Jan. 1, 1957 J. PASSIS 2,775,796

WINDOW STRUCTURES

Filed July 7, 1954

Fig. 1

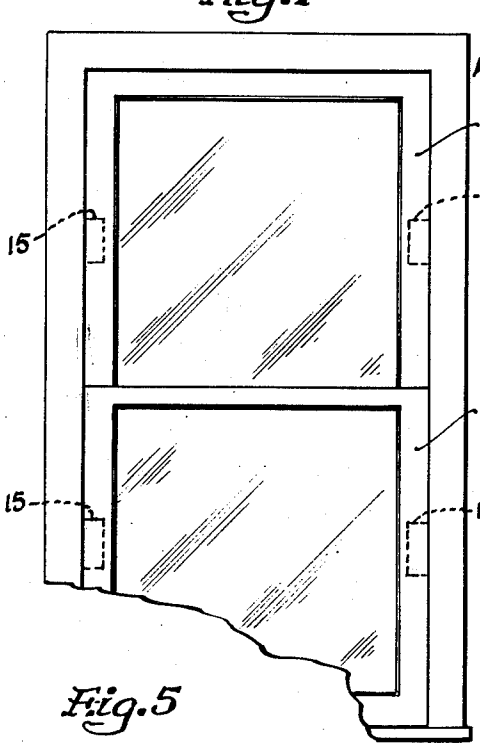


Fig. 2

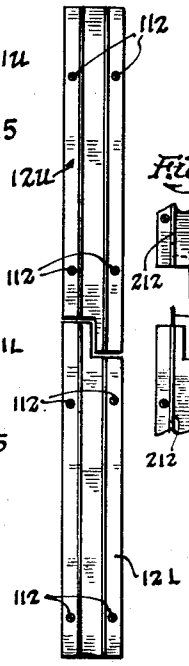


Fig. 2A

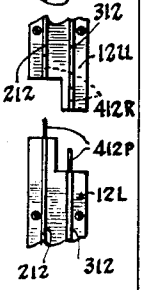


Fig. 3

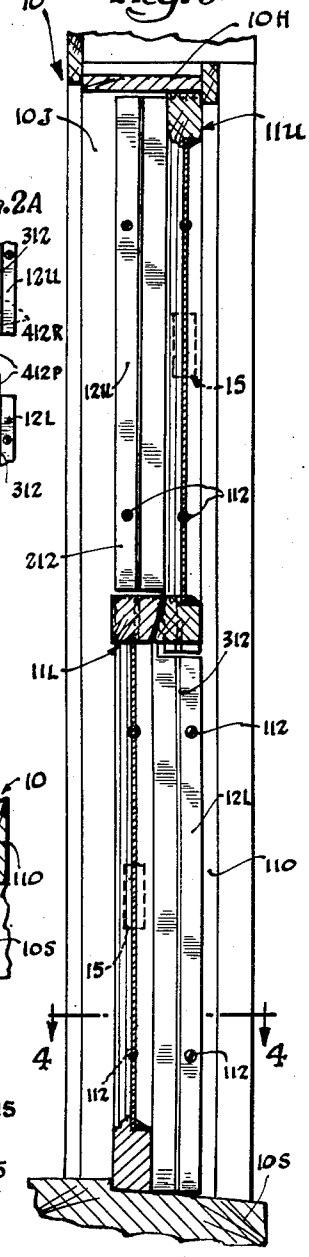


Fig. 5

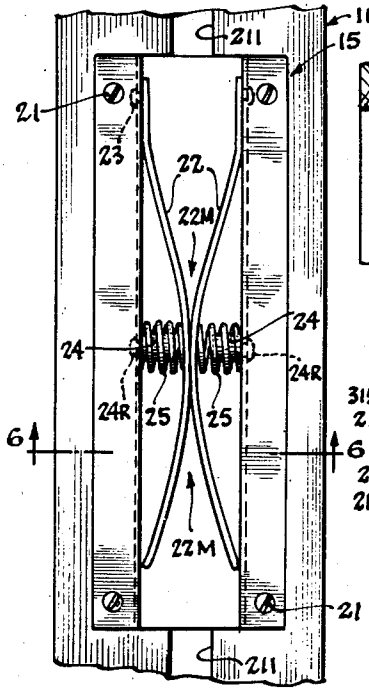


Fig. 4

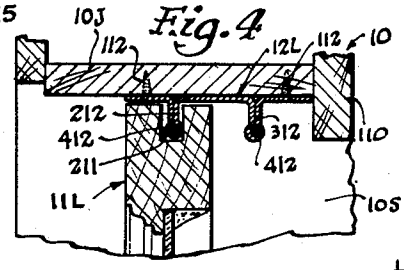
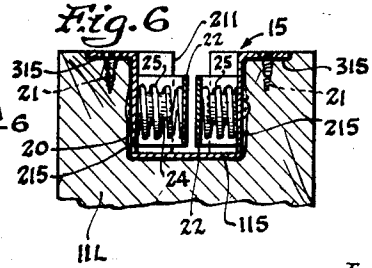


Fig. 6



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WINDOW STRUCTURES

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9 Claims. (Cl. 20—52)

This invention relates to window structures, and particularly to window structures in which the sash are maintained frictionally in the desired position of adjustment.

While many window structures have been afforded in which the sash have been held in different positions of vertical adjustment by the use of spring friction means, these devices as heretofore proposed and marketed have been ineffective in that insufficient spring tension was obtained, and such prior devices have also been objectionable in that the mounting and dismounting of the sash could be accomplished only through operations that were difficult to perform and tended to cause injury to the window frame or the sash.

In view of the foregoing, it is an important object of the present invention to provide a window structure wherein the sash may readily be mounted in or removed from the window frame without danger of damage to the frame, and wherein spring retention means are provided that operate with utmost efficiency and are adapted to facilitate the removal and replacement of the sash as this may be required.

More specifically, it is an object of the present invention to provide a simplified and improved spring retention means for use on sliding elements such as window sash, and to enable such spring retention means to be arranged whereby substantial retaining forces may be applied in an unusually efficient manner.

Further and related objects are to provide a spring retention device that may be mounted as a unit at the edge of a sliding panel such as a window sash, and to provide such a spring retention device wherein the form and nature of the spring means serve to simplify the mounting of the sliding panel and the like in association with a guiding rib or the like with which the spring retention means is to cooperate.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawing which, by way of illustration, shows a preferred embodiment of the present invention and the principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is an inside elevational view of a window structure embodying the features of the invention;

