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MOUNTING OF SASH BALANCES

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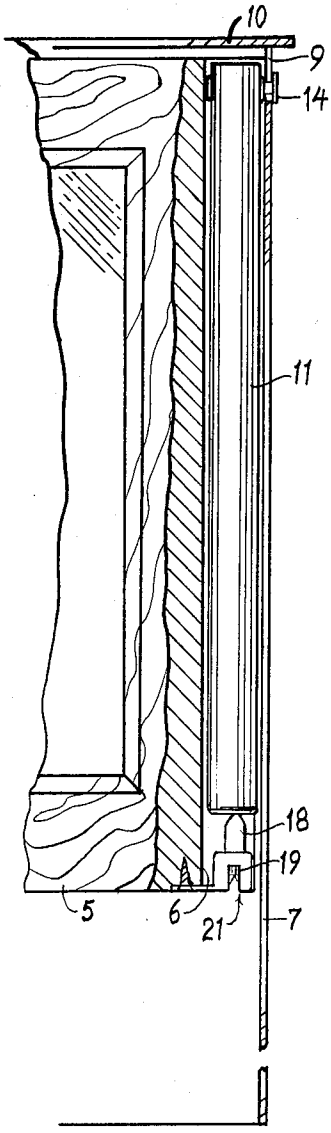


FIG. 1

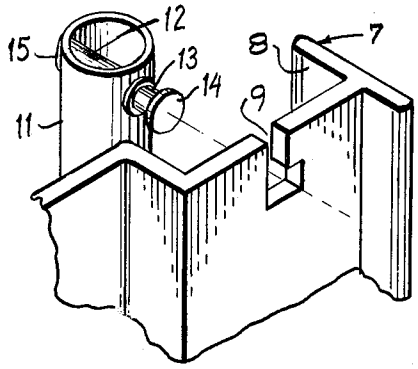


FIG. 2

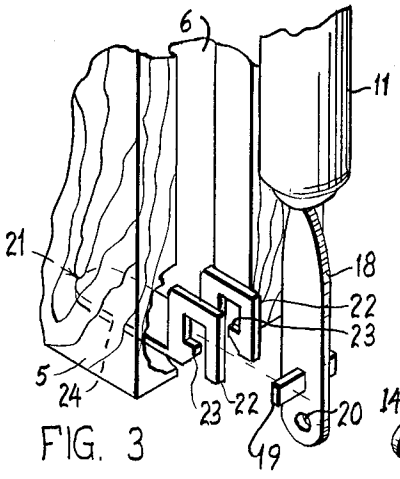


FIG. 3

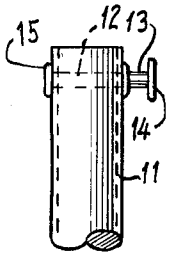


FIG. 4

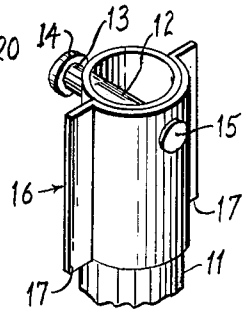


FIG. 5

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MOUNTING OF SASH BALANCES

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This invention relates to sash balances for windows, and more particularly to a mounting for a sash balance.

Extensible type sash balances have been mounted conventionally in a manner to be substantially attached to the window frame in which they are disposed; although provisions are generally made so that the balances are detachable from the sash to which they are also connected. Extensible sash balances are most commonly of the type including an elongate coil spring fastened at one end within a carrier tube therefor, a slider nut fastened to the other end of the spring, and a twisted actuator disposed through the slider and adapted to wind the spring as the sash and actuator are moved up or down in the window. Such balances are often furnished with a tubular device through one end thereof to anchor the spring in the end of the tube. The tubular device is in the form of an elongate cylindrical rivet or grommet. The tubular nature of the device is such as to permit the placement therethrough of a nail or screw to fasten the same end of the sash balance in the frame of the window against movement as the sash is operated. However, it is well known that there is considerable torsional force within the sash balance during its operation, which is transmitted directly to the fastening means for the balance. A nail or screw used to fasten the balance to the wooden frame of the window becomes loosened in time by the "working" of the sash balance thereagainst as the sash is raised and lowered. Even with the use of aluminum weather strip and sash channels and the like, such fasteners are subject to being loosened in the wooden frame behind the channel; thereby enlarging the hole therein so that the fastener does not hold securely. The use of larger fasteners to replace loose ones is obviated by the size of the opening through the tubular device in the end of the balance.

