Aug. 10, 1926. 1,595,499

J. BIRK

WINDOW LIFT

Filed March 3, 1923 2 Sheets-Sheet 1

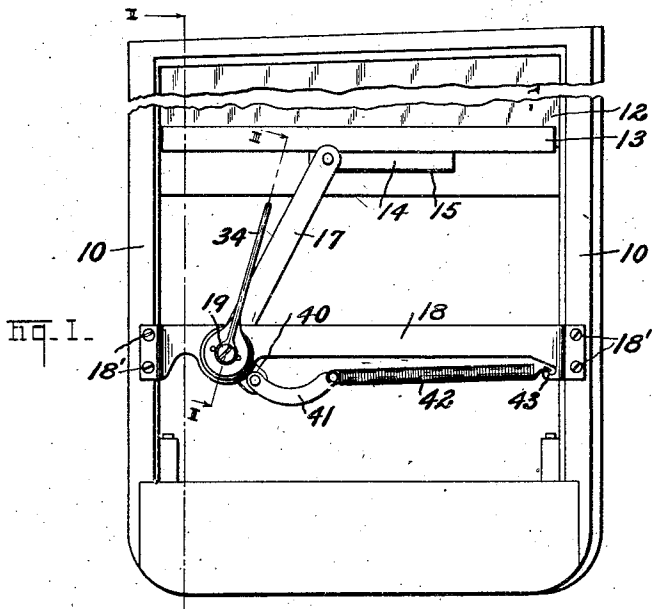


Fig. I.

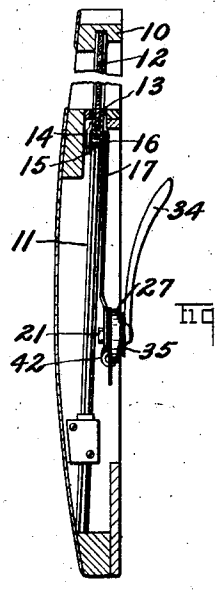


Fig. II.

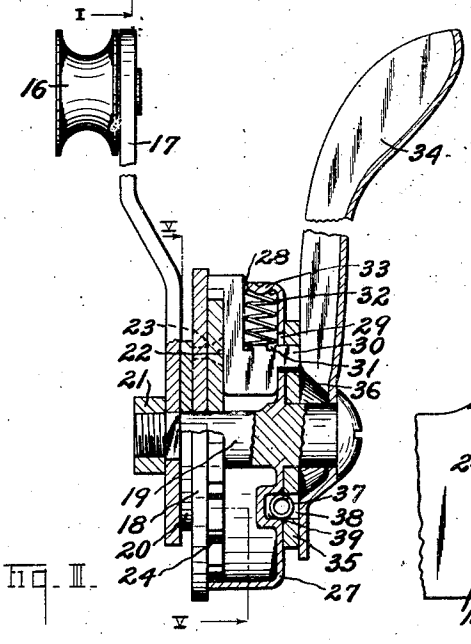


Fig. III.

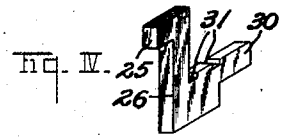


Fig. IV.

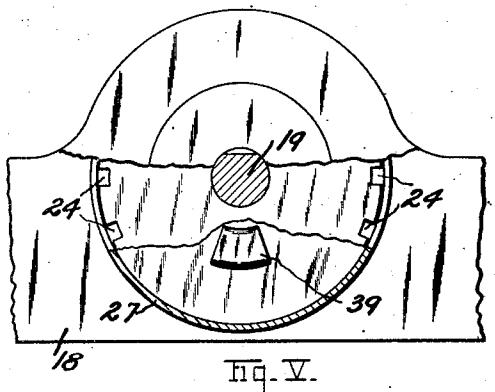


Fig. V.

INVENTOR.
John Birk.
BY Solon J. Broughton,
ATTORNEY.