Fig. 2 is an elevational view of the sectional guide strips that are utilized;

Fig. 2A is a fragmentary view similar to Fig. 2 and showing the meeting portions of the guide plates in a separated relation;

Fig. 3 is a vertical sectional view taken through the window structure of Fig. 1 and shown at an enlarged scale;

Fig. 4 is a fragmentary plan sectional view taken substantially along the line 4—4 of Fig. 3;

Fig. 5 is an elevational view of the spring retention unit; and

Fig. 6 is a plan section taken substantially along the line 6—6 of Fig. 5.

For purposes of disclosure the invention is herein illustrated as embodied in a double hung window structure having a simple plank-type frame 10 in which upper and lower sash 11U and 11L are mounted and guided for vertical movement and adjustment by means which includes guide plates 12U and 12L and cooperating friction retention devices 15 carried by the respective sash.

The frame 10 as herein shown comprises a head 10H, a sill 10S and vertical jambs 10J, the outer edge of the jambs 10J having the usual outer stop 110, and the guide paltes 12L and 12U are secured removably against the flat faces of the jambs 10J just inwardly of the stops 110 by means such as screws 112. The guide plates 12U and 12L are formed from sheet metal as shown best in Fig. 4 so that in cross section the plates each have a pair of longitudinal ribs 212 and 312 disposed in spaced parallel relation. Preferably each rib is strengthened by the inclusion of an internal rod or wire 412. At the stepped meeting ends of the upper and lower plates 12U and 12L, the wires 412 are projected from the ends of the ribs of one section or plate as at 412P, Fig. 2A, to afford aligning pins that may project into recesses 412R formed in the adjacent ends of the ribs of the other plate. The recesses 412R are formed by setting the end of the wires 412 in an inwardly spaced relation to the ends of the ribs.

The sash 11U and 11L may be of the usual construction with vertical edge grooves 211 into which the guide ribs 212 or 312 may extend to guide the sash in their raising and lowering movements, and the friction retention units 15 are recessed into the edges of the sash to afford effective continuations of the grooves 211, while at the same time locating the spring means of such units in position for cooperative engagement with the guide ribs.

