

Feb. 3, 1948.

T. J. R. BRIGHT
ACTUATING MECHANISM
Filed April 6, 1946

2,435,339

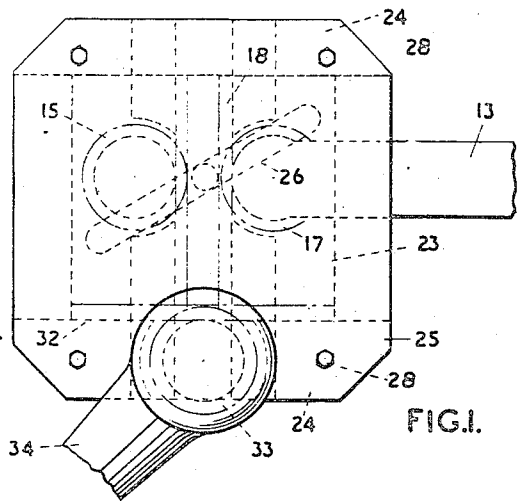
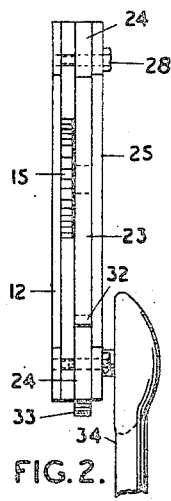
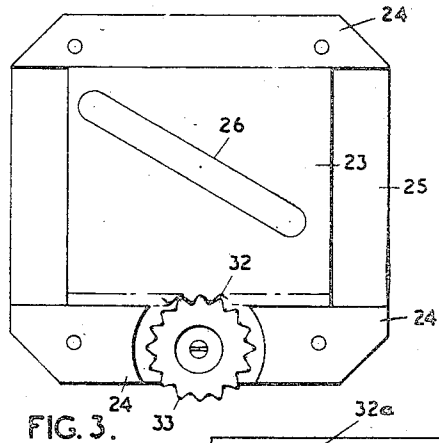
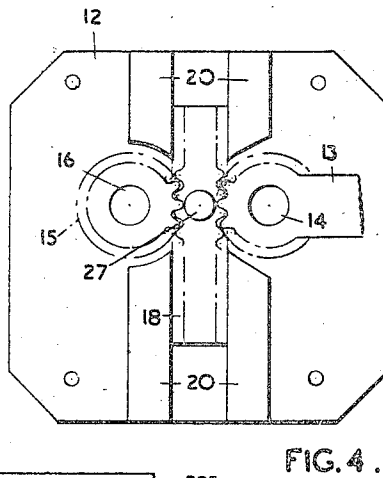
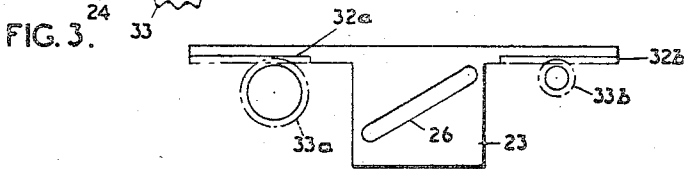
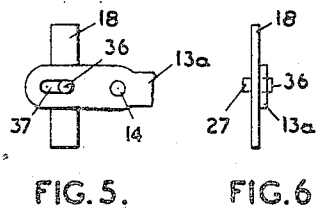
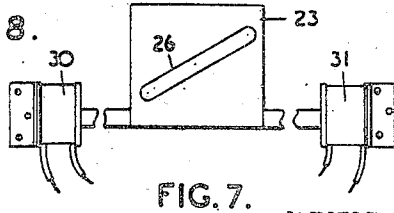


FIG. 8.



INVENTOR
THOMAS J. R. BRIGHT

BY *Mawkinney & Mawkinney*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,435,339

ACTUATING MECHANISM

Thomas John Robert Bright, Allesley,
near Coventry, England

Application April 6, 1946, Serial No. 660,181
In Great Britain February 14, 1945

Section 1, Public Law 690, August 8, 1946

7. Claims. (Cl. 74-29)

1.

