(No Model.) 4 Sheets—Sheet 1.

W. FROST.

APPARATUS FOR ADJUSTING CARRIAGE WINDOWS.

No. 340,037. Patented Apr. 13, 1886.

Fig. 1.

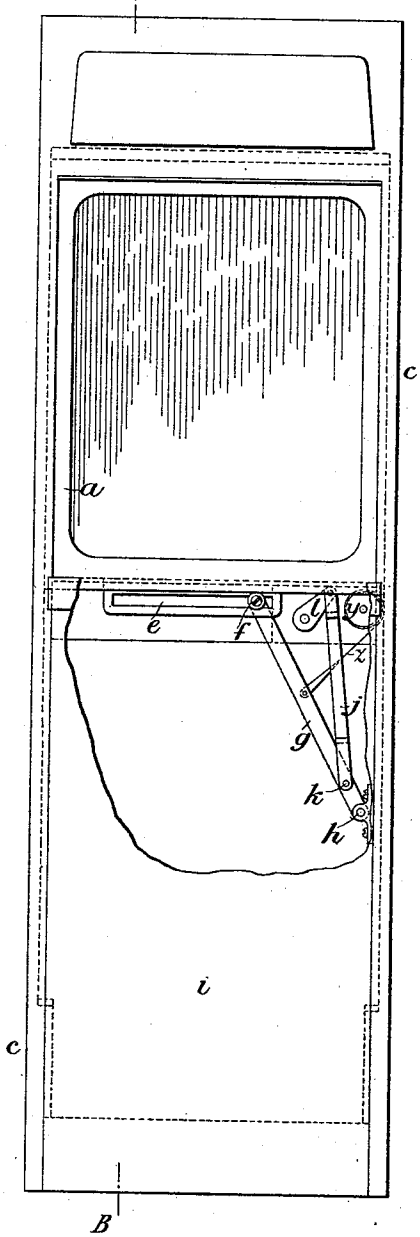
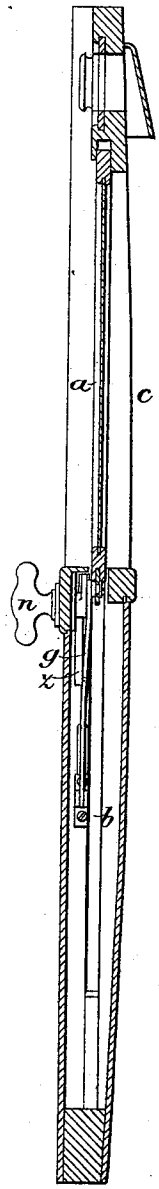


Fig. 2.



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By John J. Chester & Son
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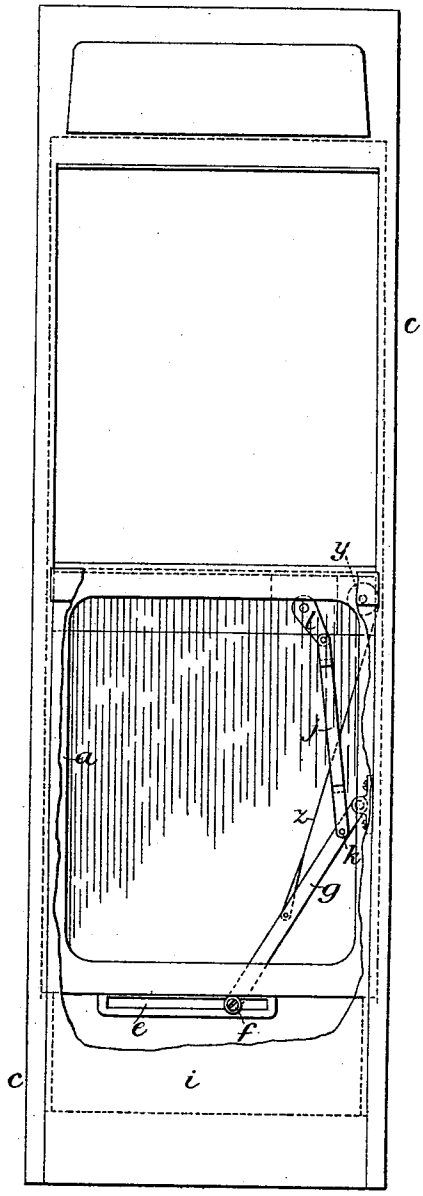
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APPARATUS FOR ADJUSTING CARRIAGE WINDOWS.

