

March 11, 1941.

E. S. PERSSON

2,234,776

LOCKING AND TIGHTENING DEVICE

Filed Jan. 21, 1939

2 Sheets-Sheet 2

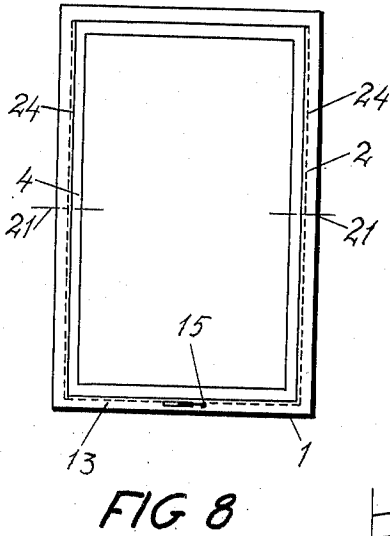


FIG. 8

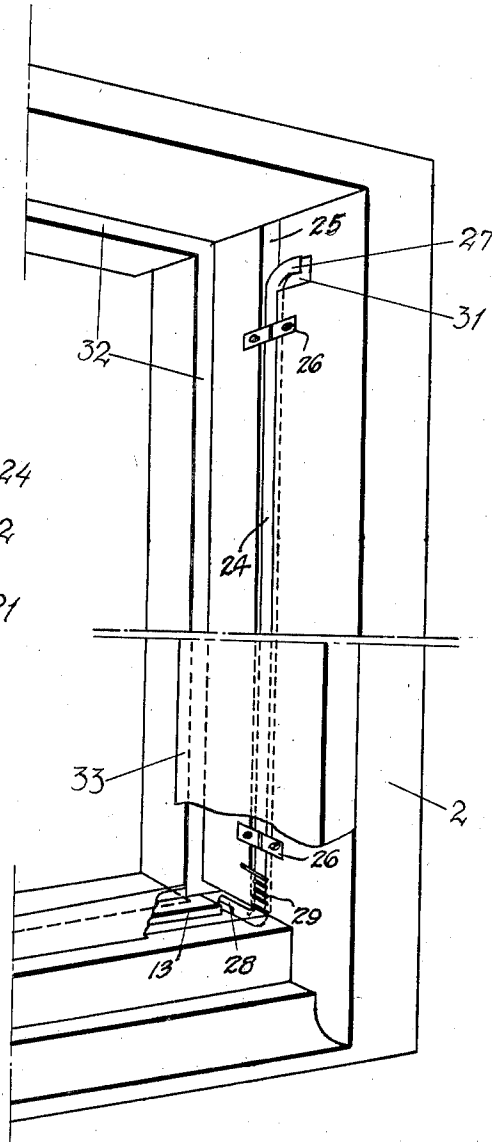


FIG. 9

INVENTOR

ERIC SIGFRID PERSSON

BY

Young, Emery & Thompson
ATTYS.

UNITED STATES PATENT OFFICE

2,234,776

LOCKING AND TIGHTENING DEVICE

Eric Sigfrid Persson, Malmö, Sweden

Application January 21, 1939, Serial No. 252,201

In Sweden January 20, 1938

10 Claims. (Cl. 292-45)

This invention relates to a locking and tightening device particularly for windows, and which offers several important improvements in respect of manufacture and effectively over known means for the same purposes.

An object of the invention is to provide a device insuring an effective tightening along a joint between the window frame and the sash.

Another object is to provide a device insuring an effective tightening simultaneously along an opening edge of the window and at two edges perpendicular to said opening edge.

An embodiment of the invention is described below with reference to the drawings, in which:

Figure 1 shows a plan view on a small scale.

Fig. 2 shows, on an enlarged scale, a partial horizontal sectional view of the device mounted in a window frame.

Fig. 3 shows a side elevation of the same device.

Fig. 4 shows a partial horizontal sectional view similar to Fig. 2, but including also the window sash.

Figs. 5-7, inclusive, show sectional views of other embodiments.

Fig. 8 shows, on a small scale, a plan view of a window provided with a special embodiment.

Fig. 9 shows, on an enlarged scale, a partial perspective view of a frame provided with the last-mentioned embodiment.

The window shown in Fig. 8 comprises a frame 1, 2 and the sashes 4 which are mounted so as to pivot about the horizontal central axis 21, 21. Along the lower horizontal joint between the frame and the window sashes a locking device 13 is provided, which is operable by means of the handle 15. This locking means is preferably of the kind indicated in my co-pending patent application, Serial No. 209,848, and adapted in locking position to press the bottom piece of the inner sash 4 inwards against an abutment of the bottom piece 1 of the window frame, in said way causing a good locking and tightening effect along this joint.

