No. 676,558. Patented June 18, 1901.

D. HOYT.

SASH BALANCE.

(Application filed Dec. 8, 1900.)

(No Model.)

Fig. 1.

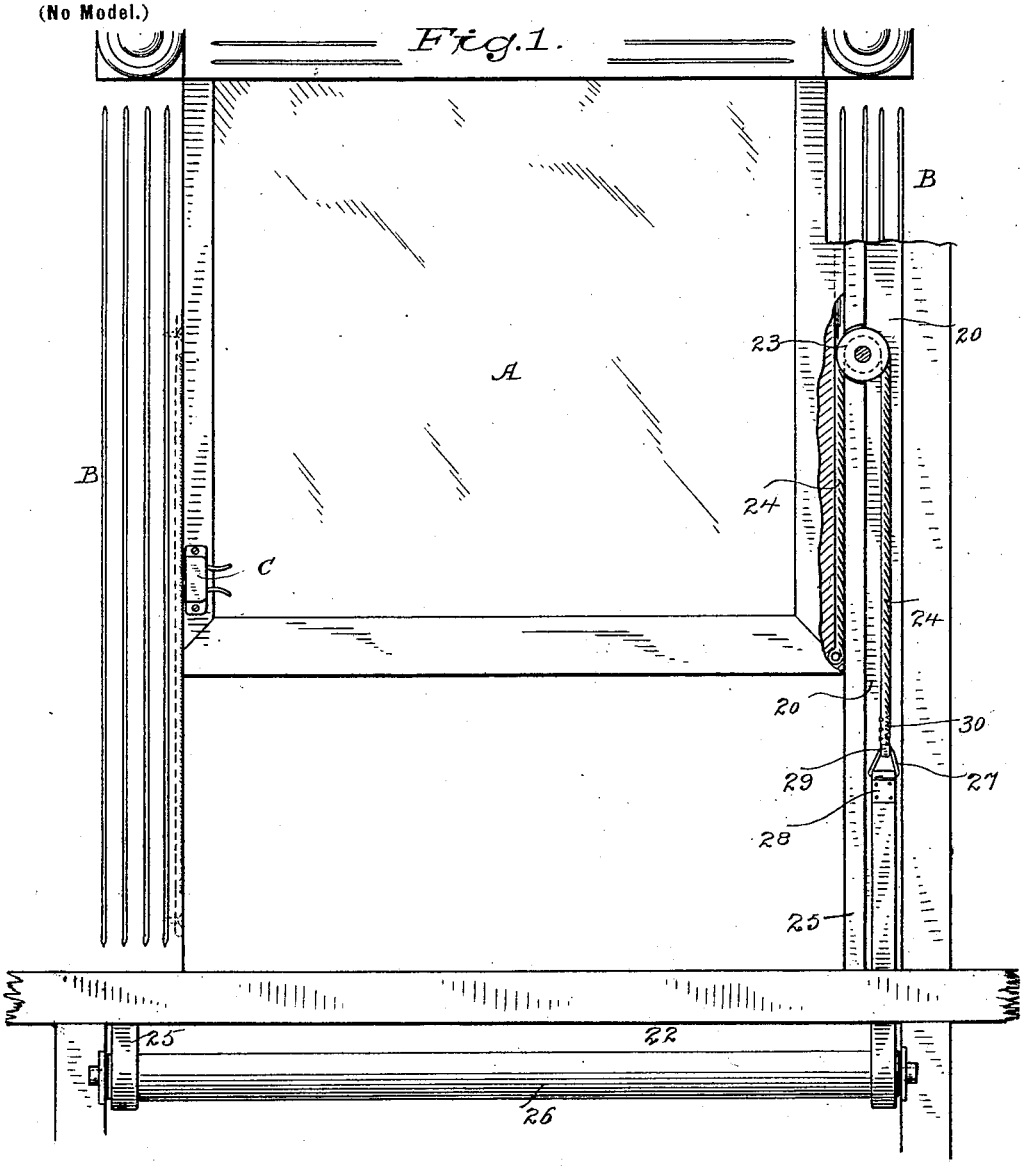
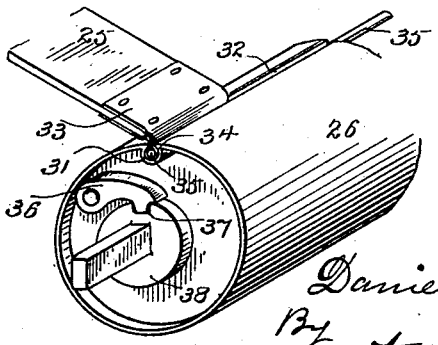


