March 26, 1946. O. L. DAUTRICK ET AL 2,397,090

WINDOW STRUCTURE

Filed Dec. 17, 1943 2 Sheets-Sheet 1

Fig. 1.

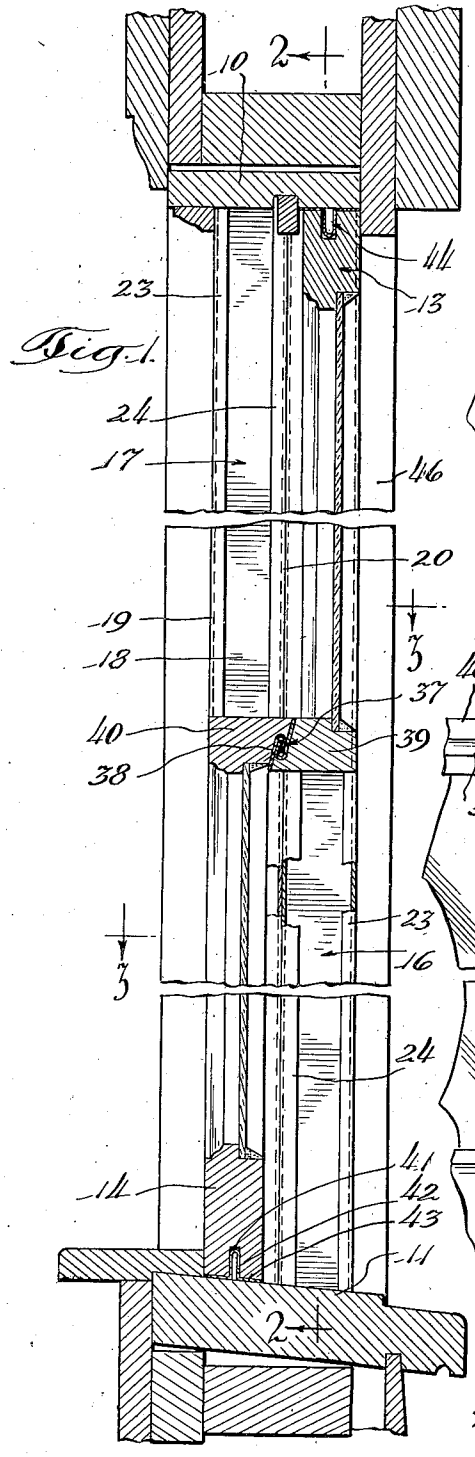


Fig. 2.

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Filed Dec. 17, 1943 2 Sheets-Sheet 2

Fig. 3.

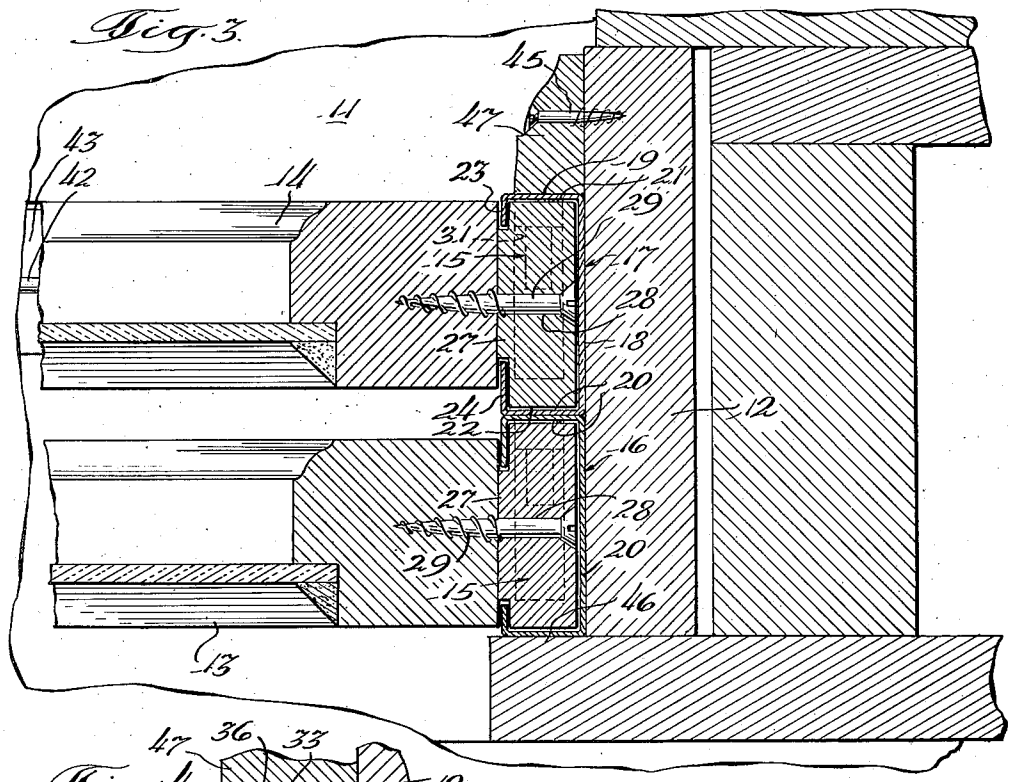


Fig. 4.