The spring units 15 have a generally channel shaped housing formed from sheet metal to afford a web 115 having upstanding parallel side flanges 215, mounting flanges 315 that extend from the upper edges of the side flanges 215 in a common plane and in opposite directions. This housing recesses into a side edge of one of the sash in a recess 20 so that the channel is centered upon the groove 211 and forms an effectual continuation thereof, and the flanges 315 are recessed into the edge face of the sash and are secured in position by screws 21, as shown in Figs. 5 and 6.

The channel that is thus defined has spring means therein associated with the opposite side flanges 215 thereof and arranged to press with a gripping or clamp-like action upon opposite sides of the related guide rib, and such means are arranged under the present invention so that they not only provide the necessary frictional forces for retaining the sash in the desired position of vertical adjustment, but also are arranged so that the sash may be readily and easily slid endwise onto the guide ribs so as to bring the spring means into the proper cooperating relationship with respect to the guide ribs. Thus, a pair of bow springs 22 are disposed in the channel with the opposite ends of the bow springs engaged in each instance with one of the side flanges 215 and with the central portions of the two bow springs 22 in engagement substantially midway between the two side flanges. One end of each bow spring 22 is anchored to the adjacent side flange 215 by means such as a rivet 23, thus to fix the bow springs in the desired position longitudinally of the channel. The bow springs are thus positioned and related as to define what may be termed an entry mouth 22M, Fig. 5, at both the upper and lower

ends thereof so that the necessary entry of an end of a guide rib may be readily accomplished.

In the present instance, the bow springs **22** are relatively thin, and although such thin bow springs will exert some degree of clamping action on the guide rib, I prefer to supplement the forces applied by the bow springs through the provision of additional spring means disposed between the side flanges **215** and the central portions of the bow springs **22**. To this end, I provide a pair of guide pins **24** secured as by riveting at **24R** to the side flanges **215**, and these pins **24** extend inwardly of the channel toward the central portions of the bow springs **22**. It will be noted, however, that the pins **24** terminate in substantially spaced relationship with respect to the adjacent bow spring **22** so that the bow spring may be flexed in its central portion toward the adjacent side flange **215**. The pins **24** serve as a mounting and locating means for a pair of expansive coil springs **25** that surround the respective pins **24** and act between the flanges **215** and the central portions of the bow springs so as to urge the bow springs toward each other with a relatively large force. Hence when the bow springs **22** are engaged with opposite sides of a guide rib such as the guide rib **212**, the frictional forces will be quite substantial and the sash will be effectually held in any desired position of vertical adjustment.

With the structure that is here shown, it will be evident that the sash may be readily mounted in or removed from the window frame, and to do this, both of the sash may be located in their lower positions, after which the upper guide plate sections **12U** may be unloosened by removal of the fastening screws **112** and may be removed from the window frame. The inner sash **11L** may then be moved upwardly and tilted inwardly so as to remove the same from engagement with the lower guide plates **12L**. A similar procedure may be followed with respect to the upper sash **11U**.

It is noted that conventional weathersealing means may be defined at the various edges and meeting rail portions of the sash, but since this forms no part of the present invention, any illustration thereof has been eliminated in the interest of clarity.

From the foregoing description, it will be apparent that the present invention defines a new and improved window structure wherein simple and effective frictional retaining means enable the sash to be effectually held in any desired position of adjustment, and such retaining means, coupled with the sectional guide plates, make it possible for the sash to be readily mounted and dismounted without disfiguring the elements of the window frame.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a friction retention unit for controlling the position of a panel adapted to slide in a generally fixed path such as a window sash, a channel of uniform width and having a base web, said channel being parallel to an edge of said panel, parallel spaced side flanges extending from said base web and mounting flanges extending in opposite directions in a common plane from the free edges of said side flanges, a pair of bow springs mounted on opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage and yieldingly press against each other, means anchoring one end of each of said bow springs to the side flange with which it is engaged, a pair of expansive coil springs disposed respectively between said side flanges and the central portions of the adjacent bow springs, and guide pins of a length less than the length of the coil springs and fixed to the respective side flanges and extended into said coil springs to hold said springs in position.