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Fig. 3.



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APPARATUS FOR ADJUSTING CARRIAGE WINDOWS.

No. 340,037. Patented Apr. 13, 1886.

Fig. 4.

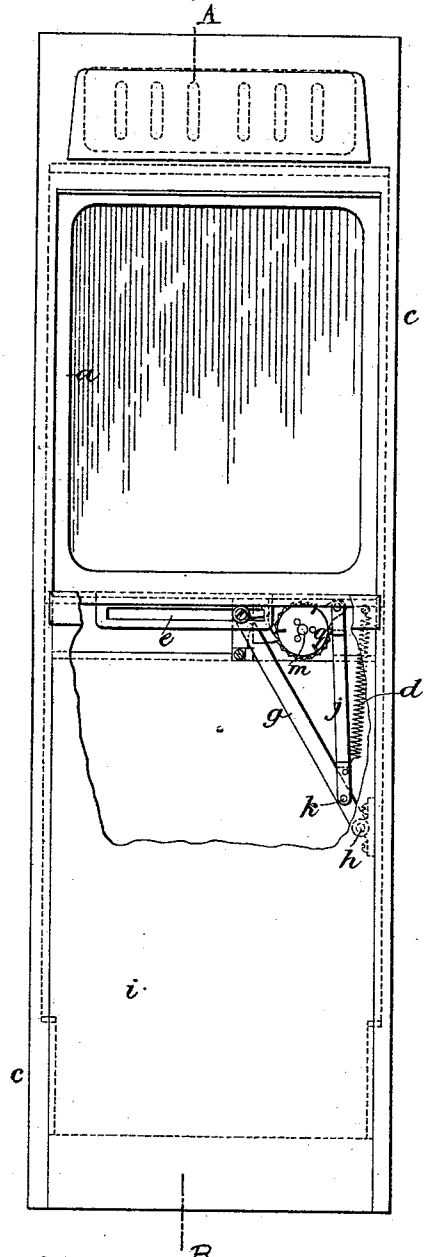


Fig. 5.

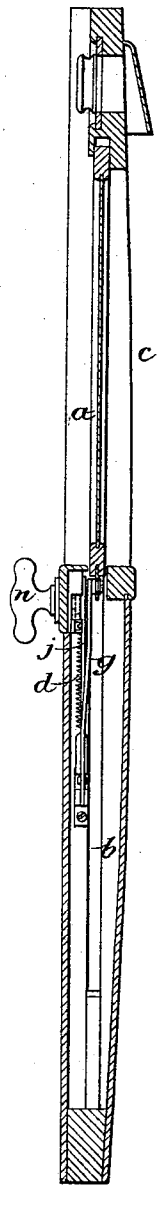
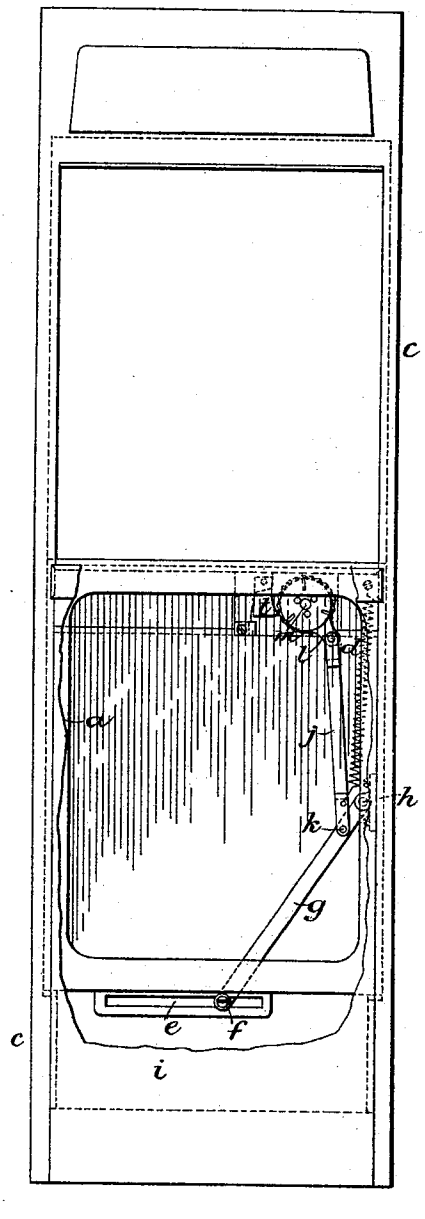


Fig. 6.



