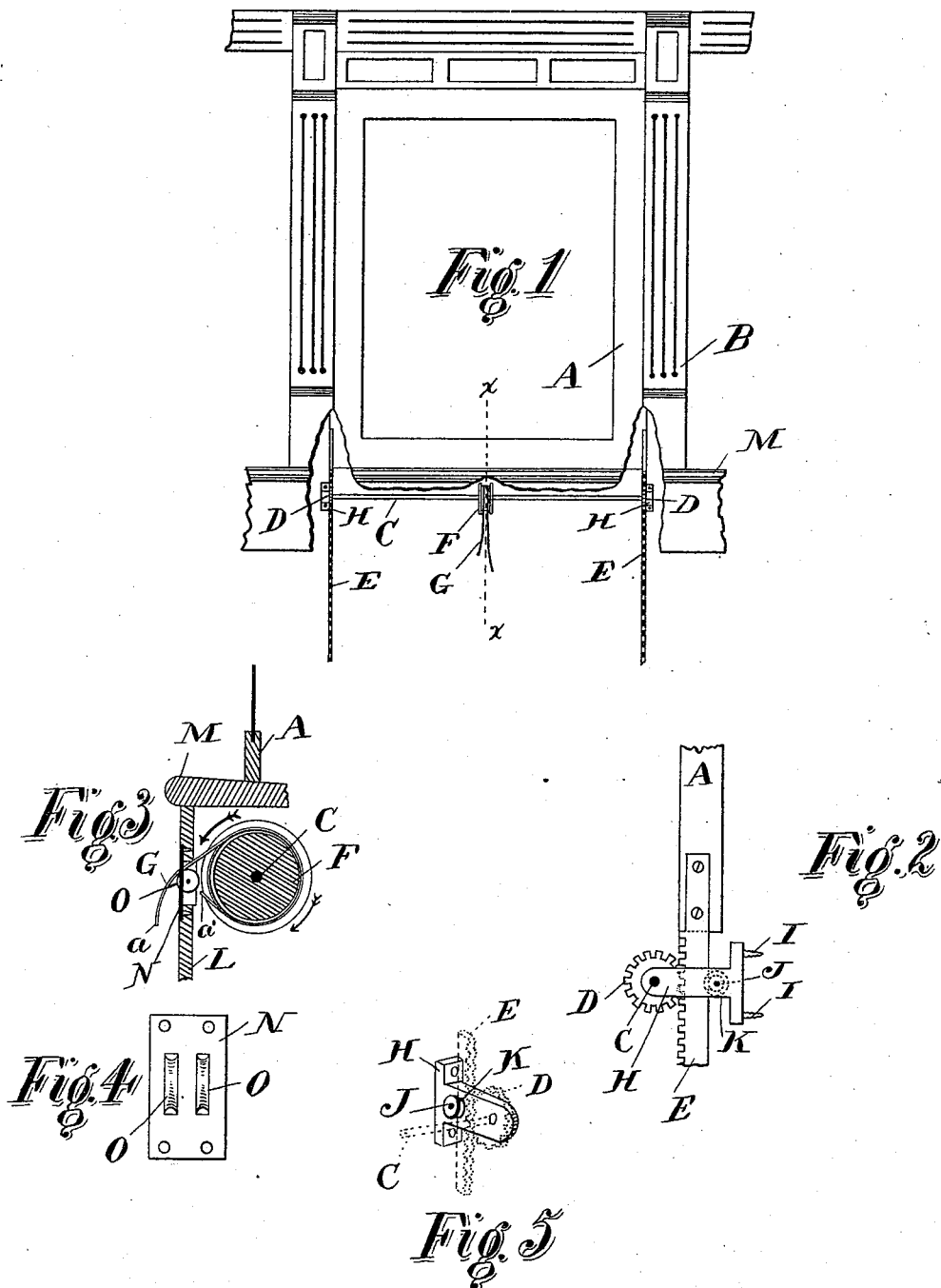


(No Model.)

L. HUNTINGTON.
SASH BALANCE.

No. 523,473.

Patented July 24, 1894.



Witnesses.
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Geo. W. Redbury

Inventor.
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UNITED STATES PATENT OFFICE.

LOUIS HUNTINGTON, OF TAHOE, CALIFORNIA.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 523,473, dated July 24, 1894.

Application filed February 21, 1894. Serial No. 501,056. (No model.)

To all whom it may concern:

Be it known that I, LOUIS HUNTINGTON, a citizen of the United States, residing at Tahoe city, in the county of Placer and State of California, have invented certain new and useful Improvements in Windows; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention is an improvement in devices for opening and closing windows without the use of weights or springs, and is designed for its greater simplicity of construction and efficiency and certainty of operation.

