March 17, 1964 F. C. OSTEN, SR 3,124,849

SPRING-BALANCE-MOUNTED REMOVABLE SASH WINDOW

Filed Oct. 11, 1960 2 Sheets-Sheet 1

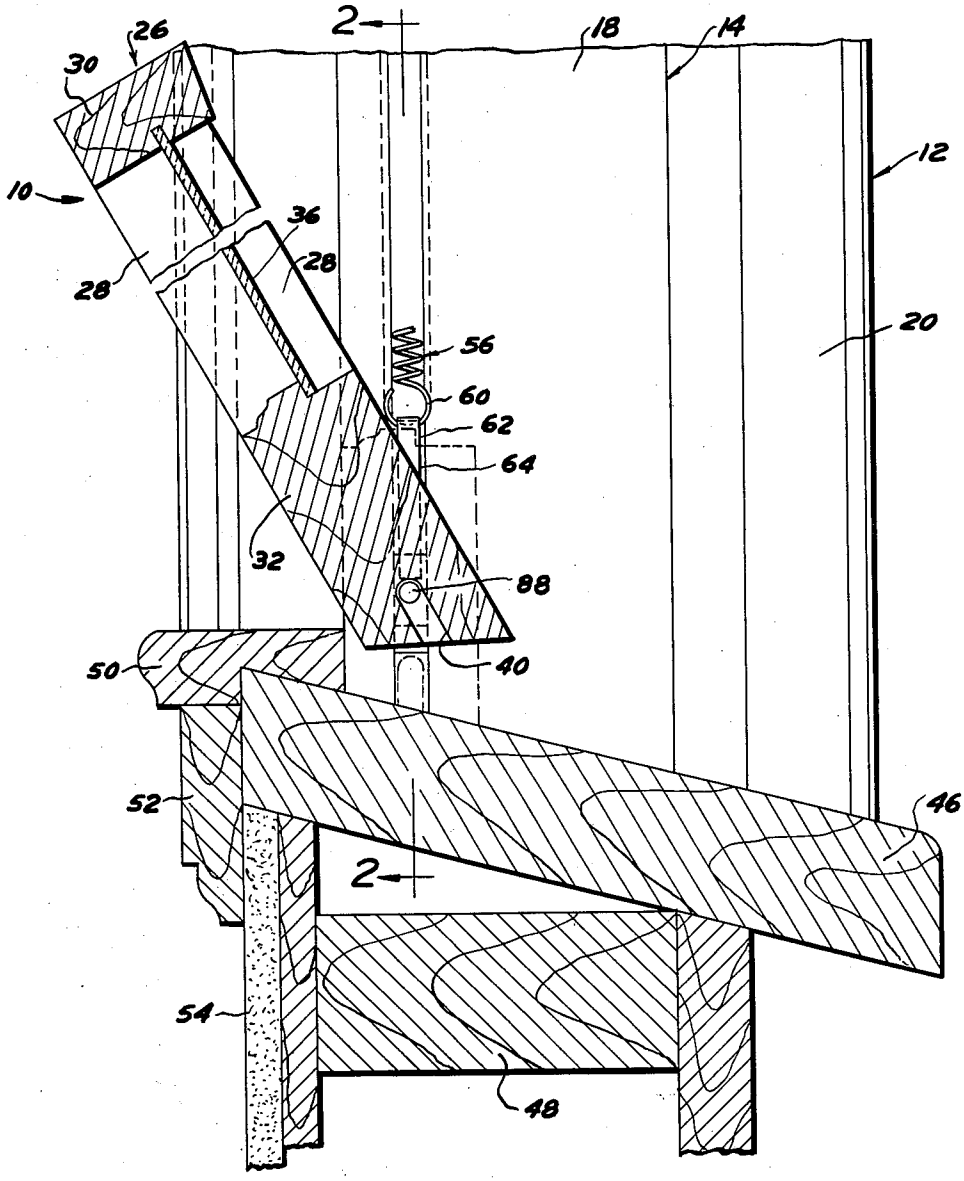



Fig. 1

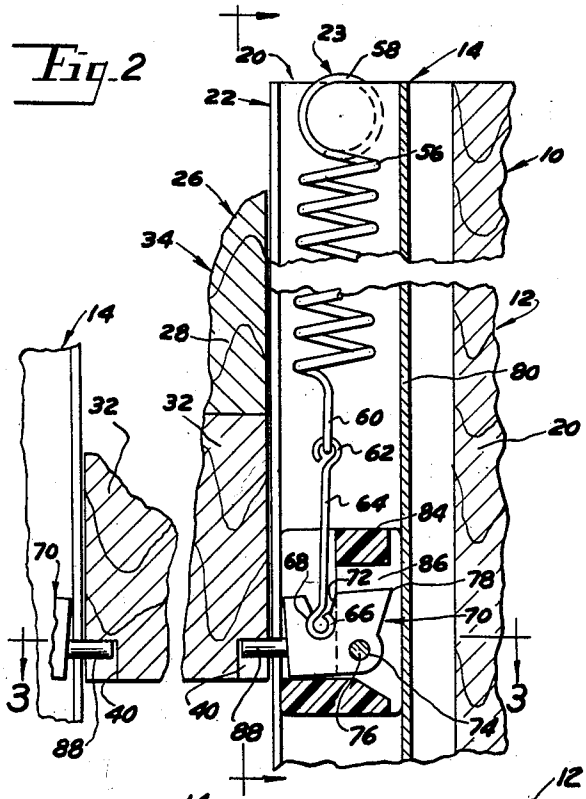
INVENTOR.
FRED C. OSTEN SR.
BY
Barthel & Bugbee
ATTORNEYS

March 17, 1964 F. C. OSTEN, SR 3,124,849

SPRING-BALANCE-MOUNTED REMOVABLE SASH WINDOW

