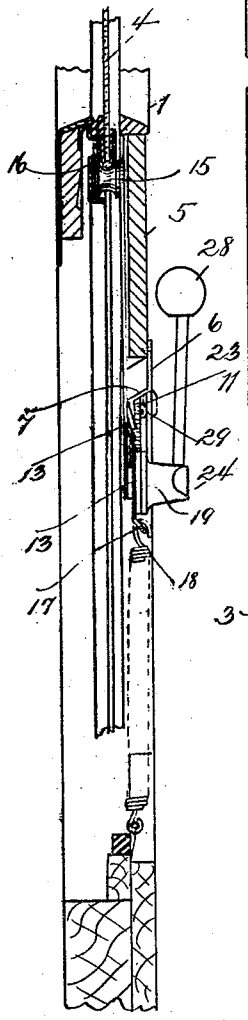
Aug. 12, 1930. S. W. NICHOLSON 1,772,755

WINDOW REGULATOR

Filed Oct. 3, 1924 2 Sheets-Sheet 1

Fig. 2



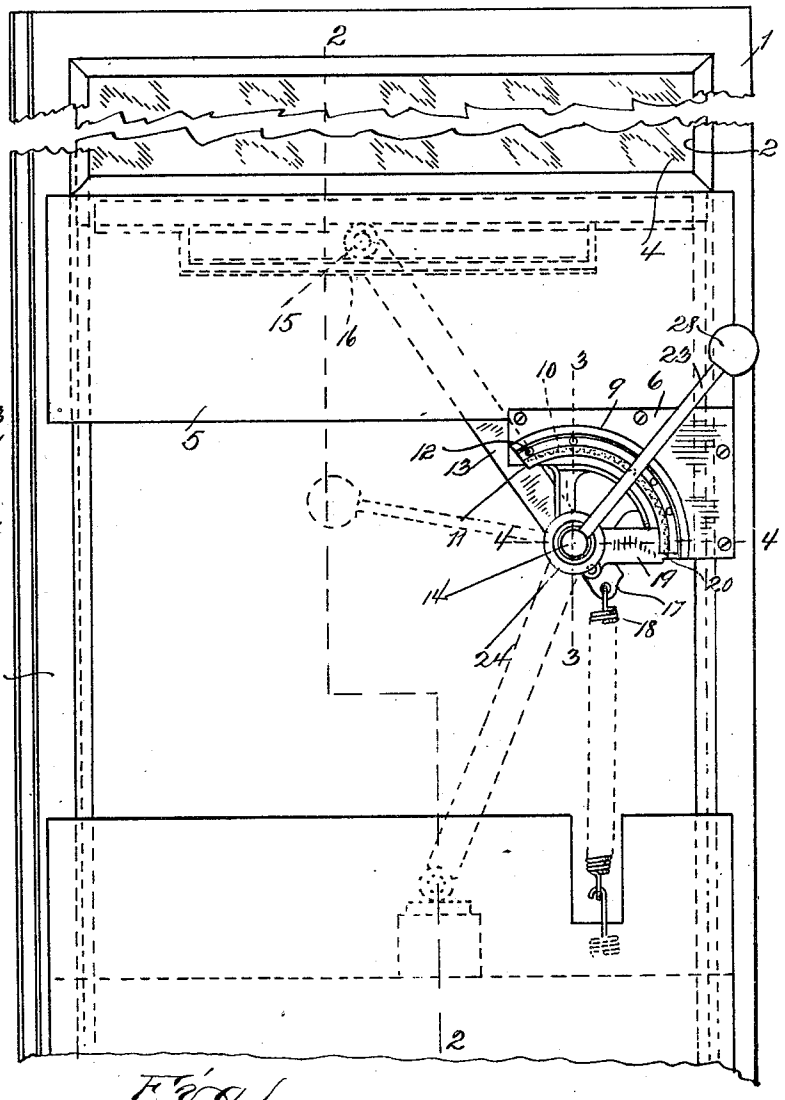


Fig. 1.

Inventor
Stanley W. Nicholson

By Whittemore, Hulbert & Whittemore & Belknap.

