

L. J. LE CLAIR.
BALANCING DEVICE FOR SLIDING WINDOWS.
APPLICATION FILED FEB. 27, 1912.

1,035,203.

Patented Aug. 13, 1912.

2 SHEETS-SHEET 1.

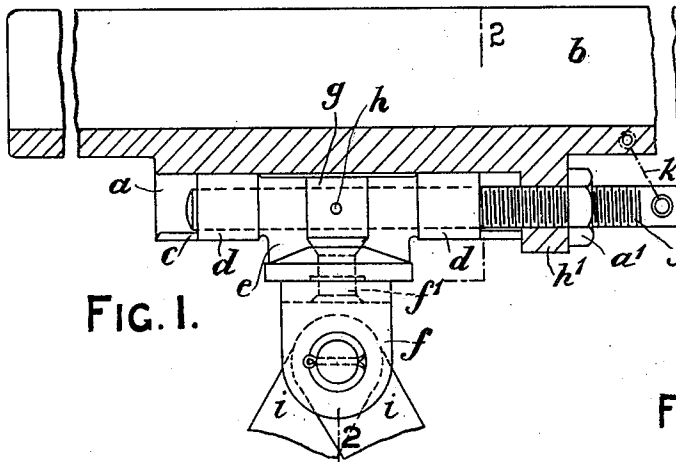


FIG. 1.

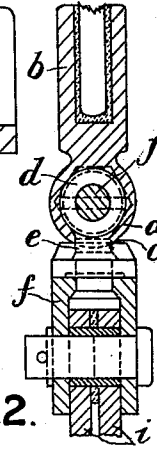


FIG. 2.

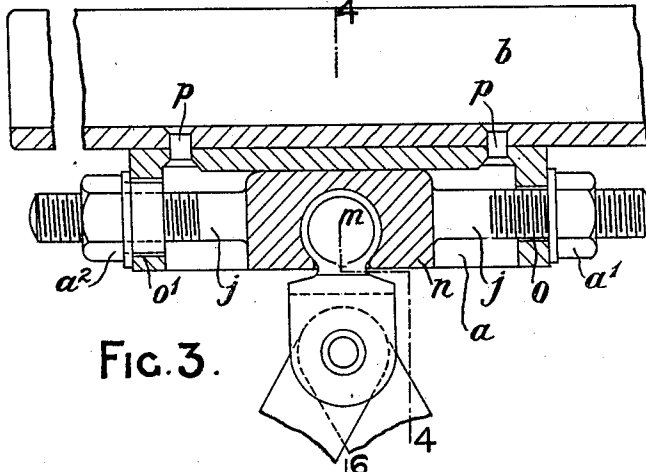


FIG. 3.

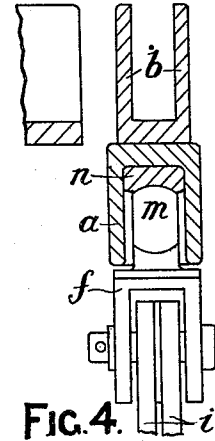


FIG. 4.

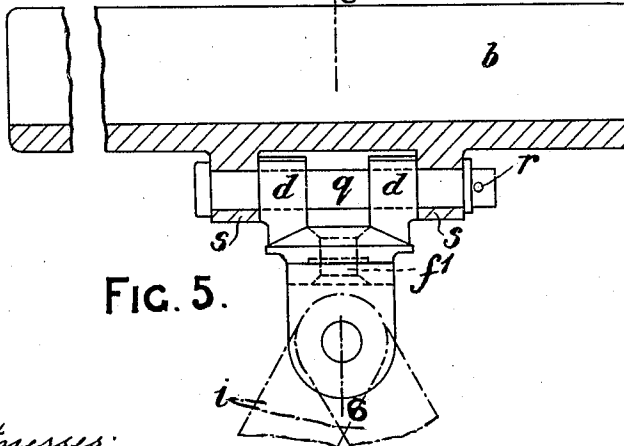


FIG. 5.

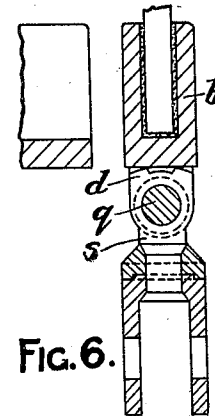


FIG. 6.

