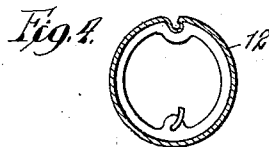
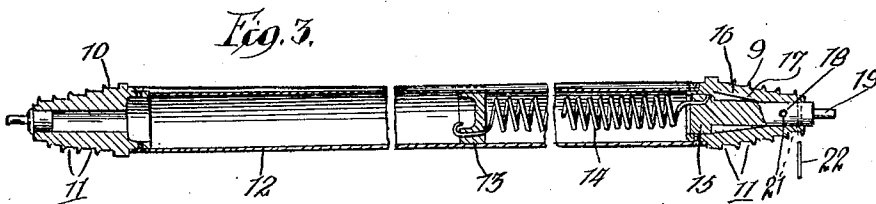
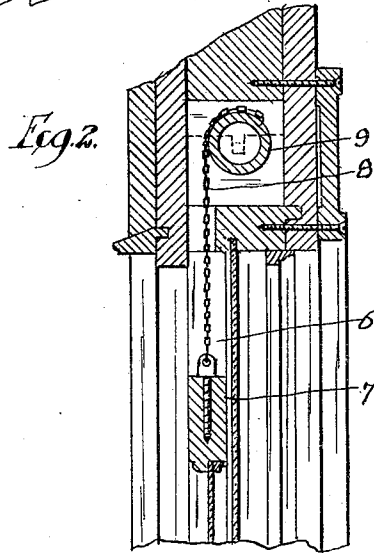
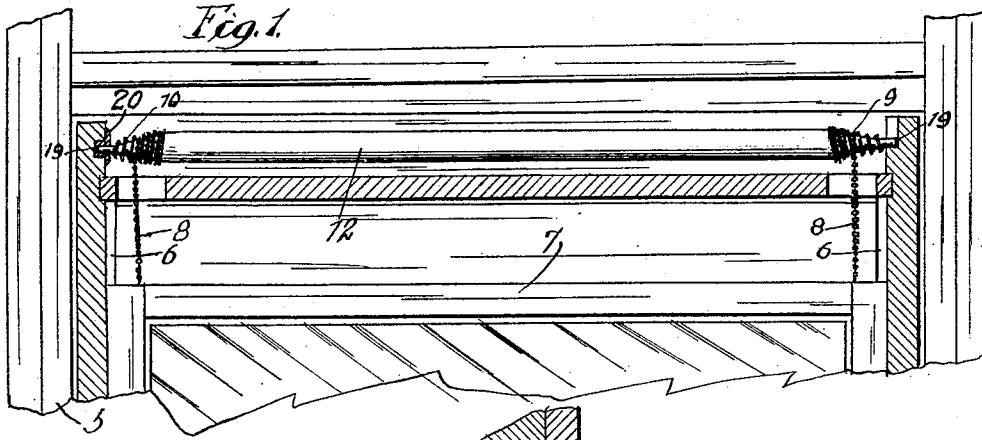


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WINDOW LIFTING MECHANISM.  
APPLICATION FILED DEC. 26, 1908.

932,370.

Patented Aug. 24, 1909.



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# UNITED STATES PATENT OFFICE.

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## WINDOW-LIFTING MECHANISM.

932,370.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed December 26, 1908. Serial No. 469,196.

*To all whom it may concern:*

Be it known that I, LARS J. BERG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented certain new and useful Improvements in Window-Lifting Mechanism, of which the following is a specification.

This invention relates to spring mechanism for controlling the movements of a window which is adapted to be used in lieu of weights which are frequently employed for  
10 that purpose.

Under certain conditions, especially where compactness of arrangement is desirable, as for instance in car windows, it is not desirable to use weights, and the mechanism of the present invention is constructed with special reference to the economy of space and compactness of arrangement. In the use of  
15 spring devices for this purpose the spring will naturally be subjected to the greatest tension when the window is completely lowered, and will thereafter be subjected to a constantly lessening tension as the window is raised more  
20 and more, permitting the spring to resume its normal position.

The object of the present invention is to equalize the tension of the spring at different points in the travel of the window, or, if anything, to increase the pull of the spring as the  
25 window is raised, so as to eliminate the tendency for a window to work up under spring tension after it has been completely closed.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a sectional elevation of a window casing, showing the upper portion of a window frame; Fig. 2 a cross  
30 sectional detail of the same; Fig. 3 a longitudinal sectional view of the spring cylinder and worm drum; and Fig. 4 a sectional view, showing the method of securing the spring in position.

The invention is applied to a window frame  
35 5, provided with suitable guideways 6 for regulating the movements of the window 7. The window has secured thereto chains or cables 8, the upper ends of which are carried  
40 around worm drums 9 and 10, which increase in diameter toward the center and are provided with spirally extending grooves 11 adapted to have the chains fastened there-  
45 unto. The worm drums are connected by means of a tubular casing or cylinder 12, like

that ordinarily employed in connection with window shade rollers, which cylinder or casing has fixedly located therein a block 13 which receives the inner end of a coil spring 14, the outer end of which is entered into the  
50 enlarged inner end of a pintle 18 which serves as a bearing for the drum.

The inner block 13 is fixedly held within the cylinder or casing in any suitable manner, and the pintle is loosely mounted there-  
55 in and held against rotation with the cylinder by means of a key or tongue 19, which is held within a socket 20 suitably positioned within the window casing. The arrangement is one which permits the casing with  
60 the worm drums fixedly secured thereto to revolve around the pintles as a bearing, and as the window descends the chains will revolve the worm drums and the cylinder, and cause the spring to be revolved, and thereby  
65 increase the tension on the spring. As shown, the cylinder is provided with but a single spring and pintle, though, obviously, this construction could be duplicated at the other end of the cylinder. The ends of the  
70 chain are fixedly secured near the inner or enlarged ends of the worm drums, and as the chain winds up it will wind on a drum of constantly decreasing diameter.

In use, with the window in its lowermost  
75 position, the spring tension will be at its maximum and the pull on the chains will be exerted from the worm drums at the point of greatest diameter and least efficiency. This causes the weight of the window to exert its  
80 greatest effect in counterbalancing the tension of the spring, with the result that the greatest spring tension will act against the pull of the window working at the point of greatest leverage. As the window rises the  
85 leverage will decrease in unison with the decrease of the spring tension, so that these two forces will tend to counterbalance one another at all points in the travel of the win-  
90 dow. If desired, the parts can be proportioned to reverse the ordinary tendency and cause the spring to act more strongly toward the end of the window movement than at the beginning. The arrangement, moreover, is  
95 one which prevents the coils of the chain or cable from overlapping one another, since the chain or cable will follow the spiral groove from end to end of the worm drums.

In assembling the parts, it is desirable to hold the drum against revolution with re-  
100 110

spect to the pintle when the parts have been put under spring tension. In order to secure this result, registering holes 21 are provided in the pintle and drum, respectively, 5 into any one of which a pin 22 can be temporarily inserted, to be thereafter withdrawn when the device is put into motion.

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

10 In a device of the class described, in combination with a window, a cylinder rotatably

mounted above the window, and provided at each end with a tapered drum, a connection at each side of the window secured to the larger end of the drum and revoluble there- 15 with, and a spring within the cylinder adapted to be put under tension by the lowering of the window, substantially as described.

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Witnesses:

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