A. D. & E. J. RAWLINGS.

AUTOMATIC SASH RAISING MECHANISM.

APPLICATION FILED DEC. 23, 1914.

1,154,432.

Patented Sept. 21, 1915.

2 SHEETS—SHEET 1.

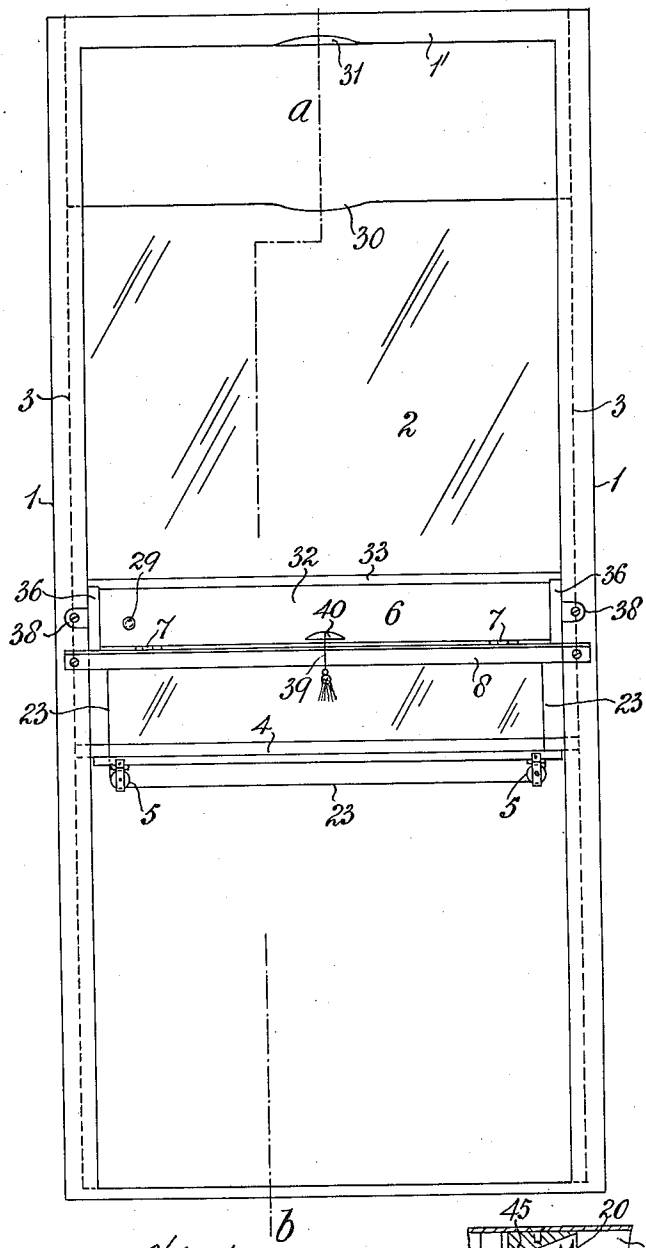


Fig. 1.

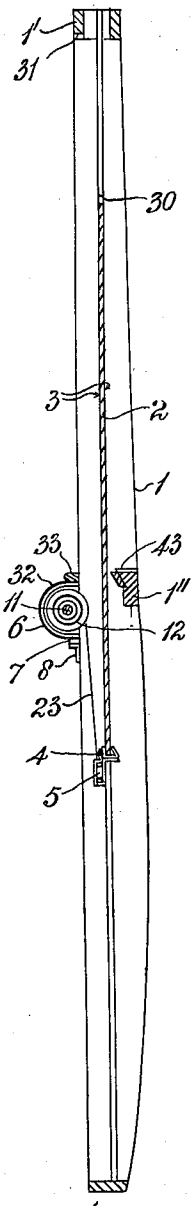


Fig. 2.

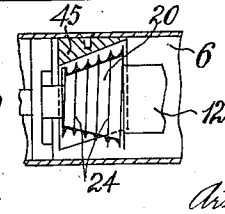


Fig. 10.

