March 23, 1943. E. G. SIMPSON 2,314,429

RELEASABLE WINDOW REGULATOR CLUTCH

Filed Jan. 21, 1941 2 Sheets-Sheet 1

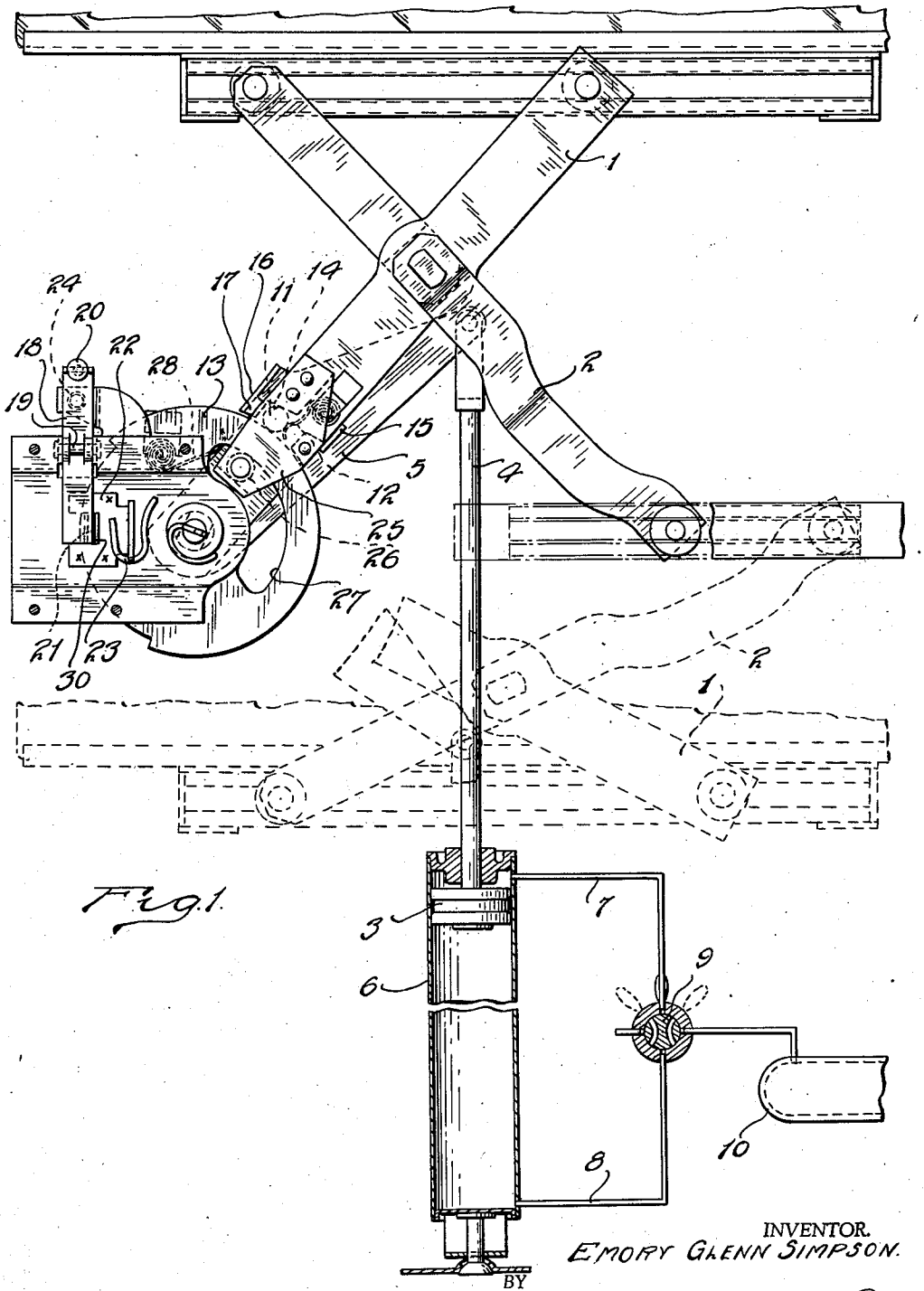


Fig. 1.