This invention relates to an actuating mechanism for a slidable window, roof or the like, and, although not limited in this respect, it is particularly applicable to a mechanism for actuating a vertically-slidable window of a motor-vehicle or the like, i. e., where space for the mechanism is strictly limited.

An important object of the invention is to provide an inexpensive construction of compact design.

A further object is to provide, for a motor-vehicle window, an actuating mechanism incorporating an irreversible means which will give instantaneous and positive locking of the window in any position to which it is moved by the actuating mechanism, and instantaneous release and movement of the window when the actuating mechanism is operated—as opposed to the usual mechanisms incorporating a clutch which necessitates a certain amount of free movement of the operating handle before the window can be moved.

By "irreversible means" I mean that the actuating mechanism can effect movement of the window in either direction, but the window cannot be moved except by the actuating mechanism.

A further object is a compact design with which alternative positions for an operating knob or other handle can be provided in a very simple manner.

A still further object is a compact design with which selection can be made in a very simple manner for the actuation of the window by winding or, alternatively, by quick-acting means as desired.

A still further object is a compact design which can be readily adapted, as required, for operation by a slidable knob, a rotatable handle, or a push-pull mechanism, or electrically, hydraulically, or by compressed air.

The actuating mechanism of the invention broadly consists in at least one pivotally mounted arm to shift the window or the like, a slidable flat bar or other member connected with the arm (as by having teeth to engage teeth fast with the arm and concentric with its pivoted axis) to turn the arm about its axis, thereby to shift the window or the like, when the said member is slid, a second member, for example, a flat plate, slidable in a plane parallel to, and in a different direction from, that of the first member, and a pin-and-slot connection between the two members providing an irreversible connection by which the second member can slide the first.

Preferably, the pin-and-slot connection in-

2.

cludes a projection on the first member and a slot in the second member inclined to the direction of movement thereof at a requisite angle. Preferably, too, use is made of a pair of base plates secured in spaced relation to be parallel to the planes of movement of the slidable members and to enclose them and part of the arm and its connection to the first of the members, each base plate having means serving as a guide for one of the said members.

In the accompanying drawings—

Figure 1 is a side elevation of an actuating mechanism according to the invention, for a vertically-slidable window of a motor-vehicle;

Figure 2 is an elevation thereof taken from the left;

Figure 3 is a view, from the inside, of one of the base plates which slidably guides the second of said members, the latter being shown in the form of a flat plate;

Figure 4 is a view, also from the inside, of the other base plate which slidably guides the first of the said members and upon which the said arm is pivoted;

Figures 5 and 6 are side and end elevations, respectively, to a smaller scale, showing an alternative means connecting the said arm to the first of the slidable members;

Figure 7 illustrates how the second slidable member may be servo actuated instead of manually; and

Figure 8 shows two other forms of actuating means.

In carrying out the invention, as applied to a sliding window, for a motor-vehicle, which is not properly guided when in the open position by the stationary window frame (as in the case of a sliding window in an ordinary front door of a motor-vehicle), there is a fixed base plate, such as that marked 12, to be secured directly or indirectly to a stationary portion of the vehicle, for example, to the front door, and pivotally mounted upon this plate are two window-shifting arms provided at their free ends with rollers or the like to engage a channel formed on the underside of the frame of the sliding window. In the closed position of the latter the arms extend upwardly, usually forming an acute angle with one another, being biased towards one another—i. e., in a direction to close the window still further. In the open position of the window the arms have been swung around, usually through more than 90°, to extend downwardly, and usually again to be inclined at the same acute angle to one another.