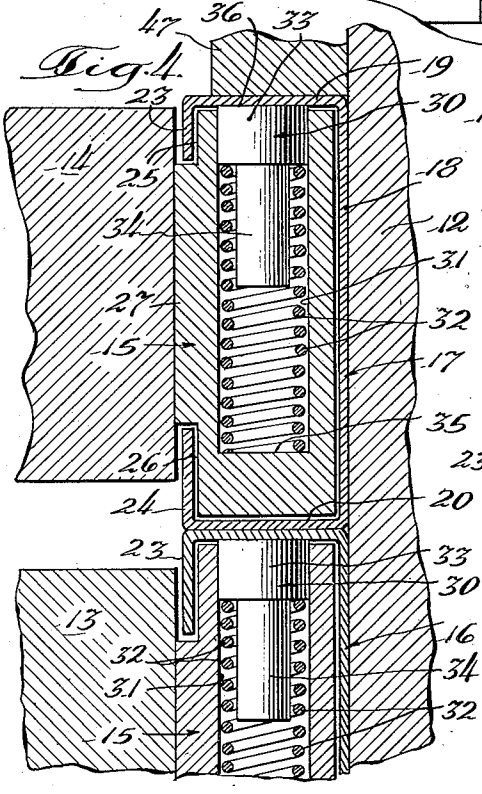


Fig. 5.

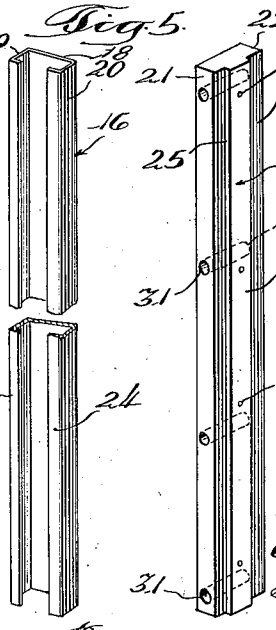
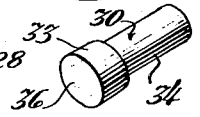


Fig. 6.

Fig. 7



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Patented Mar. 26, 1946 2,397,090

UNITED STATES PATENT OFFICE

2,397,090

WINDOW STRUCTURE

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Detroit, Mich.

Application December 17, 1943, Serial No. 514,632

1 Claim. (Cl. 20—54)

The present invention relates to window structures and is particularly concerned with windows of the sash type.

One of the objects of the invention is the provision of an improved structure for supporting and guiding windows of the sash type in such manner that the builders may dispense with the usual ropes, pulleys, and sash weights of the prior art, the sashes being held in any adjusted position by means of a plurality of spring pressed friction members.

Another object of the invention is the provision of an improved window sash structure which is so arranged that each sash with its guides may be installed or removed as a unit so as to facilitate the cleaning or painting of the windows or sashes, and to eliminate the hazards which have been found with the devices of the prior art where it has been necessary to clean or paint the windows or sashes from the outside.

Another object of the invention is the provision of an improved sliding sash unit by means of which any sash may be guided for maintaining an effective closure of the window frame and by means of which the sash is automatically held in any adjusted position.

Another object of the invention is the provision of improved sash hardware which is sturdy, capable of use for a long period of time without necessity for repair or replacement of parts, and adapted to be manufactured at a low cost so that it may be capable of extensive use.

Another object of the invention is the provision of an improved sash supporting structure which is practically weather-tight and by means of which the sashes are supported so that they can always be easily opened or closed or moved to any desired adjusted position.

