March 25, 1969 R. J. WEIDNER ET AL 3,434,236

SASH LOCK

Filed June 7, 1967

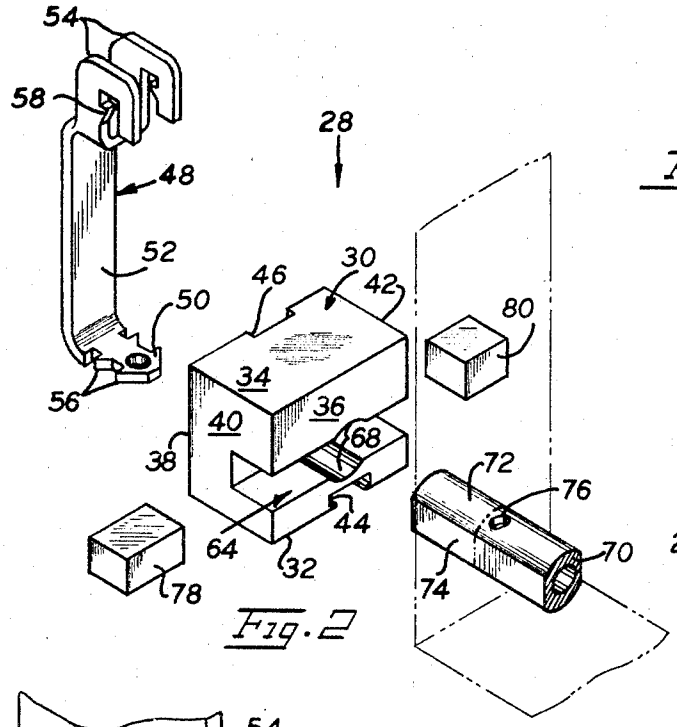

Fig. 2

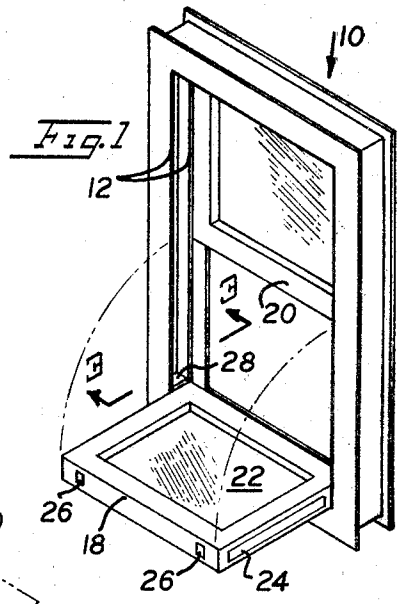

Fig. 1

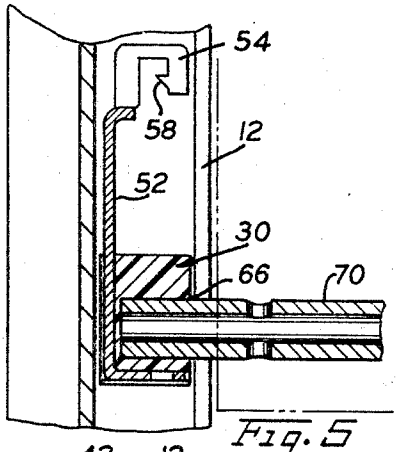

Fig. 5

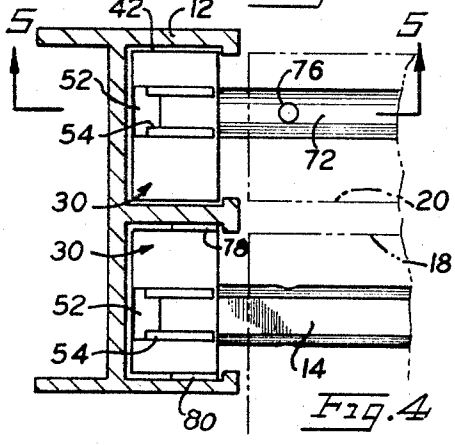

Fig. 4

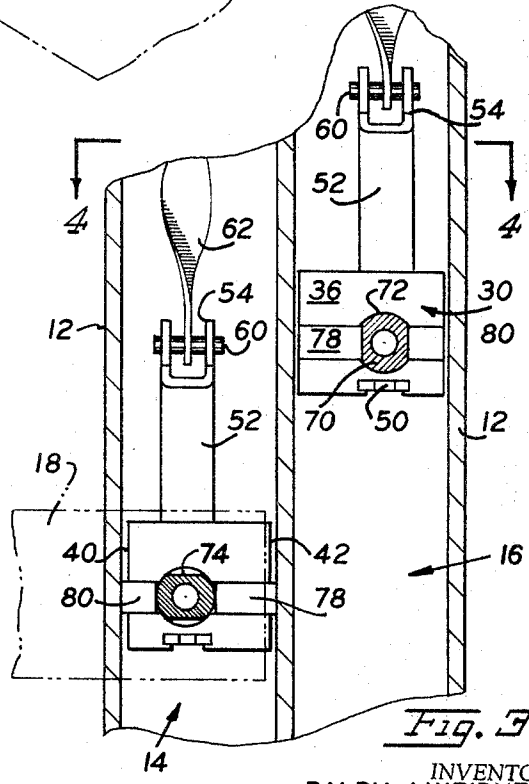

Fig. 3

INVENTORS
RALPH J. WEIDNER
JAMES BENIGNO

BY

ATTORNEY

United States Patent Office

3,434,236

Patented Mar. 25, 1969

3,434,236

SASH LOCK

Ralph J. Weidner, Stony Brook, and James Benigno, Brooklyn, N.Y., assignors to Kassl Window Company, Inc., Plainview, N.Y., a corporation of New York

Filed June 7, 1967, Ser. No. 644,376

Int. Cl. E05d 15/22

U.S. Cl. 49—176

7 Claims

ABSTRACT OF THE DISCLOSURE

Herein is described and shown a window construction having a support frame and a sash unit mounted therein for vertical movement. The sash is additionally pivoted out of the frame on an axis normal thereto. Particular attention is paid to the construction of a mount for the axle defining the pivot axis and its added function as a locking mechanism restraining vertical movement when the sash is pivoted and as a holder for the terminal section of a counterbalance mechanism.

The present invention relates to the construction of windows and more particularly to a vertically operating sash window pivotable out of its supporting frame for cleaning and maintenance.

For some time now, it has been common to provide "hung" or vertically movable sashes pivotable outward of its frame so that both faces of the window are easily accessible. In general, such constructions comprise a conventional stationary support frame having vertically oriented guide grooves on either side. The window sash is mounted for vertical movement in the guide grooves and is provided with retractable guide members extending into each groove. The sash or window unit is additionally provided with an axle, mounted in a sash cross member, which extends from opposite sides into the opposed guide grooves. The axle provides an axis normal to the vertical movement of the window about which the sash may be pivoted.

At each end of the axle, there is located a sash lock-axle mount which functions to maintain the axle securely within the frame guide grooves while permitting it to slide vertically therein and to secure the end of the flexible balance or weight mechanism to the window unit and to provide, in cooperation with the axle, engagement with the guide groove walls to prevent vertical movement of the window when it is pivotally displaced from the frame.

It will be appreciated that the functions of the sash lock-axle mount are most vital to the operation of the window both in its vertical or pivoting movement and that it is required to be relatively precise in structure and sure in operation.

