July 23, 1929. H. B. HASKINS 1,721,907

WINDOW REGULATOR MECHANISM

Filed Oct. 10, 1927

Fig. 1.

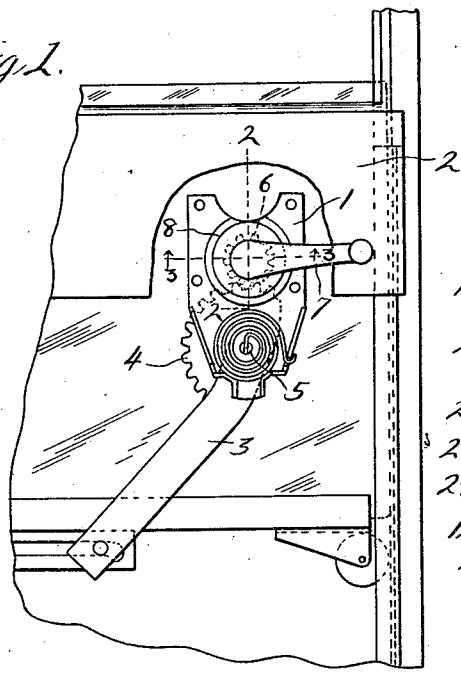


Fig. 2.

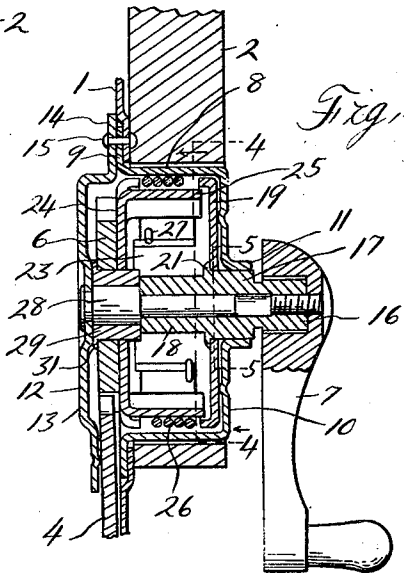
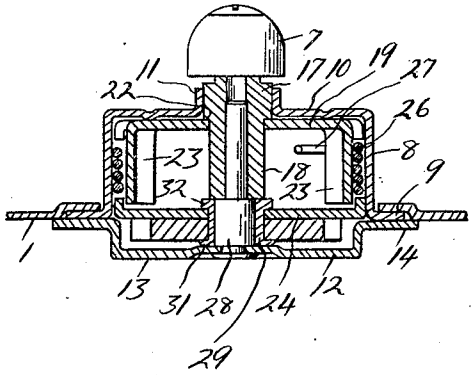


Fig. 3.



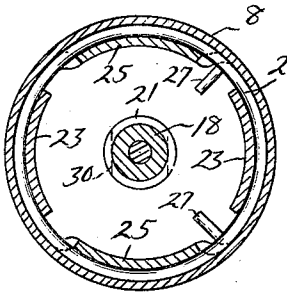


Fig. 4.

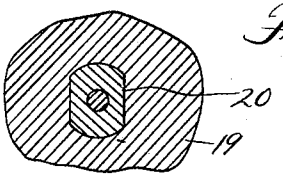


Fig. 5.

Inventor
Howard B. Haskins

By Whittemore Hulbert & Whittemore & Belknap

Attorneys

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UNITED STATES PATENT OFFICE.

HOWARD B. HASKINS, OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DURA COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

WINDOW-REGULATOR MECHANISM.

Application filed October 10, 1927. Serial No. 225,359.

The invention relates to window regulator mechanisms and more particularly refers to window regulator clutches. The invention has for one of its objects to so construct the mechanism that the driving and driven members of the clutch are interchangeable, thereby reducing the cost of manufacture and assembly. The invention has for another object to construct the mechanism to provide an extended bearing for the driven member. With these and 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 inside elevation, partly broken away, of a portion of a motor vehicle door having applied thereto a window regulator mechanism embodying my invention;

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

Figures 4 and 5 are cross sections respectively on the lines 4—4 and 5—5 of Figure 2.

The window regulator illustrated in the present instance has the mounting plate 1 which is secured to and depends from the lock board 2 of the door. 3 is the lifter arm of the window regulator rigidly secured to the gear segment 4, which latter is pivotally mounted at 5 upon the mounting plate. 6 is the pinion meshing with the gear segment and 7 is the handle for actuating the pinion, which, through the gear segment and lifter arm, raises and lowers the window.

To lock the lifter arm in its various positions of angular adjustment when driving force is no longer applied through the handle and also to provide for releasing the lock when driving force is applied through the handle, the following clutch is provided. 8 is a cup having the annular flange 9 at its outer end and the annular flange 10 at its inner end, which latter flange terminates in the cylindrical flange 11. The cup is inserted through the mounting plate from its outer side and the annular flange 9 of the cup abuts the outer face of the recessed portion of the mounting plate surrounding the opening through which the cup extends. 12 is a cupped plate having its web 13 offset outwardly from the plane of the mounting plate and the annular flange 14, which abuts the annular flange 9, these two flanges being rigidly secured to each other and to the mounting plate as by means of the rivets 15. The cup and the cupped plate together form the support and housing for the clutch, the gear segment 4 extending between the lower portion of the web 13 of the cupped plate and the mounting plate 1.

