March 17, 1970 W. O. JOHNSON 3,500,586

BALANCE MEANS AND SASH ASSEMBLY

Filed March 28, 1968 2 Sheets-Sheet 1

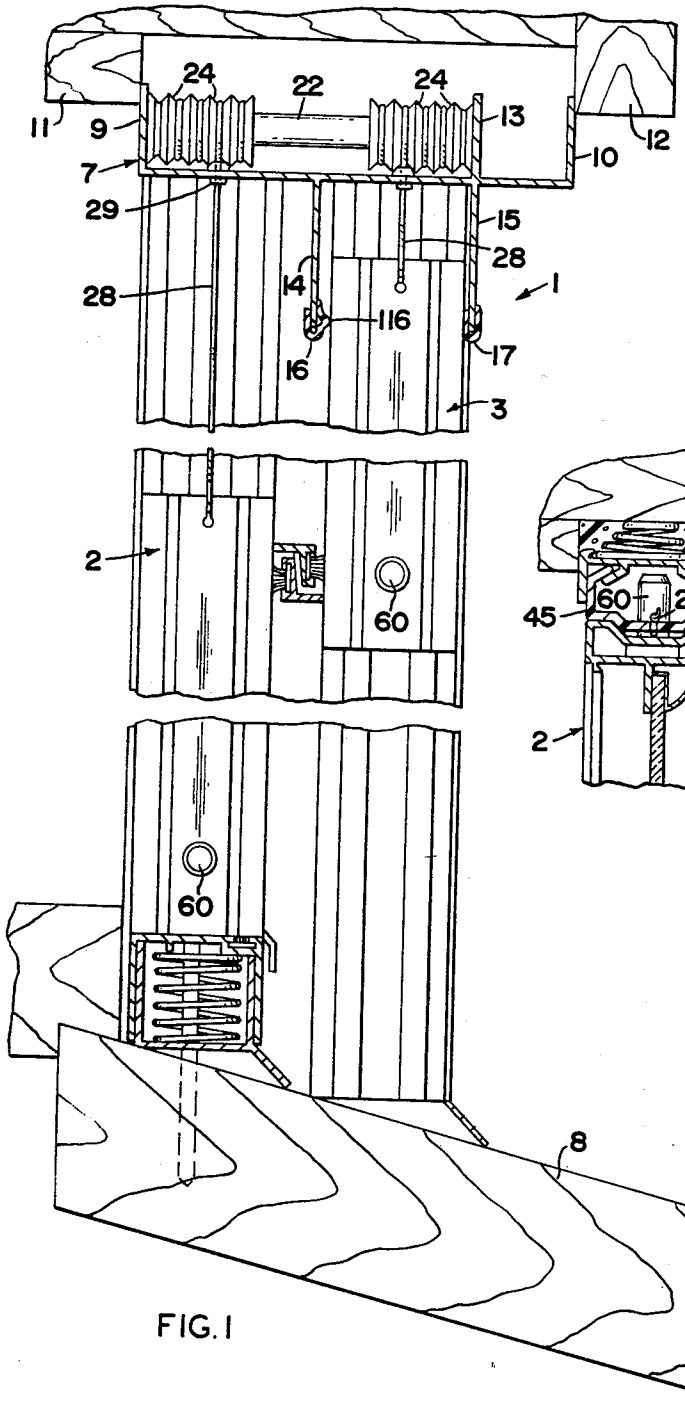


FIG. 1

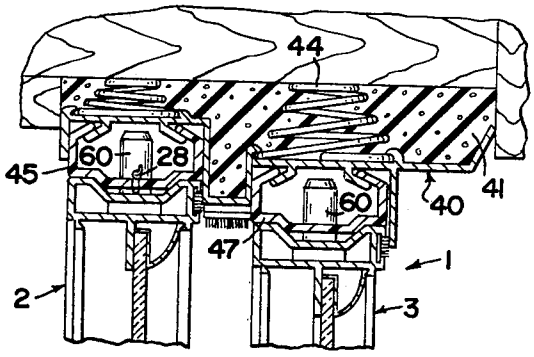


FIG. 4

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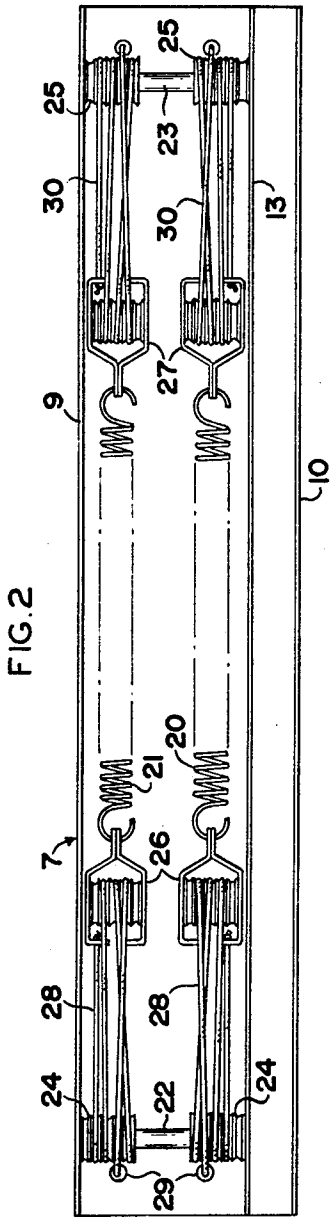


FIG. 2

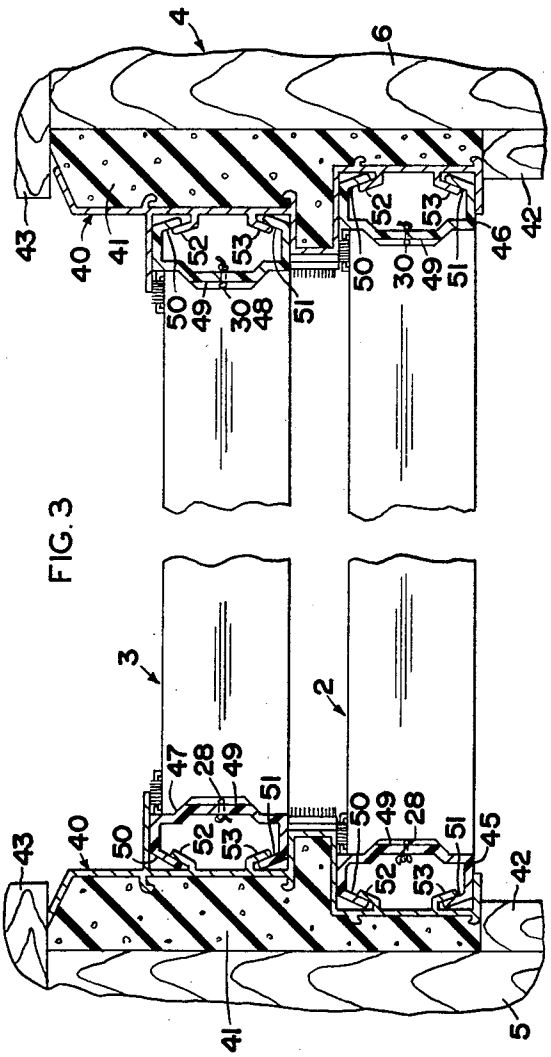


FIG. 3

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United States Patent Office 3,500,586
Patented Mar. 17, 1970

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BALANCE MEANS AND SASH ASSEMBLY

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Filed Mar. 28, 1968, Ser. No. 716,736
Int. Cl. E05d 13/12
U.S. Cl. 49—431 1 Claim

ABSTRACT OF THE DISCLOSURE

A slidably positioned single or double hung window sash assembly is provided and it is characterized by the use of a single coil spring positioned in a top header of the window assembly and operatively engaging a pair of block and tackle assemblies which resiliently engage and position a sash operatively in the window assembly by individual cords extending from the block and tackle assemblies and operatively engaging a window sash. The sash is slidably positioned in the assembly by sash runner strips having flanges thereon slidably engaging flanges formed on side jamb liners positioned in the assembly.

This invention relates to slidably positioned windows and particularly to a pair of vertically slidable window sashes positioned in a window assembly by improved, low cost balance means.

Heretofore there have been many different types of window assemblies provided and in many instances, pairs of balance means operatively engage each sash in a window assembly to facilitate vertical sliding action thereof.

It is the general object of the present invention to provide a novel and improved slidable window sash assembly wherein balance means are present to engage the window sash but wherein such balance means have a common spring member controlling two individual balance members operatively engaging a window sash.

