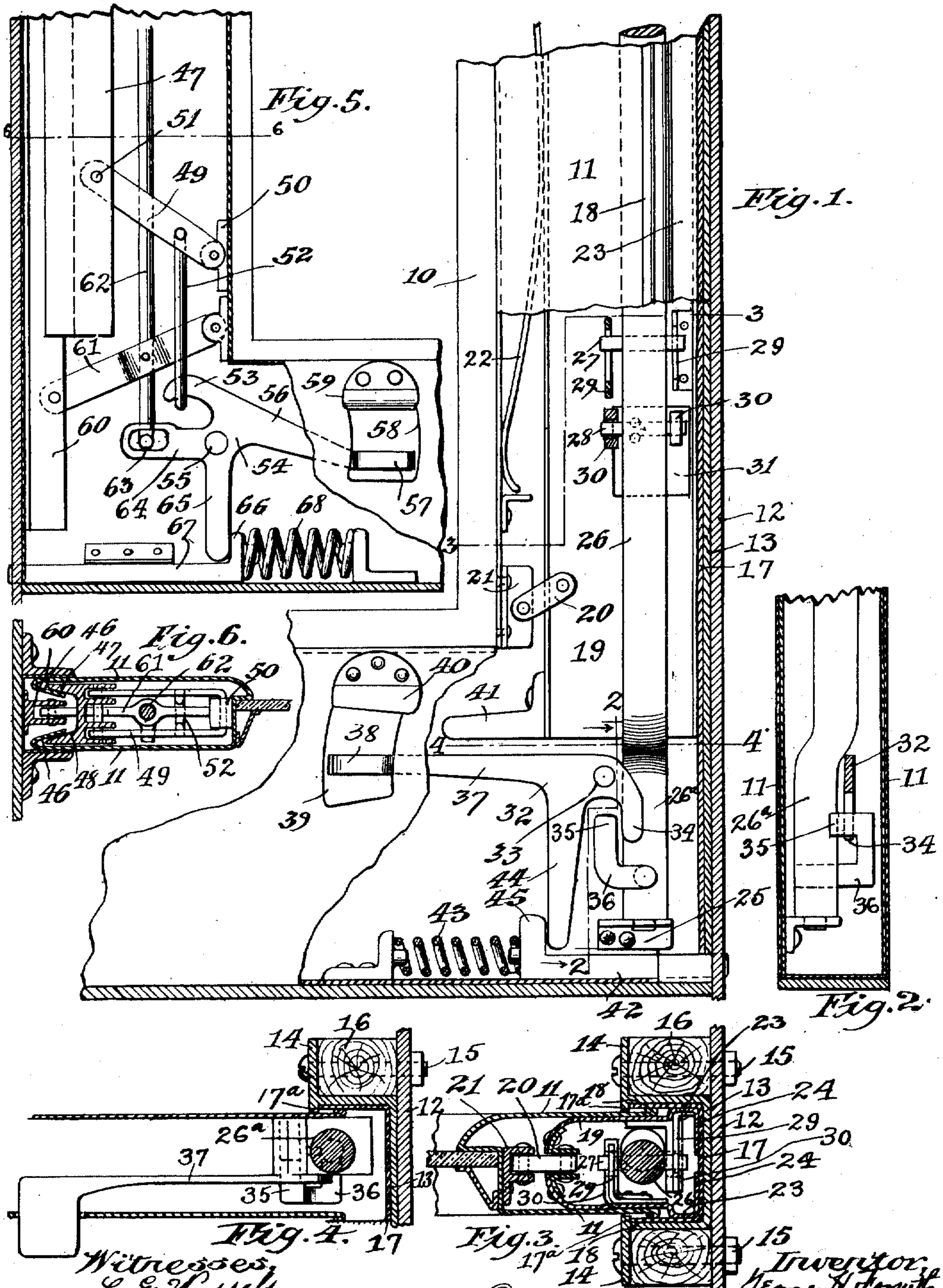


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Witnesses,
C. E. Russell
S. N. Pond

Inventor,
George H. Forsyth
By Offield, Towle & Lathrop

UNITED STATES PATENT OFFICE.

GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

SASH CONSTRUCTION.

994,142.

Specification of Letters Patent.

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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 designed for use in connection with hollow sheet metal sash constructions in which the side walls of the sash stile engage the side walls of the guide under more or less tension; and the principal object of the invention is to provide an improved and efficient means whereby this tension and the consequent friction may be relieved preliminary to the opening and closing movement of the sash.