It is an object of the present invention to provide a sash lock-axle mount which is simple and economical to make and use and which performs its vital functions.

It is another object of the present invention to provide an axle mount having means by which the balance or weight may be easily attached without the necessity of disassembling either block or sash from the support frame.

It is also an object of this invention to provide a mount which coacts with the sash axle to provide a positive locking action with the support frame.

It is still another object of the present invention to provide a sash lock-axle mount of the type described having frame engaging means acting to deform the window guide groove frame, upon actuation by the axle, which deformation acts subsequently to reset the engaging means to its normal position to insure proper sliding action.

These and other objects, features and advantages of the present invention will be observed and understood from the following description of an illustrative embodiment when taken in conjunction with the accompanying drawing wherein:

FIG. 1 is a front elevational view of a double hung window illustrating the normal position of an upper sash and the pivoted position of the lower sash;

FIG. 2 is an exploded perspective view of the mount of the present invention showing also its relationship with the sash axle;

FIG. 3 is a partial vertical cross section through the window frame of FIG. 1 along lines 3—3 showing the mount in use;

FIG. 4 is a horizontal cross section along lines 4—4 of FIG. 3 and,

FIG. 5 is still another vertical section along lines 5—5 of FIG. 4.

With respect to FIG. 1, the window construction comprises a rather conventional stationary frame **10** adapted to be set into a building construction. The inner surface or jamb of the frame **10** is provided with spaced walls **12** defining parallel vertical guide grooves **14** and **16** within which are respectively hung window sashes **18** and **20**, each having a glass pane **22**. The upper or rear sash **20** is shown in its normal vertical position. The lower or front sash **18** is shown in its tilted position pivoted approximately 90° to the vertical.

Each sash member is provided with retractable guide members **24** (here shown in retracted position) adapted to enter into the vertical guide groove. The guide member is operated, for example, by a finger button **26** in a manner now very conventional in the art. The sash lock-axle mount **28** of the present invention is seen located in the guide groove **14** in conjunction with the lower cross member of sash **18** in which an axle (not shown in FIG. 1) is mounted.