Another object of the invention is to provide a coil spring in a top header of a window assembly and wherein such coil spring operatively engages a pair of individual block and tackle means each having a flexible cord connecting thereto and extending therefrom with a pair of such cords from the two block and tackle means operatively engaging a sash to facilitate vertical movement of the sash.

Another object of the invention is to provide novel and improved vertically movable window sash assemblies wherein the sash operatively engages a side jamb liner by the means of complementary shaped flanges on the side jamb liner laterally inner surface engaging flanges on the laterally outer surface of the window sash assembly.

A further object of the invention is to provide a novel and improved pivotally positioned window sash in a sturdy window assembly having a long service life with a minimum of maintenance.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

For an understanding of the invention, reference is made to the accompaying drawings, wherein:

FIG. 1 is a vertical section, with portions thereof broken away, of a double hung window sash assembly embodying the principles of the invention;

FIG. 2 is a plan view of the top header and associated means of the window assembly of FIG. 1;

FIG. 3 is a partially broken away, horizontal section of the window sash assembly of FIG. 1, with the window sashes therein horizontally aligned and shown in elevation; and

FIG. 4 is a fragmentary enlarged horizontal section of the window sash positioning means and a portion of the side jamb assembly associated therewith.

When referring to corresponding members shown in the drawings and described in the specification, corresponding numerals are used to facilitate comparison therebetween.

Attention now particularly is directed to the details of the structure shown in the drawings, and a window assembly is indicated as whole by the numeral **1**. Such window assembly **1**, in this embodiment of the invention, is shown as comprising a pair of sashes **2** and **3** positioned in the assembly for sliding movement in vertical planes. The window assembly **1** is operatively associated with a building **4** that includes suitable side jambs **5** and **6** for the window assembly. A top header **7** forms the upper portion of the window assembly and a sill **8** completes the framing means for the sashes to be operatively positioned in the window assembly.

As an important feature of the present invention resides in the means associated with the top header **7**, such part of the window assembly **1** will be first described in detail. Preferably this top head **7** is formed from an extruded metal member and it is made from any conventional material, such as aluminum, and is of generally U-shape in vertical section, as indicated in FIG. 1. Such header **1** includes a pair of edge flanges **9** and **10** and the header **7** is of such a size as to be received in a conventional window opening that may be defined by trim strips **11** and **12** secured in the building **4**. In addition, the header **7** has another vertically upwardly extending flange **13** provided therein adjacent the flange **10**, and the top header has a pair of parallel, downwardly extending flanges **14** and **15** that are adapted to engage the upper sash **3** when moved to its uppermost position. These flanges **14** and **15** may have any suitable resilient guide or sealing strips **16** and **17** secured thereto with the strip **16** having a sealing rib **116** thereon.

It is a feature of the invention that a coil spring **20** is provided for controlling the position of the lower sash **2** and a similar coil spring **21** is provided to engage and control the vertical position and movement to engage and FIG. 2 of the drawings clearly shows that shafts **22** and **23** are suitably secured to and extend between the flanges **9** and **13** to be positioned thereby perpendicular to the longitudinal axis of the header adjacent the ends thereof. A plurality of individual sheaves **24**, **24** and **25**, **25** are journalled on the individual shafts **22** and **23**, respectively, and multi-sheave blocks **26** and **27** are secured to the spring **20**, at the ends thereof. An operative block and tackle means, or assembly is formed by threading a cord **28** around the block **26** and the sheaves **24** associated with the shaft **22**, with one end of the cord **28** extending down through an aperture in the lower portion of the header **7**. The other end of the cord **28** is affixed to the multi-sheave block **26**. This aperture has a suitable sleeve or grommet **29** therein, so that an end of the cord **28** can extend down to and operatively engage the lower sash **2**. A similar cord **30** engages the block **27** and the associated sheaves **25** on the shaft **23** and likewise extends down for operative engagement with the opposite side of the sash **2** whereby a balanced lifting action can be obtained on the sash, as hereinafter described. It will be seen that any movement of the sash **2** upwardly results in an elongation of the block and tackle means engaging each end of the spring **20** as well as a shortening of the spring, and that lowering the sash will cause a reduction in length of the block and tackle assemblies and an elongation of the coil spring whereby one coil spring is used for operative association with and forming, in effect, a component of each of a pair of balance means engaging the sash **2**. Or, it can be considered that a unitary balance

means engages both sides of the sash and controls the vertical positioning thereof.

