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ROTARY OPERATOR FOR CASEMENT WINDOWS

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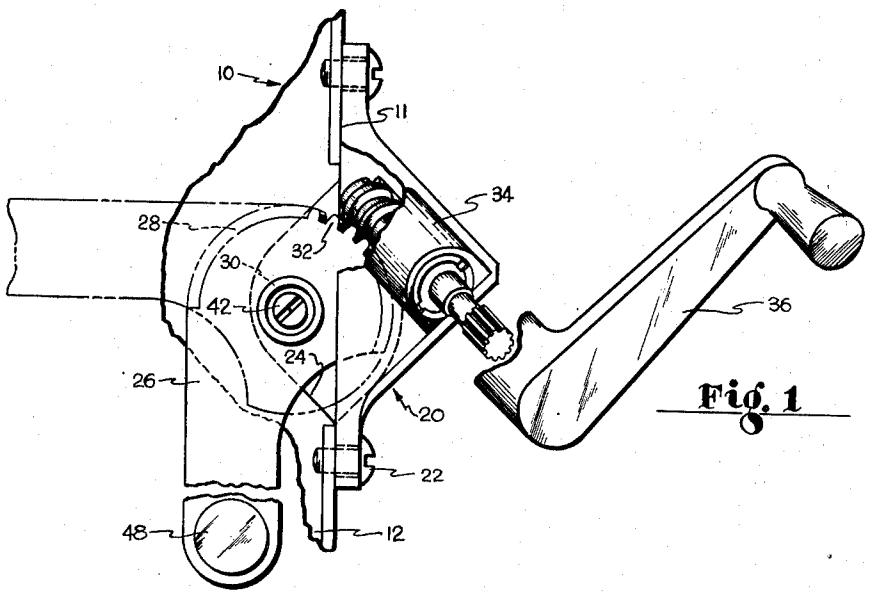


Fig. 1

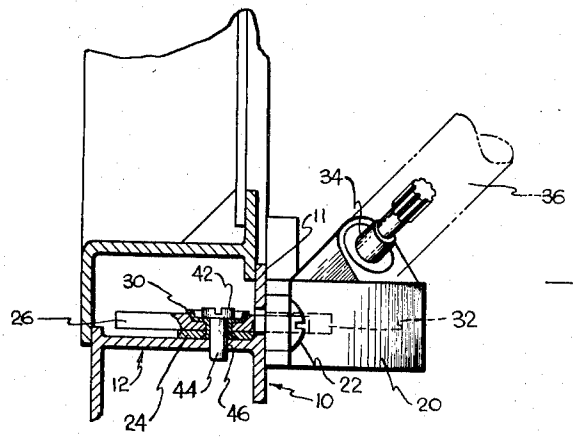


Fig. 2

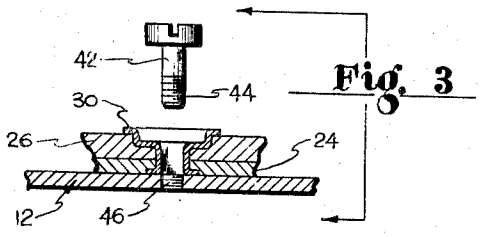


Fig. 3

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ROTARY OPERATOR FOR CASEMENT WINDOWS

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2 Claims. (Cl. 268—119)

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This application relates to rotary operators for casement windows, sometimes known as window regulators.

The conventional rotary operator for casement windows includes a housing which is secured to the vertical surface of a stationary window frame by horizontal securing screws, and in such housing is mounted a worm which cooperates with the toothed sector on the hub of a regulator arm pivotally mounted on a vertical pivot in said housing, with the worm having an exposed end operated by a conventional handle.

The present invention relates to such devices but aims to provide certain new and useful improvements as follows: One aim is to provide a means for mounting the housing not only on the vertical surface of the stationary window frame, but also on a horizontal surface of such window frame, whereby additional and superior mounting for the housing is thus afforded.

An additional aim and object of the present invention is to locate the pivot axis of the regulator arm hub on the horizontal surface of the stationary window frame rather than as is conventional, with the result that the size of the housing may be reduced and the cost of it thereby likewise reduced.

A further aim and object of the present invention is to locate the parts of the regulator in such a way that the axis of the worm when the regulator is viewed in horizontal projection is at an acute angle to the open side of the housing normally closed by the vertical surface of the stationary window frame.

Further aims and objects of the present invention will best be understood upon reference to the attached drawing which shows an embodiment of the regulator.

In such drawing:

Fig. 1 is a plan view of the regulator as if mounted on a stationary window frame.

Fig. 2 is an elevational vertical section view of the regulator.

Fig. 3 is a transverse sectional view, somewhat enlarged, of the regulator parts with the section line being through the pivotal axis at the hub of the regulator arm.