In thus showing, in FIG. 1, the environment of the present invention, omitting detailing of the frame, the axle and balance mechanism, as well as other structural details which may, for this introductory purpose, be considered conventional. We have also shown in FIG. 1 and in the remaining figures to be described, only the details of one side of a window. Since windows are symmetrical in construction, it is believed only necessary to describe one-half thereof, it being appreciated that the other half will be the same.

Having thus set the environment for the present invention, we turn to FIGS. 2–5 for a more detailed showing of the axle mount, its structure and operation. The mount **28** is formed of a substantial rectangular block **30** having a bottom **32**, a top **34**, a front **36**, a rearwall **38** and respectively opposed sides **40** and **42**. The block **30** is machined or otherwise smoothly finished at least on its back **38** and sides **40** and **42**. The block **30** is machined or otherwise smoothly finished at least on its back **38** and sides **40** and **42** in order to slide within grooves **14** or **16** as previously described. The sides **40** and **42** being located adjacent the walls **12** as shown for example in FIGS. 3 and 4.

Within the bottom **32** and rear wall **38**, there is fashioned a pair of slots **44** and **46**, respectively, extending at right angles to each other. Within the slots **44** and **46** is mounted a U shaped bracket **48** having a lower arm **50**, an elongated central portion **52** and a bifurcated hooked shaped upper arm **54**. The lower arm **48** is provided with a suitable number of prongs **56** designed for force fit engagement with the material of the block **30** and is placed within slots **44** and **46** so that its elongated central portion **52** extends upwardly through the slot **46**. The hooked shaped arm **54** thereby extends over the top wall **34** of the mount. The depth of the bracket mem-

ber 48 is such that conforms to the slots 44 and 46 to eliminate the possibility of any interference with the walls of guide grooves 14 or 16. If greater security is desired in fitting the bracket to the block 30, suitable fasteners may be employed to reinforce the fit.

Each of the portions of the bifurcated arm 54 is provided with a prong member 58 extending into the bight of the hook and is adapted to receive a cross pin 60 secured centrally to the end of a flexible counterbalance band or cord 62. The opposite end of the band 62 carries a conventional counterbalance or weight (not shown).

The bifurcated hooked arm 54 and the cross pin 60 cooperate to anchor the counterbalance mechanism with the mount block in all normal use since the pull of the weight and sash are opposed to each other whether the window is being raised, lowered or pivoted. On the other hand, the hooked member, extending above and removed from the block permits the easy separation of the counterbalance mechanism, should it be so desired, simply by pushing pin and bracket relatively inward toward each other and releasing the pin from the hook. This separation, it will be readily observed, may be accomplished manually without tools and without removing sash or mount block from the frame. Thus, the sash may be manipulated and the counterbalance mechanism repaired or replaced with an absolute minimum of handling.

The block 30 is further machined or cut smoothly with a transverse slot 64 running through from one side wall to another and rearwardly from the front wall 36 to approximately the midpoint between it and the rear wall 38. Centrally of the slot 64 and extending into the body of the block 30, almost to its rear wall 38, there is provided a circular bore 66 having a diameter at least slightly greater than the height of slot 64. The bore 66 is also extended frontally through the slot 64 so as to form, on the upper and lower faces of the slot, arcuate surfaces 68. The bore 66 is adapted to receive and to permit rotation therein of the end of a sash axle 70 having, at least at such end, upper and lower arcuate segments 72 joined by chordal segments 74.

The axle 70 is fixed with the lower cross member of of the sash in a conventional manner by pins or screws (not shown) through holes such as 76. In fixing the axle in the cross member of the sash, the chordal segments 74 are maintained vertically and the axle, for convenience in pivoting, is not centered so that, as will be observed from FIGS. 2 and 3, its ends do not enter the block 30 directly at its center. However, the diametral dimensions of the axle 70 are conformed to the diametral dimensions of bore 66 so that its ends fit snugly within the bore but will rotate upon tilting of the sash.

The axle mount is finally assembled by inserting within the slot 64, on both sides of the axle 70, rectangular latch members 78 and 80 which conform to the dimensions of the slot, so as to also fit snugly but slide therein. It will be observed that latches 78 and 80 are of different size, as a consequence of the fact that axle 70 is not centered in the sash cross member. The latch members 78 and 80 are, however, of sufficient length to permit engagement of their outer end with the adjacent wall 12 when shifted outwardly by the arcuate segment 72 and are more in the nature of rectangular pins for a purpose soon to be explained.

