April 23, 1963 R. L. KLEIN 3,086,259

WINDOW STRUCTURE WITH REMOVABLE SASHES

Filed Aug. 15, 1960 2 Sheets-Sheet 1

FIG. 1

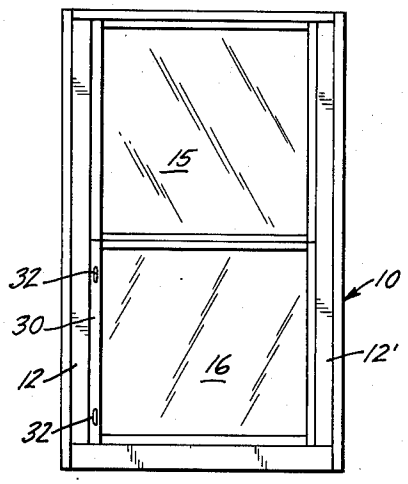


FIG. 2

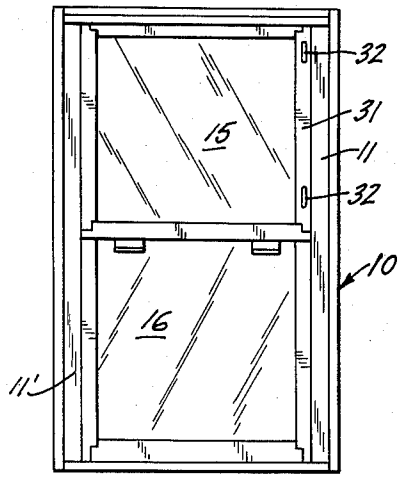


FIG. 3

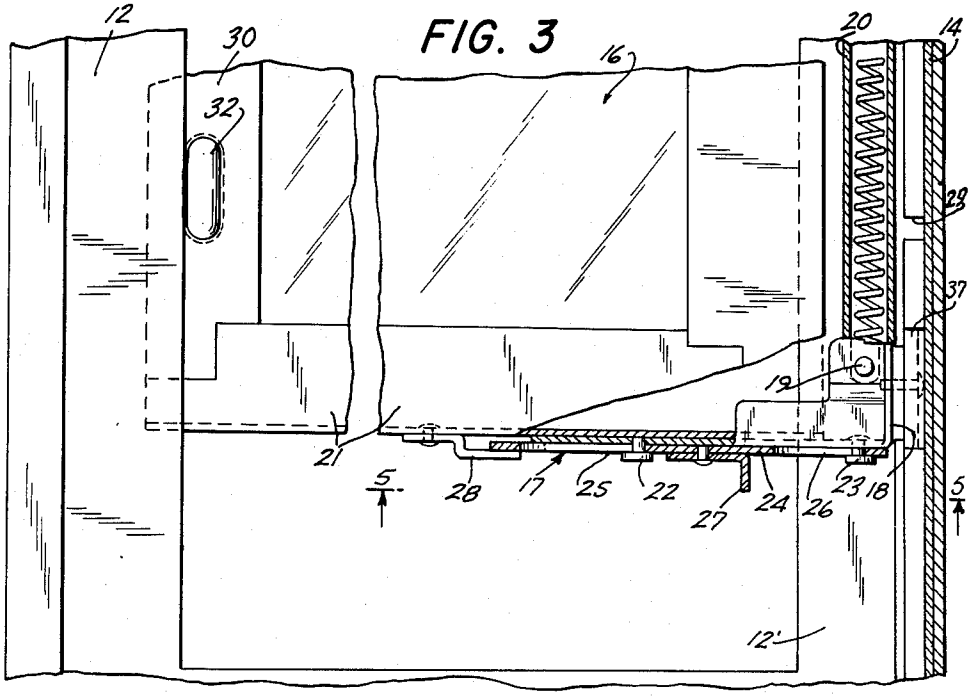
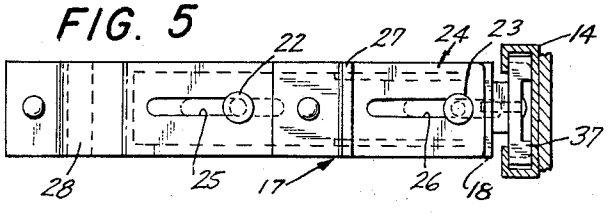