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APPARATUS FOR ADJUSTING CARRIAGE WINDOWS.

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Fig. 9.

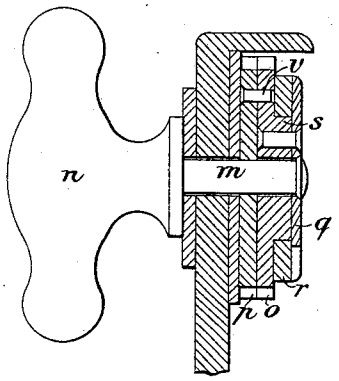


Fig. 7.

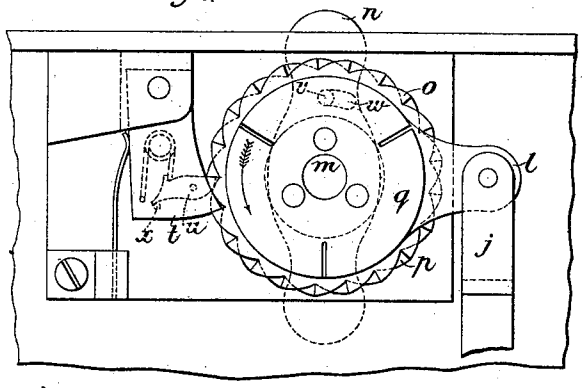
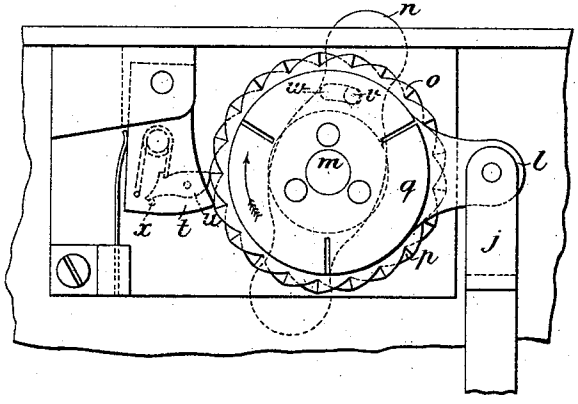


Fig. 8.



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UNITED STATES PATENT OFFICE.

WALTER FROST, OF LONDON, ENGLAND, ASSIGNOR OF TWO-THIRDS TO HARRY EDMUND WINTER AND JEAN LODOIS MÉRIGOT, OF SAME PLACE.

APPARATUS FOR ADJUSTING CARRIAGE-WINDOWS.

SPECIFICATION forming part of Letters Patent No. 340,037, dated April 13, 1886.

Application filed February 17, 1885. Serial No. 156,184. (No model.) Patented in England July 9, 1884, No. 9,972.

To all whom it may concern:

Be it known that I, WALTER FROST, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in Apparatus for Raising and Lowering the Windows of Railway and other Carriages, of which the following is a specification.

This invention relates to improvements in apparatus for raising and lowering the sliding windows of railway and other carriages, the object of the invention being the production of an apparatus whereby the sashes can be easily and quickly opened and closed by merely operating by the hand a handle or knob on the inside of the carriage door or window.

In carrying out my invention the sash-frame carrying the glass is made to freely run up and down in grooves or guides, as usual, and the said sash frame is counterbalanced by a spring or weight. Along the bottom of the sash-frame is a slot, in which runs a small wheel or runner-block. The said wheel or runner-block is attached to the end of a radiating lever, jointed at the other end to the side of the sash-box, and at a short distance from this joint there is jointed on the radiating lever a link, which is connected at the other end to a crank fixed rigidly on the spindle of the knob or handle in such a manner that when the handle or knob having the crank is turned it communicates a motion to the radiating lever by means of the link, and by means of the radiating lever a raising or lowering motion is given to the sash-frame, according to the direction in which the handle is turned.

