

Sheet 2-2 Sheets.

H. Chatfield,

Elevator,

No 70,412,

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Fig: 2

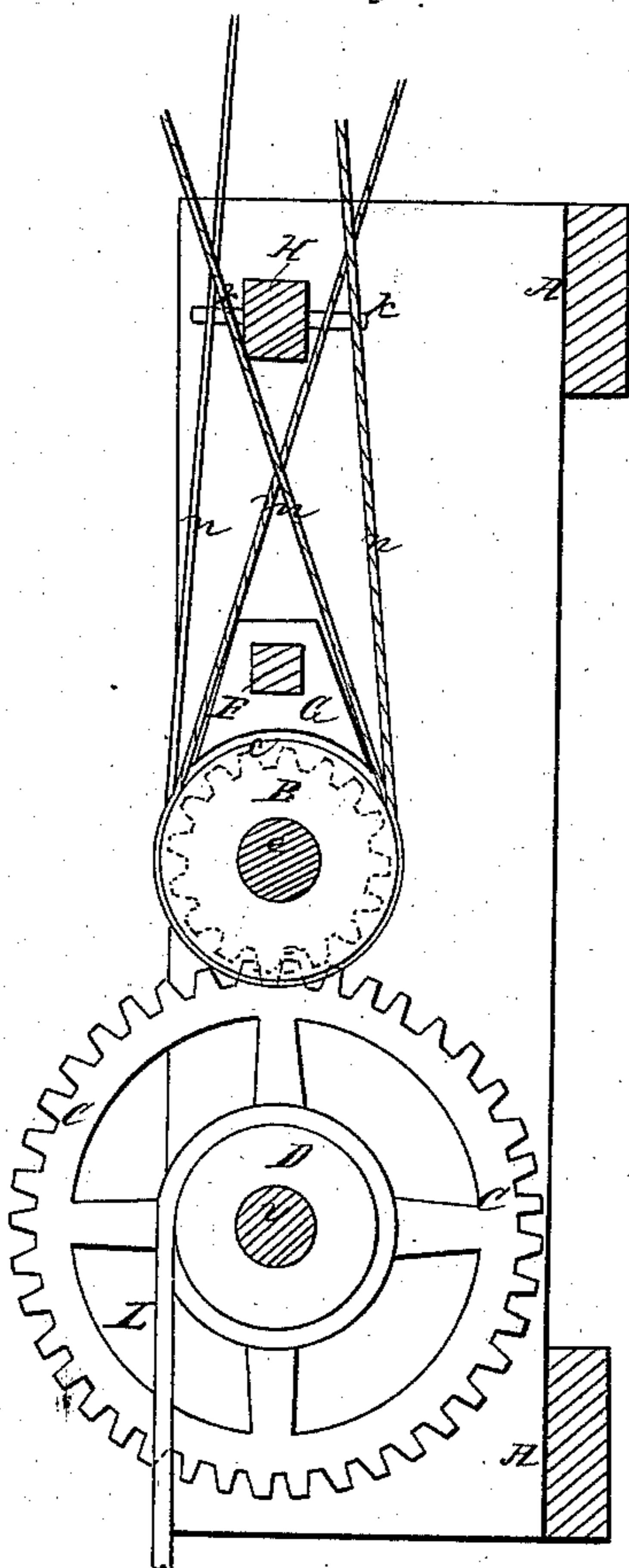
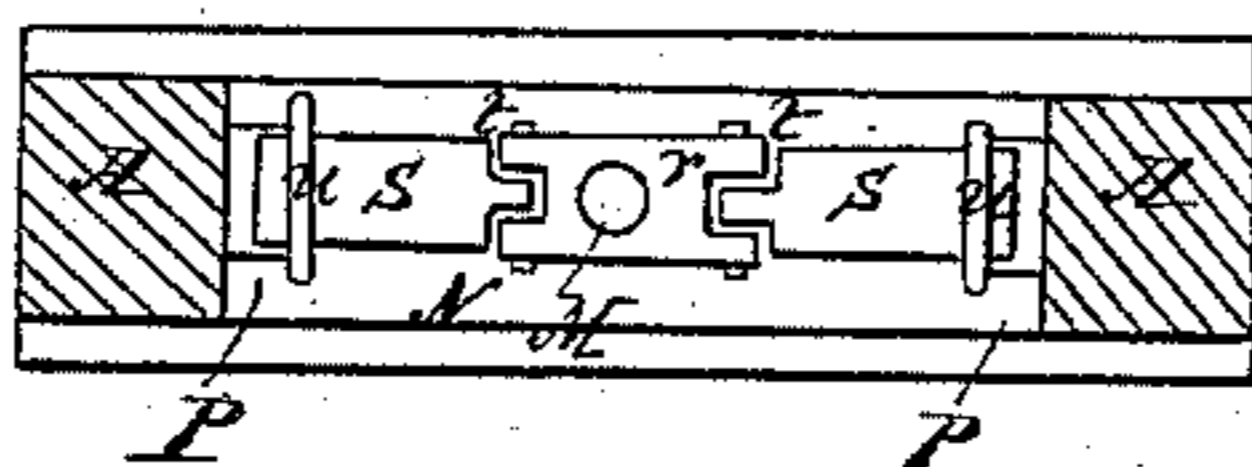