16 is the driving shaft, to the inner end of which is secured the handle 7. This driving shaft has the enlarged cylindrical portion 17 which is journaled in the cylindrical flange 11 of the cup and the reduced outer end portion 18, which is arranged within the cup. 19 is the driving member arranged within the cup and fixedly secured to the driving shaft 16. This driving member is preferably stamped from sheet metal to cup shape and its web has an axial opening therethrough for fitting the inner end of the enlarged cylindrical portion 17 of the driving shaft, this inner end having its opposite sides flatted at 20, as shown particularly in Figure 5. Fins 21 are sheared up to clamp the web of the driving member against the shoulders 22 formed by flatting the opposite sides. The driving member has the pair of diametrically opposite or symmetrically arranged transversely extending fingers 23. 24 is the driven member arranged within the cup 8 and formed in exactly the same manner as the driving member 19, this driven member being stamped from sheet metal to cup shape and having the pair of diametrically opposite or symmetrically arranged fingers 25, which are adapted to alternately engage in either space between the fingers 23. Both sets of fingers 23 and 25 are offset radially inward from the periphery of the webs of the driving and driven members to accommodate the coil spring 26, which encircles these fingers and is limited in its axial movement in either direction by the peripheral portions of the webs. This coil spring is adapted to be expanded against the cup 8 to lock the clutch from turning and has the inturned ends 27 which extend through the spaces between one of the tongues 23 and the two tongues 25, the arrangement being such that upon turning the driving member 19 through the handle 7, the tongue 23 of this driving member embraced by the inturned ends 27 engages one of these inturned ends to contract the coil spring, thereby releasing the lock, after which it, through this inturned end and the adjacent tongue 25 of the driven member, turns the driven member. However, if driving force

is applied through the driven member one of its tongues engages the adjacent inturned end of the coil spring to expand the same firmly against the cup to thereby lock the parts from rotation.

28 is a pin fixedly secured to the web 13 of the cupped plate 12 as by being riveted thereto and extending axially into the driving shaft 16, the outer end of this pin terminating opposite the cylindrical flange 11. 29 is a bushing journaled upon the outer end of the pin adjacent the web 13 and having fixedly secured thereto the pinion 6 and the driven member 24, this bushing, as shown particularly in Figure 4, having its opposite sides flatted at 30 and the openings in the pinion and web of the driven member being correspondingly shaped. Fins 31 are sheared up from the outer end of the bushing to cooperate with the shoulders 32 upon the inner end of the bushing formed by flatting the latter, these fins and shoulders holding the pinion and driven member from axial movement relative to the bushing. The size and shape of the bushing is exactly the same as the size and shape of the inner end of the enlarged cylindrical portion 17 of the driving shaft so that the driven member 24 may be and is exactly the same as the driving member 19. This bushing, furthermore, forms an extended bearing for the driven member.

From the above description it will be readily seen that I have provided an improved window regulator mechanism in which the driving and driven members of the clutch are exactly the same and therefore interchangeable. As a result, these parts may be manufactured and assembled at lower cost than if they were different. It will also be seen that the clutch is of rigid construction.

What I claim as my invention is:

1. In a window regulator mechanism, the combination with a stationary member, and a friction member engageable with said stationary member, of interchangeable rotary driving and driven members operating upon said friction member to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

2. In a window regulator mechanism, the combination with a stationary housing and a friction member within said housing and arranged to be expanded thereagainst, of interchangeable rotary driving and driven members operating upon said friction member to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

3. In a window regulator mechanism, the combination with a support, of a driving member journaled upon said support, a pin upon said support and a driven member upon said pin, said driving and driven members being interchangeable and operating to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

4. In a window regulator mechanism, the combination with a support including a cup, of a driving member journaled in said cup, a pin upon said support, a driven member journaled upon said pin and a coil spring within said cup and arranged to be expanded thereagainst, said driving and driven members being interchangeable and operating upon said coil spring to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

5. In a window regulator mechanism, the combination with a support, of a driving member journaled upon said support, a pin upon said support, a pinion, a driven member, and a bushing journaled upon said pin and securing said pinion and driven member to each other, said driving and driven members being interchangeable and operating to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

6. In a window regulator, the combination with a stationary member and a friction member engageable with said stationary member, of interchangeable rotary driving and driven members, each having symmetrically arranged fingers extending between the fingers of the other, said driving and driven members operating upon said friction member to effect locking when driving effort is exerted through one member and to permit turning when driving effort is exerted through the other member.

7. In a window regulator mechanism, the combination with a support including a cup, of a shaft journaled in said cup, a driving member secured to said shaft and arranged within said housing, a pin upon said support, a pinion, a driven member extending within said housing, a bushing journaled upon said pin and extending through and securing said pinion and driven member to each other, and a coil spring within said cup and arranged to be expanded thereagainst, said driving and driven members being interchangeable and having interengaging fingers encircled by said spring and operating thereupon to effect locking when driving effort is exerted through said pinion and driven member and to permit turning when driving effort is exerted through said shaft and driving member.

In testimony whereof I affix my signature.

HOWARD B. HASKINS.