Nov. 1, 1927. 1,647,654

S. W. NICHOLSON

WINDOW REGULATOR

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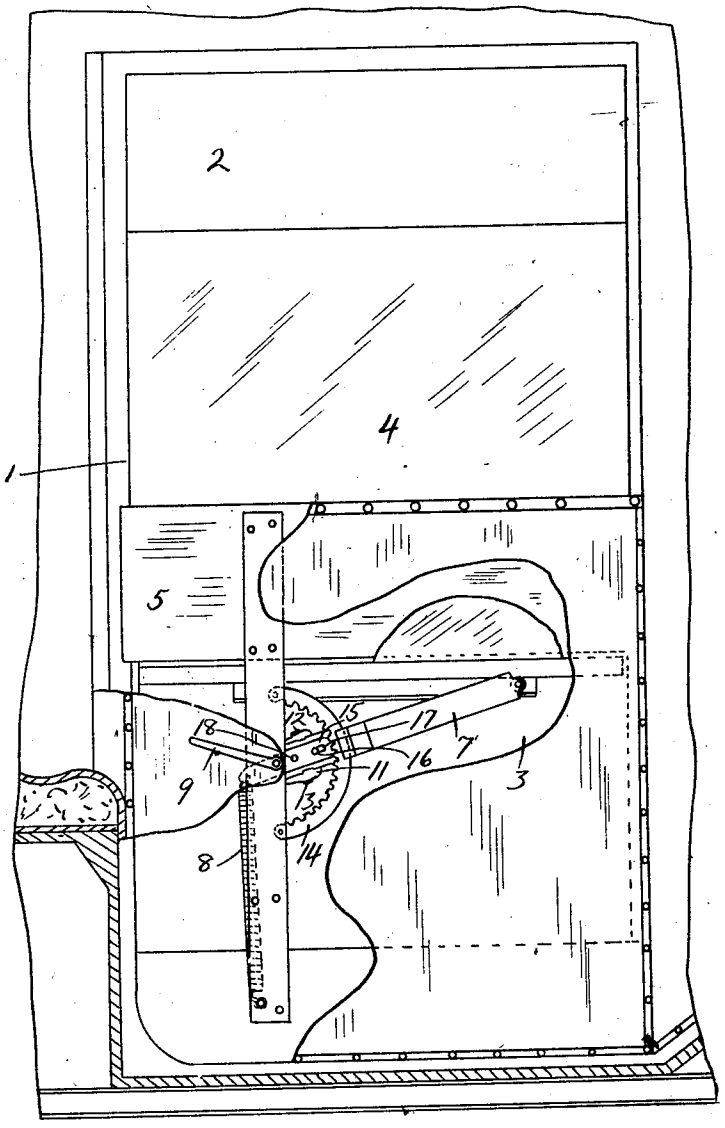


Fig. 2.

Inventor
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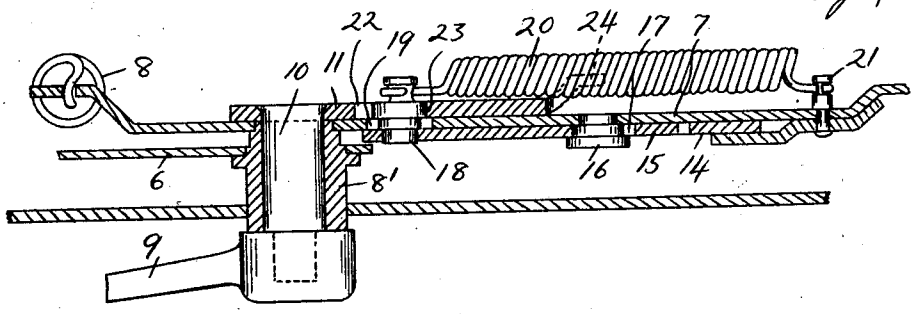
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Fig. 4.