Attorneys

Aug. 12, 1930. S. W. NICHOLSON 1,772,755

WINDOW REGULATOR

Filed Oct. 3, 1924 2 Sheets-Sheet 2

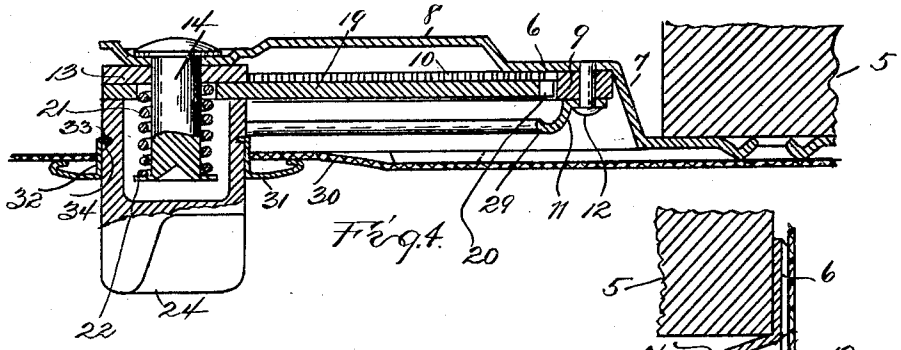


Fig. 4.

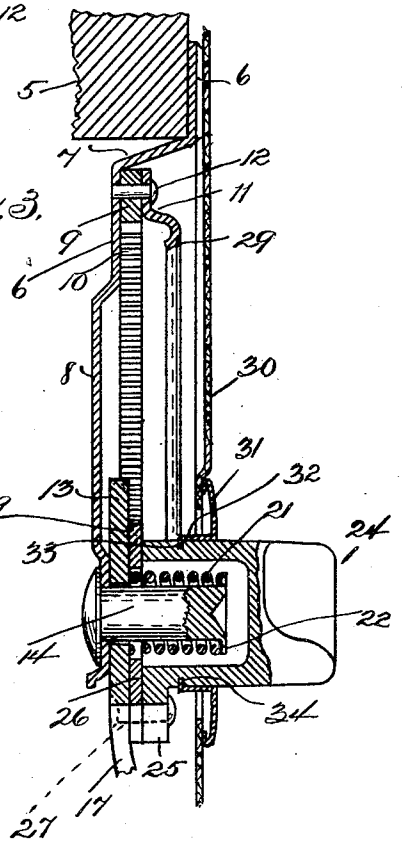


Fig. 3.

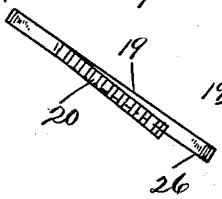


Fig. 6.

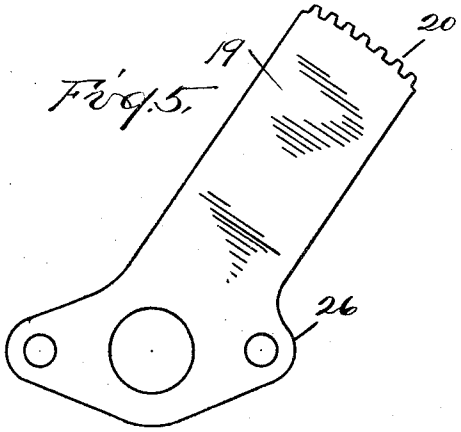


Fig. 5.

Inventor
Stanley W. Nicholson

By Whittemore, Hulbert & Whittemore
Attorneys

Patented Aug. 12, 1930 1,772,755

UNITED STATES PATENT OFFICE

STANLEY W. NICHOLSON, OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DURA COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

WINDOW REGULATOR

Application filed October 3, 1924. Serial No. 741,466.

The invention relates to window regulators and is particularly applicable to mechanisms for raising and lowering windows of vehicles. One of the objects of the invention is the provision of an improved window regulator of the quick acting type. Another object is the provision of an improved window regulator which is located at a readily accessible and convenient point and in which the handle provides a considerable leverage in raising or lowering the window. A further object is the provision of an improved window regulator in which the handle is movable in transverse directions to effect the unlocking and the raising or lowering of the window.

With these as well as other objects in view, the invention resides in the novel features of construction and combinations and arrangements of parts as more fully hereinafter set forth.

In the drawings:

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

Figures 2, 3 and 4 are cross sections respectively on the lines 2—2, 3—3 and 4—4 of Figure 1;

Figures 5 and 6 are side and end elevations respectively of the latch member.

