-bolt 32 overcomes the spring 26, draws the backing and contact strips downwardly and, by reason of the inclined connecting links, also imparts a simultaneous outward or releasing movement to said strips, thereby freeing the plate from the frictional engagement of said strips and allowing it to be readily raised and lowered.

In association with the foregoing mechanism I also preferably provide a similarly acting device for effecting a snug contact with the edge of the plate 14. The device herein shown for this purpose consists of a vertical transversely disposed strip 35 disposed within the hollow guide, its marginal portions conveniently passing through the U-shaped ends of the links 19, for which purpose the said strip 35 is transversely slotted at 35^a for the passage of the pins 21, said slots permitting the necessary lateral play of said pins in the operation of the backing strips 15 and also forming the means of supporting the strip 35 on said pins so as to effect vertical up and down movements of the strip 35 synchronously with said movements of the backing strips 15. The outer face of the backing strip 35 is provided with a relatively narrow facing or contact strip 36 of similar material to that of the contact strips 17 and adapted for direct engagement with the edge of the plate 14. The bodily lateral movement of the strips 35 and 36 toward and from the edge of the plate 14 is conveniently effected by means of operating cam inclines, one of which may be formed by punching from the metal of the strip 35 an inclined rear projection 35^b the outer surface of which slidingly engages a correspondingly inclined stop 37 secured to the jamb-post member 11. The direction of these coöperating inclined or cam surfaces is such that the upward thrust imparted to the backing strip 35 from the spring 26 by virtue of the connection of said strip with the pins 21 tends to force the strips 35 and 36 toward and into snug contact with the edge of the plate 14. When the strips 15 are drawn downwardly, the up-

ward thrust of spring 26 on the strip 35 is intermitted, and consequently the pressure of the contact strip 36 upon the edge of the plate is likewise relieved. It will also be observed that by virtue of the described construction, and irrespective of the manually operated releasing means, a downward pull on the plate tends to automatically separate the laterally acting contact strips by reason of the downward pull thereon resulting from their frictional engagement with the plate and the outward thrust imparted by their inclined supporting links.

In Fig. 7 I have illustrated a modified form of contact strip which may be substituted for either or both of the strips 16, 17 and 36; the same consisting simply of a suitably bent bow spring 17^a that may be secured to its backing member in the manner and by the means already described in connection with the strip 16, said strip 17^a having a rear portion 17^b provided with backwardly pressed lips 17^c projecting through the slots 15^a of the backing strip 15, or similar slots formed in the backing strip 36 and confined by pins 18^a.

The lower horizontal edge of the plate 14 is preferably equipped with a finishing or reinforcing bar 38 that may conveniently be pressed from sheet metal and provided with a reëntrant channel portion 38^a seating the lower edge of the plate. I also provide the lower edge of the plate with a suitable lift which, as herein shown, consists of a narrow U-shaped piece 39 of a form adapted to snugly fit the lower margin of the glass, secured to the latter by a bolt or rivet 40 and provided with a forwardly projecting finger-piece 41. To accommodate the lift 39, the reëntrant channel portion 38^a of the bar 38 is cut out to an extent equivalent to the area of the lower portion of the lift. This construction enables the lift to embrace the lower edge of the plate, thus giving it a strong hold upon the latter.

In the lower open edge of the transverse finishing or reinforcing bar 38, I preferably fit a telescoping weather strip 42, the same being confined with capacity for sufficient vertical movement to effect this purpose by means of transverse pins 43, and normally pressed downwardly by means of internal compression springs 44, the lower edge of said weather strip being in shape to conform to the slant or inclination, if such there be, of the sill 22. The pins 43 not only serve to confine the weather strip, but also rigidly space the sides of the finishing strip 38 and prevent the latter from spreading.

As a further means of guarding the lower edge of the plate against the entrance of dust, cold air, and the like, I also preferably employ a guard in the nature of a rotatable cylinder 45, the end pintles of which are mounted in inclined slotted bearings 46^a formed in the end wall of a covering box or housing 46 on the sill, whereby the rolls or cylinders normally tend by gravity to hug the lower edge of the finishing strip 38. Said rolls or cylinders might be mounted on the finishing strip and are preferably surfaced with a yielding material, such as cloth, leather, rubber, or the like, indicated at 45^a. The same device may, of course, be applied to the upper edge of the plate to guard the latter, if desired.