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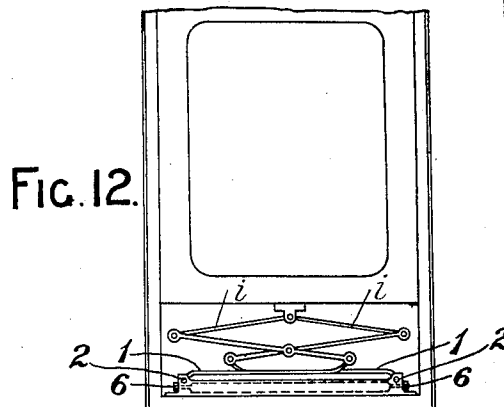
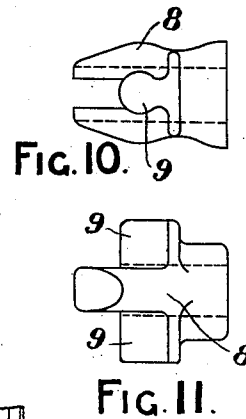
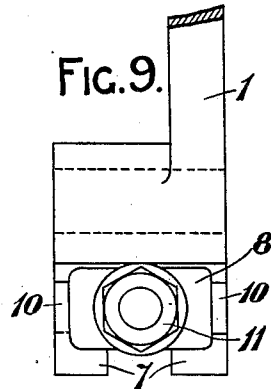
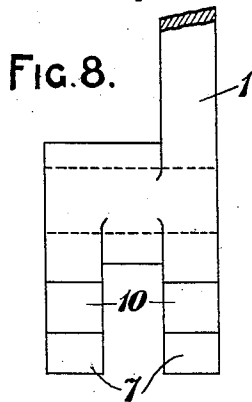
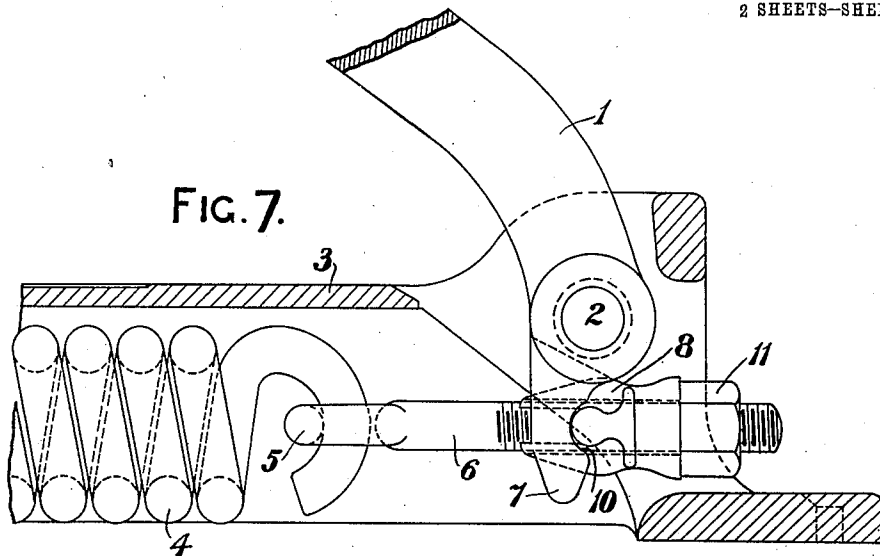
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

LOUIS JEAN LE CLAIR, OF LONDON, ENGLAND.

BALANCING DEVICE FOR SLIDING WINDOWS.

1,035,203.

Specification of Letters Patent.

Patented Aug. 13, 1912.

