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1,676,441

S. R. JACKSON

MECHANICAL MOVEMENT

Filed Oct. 26, 1923

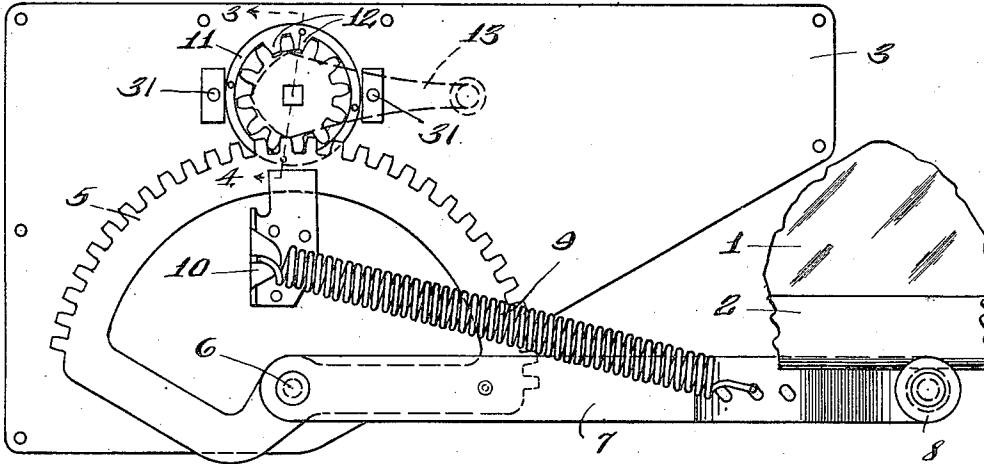


Fig. 1.

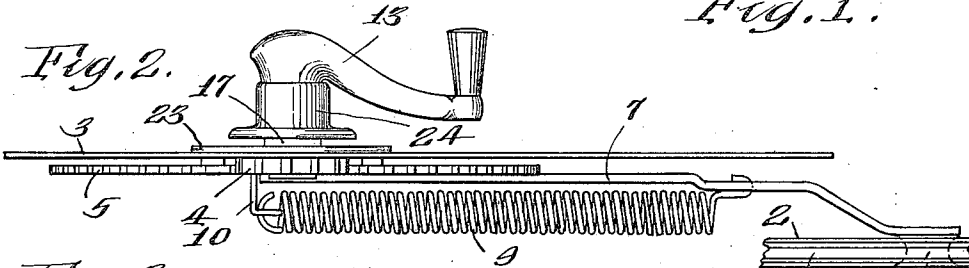


Fig. 2.

Fig. 3.

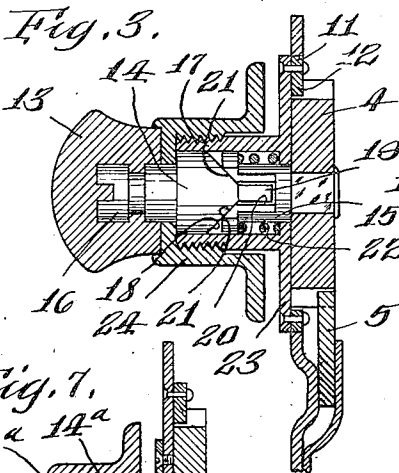


Fig. 4.

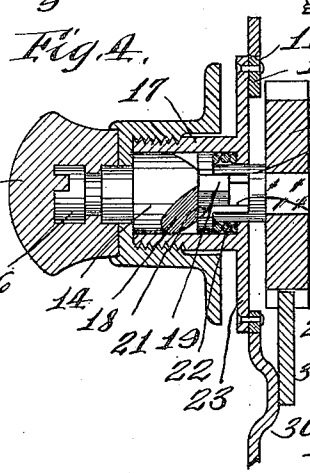


Fig. 5.

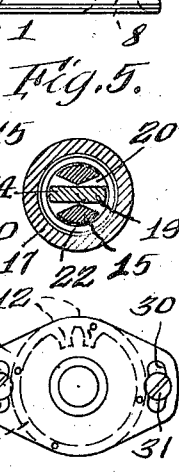


Fig. 7.

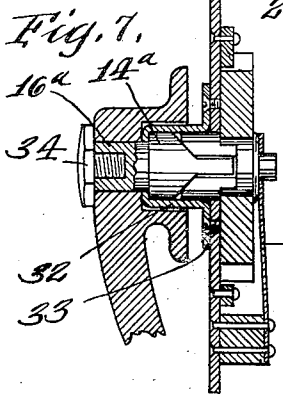
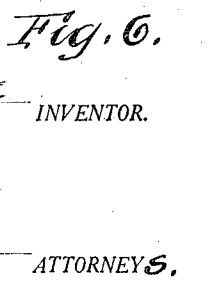


Fig. 6.



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MECHANICAL MOVEMENT.

Application filed October 26, 1923. Serial No. 670,980.

