March 7, 1944. O. L. DAUTRICK 2,343,446

WINDOW STRUCTURE

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Fig. 1.

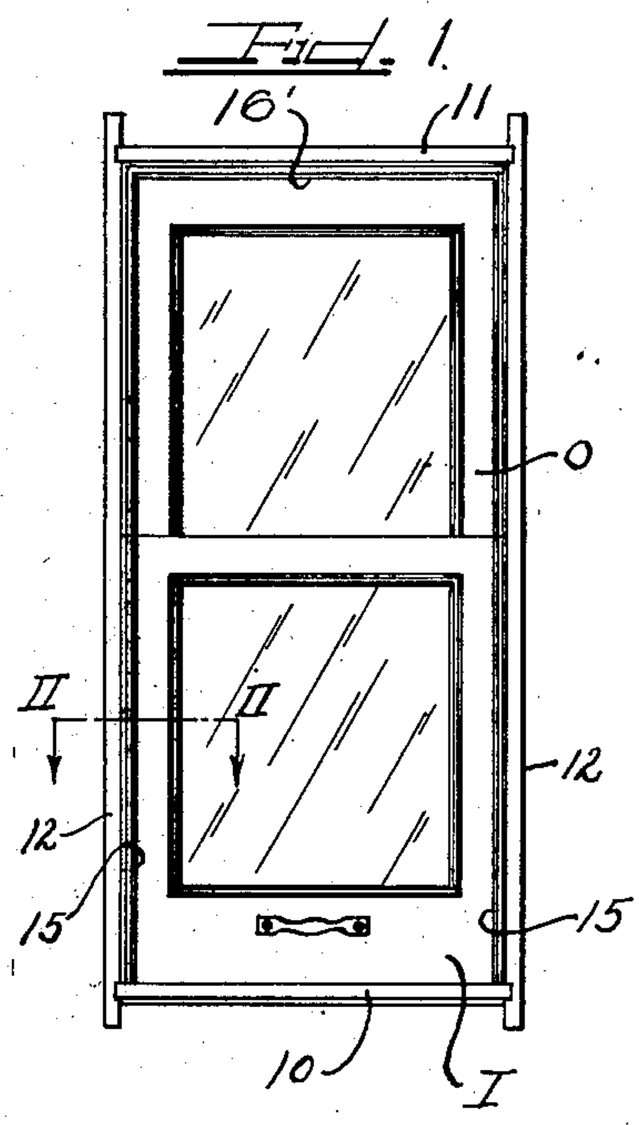

Fig. 6.

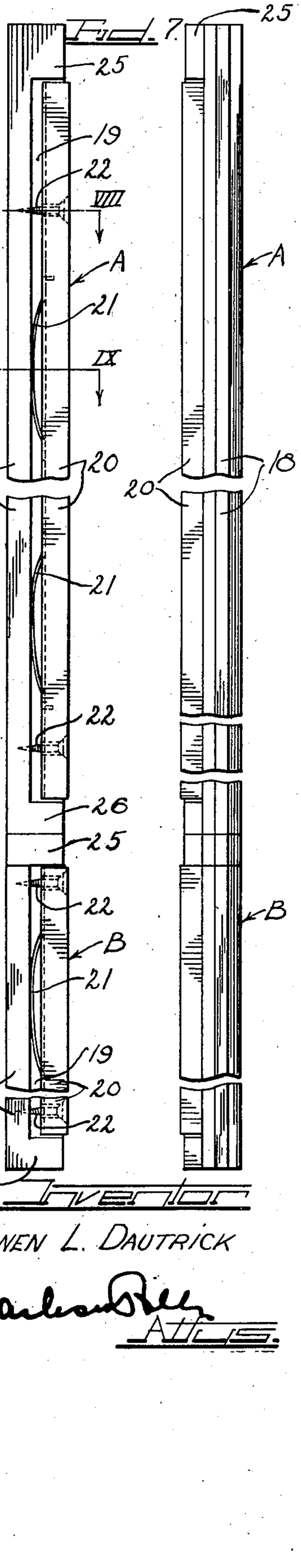

Fig. 8.