Filed Oct. 11, 1960 2 Sheets-Sheet 2

Fig. 2



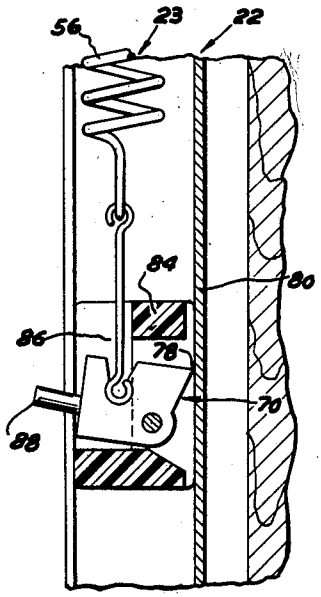




Fig. 4

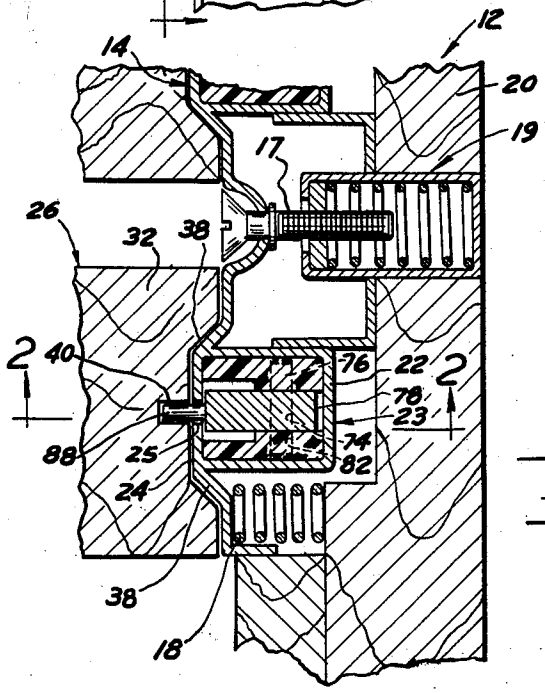



Fig. 3

INVENTOR.
FRED C. OSTEN SR.
BY
Barthel & Bugbee
ATTORNEYS

United States Patent Office 3,124,849 Patented Mar. 17, 1964



3,124,849

# SPRING-BALANCE-MOUNTED REMOVABLE SASH WINDOW

Fred C. Osten, Sr., 14500 Abington St., Detroit 27, Mich.