In the drawings only one, 13, of the arms is shown, being pivoted at 14 on the base plate 12. A second arm, when required, can be formed integrally with the toothed wheel 15 which is pivoted at 16 on the base plate 12. The pivotally-mounted end of the arm 13 has teeth 17 concentric with its pivot 14 provided directly thereon, or, of course, the arm may be fast with a separate pinion or toothed quadrant. The spacing of the respective pivots 14 and 16 (Figure 4) from one another is such that the teeth can be engaged by teeth on said first-mentioned slidable member shown in the form of a double rack 18 which extends between them and which may be guided for movement in a vertical direction by strips 20.

The spring bias which is usually provided may be by means of a spiral spring (not shown) associated with the pivotal mounting of the arm, or of both arms when provided. The springs may be anchored at one end to the associated base plate in any convenient manner, and their other ends may be hooked to engage round lugs pressed up from the arms. Alternatively, the spring bias may be provided to act upon either of the said slidable members.

In a modification of this arrangement one of the arms aforesaid is omitted and any appropriate means is provided for guiding the edge of the first slidable member 18 (which need not now be toothed on this edge) remote from the teeth of the remaining arm—for example, as actually shown. In this case a link can be pivotally mounted upon the base plate 12 to move parallel to the toothed arm, the latter and the link supporting the tail of a T-shaped bracket the upper part of which carries rollers or the like to engage the channel of the sliding window frame.

It will be understood that, in the case of a sliding window which is properly supported by the stationary window frame along the whole length of its movement, a single shifting arm directly engaging the channel or the like on the sliding window frame will be sufficient, two shifting arms, or the T-shaped bracket arrangement, being required when the sliding window has to be supported in the lowered position against tilting in its plane. The illustrated actuating mechanism is, in fact, one for a window which is at all times fully supported.

For operating a pair of shifting arms or a single shifting arm as aforesaid, I provide the aforesaid second member 23 to slide substantially at right angles to the rack, the member 23 being a flat plate guided by strips 24 in the other base plate 25 and having a slot 26 in it at an appropriate inclination to the direction of movement of the rack so that movement of the member 23 will effect movement of the rack by means of a roller or other projection 27 carried by the rack and engaged by the slot 26, but so that the rack 18 cannot be moved to move the member 23. The two base plates 12 and 25 are held in spaced relation to enclose the parts as shown by means of washers and screws 28 or the like.

The member 23 may be provided with a handle (not shown) by means of which it can be manually slid to-and-fro to open or close the sliding window or, alternatively, it may be remotely-controlled as by means of pneumatic or hydraulic devices, or, of course, by solenoids 30, 31 as shown by Figure 7, which act on opposite ends and are selectively energizable. As another alternative rack teeth 32 (Figures 1 to 4) may be fast with

the member to engage a rotatable actuating pinion 33 which is journaled in the base plate 23 and carries an actuating handle 34. The arrangement may be such that several revolutions of the pinion will be necessary to move the window fully along the length of its travel or, alternatively, so that less than one revolution will be sufficient fully to traverse the window.

Alternatively, as shown by Figure 8, I may provide two parallel lines of rack teeth 32a—32b to be fast with the said member 23 and in this case I can selectively provide two different-sized pinions to coact with the rack teeth respectively, making appropriate provision for the pivotal mounting of the pinions from the fixed plate 25. Thus, with the same mechanism, with one of the pinions 33a I can offer a quick-acting mechanism, and with the other 33b a winding mechanism, as required. Or I can easily convert one to the other, by the substitution of one pinion for the other.

Figure 8 also shows that I have a large choice in the actual position of the actuating pinion 33.

In a preferred arrangement the projection 27 on the rack which is engaged with the toothed arms (when there are two arms) is about midway of the length of the rack and between the pivotal axes of the arms when they are collinear—i. e., when the window is half-way down, as shown by Figures 1 to 4, and in these conditions the projection 27 is approximately half-way along the slot in the said member 23.

By providing rack teeth directly on the latter, when it is to be operated by a pinion, the mechanism can be made to be very compact.

