March 30, 1926. 1,578,348

S. W. NICHOLSON

WINDOW CONTROL MECHANISM

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Fig. 1.

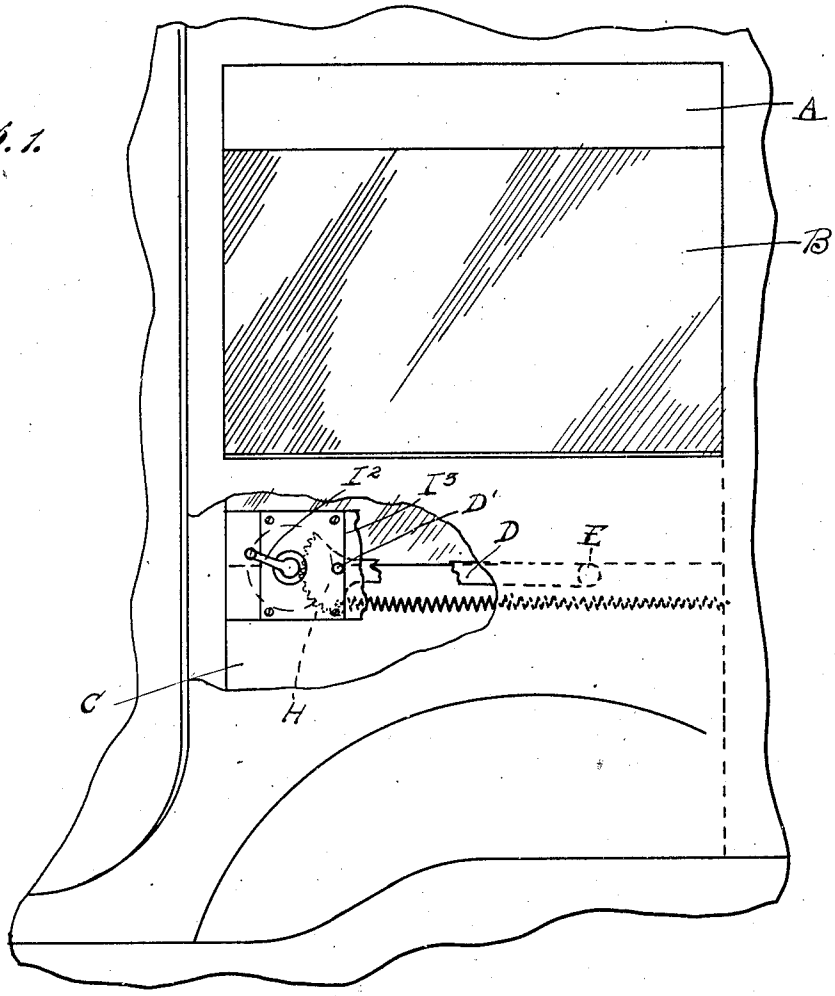


Fig. 2.

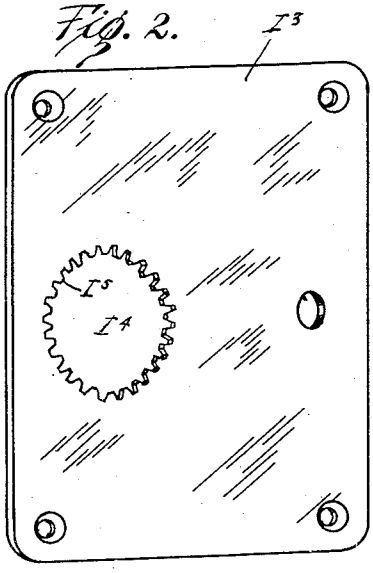


Fig. 3.



Fig. 4.



Fig. 5.

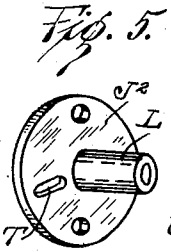
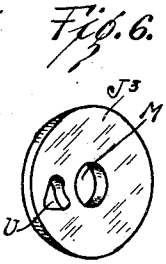


Fig. 6.



