G. H. FORSYTH.

SASH CONSTRUCTION.

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1,086,316.

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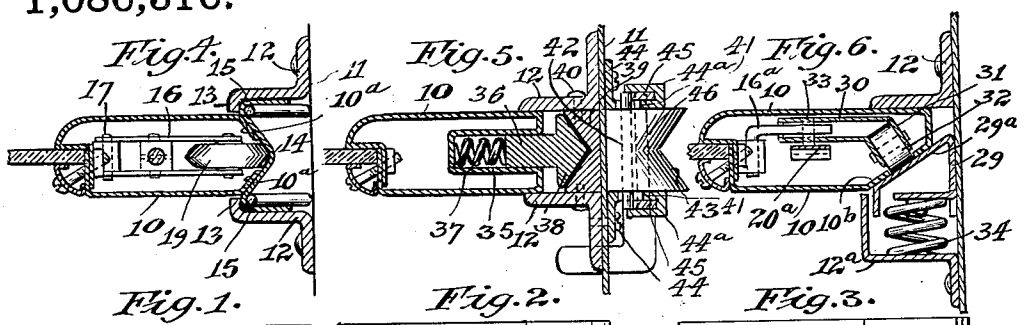
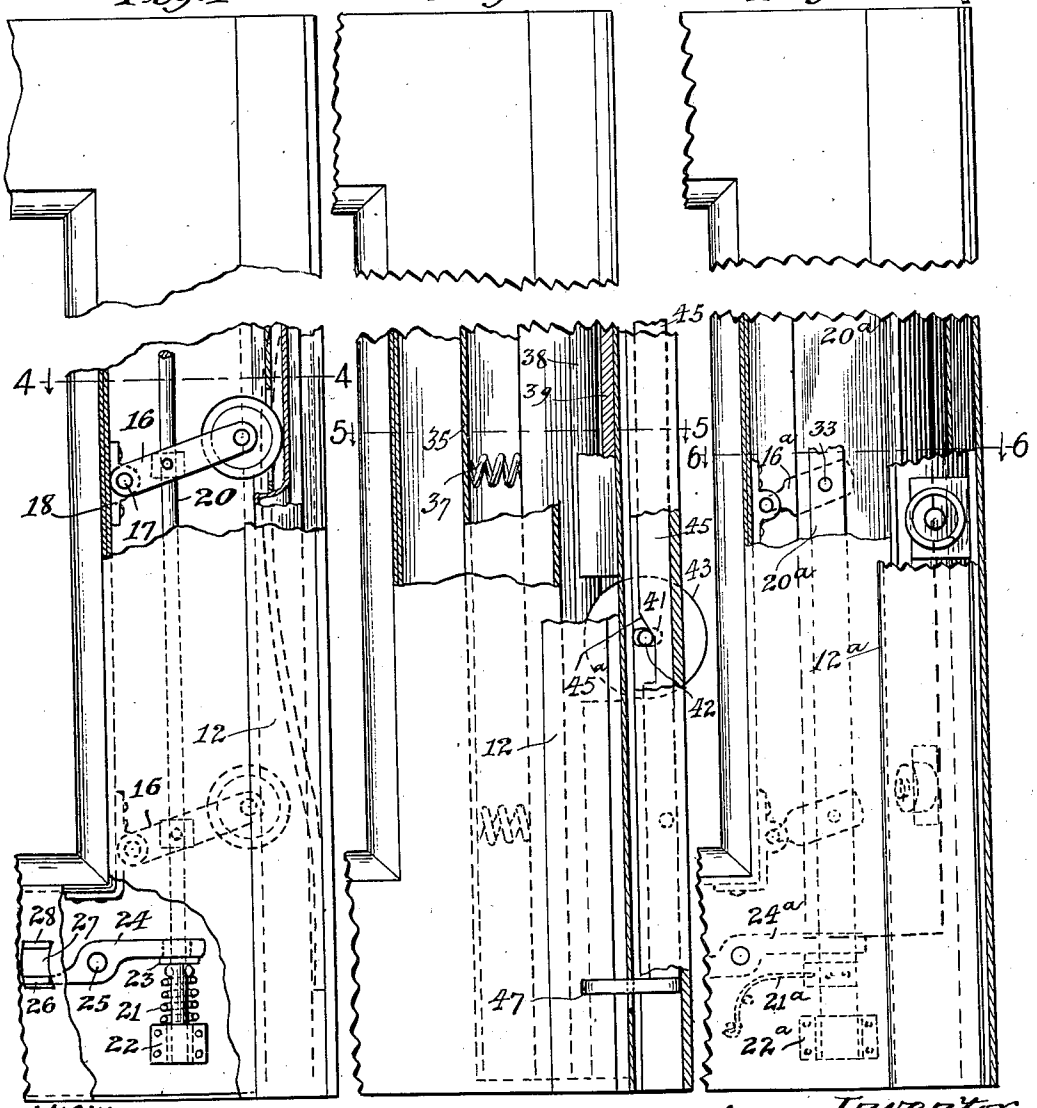