2. In a friction retention unit for controlling the position of a panel adapted to slide in a generally fixed path such as a window sash, a channel of uniform width and having a base web, said channel being parallel to an edge of said panel, parallel spaced side flanges extending from said base web, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, means anchoring said bow springs to the side flange with which they are engaged, a pair of expansive coil springs disposed respectively between said side flanges and the central portions of the adjacent bow springs, and guide pins of a length less than the length of the coil springs and fixed to the respective side flanges and extended into said coil springs to hold said springs in position.

3. A friction retention unit of the character described for a panel such as a window sash that is adapted to slide in a generally fixed path comprising in combination, a channel of uniform width and having a base web, parallel spaced side flanges extending from said base web and mounting flanges extending in opposite directions in a common plane from the free edges of said side flanges, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, means anchoring one end of each of said bow springs to the side flange with which it is engaged, a pair of expansive coil springs disposed respectively between said side flanges and the central portions of the adjacent bow springs.

4. In a friction retention unit of the character described for controlling the position of a sliding panel adapted to slide in a generally fixed path such as a window sash, a channel of uniform width and having a base web, parallel spaced side flanges extending from said base web, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, means anchoring each of said bow springs to the side flange with which it is engaged, and other spring means disposed respectively between said side flanges and the central portions of the adjacent bow springs and urging the central portions of said bow springs together.

5. In a friction retention unit for controlling the position of a sliding panel such as a window sash adapted to slide in a generally fixed path, a channel of uniform width having a base web, parallel spaced side flanges extending from said base web and mounting flanges extending in opposite directions in a common plane from the free edges of said side flanges, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, means anchoring one end of each of said bow springs to the side flange with which it is engaged, and supplemental spring means mounted on said side flanges and acting between said side flanges and the central portions of said bow springs.

6. In a friction retention unit for controlling the position of a sliding panel slidable in a generally fixed path such as a window sash, a channel of uniform width having a base web, parallel spaced side flanges extending from said base web, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, a pair of expansive coil springs disposed respectively between said side flanges and the central portions of the adjacent bow springs to urge the central portions of the bow springs together, and means anchoring said bow springs to the side flange with which they are engaged.

7. In a window structure, a frame having a head, a sill and jambs, sectional guide plates secured on the adjacent faces of the jambs so as to extend from top to bottom thereof, said guide plates each having a pair of laterally spaced projecting guide ribs, there being two guide plate sections on each jamb meeting adjacent the midpoint between said head and sill, upper and lower sash having side edge grooves formed therein embracing the respective guide ribs of said guide plates, and friction retention units mounted in each side edge of each sash in alignment with said grooves, and spring means in each such unit operable to grip opposite sides of the related rib with a yielding clamping action to hold the sash in any desired position of vertical adjustment.

8. In a window structure, a frame having a head, a sill and jambs, guide plates secured on the adjacent faces of the jambs so as to extend from top to bottom thereof, said guide plates each having a pair of laterally spaced projecting guide ribs, upper and lower sash having side edge grooves formed therein embracing the respective guide ribs of said guide plates, and friction retention units mounted in each side edge of each sash in alignment with said grooves, and spring means in each such unit operable to grip opposite sides of the related rib with a yielding clamping action to hold the sash in any desired position of vertical adjustment.

9. In a window structure, a frame having a head, a sill and jambs, guide plates secured on the adjacent faces of the jambs so as to extend from top to bottom thereof, said guide plates each having a pair of laterally spaced projecting guide ribs, upper and lower sash having side edge grooves formed therein embracing the respective guide ribs of said guide plates, and friction retention units mounted in each side edge of each sash in alignment with said grooves, each such unit comprising a channel having a base web, parallel spaced side flanges extending from said base and mounting flanges extending in opposite directions in a common plane from the free edges of said side flanges, a pair of bow springs mounted in opposed relation in said channel with each having its opposite ends engaged with a side flange so that the central portions of said bow springs engage each other, means anchoring one end of each of said bow springs to the side flange with which it is engaged, a pair of expansive coil springs disposed respectively between said side flanges and the central portions of the adjacent bow springs, and guide pins of a length less than the length of the coil springs and fixed to the respective side flanges and extended into said coil springs to hold said springs in position.

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