Another disadvantage in conventional sash balances lies in the nature of the fastening or mounting means therefor. In most cases a sash is provided with a plough, or longitudinal groove, in one or both edges thereof, in which the sash balance is disposed when the sash is in the window. It follows that, for proper and efficient operation of the sash balance, the balance must be properly aligned or disposed in the plough of the sash so that the sash balance and sash will not bind during raising or lowering of the sash. Careless workmen at times fail to properly center the sash balance in the sash channel of the window frame during the installation of the balance, thereby causing malfunctioning of the balance due to improper alignment with the plough in the sash.

Moreover, should it become desirable or necessary to remove the sash balance for replacement or maintenance of the window or balance, the dangers of the mounting or fastening means are all accelerated when the screw is removed to facilitate removal of the balance from the window. It is well known that when the screw is replaced in the same hole from which it was removed, it neither holds as securely nor for as long as if it had remained undisturbed.

It is therefore an object of this invention to provide a sash balance mounting means which securely mounts the sash balance to the window, yet leaving the sash balance independently disposed within the window frame.

It is another object of this invention to provide a sash balance mounting providing for a completely removable and replaceable sash balance.

Another object is to obviate the chances of a sash balance mounting becoming loosened during normal usage thereof.

In carrying out the objects of the invention there is provided a window including slidable sash, a sash balance for the sash, and detachable means for connecting one end of the sash balance to the sash and the other end of the sash balance to the window frame.

A complete understanding of the invention will be had from the following detailed specification when read with reference to the accompanying drawings, in which:

FIGURE 1 is a longtiudinal fragmentary view of a window, with parts cut away to illustrate the invention.

FIGURE 2 is an exploded view of the invention, in part, and illustrating on an enlarged scale one end of a window combination.

FIGURE 3 is an exploded view of the invention, in part, and illustrating on an enlarged scale one end of a window combination.

FIGURE 4 is an enlarged longitudinal view illustrating one feature of the invention.

FIGURE 5 is an enlarged view of a modification of the invention.

With reference to FIGURE 1, there is shown a substantially conventional window construction including a window frame having a header **10**, and a side rail **7**. A sash **5** is shown as being mounted slidably within the frame, it being understood that only one side of the window is shown. The side not shown can be the same as the side shown, and all following description will suffice for the entire combination. Further, the sash **5** illustrated is the upper sash, its description being the same as for the lower sash. One slight modification is made for lower sash, however, as will appear.

A sash balance **11** is shown operatively mounted in the window. The sash balance **11** is of the tubular type having an extensible operating rod **18** extending from one end thereof. One end of the sash balance **11** is connected to the window frame, in this case it being the upper end of the balance **11**. The operating rod **18** is connected by detachable means to the sash **5**, as will appear. The sash **5** is formed with a plough **6**, or longitudinal groove in the edge thereof, in which the sash balance **11** is disposed when in place in the window. (See FIGURES 1 and 3.)

The side rail **7** is formed as a U-shaped channel having sides **8** (FIGURE 2) between which the edge of the sash **5** is disposed when the sash is in place.

FIGURE 3 illustrates the detachable means provided for operatively connecting the sash balance **11** to the sash **5**. A toggle **19** is disposed through the end of the operating rod **18** of the sash balance. In the bottom of the sash **5** there is fastened a bracket **21** which is formed with opposing U-shaped arms **22** defining openings for receiving the toggle **19**. Detents **23** are formed inwardly in opposite directions from the end of the arms **22**, and act as retainer hooks, as will appear, for retaining the toggle **19** during operation of the window. To make the operative connection between the sash balance **11** and the sash **5** the toggle of the operating rod **18** is engaged in the openings formed by the U-shaped arms **22** of the bracket **21**, and is retained therein by the detents **23**.

It will be observed that a small hole **20** is formed in the end of the operating rod **18**. The hole **20** is provided so that the user of the window may insert a hook-shaped tool, not shown, into the hole **20** from below for manipulating the operating rod **18** and the toggle **19** for connecting and disconnecting the rod from the bracket **21**. The sash balance **11** may be pre-tensioned according to conventional practice by this means. To pre-tension the sash balance **11** in this case, it is necessary to rotate the operating rod **18** in a counter-clockwise direction from below by using the tool inserted in the hole **20**. The

toggle **19** is then aligned with the openings in the arms **22** of bracket **21** and placed therein. It is obvious that the tension imparted to the rod by the pre-tensioned sash balance engages the operating rod and toggle **19** thereof against the detents **23** to maintain the operative connection between the sash balance **11** and the sash **5**.

A second detachable means is provided for connecting the other end of the sash balance **5** to the window frame. In the embodiment shown in FIGURES 1, 2 and 4, it will be seen that the sash balance **11** is connected to the channel formed in the side rail **7**.