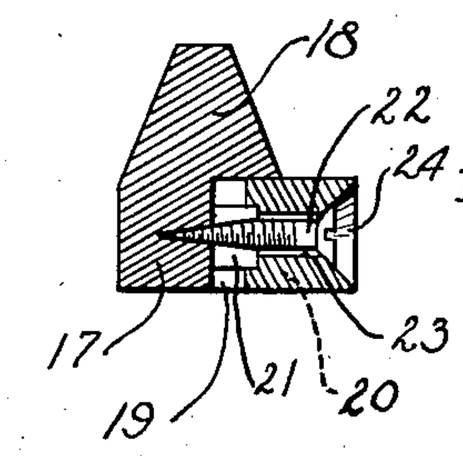

Fig. 9.

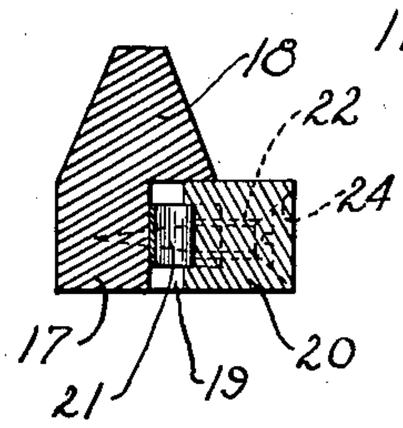

Fig. 2.

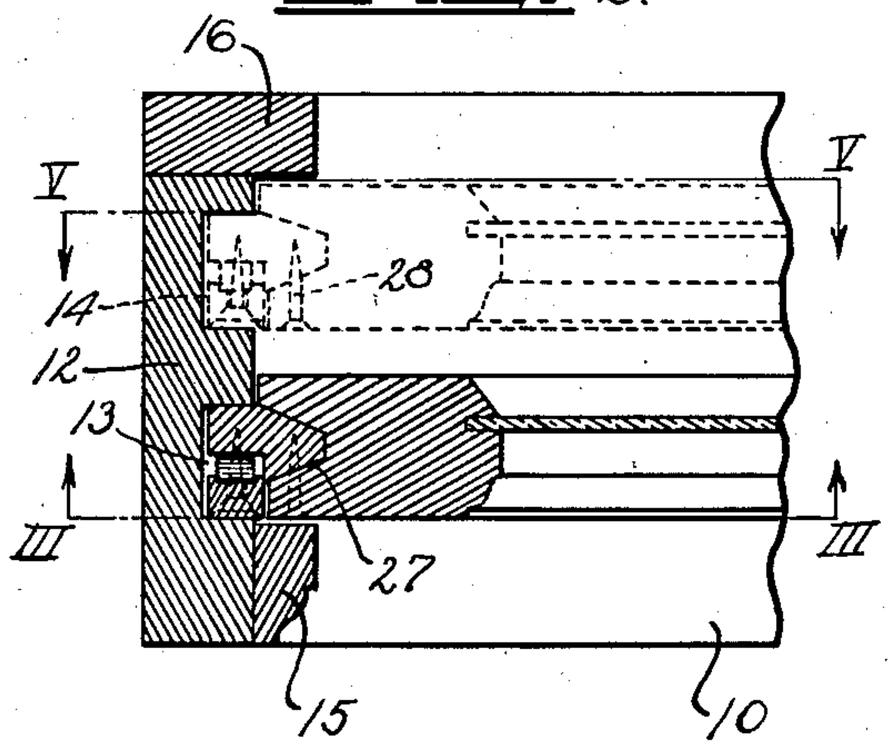

Fig. 7.

Inventor

OWEN L. DAUTRICK

By Charles Bell Atty.