This invention has for its object a particularly simple and efficient mechanical movement particularly adapted to raise and lower the windows, such as the windows of automobiles. More particularly, it has for its object a mechanical movement in which the rotating driving element is normally locked and is actuated by the rotatable handle which operates to release the driving element of the lock turning the driving element and again engages the lock, which driving element is turned up by a turning movement of the handle, such as would naturally be given it to turn the driving element only.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation of this mechanical movement, the contiguous part of the means to which the movement is transmitted, as a window sash being shown.

Figure 2 is an edge view looking downwardly, of parts seen in Figure 1.

Figures 3 and 4 are enlarged sectional views taken on the plane of line 3—4, Figure 1, the parts being shown in normal position, Fig. 3, and in shifted position in Fig. 4.

Figure 5 is a sectional view, parts being omitted, on line 5—5, Fig. 4.

Figure 6 is a detail view of the lock member.

Figure 7 is a view similar to Figure 3, of another form of this invention.

This mechanical movement comprises generally a gear member, a lock member meshing with the gear member, one of such members being shiftable axially into and out of engagement with the other member, actuating means movable about an axis and connections by which the shiftable member is shifted axially out of mesh with the other member during the initial part of the rotary movement of the handle prior to the transmission of motion by the gear member and, also, is shifted back into mesh with the other element at the end of each operation of the handle.

This mechanical movement is particularly

applicable for raising and lowering the windows, such as the windows of automobiles, and 1 designates the window pane which is movable in any well known manner in guides in the door of the vehicle and which usually has a sash rail or a reinforcing strip 2 at its lower end.

3 is a suitable supporting plate for the mechanical movement, this plate being mounted within the door of the automobile on a transverse frame member placed in the door for supporting the window operating mechanism, the plate 3 being secured in any suitable manner.

The driving gear element in this embodiment of my invention, includes a gear 4, which meshes with the gear element as a tooth segment 5 mounted on a suitable shaft or center 6 supported by the plate 3, the motion being transmitted from the segment to the window through an arm 7 formed integral with the segment 5 or mounted on the shaft 6 and connected to the segment 5 to move, as a unit, therewith, this arm 7 having a roller 8 at its outer end bearing against the lower edge of the window, that is, against the rail or strip, 2.

A suitable counterbalancing spring 9 is connected at one end to the arm 7 and at its other end to a bracket 10, secured to the plate 3. Obviously on turning the segment 5 by turning the gear 4, the arm 7 will be raised or lowered and thus raise or lower the window 1.

In order to hold the window 1 at various elevations, means is provided for locking the gear 4 from rotation in any position of the arm 7 or the window 1, this lock being here shown as a toothed member having a tooth or teeth normally meshing with the gear member 4 and one of these members being shiftable axially out of mesh with the other preliminary and subsequent to each turning of the gear 4 and hence, shifting of the window 1.

As here illustrated, the lock is stationary and the gear 4 shiftable axially, the lock comprising a ring 11 fixed to a supporting plate 3 concentric with the gear 4 and having one or more teeth 12 meshing or interlocked with the teeth of the pinion 4, as shown in Figures 1 and 3.

The means for actuating the gear 4 for

shifting it axially comprises a handle 13 in the form of a crank movable about the axis of the gear 4, and connections between the crank and the gear 4. These connections include driving and driven parts 14, 15 connected respectively to the handle 13 and to the gear 4 and arranged coaxially with the handle and the gear, said parts 14 and 15 being connected together by a lost motion connection and having coacting cam faces arranged to shift the part 15 axially while the lost motion is being taken up during the initial part of the movement of the handle 13 and, also during the last part of the movement of the handle 13 after the window has been raised or lowered.

As here shown, the part 14 is secured to the handle 13 at the hub thereof in any suitable manner and comprises a head and a stem 16 imbedded in the handle, the head being rotatably mounted in a sleeve or hub 17 secured in the plate 3, this head having inclined flat cam faces 18 on diametrically opposite sides thereof, and also, having a flat portion 19 arranged in a diametrically extending passage 20 in the member 15, this passage 20 diverging from the center in the member 15 toward the periphery thereof, in order to permit the rocking of the member 15 and the lost motion between the members 14 and 15.

The member 15, also, comprises a head journaled in the hub 17 and the stem on which the gear 4 is mounted, the slot 20 being formed in the head and in the stem, also, the head in the part 15 is formed with inclined faces 21 complementary to the faces 18 of the driving part 14.

Obviously, due to the slot or passage 20, the movement of the handle 13 rotates the driving part 14 relatively to the part 15, during such relative rotation, the cam faces 18 act on the cam faces 21 of the part 15 and shift the part 15 and the pinion or gear 4 axially out of mesh with the lock 11, so that the continued rotation of the handle rotates the gear 4 and segment 5, and actuates the arm 7.

The shifting of the part 15 is against a retaining spring 22 and thus at the end of the turning movement of the handle 13 or when the operator releases the handle 13, the spring again reacting on the part 15 will thrust it to the left from the position shown in Fig. 4 to that shown in Fig. 3 and in so doing turns the part 14, if the teeth of the gear 4 are not in line with the teeth of the lock 11, and shifts the gear 4 into mesh with the lock 11.