In the modification of Figures 5 and 6 the window-shifting arm 13a has a pin-and-slot connection with the vertically slidable member 18. Thus the latter has projections on its opposite faces, one 27 for engagement with the slot 26 of the slidable member 23, and the other 36 for engagement with the slot 37 of the arm 13.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. Actuating mechanism, for a slidable part such as a window of a motor-car, including a pair of base plates, means holding said base plates in spaced superposed relation, at least one pivotally-mounted arm to shift said part, a slidable member operatively connected with said arm to turn the latter about its pivotal axis, thereby to shift said part, when said member is slid, a second member slidable in a plane parallel to, and in a different direction from, that of the first, said members being disposed between said plates and being respectively guided thereby, and a pin-and-slot connection between said members providing an irreversible connection by which said second member can slide said first.

2. Actuating mechanism, for a slidable frame such as that of a window of a motor-car, including a base plate, an arm pivotally mounted on said base plate to shift said frame, a slidable member operatively connected with said arm to turn the latter about its pivotal axis, thereby to shift said frame, when said member is slid, a second member slidable in a plane parallel to, and in a different direction from, that of the first, and a pin-and-slot connection between said two members, including a projection carried by said first member and engaged with a slot in said second member, providing an irreversible connection by which said second member can slide said first.

5

6

3. Actuating mechanism, for a slidable window, including a pair of base plates held in spaced superposed relation, at least one arm pivoted on one of said base plates to shift said window, a vertically slidable member guided by said one base plate and operatively connected with said arm to turn the latter about its pivotal axis, thereby to shift said window, when said member is slid, a second member in the form of a flat plate slidable in a plane parallel to that of the first member and in a horizontal direction, said second member being guided by the other of said base plates, and a projection carried by said first member and engaged with a slot in said second member, said slot being inclined at an angle relatively to the direction of movement of said first member such as to provide an irreversible connection by which said second member can slide said first member, both said members being disposed between said base plates.

4. Actuating mechanism, for a slidable frame, including a base plate, at least one arm pivotally mounted on said base plate to shift said frame, teeth fast with said arm and concentric with its pivotal axis, a slidably-mounted toothed member engaged with said teeth, a second member slidable in a plane parallel to that of the first and in a direction transverse thereto, and a projection on said first member engaged with an inclined slot in said second member, the inclination being such as to provide an irreversible connection whereby said second member can slide the first to shift said frame.

5. Actuating mechanism, for a slidable frame, including a base plate, at least one arm pivotally mounted on said base plate to shift said frame, teeth fast with said arm and concentric with its pivotal axis, a slidably-mounted toothed rack engaged with said teeth, a plate slidable in a plane parallel to that of said rack and in a direction transverse thereto, a projection on said rack engaged with an inclined slot in said slidable plate, the inclination being such as to provide an irreversible connection whereby said slid-

able plate can slide said rack to shift said frame, and a toothed rotatable member engaged with rack teeth formed on said slidable plate to enable the latter to be slid on rotation of said toothed member.

6. Actuating mechanism, for a slidable frame, including a pair of base plates, means holding said base plates in spaced superposed relation, at least one arm pivotally mounted on one of said base plates to shift said frame, teeth fast with said arm and concentric with its pivotal axis, a toothed member slidably guided in said one base plate and engaged with said teeth, a second member slidable in a plane parallel to that of the first and in a direction transverse thereto, said second member being guided in the other of said base plates, both said members being disposed between said base plates, and a projection on said first member engaged with an inclined slot in said second member, the inclination being such as to provide an irreversible connection whereby said second member can slide the first to shift said frame.

7. Actuating mechanism, for a slidable part such as a window of a motor-car, including a base plate, at least one pivotally-mounted arm to shift said part, a slidable member operatively connected with said arm to turn the latter about its pivotal axis, thereby to shift said part, when said member is slid, a second member slidable in a plane parallel to, and in a different direction from, that of the first, and a pin-and-slot connection between said two members providing an irreversible connection by which said second member can slide said first.

THOMAS JOHN ROBERT BRIGHT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,687,481	Floraday et al.	Oct. 9, 1928