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To all whom it may concern:

Be it known that I, LOUIS JEAN LE CLAIR, a subject of the King of Great Britain and Ireland, residing at London, England, (whose post-office address is Moorgate Works, Moorfields, in the city of London, England,) have invented certain new and useful Improvements in Balancing Devices for Sliding Windows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sliding windows for railway and other carriages and especially to that class of window carried by an arrangement of toggle levers or lazy-tongs designed to expand and contract as the window is raised and lowered, springs being arranged in conjunction with the levers for balancing the weight of the window and supporting it at any point. In frameless windows of this type there is a liability of the glass breaking if the glass and toggle levers or lazy-tongs do not move in the same plane, and the present invention has for its object to so mount the window (glass) on the toggle levers or lazy-tongs as to compensate for or permit the relative displacement of the planes whereby the plane of the one may intersect the plane of the other, in a line passing through the point of support of the window, so that the window can be freely raised and lowered, even when the window lies in a different plane to that of the lazy tongs, without liability of breaking the window. Further according to this invention the supporting toggle levers are connected to the usual grooved supporting bar, in the lower edge of which the plate glass is cemented or otherwise fixed, by means of a universal joint which allows the planes of movement to be in any relation to each other.

A further feature of the present invention consists in an improved method of operatively connecting the lower levers or members of the toggle lever or lazy-tongs mechanism to the balancing spring or springs, whereby the rigid or substantially rigid connection of these parts, as heretofore employed, is avoided and consequently the injurious strains put upon parts of the mechanism are also avoided. According to this part of the invention the lower levers or members of the lazy-tongs mechanism are

constructed and arranged so as to operatively engage with suitable hooked bolts or the like which latter are, as usual, connected to or engaged with the balancing spring, the arrangement being such that in raising and lowering the window the parts can freely move without injurious strains being put upon the apparatus.

To enable my invention to be fully understood I will describe how it can be carried into practice by reference to the accompanying drawings, in which:—

Figure 1 is a sectional elevation showing the grooved supporting bar of a window carried by toggle levers or lazy-tongs and having my improvements applied thereto. Fig. 2 is a vertical section on the line 2—2 Fig. 1 and showing a part of the window. Fig. 3 is a similar view to Fig. 1 illustrating a modification, and Fig. 4 is a section on the line 4—4, Fig. 3. Fig. 5 is a sectional elevation illustrating a further modification. Fig. 6 is a section on the line 6—6, Fig. 5. Figs. 7 to 12 illustrate the hereinbefore mentioned improved means of connecting the lower levers or members of the lazy-tongs apparatus to the balancing spring. Fig. 7 is a longitudinal section of one end portion of the stationary support, showing portions of the spring, lazy-tongs and their connections. Fig. 8 is a detail end view of the forked lug at the end of one of the arms of the lazy-tongs. Fig. 9 is a similar view to Fig. 8, but shows also the sleeve 8 and the nut 11. Figs. 10 and 11 are respectively side and plan views of the sleeve 8. Fig. 12 is a front view showing the lazy-tongs connected to a window and to a stationary support.

In the arrangement illustrated in Figs. 1 and 2 a longitudinal socket *a* is provided upon the underside of the usual grooved supporting bar *b* of the sliding window which socket is slotted at *c* in the underside and forms one part of a hinge, the other part *d* of the hinge being introduced into the socket *a* from one end and having a portion *e*, projecting through the slot *c*, carrying the stirrup or fitting *f*, to which are pivoted the toggle levers, *i, i*, the upper portion of the said stirrup or fitting *f* comprising the hinge part *e* being free to rotate around the pin *f'* in a direction at right angles to the axis of movement of the hinge. The two portions *d* of the hinge have passing through them an adjusting screw

bolt *j*. The said bolt *j*, on which is secured by means of pin *h* a collar *g* screws in one end of the socket or bracket *h'* and is provided with a locking nut *a'*. By means of this bolt *j* the relative positions of the parts *a* and *d* of the hinge may be varied to correspond with the center of gravity of the window. *h* indicates a wire for securing the screw bolt *j* after adjustment in order to prevent its being shifted or removed by unauthorized persons, the said wire being sealed by a lead or other seal.

In the arrangement shown in Figs. 3 and 4 a ball and socket joint arrangement is employed in place of the hinge *a, d*, and the pivoted stirrup *f*, Figs. 1 and 2. The ball *m* thereof is formed at the head of the pivoted stirrup or fitting *f*, and the socket in a block *n* having a screw threaded adjusting bolt *j* at each end, or one end only, for longitudinal adjustment, one of such pins, provided with a nut *a'*, sliding in a hole *o* in the part *a* which is fixed to the grooved supporting bar *b* by rivets or screws *p, p* while the other bolt *j* is provided with a nut *a''* having a boss which projects into a hole *o'* in the part *a*.