FIG. 5



INVENTOR.
ROBERT L. KLEIN

BY Ralph M. Klein

ATTORNEY

April 23, 1963 R. L. KLEIN 3,086,259

WINDOW STRUCTURE WITH REMOVABLE SASHES

Filed Aug. 15, 1960 2 Sheets-Sheet 2

FIG. 4

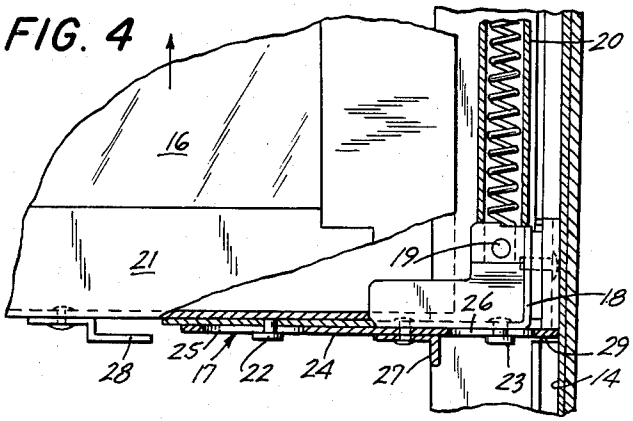


FIG. 8

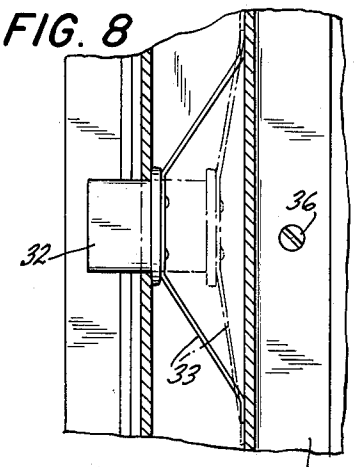


FIG. 6

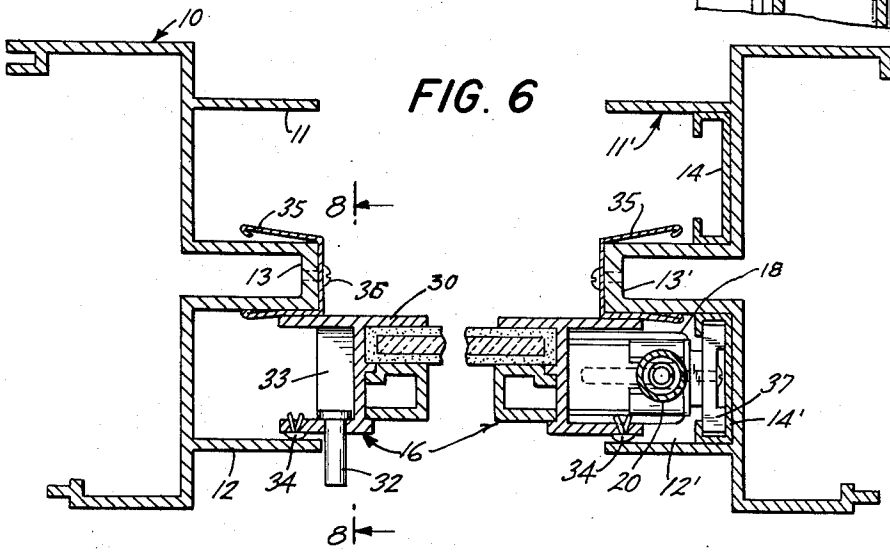
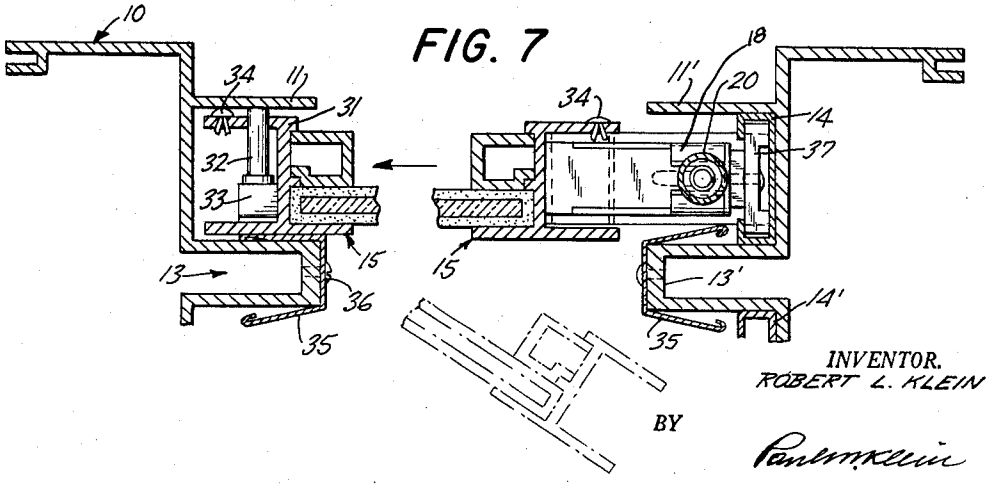