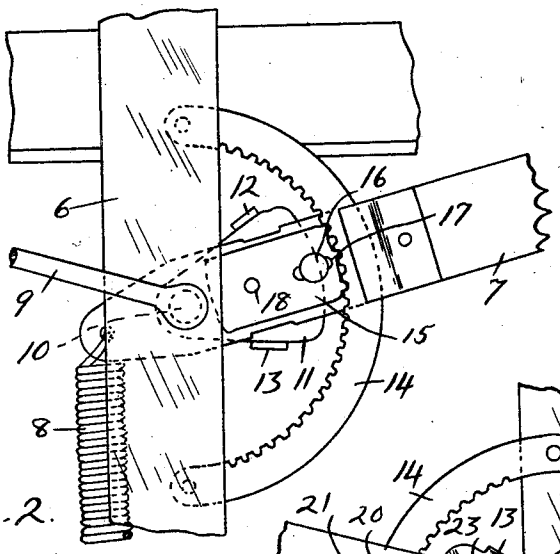


Fig. 2.

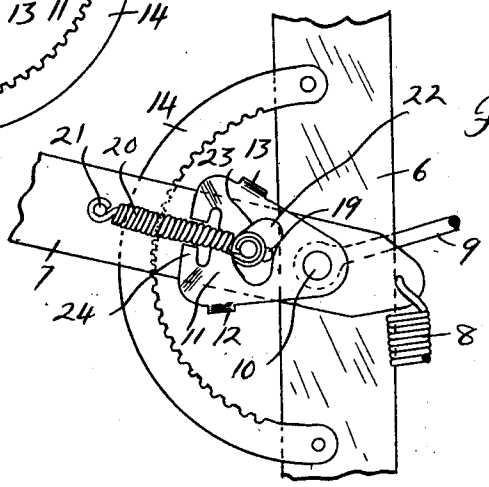


Fig. 3.

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Patented Nov. 1, 1927. 1,647,654

UNITED STATES PATENT OFFICE.

STANLEY W. NICHOLSON, OF TOLEDO, OHIO, ASSIGNOR TO THE DURA COMPANY, OF TOLEDO, OHIO, A CORPORATION OF DELAWARE.

WINDOW REGULATOR.

Application filed June 2, 1924. Serial No. 717,342.

The invention relates to window regulators and is particularly applicable to mechanisms for raising and lowering the windows of motor vehicles. One of the objects of the invention is to provide an improved window regulator which quickly raises and lowers a window. Other objects of the invention reside in the novel features of construction and combinations and arrangements of parts as more fully hereinafter set forth.

Figure 1 is an interior view, partly broken away, of a motor vehicle door having applied thereto a window regulator embodying my invention;

Figure 2 is an enlarged inner side elevation of a portion of the window regulator;

Figure 3 is an enlarged outer side elevation thereof;

Figure 4 is a cross section on the line 4—4 of Figure 2.

In the present instance 1 is the door of a motor vehicle having in its upper portion the opening 2 and in its lower portion the chamber 3. 4 is the window or closure which is preferably in the nature of a glass plate and is vertically slidable in guideways in the door to close the opening 2 or enter the chamber 3. 5 is the usual lock board of the door.

The support for the window regulator comprises the mounting plate 6 which is preferably formed of sheet metal and extends vertically between the lock board 5 and the bottom rail of the door and is suitably secured thereto. 7 is the lifter arm which is pivoted near one end upon the mounting plate 6 and is suitably connected at the other end to the window 4 to raise and lower the latter. The pivotal end portion of the lifter arm is extended slightly beyond the pivot for terminal engagement by a counterbalancing coil spring 8 which extends downwardly and has its lower end suitably connected to the mounting plate 6.

The pivot for the lifter arm 7 is in the nature of a bushing 8′ mounted in the mounting plate 6. For actuating the lifter arm to raise or lower the window I have provided the handle 9 at the inner end of the bushing and secured upon the shaft 10, which is journalled in the bushing, and the actuating member 11, which is secured upon the end of the shaft at the outer end of the bushing. This actuating member extends along the outer side of the lifter arm and is provided with the transverse lugs 12 and 13 at its opposite edges which are adapted to alternatively engage the opposite edges of the lifter arm.