Filed Oct. 11, 1960, Ser. No. 61,988
1 Claim. (Cl. 20—52.2)

This invention relates to removable sash windows and, in particular, to removable sash windows equipped with automatically-locking sash balances.

One object of this invention is to provide a removable sash window which is mounted upon the vertically-slidable locking unit of an automatically-locking sash balance so as to be normally supported thereby but to be instantly removable therefrom, whereupon the sash balance is automatically locked in the position it occupied at the instant the sash window was removed.

Another object is to provide a removable sash window of the foregoing character wherein the sash is tiltably supported upon the sash balance in such a manner as to be tiltably removable therefrom, such removal automatically causing such locking of the sash balance.

Another object is to provide a removable sash window of the foregoing character wherein the window frame is provided with two automatically-locking sash balances each equipped with a lock carrier having a locking member rockably mounted thereon and carrying a combined pivot and lock operating member projecting toward the sash, which the sash pivotally engages in such a manner that when the sash is resting upon the pivot members, it disposes them in horizontally coaxial positions and at the same time causes the locking action of the sash balance to be automatically released, thereby bringing the sash balancing spring or weight into balancing operation while permitting the window to be slid upward or downward in its sash guides, but when the sash is tilted and lifted off these pivot members, the latter are automatically swung upward by the sash balancing springs into non-coaxial positions wherein the locking members are moved into locking engagement with their respective sash guides upon removal of the sash from the pivot members.

Another object is to provide a removable sash window as set forth in the object immediately preceding, wherein the pivot members engage pivot bearing notches in the sash, such notches facilitating removal of the sash from the pivot members.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

FIGURE 1 is a fragmentary vertical section through a tiltably-removable sash window installation wherein the sash is pivotally mounted on the locking member of an automatically-locking sash balance, according to one form of the invention, taken along the line 1—1 in FIGURE 2, with the upper sash and the central portion of the lower sash omitted to simplify the disclosure and converse space so as to show the construction upon the largest possible scale;

FIGURE 2 is an enlarged fragmentary vertical section, taken along the lines 2—2 of FIGURES 1 and 3, with the major part of the sash omitted, except for its pivotal connections with the sash balances, for the same reason as in FIGURE 1;

FIGURE 3 is a fragmentary horizontal section, taken along the line 3—3 in FIGURE 2; and

FIGURE 4 is a fragmentary vertical section, similar to the right-hand side of FIGURE 2, with the sash removed and the locking member of the sash balance tilted into its locking position engaging the sash balance casing.

Referring to the drawings in detail, FIGURES 1 to 4 inclusive show a double-hung tiltably-removable sliding sash window installation, generally designated 10, according to one form of the invention as consisting generally of a window frame 12 having on its opposite sides two resiliently-mounted vertical sash guides 14 (one only being shown) slidably engaging a fixed channel guide member 16 fastened to the adjacent vertical window frame side members 20 (FIGURE 3). The sash guides 14 are yieldingly urged away from the window frame side members 20 by helical compression springs 18 and limited in their motion by stop screws 17 threaded through the central portions of the sash guides 14 into correspondingly-threaded spring boxes 19 secured to and mounted in the window frame side members 20 at vertically-spaced intervals therealong. The spring boxes 19 are conventional and may conveniently be of the construction described and claimed in the Osten Patent No. 2,658,242, issued November 10, 1953, for Window Construction, and their details are beyond the scope of the present invention.