Fig. 1. Fig. 2. Fig. 3.



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SASH CONSTRUCTION.

1,086,316. Specification of Letters Patent. 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 Sash Constructions, of which the following is a specification.

This invention relates to improvements in sash constructions, and has reference more particularly to improved means for adjusting and guiding the sash under a substantially tight fit in the guides.

The invention is more particularly, and as herein illustrated, designed for application in connection with hollow metal sash constructions, although capable of application and use in connection with sash constructions generally.

In its principal and essential features, the invention comprehends the combination with a sash and its guide, of means therebetween for normally maintaining a practically air and dust proof fit of the sash in the guide, as well as for automatically adjusting the sash to variations in width of the window opening, and means for relieving the frictional contact between the snugly fitting parts when the sash is to be raised or lowered. This relieving of the frictional engagement of the relatively sliding parts carried by the sash and guide, respectively, is effected by a partial or entire separation of said parts, which separation may be effected by a lateral movement of either the part carried by the sash or the part carried by the guide. The automatic adjustment and snug fit of the sash is effected through the agency of a laterally movable member between the frame and adjusting strip, which adjusting strip may, in one form of the invention, be carried by the sash guide and movable transversely thereof, and in another form of the invention it may be carried by the sash, being so mounted as to be movable transversely of the latter. In order to relieve the frictional engagement between the sash and the guide I preferably employ antifriction means adapted to be brought into operation during the upward and downward movement of the sash.

In the accompanying drawings I have illustrated both of the forms of the invention above referred to, and referring thereto,—

Figures 1, 2 and 3 are side elevational views, partly broken out to show interior parts, of a sash stile, the latter being broken out intermediate its ends. Figs. 4, 5 and 6 are cross-sectional views on the lines 4—4, 5—5 and 6—6 of Figs. 1, 2 and 3, respectively.

Referring first to Figs. 1 and 4, 10 may designate a hollow sheet metal sash stile, the outer edge whereof is formed by inwardly turned inclined resilient lips 10^a on the opposite faces of the stile, or by a continuous transverse strip apertured at intervals for the passage of anti-friction rollers hereinafter described. The line 11 indicates the base of the casing guide, and 12 indicates a pair of angle-strips secured to the base 11 to form the side walls of the guide-groove, said strips having inwardly turned lips 13, serving to confine within the guide-groove a channel-shaped adjusting strip 14 that is normally pressed outwardly toward the stile by a pair of bow springs 15. The channeled portion of the strip between the springs 15 is shaped to conform substantially to the inclination of the lips or marginal formation 10^a of the stile so as to produce a snug and practically air and dust proof fit with the latter. As a means for relieving this snug fit of the adjusting strip with the stile, I mount within the stile and at suitable intervals longitudinally thereof a series of links 16 that are pivoted at their inner ends at 17 to brackets 18 secured to the inner edge of the stile and are provided at their outer ends with rollers 19, the peripheries of which are beveled on both sides as shown to conform to the contour of the central portion of the adjusting strip 14, as clearly shown in Fig. 4. These links 16 operate as thrust-members, when the sash is to be raised or lowered, to thrust the adjusting strip 14 inwardly of the guide-groove and out of substantial frictional contact with the outer edge of the stile. This may be effected in a simple manner by means of a vertical connecting rod 20 that extends through and is swiveled to the series of links 16, and is normally forced upwardly to throw the thrust-links out of commission as by a coil spring 21 surrounding its lower end between a guide 22 for the foot of the rod and a collar 23 on the rod slightly above its lower end. The rod is positively actuated in a manner to lower the thrust-links 16 by means of a thumb-lever 24 pivoted in the sash frame at 25 and having a laterally projecting movable pinch-handle 26 extending through a

