March 2, 1926. 1,575,038

A. R. CLAS

WINDOW REGULATOR

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Fig. 5.

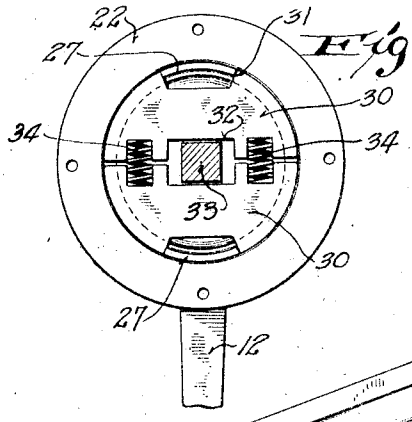


Fig. 1.

Fig. 3.

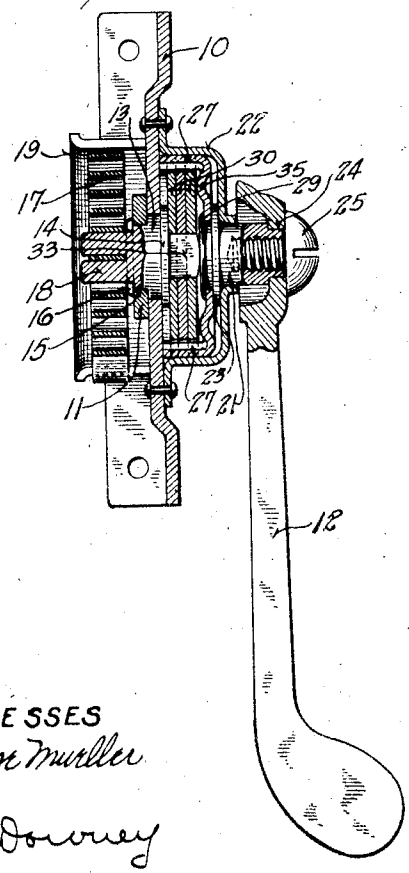
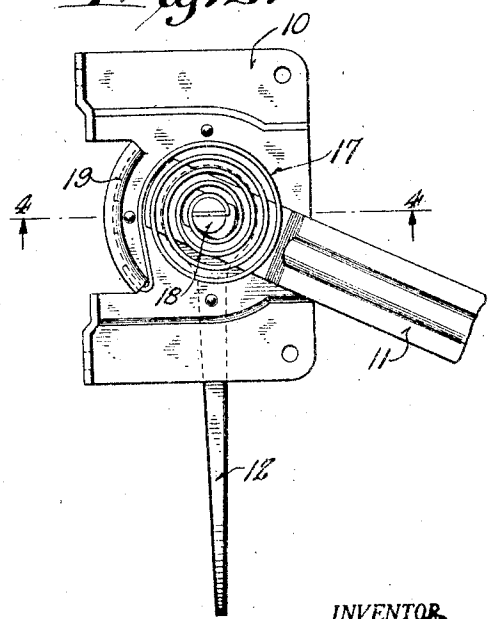


Fig. 2.



WITNESSES

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Fig. 4.

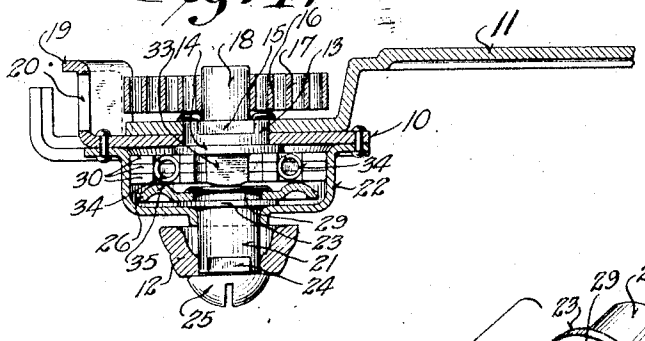

Fig. 6.