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Fig. 3

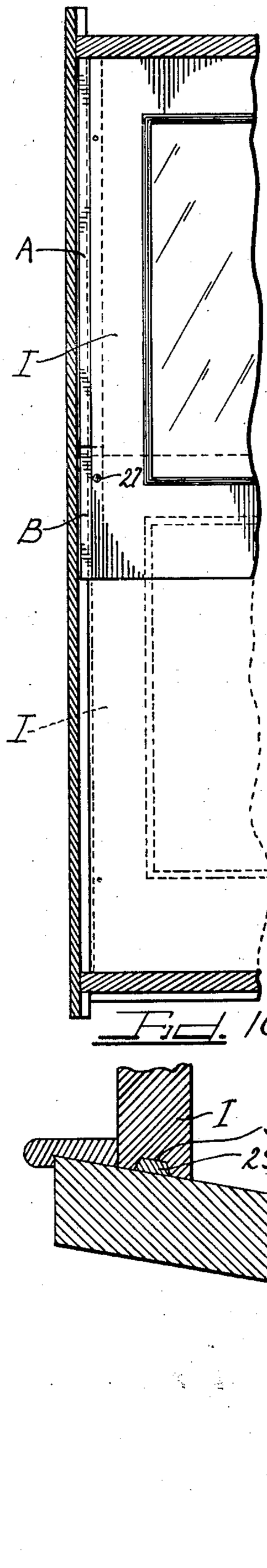

Fig. 4

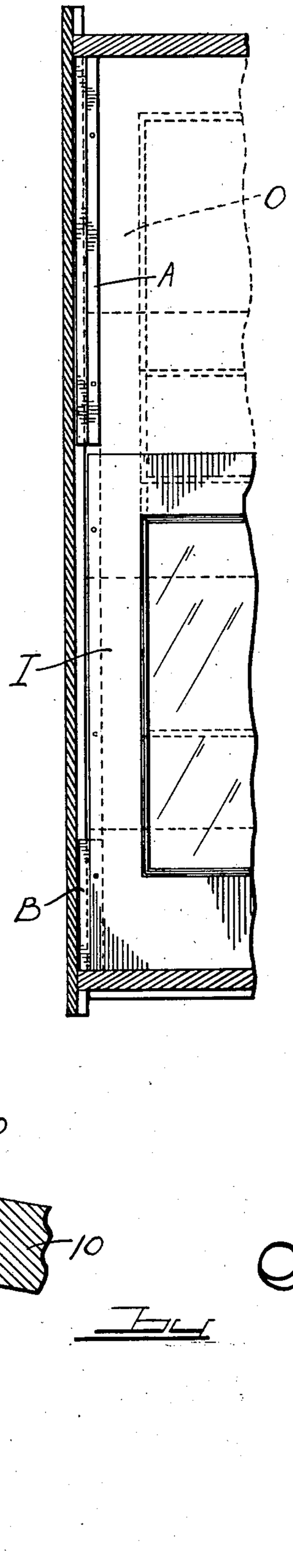

Fig. 5

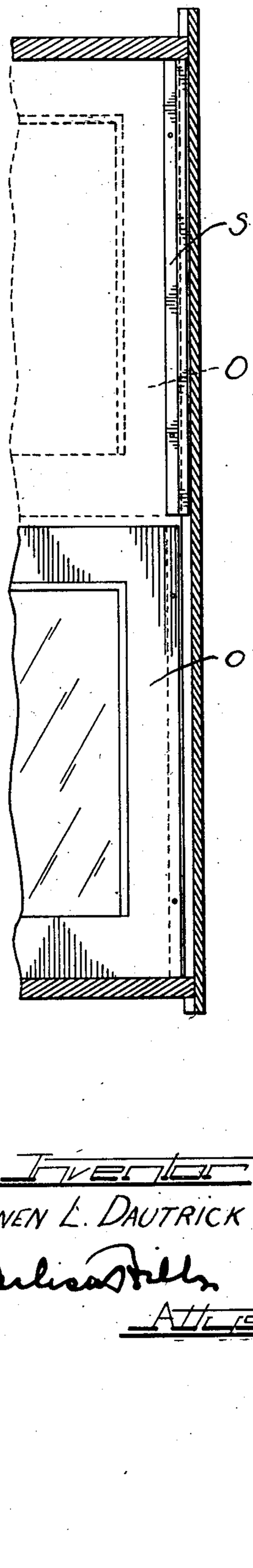

Fig. 10.

Inventor

OWEN L. DAUTRICK

By Charles Stillman

Atty.

Patented Mar. 7, 1944

2,343,446

UNITED STATES PATENT OFFICE

2,343,446

WINDOW STRUCTURE

Owen L. Dautrick, Ferndale, Mich.

Application April 13, 1942, Serial No. 438,731

1 Claim. (Cl. 20—52.3)

This invention relates to window structures of the type in which window sashes are slidable in frames and are frictionally held in adjusted position without the use of pulleys, sash cords, or counterbalancing weights.

Under present war conditions there is an increased demand for window units for defense housing, and the Government does not permit metal to be used for weatherproofing and requires the use of metal parts to be reduced to a minimum.

An important object of my invention is to produce a window unit which, with the exception of a minimum number of stock screws and a comparatively small number of springs, is entirely of non-metallic material such as wood.