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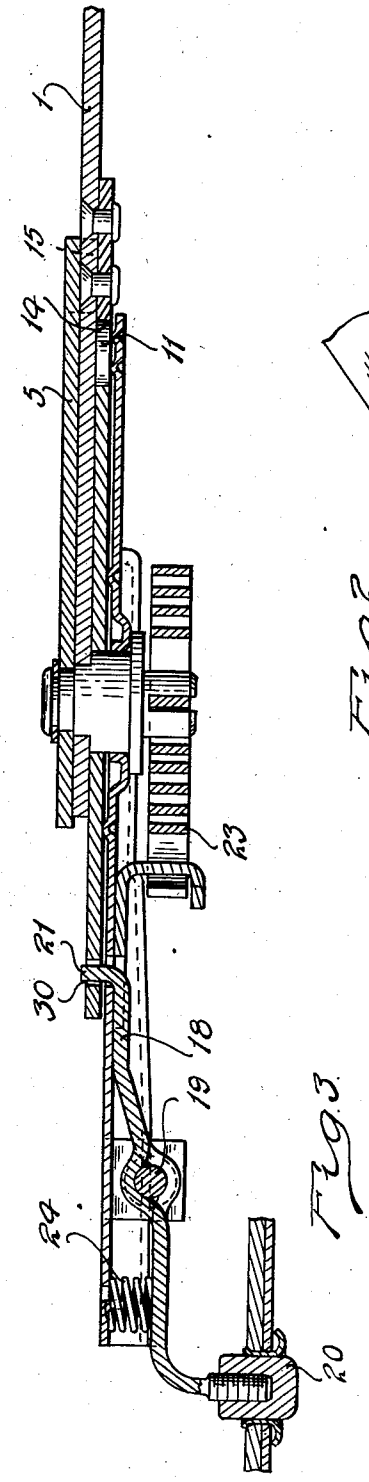


FIG. 3.