Aug. 10, 1926. 1,595,499

J. BIRK

WINDOW LIFT

Filed March 3, 1923 2 Sheets-Sheet 2

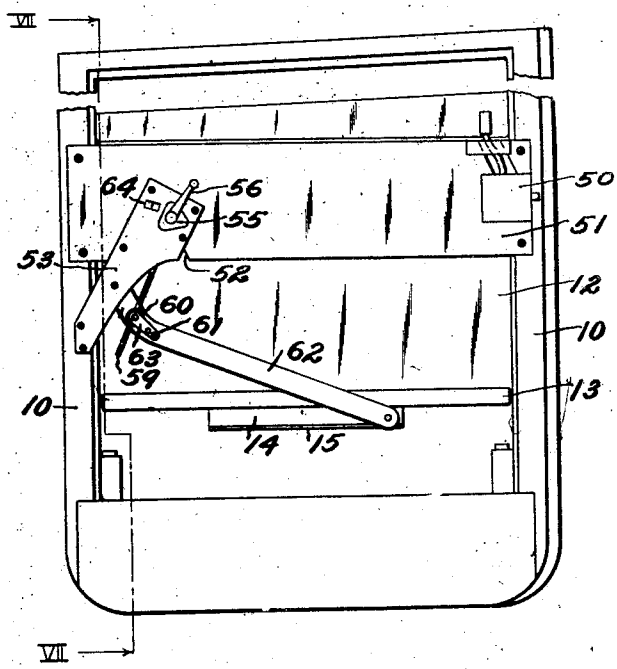


Fig. VI.

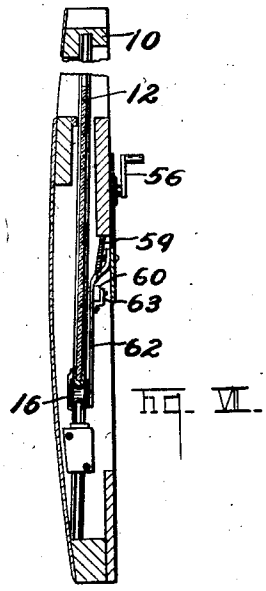


Fig. VII.

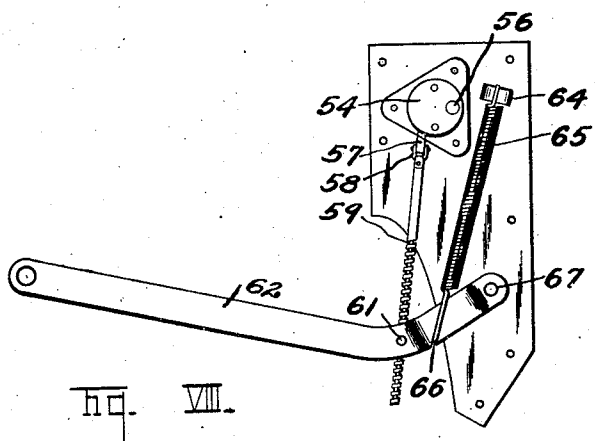


Fig. VIII.

INVENTOR.
John Birk.
BY Solon J. Boughton
ATTORNEY

Patented Aug. 10, 1926. 1,595,499

UNITED STATES PATENT OFFICE.

JOHN BIRK, OF TOLEDO, OHIO, ASSIGNOR TO THE WILLYS-OVERLAND COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

WINDOW LIFT.

Application filed March 3, 1923. Serial No. 622,504.

This invention relates to improvements in window lifts, being intended primarily for application to motor vehicles.

One object of the invention is the provision of a device of this character which is adapted to be entirely assembled before being applied to the door or window frame, that is, one in which the entire mechanism is mounted upon a single base or support. This base or support also has the further function of bracing the door or window to which it is applied.

Another object of the invention is the provision of a window lift which will be capable of quick and easy installation.

A further object is the provision of simplified mechanism for automatically holding the slidable window in various positions.

Other objects, and objects relating to details of construction and economies of manufacture, will appear as I proceed with the description of that embodiment of the invention, which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which:

Figure I is a side, elevational view of an automobile door embodying one form of my improved window lift.

Fig. II is a vertical, sectional view taken substantially on the line II—II, Fig. I.

Fig. III is a sectional view taken substantially on the line III—III, Fig. I, and showing my automatic latch mechanism in detail.

Fig. IV is a perspective view of a dog comprising a part of the latch mechanism.

Fig. V is a detail view of the latch mechanism, taken partly in section upon the line V—V, Fig. III.

Fig. VI is an elevational view similar to Fig. I, but showing a modified form of the invention.

Fig. VII is a vertical, sectional view taken substantially on the line VII—VII, Fig. VI, and

Fig. VIII is a detail elevational view of the lift mechanism illustrated in Fig. VI, viewed from the rear.

Referring now to the modification shown in Figs. I to V inclusive, 10 represents the stiles of an automobile door, provided with ways 11, in which is adapted to slide vertically a pane of glass 12, upon the bottom edge of which is clamped a metal channel 13. Near the middle of the channel 13, I secure thereto, preferably by welding, a depending metal member 14 having at its lower edge a substantially horizontal flange 15. The channel 13 and the flange 15 form upper and lower tracks upon which is adapted to run a roller 16 carried by the free end of the window lifting lever 17.