In Fig. 2, 1 indicates the bottom piece of the window frame, the side piece 2 of which is provided with a horizontal slot 3, which is through-going in the embodiment shown. The bottom of said slot is preferably level with the top surface of the bottom piece 1. In the present example, when the window is opened the lower edge is moved in the direction indicated by the arrow A in Fig. 4.

In the inside of the side piece 2 of the frame a longitudinal recess 5 is provided extending along

the whole length of the side piece and in this recess an oval pipe 6 is provided. In the position shown in dotted lines in Fig. 4, the pipe is quite clear of the window sashes so that they can be opened. In the position shown in full lines, however, it engages a recess of the sash, thereby pressing the sash outwards at the same time as it engages the frame 2, in this way clamping the sashes simultaneously as the joint between the sashes and the frame is effectively sealed.

At its top, the pipe extends a distance into the top piece of the frame. At its bottom, it rests in a hole 7 of a plate 8 secured in the slot 3. Above the plate 8 an arm 9 is secured to the pipe 6, said arm being provided with a hole or guide of such a shape and size as to make the pipe 6 displaceable but not turnable therein. The pipe is simply removable by lifting it out of said guide. The free end of the arm 9 is articulated to a rod 10, the lower surface of which is provided with teeth 11 covering more or less of the length of its underside, said teeth coacting with corresponding teeth 12 on the upper surface of a rod 13. The toothed portion of the two rods 10 and 12 are pressed against each other by means of a sleeve 14 pushed over them.

Fig. 1 shows, on a small scale, how two pipes 6 can be operated together, said pipes being positioned one at each of the vertical side pieces of a window of the kind indicated above. The rods 13 are pivotally connected with a two-armed lever 15 pivoted at 16 in such a manner that when turning the lever 15 in a clockwise direction (Fig. 1) the rods 13 pull the arms 9 towards each other and thus said arms 9 turn the pipes 6 to locking and tightening engagement with the sashes. When turning the lever 15 in the opposite direction the sashes are disengaged.

Figs. 5 to 7, inclusive, show some modifications of the locking and tightening device having a rod or the like substituted for the pipe 6. The shape of said rod or the like, as well as the shape of its corresponding abutment surfaces in the sash, is illustrated in the figures. According to Fig. 5, rubber sealing strips or the like 19 are provided at the abutment surfaces of the frame and the sash. According to Fig. 6, corresponding sealing strips are provided on the rod 6, and according to Fig. 7, the rod 6 is positioned below a diaphragm 18 movably connected to the frame, said diaphragm being pressed against the sash when the rod is turned.

In another embodiment (Fig. 9), two round

iron rods 24 are mounted along the vertical joints of the window, said rods co-acting with the locking and tightening means 13 acting along the lower horizontal joint. The rod 24 is positioned in a recess 25 extending along the side piece 2 of the frame. Said rod 24 is pivotally mounted in clamps 26. At its upper end the rod is provided with a locking member 27 perpendicular to the longitudinal axis of the rod and at its lower end with an operating member 28 also perpendicular to said longitudinal axis although projecting in a direction opposite to that of the member 27. A spring 29 is mounted on member 28 and is adapted to press said member 28 to the left in Fig. 9.

When the window is being opened and the locking and tightening means 13 is brought out of locking position by operating the handle 15, the rod 13 is pulled to the left in the example illustrated. Hereby the member 28 can be displaced to the left by the effect of the spring 29. When the rod 24 turns in the clamps 26 about its pivot axis, the locking member 27 is brought into the recess 31 of the frame. Hereby it clears the way for the sash which can thus be swung out into open position.

When the window is being closed, the sashes are brought back to closed position and the locking and tightening means 13 is operated by means of the handle 15. Hereby the rod portion 13 is displaced to the right in Fig. 9. Then it presses the member 28 of the locking rod 24 to the right and the rod 24 turns about its longitudinal axis. Thus the locking member 27 is brought out of the recess 31 of the frame and into engagement with a suitable recess in the adjacent surface of the inner sash. In locking position, the locking member presses the upper portion of the sash pivotally mounted at 21, 21 outwards against the tightening surfaces 32 of the frame. In this way an effective tightening is obtained not only adjacent the locking and tightening means 13 but all around the window sash. The fact that the sash is thus pressed against the tightening surfaces of the frame effectively prevents warping of the same due to wind pressure or climatic influences.

The spring 29 prevents the locking member 27 from being brought into locking position, for instance by accidental operation of the handle 15 and from remaining in said locking position upon returning of the handle 15, and thereby remaining in the way of the sashes, hindering them when they are to be closed.

In order to avoid any reduction of the tightening effect by wear of the surface of engagement for the locking member 27 in the sash, said surface is suitably covered with a wear-proof material, for instance iron-plate, on which said member 27 operates. The parts of the sash engaged by the member 27 as well as the recess 31 of the frame can be given any desired shape, such as a circular shape.