In the present instance I have shown my invention as applied to the door 1 of a motor vehicle having the opening 2 in its upper portion and the chamber 3 in its lower portion. 4 is the window or closure for the opening 2 vertically slidable in the side uprights of the door from a position closing the opening 2 into the chamber 3. 5 is the lock board of the door extending between and secured to the side uprights thereof at the lower edge of the opening.

My improved window regulator is particularly applicable for raising and lowering the window beside the driver of a motor vehicle and is so located upon the door 1 that it is readily accessible and conveniently operated. As shown 6 is the mounting plate preferably in the form of a gusset plate, which is secured at its upper edge to the inner side of the lower edge of the lock board and at its front edge to the inner side of the front upright of the door, the driver's seat being adjacent to the rear upright of the door. This mounting plate has the outturned arc-shaped portion 7 below the lock board and extending adjacent to the front upright and the sector-shaped portion 8 connecting into the outer edge of the arc-shaped portion 7. 9 is the arc-shaped rack having the series of teeth 10 upon its inner edge and 11 is the arc-shaped guard which will be subsequently referred to. The rack is secured to the inner side of the sector-shaped portion 8 adjacent to the arc-shaped portion 7 by suitable means such as the rivets 12, which latter also secure the guard 11 to the inner side of the rack. With this arrangement the door is reinforced.

13 is the pivotal lifter arm journaled near its inner end upon the pin 14 and suitably connected at its outer end to the window 4, as by means of the roller 15 which is secured to the arm and engages in the channel 16 secured to and depending from the window. The pin 14 is secured to the apex of the sector-shaped portion 8 and extends inwardly therefrom. The inner end of the lifter arm is extended beyond the pin 14 to provide the securing portion 17 for one end of the window counterbalancing spring 18, the other end of this spring being suitably connected to the lower rail of the door. 19 is the latch member copivotally mounted with and extending at an angle to the lifter arm and having its inner end secured thereto and its outer end provided with the series of teeth 20 which are concentric and engageable with the series of teeth 10 upon the rack. The lifter arm is loosely journaled upon the pin 14 to per-

mit of rocking the lifter arm parallel to the axis of the pin and more particularly about the longitudinal axis of the lifter arm whereby the latch member may be rocked to disengage its teeth from the teeth of the rack. The lifter arm and also the latch member are normally maintained at right angles to the pin by the coil spring 21 which surrounds the inner portion of the pin and abuts the lifter arm and the annular outwardly turned flange 22 upon the inner end of the pin.

23 is the handle for actuating the latch member to disengage the same from the rack and also for actuating the lifter arm to raise or lower the window. This handle extends at an angle to both the latch member and lifter arm and is preferably located in the angle between the same. This handle is threaded at its inner end into the stub shaft 24 which is secured to the lifter arm 13 and latch member 19. As shown the stub shaft has the oppositely extending foot flanges 26 upon the latch member and through both of which suitable securing means, such as the rivets 27, extend for securing the stub shaft and latch member rigidly to the lifter arm. The handle has at its outer end the ball 28 affording a grip and the relative lengths of the handle and lifter arm are such that the handle provides the necessary leverage for easy raising and lowering of the window. The parts are so arranged that the ball of the lifter arm in the closed position of the window is adjacent to the front upright of the door and in the open position of the window is to the rear of the pivot and nearly horizontal therewith.

To adjust the window the handle 23 is laterally adjusted inwardly thereby rocking the lifter arm 13 about its longitudinal axis and disengaging the teeth 20 of the latch member 19 from the teeth 10 of the rack 9. As shown particularly in Figure 6 the teeth of the latch member are offset to extend at an angle to the body of the latch member in order to facilitate the disengagement of these teeth from the rack teeth. The handle is then swung in the transverse plane about the pin 14 thereby swinging the lifter arm 13. When the window has been adjusted to the desired position the handle is released and the spring 21 operates to re-engage the teeth of the latch member with the teeth of the rack to thereby hold the window in its adjusted position.

The arc-shaped guard 11 upon the inner side of the rack 9 has the inwardly offset inner edge 29 which is engageable with the outer end of the latch member 19 to limit the rocking of the latch member from locking position.

30 is the trimming at the inner side of the door and concealing the lifter arm, latch member, and associated parts, the stub shaft 24 extending through this trimming. 31 is the escutcheon surrounding the stub shaft and covering the portion of the trimming adjacent thereto. This escutcheon has the transverse tongues 32 engageable around the stub shaft and provided at their outer edges with the axially inturned projections 33 which are detachably engageable in the annular groove 34 formed in the stub shaft. With this arrangement of escutcheon the same may be readily applied.