Fig. 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 676,558, dated June 18, 1901.

Application filed December 8, 1900. Serial No. 39,116. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HOYT, a citizen of the United States, residing at South Norwalk, county of Fairfield, State of Connecticut, have invented a new and useful Sash-Balance, of which the following is a specification.

My invention relates to the class of sash-balances in which the weight of the sash is counterbalanced by spring-power instead of by the use of weights, and has for its object to provide mechanism of this character which shall be adapted for general use, and especially adapted for use upon the windows of railway-cars, and which shall be inexpensive, easily applied, durable, and practically impossible to get out of repair.

After considerable study of the subject I have come to the conclusion that owing to the peculiarities of car construction and the constant vibration to which the windows are necessarily subjected balancing devices that could be conveniently applied to car-windows have proved sufficiently ineffective in use to preclude their general adaptation, and some devices capable of accomplishing the desired result have been so expensive or so complicated or have required so much cutting away of the woodwork as to render them impracticable for this use. For these or other reasons up to the present time in nearly all cars constructed, from street-cars to the most expensive special trains, the windows are not provided with any balancing devices whatever.

My present invention provides a device of few parts inexpensive to make and easily applied to all cars, new or old, and which will, moreover, effectively and satisfactorily accomplish the result aimed at.

With these ends in view I have devised the simple and novel sash-balance of which the following description, in connection with the accompanying drawings, is a specification, reference characters being used to designate the several parts.

Figure 1 is an elevation, partly broken away, illustrating the application of my invention to a car-window, the window being shown as partly raised; and Fig. 2 is a detail perspective, on an enlarged scale, showing the attachment of the straps to the spring-roller.

A denotes a car-window, and B the casing, which may be of any ordinary or preferred construction, it being simply required that pockets 20 be provided in the casing at the sides of the window and that a pocket 22 be provided in the casing below the window.

C denotes a spring sash-lock which may be of any ordinary or preferred construction and the action of which is to lock the sash in the raised or in any partially-raised position in which it may be placed, as indicated in the drawings.

23 denotes a pulley in the casing, there being one upon each side of the window, and 24 a cord or chain attached to the edge of the window near the bottom and extending upward over the pulley and having its other end attached to a flexible strap 25 in one of pockets 20.

26 denotes a spring or, as it is sometimes called, "self-acting" roller located in pocket 22 under the window. This spring-roller extends the entire width of the window and also the width of both pockets 20, flexible straps 25 extending downward within the pockets and being connected to the ends of the spring-roller, so as to wind thereon in a circular or radial coil and raise or assist in raising the window by counterbalancing the weight of the window. By providing straps as a means of connection between the cords or chains and the spring-roller and by so constructing and arranging the parts that the straps will be wound upon the spring-roller in circular or radial coils—that is, the layers of the coils will be wound one upon another radially—I avoid the difficulties heretofore existing in devices of this character and provide a construction that is perfectly reliable under all circumstances, as it is practically impossible for it to get out of repair or to fail to operate instantly and effectively under all the varying conditions of use.