FIG. 7



INVENTOR.
ROBERT L. KLEIN

BY

Paul M. Klein

ATTORNEY

United States Patent Office 3,086,259 Patented Apr. 23, 1963

3,086,259
WINDOW STRUCTURE WITH REMOVABLE SASHES

Robert L. Klein, 9 Woodlawn Drive, Morristown, N.J.
Filed Aug. 15, 1960, Ser. No. 49,615
8 Claims. (Cl. 20—52.2)

This invention relates generally to windows having at least one mobile sash or a plurality of mobile sashes, such as for instance, those known as a double hung window in which latter operates a lower, inner or bottom sash and an outer, upper or top sash. Specifically, this invention pertains to a window construction wherein at least one of such mobile sashes or all of the sashes are bodily removable, when desired.

As is well known, the cleaning and washing of windows, especially from the outside, is a difficult and often a dangerous procedure. The present invention deals with a window structure wherein either one or a plurality of sashes are bodily removable so that the cleaning or washing of the sashes can be effected within the premises.

The prime object of the present invention therefore is the provision of a window structure having one or more bodily removable sashes, and wherein means are provided for facilitating their removal and replacement, as well as their usual functions of being readily movable in vertical directions within the jambs of their window frame.

As a typical example, the usual double hung window structure consists of a window frame having inner and outer jambs separated by a parting bead. Operative within the jambs are two vertically movable, usually counter balanced sashes, one an inner, lower or bottom sash and an upper, outer or top sash, both sashes including bottom, top and side rails. The top rail of the inner sash and the bottom rail of the outer sash are called the meeting rails. The sashes which run in their respective jambs are usually made weathertight by weather stripping secured within the jambs and about the parting bead. In heretofore employed double hung windows the sashes are not removable, but they can of course move vertically in upward and downward directions, and are usually provided with counter balances in the form of either counter weights or what are known as spring balances.

Having thus generally outlined a typical structure of heretofore used double hung windows, the foregoing prime object and other important objects and advantages of the present invention will be more fully understood from the ensuing description, in connection with the accompanying drawings, illustrating as an example, and for explanatory purposes only, a double hung window structure, without intending to limit the present invention to just such a structure, since this invention is applicable to what is known as a single hung window with one of the sashes held fixed so that only one of the sashes is movable, and also applies to what may be considered a "triple or multiple" hung window, with a plurality of sashes movable in three or a multiplicity of tracks or jambs. In the drawings:

FIG. 1 is a vertical plan view of a double hung window structure according to the present invention, seen from the inside of a room;

FIG. 2 is a similar illustration to FIG. 1 of a double hung window structure as it appears from the outside;

FIG. 3 is an enlarged, partial, typical detail view of the lower portion of an inner or bottom sash within its frame, such as seen in FIG. 1, but with the sash partly lifted and supported by a spring balance housed in the right-hand jamb, the sash being connected by means of operative latch means with said spring balance;

FIG. 4 is an enlarged right-hand, lower corner detail view of a sash similar to that seen in FIG. 3, but with the latch means in an anchored, fixed position, and with the sash disconnected from its balance;

FIG. 5 is a bottom detail view of the latch means used in connection with the sashes, as shown in FIGS. 3 and 4;

FIG. 6 is a typical fragmental cross section through a double hung window frame, showing the inner or bottom sash partly in section;

FIG. 7 is a fragmental horizontal cross sectional view similar to that shown in FIG. 6 but showing the outer or top sash partly in section, and in position for bodily removal from the window frame; and

FIG. 8 is a detail view showing a portion of a sash in cross section and a spring-biased anti-friction guide device for the sash adapted to engage the inner edge of the jamb.