Each resiliently-mounted sash guide 14 is formed preferably of metal or other suitable material, extruded aluminum being found satisfactory for this purpose. Integral with or separately attached to each sash guide 14 are two laterally-spaced elongated hollow sash balance casings 22 or two spring sash balances, generally designated 23, each having an elongated slot 25 in the forwardly-projecting portion 24 of truncated V-shaped cross-section thereof which serves as a guide rib for upper and lower vertically-sliding sash 26. Only one such sash is shown in FIGURES 1 and 2, but it will be understood that the window installation 10 is equipped with an upper sash and a lower sash 26 of similar construction and similarly supported and balanced. Accordingly, a single description of the lower sash and its pivotal spring sash balance 23 shown in FIGURE 1 will suffice for the upper sash 26 omitted therefrom.

Each vertically-sliding sash 26 has opposite vertical side rails 28 and top and bottom rails 30 and 32 (FIGURE 1) which collectively form the sash frame 34 containing the window pane 36 of each sash 26. The vertical side rails 28 and the opposite ends of the bottom rail 32 contain a vertical guide groove 38 of truncated V-shaped cross-section which slidably engages the forwardly-projecting guide rib portions 24 of the sash guides 14. The lower corners of the bottom rail 32 contain inverted U-shaped pivot bearing notches 40 extending inwardly toward one another from the lower ends of the vertical guide grooves 38. The window frame 12 has the usual window sill 46, cross member or stud 48 and on its inner or room side above the sill 46 has the usual stool 50 which is rabbeted to receive the upper inner edge of the sill 46. An apron 52 beneath the stool 50 abuts the inner edge of the sill 46 above the wall plaster 54.

Mounted within the hollow sash balance casing 22 is a tension spring 56 having its upper end loop 58 hooked over the upper end of the sash balance casing 22 and having its lower end loop 60 hooked onto the upper end loop 62 of a link or bar 64. The lower end loop 66 (FIGURE 2) of the bar link 64 is of cylindrical shape and pivotally engages a bearing bore 68 in a tilting locking member or pawl 70 having a clearance notch 72 above it for the swinging back and forth of the bar link 64. The locking member or pawl 70 is bored as at 74 to receive a transverse pivot pin 76 disposed outwardly of the bearing bore 68 so as to provide a lever arm therebetween. The upper outer edge of the locking member or pawl 70 is sharp in order to form a prong 78 to dig into the rearward wall 80 of the sash balance casing 22 in the locking position of the locking member or pawl 70 (FIGURE 4).

The opposite ends of the pivot pin 76 are seated in aligned bores 82 in a supporting block or lock carrier 84 having a cavity 86 therein tiltably receiving the locking member 70. The cavity 86 is in the form of a horizon-

tal passageway through the block 84 and cut away upward for the passage of the link 64 (FIGURE 2).

The locking member or pawl 70 on the opposite or forward side from the rearward locking edge 78 is provided with an approximately horizontally-projecting combined pivot and lock operating pin 88, either integral with the locking member 70 or inserted in the front face of the latter, as by drilling the locking member 70 to receive it. Since there are two sash balances 23 disposed on opposite sides of the window frame 12 (FIGURE 2), there are also two pivotal operating pins or trigger trunnions 88 projecting inwardly toward one another into the inverted U-shaped pivot bearing notches 40 in the lower corners of the bottom rail 32 of the sash frame 34 of the vertical sliding sash 26. The pins 88 project into the window opening in the window frame 12 through the elongated vertical slots 25 in the sash guides 14.

In the operation of the invention, let it be assumed that the sash 26 is in the vertical position shown in FIGURE 3 with its guide grooves 38 slidably engaging the guide ribs 24 and with its bottom notches 40 resting upon the pivot pins 88. In this position (FIGURE 2), the weight of the sash 26 acting upon the combined pivot and lock-operating pins 88 swings the locking members 70 counterclockwise around their pivots 76 in their supporting slide blocks 84 while forcing the pivot pins 88 downward into substantially horizontal coaxial positions. This swinging or tilting of the locking members or pawls 70 disengages their sharp locking edges 78 from the rear walls 80 of the sash balance casings 22. This in turn frees the blocks 84 for vertical sliding movement within the casings 22 and applies the force of the balancing springs 56 to the sash 23 through the pivot pins 88, balancing the weight of the sash 26.

