ADJUSTING HARDWARE FOR SASHES AND THE LIKE

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Inventor
Sern Madsen

Examiners
By Bair, Freeman & Sinclair

Attorneys
An object of my invention is to provide adjusting hardware for sashes and the like having improved details of construction over the hardware illustrated in my Letters Patent No. 2,048,131, of June 21, 1938.

A further object is to provide adjusting hardware of this general character having a one-way bendable chain which is neat in appearance and rigid when in an extended position due to its constructional features.

Still a further object is to provide at one end of the adjuster chain a means for connecting the chain to a sash comprising an element having a central pintle portion and enlarged end portions to receive screws which extend into the sash.

Still a further object is to provide the links of the chain with gashes for coaction with the worm threads of an operating worm enclosed in a case and from one link of the chain to omit the gash so that the worm of the operator can engage this link to limit extension of the chain from the case.

Another object is to provide an operating worm for the chain having a bore and a crank having a shank removably and non-rotatably mounted in the bore, means being provided in the bore for limiting the extension of the shank therein and such means being adjustable longitudinally of the bore to determine the extent of reception of the shank therein for the particular window installation being made.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of the adjusting hardware for sashes and the like, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a window adjusting means embodying my invention showing it applied to the vertical jamb member of a window frame and showing a window in closed position thereagainst.

Figure 2 is a similar view showing diagrammatically the window extended to an open position by the adjusting mechanism.

Figure 4 is a vertical sectional view on the line 4—4 of Figure 3 showing an adjustable friction means for the operating or adjusting hardware to retain it in various adjusted positions.

Figure 5 is a sectional view on the line 5—5 of Figure 3 showing a bottom plan view of one corner of the operator and illustrating a track associated therewith for guiding the chain of the operator.

Figure 6 is a perspective view of a straddle element of the operator chain.

Figure 7 is a perspective view of a tension element of the operator chain.

Figure 8 is a perspective view of a pintle member for connection to one end of the chain for attaching the chain to a sash; and

Figure 9 is a bottom plan view of the chain illustrating the association of the straddle and tension elements and pintle member with each other.

Referring to the accompanying drawing, in Figure 1 a window frame is illustrated having a side jamb 10 and a sill 12. A stool 13 is mounted on the sill 12. A sash 14 is closable against the window frame, the frame having a stop 15 against which the sash 14 closes. A weather strip W surrounds the sash and has a leaf 16 engaging the jamb 10 to provide a weather seal around the sash. The sash is mounted relative to the window frame by means of tracks 18, rollers 20 cooperating therewith and pivoted arms 22, as clearly disclosed in my co-pending application Serial Number 127,148, filed February 23, 1937.

Briefly, two of the tracks 18 are attached to the head and sill of the window frame. Two of the rollers 20 are provided, mounted on brackets 24 extending from the sash 14, and two of the arms 22 are provided having their ends pivoted respectively to brackets 25 at the top and bottom of the sash 14 and to the sill and head of the window as indicated at 26. This type of mounting is provided so that during the opening of the window, the opening edge thereof travels in a substantially straight line outwardly from the window frame, as obvious from an inspection of Figure 2.

An operator is provided for opening and closing the sash comprising a case 27 from which a chain C' is adapted to extend. The case C is made in two halves, as shown in Figure 5, these halves being held together and also held on the jamb 10 by wood screws 30. The jamb 10 is routed out as indicated at 32 in Figure 4 to receive the back of the case C so that its outer face may be flush with the stop strips 14 which extend upwardly and downwardly from the case C.

Within the case C I provide a guide means for the chain C', which guide means causes the chain to bend through a 90° angle in passing from the outer end of the case and from the lower wall thereof to be concealed in a groove 34 in the stop 55.
below the case, this groove forming a continuation of the guide means. The guide means comprises an inner curved wall 36, an outer curved wall 38 and a pair of side walls 40. The walls 40 are supported by the curved walls 36 and 38 which have lateral extensions 42 engaged in slots 44 of the walls 40. The extensions 42 extend into slots 46 in the case C and are thereby held in a predetermined position relative to the case.

The chain C' comprises a series of straddle elements A and a series of tension elements 48. The tension elements 48 have perforations 50 for pivot pins 52, while the flanges 56 are provided with pin bearing notches 64 adapted to engage the peripheries of the pivot pins 52.

The tension elements 48 are successively arranged single and double as shown in Figure 9, and are positioned between the flanges 56. After the pivot pins 52 are inserted through the perforations 50 and through the notches 64 and properly riveted, the elements of the chain C' are held in assembled position for flexing in one direction only.

