OPERATING MECHANISM FOR WINDOW REGULATORS AND DOOR LATCHES

Filed Aug. 19, 1935

2 Sheets-Sheet 2
This invention relates to mechanism for operating a window regulator and a door latch for vehicles, such as automobiles in such manner that a single handle may be employed either to raise or lower the vehicle window or to actuate the latch for opening the door, as desired.

It is an object of the invention to produce a simple and efficient device of the above character which can be readily installed and can be manufactured at a relatively low cost.

Another object is to produce a device of the above character by which the window can be raised or lowered by rotating the handle in one direction or the other, and the latch can be actuated by tilting the handle.

Other objects and advantages of the invention will hereinafter appear, and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a window regulator and door latch showing a portion of a vehicle door and mechanism for selectively operating either the regulator or the latch; Fig. 2 is an enlarged sectional elevation on the line 2—2 of Fig. 1, showing the rotatable and tiltable handle and associated mechanism; Fig. 3 is an enlarged sectional elevation on the line 3—3 of Fig. 2, showing a portion of the latch actuating arm and the cam member for swinging the arm; Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2, and Fig. 5 is a sectional view similar to Fig. 2, showing the handle tilted for retracting the latch.

The illustrated embodiment of the invention comprises a vehicle door 10 on the free vertical edge of which is mounted a latch unit 1, and spaced inwardly from the edge of the door is a window regulator mechanism 2. The latch unit comprises a case plate 11 on which a bolt plate 12 is slidably, a spiral spring 13 urging the bolt plate forwardly to latching position. Fixed to the bolt plate is the bolt nose 14 which projects outwardly from the edge of the door when in latching position. From the outside of the door the latch bolt is retracted by a roll-back 15 having a squared opening 16 to receive the usual operating spindle (not shown). For retracting the latch bolt from the inside of the door an extension 17 of the bolt plate 12 is pivoted to a link 16, the rear end of which is pivoted to the upper end of an arm 18, the lower end of which is pivoted on a pin 20 secured to a mounting plate 21.

The regulator 2 is of well-known construction and consists of a mounting plate 22 on which gears 23 and 24 are mounted. The gears 23 and 24 mesh with each other and have fixed thereto arms 25 and 26, respectively. The arms 25 and 26 have studs or rollers 27 which engage in a horizontal elongate slot 28 formed in a channel 29, which is secured to the lower edge of the vehicle window 30. It is apparent that upon swinging the arms toward each other, the window 30 is raised, and upon swinging the arms away from one another, in the position shown, the window is lowered. Suitable spring means 31 is provided for counterbalancing the weight of the window to assist in raising the same, as will be readily understood.

Meshing with the gear 23 is a pinion 32 which is mounted on a clutch shaft 33, and also mounted on the shaft 33 is a clutch unit 34. The clutch unit 34 is of any suitable type for militating against retrograde movements of the pinion, thereby to retain the regulator arms 25 and 26 in adjusted position. One end of the clutch shaft 33 has bearing in a part 36 of the mounting plate 22 and the opposite end bears in a mounting plate 37 for the handle.

Heretofore a regulator handle has been mounted on a shaft similar to the clutch shaft 33, but in this instance, instead of an operating handle, an embossed gear 35 is mounted on one end of the shaft 33 for turning movement therewith. Meshing with the gear 35 is a gear 36 of the same size as the gear 35. Fitting into the gear 36 is a sleeve 39 which has bearing in the mounting plate 37 and is provided with a split or bifurcated end portion 40 between the parts of which is pivoted on a pin 42 an operating handle 41 having a knob 45. It will be apparent that by rotating the handle 41 the gear 36 is rotated which in turn rotates the gear 35 and thus the clutch shaft 33. It is apparent that the regulator arms 25 and 26 may be swung in one direction or the other, depending upon the direction of rotation of the handle 41, the regulator mechanism functioning in the usual manner well known to those skilled in this art.