Numerous modifications of the embodiments described above can be made within the scope of the invention. Thus prominence may be given to the fact that the invention is suitable for windows and the like of every kind, irrespective of the kind of mounting thereof.

In the embodiment shown in Fig. 9, several locking members may also be placed on a common rod and the device may be used, for instance, for common locking of several sashes positioned one above the other. The locking device can be placed in the frame or in the sash,

and at two or more window edges. The coaction between the locking and tightening means 13 and 24 can be obtained in different ways. Thus, instead of pushing the operating member at the lower end of the locking rod to the right in the figure when locking, as in the above example, the rod positioned in the bottom piece of the frame could be arranged to pull said operating member to the left in the figure, the operating member then projecting in the opposite direction. The replacing spring could be arranged in different ways, or the device made in such a manner as to attain the effect of the spring without actually using the spring device.

I claim:

1. A locking and tightening device for windows and the like having a frame and a sash, comprising a rod or the like of non-circular cross-section mounted between said frame and sash, said rod extending along the joint between said frame and sash, and manually operated means for turning said rod in different directions about an axis substantially parallel to the rod to cause the outermost edges of the rod to engage and disengage the adjacent parts of said frame and sash, said rod in the former case keeping said window member in closed position and at the same time causing a tightening effect and, in the latter case, allowing the window to be opened.

2. A device according to claim 1, further comprising a guide for receiving the lower end of the rod or the like so that the rod may be simply removable by lifting it out of said guide.

3. A device according to claim 1, in which two or more rods or the like are connected to a common operating device.

4. A device according to claim 1, in which the rod or the like is provided with locking members projecting at an angle to the pivot axis of the rod, said locking members being brought to engage and disengage the adjacent window member when pivoting the rod.

5. A device according to claim 1, in which the rod or the like is provided with locking members projecting at an angle to the pivot axis of the rod, said locking members being brought to engage and disengage the adjacent window member when pivoting the rod and adapted, when in engaging position, to press the window sash against an abutment of the frame in order to cause a tightening effect.

6. A device according to claim 1, in which the rod or the like is provided with locking members projecting at an angle to the pivot axis of the rod, said locking members being brought to engage and disengage the adjacent window member when pivoting the rod, and a spring to give the rod a tendency to occupy a certain position.

7. A device according to claim 1, in which the rod or the like is provided with locking members projecting at an angle to the pivot axis of the rod, said locking members being brought to engage and disengage the adjacent window member when pivoting the rod, and a spring to give the rod a tendency to occupy a certain position, the rod or the like being adapted to coact with a locking device placed along a window edge and provided with a member in a way to cause said locking device, when moved to locking position, to act on a corresponding operating member of the rod or the like so as to make said rod pivot and engage the adjacent window member and, when the locking device is being moved to opening position, to clear said operating member of

the rod or the like so as to allow said rod or the like to be moved out of engagement by means of the spring device.

8. A locking and tightening device for windows and the like having two elements movable relative to each other and adapted to be locked or tightened in juxtaposed relation, comprising a rod-like member of elongated non-circular cross-section extending longitudinally between said elements, and means for rotating said member about a longitudinal axis to cause the edges of said member to engage the adjacent portions of said elements.

9. In a window having a frame and a sash pivoted to swing about a horizontal axis intermediate the top and bottom of said frame, said frame having stops at the upper portion limiting the outward movement of the sash and stops at the lower portion of the frame limiting the inward movement of the sash, locking means at the lower edge of the window for drawing the lower edge of the sash in against its stop, said frame having a vertical slot formed in one side thereof, a vertical rod rotatably mounted in said slot, means at the upper end of said rod for engaging the upper portion of the sash and urging the latter outwardly against its stop, and means for transmitting movement from the locking means

at the lower portion of the window to said rod to simultaneously urge the sash inwardly at the bottom and outwardly at the top against the corresponding stops.

10. In a window having a frame and a sash pivoted to swing about a horizontal axis intermediate the top and bottom of said frame, said frame having stops at the upper portion limiting the outward movement of the sash and stops at the lower portion of the frame limiting the inward movement of the sash, locking means at the lower edge of the window for drawing the lower edge of the sash in against its stop, said frame having a vertical slot formed in one side thereof, a vertical rod rotatably mounted in said slot, means at the upper end of said rod for engaging the upper portion of the sash and urging the latter outwardly against its stop, means for transmitting movement from the locking means at the lower portion of the window to said rod to simultaneously urge the sash inwardly at the bottom and outwardly at the top against the corresponding stops, and spring means for urging the rod to a position to remove the means at the upper end thereof to a position out of the path of movement of the sash.

ERIC SIGFRID PERSSON.