Referring to the drawing it will be observed that there is shown at 10 a stationary window frame having a vertical surface 11 and a horizontal surface 12. The regulator itself includes a housing 20 having an open side adapted to be closed by the vertical surface 11 when the housing 20 is secured to that surface as by the screws 22. The housing has a horizontal wing 24

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adapted to project through the vertical surface 11 and to overlie the horizontal surface 12 of the frame 10. A regulator arm 26 has a hub 28 overlying the wing 24 and secured thereto by a hollow rivet 30. The hub 28 has a toothed sector 32 at least partially within the housing 20 for cooperation with a worm 34 in the housing, with such worm having an exposed handle 36 whereby it may be rotated for rotating the arm 26 on the axis of the hollow rivet 30. A vertical pin 42 having its lower end threaded as at 44 passes through the hollow rivet 30 and threads into a tapped hole 46 of the horizontal surface 12 of the frame 10, and such pin functions for pivotally mounting the arm 26 at its hub to the frame surface 12 and also for securing the housing wing 24 to said frame surface 12.

The axis of the worm, when the regulator is viewed in horizontal projection, as in Fig. 1, is at an acute angle to the open side of the housing 20.

On the end of arm 26 remote from hub 28 is a pin 48 for detachably connecting the arm 26 to a window ventilator whose position is to be regulated.

The regulator is assembled at the point of manufacture with arm 26 in the housing 20 and with rivet 30 being relied upon for securing the arm and the housing in assembly. At the point of installation the hole 46 is drilled and tapped and pin 42 is threaded into it through rivet 30 and this simultaneously pivotally mounts the arm to the horizontal surface 12 of the window frame and also secures the housing to said horizontal surface of the window frame. The rivet, therefore, is provided only for the purposes of maintaining the arm and housing in assembly during manufacture and shipment and installation, but it is really the pin 42 and the cooperation of that pin with the arm and the housing and, most important, with the window frame surface 12, that finally assembles all the parts, mounts them, and pivots the arm.

The pivot axis of screw 42 or pin 42 is within the steel frame 10 rather than in the conventional construction being on the handle side of such steel frame. Such location of the pivot axis makes it unnecessary to have the conventional large housing and permits the use of a small housing and thus reduces the cost of the parts. Only enough housing is required to house the small portion of the arm hub that is to the right of the vertical surface 11 of the frame 10, as viewed in Figs. 1 and 2.

Whereas in the ordinary construction the only

means relied upon for mounting the housing are the screws 22 and the vertical surface 11 of the frame 10, in the construction herein disclosed an additional means, namely the pin 42 and the horizontal surface 12 of the frame 10 are provided for mounting of the parts.

Now having described the regulator construction herein disclosed, reference should be had to the claims which follow.

I claim:

1. In a window regulator, a stationary window frame having a horizontal surface and a vertical surface, a housing having a top horizontal member, a bottom horizontal member, a vertical member joining the horizontal members at one of their edges, with the housing having an open vertical side between the unjoined edges of the horizontal members, horizontal screws clamping the housing against the vertical surface of the frame with its open side against such vertical surface, said frame having an opening in its vertical surface horizontally aligning with the open side of the housing, said housing having a horizontal extension formed as a distinct extension of one of the horizontal housing members and overlying the horizontal surface of the frame when the housing open side is against the vertical surface of the frame, a regulator arm having a hub vertically aligned with said extension and said horizontal surface of the frame, and a vertical pin passing through said hub and extension and interlocking into said frame horizontal surface and thus pivotally mounting said arm at its hub to said frame horizontal surface and also securing said extension to said frame horizontal surface, and an operator in said housing and journalled in the vertical member of the housing and operatively connected to said hub for actuating it, said connection being established through the open side of the housing and the opening in the vertical surface of the frame.

2. In a window regulator, a stationary window frame having a horizontal surface and a vertical surface, a housing having a top horizontal member, a bottom horizontal member, a vertical member joining the horizontal members at one of their edges, with the housing having an open vertical side between the unjoined edges of the horizontal members, horizontal screws clamping the housing against the vertical surface of the frame with its open side against such vertical surface, said frame having an opening in its vertical surface horizontally aligning with the open side of the housing, said housing having a horizontal extension formed as a distinct extension of one of the horizontal housing members and overlying the horizontal surface of the frame when the housing open side is against the vertical surface of the frame, a regulator arm having a hub vertically aligned with said extension and said horizontal surface of the frame, and a vertical pin passing through said hub and extension and interlocking into said frame horizontal surface and thus pivotally mounting said arm at its hub to said frame horizontal surface and also securing said extension to said frame horizontal surface, and an operator in said housing and journalled in the vertical member of the housing and operatively connected to said hub for actuating it, said connection being established through the open side of the housing and the opening in the vertical surface of the frame, said hub and said extension also being secured to each other by a hollow rivet inside which is said pin.

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