To remove the sash 26 from the window frame 12, the operator grasps the top rail or meeting rail 30 of the sash 26 and pulls it toward him into the position shown in FIGURE 1, pivoting around the combined pivot lock-operating pins 88 engaging the upper ends of the inverted U-shaped fulcrum notches 40. As the operator swings the sash 26 in this manner, the flared sides of the guide grooves 38 engage the correspondingly beveled sides of the guide ribs 24 of the sash guides 14 to exert a camming action forcing the sash guides 14 toward the window frame side members 20 and permitting the sash 26 to force its way past the guide ribs 24 into the inclined position shown in FIGURE 1. The operator now pulls upward upon the top rail or meeting rail 30, withdrawing the notches 40 in the bottom rail 32 from engagement with the supporting pivot pins 38.

The removal of the sash 26 in this manner and the consequent disengagement of the upper ends of the notches 40 from the supporting pivot pins 88 frees the locking members or pawls 70 to tilt upward in response to the pull of the links 64 by the balancing springs 56. As a consequence, the prongs 78 are swung into engagement with the rearward walls 80 of the sash balance casings 22 (FIGURE 4), digging into the latter and automatically halting the supporting slide blocks 84 of the spring sash balances 23 in their positions occupied the instant the sash 26 was removed, as described above.

To reinsert the sash 26, for example, after cleaning the window pane 36, the operator reverses the foregoing procedure. Grasping the upper or meeting rail 30 of the sash 26 he pushes the lower rail 32 into the space between the resiliently-mounted sash guides 14, forcing them apart by the camming action on the bevelled sides



of the flared guide ribs 38 described above, against the thrust of the springs 18, at the same time aligning the lower corner pivot bearing notches 40 with the combined pivot and lock operating pins 88 on the tilting locking member 70. As the upper end of each notch 40 engages and pushes down upon its respective operating pin or fulcrum trigger element 88, the weight of the sash 26 acting downwardly upon the pins 88 tilts the locking members 30 around their pivot pins 76 toward one another and thereby withdraws their sharp-edged locking prongs 78 from locking engagement with the rear walls 80 of the sash balance casings 22. The locking members 70 thus tilt from the positions shown in FIGURE 4 to the positions shown in FIGURE 2, whereupon the balancing springs 56 are released to resume their balancing functions of counteracting the weight of the sash 26.

While the operation has been described in connection with the lower sash 26, the construction and operation pertaining to the upper sash are substantially identical and procedure is accordingly similar to that described above.

What I claim is:

A combination self-locking spring sash balance and tiltable sash-supporting device used with a horizontally-pivoting tiltably-removable sash, said device comprising

an elongated vertical sash balance casing having a front wall with an elongated vertical aperture extending therethrough,

a resilient sash-balancing member mounted within said casing and anchored thereto,

a locking member carrier reciprocably mounted in said casing,

a locking member movably mounted on said carrier for motion into and out of locking engagement with said casing,

a combined pivot and lock-operating member connected to said locking member and in the absence of the sash projecting outwardly from said casing through said aperture in an upwardly and inwardly inclined direction and swingable downwardly in response to engagement of the sash therewith;

means responsive to the engagement of the sash with said combined pivot and lock-operating member for swinging said combined pivot and lock-operating member downwardly into an approximately horizontal position and thereby moving said locking member out of locking engagement with said casing, and responsive to the disengagement of the sash from said combined pivot and lock-operating member for swinging said combined pivot and lock-operating member upwardly and consequently moving said locking member into locking engagement with said casing,

and a sash-supporting bearing structure containing an open-ended notch of approximately inverted U-shape at the bottom of the sash pivotally engageable with said combined pivot and lock-operating member when the pivot and lock-operating member is contained in said notch to permit the horizontal pivotal tilting movement.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,747,219 | Haas | May 29, 1956 |
| 2,828,513 | Nardulli | Apr. 1, 1958 |
| 2,933,757 | Almendinger | Apr. 26, 1960 |
| 3,012,292 | Brengman | Dec. 12, 1961 |