Figs. 5 and 6 illustrate a simplified form of the invention wherein there is no provision for lateral adjustment, and a plain bolt or pin *q* secured by means of a cotter pin *r* in lugs *s, s*, provided on the underside of the grooved supporting bar *b*, constitutes one part of the hinge on which the other part *d* moves.

As shown in Figs. 1, 2, 5, and 6 the parts *e* and *f* are connected to each other by a vertical pin or pivot *f'* so that the said parts *e* and *f* can turn relatively to each other on a vertical axis.

Referring to Figs. 7 to 12 of the drawings, particularly to Fig. 7 which is a part view of the lower portion of the toggle lever or lazy-tongs mechanism, 1 represents one of the lower levers or members of the lazy-tongs which levers are, as usual, pivoted at 2 to the casting or housing 3, 4 being the balancing spring which is engaged at each end by the hooked ends 5 of the bolts 6. According to this invention, instead of the bifurcated extensions or short arms 7 of the levers 1 being, as heretofore, more or less rigidly connected to the bolts 6 the said short arms 7 simply bear on suitable pivots or projections on a part 8 which is bored so as to be slidable and capable of turning on the bolt 6. As shown the part 8 has provided on opposite sides a projection 9 the said projections forming bearings or pivots, and the short arms 7 of the lever 1 are provided with suitably curved recesses 10 which bear on or freely engage with the said pivots 9. 11 is a nut on the outer end of the bolt 6 this nut serving for retaining the part 8 in position on the bolt 6 and also serving

for adjusting the tension on the balancing spring 4.

The construction and arrangements of the parts as shown in Fig. 7 are such that in working the parts move freely, relatively to each other, in such a way as to avoid injurious strains, and further, the arrangement is such as to facilitate the movement of the window.

Instead of the projections or pivots 9 above referred to, swivels or other suitable means might be employed for obtaining the desired freedom of movement of the part 7 relatively to the bolt 6 or to the part 8.

Although this invention is mainly intended for use with frameless windows, it is to be understood that it may be used in connection with windows mounted in a frame such, for instance, as shown in Fig. 12.

What I claim, as my invention, and desire to secure by Letters Patent is:—

1. The combination, with a stationary support, and a lazy-tongs carried thereby; of a slidable window, an upper connecting piece secured to the window, a lower connecting piece hinged horizontally to the upper connecting piece, and a stirrup having its upper end connected by a vertical pivot to the lower connecting piece and having its lower end connected to the lazy-tongs by a horizontal pivot.

2. The combination, with a stationary support, and a lazy-tongs carried thereby; of a slidable window, a stirrup having its lower end pivoted to the lazy-tongs by a horizontal pivot, and pivoted connecting devices arranged between the said stirrup and window and permitting the window to move on a vertical axis and also to tilt laterally.

3. The combination, with a stationary support, and a lazy-tongs carried thereby; of a slidable window, a stirrup having its lower end pivoted to the lazy-tongs by a horizontal pivot, an upper connecting piece secured to the window, a lower connecting piece slidable horizontally in the upper connecting piece, means for adjusting the lower connecting piece relative to the upper connecting piece, and a vertical pivot operatively connecting the stirrup with the lower connecting piece.

4. The combination, with a stationary support, and a lazy-tongs carried thereby; of a slidable window, an upper connecting piece secured to the window and provided with a horizontal guide, a lower connecting piece hinged horizontally to the upper connecting piece and slidable longitudinally in its guide, means for adjusting the lower connecting piece relative to the upper connecting piece, and a stirrup having its upper end connected by a vertical pivot to the lower connecting piece and having its lower end connected to the lazy-tongs by a horizontal pivot.

5 5. The combination, with a stationary support, of a lazy-tongs pivoted to the support and having a forked lug on the end of one of its lower arms, a spring connected at one end to the other lower arm of the lazy-tongs, a non-revoluble sleeve provided with lateral lugs which engage pivotally with the said forked lug, a bolt connected to the other end of the said spring and passing through

the said sleeve, and means for adjusting the 10 position of the sleeve on the bolt.

In testimony whereof I affix my signature, in presence of two witnesses.

LOUIS JEAN LE CLAIR.

Witnesses:

ERNEST A. IDLE,
H. P. VENN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
