Jan. 29, 1924. 1,481,915

C. E. LETTS

DEVICE FOR OPERATING SLIDING SASH OR PANELS

Filed May 19, 1922

Fig. 1.

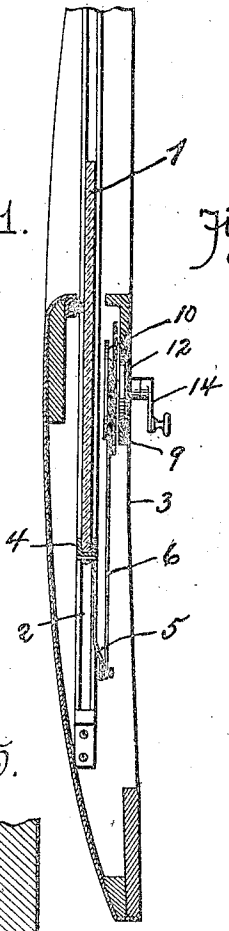


Fig. 2.

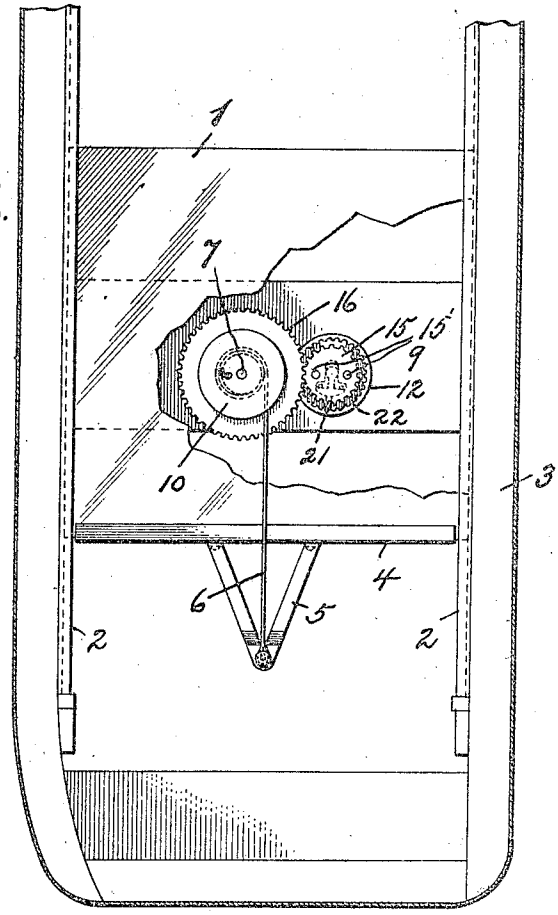
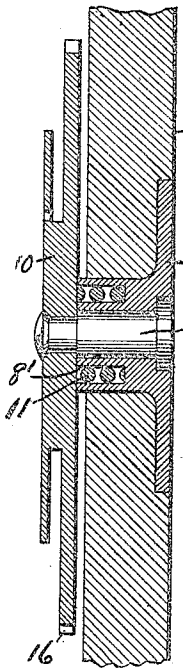


Fig. 5.



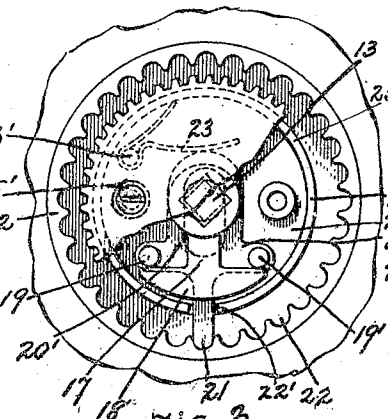


Fig. 3.

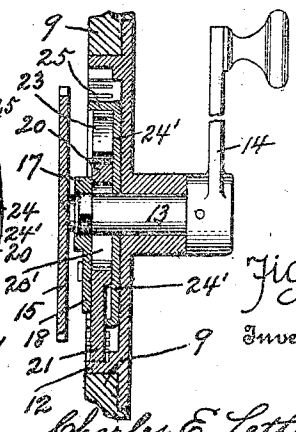


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES E. LETTS, OF DETROIT, MICHIGAN.

DEVICE FOR OPERATING SLIDING SASH OR PANELS.

Application filed May 19, 1922. Serial No. 562,131.

To all whom it may concern:

Be it known that I, CHARLES E. LETTS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Devices for Operating Sliding Sash or Panels, of which the following is a specification.

My invention relates to improvements in devices for raising and lowering window sash or panels and is particularly adapted for operating the movable glass sash or panels in enclosed types of automobile and carriage bodies.

Among the objects in view is to provide an extremely simple, inexpensive and efficient device whereby the movable glass, sash or panel of an enclosed automobile or carriage may be readily and evenly raised and lowered with a minimum of effort.

A further object of my invention is to provide a device of the described character whereby the glass, sash or panel may be held in any desired adjusted position.

With the above and other objects in view, all of which will appear hereinafter, my invention consists in the novel construction, arrangement and combinations of parts as hereinafter fully described, illustrated in the accompanying drawing and pointed out more specifically in the appended claims.