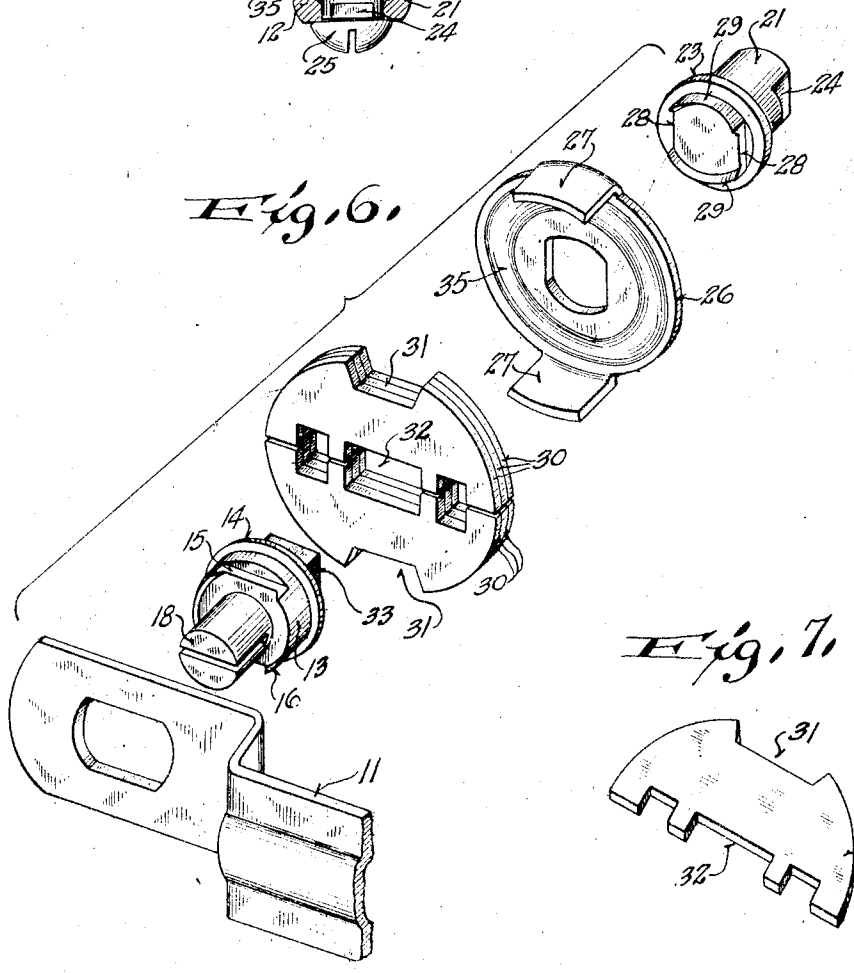

Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

ANGELO ROBERT CLAS, OF TOLEDO, OHIO.

WINDOW REGULATOR.

Application filed November 7, 1924. Serial No. 748,403.

To all whom it may concern:

Be it known that I, ANGELO ROBERT CLAS, a citizen of the United States, and resident of Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Window Regulators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to window regulators of the quick-acting type, particularly designed for use in automobile doors where the necessity for directional signaling by the driver's extended arm makes speedy action in opening and closing the window of great importance.

An object of the invention is to provide a window regulator which will accomplish the full opening movement of the window by a relatively short stroke of the operating lever and which will securely hold the window in any position in which it is placed.

Another object of the invention is to produce such a window regulator that may be operated with ease and that will be inexpensive to manufacture though strong and durable.

Another object of the invention is to provide a braking mechanism for window regulators of this type which will be sure in its action and will afford a plurality of independent frictional engaging surfaces urged by coiled springs.

With the above and other objects in view the invention consists in the window regulator as herein claimed and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in different views,

Fig. 1 is a front view of a window regulator constructed in accordance with this invention;

Fig. 2 is a rear view thereof;

Fig. 3 is a central sectional vertical view thereof;

Fig. 4 is a horizontal sectional view;

Fig. 5 is a view showing the brake members in their relation to the stationary cup or housing;

Fig. 6 is a perspective view of separated parts in the order of their assembly, and

Fig. 7 is a perspective view of one of the brake disk segments.

In these drawings, 10 indicates a base plate adapted to be secured in place in the automobile door or the like and forming a support for a window-lifting arm 11 of usual construction and an operating lever or handle 12, the handle and arm being connected together through instrumentalities co-operating to provide free communication of force applied to the handle or lever for swinging the arm to raise or lower the window but to effect a brake to resist movements of the parts from force applied to the arm as by the weight of the window.

The arm 11 is fixed on a pivot member 13 and the latter is pivotally mounted in an opening of the base plate, as seen in Fig. 3, a flange 14 of the pivot member bearing against the back of the base plate. The arm has a wrench-hold engagement with the parallel shoulders 15 of the pivot member and is riveted thereto by turning over the feathered edge 16 thereagainst. The outer end of the arm 11 supports the window in the usual manner and the weight of the window is counterbalanced by a helical spring 17 wound about and engaged with the slotted boss 18 on the rear end of the pivot member with its hook-shaped outer end engaged with a flange 19 bent up from the base plate. One or more openings 20 may be provided in the flange 19 to afford additional points of engagement for the hooked end of the spring whereby an adjustment may be made to vary the action of the spring so as to properly counterbalance the window.

The handle 12 is fixed on a handle shaft 21, which is journaled in a cup-shaped bearing member 22 fixed in place by being riveted to the base plate 10. A flange 23 on the handle shaft bears against the inner wall of the stationary cup or casing 22 and the handle member may be keyed on the shaft by fitting on the parallel wrench shoulders 24, where it is held by the head of a screw 25, as shown.

Inside the cup-shaped bearing member 22 the handle shaft 21 has rigidly secured to it a driving yoke or cam 26 with a pair of parallel yoke fingers 27. As shown, the driving member consists of a disk fitting on parallel wrench shoulders 28 on the end of the handle shaft 21 and riveted in place by having feathered edges 29 on the end of the shaft bent over thereagainst.