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Fig. 7.

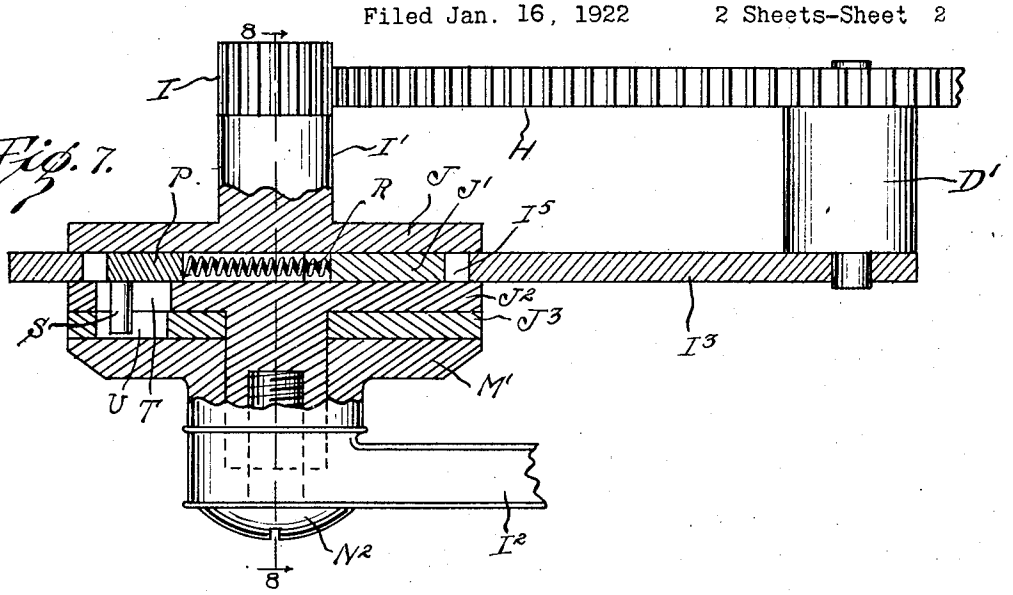
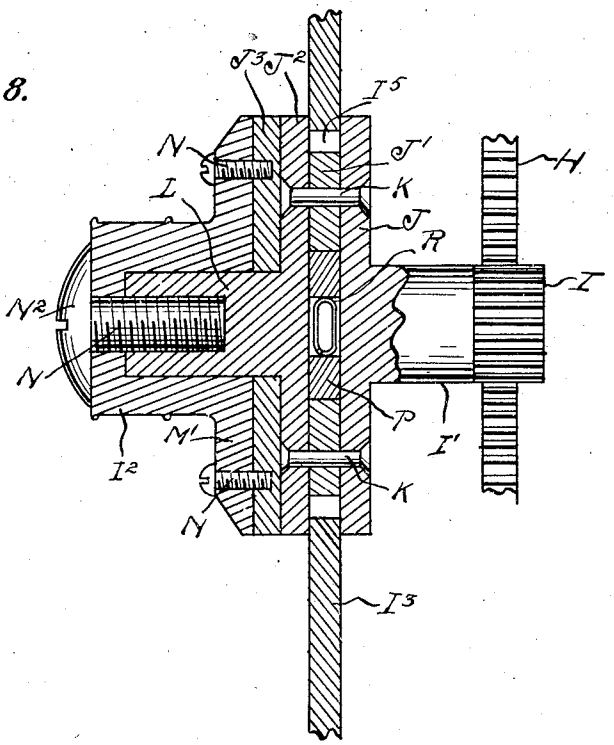


Fig. 8.



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Patented Mar. 30, 1926. 1,578,348

UNITED STATES PATENT OFFICE.

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

WINDOW-CONTROL MECHANISM.

Application filed January 16, 1922. Serial No. 529,486.