slot 27 of the sash and coöperating with a fixed pinch-handle 28 on the sash. From this construction it will be evident that by compressing the pinch-handles 26 and 28, the rod 20 will be drawn downwardly, thereby drawing the thrust-link 16 toward the horizontal position whereby the adjusting strip 14 is thrust against the bow springs 15, inwardly of the guide-groove, thereby relieving the frictional contact between the lips 10^a of the stile and the adjusting strip. Of course, the rollers 19 continue to engage the adjusting strip as the sash is raised and lowered, but as they have rolling contact only with said adjusting strip the friction of such rollers is negligible.

Figs. 3 and 6 illustrate a modified form of the principle of the mechanism of Figs. 1 and 4 wherein the adjusting strip, in addition to the function of maintaining a snug fit between itself and the sash, also operates to maintain a snug sliding fit between one side of the sash and a side wall of the guide. In this form of the invention, the adjusting strip, which is shown at 29, consists of a channel-shaped member disposed in the guide-groove between the lateral confining walls 12 and 12^a thereof, being adapted to move in a direction transverse to the guide-groove and provided with an inclined operative face 29^a that lies obliquely of the plane of the sash, and has relative sliding engagement with a coöperating inclined or oblique surface 10^b formed on the margin of the stile, which surface 10^b may, as in the case of 10^a, consist of a pair of inwardly turned resilient lips sufficiently separated to accommodate the anti-friction rollers, or of a single continuous surface apertured for the play of said rollers therethrough. Within the hollow stile is a longitudinally extending hollow strip 30 having an obliquely bent outer margin 31 disposed at a right angle to the oblique surfaces 29^a and 10^b of the adjusting strip and stile, respectively. Within this oblique marginal portion of the member 30 is mounted at intervals a series of rollers 32 that engage, through apertures in the wall 10^b of the sash, the oblique wall 29^a of the adjusting strip 29. The strip 30 is pivotally mounted on a plurality of thrust-links 16^a mounted similarly to and having the same functions as the links 16 already described. On the pivot-pins 33 by which the strip 30 is mounted on the links 16^a, is mounted a flat actuating strip 20^a that has the same functions as the rod 20 of Figs. 1 and 4, being guided at its lower end in a keeper 22^a and normally forced upwardly by a leaf spring shown at 21^a. The strip 20^a is manually depressed to actuate the arms 16^a and, through the descent of the member 30 and rollers 32, force the adjusting strip 29 back and out of substantial contact with the sash stile by means of a thumb-lever 24^a similar to the thumb-lever 24 already described. The adjusting strip 29 is yieldingly pressed forward or toward the sash by backing springs 34, which springs serve the further function, in connection with the coöperating inclined surfaces of the sash and adjusting strip, of forcing the outer side wall of the stile into snug engagement with the coöperating side wall of the guide-groove.

In Figs. 2 and 5 I have illustrated another embodiment of the same operative principle wherein the adjusting strip, instead of being mounted in the guide-groove, is carried by the sash stile, the mechanism being provided with means for forcing said adjusting strip inwardly relatively to the sash stile and out of substantial engagement with its coöperating member of the guide-groove to relieve the friction when the sash is to be raised or lowered. Describing this construction, the outer edge of the stile 10 is formed with a reëntrant longitudinal groove 35, in which is mounted the shank or stem 36 of the adjusting strip, this latter being backed by springs 37 and having a beveled outer bead or head 38 adapted to engage a correspondingly concave-faced strip 39 secured in and to the bottom wall of the groove as by means of pins or screws 40 passing through the side strips 12 of the guide. The strip 39 is slotted at intervals to permit of the operation therethrough of rollers as hereinafter more particularly described. The bottom wall member 11 of the guide is likewise provided with apertures or slots registering with the slots of the strip 39; and on the back wall of the member 11 is mounted in horizontally slotted bearings 41 the ends of the spindle 42 of each of a series of rollers 43; the slotted bearings 41 being formed in supporting strips 44 suitably secured to the rear side of the bottom wall 11. The rearwardly projecting portions of the brackets 44 are formed as guides 44^a to slidingly receive a pair of roller-actuating strips 45 that are connected to operate in unison by one or more cross-pins 46 and are each provided at properly spaced intervals with inclined or cam surfaces 45^a constituting one edge of a series of notches, said inclined surfaces 45^a lying directly above and engaging the projecting ends of the spindles 42 of the rollers 43. One or both of the actuating strips 45 is provided with an inwardly projecting toe 47, the depression of which causes the inclined surfaces 45^a to slidingly engage the spindles 42 and thereby force the rollers 43 inwardly; the engagement of the peripheries of said rollers with the outer face of the adjusting strip 38 in turn forcing the latter inwardly in opposition to the springs 37 and relieving it of frictional engagement with the strip 39.