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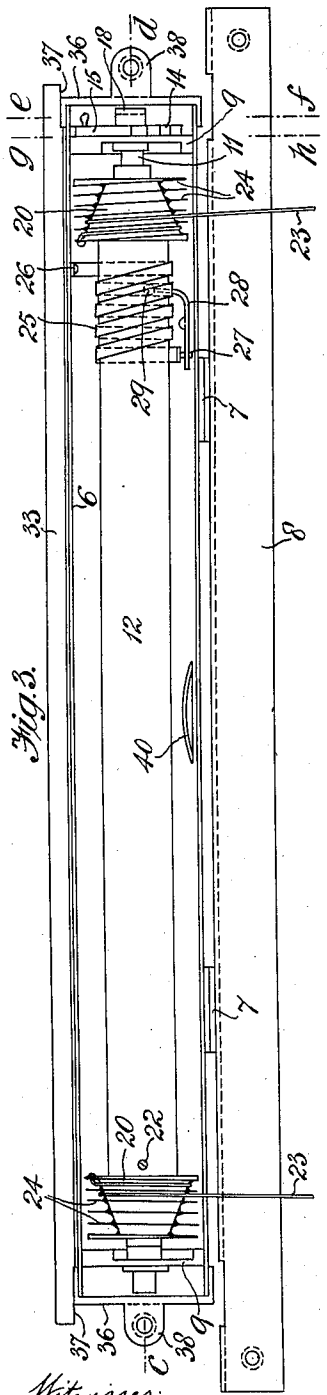


Fig. 3.

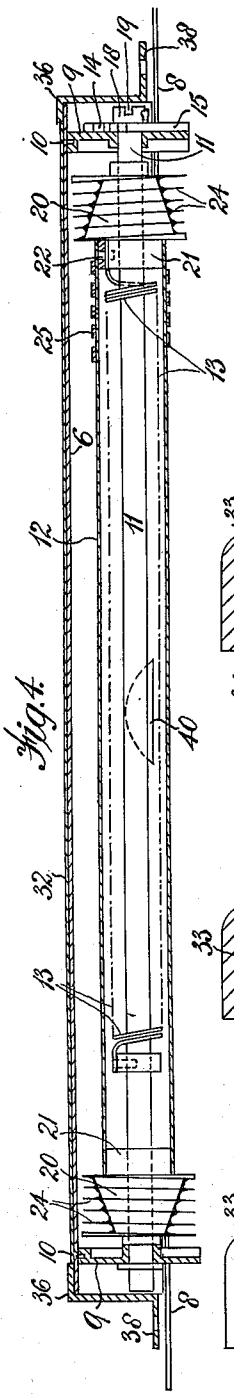


Fig. 4.

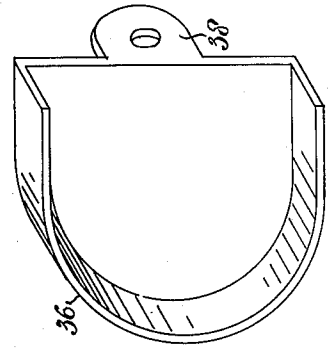


Fig. 8.

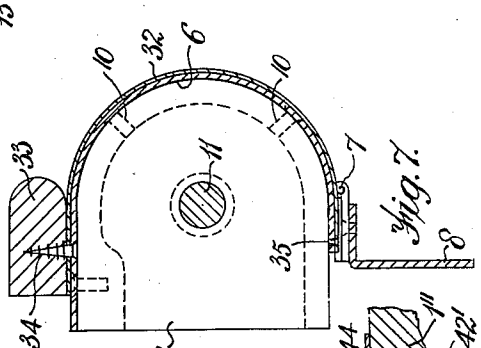


Fig. 7.

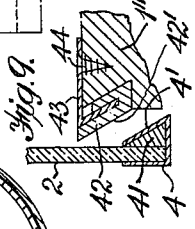


Fig. 9.

Fig. 6.

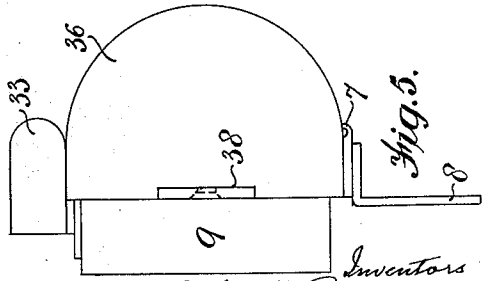


Fig. 5.

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UNITED STATES PATENT OFFICE.

ARTHUR DANIEL RAWLINGS AND ERNEST JOHN RAWLINGS, OF CLAPHAM, LONDON, ENGLAND.

AUTOMATIC SASH-RAISING MECHANISM.

1,154,432. Specification of Letters Patent. Patented Sept. 21, 1915.