To all whom it may concern:

Be it known that I, STANLEY W. NICHOLSON, a citizen of the United States of America, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Window-Control Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to window control mechanism, and more particularly to devices for raising and lowering the windows of motor vehicles.

The invention consists in a novel mechanism for actuating a pivotal control arm for a sliding window and in a locking means for normally maintaining said arm stationary in any desired position.

In the drawings:—

Figure 1 is an interior view of an automobile having a window equipped with the improved control mechanism;

Figure 2 is a perspective view of a supporting plate for said mechanism;

Figures 3, 4, 5 and 6 are perspective views of a series of disks which are assembled in coaxial relation in the improved mechanism;

Figure 7 is a horizontal sectional view of the parts assembled upon the locking plate;

Figure 8 is a cross section view of the same taken on line 8—8 of Figure 7.

In these views the reference character A designates a window opening in the upper portion of an automobile or other vehicle and B is a vertically slidable glass plate forming a closure for the opening A and adapted in lowered position to enter a chamber C formed below the opening A. D is a control arm for the plate B, pivotally mounted at D′, and carrying at its free end a roller E bearing against the lower edge of the plate B. The arm D is formed at its pivotal extremity with a segmental gear H which meshes with a pinion I upon a stub shaft I′ adapted to be driven by a handle I^2, accessible as is common practice interiorly of the vehicle.

Describing now the mounting for the parts enumerated, I^3 is a rectangular plate secured within the chamber C and having a circular opening I^4 marginally formed with gear teeth I^5. J, J′, J^2 and J^3 are disks for operatively connecting the stub shaft I′ to the handle member I^2. The disk J′ is disposed in the plane of the plate I^3 within the opening I^4. The disks J and J^2 are of a diameter somewhat greater than that of the disk J′ and are arranged coaxially with the latter at opposite sides of the plate I^3, the three said disks being rigidly connected for unitary rotation by rivets K. The stub shaft I′ projects integrally from the disk J in one direction and a pin L projects in the opposite direction coaxially with said shaft passing free through an opening M in the disk J^3. The outer end portion of the pin L provides a mounting for the handle I^2, the latter being integrally formed with a circular plate M′ and screws N being extended through said plate into the disk J^3 to rigidly attach the handle to said disk. N′ is a screw axially connecting the handle I^2 and pin L, said screw having a large head N^2 for retaining the handle rotatively on said pin. Thus it is seen that the handle I^2 and disk J^3 are connected in a unitary relation and are adapted to turn upon the pin L independently of the unit formed by the disks J, J′, J^2.

The disk J′ is formed with a radial slot O within which there is slidably mounted a latch bolt P having at its outer end an integral tooth Q and acted upon by a coil spring R urging said bolt outwardly to engage said tooth between any of the notches I^5 with which said tooth may be registered. Said latch bolt carries a radially projecting pin S passing through a radial slot T in the disk J^2 and entering an approximately triangular cam opening U in the disk J^3.

Considering now the operation of the described construction it is to be understood that actuation of the handle I^2 in either direction first retracts the bolt P and then establishes a drive to the unit J, J′, J^2 to swing the arm D up or down according to the direction in which the handle I^2 is turned. Analyzing this result it will be seen that the disk J^3 turns as a unit with the handle I^2 owing to the connection established by the screws N. The pin S projecting into the cam opening U provides for a slight lost motion between the unit formed by the disk J, J′, and J^3. Normally the pin S engages the apex or outermost point of the slot U owing to the outward effort exerted by the spring R. In taking up the initial lost motion, one or the other of the inwardly divergent edges of the cam opening U acts upon the pin S (according to the direction of rotation of the handle) to effect retraction of

the bolt P. Thus by the time the lost motion is fully taken up the tooth I is disengaged from the notched edge I^5 and continued rotation of the handle I^2 will drive the unit J, J', J^2 through said pin S and will communicate the desired angular movement to the arm B.

It is to be observed that the invention derives from a single spring the functions of normally projecting the bolt P and maintaining a neutral or intermediate position of the handle as regards the lost motion movement of the latter.