I sometimes employ in connection with the said apparatus a ratchet arrangement consisting of two ratchet-wheels attached to the spindle of the handle, the said ratchet-wheels having their teeth formed in opposite directions. The crank on the handle works frictionwise with one of the ratchet-wheels, which allows of the window being lowered by the pressure of the hand without using the handle. The other wheel is rigidly fixed to the handle-spindle, and in the teeth of the said ratchet-wheels works a compound-spring ratchet. The main part of the ratchet takes into the wheel which works frictionwise with the crank, and the other part of the ratchet takes into the ratchet-wheel fixed rigidly on the spindle of the handle. These ratchets operate in such a manner that when the handle is turned to the right hand the ratchet-wheels revolve and allow the main ratchet to fall successively into the teeth of its ratchet-wheel until the sash-frame is raised to its desired position, when the handle will be prevented from turning any farther. By turning the handle to the left hand the ratchet-wheel fixed rigidly on the handle-spindle is first moved the distance of the length of a tooth in the wheels, the ratchet-wheel fixed on the handle-spindle having a pin which works in a slot in the ratchet-wheel which is loose on the handle-spindle, which arrangement allows of the said motion, and by this motion the main ratchet is raised out of its ratchet-wheel by the second part of the ratchet acting on a pin in the main ratchet, thus allowing the sash-frame to be lowered tooth by tooth until the turning of the handle stops, and by this arrangement the window can be maintained at any required position or height.

In order to enable my invention to be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

Figure 1 represents an elevation of the outer side of a railway or other carriage door, showing my improved apparatus for raising and lowering the window of the same applied thereto. In this view part of the frame of the door is removed to more clearly illustrate my invention, and the window is shown in its raised or closed position. Fig. 2 is a vertical transverse section of the same on line A B of Fig. 1. Fig. 3 is a similar view to Fig. 1, but showing the window in its lowered or open position. Figs. 4, 5, and 6 are similar views to Figs. 1, 2, and 3, but showing the improved apparatus provided with an arrangement of ratchet-wheels to admit of the window being lowered by the pressure of the hand alone when required. Figs. 7, 8, and 9

are detached views drawn to a larger scale, showing the arrangement of the ratchet-wheels.

Similar letters in all the figures represent similar parts.

I will first describe my invention by reference to Figs. 1 to 3.

a is the sash-frame of the window, made to freely run up and down in the grooves or guides *b*, in the frame of the door *c* (or of the window) in the usual manner.

y is a barrel containing a coil-spring for counterbalancing the weight of the sash-frame; or a weight may be employed for this purpose.

e is the slot at the bottom of the sash-frame *a*, and *f* is the small wheel, roller, or runner-block, which runs in the slot *e*.

g is the radiating lever, to one end of which the roller *f* is attached, the other end being jointed at *h* to the side of the sash-box *i*.

j is the link, jointed at *k* to the radiating lever *g*, and *l* is the crank on the spindle *m* of the knob or handle *n*, to which crank *l* the other end of the link *j* is jointed, as shown.

z is a tape or band, of metal or other suitable material, which passes round the barrel *y* and is attached to the radiating lever *g*, and which is wound on the said barrel by means of the coil-spring hereinbefore described, so as to assist in raising the window.

To raise the window, the parts being in the position shown in Fig. 9, the handle *n* is turned toward the right-hand side, whereby the crank *l* will raise the link *j* and radiating lever *g*, thereby raising the sash-frame *a*, which will remain in any position to which it may be raised or lowered by being counter-weighted by the coil-spring, which operates the barrel *y* and winds the tape or band *z* thereon and assists in raising the radiating lever *g*. To lower the window, the handle *n* is simply turned in the opposite direction, and the operation of the parts will be well understood without further description. If required, the crank *l* may have notches or teeth cut in its circular portion and a spring locking-piece taking into these teeth in such a manner that it can be unlocked on turning the handle in either direction.