Application filed December 23, 1914. Serial No. 878,787.

To all whom it may concern:

Be it known that we, ARTHUR DANIEL RAWLINGS and ERNEST JOHN RAWLINGS, subjects of the King of Great Britain and Ireland, residing, respectively, at 11 Sandmere road, Clapham, and 9 Franconia road, Clapham Park, Clapham aforesaid, London, S. W., England, have invented new and useful Improvements in Automatic Sash-Raising Mechanism, of which the following is a specification.

The invention relates to the windows of motor cars and other road vehicles, railway carriages and the like.

The invention consists of improvements in mechanism by which the sashes of said windows are automatically raised and to mechanism of that type in which a cord passed round pulleys carried by the lower part of the sash is attached at its ends to a spring-actuated roller mounted in bearings or supports fixed to the central part of the door or frame in which the sash is slidably mounted.

An automatic sash-raising mechanism of the above referred to type though fulfilling the purpose for which it is designed possesses the disadvantage that considerable care must be exercised in controlling the upward movement of the sash, as the spring contained in the spring-actuated roller will, unless it is properly checked, cause the sash to be rapidly shot upward.

The main object of the present invention is to provide the spring-actuated roller of a sash-raising mechanism of the above referred to type with means by which the rotative effort exerted by the spring on the spring-actuated roller shall be always uniform, that is to say shall be independent of the varying tension of the spring as the latter is unwound.

Another object of the invention is to provide improved means for holding and releasing the spring-actuated roller.

The above described improvements as well as details of construction connected with the invention are shown on the accompanying drawings, which illustrate the application of the invention to the door of a modern motor car.

Of these drawings, Figure 1 is an elevation of said door viewed from its inner side, certain parts, which have no bearing on the invention, being omitted. Fig. 2 is a vertical section of the door on the line *a*—*b* of Fig. 1. Fig. 3 is an elevation, as seen from the outer side, of the spring-actuated roller, certain of the parts associated therewith, a cover or case which supports and partly incloses said spring-actuated roller, and a metal strip to which said cover or case is preferably hinged. Fig. 4 is a horizontal section of Fig. 3, taken on the line *c*—*d*. Figs. 5, 6, 7 and 8 are views, drawn to an enlarged scale, illustrating certain details of construction connected with said spring-actuated roller and its cover or case, Fig. 5 being an end view, Figs. 6 and 7 being transverse sections taken on the line *e*—*f* and *g*—*h* of Fig. 3, and Fig. 8 an isometrical view illustrating more clearly the shape of end caps for said cover or case. Fig. 9 is a section of the lower part of the sash and part of the central cross member of the door. Fig. 10 is a section of part of the spring-actuated roller illustrating a modification connected therewith.

Referring now to these drawings, 1 is the door of a motor car, 2 is the sash of the door, and 3 are guides for said sash. The sash 2, as usual in the majority of modern motor cars, consists of a plain sheet of glass provided at its bottom with a metal strip 4.

5 are guide pulleys rotatably mounted in bearings supported from the strip 4.

6 is a cover or case, hereinafter referred to as the case, which conceals and protects the majority of the parts of the sash-raising mechanism. The case 6 is secured to the door 1 by means of hinges 7, so that it can, after it has been unscrewed from or otherwise released from its normal position, be turned backward to allow of inspection of the parts covered by it. The screws by which the lower leaves of the hinges 7 are secured to the door may be screwed into the woodwork of the door but preferably engage with tapped holes in a metal strip 8 which is screwed to the door.

9 are plates secured in position in the ends of the case 6 by means of screws 10, and 11 is a shaft rotatably mounted in the end plates 9.

12 is a roller surrounding the shaft 11, and 13, Fig. 4, is a coiled spring also surrounding the shaft 11 and connected at one of its ends to said shaft 11 and at its other end to the roller 12. The function of the spring 13, as usual in the type of mechanism to which our invention relates, is to effect, through the tension imparted, to it, the rotation of the roller 12 and the consequent raising of the sash 2.