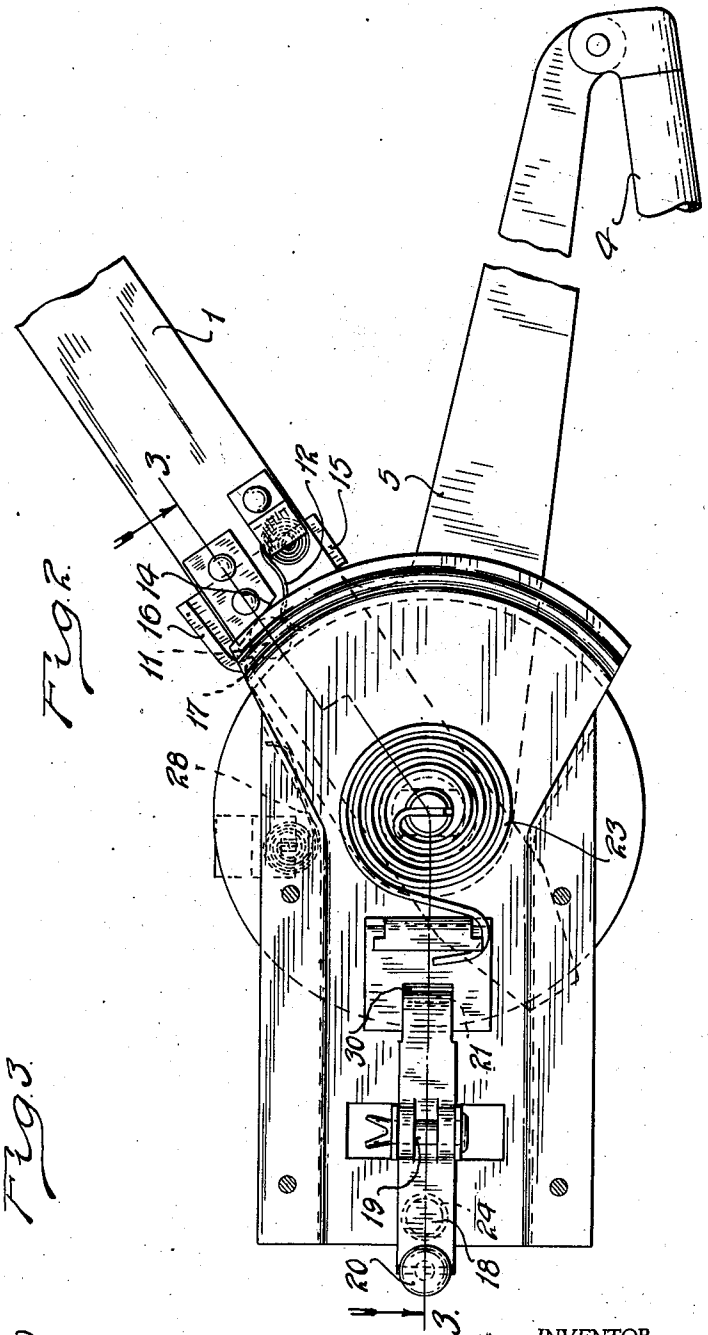


FIG. 2.

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2,314,429

RELEASABLE WINDOW REGULATOR CLUTCH

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Application January 21, 1941, Serial No. 375,162

4 Claims. (Cl. 268—125)

This invention relates to power operated window regulators. It is desirable to use power operated window regulators without providing the usual handle for hand operation. The window regulator handle on the inside of a car is undesirable, as it is in the way of the knees and the steering and there are other objections.

One of the arguments for power operated window regulators is that it eliminates the objectionable handle. It may happen in an accident, if the source of power has been crippled, one may get locked into the car and not be able to get out.

To overcome this difficulty, I have provided an emergency release for the clutch which I believe to be a new and novel idea. I have also provided an effective clutch which is self-locking and self-releasing when the power is effective.

In the drawings:

Fig. 1 is an elevation partly in section of one form of the invention.

Fig. 2 is an elevation of a second form of the invention.

Fig. 3 is a section taken on the line 3—3 of Fig. 2.

The window regulator is a lever type of regulator that here happens to be shown with a lifting arm 1 and an auxiliary lifting arm 2. The power may be of any type but here is shown as either vacuum or positive fluid pressure. A piston 3 has a piston rod 4 connecting with the power arm 5 of the window regulator. 6 is a cylinder at the opposite ends of which are fluid connections 7 and 8 controlled by a valve 9. The source of power is here shown as a manifold 10 of an automobile engine.

The clutch is attached to the load arm of the regulator and is a roller clutch with a roller 11 stressed by the free end of the clock spring 12. Such a clutch is described and claimed in the Simpson Patent No. 1,343,410. The roller swings about a circumference or periphery of a disc 13 which circumference has its center at the center about which the load arm 1 turns. The load arm is provided with a wedging block 14 adapted to contact the periphery of the roller 11 and jamb the roller between the wedging surface of the block 14 and the periphery of the disc 13. See Stickney Patent No. 403,562.

When clockwise actuation comes from the arm 1, that is, when the window tries to drop, the wedging surface 14 jambs the roller (or it might be a ball) into the periphery of the fixed disc 13 and locks the window from downward movement. When the window tries to jump or rise, it is free to do this but it seldom will do any jumping and, if it does, it will not be harmful.

When effort comes through the power arm 5, the power arm will contact with the load arm 1 by means of lug 15 on the power arm. This will raise the window panel. When effort comes to lower the window from the power arm 5, the lug 16 on the power arm has a projection 17 which first contacts the roller 11 and drives the roller out of the wedging engagement with lug 14 and the periphery of disc 13. Disc 13 can rotate when released by the emergency lever 18 which is best shown in the modified form of Fig. 3. It is pivoted at 19 and has at one end a push button 20 that protrudes through the door panel (as shown in Fig. 3). The other end has a turned down projection 21 which, in the form shown in Fig. 1, engages in a slot in the plate 22 spot welded to the regulator plate and also slot 30 in the disc. This plate 22 also forms an anchor for one end of the usual counterbalancing spring 23 which is the clock type that is ordinarily used, as shown in Fig. 2.