I claim:

1. The combination with a window casing, of a plate therefor, a pair of contact strips adapted to have bodily movement toward and from the opposite faces of said plate, resilient means normally keeping said contact strips in engagement with said plate, and means for releasing said contact strips, whereby the plate may be raised and lowered, respectively.

2. The combination with a window casing, of a plate therefor, a contact strip adapted to have bodily movement toward and from the face of said plate, another contact strip adapted to have bodily movement toward and from an edge of said plate, and common means for actuating said contact strips.

3. The combination with a window casing, of a plate therefor, a pair of contact strips adapted to have bodily movement toward and from the opposite faces of said plate, a contact strip adapted to have bodily movement toward and from an edge of said plate, and common means for actuating all of said contact strips.

4. The combination with a window casing having a hollow guide, of a plate having a margin projecting into said hollow guide, a contact strip in said guide having a yielding surface adapted to engage a side of the margin of said plate, another contact strip adapted to engage the edge of said plate, backing strips to which said contact strips are secured, and manually operable means for moving said backing strips bodily toward and from said plate.

5. The combination with a window casing having a hollow guide, of a plate having a margin projecting into said hollow guide, contact strips having yielding surfaces adapted to engage the opposite sides and edge of the margin of said plate, backing strips to which said contact strips are secured, inclined links disposed in a plane transverse to the plate and pivotally supporting said strips, coöperating cam surfaces on said marginal backing strip and a wall of the casing, respectively, spring means normally exerting a longitudinal thrust upon said backing strips whereby the contact strips carried thereby are caused to hug the sides and edge of said plate, and manually operable means for overcoming

the action of said spring whereby the holding effect of said contact strips is relieved.

6. The combination with a window casing having a hollow guide, of a plate having a margin projecting into said guide contact strips engaging the opposite sides of said plate, inclined links disposed in a plane transverse to the plate and pivotally supporting said strips, spring means for actuating said strips located below the sill of said casing, whereby the strips are normally kept in engagement with said plate, and means for releasing the spring pressure on said contact strips, thereby enabling said plate to be moved in a vertical plane, substantially as described.

7. The combination with a window casing having a hollow guide, of a plate having a margin projecting into said casing, a pair of contact strips adapted to engage opposite surfaces of said plate, a link connecting each of said strips with the window casing, a transverse member connecting said strips, spring means engaging said transverse member and forcing said strips into contact with said plate, and means for releasing said spring means, thereby enabling the plate to be moved in a vertical plane, substantially as described.

8. In a window construction, the combination with a casing, of a hollow guide, a plate having a margin projecting into said guide, contact strips on opposite sides of said plate, a link associated with each strip connecting the same with said casing, a transverse member between said strips, an auxiliary contact strip within said guide and adapted to engage the edge of said plate and having slotted engagement with said links, spring means engaging said transverse member, whereby said contact strips are forced against opposite surfaces and the edge of said plate respectively, and means for releasing said spring means, thereby loosening the engagement of said strips with said plate, whereby the plate may be moved in a vertical plane, substantially as described.

9. The combination with a window casing, having a guide, of a plate having a margin projecting into said guide, and movable contact means adapted to engage said plate and hold the latter in adjusted position, said contact means comprising a contact strip surrounded by a tube of flexible material, a backing strip, and means for removably securing said contact strip to said backing strip, substantially as described.

10. The combination with a window casing, and a plate slidably mounted therein, of a frame for said plate fixed against movement with the plate and comprising a pair of strips mounted within the casing one on each side of the plate for movement in planes at substantially right angles to the plane of the plate, resilient means pressing the strips from opposite directions into contact with the marginal side faces of the plate, and manually operable means to retract the strips from contact with the plate, substantially as described.

11. The combination with a window casing, and a plate slidably mounted therein, of a frame for said plate fixed against movement with the plate and comprising a pair of strips mounted within the casing one on each side of the plate for movement in planes at substantially right angles to the plane of the plate, resilient means pressing the strips from opposite directions into contact with the marginal side faces of the plate, another strip mounted for movement in the plane of the plate, resilient means pressing the last named strip into contact with the edge of the plate, and manually operable means to retract the strips in unison from contact with the plate, substantially as described.

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