For locking the lifter arm in its various positions of adjustment I have provided the arcuate rack 14 which is suitably secured to the mounting plate 6 with its center of curvature registering with the axis of rotation of the lifter arm. This rack is engageable by the latch member 15 at the inner side of the lifter arm and movable longitudinally relative to the lifter arm. For securing the latch member to the lifter arm and at the same time permitting of the relative longitudinal movement, there is the shouldered rivet 16 extending through the lifter arm and latch member and engaging in the elongated opening 17 in the latter. There is also the shouldered rivet 18 extending through the opposite end of the latch member and elongated openings 19 in the lifter arm. 20 is a coil spring having one end connected to the rivet 18 and the other end connected to the lifter arm outwardly beyond the rivet 16 by suitable means such as the rivet 21.

To move the latch member 15 out of engagement with the rack 14 prior to the swinging of the lifter arm 7, the actuating member 11 is provided with the opening 22 through which the rivet 18 extends and having the cam surfaces 23 which intersect at the center line of the actuating member and are alternatively engageable by the rivet depending upon the direction of swinging of the handle 9.

To retain the actuating member 11 in neutral position so that the rivet 18 is engageable in the apex formed between the cam surfaces 23 of the actuating member 11, thereby permitting locking engagement of the latch member 15 with the rack 14, I have provided upon the actuating member 11 and at its outer end the laterally offset projections or lugs 24 which are engageable with opposite sides of the spring 20 intermediate its ends. Thus with this arrangement this spring, in addition to normally retaining the latch member in locking engagement with the rack, normally retains the actuating member in neutral position to permit locking engagement between the latch member and rack.

In operation and with the parts in the position shown in Figure 1 if it is desired to raise the window 4 the handle 9 is swung in a counter-clockwise direction, thereby correspondingly swinging the actuating member 11 to bring its lug 13 in engagement with the lower edge of the lifter arm 7. However, prior to engagement of the lug with the lifter arm a cam surface 23 of this actuating member compels the latch member 15 to become disengaged from the rack 14. When the window has been raised to the desired position, the handle 9 is released and the coil spring 20 returns the actuating member 11 to neutral position and also re-engages the latch member with the rack.

What I claim as my invention is:

1. In a window regulator, the combination of actuating means for an arm movable relative thereto and including a member at one side of the arm and having portions engageable with opposite edges thereof, means controlled by said actuating means for locking the arm in its adjusted positions including a member movable longitudinally of the arm and located on the opposite side of the arm to said first mentioned member, and a common means for normally holding said last mentioned member in locking position, and said first mentioned member in neutral position.

2. In a window regulator, the combination of actuating means for an arm movable relative thereto and including a member at one side thereof, means controlled by said actuating means for locking the arm in its adjusted positions and including a member at the opposite side thereof, and a coil spring engageable with and normally holding said last mentioned member in locking position and said first mentioned member in neutral position.

3. In a window regulator, the combination of actuating means for a pivotal arm including a member at one side thereof and having portions engageable with opposite edges thereof, means controlled by said actuating means for locking the arm in its adjusted positions, including a member at the opposite side of the arm and movable longitudinally thereof, a coil spring at the first mentioned side of the arm for normally holding said last mentioned member in locking position, and means upon said first mentioned member engageable with said coil spring for holding said first mentioned member in neutral position.

4. In a window regulator, the combination of actuating means for a pivotal arm including a member engaging the pivot of the arm and rockable relative to the arm, said member having portions engageable with opposite edges of the arm, means controlled by said actuating means for locking the arm in its adjusted positions including a member on the opposite side of the arm and movable longitudinally relative thereto, means for moving said last mentioned member from locking position upon the rocking of said first mentioned member relative to the arm, and a coil spring engaged intermediate its ends by said first mentioned member for normally holding said first mentioned member in neutral position and connected to said second mentioned member for normally holding said second mentioned member in locking position.

5. In a window regulator, the combination of a member having an arcuate rack with its center of curvature at the pivot of a pivotal arm, a latch member slidable longitudinally of said arm into engagement with said rack, an actuating member engaging the pivot of said arm and rockable relative to said arm, said actuating member having portions engageable with opposite edges of said arm, cooperating means upon said actuating member and latch member for moving the latter from engagement with said rack upon rocking of the former, and a coil spring connected to said latch member for normally retaining the same in engagement with said rack and engageable intermediate its ends by said actuating member for normally retaining the latter in neutral position.

In testimony whereof I affix my signature.

STANLEY W. NICHOLSON.