In this form of the invention, the lift mechanism is mounted upon a transverse, metallic bar or rail 18 which bridges the space between the stiles 10, being secured to the same preferably by means of screws 18′, thus forming a rigid brace for the door. Near one end of the rail 18 there is provided an opening within which is journaled a pivot 19. A washer 20 surrounds the pivot at the rear of the rail 18 and serves to space the lever 17 therefrom. The pivot and lever are provided with interengaging flattened surfaces in order to provide against relative rotation, and the lever is retained upon the pivot by means of a nut 21.

A disc 22 provided with a central opening for the reception of the pivot, is secured to the bar 18 by any suitable means, as by screws 23. This disc has spaced notches 24 extending either partially or entirely around its periphery. The notches are intended for the reception of a projection 25 on the outer end of a radially arranged dog 26.

A cup-shaped casing 27 is rigidly mounted at its center upon the pivot 19, and is of a size to rotate freely around the disc 22, its edge bearing upon the rail 18. At one point in its periphery, the casing 27 is cut away to provide a guide 28 for the outer end of the dog 26. In the side of the casing there is formed a slot 29 constituting a guide for a lateral projection 30 upon the dog. The dog is preferably provided with a pair of grooves 31 for positioning one end of a coil spring 32, the other end of which bears against the periphery of the casing 27, being held in place by an internally extending boss 33, which may be formed by indenting the metal of the casing with a blunt tool.

Between the casing 27 and the headed forward end of the pivot 19, a handle 34 with a disc 35 fixed thereto, are freely rotatable. The disc 35 is cut away on one side with a V-shaped groove 36 for the reception of the projection 30, the sides of the groove constituting cam surfaces adapted to force the dog outward when the handle 34 is rotated. In order to hold the handle 34 and

plate 35 normally in such position as to permit the projection 30 to rest in the bottom of the V-shaped groove 36, I provide a small coil spring 37 which rests partly in an arcuate slot 38 in the plate 35, and partly in an arcuate pocket 39 formed in the casing 27.

The lever 17 may be conveniently formed in the shape of a bell crank having one arm 40 extending downwardly. At the end of this arm I prefer to pivot a link 41, to the opposite end of which is secured a counterbalance spring 42, the opposite end of the spring being mounted upon a hook-shaped projection 43 on the bar 18. The link 41 is bow-shaped in order to clear the latch mechanism. It will be obvious, however, that it may be dispensed with entirely, if the arm 40 of the lever is lengthened somewhat.

Operation.—Assuming that the window 12 is in any adjusted position, with the projection 25 of the dog 26 resting in one of the notches 24 in the periphery of the disc 22, and assuming that it is desired to move the window to some other position of adjustment, the operator grasps the handle 34 and revolves it in one direction or the other, depending upon whether he desires to move the window toward open or closed position. The first effect of the revolution of the handle 34 is to cause one side of the V-shaped groove 36 to exert a camming action upon the projection 30 of the dog, thus forcing the dog in an outward direction radially against the pressure of spring 32, thereby disengaging the projection 25 on the dog from the notch 24 in which it had been resting. The extent of the outward motion of the dog is limited by the end of slot 29 in the casing 27. Further movement of the handle then produces bodily motion of the dog 26 in a circular path, carrying with it the casing 27 and rotating the pivot 19 to which the casing is attached. The lever 17 being fixed upon the inner end of the pivot 19, swings through nearly the same angle as the handle 34 and causes the roller 16 to run upon the channel 13 or flange 15, as the case may be, to elevate or lower the window. When the operator releases the handle 34, the spring 32 causes the dog 26 to move inwardly to engage in one of the notches 24, or if the projection 25 does not happen to be opposite a notch 24, the window will move down slightly by gravity until the dog 26 is in proper position to engage the nearest notch.

It will be observed that the mechanism, whose operation has just been described, is entirely automatic and quite simple in its nature. Furthermore, it is so designed as to permit the use of stamping for nearly all of its constituent parts.