The vertical ends of the flanges 56 of the straddle elements A limit bending of the chain to a straight line in one direction, while angular shoulders 66 are provided to permit flexing of the chain C' in the opposite direction, so that it can bend in passing through the guides 36—38—48, but will remain in a rigid straight supported position when extended as in Figure 2, thus retaining the sash S against either inward or outward movement relative to the window frame.

The walls 40 of the guide are provided with longitudinal grooves 40' which provide clearance for the riveted heads of the pivot pins 52 in the case C. The particular construction of the chain permits allment of the flanges 56 with each other without the necessity of having to bend the ends thereof in inward and outward directions as shown in my Patent Number 2,048,131 of June 22, 1936.

In operation it will be obvious that the worm 52 upon rotation will exel or retract the chain due to the spiral thread 60 thereof engaging the successive gashes 58 in the back of the chain.

The chain is connected to the sash by a hinge element H comprising a central pintle portion 68 and enlarged end portions 70. These end portions are perforated to receive screws 72 extending into the sash S for attaching the hinge element to the sash.

The pintle portion 68 is received in a loop 74 of a special tension link having elongated arms 78 through which the first two pivot pins 52 of the chain C extend so that the first link of the chain is non-pivotal relative to the loop 74 and thereby this link is prevented from upward inclination relative to the sash S by the pintle 68 extending through the loop 74 and pivotally attached to the sash. This prevents any possibility of pushing the center of the chain C' upwardly when it is extended as shown in Figure 2, and thus prevents closure of the sash S except by operation of the worm 62. The pintle portion 68 of the hinge element H, however, permits pivotal movement of the chain C' in a horizontal plane as the sash S is opened and its aspect angle relative to the chain thus changes.

At the other end of the chain C' a special straddle element A' is provided which omits, at the position 58' illustrated in Figure 3, a gash 58. Accordingly as the chain is extended by rotation of the worm 62, the chain C' will engage this portion of the straddle element A' and thus limit extension of the chain C' from the case C.

The worm 62 has a journaling sleeve 78 journalled in a bearing 80 at one end of the case C and in friction blocks 82 at the other end thereof. The friction blocks 82 are secured in the case C by adjusting screws 84, which, it will be noted in Figure 4, extend in opposite directions. This is so that access may be had to the head of one screw from one side of the case C and access may be had to the head of the other screw from the other side of the case. Therefore the case may be applied either to the right hand jamb or the left hand jamb of the window frame, and a screw is available for adjusting the tension of the blocks 82 on the sleeve 78, when applied either way.

The friction blocks and adjustment means are provided so that the worm 62 can be locked against rotation due to any inward or outward pressure on the sash S tending to cause retraction or expulsion of the chain C', and thereby rotation of the worm 62.

The sleeve 78 is provided with a linear angular hole 85 to receive the shank 86 of a crank 90. The shank 86 is of considerable length and is limited in its extension into the sleeve 78 by a friction plug 82. This plug, as shown by solid and dotted lines in Figure 3, may assume different positions and may be adjusted to such different positions by the simple expedient of using a punch to drive it deeper toward either end of the bore 85 to suit the particular window installation being made. Obviously it is desirable to have the crank 90 project a minimum distance from the inside casing of the window, yet clear the casing sufficiently to prevent striking the casing during rotation.

The plug 82, after being properly adjusted in the bore is held by frictional contact therewith and thereby subsequently acts as a stop to limit extension of the shank 86 into the bore whenever it is inserted therein.

The type of adjusting hardware illustrated permits mounting of a screen inside of the sash S without the necessity of removing the screen when the adjusting hardware is to be operated. This is accomplished by arranging the screen stops 92 on the sides and top of the window frame, against which a screen 93 is positionable. The screen 93 may be held in position, that is with the case C for the operator between the screen stop and the frame (as shown in Figure 1) and the case being positioned so that its inner face is flush with the inner face of the stops 14, the case C does not in any way interfere with the positioning or removal of the screen 93.

Some changes may be made in the construction and arrangement of the parts of my adjusting hardware for sashes and the like without departing from the spirit and scope of the invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. In a device of the class described, a rotatable operator having a bore, an operating crank hav-
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2. In a device of the class described, a rotatable operator having a bore, an operating crank having a shank removable and non-rotatable relative thereto and means in said bore to limit the degree of extension of said shank thereinto, said means being movable longitudinally of the bore to suit the particular installation being made and thereafter retained by friction against normal pressure of said shank thereagainst during operation of the operator by the crank.

SERN MADSEN.