A further important object is to provide window structure in which slider elements, substantially entirely of wood, are insertable in the ordinary channels in the window frame for frictional engagement therein and to be detachably secured to the window sash to form the guides therefor when raised or lowered, and with the slider elements so constructed and arranged that, upon detachment of the sash, the slider elements and the sash may be relatively displaced longitudinally so as to free the sash for bodily removal from the frame for purposes of inspection or repair, or for washing, and so that for resetting of the sash in the frame, the sash and the slider elements may be readily manipulated back into service position.

Another important object is to provide such structure for the sash and the slider elements that distortion or injury of the slider elements will be prevented in the event the slider elements and the sash become stuck together due to paint, swelling, or other causes.

In general, the object is to produce a window structure or assembly in which the sash may be moved freely up and down without sticking and will be held in any adjusted position, free of rattle, without the use of weights, pulleys, or weight pockets, and in which the sash may be conveniently bodily removed from the frame.

The various features of my invention are incorporated in the structure shown on the drawings, in which:

Figure 1 is a front elevation of a window comprising upper and lower sashes;

Figure 2 is an enlarged cross section on plane II—II of Figure 1;

Figure 3 is a section on plane III—III of Figure 2 showing the lower sash raised preparatory to bodily removal thereof from the frame;

Figure 4 is a section similar to Figure 3 but showing the lower sash in its lower position for disconnection thereof from the slider elements;

Figure 5 is a section on plane V—V of Figure 2;

Figure 6 is a rear side elevation of one of the slider assemblies for the lower sash;

Figure 7 is a front side elevation of one of the slider assemblies for the lower sash;

Figure 8 is an enlarged section on plane VIII—VIII of Figure 6;

Figure 9 is an enlarged section on plane IX—IX of Figure 6; and

Figure 10 is an enlarged cross section of the lower end of the lower sash and the sill board showing weather stripping at the sill.

Figure 1 shows a window frame of usual standard construction comprising the sill 10, the upper rail 11, and the sides 12, inner and outer sashes I and O being vertically slidable in the frame. Referring to Figure 2, each side wall 12 has inner and outer rectangular channels 13 and 14 extending longitudinally between the sill and the upper rail. Along the inner edges of the side walls 12 are detachably secured the molding stops 15, and along the outer edges of the side walls are the usual blind stops 16, a top stop strip 16' being secured to the upper rail 11.

Each of the slider elements S for the inner sash comprises an upper section A and a lower section B. The total length of each element is equal substantially to the height of the inner sash, but the upper section is of a length slightly less than the distance between the upper rail 11 of the window frame and the top of the inner sash when in its down position. The sections A and B, except for length, are of the same construction. Each comprises a body strip 17 of rectangular cross section and having the bevelled tongue 18 extending inwardly therefrom, the body being cut away to leave the rectangular recess 19, which is overhung by the tongue 18. Within the recess 19 engages the friction or braking strip 20 of rectangular cross section, one or more springs 21 between the strips 17 and 20 urging them apart for frictional engagement of the outer surfaces of the strips with the side walls of the corresponding channels in the window frame side walls. Screws 22, which may be of the ordinary flat head type, extend through the holes 23 in the strip 20 and thread into the strip 17 for guiding and limiting the movement of the strip 20 relative to the strip 17. The holes 23 are of sufficient diameter for easy movement of the strip 20, and in the outer side of the strip 20 are the countersunk holes 24 for the screw heads, these countersunk holes being of a depth so that the screw heads will never project beyond the outer side of the strip. The recess or channel 19 preferably terminates a distance short of the upper and lower ends of the strip 17 so as to leave upper and lower abutments 25 and 26 for holding the braking strip 20 against longitudinal movement which might strain or distort the screws 22 when the sash is raised or lowered.

The slider elements S' for the outer sash O (Figure 5) are constructed the same as the slider elements S for the inner sash, except that the elements S' are continuous and of a length substantially equal to the height of the outer sash, the elements S' being in the outer channels 14 in the frame side walls 12.

The bevelled tongues 18 on the slider structures are received in correspondingly shaped grooves 27 in the sides of the respective sashes, as shown on Figure 2, and ordinary wood screws 28 may be employed for detachably securing the sashes to their respective slider elements, so that upon raising or lowering of the sashes their respective slider elements will move therewith in the frame side channels to be held in any adjusted position by the frictional engagement of the slider elements with the channel side walls caused by the springs 21.