In the present window structure there is employed a window frame generally indicated at **10** in FIGS. 1, 2, 6 and 7, and which frame includes outer jambs **11** and **11'** and inner jambs **12** and **12'**, the jambs being separated by parting beads **13** and **13'**, respectively, see FIG. 6. Within jambs **11'** and **12'** there will be seen a guide channel **14** and **14'**, respectively, the purpose of which will be presently explained. Within jambs **11** and **11'** operates an outer or top sash **15**, see FIG. 7, while within jambs **12** and **12'** there is operative an inner or lower sash **16**, see FIG. 6. Within jambs **11'** and **12'** are provided spring or counter balances for each of the two sashes, see FIG. 3, which will be presently identified, their construction and operation being well known in the art.

As will be noted from FIGS. 6 and 7, the width of the sashes is substantially less than the distance between the inner faces of their respective jambs.

In FIGS. 3, 4 and 5 a typical arrangement of latch means **17** for the sashes is illustrated. These latch means are composed of a foot member **18** to which are attached at **19**, balances **20**. The foot member extends beneath the bottom rail **21** of the sash, and operatively held by rivets **22** and **23** is a slide or latch **24**, which is slotted at **25** and **26** to permit its movement relative to said rivets. Slide **24** is provided with a finger grip **27** for facilitating its movement. Slide **24** is intended to move either into or outwardly from the right-hand jamb **12'**. Fixedly secured at the lower face of bottom rail **21** is a detent **28** adapted to receive the left-hand end of slide or latch **24** when sash **16** is intended to be connected with counter balance **20**, as illustrated in FIG. 3. In FIG. 4 latch slide **24** is shown moved toward the right, that is into the jamb, and disengaging detent **28**, whereby sash **16** is now disconnected from balance **20**. It will be seen that guide channels **14** and **14'** are provided with a recess **29** adapted to accommodate the right-hand end of latch slide **24**, see FIGS. 3 and 4.

Referring now to FIGS. 1, 2, 3, 6 and 7, it will be noted that at the left side rail **30** of inner or bottom sash **16**, see FIGS. 1, 3 and 6, and at side rail **31** of outer, upper or top sash **15**, there are provided depressible sash guide means **32**, supported by springs **33** lodged within the respective side rails of the two sashes. Springs **33** normally urge sash guide elements **32** to an outward position as seen in FIGS. 1, 2, 3, 4 and 8. These guide elements **32** are adapted to normally extend from the sashes as seen in FIG. 6 and in FIG. 8 in full lines, and to engage the interior edges of the jambs, opposite those containing the spring balances **20**.

Operation

As seen in the drawings serving for explaining the principle of the present invention, both top and bottom

sashes are shown supported by only a single counter or spring balance 20 at the right side jambs for the sashes. Obviously the spring balances could be mounted at the left side jambs, in which case of course the position of the structures shown in FIGS. 6 and 7 of the sashes and their anti-friction guide elements 32 would be accordingly reversed. In order to render the sashes counter balanced, latch means 17 shown in FIGS. 3, 4 and 5, to which counter balances 20 are secured at 19, must assume the position indicated in FIGS. 3 and 5, that is when the left hand end of operative latch 24 engages detent 28, permanently secured at the lower face of bottom rail 21 of the sashes. In that position of the latch means both sashes are securely connected with their respective spring balances, thus being counter balanced for easy movement within their respective jambs.

While the sashes are in their counter balanced position, anti-friction guide means 32 extending outwardly from side rails 30 and 31 of the two sashes, as seen in FIG. 8 in full lines, guide the sashes along the inner edges of the jambs opposite those containing the balances. Guide elements 32 are preferably made of nylon or any other friction-reducing material, and are normally urged outwardly by compressible springs 33.