This detachable means comprises a pin **12** in the end of the sash balance **5** having a portion **13** extending sidewardly from the sash balance. An enlarged head **14** is formed on the end of the pin portion **13**. It will also become obvious that the pin **12** forms means for holding the parts of the sash balance **5** together inside the main body portion thereof. This is accomplished by peening over the end of the pin as at **15** and on either side of the balance so as to secure the pin **12**. The channel **7** is formed with a slot **9** which may extend downwardly from the top of the channel a distance sufficient to receive the portion **13** of pin **12**. The pin portion **13** is thus engaged or otherwise disposed in the slot **9** with the head **14** of the pin engaged behind the wall of the channel side rail **7**. In this embodiment it is desirable to make the slot **9** L-shaped and to locate the slot to the side of the center of the channel between the sides **8** thereof so that the L portion of the slot is centered between the sides **8** of the channel. Thus the pin portion **13**, when disposed in the slot **9**, will be retained by the L portion of the slot due to the torsional force within the sash balance **5**; and will therefore have no tendency to "ride" up and down in the slot **9** as the sash **5** is raised and lowered during normal usage.

FIGURE 5 illustrates a modification of the sash balance **11** and the second detachable means therefor for securing the balance **11** to the window frame. It is recognized that, with lower sash in a window, a top stop is usually provided within the window frame for limiting the travel of the sash at the top of the window. Thus it is that FIGURE 5 illustrates a stop **16** disposed on the sash balance **11** for limiting the vertical movement of a sash operated therewith. In this embodiment the stop **16** may be a U-shaped plate of any suitable rigid material held to the sash balance **11** by the peened-over portion **15** of the pin **12**. The stop **16** is formed with outwardly extending portions having edges **17** against which the sash is adapted to abut at the limit of its movement in the window frame along the sash balance **11**. While the stop **16** is designed chiefly with the lower sash in mind, it is to be understood that its use may be in any application requiring such a stop device for limiting the travel of a sash.

The operation of the window and sash balance according to the invention is as follows. During assembly of the window and the installation of the sash balance **11** thereinto, the sash balance **11** is first secured in the window frame side rail **7** by engaging the portion **13** of pin **12** in the slot **9** as described, permitting the sash balance **11** to hang in the frame of the window. The sash **5** is then inserted in the frame of the window after the operating rod **18** has been pulled downwardly so that the toggle **19** will be disposed below the bracket **21** when the sash **5** is installed with the sash balance **11** being disposed in the plough **6** of the sash **5**. The operator then pre-tensions the sash balance **11** by turning the operating rod **18**.

The tension of the sash balance urges the rod **18** upwardly and the toggle is then engaged in the openings in the arms **22** of the bracket **21** and is retained thereat by detents **23**.

The sash balance **11** is now detachably and operatively connected to the sash **5**, and is detachably and securely mounted in the window frame. It will, of course, be understood that the side of the window not illustrated may be substantially the same as the side shown. The exception is that additional means may be provided for permitting lateral movement of the sash **5** to facilitate removal and replacement thereof in the window frame. Thus the foregoing description will apply equally for the side not shown for the purposes of this invention.

The above procedure is reversed for removal of the sash and the sash balance.

It will readily become apparent that, among other advantages, the sash balance is securely and detachably held in the window and at the same time to the sash. The torsional forces involved in normal usage of the sash balance are not detrimental to the means for mounting same in the window, and damage to the mounting means and the window frame is thus overcome. Positive alignment of the sash balance in the plough of the sash is assured by the nature of the mounting means, whereby the balance may be mounted only in proper alignment in the channel in the side rail of the frame.

A single embodiment of the invention having been shown and described for the purpose of illustration, it is to be understood that the invention is not to be limited thereto, but is to be construed as fairly falls within the spirit and scope of the appended claim.

I claim:

The combination of a window structure including slidable sash, a channel for the sash formed in window frame, said channel being formed with a slot in one end thereof, a detachable sash balance for the sash, detachable means for connecting one end of said sash balance to said sash comprising a bracket on the sash formed with arms defining an opening, and a toggle on the sash balance engageable in the opening in said bracket, and second detachable means for connecting the other end of said sash balance in said channel including a pin extending sidewardly from one end of said sash balance, an enlarged head formed on said pin, said pin being disposed in said slot when the sash balance is in place, and a stop for limiting the travel of said sash, said stop including a plate held to said sash balance by said pin, said plate having portions extending therefrom defining edges for abutting the sash at the limit of its vertical travel.

References Cited by the Examiner

UNITED STATES PATENTS

565,525	8/1896	Tucker	248—224 X
1,337,012	4/1920	Goodwin.	
2,603,167	7/1952	Webster et al.	248—224 X
2,871,506	2/1959	Decker et al.	20—52.2
2,885,725	5/1959	Glass	20—52.2 X
2,986,771	6/1961	Martin	20—52.2 X

FOREIGN PATENTS

766,456	11/1951	Germany.

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