The inner end portion of the handle 41 is rounded or ball-like, as indicated at 43, to fit in the cup-shaped socket 45 of an escutcheon 44 which is urged into intimate engagement with the surface 43 by a spring 46 which bears at one end against the mounting plate 37 and at the opposite end against a sleeve 47 socketed in the under surface of the escutcheon. Formed on the inside of the ball-like surface 43 is a cutout portion 48 providing a cam surface against which abuts an enlarged offset head 49 of a pin 50 which is slidable in but non-rotatable relative to the sleeve 38 and extends therethrough. The inner end of the pin 50 bears against one end of a cam member 51 which is pivotally mounted on a pin 52. The pin 52 is mounted in brackets 53 integral with a cover plate 54 which extends over the gear 35 as secured to the mounting plate 37. The opposite end of the cam member 51 is engageable with a cam surface 55 formed on the latch operating arm 18.
By tilting the operating handle 41 the cam surface 46 thereof, engaging the enlarged head 49 of the pin 50, depresses the latter, thereby rocking the cam member 51 in a clockwise direction (Fig. 2, to rock the arm 19 to the left of Fig. 1 and retracting the bolt nose 4 by means of the link 18, extension 17 and bolt plate 12. As soon as the handle 41 is released, the bolt spring 13 returns the bolt nose to latching position and swings the arm 19 back to its normal position. A spring 55, which encircles the pin 20 and engages at its ends the mounting plate 37 and arm 19, respectively, assists in returning the arm 19 to its normal position.

A pin and slot connection 56 between the arm 19 and the mounting plate 37 guides the swinging movement of the arm. It will be understood that tilting of the handle 41 can be accomplished in any position of the latter, inasmuch as the pin 50 is adapted to turn when the handle is rotated so it is always in the proper position when the handle is tilted.

In order to dog the outside roll-back 15 to prevent turning of the outside handle, a slide 57 is guided on the bolt plate 12 and is actuated by a knob 58 which is accessible on the inside of the door. By pushing the knob 58 forwardly, the slide engages the roll-back 15, preventing rotation thereof. The slide is so arranged that upon retraction of the bolt, as by slamming of the door or tilting of the handle 41, the slide 57 is automatically moved out of dogging position, a portion of the bolt plate 12 camming the dogging slide rearwardly in a manner well known to those skilled in this art.

From the above description it will be understood that the handle 41 not only serves to operate the window regulator but also to retract the latch bolt. The regulator mechanism B is guided in the usual manner by turning the handle in one direction to raise and in the opposite direction to lower the window. In any position of the handle, the latch may be retracted by merely tilting the handle which operates positively to withdraw the latch, thereby to open the door. The above-described mechanism has been so designed as to be attached to or associated with the regulator mechanism now in use. All that is necessary is to mount the gear 35 on the clutch shaft 33 and secure the mounting plate 31 to the regulator plate 22 by rivets 59 or other suitable means. If desired, the regulator plate 22 can be enlarged sufficiently to accommodate the additional mechanism. It is to be understood that the construction of the latch unit L forms no part of this invention and many latches which are at present in use can be readily adapted for the purpose.

Numerous changes and details of construction, arrangement and operation may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What I claim is:
1. In a device for selectively operating a window regulator and a door latch, a handle having a rounded part at its inner end, and having the outer portion of the rounded part cut out to form a cam surface, a pin, means for mounting the rounded portion of the handle for rotary and tilting movements, means to actuate the window regulator including a part in which the pin is slidable, but held against rotary movement one end of the pin being aligned with the rounded portion of the handle, and one of the last named means having a cam whereby upon tilting of the handle the pin will be depressed, an escutcheon conformably engaging a part of the rounded portion of the handle, springs means to force the escutcheon against the said part of the handle, and means operable by the outer end pin for actuating the door latch retraction means.

5. A mechanism in accordance with claim 4 in which the spring means encompasses the pin.

6. In a device for selectively operating a window regulator and a door latch, means for actuating the window regulator including a rotary element, a sliding member, means for mounting said member on the element for turning the latter but to permit sliding thereof, a handle disposed over the member, camming means associated with one of the last two named elements, means for mounting the handle for turning and tilting movements whereby upon tilting of the handle, the latter will depress the member, means to retract the door latch, and a cam operable by the depression of the member to operate the door latch retraction means.

7. A device as set forth in claim 6, wherein an escutcheon is disposed over the inner end part of the handle and wherein there is a spring urging the escutcheon against the inner end part of the handle.

8. A device as set forth in claim 6 wherein an escutcheon is disposed over the inner end part of the handle and wherein there is a spring urging the escutcheon against the inner end part of the handle.

HOLDEN W. RIGHTMYER.