In the arrangement shown in Figs. 4 to 9, in which the ratchet arrangement is employed, a spiral spring, *d*, is shown for counterbalancing the weight of the window, the said spring being attached to the door-frame *c* and to the link *j*.

o and *p* are the two ratchet-wheels, having their teeth formed in opposite directions, as shown clearly in elevation at Figs. 7 and 8, and in section at Fig. 9. The ratchet-wheel *o* is loose upon the handle-spindle *m*, and works frictionwise with the crank *l* by means of a spring-plate, *q*, riveted or otherwise suitably fixed to the ratchet-wheel *o*, and bearing upon the surface of the boss *r* of the crank, as shown in Fig. 9. The ratchet-wheel *o* is provided with a boss, *s*, upon which the boss *r* of the crank can rotate when the window is lowered by the pressure of the hand without using the handle *n*. When, however, the window is raised or lowered by means of the handle *n*, the boss of the crank is by means of the said friction forced to rotate with the ratchet-wheel *o*, as hereinafter described. The other ratchet-wheel, *p*, is rigidly fixed to the handle-spindle *m*.

t and *u* represent the compound-spring ratchet. The main part, *t*, thereof takes into the ratchet-wheel *o*, and the other part, *u*, pivoted to the main part *t*, takes into the ratchet-wheel *p*.

v is the pin on the ratchet-wheel *p*, and *w* is the slot in the ratchet-wheel *o*, in which slot the pin *v* works, and by means of which the ratchet-wheel *p* is allowed (when the handle *n* is turned toward the left hand to lower the window) to be moved the distance of the length of one tooth.

x is the pin on the main ratchet *t*, against which the ratchet *u* bears when its ratchet-wheel *p* is being turned toward the left hand, as already described, and by which motion the main ratchet *t* is moved out of the teeth of its ratchet-wheel *o*, and the window, by continuing to turn the handle, is lowered tooth by tooth into any desired position.

To raise the window, the parts being in the position shown in Fig. 6, the handle *n* is turned toward the right hand in the direction indicated by the arrow in Fig. 7, when the main ratchet *t*, as the ratchet-wheels *o* and *p* revolve, will fall successively into the teeth of its ratchet-wheel *o*, and the part *u* of the compound ratchet will pivot on the main ratchet *t*, and will pass over the teeth of its ratchet *p*. The ratchet-wheels as they revolve will carry with them the crank *l*, which, by means of the link *j*, will cause the radiating lever *g* to raise the window, the roller *f* meanwhile sliding in its slot *e* until the window is closed, when the handle will be prevented from turning any farther, or until the window is raised to any other required position or height, at which position or height it will be maintained. To lower the window, the handle *n* is turned toward the left-hand side in the direction indicated by the arrow in Fig. 8, when the main ratchet will be moved out of the teeth of its ratchet-wheel *o* in the manner hereinbefore described, and shown in the said Fig. 8, and both ratchet-wheels will be free to rotate, and will carry with them the crank *l* until the window has been lowered to the required potion by means of the link *j* and lever *g*, when the handle *n* is released and the window will be maintained in the said position.

If the window be pressed by the hand in order to lower the same, the ratchet-wheels will be prevented from moving by means of the compound ratchet, and the boss *r* of the crank will be forced by the window operating the link *j* and lever *g* to move frictionwise over the ratchet *o*.

Having now described the nature of the said

invention and in what manner the same is to be performed, what I claim is—

1. In apparatus for raising and lowering the windows of railway and other carriages, the combination of a radiating lever jointed at one end to the frame of the door or window, and having its other end sliding in a slot in the sash-frame, with a link and crank, substantially as and for the purposes hereinbefore described.

2. In apparatus for raising and lowering the windows of railway and other carriages, the combination of a radiating lever jointed at one end to the frame of the door or window, and having its other end sliding in a slot in the sash-frame, with a link, and a crank rigidly fixed on the spindle of a handle working in the frame of the carriage door or window and a counterbalancing-spring, (or a weight,) all arranged substantially as and for the purposes hereinbefore described, and represented in the accompanying drawings.

3. In apparatus for raising and lowering the windows of railway and other carriages, the combination of the described arrangement of radiating lever, slot, link, and crank with a ratchet mechanism and handle, substantially as and for the purposes hereinbefore described, and represented in the accompanying drawings.

4. In apparatus for raising and lowering the windows of railway and other carriages, the combination of the described arrangement of radiating lever, slot, link, crank, ratchet mechanism, and handle with a counterbalancing-spring, substantially as and for the purposes hereinbefore described, and represented in the accompanying drawings.

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Witnesses:
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A. ALBUTT.