In the drawings:

Figure 1 is a vertical sectional view of a portion of an automobile door having a sash that may be raised and lowered.

Figure 2 is a vertical transverse sectional view of the same, showing the mechanism in elevation.

Figure 3 is an enlarged side elevation of the locking device, partly broken away.

Figure 4 is a vertical sectional view of the locking device.

Figure 5 is an enlarged detail view in vertical section illustrating the sheave or pulley used in connection with the device.

In the drawings, 1 indicates a window pane or sash slidable in guides 2 in the door frame 3 of an automobile or carriage body. The lower edge of the window pane 1 is provided with a binder strip 4 to which is secured a suitable hanger 5.

The means for raising and lowering the glass pane or sash comprises a shaft 7 rotatably mounted in a bearing 8 secured within the door panel 9, and fixedly mounted on the said shaft is a sheave or pulley 10 to which is suitably attached one end of a cable 6, the other end of which is attached to the hanger 5. The cable may be wound upon the sheave by rotating the shaft in either direction whereby to raise the glass pane, while the cable will unwind from the sheave when the glass pane is being lowered.

The bearing 8 is provided with a recess 8′ within which is arranged a coiled spring 11 which bears against the inner face of the sheave and acts as a brake or friction device for the latter during its rotation. The braking or dragging action of the spring should be such as to more than offset the weight of the glass in order that there might be a drag on the locking device presently described when lowering the glass.

It is extremely important that a brake or friction device be employed, acting either directly or indirectly to exert a drag upon the gearing, otherwise it would be found in practice that in lowering the glass the weight thereof would rotate the gearing so fast that the locking device would be prevented from functioning to check the descent of the glass in the event of it being desired to check such descent at some intermediate point.

While I have shown and described a friction device comprising a coiled spring bearing upon the sheave, it will be understood that any other desired means or arrangement may be employed for attaining the desired object, as for instance a spring or springs arranged to bear directly upon the glass sash to check its descent when being lowered.

Arranged within a recess in the panel 9 of the door is a casing 12 and journaled in the latter is a winding arbor or shaft 13 provided with an operating crank 14. Loosely mounted upon the arbor 13 is a small gear wheel 15 meshing with peripheral teeth 16 on the sheave 10.

Fixedly secured upon the arbor 13 is an arm 17 having a cross-head 18 adapted to engage studs or pins 19, 19′ carried by a movable locking element or member 20. The latter is provided with an elongated slot 20′ through which freely extends the arbor 13. By this construction the member 20 is loose upon the arbor 13 and adapted for diametrical displacement upon the latter. The member 20 is provided with an integral arm 21

constituting a bolt which is adapted to engage in internal circumferentially disposed notches or teeth 22 on the casing 12, the latter with its teeth constituting a second or fixed locking element or member cooperating with the member 20.

The member 20 is held normally in engagement with the teeth 22 by a spring 23 fixed to a stud 23′ carried by a cup-shaped member 24 comprising a plate 24′ and a circular rim or flange 25, said member 24 being loosely mounted on the shaft 13. The spring 23 bears constantly upon the inner end of the member 20, its action being such as to normally force the bolt 21 into engagement with the teeth 22.

The bolt passes freely through a slot 22′ provided in the flange 25, said slot serving to guide the bolt when moving into and out of engagement with the teeth, as presently described.

The gear wheel 15 is bolted by means of bolts 15′ to the member 24, so as to rotate therewith.

When it is desired to raise the sash from the position represented in Figs. 1 and 2 the crank 14 is rotated in a direction to cause the gear wheel 15 through the medium of the teeth 16 to turn the sheave 10 so as to effect the winding up of cable 6. The initial rotation of the crank 14 causes the arm 17 to turn, and by reason of the action of the head 18 on the stud 19, the locking member 20 is moved diametrically, thereby causing the bolt 21 to free the teeth 22. This leaves the arbor 13 free to rotate under the turning action of the crank 14. The continued rotation of arbor 13 and arm 17 causes the cross-head 18, by bearing upon the stud 19, to rotate the member 20, and by reason of the bolt 21 bearing upon the edge of the slot 22′, the member 24 will be rotated, and inasmuch as the gear wheel 15 is bolted to said member 24, said gear wheel will be rotated and cause the rotation of the sheave to wind up the cable.

When it is desired to lower the sash, the crank 14 is turned in a direction opposite to that for raising the sash, thus causing the head 18 to act upon the stud 19′ to move the locking member 20 diametrically until the bolt 21 frees the teeth 22, after which the parts will be actuated in identically the same manner as when raising the sash, but in this instance the bolt will bear against the opposite edge of the slot whereby the various parts will be rotated in a direction opposite to that first described to permit the unwinding of the cable and the lowering of the sash.

When the sash has reached any desired position either in the raising or the lowering of same, the rotation of the crank 14 is discontinued, whereupon the spring 23 will operate upon the locking member 20 to cause the bolt 21 to again engage the teeth 22, thereby positively locking the sash against further movement.