It is further to be noted that the relatively small pinion I acting upon the large segment H provides an exceedingly simple mechanism for angularly adjusting the arm D with a very slight manual effort.

An important advantage derived from the described construction is the economy involved in use of sheet metal stampings for most of the elements of the mechanism, it being well known that stamped sheet metal elements are relatively inexpensive as compared to forgings or castings. The use of sheet metal as described is furthermore advantageous in that the use of such element secures a very compact pivotal mounting for the described mechanism. This is a considerable asset, where the mechanism must be inclosed as in the present case within a quite restricted space.

What I claim as my invention:—

1. In a device of the character described, the combination with a mounting plate, of a stamped sheet metal pivot member, and a latch bolt formed of stamped sheet metal, of substantially the same thickness as said pivot member, the mounting plate being formed with a notched opening to receive the pivot member and the latter being radially slotted to mount the latch bolt, a spring urging the latch bolt into engagement with the notched periphery of said opening, a drive member connected to said pivot member at one side of the mounting plate, a driving member at the other side of the mounting plate, having a lost motion connection to the pivot member for retracting said bolt.

2. In a device of the character described, the combination with a disk shaped pivot member, of a bolt radially slidable in said member, a mounting plate formed with an opening receiving said pivot member, said opening being peripherally notched for engagement by said bolt, a spring between said bolt and pivot member urging the bolt into engagement with the notched margin of said opening, a pair of disks of greater diameter than said pivot member at opposite sides of said mounting plate, one of which pair is radially slotted, means rigidly connecting the said disk and pivot member, a driven member connected to the other disk of said pair, a pin upon said bolt projecting through said slot, and a handle member having an opening formed with opposed beveled edges engageable by said projecting pin.

3. In a device of the character described the combination of a pivot member for a control arm, a bolt radially slidable in said pivot member, a mounting for said pivot member notched for engagement by said bolt, a handle member for actuating said pivot member having a lost motion connection to the pivot member for initially retracting said bolt upon actuation of the handle, and a single spring urging said bolt into normal projected position and also maintaining a normal neutral position of the handle with respect to the lost motion movement thereof.

4. In a device of the character described, the combination with a sheet metal plate having an opening therein with a notched margin, of a sheet metal disk fitted in said opening, a window control element secured to said disk at one side of said plate, a latch member mounted in said disk for engagement with the notched periphery of said opening, an actuating member in said control element carried by said disk at the other side of said plate, said actuating member having a lost motion drive connection with said disk, and means for effecting retraction of said latch member through the initial lost motion travel of said actuating member.

5. In a device of the character described the combination with a sheet metal mounting plate and a stamped sheet metal pivot member carried by said plate, of a latch element formed of stamped sheet metal set into an opening in said pivot member and engageable with said mounting plate, a spring reacting upon said latch member and pivot member to urge the former to latched position, a window lifter element engaging said pivot member at one side of said mounting plate, and actuating means for said element engaging the pivot member at the other side of the mounting plate.

6. In a device of the character described, the combination of a sheet metal plate having a portion thereof provided with a notched margin, a second portion laterally spaced from said first-mentioned portion for carrying a driven member, and means for actuating the driven member and for engaging the notched margin of said plate for locking the driven member in its adjusted positions.

7. In a device of the character described, the combination of means movable relative to and adapted to actuate a driven member, means controlled by said actuating means for locking the driven member in its adjusted positions, said locking means being movable relative to the driven member, and a common means for normally holding said

locking means in locking position and said actuating means in predetermined position relative to the driven member.

8. In a device of the character described, the combination of means for actuating a driven member, said actuating means being movable relative to the driven member and in a plane parallel thereto, means controlled by said actuating means for locking the driven member in its adjusted positions, said locking means being movable relative to the driven member, and a single yieldable member for normally holding said locking means in locking position and said actuating means in a predetermined position relative to the driven member.

In testimony whereof I affix my signature.

STANLEY W. NICHOLSON.