In applying the present principle of bodily sash removal to window structures with very large and heavy sashes, two spring balances may have to be used, one for each side rail of the sashes. Obviously, the use of the anti-friction guide elements 32 secured in one of the side rails will be retained, although these guide elements will have to be modified so as not to interfere with the operation of the spring balance in the side rail. The depth of the latter as well as its jamb may have to be increased to accommodate the spring balance and to facilitate the inward movement of the sash into the jamb during removal and insertion of the sash. The foregoing suggested changes for heavy sashes are self-understood since they are obvious, and therefore are not illustrated.

Bodily Removal of the Sashes

Referring again to the illustration of what may be termed light-weight sashes, when the latter are to be removed, latch means 17 are operated so that mobile latch 24 is pushed by means of grip 27 into the jambs 11' and 12', while the sashes are being gently moved until slide 24 engages recesses 29 provided in guide channels 14. When slide 24 is thus held within recess 29, the spring balances become automatically disengaged from the sashes.

Now guide elements 32, normally extending from the sash side rails, are depressed against the tension of springs 33, thus facilitating the movement of these side rails into their respective jambs sufficiently so that the opposite sash side rails clear the opposite jambs (11' and 12'). Thus the sashes can now be swung past these opposite jambs and the sashes can be bodily removed from the window frame for washing, cleaning or any other purpose, in the manner indicated in broken lines in FIG. 7.

Reinserting the Sashes

When the sashes are to be replaced, depressible guide means 32 are again moved inwardly against the tension of springs 33 so that the sashes can pass into their respective jambs 11 and 12. Of course the insertion of the sashes takes place above the latch means 17, held stationary by means of their slides 24 previously moved into recesses 29 of guide channels 14. The sashes are placed into their respective jambs, until they rest upon their latch means 17. Now slides 24 are moved by means of finger grip 27 into engagement with detents 28, thereby clearing recesses 29 of channels 14. At that moment the sashes become reconnected to and counterweighted by their respective balances; at the same time guide means 32 assume their normal, outward position and facilitate the movement of the sashes in vertical directions.

Referring again to FIGS. 6 and 7, it will be noted that each of the side rails of both sashes is provided with anti-friction guide buttons 34 and that straddling parting beads 13 there is provided a resilient weatherstrip 35, the flanges of which are resilient and normally extend outwardly from bead 13 when not engaging the sash side rails, but forming a weathertight connection with one face of the side rails, while guide buttons 34, at the opposite faces of the side rails, urge the side rails against weatherstrip 35. Guide buttons 34 are made of anti-friction material, the same as guide means 32, while weatherstrip 35 is preferably made of resilient, non-corrosive material and is secured to bead 13 in any convenient manner, such as self-tapping screws 36.

In FIGS. 3, 4, 5, 6 and 7 it will be noted that latch means 17 are provided with anti-friction guide elements 37, which are shaped to fit into and to be guided within guide channel 14. Guide elements 37 not only guide latch means 17 in their vertical travel, but also preserve their correct position relative to the sashes, while subjected to the tension of counter balances 20.

Referring now to the suggested modified arrangement of two spring balances for large, heavy sashes, a double arrangement of latch means 17 may have to be adapted, that is one for each sash side rail and their respective spring balances.

While in the foregoing specific embodiments of a double hung window structure are described, it is quite obvious that the same principle in structure and operation is applicable to windows with either a single removable sash and a fixed sash, or to windows with a plurality of sashes wherein either one, two or all of the sashes are bodily removable from the window frame, as well as to window structures with heavy sashes requiring two spring balances, and it is to be understood that in the course of producing the various items illustrated and mentioned herein, changes and improvements may have to be incorporated, which are deemed to reside within the scope of the present invention, as defined in the following claims.