Contained within the cup-shaped bearing member 22 and frictionally engaging the cylindrical walls thereof are a number of ex-

panding sectional disks 30 forming brake members and constituting the driving connection between the handle 12 and arm 11 by having notches 31 in their outer edges receiving the parallel fingers 27 of the driver 26 and by having rectangular central openings 32 receiving a square cam projection 33 on the end of the pivot member 13. Coiled springs 34 are contained in registering notches at the inner edges of the disk sections tending to expand the disks into frictional engagement with the cylindrical walls of the cup-shaped bearing member and the disk sections are held in place by being confined between the flange 14 of the pivot member and an embossed ring 35 formed on the driver 26, as seen in Figs. 3 and 4.

From the foregoing it will be obvious that the effect of the coiled springs 34 is to expand the brake disks 30 into frictional engagement with the cylindrical wall of the cup-shaped bearing member 22 to hold all parts against turning. The weight of the window supported by the arm 11 tends to turn the pivot member 13 but the wedging action of the square projection 33 thereof between the disk sections tends to push them apart with greater force and into a tighter fitting relation with the walls of the cup-shaped member 22 to increase the resistance to turning movement. Pressure applied to the handle member 12 in either direction will, however, release the engagement of the friction disks by the turning movement of the fingers 27 tending to press the disk sections together against the action of springs 34. By releasing the frictional engagement of the disks the parts turn freely, motion being communicated from the handle member to the window-supporting arm through the driving connection formed by the disks between the fingers of the driver 26 and the square projection on the pivot member of the arm. This freedom of action is the same whether the handle is turned for raising or lowering the window and the direct connection between the handle and the arm enables the full opening or closing movement of the window to be accomplished by the same arc of movement of the handle that is given to the window-supporting arm, which, in practice, is approximately 90°. Thus, because of the effective brake for rigidly holding the window in any position, the handle may be directly connected with the window arm and the full movements of the window may be produced by means of a short stroke of the handle to accomplish the quick opening and closing of the window for hand signaling purposes.

While the expanding friction member is preferably in the form of a number of segmental friction disks, in order to obtain increased frictional bearing surface, it may consist of a single expanding disk member and the cam 33 may have any form that will cause it to wedge the disk sections apart when turned.

What I claim as new and desire to secure by Letters Patent is:

1. A brake comprising a bearing member having a cylindrical wall, a sectional disk normally bearing against said wall, a driving member having engagement with the disk sections near their peripheries, and a driven member having a cam fitting between the disk sections.

2. A brake comprising a stationary member having cylindrical bearing walls, a sectional friction disk normally bearing against said bearing walls, a driving member having connection with the disk sections, and a driven member having a cam fitting between the disk sections.

3. A brake comprising a stationary bearing member having a cylindrical bearing surface, a sectional friction disk bearing with spring pressure against the bearing surface, a driving member having connection with the disk sections, and a driven member having a cam engaged between the disk sections.

4. A brake for window regulators and the like comprising a stationary bearing member, sectional disks fitting therein, coiled springs confined between the disk sections for holding them in frictional engagement with the bearing surface of the bearing member, a handle member having connection with the disk sections, and a window-supporting arm member having a cam fitting between the disk sections.

5. In a window regulator, a window-supporting arm, a handle member and a direct driving connection between the window-supporting arm and the handle member comprising a sectional disk with its sections in driving connection with the handle member, a cam having connection with the window-supporting arm and fitting between the disk members, and a stationary bearing member surrounding the sectional disk and normally engaged thereby.

6. A window regulator of the pivoted arm type having a short stroke direct-connected handle comprising a pivotally mounted window-supporting arm, a pivotally mounted handle member coaxial therewith, an expanding disk brake member forming a direct driving connection between the handle member and the window-supporting arm by having the handle member engaging the sections thereof and the window-supporting arm engaging between the disk sections, and a stationary bearing member within which the expanding disk bears.

7. A window regulator comprising a base plate, a pivot member mounted to turn therein, a window-supporting arm carried by the pivot member, a cup-shaped bearing mem-

ber mounted on the base plate, a handle member mounted to turn therein, yoke fingers carried by the handle member, sectional disks fitting in the bearing member and engaged by the yoke fingers of the handle member, and a cam on the pivot member fitting between the disk sections.

8. A window regulator comprising a base plate, a flanged pivot member mounted to turn therein, a window-supporting arm fixed on the pivot member, a helical counterbalance spring connected to the pivot member and to the base plate, a cup-shaped bearing member attached to the base plate, a flanged shaft mounted to turn in the bearing member, a handle fixed thereon, a driver member fixed on the shaft and provided with outstanding parallel fingers, sectional friction disks bearing against the walls of the bearing member and having notches in their edges to receive the fingers, a square cam projection on the pivot member fitting in openings between the disk sections, and coiled springs fitting in other openings between the disk sections for forcing the disk sections apart and into frictional engagement with the walls of the bearing member.

9. In a window regulator, a pivotally mounted window-supporting arm, a pivotally mounted handle member coaxial therewith, a direct driving connection between the handle member and the arm forming a brake to hold the arm in any position, a helical spring mounted on the arm for counterbalancing the weight of the window, and a plurality of stationary engaging means in any one of which the end of the helical spring may be engaged for adjusting the counterbalancing effect of the spring to suit the weight of the window.

In testimony whereof, I affix my signature.

ANGELO ROBERT CLAS.