Any suitable means may be provided for rotating the shaft 11 for the purpose of imparting the requisite initial tension to the spring 13 and for preventing backward movement of said shaft. These means may, as shown most clearly in Fig. 6, consist of a ratchet wheel 14 fixed to one end of the shaft 11, a pivoted two-armed lever 15 provided with a projecting knob 16 and with two teeth 17 adapted to alternately engage with the ratchet wheel 14, and a projection 18 of square or other shape formed at the center of the ratchet wheel 14. The square or other projection 18 is preferably provided with a somewhat deep notch 19 for the accommodation of a screw-driver or other turning device. As will be readily understood a spring-controlled ratchet or pawl, that is to say a spring-controlled lever provided with only one tooth, may be employed instead of the lever 15, but said lever is preferable as it enables the initial tension imparted to the coiled spring 13, if found to be excessive, to be readily relaxed by rocking the lever 15 by means of the knob 16.

20 are fusee barrels adapted to freely rotate on the shaft 11, and secured in any suitable manner to the spring-actuated roller 12, the preferred method of fixing the fusee barrels to said roller being to form the fusee barrels 20 with hubs 21 snugly fitting into the ends of the roller 12 and to secure them in place therein by means of screws 22.

23 is a wire or other suitable cord which is passed under the guide pulleys 5 carried by the sash 2 and is wound on and is attached at its ends to the fusee barrels 20. As shown in Figs. 3 and 4, the helical flanges 24 of the fusee barrels 20 may, for the purpose of preventing any slip of the wire or other cord 23, be made of such depth as to extend close to the interior walls of the case 6.

The spring-actuated roller 12 is provided with a brake which, though not offering a resistance sufficient to prevent the rotation of the roller 12 when the sash 2 is being lowered and the coiled spring 13 is being wound up, will normally prevent the roller 12 being rotated by the action of the coiled spring 13. This brake preferably consists, as shown in Figs. 3 and 4, of a multi-coil spring band 25 which contacts with the exterior of the spring-actuated roller 12, is anchored at one of its ends to the case 6 by a screw 26 and is provided at its other end with a stud or abutment 27 so that it may be expanded by pressure on said stud or abutment. This pressure can be exerted by means of a lever 28, Fig. 3, pivoted to the case 6 and extending through a hole in said case to the exterior of the latter, where it is provided with a button 29, Figs. 1 and 3, by which it may be readily operated.

The upper edge of the sash 2 and the inner top cross member 1′ of the door 1 are cut away, as respectively indicated at 30 and 31 in Figs. 1 and 2, so that the occupant of the motor car or other vehicle may be able when the sash 2 is in its highest position to lower same by a downward pressure on the center of the sash.

The front of the case 6 is covered with cloth, leather or other suitable material which may be secured in position as follows: The strip of cloth or other covering material 32 is placed with its upper edge close to the upper edge of the case 6 and is held in this position by means of a wood or metal strip 33, of the length shown in Figs. 1 and 3, and screws 34, passing through the case 6 and the cloth or the like 32 and engaging with the wood or metal strip 33, see Fig. 7. The cloth or other covering material so secured is stretched over the outer surface of the case 6 and when so stretched is secured by cementing or sewing. When the cloth or the like is sewn to the case 6 the case is formed near its lower edge with a row of perforations 35, Fig. 7, for the passage of the needle and thread. The edges of the stretched cloth or other material 32 are protected and a finished appearance imparted to the sides of the case 6 by means of caps 36 of the shape shown in Fig. 8, the ends of the wood or metal strip 33 being cut away, as shown at 37 on Fig. 3, to allow the caps to be passed on to the ends of the case. The caps 36 may be secured to the case 6 by means of screws but are preferably formed with laterally extending lugs 38 by which they can be screwed to the door 1, and thus not only serve as a means for protecting the edges of the stretched cloth or other material 32 but also as the medium by which the hinged case 6 is removably secured in position on the door 1.

39, Fig. 1, is a pull cord secured to the center of the spring-actuated roller 12, and 40 is an opening formed in the bottom of the case 6 for the passage of said cord.

The metal strip 4 provided at the lower end of the sheet of glass or sash 2 is preferably made of the section shown in Fig. 9, so that it may be secured to the sash 2 by means of a triangular strip 41, while the central cross member 1″ of the door is pro-

vided with a stop which consists of a strip 42 of india-rubber extending across the door 1 and formed with an inclined face 42′ corresponding to the inclined face 4′ of the metal strip 4. The india-rubber strip 42 may be of U-shape in cross-section and be secured in position by means of a brass angle piece 43 engaging with the strip and fixed to the central cross member 1″ of the door by screws 44.