If it is desired to remove the inner sash bodily from the frame, the inner strips 15 are first detached, and then the inner sash is raised to the top of the frame as shown on Figure 3. The screws 28, which secure the sash to the upper sections A of the slider elements S, are then withdrawn and the sash together with the lower sections B of the slider elements S is then shifted down to the sill of the frame, as shown on Figure 4, and the screws 28 which secure the sash to these sections B are then removed. The frictional engagement of the slider elements in the frame channels is greater than the frictional engagement of the sash with the frusto-conical guide tongues on the slider elements, and therefore when the sash is lowered, as shown on Figure 4, the slider element sections A will remain at the upper end of the frame channels while the sash is being withdrawn longitudinally downwardly therefrom. The upper slider sections A are then removed from the frame channels, and the sash, after unscrewing from the lower slider section B, is raised to bring its lower edge a distance above the sections B which, by their frictional engagement, are held at the bottom of the frame channels, and the sash is then free to be lifted out bodily from the frame. Another procedure for bodily removing the inner sash might be to first bring the sash down to the sill, then withdraw the upper slider sections A therefrom and remove them from their frame channels, then unscrew the sash from the lower slider sections B, and then raise the sash above these lower sections for bodily removal from the frame.

The outer sash is usually bodily removed from the frame after bodily removal of the inner sash therefrom. For such removal of the outer sash, it is raised to the top of the frame, and the screws 28 are withdrawn to disconnect the sash from its slider elements S', and then the sash is moved down to the sill for bodily removal from the frame, the slider elements S' being held by friction in the upper ends of their channels, as shown on Figure 5. To reset the outer sash in the frame it is shifted upwardly to receive the slider elements S', or the slider elements are shifted down in the sash grooves, and the sash is then secured to the slider elements by the screws 28. To reset the inner sash in the frame, it is first shifted downwardly to receive the slider sections B and is then secured thereto by screws 28, and then the slider sections A are slid down the grooves 27 in the inner sash and screws 28 are applied to secure the sash to these sections A.

Figure 10 shows a practical arrangement for weather stripping between the inner sash and the sill. A weather strip 29, which may be of wood or other inexpensive non-metallic material, may be seated and secured in the channel 30 in the lower end of the sash, or it may be secured to the sill to receive the channel in the sash when the sash is closed.

With the exception of the few stock screws and the few lengths of steel band for the springs, the entire window structure may be economically made of non-metallic material such as wood. The slider elements will hold the sash in any adjusted position in the frame independently of weights, pulleys, or weight pockets and will also serve to weatherproof the window. The stops 25 and 26 on the slider elements will protect the friction or braking strips and their mounting screws against distortion, and the bevelled tongue and groove connections between the sash and the slider elements will reduce friction and eliminate sticking between the sash and the slider elements. The windows will therefore always freely move up and down and will not stick, and rattling is eliminated.

I have shown an efficient embodiment of the features of my invention, but I do not desire to be limited to the exact construction and arrangement shown and described, as changes and modifications may be made without departing from the scope of the invention.

I claim as follows:

In a window frame having guide channels in its opposite sides for a window sash, slider elements in said channels, said sash having longitudinally extending grooves in its sides, each slider element comprising a body strip and a braking strip, each body strip having a portion of rectangular cross-section engageable with one side of the corresponding channel and having a tongue extending full length thereof and projecting inwardly for engagement in the corresponding groove of said sash, each body strip having a longitudinally extending recess therein for receiving the corresponding braking strip for engagement with the other side of the corresponding channel, spring means between the strips urging them apart for friction engagement of the body strip and braking strip with the opposite sides of the corresponding channel, screws holding each braking strip to the corresponding body strip but permitting free transverse movement of said braking strip by said spring means, means detachably securing the sash to said tongues whereby said slider elements will follow the movement of the sash in the frame, the longitudinal recess in each body strip terminating short of the upper ends of the strip whereby to leave overhanging portions at the ends of the body strip over the longitudinal recess therein to function as upper and lower abutments for holding the corresponding braking strip against longitudinal displacement and for protecting the braking strip holding screws against strain, the lengths of said slider elements being such that, upon detachment of the sash from the slider element tongues, said elements and sash may be shifted relatively longitudinally for separation from each other and bodily removal of the sash from the frame.

OWEN L. DAUTRICK.