What is claimed as new is:

1. In a window structure including a window frame, and having a plurality of sashes, at least one of which being bodily removable from said window frame, the latter comprising inner and outer jambs; an inner, lower or bottom sash operative between the inner jambs, an outer, upper or top sash operative between the outer jambs, a parting bead separating the inner and outer jambs, a weatherstrip supported by said parting bead and rendering weathertight both sashes, at least one counter balance for each of the sashes housed in one of their respective jambs, at least one latch means at the bottom rail of each of the sashes for either connecting them with or disconnecting them from their respective counter balances; normally outwardly projecting, but depressible sash guide means provided at one side rail of each of the sashes and adapted to normally engage the edges of one of the sash jambs; said sash guide means being spring biased and, when said latch means are moved to their disconnecting position relative to said counter balances and when said sash guide means are depressed, the sashes are rendered movable into one of their jambs and can be swung out, past the opposite jamb, thus facilitating the bodily removal of the sashes from the window frame.

2. In a window structure as in claim 1, and wherein the sash jambs are of a sufficient depth to facilitate movement of the sashes relative to their respective jambs when the sashes and their counter balances are disconnected by the operation of said latch means.

3. In a window structure as in claim 2, and wherein said latch means have an anti-friction guide element extending into said balance-housing jambs, and wherein guide means for said anti-friction guide element are arranged within said balance-housing jambs.

4. In a window structure as in claim 3, and wherein said depressible sash guide means of the inner, bottom

sash normally project inwardly of the window frame, while the sash guide means of the outer, top sash normally extend outwardly of the window frame.

5. In a window structure as in claim 4, and wherein said sash guide means are located at one of the side rails and comprising anti-friction elements mounted upon depressible spring means, said one sash side rail having apertures for accommodating and facilitating the operation of said sash guide means but preventing their disengagement from the sash side rails, spring means housed within said sash side rails and normally urging said sash guide means in outward direction relative to said sash side rails and into engagement with the respective sash jambs.

6. In a window structure as in claim 1, and wherein said latch means are composed of the following parts: a foot member having an anti-friction guide element operative within the jamb housing said counter balance, and to which foot member the lower end of the counter balance is secured, a sliding latch having a finger grip operatively associated with said foot member, and a latch-holding detent fixedly secured to the bottom face of the lower sash rail; there being provided a guide member for said anti-friction guide element of said foot member, said guide member being located within the jamb housing said counter balance and being provided with a recess for receiving said sliding latch and being adapted to retain the latter, and thus the foot member, in a position at which the counter balance and the sash are disengaged, when the sash is to be removed from the window frame.

7. In a window structure, including a window frame, a plurality of sashes held in said frame, at least one of the sashes being bodily removable from said window frame, the latter including at least one pair of oppositely disposed jambs for receiving, guiding and facilitating the operation therein of said one sash, at least one counter balance for said sash housed within at least one of the jambs, at least one manually operable latch means associated with the bottom rail of said sash for either connecting the latter with or for disconnecting it from said counter balance, depressible sash guide means provided at one side rail of said sash; resilient means supporting

and normally urging said sash guide means outwardly in respect to said one side rail, said sash guide means being adapted to normally extend beyond the outer surface of said one side rail and to engage the edge of the jamb in which said one side rail operates, thereby normally guiding said sash in the jamb, said sash guide means, when depressed, permitting the movement of the sash into the jamb, thus facilitating the bodily removal of the sash from the window frame, provided that said latch means were placed to their disconnecting position in respect to said counter balance.

8. In a window structure having sashes bodily removable from the jambs of a window frame, an outer, top and at least one inner or bottom sash, counter balances for each of the sashes disposed at least along one of their side rails within their respective jambs, latch means associated with the bottom rails of said sashes, each latch means having a manually operable mobile slide for either connecting the counter balances with or disconnecting them from their respective sashes, and depressible guide means for the sashes operatively associated with their side rails opposite said counter balances and adapted to normally engage the edges of their respective jambs and, when depressed, to facilitate lateral movement of the sashes relative to said window frame for the removal of the sashes when said mobile latch slides are oriented to their disengaging position relative to said counter balances, and wherein said latch means have an anti-friction guide element, and wherein guide means for said guide element are provided within the jambs of the window frame in which operate the sash side rails, said guide means having recesses for retaining the mobile slide of said latch means in a position at which the counter balances are disconnected from their respective sashes.

References Cited in the file of this patent

UNITED STATES PATENTS

2,734,235	Trammell	Feb. 14, 1956
2,778,069	Starck et al.	Jan. 22, 1957

FOREIGN PATENTS

683,566	Great Britain	Dec. 2, 1952