With the construction shown it is essential that the axis of the roller on which the straps are wound shall be at substantially a right angle to the axis of each of the pulleys over which the cords pass. If a strap were employed for the complete connection between the spring-roller and the sash, a twist would necessarily occur in the strap, which would

be liable to cause it to run off from the pulley, and, on the other hand, if a cord or chain were employed for the entire connection the lower end of it would become wound upon the spring-roller in such a manner that would interfere with its freedom of movement. As is well known, a cord or chain wound several times around a roller or drum must necessarily have the coils thereon formed to some extent side by side. This would be detrimental in the present construction, for the reason that it would deflect the cord or chain off to one side and cause binding of the coils on the drum and also a binding at one side of the pocket 20 at its lower end.

By the use of the flexible connection made up of the strap and cord I am able to retain all the advantages herein set forth.

As a simple, inexpensive, and perfectly reliable means of connecting the strap to the cord or chain I provide a triangular loop 27, which is connected to the flexible strap by means of a metal strap 28, which is passed through the loop, the ends thereof lying on opposite sides of the flexible strap, to which it is secured by rivets passing through both ends of the metallic strap and the flexible strap. The triangular loop is connected to the cord by means of a metallic hook 29, which is engaged by the loop and whose shank is provided with prongs 30, which inclose and whose ends are driven into the cord or into openings in the links of the chain should a chain be used in lieu of a cord.

As a means of connecting the flexible straps to the spring-roller I provide a groove 31 in the periphery of the spring-roller, which is partly closed by a contracted neck, as at 32. The ends of a metallic strap 33 are riveted on opposite sides of each flexible strap in the same manner that strap 28 is riveted thereto, the central portion of said strap 33 forming an eye 34, with a neck above the eye. This eye is adapted to be passed into groove 31 from the end, the neck of the eye lying in neck 32 of the groove. The parts are securely locked in this position by a rod 35, lying within the groove. This rod is longitudinally movable in the groove, but is too large to pass through the neck. The rod is passed into eyes 34 on straps 33 when the latter are in the groove, thereby locking the eyes, straps 33, and the flexible straps securely to the spring-roller and in such a manner that the flexible straps will wind thereon in circular or radial coils without the least protuberance at the starting-point and in such a manner as to effectually overcome any tendency to wear loose or to break loose during the life of the car itself.

It is of course contemplated that in use pocket 22 may be opened from the front without difficulty. The spring-roller is made readily removable in any simple and convenient manner, the tension of the spring being of course subject to adjustment by torsion in the usual manner and being locked in position after adjustment by means of a pawl 36, engaging a notch 37 in a disk 38, carried by the spring.

The operation will be readily understood from the drawings and is so simple as to hardly require explanation. It being understood, of course, that the sash-lock is in the unlocking position, the operator simply moves the window up or down, as may be required, the weight of the window being partly or wholly counterbalanced by the action of the spring-roller. When the window is in the desired position, the operator simply leaves it there, in which position it will remain through the operation of a spring sash-lock of any suitable construction.

Having thus described my invention, I claim—

1. The combination with a window and a casing therefor having on opposite sides of the window pulleys and pockets 20, and under said window a pocket 22 extending the width of the window and of both side pockets, of a spring-roller in pocket 22, flexible straps connected to the ends of the spring-roller and adapted to wind thereon in a radial coil and cords connected to the opposite edges of the window and passing over the pulleys and connected to the flexible straps, so that the power of the spring-roller will act as a counterbalance for the window.

2. The combination with a window, a casing therefor having pulleys and cords connected to the window and extending over the pulleys, of a spring-roller under the window and flexible straps secured to the ends of said roller and adapted to wind radially thereon, the other ends of said straps being connected to the cords, substantially as described.

3. The combination with a window, a casing therefor having pulleys and cords connected to the window and extending over the pulleys, of a spring-roller under the window, flexible straps secured to the ends of said roller and adapted to wind radially thereon, triangular loops 27, metal straps 28 which pass through the loops and are riveted to the flexible straps and hooks 29 which are engaged by the loops and whose shanks are provided with prongs adapted to inclose and to be driven into the cords.

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

DANIEL HOYT.

Witnesses:
A. M. WOOSTER,
S. W. ATHERTON.