The hub 17 is provided on a base plate 23 suitably secured to the plate 3 and the parts 14, 15, within the sleeve 17 are held from displacement by a cap 24 threading on the sleeve 17 between the hub of the handle 13 and the end of the sleeve. The spring 22 is

located in the sleeve 17 between the head of the member 15 and a shoulder at the inner end of the sleeve.

The lock in order to be adjusted so that its teeth mesh with the gear when the window is in closed position, is so formed that it can be shifted about its axis and then permanently secured in its fixed position, as when the hub is formed with arcuate slots 30 concentric with it for receiving the screw 31 by which the lock is secured to the base plate.

As seen in Figure 7, the cap, instead of threading on a sleeve, may be formed as shown at 32 in which the sleeve is secured to the base plate, by fastening members extending through an annular flange 33 at the end of the sleeve and into a base plate. Also in Figure 7, the hub of the handle partly encloses the sleeve 17 and the handle is held in position on the stem 16^a of the part 14^a by a screw 34. Also, the spring 22^a is a flat spring mounted outside of the driving gear and of the sleeve and is fixed at one end to the base plate and thrusts at its other end against the outer face of the gear.

This mechanical movement is particularly advantageous in order to operate it and, also to raise and lower the window and to hold the window at any position, for it is merely necessary to turn the handle or crank and the locking means locks and unlocks automatically.

What I claim is:

1. A mechanical movement, comprising a gear, a lock member having a tooth normally in mesh with the gear member, and a part actuated by the gear, the gear being shiftable axially into and out of mesh with the lock member, means for turning the gear including connections for shifting the gear axially out of mesh with the lock member preliminary to the turning of the gear, the lock member being adjustable relatively to the gear to coast therewith, into position to mesh with the gear when the part actuated and the gear have reached the limit of their movement.

2. A mechanical movement, comprising a gear, a lock member, mounted concentric of the gear, and a part actuated by the gear, the gear being shiftable axially into and out of mesh with the lock member, means for turning the gear including connections for shifting the gear axially out of mesh with the lock member, preliminary and subsequent to the turning of the gear, the lock member being adjustable about its axis to position the tooth thereof to mesh with the gear when the part driven by the gear has been actuated by the gear to the limit of its movement.

3. A mechanical movement comprising a gear member, a support therefor, a lock member having a tooth normally meshing with the gear member, the gear member be-

ing shiftable axially into and out of mesh with the lock member, and actuating means for the gear member comprising a handle movable about the axis thereof, and connections arranged co-axially with the handle and the gear member and including driving and driven parts separately journaled on the support and connected respectively to the handle and the gear member, said parts having co-acting cam faces arranged to shift the gear member axially during the initial part of the turning movement of the handle.

4. A mechanical movement comprising a gear, a support therefor, a stationary lock having a tooth normally meshing with the gear, the gear being shiftable axially into and out of mesh with the lock, operating means comprising a handle movable about the axis of the gear, motion transmitting means between the handle and the gear including driving and driven parts separately journaled on the support and on which the handle and the gear are respectively mounted, said driven part being journaled adjacent to the gear and said driving and driven parts being arranged co-axially with the handle and the gear and being connected together by lost motion and having co-acting means arranged to shift the driven part and the gear axially during the rotation of the driving part to take up the lost motion.

5. A mechanical movement comprising a gear, a support having a hub, a lock member having a tooth normally meshing with the gear, the gear being shiftable axially into and out of mesh with the lock member, and actuating means for the gear comprising a handle and connections including driving and driven parts separately journaled in the hub and connected respectively to the handle and the gear, said parts having co-acting cam faces arranged to shift the part carrying the gear axially during the initial turning movement of the handle.

6. A mechanical movement comprising a gear, a support having a hub, a lock member having a tooth normally meshing with the gear, the gear being shiftable axially into

and out of mesh with the lock member actuating means for the gear comprising a handle and connections extending within the hub and including driving and driven parts connected respectively to the handle and the gear, said parts having co-acting cam faces arranged to shift the part carrying the gear axially during the initial turning movement of the handle, and means within the hub and surrounding said driven part for normally maintaining the gear in mesh with the tooth of the lock member.

7. A mechanical movement comprising a gear, a support having a hub, a lock member having a tooth normally meshing with the gear, the gear being shiftable axially into and out of mesh with the lock member, and actuating means for the gear comprising a handle and connections including driving and driven parts separately journaled in said hub and on which the handle and the gear are respectively mounted, said parts having co-acting cam faces arranged to shift the part carrying the gear axially during the initial turning movement of the handle, and a coil spring within the hub and engageable with the part carrying the gear for normally maintaining the same in position to hold the gear in mesh with the tooth of the lock member.

8. A mechanical movement comprising a gear member, a part actuated by said gear member, means engageable with said gear member for locking the same and means for turning said gear member including connections for disengaging said locking means and gear member, said locking means being adjustable relative to said gear member to effect locking engagement therewith when said part actuated by said gear member has been actuated by said gear member to the limit of its movement.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and in the State of New York, this 8th, day of October, 1923.

SHUMAN R. JACKSON.