Other objects and advantages of our invention will appear more fully from the following description and from the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the drawings, of which there are two sheets:

Figure 1 is a fragmentary vertical sectional view through a window frame and sash structure embodying the invention taken on the plane which passes at right angles to the wall within which the window frame is located;

Fig. 2 is a fragmentary elevational view in partial section taken on the plane of the line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a fragmentary horizontal sectional view taken on the plane of the line 3—3 of Fig. 1 looking in the direction of the arrows;

Fig. 4 is a fragmentary horizontal sectional view taken on the pane of the line 4—4 of Fig. 2 looking in the direction of the arrows and showing the spring-pressed friction devices for holding the sash in adjusted position;

Fig. 5 is a view in perspective of one of the metallic guide members for the sash;

Fig. 6 is a view in perspective of one of the wooden slider members which is attached to the sash for guiding it in the guide members of Fig. 5; and

Fig. 7 is a view in perspective of one of the spring-pressed plunger members carried by the sliders of Fig. 6 for holding the sash in any adjusted position.

The present sash hardware may be used on practically any type of sash windows and it is illustrated in connection with a window frame the upper rail of which is indicated at 10, the frame sill at 11, and side frame members or uprights at 12. The upper sash is indicated in its entirety by the numeral 13 and the lower sash by the numeral 14.

The sash to be used according to the present invention is of narrower width than the space between the uprights or side frame members 12 by an amount sufficient to accommodate a pair of the slider members 15 (Fig. 6) one of which is to be attached to each side of each sash.

The slider members 15 are adapted to be slidably received within the channels 16, 17 which are located on each side of the frame for slidably supporting the sash 13, 14.

The channels 16, 17 preferably comprise sheet metal members made of suitable metal such as steel or copper or spring bronze and the channeled members are preferably of the same shape but are oppositely disposed. Thus each channel member has a relatively wide body flange 18 which is slightly wider than the width of the slider 15 and a pair of edge flanges 19, 20 at right angles to the body flange 18.

The width of the edge flanges 19, 20 is preferably such that the relatively narrow edge portions 21, 22 of each slider 15 may be received inside the channel. Each edge flange 19 and 20 carries an inwardly directed retaining flange 23 and 24, respectively, and these flanges extend at right angles to the edge flanges 19 and 20 and are parallel to the body flange 18.

The sliders 15 are preferably made of relatively hard wood and they comprise elongated strips of lumber which are substantially rec-

tangular in cross section except for the angular recesses 25, 26 for the flanges 23 and 24 of the channels 16. These recesses are deep enough so that there is a clearance on both sides of the flanges 23 and 24 when the sliders 15 are attached to the sashes. This leaves a member of substantially rectangular cross section having a projecting portion 27 at the middle of one side for engaging the edge of the sash.

Each slider is provided with a plurality of apertures 28 for receiving the wood screws 29 by means of which it is attached to the edge of a sash. The sliders 15 are preferably of substantially the same length as the sash to which they are attached, while the channels 16 are preferably of substantially the same length as the inside vertical space in the window frame.

Thus the channels preferably extend from the bottom to the top of the frame while the sliders extend from the bottom to the top of each sash but in some embodiments of the invention the sliders or the channels may be made shorter since they may still effect their guiding function even though they are shorter. The channels however preferably go from top to bottom so that the edge of the sash at the window frame is completely enclosed at all times and there is no chance of cracks existing between the sash and the window frame at any time.

In order to hold each sash in its adjusted position, the sash is preferably provided with a plurality of spring-pressed friction devices such as the plungers 30 located in the bores 31 in the sliders 15 and engaged by the helical springs 32. Any suitable number of these plungers may be used and the number used depends upon the strength of the springs and the weight of the sash as the friction must be increased for the heavier sash and this can be done in some measure by increasing the spring tension or it can be done by using a greater number of plungers.

Each plunger 30 preferably has a cylindrical head 33 which may have a sliding fit in the bore 31 and each plunger preferably has a cylindrical shank 34 which is adapted to be received inside the end of the helical spring 32 to serve as a guide for the spring. The other end of the spring 32 engages the end 35 of its bore 31 and the springs are under initial compression when the slider is inserted in its channel so that the plane end 36 of each plunger engages the flat inner surface of the flange 19 or 20 and acts as a brake shoe to prevent the sliding movement of the sash.

The plungers 30 may be made of relatively hard wood or they may be formed out of a phenolic condensation compound or other non-metallic material.

The friction between the ends 36 of the plungers and the channel is sufficient to hold the sash in any adjusted position but not sufficient to prevent positive movement of the sash by an operator.

At the juncture between the upper and lower sash, the installation is preferably provided with any suitable form of weather-stripping such as the folded sheet metal weather-strip 37 which extends downward and upward, having an open upper groove for engagement with a similar weather-strip 38 having an open downward groove. The weather-strip 37 is carried by the lower rail 39 of the upper sash while the weather-strip 38 is carried by the upper rail 40 of the lower sash.