In its principal and essential features the invention comprehends the combination with a sash and a sash guide the side walls whereof are normally engaged by the sides of the sash under pressure, of an adjusting strip likewise engaging one or more walls of the sash guide under pressure, and means for both retracting the adjusting strip and relieving the pressure of the sides of the sash on the guide preliminary to raising or lowering the sash.

In one form of the invention which I have herein illustrated the adjusting strip engages both the side and transverse walls of the guide-groove, while in the other form it engages only the transverse wall; but in both forms I have embodied means for not only retracting the adjusting strip but likewise relieving the friction between the sides of the sash and the guide preliminary to manipulation of the sash.

The invention will be readily understood when considered in connection with the accompanying drawings, in which,—

Figure 1 is an elevational view, partly in vertical section, broken out to disclose interior parts, of a fragment of a hollow sheet metal sash and its guide embodying my invention. Fig. 2 is a detail fragmentary view on the line 2—2 of Fig. 1, looking in the direction indicated by the arrows. Fig. 3 is a cross-sectional view on the line 3—3 of Fig. 1. Fig. 4 is a cross-sectional view on

the line 4—4 of Fig. 1. Fig. 5 is a view similar to Fig. 1, showing a modified form of the invention. Fig. 6 is a cross-sectional view on the line 6—6 of Fig. 5.

Referring first to the form of the invention illustrated in Figs. 1 to 4, inclusive, 10 designates as an entirety a portion of a hollow sheet metal sash frame, of which the side walls of the stile are designated by 11. 12 designates the base board of the guide, to which is secured a channel-shaped metallic strip 13 forming the guide-groove for the sash stile, said channel-shaped strip having laterally projecting flanges 14 by which it is secured to the base board 12 as by bolts 15 passing through suitable wooden parting strips 16. The channel 13 is, in accordance with my invention, provided with a removable lining 17 of non-corrosive metal held in position by lips 17^a to increase the durability of the structure. The outer margins of the sides 11 of the stile are preferably lipped over on their outer sides, as shown at 18, for engagement of the wearing strip 17, it being observed that the sides 11 are preferably under more or less compression when engaged with the guide-groove so as to produce a snug sliding fit of said sides in the guide-groove. Within the hollow stile and extending longitudinally thereof is a hollow transversely elastic member which I term an adjusting strip, the same being indicated as an entirety by 19. This member is supported from the inner transverse wall of the stile at its inner or closed margin by means of a plurality of inclined links 20 that are pivoted at their lower ends to suitable brackets 21 on the transverse wall of the stile and at their upper ends are similarly pivoted to the adjacent edge of the adjusting strip. A spring 22 (Fig. 1) interposed between the back wall of the stile and the adjacent back wall of the adjusting strip tends to force the latter outwardly of the stile, which it engages under transverse pressure. The projecting portion of the adjusting strip is suitably bent, first outwardly as shown at 23 (Fig. 3) to have a sliding fit with the side walls of the guide, and the marginal portions are then bent inwardly toward each other, as shown at 24, to have a sliding engagement with the bottom or transverse wall of the guide. The transverse elasticity of the adjusting strip, which is slightly compressed when in place, tends to maintain a snug fit with the walls

of the guide independently of and in addition to the fit of the margins of the sides of the stile on the side walls of the guide. This elastic engagement of the said parts with the guide produces such a degree of friction that it is desirable to provide means for relieving this friction preliminary to the raising and lowering of the sash, and one form of such means may consist of the following parts.

In a base bracket 25 (Fig. 1) secured to the inner side of one of the sides 11 of the stile is pivoted a vertically extending spindle 26, the main portion of which lies substantially centrally of the adjusting strip, while its lower end 26^a is laterally offset for convenience of application thereto of the turning means of the spindle. In and through the spindle 26 at one or more points along the length thereof are mounted transverse pins 27, and slightly below the pin 27 is mounted another and similar pin 28. The ends of the pin 27 engage slots formed in a pair of transversely projecting arms 29 that are riveted at one end to the sides of the adjusting strip 19, as clearly shown in Fig. 3; while the ends of the pin 28 similarly engage slots in a pair of transversely extending arms 30 that are similarly secured to the inner sides of the marginal portions of the side plates 11 of the stile. To accommodate the attachment of the arms 30, the sides of the adjusting strip are sufficiently slotted, as shown at 31; this slotting or cutting out of the sides of the adjusting strip being sufficient not only to accommodate the attachment of the arms 30, but also to permit the in and out play of the adjusting strip relatively to the sides of the stile.