While I have described and illustrated my locking device in connection with a sliding sash, it is obvious that it is equally applicable to any winding arbor or rotary member.

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

1. The combination with a rotatable operating shaft, of a fixed locking member, a movable locking member adapted for diametrical displacement upon said shaft, a member rotatably mounted on the shaft, and a gear wheel secured to and rotatable with the rotatable member, the latter being adapted to be rotated by the movable locking member when the latter has been disengaged from the fixed locking member.

2. The combination with a rotatable operating shaft, of a fixed locking member, a movable locking member adapted for diametrical displacement upon said shaft, a member rotatably mounted on the shaft and serving as a guide for the movable locking member when the latter is being diametrically displaced on the shaft, said guide member being adapted to be rotated by the movable locking member when the latter has been disengaged from the fixed locking member, and a gear wheel secured to and rotatable with the said guide member.

3. The combination with a rotatable operating shaft, of a fixed annular locking member concentrically arranged with respect to the shaft, a movable locking member adapted for diametrical displacement upon said shaft, an annular member rotatably mounted on the shaft, a gear wheel secured to and rotatable with said annular member, the latter being adapted to be rotated by the movable locking member when the latter has been disengaged from the fixed locking member and means for displacing the movable locking member for the purposes specified.

4. The combination with a rotatable operating shaft, of a fixed locking member, a movable locking member adapted for diametrical displacement upon said shaft, a cup-shaped member rotatably mounted on the shaft and having an annular rim through which one end of the movable locking member extends, said cup-shaped member being adapted to be rotated by the movable locking member when the latter has been disengaged from the fixed locking member, a gear wheel secured to and rotatable with the said cup-shaped member, and means for displacing the movable locking member for the purposes specified.

5. The combination with a rotatable operating shaft, of a second rotatable shaft, gearing intermediate said shafts whereby

the second shaft may be operated from the first, a movable locking member diametrically displaceable upon the operating shaft, a fixed locking member cooperating with the movable locking member, means for displacing the movable locking member upon the operating shaft when the latter is rotated to effect the disengagement of the two locking members, and a friction device operating to exert a drag upon the gearing, for the purpose specified.

6. The combination with a rotatable operating shaft, of a second rotatable shaft, gearing intermediate said shafts whereby the second shaft may be operated from the first, a movable locking member diametrically displaceable upon the operating shaft, a fixed locking member cooperating with the movable locking member, means for displacing the movable locking member upon the operating shaft when the latter is rotated to effect the disengagement of the two locking members, and a spring arranged to exert a drag upon the aforesaid gearing, for the purpose specified.

7. The combination with a rotatable operating shaft, of a second rotatable shaft, intermeshing gear wheels intermediate said shafts whereby the second shaft may be rotated from the first, a locking member diametrically displaceable upon the operating shaft and provided with a locking arm, a fixed annular locking member having circumferential teeth with which said locking arm is adapted to engage, a cup-shaped member rotatably mounted on the operating shaft and to which member one of the gear wheels is secured, said cup-shaped member having an annular rim provided with a slot through which the said locking arm extends, means for diametrically displacing the movable locking member in one direction on the operating shaft when the latter is rotated to disengage the locking arm from the teeth of the fixed locking member, and a spring operating to displace the movable locking member in the opposite direction to cause the locking arm to again engage the teeth of the fixed locking member when the rotation of the operating shaft is discontinued.

8. The combination with a rotatable operating shaft, of a second rotatable shaft, gearing intermediate said shafts, a locking member displaceable upon the operating shaft, a fixed locking member cooperating with the movable member, and means for displacing the movable locking member upon the operating shaft when the latter is rotated to effect the disengagement of the two locking members comprising an arm fixed upon the operating shaft and having a cross-head, and pins on the movable locking member at opposite sides of the arm and adapted to be engaged by the cross-head when the operating shaft is rotated in either direction to displace the movable locking member.

9. The combination with a rotatable operating shaft, and a second rotatable shaft, of a cup-shaped member rotatably mounted on the operating shaft and comprising an annular rim provided with a slot, a fixed annular locking member having circumferential teeth and within which locking member said cup-shaped member is concentrically arranged, a movable locking member having a slot through which the operating shaft loosely passes and upon which shaft said movable member is diametrically displaceable, said movable locking member having an extended portion forming a locking bolt projecting through the slot in the rim of the cup-shaped member, and also provided with upstanding pins, an arm fixed upon the operating shaft and having a cross-head adapted to bear against said pins to effect the displacement of the movable locking member in one direction when the operating shaft is rotated in opposite directions to cause the locking bolt to disengage the teeth of the fixed locking member, a spring carried by the cup-shaped member operating to displace the movable locking member in the opposite direction to effect engagement of the locking bolt with the teeth of the fixed locking member, a gear wheel secured to the cup-shaped member and rotatable therewith, and a gear wheel on the aforesaid second rotatable shaft meshing with the first-mentioned gear wheel.

In testimony whereof I affix my signature.

CHARLES E. LETTS.

Witnesses:
KARL H. BUTLER,
ANNA M. DORR.