From the foregoing it will be seen that

by my invention I provide a simple and efficient means for automatically maintaining a snug fit of the sash in its guides as well as for automatically adjusting the sash to variations in the width of the sash opening or in the transverse dimensions of the sash-guides, and in association therewith a simple and easily manipulated means for freeing the sash from the frictional engagement necessarily existing between the sash and its immediate engaging parts, so that the sash may easily be raised and lowered with little effort and with little or no wear upon the parts. It will be evident to those skilled in the art that other and mechanically equivalent specific means for attaining the results secured by the invention may be employed without departing from the spirit of the invention or sacrificing any of the advantages thereof; and hence I do not limit the invention to any or all of the particular mechanisms disclosed except to the extent clearly indicated in specific claims.

I claim:

1. The combination with a sash and a sash-guide, of an adjusting strip mounted in said sash-guide and spring-pressed toward said sash, a series of inclined links pivoted to said sash and carrying at their free ends rollers engaging said adjusting strip, and means for moving said links toward a horizontal position whereby to thrust said adjusting strip out of frictional engagement with said sash, substantially as described.

2. The combination with a sash and a sash-guide, of an adjusting strip mounted in said sash-guide, and spring-pressed toward said sash, a series of inclined links pivoted to said sash and carrying at their free ends rollers engaging said adjusting strip, an actuating rod connecting said links, a spring normally impelling said actuating rod in a direction to render said links idle, and manually operable means for moving said actuating rod in the opposite direction whereby to throw said links into action, substantially as described.

3. The combination with a sash and a sash guide, of an adjusting strip mounted in said guide for movement toward and from said sash, a series of inclined links pivoted to said sash and engaging said adjusting strip, and means for altering the inclination of said links in unison whereby to bodily move said adjusting strip to permit the raising and lowering of the sash, substantially as described.

4. The combination with a sash and a sash guide, of an adjusting strip mounted in said guide and spring pressed toward said sash, a series of inclined links pivoted to said sash at one end and bearing with their other ends upon said adjusting strip, an actuating rod connecting said links, a spring normally impelling said actuating rod in a direction to render said links idle, and manually operable means for moving said actuating rod in the opposite direction whereby to throw said links into action, substantially as described.

5. The combination with a sash and a sash guide, of an adjusting strip mounted on one of said members for movement toward and from the other, a series of inclined links pivoted to said other member and engaging said adjusting strip, and means for altering the inclination of said links in unison whereby to bodily move said adjusting strip to permit the raising and lowering of the sash, substantially as described.

6. The combination with a sash and a sash guide, of an adjusting strip mounted on one of said members and spring pressed toward the other member, a series of inclined links pivoted to said other member at one end and bearing with their other ends upon said adjusting strip, an actuating rod connecting said links, a spring normally impelling said actuating rod in a direction to render said links idle, and manually operable means for moving said actuating rod in the opposite direction whereby to throw said links into action, substantially as described.

7. The combination with a sash and a sash guide, of an adjusting strip mounted in said guide and spring pressed toward said sash, a series of inclined links pivoted to said sash at one end and bearing with their other ends upon said adjusting strip, an actuating rod connecting said links, a spring normally impelling said actuating rod in a direction to render said links idle, a lift, and a connection between the lift and actuating rod whereby in the act of lifting the sash to automatically adjust the inclination of the links to remove the adjusting strip out of friction contact with the sash, substantially as described.

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