From the foregoing it will be seen that if the spindle 26 is turned on its pivot in such a direction as to swing the main body portion of said spindle inwardly of the adjusting strip and stile, the pins 27 and 28, through engagement with the arms 29 and 30, will first draw together the sides of the adjusting strip, thereby relieving their frictional engagement with the walls of the guide-groove, and also with the interior side walls of the stile, and will subsequently similarly compress or draw together the marginal portions of the stile, similarly releasing the frictional hold of the latter upon the guide. For this purpose, the pin-engaging slots of the arms 29 are slightly shorter than the corresponding slots of the arms 30, so that the pin 27 will begin to retract the sides of the adjusting strip slightly before the pin 28 begins a similar operation on the sides of the stile.

Any suitable or convenient means for imparting a turning movement to the spindle may be employed, such a means being illustrated in Figs. 1 and 2, wherein I have

shown an elbow lever 32 pivoted at 33 between the side walls of the stile near the lower end of the latter, said lever having a depending arm 34 adapted to contact the upwardly and inwardly turned end 35 of an arm 36 secured to the lower offset portion 26^a of the spindle; and said lever also having a horizontal inwardly extending arm 37 terminating in a thumb-piece 38 projecting through an arc-shaped slot 39 formed in the side of the lower bar of the sash and adapted to cooperate with a stationary thumb-piece 40 secured to said bar at the upper end of the slot. It will be evident that by compressing the thumb-pieces 38 and 40, the depending arm 34, through contact with the upper end 35 of the arm 36, will rock the spindle and thus relieve the frictional engagement of the sides of the adjusting strip and stile with the guide and with each other. In order to also relieve the engagement of the transversely projecting portions 24 of the adjusting strip with the base of the guide-groove, it is desirable to effect a bodily inward movement of the adjusting strip, preferably subsequent to the retraction of the sides of the latter, which may be done through contact of the arm 37 of the lever 32 with a bracket 41 (Fig. 1) secured to the lower end of the adjusting strip; this contact taking place before the pinch-handles 38 and 40 are entirely compressed. If desired, a locking plunger 42 may also be employed to lock the sash, the same being slidably mounted at the lower end of the latter and normally impelled into locking position by a compression spring 43. Said plunger may be retracted by the lever 32 by means of a depending arm 44 on said lever engaging an upstanding lug 45 of the plunger, such engagement occurring preferably somewhat in advance of the engagement of the arm 34 with the arm 36.

Figs. 5 and 6 illustrate a somewhat different mechanical embodiment of the same operative principle disclosed in the mechanism thus far described. In this form of the invention, the sides 11 of the sash stile are formed with inwardly turned inclined lips or flanges 46 adapted to be slidably engaged by a retracting or releasing device consisting of a vertical strip 47, the outer face whereof is grooved or channeled and formed with inclined longitudinal surfaces 48 that cooperate with the flanges 46. The releasing strip 47 is supported by the inner transverse wall of the stile through the agency of a series of inclined links 49 that are pivoted at their lower ends to brackets 50 carried by the stile, while their upper ends are pivoted to the releasing strip at 51. The lower of said links 49 is connected by a depending link or hook 52 with one arm 53 of a lever 54 that is pivoted at 55 in the lower part of the sash and has an inwardly

extending arm 56 provided with a thumb-piece 57 projecting through an arc-shaped slot 58 in the side wall of the bar and co-operating with a stationary thumb-piece 59 mounted on said side wall at the upper end of the slot. It will be evident that by compressing the thumb-pieces 57 and 59 the link 52 is drawn downwardly, thereby drawing downwardly the inclined links 49 and the releasing strip 47; and by virtue of the inclination of the links 49 the strip 47 is forced outwardly, and the engagement of the inclined sides 48 of the latter with the inclined lips or flanges 46 of the sides of the stile acts to compress or draw together the latter, thus relieving their frictional engagement with the side walls of the guide-groove. In association with the foregoing mechanism I also may employ an adjusting strip to accommodate the sash to variations in the width of the sash opening, such adjusting strip being shown at 60, the same being disposed between the inwardly turned flanges of the stile and pivotally connected to the transverse wall of the latter by a series of links 61 having an opposite inclination to that of the links 49. The strip 60 bears at its outer face on the bottom wall of the guide-groove, as shown in Fig. 6, and the several links 61 are pivotally connected by a connecting rod 62, the lower end of which has a pin-and-slot connection shown at 63 with an outwardly extending arm 64 of the lever 54. Said lever 54 has a depending arm 65 that engages an upstanding lug 66 on a locking plunger 67 slidably mounted at the lower end of the sash, said plunger being normally pressed outwardly by a strong compression spring 68. The action of this spring, through the lever 54 and the connecting rod 62, tends to throw the links 61 upwardly toward the horizontal position, thereby forcing the adjusting strip 60 outwardly into snug engagement with the bottom wall of the guide-groove. The compression of the thumb-pieces or pinch-handles 57 and 59 not only actuates the releasing strip 47 in the manner already described, but also retracts the locking plunger 67 and the adjusting strip 60.