Ordinarily, the lever is held in locking position by spring 24 (Fig. 3) which causes the clutch to function in its normal way. Disc 13 is then a fixed member. In case of an accident, or in case the power fails and one desires to get the window down, all that is necessary is to release the emergency lever by pushing on the button 20. The clutch ceases to be a clutch and the window will descend of its own weight or may be pulled down by pressing the hands against it and aiding gravity to cause its descent.

The clutch plate (of Fig. 1) 25, which carries also the clutch wedging block 14, extends toward the center of the disc 13 and houses another roller 26. This roller moves in the segmental slot 27 so that, when the jambing action does take place on the surfaces of the disc 13, it is between the two rollers.

Clock spring 28 with its free arm forms a spring motor connection between the fixed disc 13 and the load arm 1 of the lifter. In case the emergency lever has been operated and the fixed disc 13 has been released and the window opened, then, if the window is raised either with the power or by pulling by hand, the fixed disc will rotate back to a position where the lever can snap back into the opening to lock the disc in its fixed position, being carried back by the spring motor 28.

The form shown in Fig. 2 is the same as that shown in Fig. 1 except that the roller 26 in slot 27 of Fig. 1 has been omitted and the emergency

lever is parallel with the horizontal dimension of the supporting plate, in place of at right angles thereto (as shown in Fig. 1).

It is not essential that the clutch be a roller or a ball clutch. It might be several of the other forms of clutches, such as a toothed clutch, or, conceivably, it might be a coil spring clutch. The main idea here involved is arranging the normally fixed member in such a way that it may, in an emergency, be released from its fixed position and allowed to rotate and thereby the clutch is temporarily eliminated as an operating mechanism.

What I claim is:

1. In a window regulator and particularly a power operated window regulator, lifting mechanism and a clutch therefor, including a fixed member with which the clutch mechanism ordinarily locks, said fixed member arranged to rotate when released, means for holding the same, comprising a member having a locking relation therewith and a spring motor connection between the fixed member and the window regulator for rotating the fixed member back to its locking position when the regulator mechanism is again operated and the clutch released.

2. In a window regulator and particularly a power operated window regulator, lifting mechanism and a clutch therefor, including a fixed member with which the clutch mechanism ordinarily locks, said fixed member arranged to rotate when released, means for holding the same, comprising a member having a locking relation therewith and a spring motor connection between the fixed member and the window regulator for rotating the fixed member back to its locking position when the regulator mechanism is again operated and the clutch released, said spring motor member comprising a spring anchored to the fixed member and contacting one of the movable members of the regulator mechanism.

3. In a window regulator and particularly a power operated window regulator, lifting mechanism and a roller clutch therefor, having in combination a window regulator load arm, a window regulator power arm pivotally supported on the same pivot axis, the said two arms capable of a limited relative movement, a normally fixed disc which can be rotated on the same pivotal axis as the other two, a wedging block carried by the load arm and having a wedge surface adjacent the periphery of the disc, a rolling member engaging between the periphery of the disc and the wedging surface and serving to lock the two together when the load arm tries to descend, means on the power arm of the regulator for picking up the load arm after a limited movement to release the rolling member from its jamming engagement with the periphery of the disc and the surface of the wedging block and means releasable from the inside of the car for holding the normally fixed disc from rotation.

4. In a window regulator and particularly a power operated window regulator, lifting mechanism and a roller clutch therefor, having in combination a window regulator load arm, a window regulator power arm pivotally supported on the same pivot axis, the said two arms capable of a limited relative movement, a normally fixed disc which can be rotated on the same pivotal axis as the other two, a wedging block carried by the load arm and having a wedge surface adjacent the periphery of the disc, a rolling member engaging between the periphery of the disc and the wedging surface and serving to lock the two together when the load arm tries to descend, means on the power arm of the regulator for picking up the load arm after a limited movement to release the rolling member from its jamming engagement with the periphery of the disc and the surface of the wedging block and releasable means for holding the normally fixed disc from rotation, comprising a spring-pressed lever releasable from the inside of the car and normally having one portion locking with the normally fixed disc.

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