The means engaging the sash **3** are similar in construction and operation to those engaging the sash **2** and will not be described in detail.

In order to complete the operative positioning of the sashes in the window assembly, a side jamb liner **40** is operatively positioned on the laterally inner surface of each of the side jambs **5** and **6**. Such liners **40** normally are resiliently positioned in relation to the side jambs, as by having some resilient pad or strip **41** made from foamed polyurethane, rubber or equivalent material, spacing them from the side jambs. The side jamb liners **40** may slidably engage with stops or trim strips **42** and **43** provided in the window assembly. The side jamb liners **40** are resiliently urged laterally inwardly at all times by a plurality of members, such as coil springs **44**, that are operatively positioned intermediate the side jambs **5** and **6** and the liners **40**, as indicated in FIG. 4.

These side jamb liners are of stepped construction whereby a wider window sash receiving opening is provided for engaging the lower sash **2** in relation to the upper sash **3** so that these sashes can be pivotally positioned in the apparatus and be exposed for cleaning, repair, or other purposes. Thus, to position and engage the sashes with the side jamb liners, a plurality of sash runner members **45**, **46**, **47** and **48** are provided with a pair of such runner strips being operatively associated with the vertical side rails of each of the sashes. The sash runner members or strips preferably are made from a low friction plastic material. These runner strips **45** through **48** each are provided with a centrally located, laterally inwardly extending rib **49** thereon which operatively engages with a complementary shaped recess provided in the vertical side rail of the sashes, and each of these runner strips terminates in converging flanges **50** and **51** at the laterally outer portions of each runner strip. In general, the runner strips are of substantially U-shape in section, and these flanges **50** and **51** are shaped complementary to pairs of diverging flanges formed on the laterally inner surfaces of the liners **40** at the portions thereof engaging the sashes. These diverging flanges are indicated by the numerals **52** and **53** and the flanges **50** and **51** slidably engage the flanges **52** and **53** and operatively position the sashes for vertical movement. The sashes can be pivoted with relation to the runner strips **45** through **48** by members, such as pivot pins **60** suitably engaging the lower ends of each of the sashes and extending laterally outwardly therefrom, with such pivot pins **60** extending through suitable apertures in or otherwise being secured in engagement with the runner strips. The jamb liners **40** can be moved laterally outwardly to spring the sashes out of engagement with the runner strips.

The balance means provided in the window assembly of the invention operatively engage the sash by the cords **28** and **30** extending down to a pair of the runner strips **45** and **46**, for example, engaging the lower sash **2** whereby the balance means facilitate vertical sliding movement of the window sashes. If desired, any suitable means can be provided on the side jamb liners **40** or other portions

of the frame to restrain the sash runner strips from vertical upward movement when a window sash is disengaged therefrom.

In view of the foregoing, it is believed that a novel and improved window assembly has been provided and that efficient, low cost and practical balance means are provided to facilitate the positioning and movement of the individual sashes in the window assembly. Thus, the objects of the invention are thought to be achieved.

While one complete embodiment of the invention has been disclosed herein, it will be appreciated that modification of this particular embodiment of the invention may be resorted to without departing from the scope of the invention as defined in the appended claim.

What is claimed is:

1. In a vertically slidable window assembly including a header, side jambs, a sash, and means slidably engaging said sash with said side jambs, the combination of

a coil spring extending longitudinally of said header,

a shaft secured to said header adjacent each end thereof and extending perpendicular to the longitudinal axis thereof,

a plurality of aligned sheave means journalled on each of said shafts,

a multi-sheave means operatively secured to each end of said coil spring,

a cord means operatively threaded around and operatively engaging the sheaves of each of said sheave means to form a block and tackle means, an end of each of said cord means extending down to and engaging said sash to position it in the window assembly,

a side jamb liner for each said side jamb,

a sash runner strip slidably interlocked with each of said side jamb liners,

means securing said sash to said sash runner strips to position said sash extending therebetween,

said side jamb liner being of channel shape in horizontal section and having a pair of vertically extending diverging flanges on the laterally surfaces thereof, and

said sash runner strips terminating at their laterally outer margins in a pair of converging flanges slidably engaging said side jamb liner flanges.

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KENNETH DOWNEY, Primary Examiner

U.S. Cl. X.R.

16—197; 49—419, 445