From the foregoing it will be observed that in both forms of the invention illustrated provision is made for securing automatic adjustment and a snug fit to the sash in its guides through the provision of the adjusting strip, and provision is also made for relieving the frictional hold of both the adjusting strip and the sides of the stile on the guide, preliminary to the raising and lowering of the sash, thus facilitating the movement of the latter while maintaining a tight and practically dust, moisture, and air-proof fit of the sash in its guides when in closed position.

It will be evident that modifications and

variations in the detail devices employed for effecting the results stated will readily occur to those skilled in the art, and hence I do not limit the invention to the particular mechanisms disclosed, except to the extent indicated in specific claims.

In the construction shown, wherein the guide is in groove or channel form, the transverse elastic effect is secured by making the side walls of the stile of outwardly flaring form and compressing them into the guide-groove. It is evident that this same principle might be employed in connection with a projecting guide by making the side walls of the stile of inwardly inclined form and expanding them over the side walls of the guide.

I claim:

1. The combination with a sash guide, of a sash stile having a side thereof normally engaging the guide under pressure, said side having a marginal stiffening member, and means engaging said stiffening member for relieving the pressure of said side against the guide.

2. In a window construction, the combination of a sash guide, a sash having sides engaging the sides of said guide, means for loosening the engagement of the sides of said sash with said guide, adjusting means engaging the bottom of said guide, means for loosening the engagement of said adjusting means, and common means for actuating the loosening means associated with the sash and the loosening means associated with the adjusting means, substantially as described.

3. In a window construction, the combination of a sash guide, a sash having sides engaging said guide, means for loosening the engagement of the sides of said sash with said guide, adjusting means engaging the bottom of said guide, loosening means for said adjusting means, a lock on said sash, and common means for actuating the loosening means associated with the sides of said sash, the loosening means for said adjusting means and the lock, substantially as described.

4. In a window construction, the combination of a sash guide, a sash having sides engaging said guide, means for loosening the engagement of the sides of said sash with said guide, an adjusting strip engaging the bottom of said guide, loosening means for said adjusting strip, and common means for first actuating the loosening means associated with the sides of said sash and then actuating the loosening means associated with said adjusting strip, substantially as described.

5. In a window construction, the combination of a sash guide, a sash having sides engaging the sides of said guide, means for loosening the engagement of the sides of

said sash with said guide, adjusting means engaging the bottom of said guide, means for loosening the engagement of said adjusting means, and manually operated means for actuating the loosening means associated with the sash and the loosening means associated with the adjusting means, substantially as described.

6. In a window construction, the combination of a sash guide, a sash having sides engaging said guide, means for loosening the engagement of the sides of said sash with said guide, an adjusting strip engaging the bottom of said guide, loosening means for said adjusting strip, and manually operated means for first actuating the loosening means associated with the sides of said sash and then actuating the loosening means associated with said adjusting strip, substantially as described.

7. In a window construction, the combination of a sash guide, a sash having sides engaging said guide, means for loosening the engagement of the sides of said sash with said guide, a link connecting said loosening means with said sash, a second link attached to said first link, manually operated means engaging said second link, an adjusting strip engaging the bottom of said guide, a link connecting said adjusting strip with said sash, and means connecting the link between

said adjusting strip and said sash with said manually operated means, whereby actuation of the latter loosens the engagement of the sides of said sash with said guide and the engagement of said adjusting strip with the bottom of said guide, substantially as described.

8. In a window construction, the combination of a sash guide, a sash having sides engaging said guide, means for loosening the engagement of the sides of said sash with said guide, a link connecting said loosening means with said sash, a second link attached to said first link, manually operated means engaging said second link, an adjusting strip engaging the bottom of said guide, a link connecting said adjusting strip with said sash, and means connecting the link between said adjusting strip and said sash with said manually operated means, whereby actuation of said manually operated means first loosens the engagement of the sides of said sash with said guide and then loosens the engagement of said adjusting strip with the bottom of said guide, substantially as described.

GEORGE H. FORSYTH.

Witnesses:

SAMUEL N. POND,
FREDERICK C. GOODWIN.