The novelty resides in the peculiarities of construction and the combination, arrangement, and adaptation of parts, all as more fully hereinafter described and particularly pointed out in the appended claims.

A further object of my invention is to provide a simple device, by the use of which the window may be operated without directly grasping the sash, thereby making it possible to raise or lower a window situated at a considerable distance or height from the operator.

In the drawings hereunto annexed and constituting a part of this specification: Figure 1 is an elevation of an ordinary railroad car window, with a portion of the lower frame broken away, showing the position of the operating means. Fig. 2 is a side elevation of the pinion bearing and a portion of the window sash and rack attached thereto. Fig. 3 is a section through the line *xx* Fig. 1. Fig. 4 is an elevation of the guide pulleys through which the operating chain or cord is intended to pass, and Fig. 5 is a perspective view of the bearing for the shaft, representing in dotted lines the position of the rack and pinion.

Reference being had to the above figures, A represents the sash of an ordinary car window, the lower portion of the frame B of which is broken away in order to show the position of the operating devices; which consist essentially of a longitudinal shaft C having a pinion wheel D secured to each extremity, the teeth of each wheel being adapted to

mesh with a vertical rack E secured to the side rails of the sash A, and a flanged wheel F secured to the central portion of the shaft C, the wheel F being adapted to be revolved in either direction by means of a chain or cord G passing about its periphery.

The shaft C is held in the required revolvable position relative to the sash A by means of the bearings H which are secured to the frame B by means of the screws I. Revolvably secured to each of the bearings H is a wheel J, between which and the pinion D the rack E is adapted to pass. The object of the wheel J being to prevent, with the least friction the teeth of the rack E from leaving the pinion wheel D; and to obviate the liability of the rack leaving the pinion in a side direction, I have constructed the wheel J with a projecting guide flange K.

Mortised in the panel L below the sill M and directly in front of the flanged wheel F is the metallic plate N which bears the grooved pulleys O over which and through the plate N the ends (*a*) and (*a'*) of the cord or chain G pass.

The method of operation of my invention is as follows: When it is desired to open the window the end (*a*) of the cord G or that passing in the direction of the tangent from the upper portion of the periphery of the wheel F, is drawn downward thus causing the wheel F to travel in a direction indicated by the dark arrow in Fig. 3, which motion is imparted through the shaft C to the pinions D causing the latter and consequently the window to travel upward. It is manifest that as the end (*a*) of the cord or chain G is drawn downward the end (*a'*) is drawn, by the revolution of the wheel F, in the opposite direction. When however it is desired to close the window the end (*a'*) of the cord is drawn downward, causing the wheel F to travel in the direction indicated by the light arrow in Fig. 3, and the pinion D operating on the racks E cause them to travel downward and lower the window into a closed position.

It will be readily seen that by regulating the relative diameters of the pinions D and wheel F any degree of lifting power may be applied to the window and in cases of windows of extreme weights, suitable gears may be interposed between the wheel F and shaft

C in order to exert the desired power to the shaft, the addition of such a well known device not requiring an inventive act, but merely mechanical skill.

5 I do not desire to confine myself to any particular position of the wheel F on the shaft C nor to the locality of the shaft C and connections, as it is evident that the shaft C and pinions D may be placed above the window
10 sash A and the device be operative. In this latter case the racks F would extend upward above the frame A.

It will be manifest from the foregoing description and accompanying drawings that I
15 have provided simple, efficient and inexpensive means whereby windows may be raised or lowered without the application of manual effort directly to the sash, and in the case of rail-way car windows, to which my invention
20 is especially applicable, the window may easily be operated without the necessity of the operator rising from his seat.

I am aware that changes in the form, position and relative proportion of the parts of
25 the devices herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages thereof and I therefore reserve the right to make such changes and
30 alterations as fairly fall within the scope of my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a window, the combination of a sliding sash with a horizontal revoluble shaft, said shaft bearing one or more pinion wheels, the teeth of said wheels meshing with corresponding teeth on one or more vertical racks projecting from and secured to said sash, and
40 a flanged guide wheel situated near said pinion wheel and between which and said pinion wheel, said rack is adapted to pass, substantially as and for the purpose set forth.

2. In a window, the combination of a sliding sash with a horizontal revoluble shaft, said shaft bearing one or more pinion wheels, one or more vertical racks secured to and projecting from said sash, a flanged guide wheel situated near said pinion wheel, and between which and said pinion wheel said rack
50 is adapted to pass, a flanged wheel or drum secured to said shaft, and a means connected with said flanged wheel or drum through which revolution is imparted to said shaft, substantially as and for the purpose set forth.
55

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

LOUIS HUNTINGTON.

Witnesses:

JOHN SACHAU,

GEO. F. KINCAID.