The operation of the mount as a locking device is clearly understood by reference to FIGS. 3 and 4 in which, as we have previously noted, we have shown the device, in guide grooves 16, in normal position and the device in guide groove 14 attached to a sash pivoted outwardly. In the normally hung sash, the axle 70 is of course maintained so that its chordal segments are vertically aligned and therefore the rectangular latch pins 78 and 80 can be fully recessed within the body 30. The sash in this condition is permitted free and unhampered movement up and down within the guide groove. On the other hand, in the pivoted sash, the axle 70 is rotated and its chordal segments become substantially horizontal and cause the arcuate segments 72 to force the rectangular pins 78 and 80 outward of the block body 30 into engagement with the adjacent walls 12.

Since the walls 12 are relatively thin and therefore less rigid in construction than the latch pins 78 and 80, or the axle 70, and since the pins have an almost point contact, they tend to deform the wall portion locally at the point they engage. This deformation enhances and additionally insures the locking action of the pivoted sash, allowing it to be firmly restrained at any height in the guide groove. Furthermore, this deformation assists in the retraction and recessing of the members 78 and 80 into the block 30 when it is desired to return the sash to vertical movement. When doing so, the sash and axle are rotated so that the chordal segments are again vertical. Since the rectangular members 78 and 80 are not resilient nor are they spring loaded, they will not automatically return to their recessed positions. However, upon first vertical movement of the sash, the edge of the deformed portion of the wall 12 will exert a reactive force upon the pins 78 and 80, causing them to return to their inward position.

Thus, we have provided a sash lock and mounting block which provides simple and easily operable means for anchoring the counterbalance and for securely locking the sash in pivoted position. The device may be simply fabricated from plastic material such as nylon or from any suitable metal and the balance bracket may be of metal or aluminum. Of course, the window frame, sash and other parts may be of aluminum, wood, or other materials, as desired.

Obvious equivalents of the illustrated embodiment will be appreciated. For example, the pins 78 and 80 and the slot 64 may be made circular in configuration and contained wholly within the body of block 30. The axle 70 may be made in two portions rather than in one extending across the entire width of the sash. The hooked arm and counterbalance anchor pin may be replaced by other suitable connecting means. While this invention has been described with reference to certain features, structure and material, it will be apparent that various other modifications might be made without departing from the principle and scope of this invention.

We claim:

1. A window construction comprising a stationary support frame of generally rectangular shape and vertical guide grooves in opposite sides thereof, a sash mounted for vertical movement in said frame which is pivotal about an axis normal to said vertical movement into a position extending out of said support frame, axle means mounted in a cross member of said sash extending from opposite sides thereof into said support frame defining said pivotal axis, and an axle mount for supporting said sash in said guide grooves and for restraining vertical movement of said sash in said pivoted position, comprising a block having a bore adapted to receive said axle for rotary movement therein, and latch means slidably mounted within said block in opposed diametral relationship to said axle, said latch means being movable outwardly of said block upon rotation of said axle into engagement with said support frame thereby restraining movement of said sash, said axle having a pair of opposed arcuate segments alternating with a pair of opposed chordal segments, said chordal segments being engageable with said latch means when the sash is in vertical position, said arcuate segments being engageable with said latch means when the sash is pivoted, thereby forcing said latch means into engagement with said supporting frame.

2. The construction according to claim 1 wherein said latch means comprise a pair of pin members adapted to engage the support frame in a limited area and to deform said frame thereat.

3. The construction according to claim 2 wherein said latch means is actuated to return into said block upon re-

turn of the sash to vertical movement by the engaging deformed portion of the frame returning from its deformation.

4. The construction according to claim 1 wherein said guide groove is substantially rectangular in dimension and said block conforms thereto in at least width and depth, said block having front, rear and side faces, a bore centrally of said front face and running substantially through to said rear face, a slot running from side to side through a portion of said bore, the axle being mounted in said bore and the latch means mounted in said slot.

5. The construction according to claim 4 wherein the latch means comprise a pair of rectangular pin members having an outer face adapted to deform the frame upon engagement.

6. The construction according to claim 1 including means for securing the terminal end of a counterbalance mechanism, said last named means comprising an arm secured to said axle mount and extending upward therefrom ending in a fastener connection above and removed from said mount.

7. The construction according to claim 5 wherein said

means for securing the counterbalance comprises a U shaped member, one arm of which is secured in the axle mount, the other arm forming a hook member for attaching said counterbalance mechanism, and the connecting portion being elongated thereby extending said hook above and removed from said axle mount.

References Cited

UNITED STATES PATENTS

634,384	10/1899	Weingaertner et al.	49—173
2,500,849	3/1950	Menns	49—181
3,124,849	3/1964	Osten	49—181 X
3,126,588	3/1964	Osten	49—174
3,183,559	5/1965	Love	49—414
3,335,523	8/1967	Isler et al.	49—176 X

REINALDO P. MACHADO, *Primary Examiner.*

DENNIS L. TAYLOR, *Assistant Examiner.*

U.S. Cl. X.R.

49—181