If desired the helical flanges 24 of the fusee barrels 20, instead of being made of such depth as to extend close to the interior walls of the case 6, as shown in Figs. 3 and 4, may be made, as illustrated in Fig. 10, of a depth merely sufficient to accommodate the wire or other cord 23. In this case disengagement of the cord 23 from the fusee barrels 20 would be prevented by means of suitable guards, such as the guard 45.

The improved sash-raising mechanism is used in the following manner:—Assuming that it is desired to wholly or partly lower the sash 2 the occupant of the vehicle either pulls the cord 39 or exerts a downward pressure on the sash, the cut-away part 30 of the sash and the cut-away part 31 of the inner top member 1′ of the door allowing him to exert this pressure when the sash is in its highest position. As the sash 2 is lowered the roller 12 is rotated and the coiled spring 13 is wound up, but as soon as the occupant ceases to pull the cord 39 or press on the sash 2 the latter will be retained in the position into which it has been moved by the frictional grip exerted by the multi-coil spring band 25. If the occupant desires that the sash 2 shall be partly raised he presses on the button 29 and thereby expands the multi-coil spring band 25, with the result that the roller 12 is rotated by the coiled spring 13 and the sash 2 rises until such time as the user ceases to press on the button 29, when the multi-coil spring band 25 will again contact with the roller 12 and exert a frictional grip sufficient to retain the sash 2 in the position into which it has moved. If the sash is to be fully raised pressure on the button 29 is maintained until the strip 4 at the bottom of the sash comes into contact with the india-rubber strip 42. The india-rubber strip 42 not only serves as a shock-absorbing stop but also insures, when the sash is fully raised, a water-tight joint. As usual in the type of mechanism to which the present improvements relate the coiled spring 13 is wound up to such an extent that there is when the sash 2 is in its highest position an initial tension of said spring. The winding up of the coiled spring 13 is effected by inserting a screw-driver in the notch 19 of the projection 18 on the ratchet wheel 14 and turning the shaft 11 the necessary number of times. The initial tension thus imparted to the coiled spring 13, if found to be too great, can be relaxed by rocking the lever 15 by means of the knob 16.

Having now described our invention, what we have invented and desire to secure by Letters Patent of the United States, is as follows:—

1. In mechanism for automatically raising the sash of a window of a motor car or other vehicle the combination of a protective case of D-shape in cross-section hingeably secured to the center of the door, a spring-actuated roller having its shaft mounted in bearings at the ends of said hinged case, fusee-barrels fixed to said roller and provided with helical flanges extending close to the inner walls of said case, guide pulleys carried by the lower part of the sash, and a cord passing under said guide pulleys and secured at its ends to said fusee-barrels, substantially as described.

2. In mechanism for automatically raising the sash of a window of a motor car or other vehicle the combination of a protective case of D-shape in cross-section hingeably secured to the center of the door, a spring-actuated roller having its shaft mounted in bearings at the ends of said hinged case, a braking device acting on said spring-actuated roller, means for releasing said braking device, fusee-barrels fixed to said roller and provided with helical flanges extending close to the inner walls of said case, guide pulleys carried by the lower part of the sash, and a cord passing under said guide pulleys and secured at its ends to said fusee-barrels, substantially as described.

3. In mechanism for automatically raising the sash of a window of a motor car or other vehicle the combination of a spring-actuated roller, a ratchet wheel fixed to the shaft on which said roller is mounted, a ratchet engaging with said ratchet wheel, a braking device acting on said spring-actuated roller, means for releasing said braking device, fusee barrels fixed to said spring-actuated roller, a cord secured at its ends to said fusee barrels and wound thereon, and guide pulleys for said cord carried by the lower part of the sash, substantially as described.

4. In mechanism for automatically raising the sash of a window of a motor car or other vehicle the combination of a spring-actuated roller, a hinged cover or case for said roller, a ratchet wheel fixed to the shaft on which said roller is mounted, a ratchet engaging with said ratchet wheel, a multi-coil spring band bearing on said roller and anchored at one of its ends to the case covering the roller, a lever pivoted to said case, operatively connected to the free end of said multi-coil spring band and adapted by its

movement to expand said multi-coil spring band, fusee barrels fixed to said spring-actuated roller, a cord secured at its ends to said fusee barrels and wound thereon, and guide pulleys for said cord carried by the lower part of the sash, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ARTHUR DANIEL RAWLINGS.
ERNEST JOHN RAWLINGS.

Witnesses:
CHARLES FLETCHER ENNIS,
H. D. JAMESON.