What I claim as my invention is:

1. In a locking mechanism for a window regulator, the combination of a pivotal lifter arm, said arm being rockable in a direction parallel to the axis upon the locking and release thereof, and a handle movable in transverse directions for actuating said arm.

2. In a locking mechanism for a window regulator, the combination with a pivotal lifter arm, of means for locking said arm in various positions including a latch member upon said arm and movable in a direction transverse to the direction taken by said arm in actuating the window to release said arm, and a handle movable in transverse directions for actuating said arm and latch member.

3. In a locking mechanism for a window regulator, the combination with a pivotal lifter arm, of a locking member, a cooperating locking member mounted upon said arm and movable in a direction transverse to the direction taken by said arm in actuating the window to release the locking members, and a handle movable in transverse directions and operatively connected to said arm and cooperating locking member.

4. In a locking mechanism for a window regulator, the combination with a pivotal lifter arm, of means for locking said arm in various positions including a co-pivotal latch member rigidly connected to said arm, and a handle rigidly connected to said arm and latch member for moving the same in a direction to actuate the window and for initially rocking said arm and latch member in a transverse direction to release said arm.

5. In a locking mechanism for a window regulator, the combination with a mounting plate and a pin secured thereto, of a lifter arm loosely journaled upon said pin, means rigidly connected to said arm for rocking the same in a direction parallel to the axis of said pin and about said pin as a pivot and means dependent upon the rocking of said lifter arm to lock the same.

6. In a locking mechanism for a window regulator, the combination with a mounting plate and a pin secured thereto, of a rack, a lifter arm loosely journaled upon said pin, a latch member rigidly connected to said arm and engageable with said rack, and means rigidly connected to said arm and latch member for rocking the same in a direction parallel to the axis of said pin to release said latch

member from said rack and for subsequently moving the same about the pin as a pivot.

7. In a locking mechanism for a window regulator, the combination with a mounting plate having an off-set portion, a rack secured to the off-set portion, and a pin upon the off-set portion, of a lifter arm loosely journaled upon said pin, a latch member rigidly connected to said arm and engageable with said rack, and a handle operatively connected to said arm and latch member to initially rock the former about its axis to disengage the latter from said rack and subsequently move the former about the pin as a pivot.

8. In a locking mechanism for a window regulator, the combination with a mounting plate and a pin secured thereto, of a lifter arm loosely journaled upon said pin, means for locking said arm in various positions including a latch member rigidly secured to said arm, a stub shaft rigidly secured to said lifter arm, and a handle rigidly secured to said stub shaft, said handle being movable in a direction parallel to the axis of said pin to initially release said arm and then movable in a transverse direction to swing said arm about said pin as a pivot.

9. In a locking mechanism for a window regulator, the combination with a mounting plate and a locking member secured to said mounting plate, of a pivotal lifter arm, a locking member rigidly connected to said lifter arm and engageable with said first-mentioned locking member, means rigidly secured to said lifter arm and second-mentioned locking member for rocking the same in a direction transverse to said mounting plate and for subsequently moving the same in a direction substantially parallel to said mounting plate, and means upon said mounting plate for limiting the first-mentioned movement of said lifter arm and second-mentioned locking member.

10. In a locking mechanism for a window regulator the combination with a pin, of a lifter arm loosely journaled upon said pin, means for locking said arm in various positions including a latch member non-rotatably secured to said arm and movable in a direction transverse to the direction taken by said arm in actuating the window to release said arm, means for actuating said arm and latch member and a coil spring surrounding said pin for normally retaining said latch member in locking engagement.

11. In a locking mechanism for a window regulator, the combination with a pivotal lifter arm, of means for swinging said lifter arm about its pivot and for rocking said lifter arm about its longitudinal axis and means dependent upon the rocking of said lifter arm to lock the same.

12. In a locking mechanism for a window regulator, the combination of a pivotal lifter arm, of a stationary locking member, a cooperating locking member mounted upon and extending at an angle to the longitudinal axis of said arm, said cooperating locking member being movable in a direction transverse to the direction taken by said arm in actuating the window to release the locking members, and a handle movable in transverse directions and operatively connected to said arm and cooperating locking member.

In testimony whereof I affix my signature.

STANLEY W. NICHOLSON.