The mechanical principles embodied in the modification illustrated in Figs. VI, VII and VIII, are shown and described in Patent No. 1,419,937, issued June 20, 1922 to J. D. Lawrence, et al. So far as this modification is concerned, my invention relates principally to the mounting of the mechanism. The parts which are common to this modification, and to that above described, are similarly numbered. In Fig. VI, the transverse board or rail in which the door lock 50 is mounted, which is commonly known as the lock-board, is shown at 51. This board is notched upwardly from the bottom edge in order to accommodate a portion of the lift mechanism. One edge of the notch appears at 52 in Fig. VI. A metal plate 53 is secured at one end to the lock-board over the notch 52, and at the other end to the adjacent stile 10. The lift mechanism is carried principally upon the under side of the plate 53. 54 represents a casing having a triangular base riveted or otherwise secured to the under side of the plate 53, the latter being preferably struck up slightly to receive said base, as indicated at 55 in Fig. VI. The casing 54 contains gearing (not shown) for transmitting motion from a crank 56 to a short shaft 57 (Fig. VIII). The latter is connnected by means of a universal joint 58, with one end of a screw 59 which runs through a nut 60 journaled by means of trunnions 61 mounted in the lifting lever 62 and in a small bracket 63 secured to the back of the lever as shown in Fig. VI. Near the upper end of the plate 53 a short band of metal 64 is struck inwardly from the plate for the reception of the upper end of a counterbalance spring 65, the lower end of which is hooked into a notch 66 in the lever 62.

The lever 62 is pivotally mounted at 67 upon the under side of the plate 53 in a position intermediate the ends of that plate. The mounting of the lever therefore, as in the case of the first described modification, is firm and secure as compared with structures in which the lever is mounted upon a bracket extending toward the middle of the door from one of the stiles and secured to the door only at its base.

It will be observed that when the mechanism is in position upon a door, the spring 65, the casing 54 and a considerable portion of the screw 59 are hidden from view and protected by the plate 53. This constitutes one of the advantages of my construction, in addition to the ease of assembly and installation, the latter advantages being present also in the first described modification.

I claim as my invention:

1. In a locking mechanism for a window lift, a lifting lever, a pivot to which said lever is fixed, a notched disc concentric with said pivot and adapted to be secured to the window frame, a dog disposed at one side of the disc, a guide for said dog carried by said pivot, a handle loosely mounted upon said

pivot and carrying means adapted to slide said dog outwardly at the beginning of motion of the handle in either direction and thereafter to move the dog bodily, said dog having a portion adapted when at the inner limit of its radial motion, to engage the notches in said notched disc, and resilient means tending to force the dog inwardly.

2. In combination, a pivot, a window lifting lever fixed thereon, a disc concentric with said pivot, provided with notches in its periphery, said disc being adapted to be secured to a window frame, a casing fixed to said pivot and surrounding said disc, a dog slidable in said casing, a spring within the casing arranged to press against the periphery thereof and tending to force said dog into said notches, a handle loosely mounted on said pivot and provided with means adapted upon actuation of the handle in either direction, to first slide said dog outwardly to clear the notches, and thereafter to rotate said pivot through the intermediacy of the dog and casing.

3. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a notched plate secured to the frame, a casing mounted upon and rotatable with said pivot member, a dog within the casing having a lateral projection adapted to engage said plate within said notches and having another projection extending through a slot in the wall of the casing, a handle for rotating said pivot member, and means upon the pivot member for moving said dog to release position.

4. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a notched plate secured to the frame, a casing mounted upon and rotatable with said pivot member, a dog within the casing having a lateral projection adapted to engage said plate within said notches, operating means for said pivoted member, and means connected therewith adapted to move said dog to release position upon initial movement of the operating means.

5. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a disc secured to the frame and having a plurality of peripheral notches formed therein, a dog slidable at one side of the disc and having a lateral portion adapted to extend into the notches thereof, operating means for said pivot member, and means connected therewith for moving the dog to release position.

6. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a disc secured to the frame and having notches in its periphery, a dog disposed at one side of the disc and having a lateral portion adapted to project into the notches of the disc, means carried by the pivot member for moving the dog outwardly to release position, and a handle for operating the pivot member.

7. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a disc secured to the frame and having notches in its periphery, a dog disposed at one side of the disc and having a lateral portion adapted to project into the notches of the disc, a casing for the dog having a slot for receiving a projecting portion thereof, means for operating said pivotal member, and means connected therewith for engaging the projecting portion of the dog and adapted to move said dog to release position.

8. In a locking mechanism for a window lift, a frame, a pivot member journaled upon the frame, a lifting lever connected with said pivot member, a disc secured to the frame and having notches in its periphery, a dog disposed at one side of the disc and having a lateral portion adapted to project into the notches thereof, a casing for the dog having a slot for receiving a projecting portion thereof, a spring within the housing for returning the dog to latching position, a handle for rotating said pivoted member, and means connected with the handle adapted to engage the projecting portion of the dog to move said dog to release position.

In testimony whereof, I affix my signature.

JOHN BIRK.