At the bottom, the bottom rail of the lower sash 14 is preferably grooved at 41 for receiving a substantially U-shaped weather-strip 42 which has outwardly extending attaching flanges 43 secured to the sill 11. A similar weather-strip 44 is arranged at the top for engagement in a groove in the top rail of the top sash 13.

The frame is provided with the usual inner window stop 47 which may be secured in place by a plurality of wood screws since this stop may be removed for taking out the sash units. The frame is also provided with any suitable form of outer window stop 46 such as the usual rectangular strip of wood or the trim may extend inwardly over the edge of the window frame as shown in Fig. 3 to act as the outer stop.

The assembly of my window structure is as follows: Each sash is preferably trimmed to proper width so that when the sliders 15 are attached at each side of the sash, the sash and sliders will slide readily in the channels 16 when they are placed in the window frame between the stops 46 and 47. The sliders are attached to the edge of the sash by means of the wood screws 29 and the channels 16 are then slid endwise on the sliders 15, one channel being used at each side. As the channels are slid on the sliders, the springs 32 and plungers 30 are placed in their bores 31, and the plungers are pressed inwardly until they can be received in the channel.

Assuming for example that the upper sash has been assembled with its sliders, channels and plungers, the plungers will retain the channels in any adjusted position and the channels may be moved to such a position that they project equally from both ends of the sash. Then the sash and its channels may be handled as a unit and placed in the window frame against the stop 46 in the position shown in Fig. 3. The next or lower sash may then be assembled with its sliders, plungers and channels, and placed in the frame in its proper position. Then both channels may be secured in place by means of the window stop 47 secured by wood screws 45 and whenever it is desired to remove a sash, it may be removed as a unit with its channels and sliders merely by removing the screws of the window stop 47.

The operation of the window structure is as follows:

The channels 16 engaging the sliders 15 act as weather-strips at the edge of each sash and since the wooden sliders engage metal channels, the sash will slide more readily than the devices of the prior art where wood engages wood. No sash weights, cords or pulleys need be used and the labor of installing such sash is thus greatly reduced and the cost is also reduced.

When it is desired to lift a window, the operator need only exert sufficient force to overcome the friction of the plungers carried by that sash engaging the side flange of the channels and this friction is only slightly more than enough to hold the sash in its adjusted position. The sash will then be held where it is placed by means of the spring pressed plungers 30. When the sash is closed, the operator need only exert a relatively small force as the weight of the sash is added to his efforts in forcing the sash downwardly.

It will thus be observed that the present window structure permits the sash to be removed as a unit with its guides whenever it is desired to wash the sash or paint it and the present installation accomplishes the same purposes without the use of any sash weights, pulleys, or ropes. It may be used upon simpler types of window

frames since they do not require a box for the sash weights and the present structure greatly reduces the expense of installation of the window sashes.

The sliding action of the sash in its present structure is much more certain and dependable and there is less possibility of the sash sticking in its guides than with the devices of the prior art where the edge of the sash had sliding engagement with wood surfaces that are usually painted. The present window structure may be used for a long period of time without necessity for repair or replacement of any of its parts and it is not necessary to paint the metallic parts of the window since they may be made out of steel or other metal suitably treated to resist corrosion.

Since the screws which attach the sash to its guides have their heads located inside the channels, these screws are not visible and cannot be removed from the outside by unauthorized persons.

While we have illustrated a preferred embodiment of our invention, many modifications may be made without departing from the spirit of the invention, and we do not wish to be limited to the precise details of construction set forth, but desire to avail ourselves of all changes within the scope of the appended claim.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States, is:

In a window frame having outer and inner stops and having oppositely disposed vertical frame members, a pair of channelled sheet metal guide members located between the stops adjacent each vertical frame member of the window frame, said channelled guide members being of substantially rectangular shape in cross section and having inwardly extending flanges on the side adjacent the sash, said flanges being spaced from each other to provide an opening in each channel, a wooden slider member having a sliding fit in each of said channels, said slider member being provided with a plurality of transversely extending bores and said bores being provided with friction plungers engaged by compression springs in said bores to place sufficient friction between said plungers and one of the side flanges of each of said channelled members to hold a sash in any predetermined adjusted position, each of said slider members comprising an integral strip of greater width than the window sash to which it is attached to extend laterally beyond one side of the sash only, and the friction means holding the channels on the sliders at the edge of each sash when assembled so that the sash with its sliders and channels may be inserted or removed from the window frame as a unit.

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