Fig: 3.



Witnesses:

E. J. Brown,
J. B. Centre

Inventor:

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By his atty,
J. S. Brown

United States Patent Office.

HENRY CHATFIELD, OF WOLCOTTVILLE, CONNECTICUT.

Letters Patent No. 70,412, dated November 5, 1867.

IMPROVEMENT IN HOISTING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HENRY CHATFIELD, of Wolcottville, in the county of Litchfield, and State of Connecticut, have invented Improvements in Hoisting Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a front elevation of a hoisting apparatus provided with my improvements,

Figure 2 a vertical section of a position thereof, in a plane indicated by the line $x x$, fig. 1,

Figure 3 a transverse horizontal section, in a plane indicated by the line $y y$, fig. 1.

Like letters designate corresponding parts in all of the figures.

My improvements are applied to a power-winding apparatus for raising heavy weights, using two belts, one open and the other crossed, with fast and loose pulleys for reversing the motions to raise or lower the weights.

Let A represent the frame or ways of the apparatus, and N a guide-frame, ascending and descending in the ways, the weight being secured thereto. The frame N is suspended and raised by a rope or chain, L, which is wound upon a horizontal shaft or drum, D. The driving-pulley may be upon this shaft, for raising lighter weights, but, for raising heavy weights or articles, gearing B C may be employed to speed down the motion from a separate pulley-shaft, c , and thereby increase the power. This speeding down may be carried to any extent, there being intermediate gearing, if necessary.

The two loose pulleys being represented by $a b$, and the fast pulley by c , between the loose pulleys, the crossed belt m and open belt n are situated such a distance apart that when one is on the fast pulley the other is on its respective loose pulley. Hence, one must pass off from the fast pulley before the other begins to pass upon it, and there is an interval, therefore, when the winding-shaft is not sustained by the belt, and, to insure safety, some secure means must be adopted to sustain the weight during that interim between the actions of the belts.

My improvement in this part of the apparatus consists in the method of operating the brake G, which holds against the fast pulley c by the movement of the sliding belt-shipper H, through means of a pair of toggle-arms, I I, that connect the said belt-shipper with the brake-lever F. This brake-lever is pivoted at one end, f , and one toggle-arm, I, is pivoted to the other vibratory end of the lever, as at g . The two toggles are jointed together at i , and the upper toggle is secured rigidly to the belt-shipper H by passing it transversely through the same, and securing it by a screw-thread thereon and nuts $j j$, substantially as shown in fig. 1. The length of the toggle-arms and the pressure of the brake are adjusted by these nuts, or the equivalent thereof. The toggle-arms are so arranged that, when either belt is on the fast pulley c , they will not be in line with each other, as shown by black lines in fig. 1, and hence the brake G will be drawn away from the pulley and not hinder its free motion. But, when the toggle-arms are brought into line with each other, as shown by red lines in the same figure, they will force the brake powerfully against the pulley, and this takes place just when the belts are off of the fast pulley. This movement is automatic and sure, and, if all parts are strong and firm, it cannot fail to secure the safe suspension of the weight. I have found it to be perfectly reliable in practice with the heaviest weights.

But, to secure the apparatus against accident, even if the safety-brake G should fail, I have added a device to prevent the weight from falling, even if the suspension should fail. For this purpose the guide-frame N, to which the weight is attached, and which is suspended by the winding-rope or chain L, is provided with a pair of strong dogs or catches, $s s$, which act in connection with racks or sustaining notches $p p$ along both sides of the ways A A, substantially as shown in the drawings. The dogs are pivoted at $t t$ to a central cross-bar, r , through which passes a suspension-bolt, M, forming the connection between the rope L and the guide-frame N. This bolt also extends down through the head of the said guide-frame and through a spring, o , underneath the same. It has a sliding movement in its place, and all the parts are so arranged that, when a weight or article is suspended by the frame, the spring o is compressed and the bolt is raised to its highest position, and this draws the dogs in, so that they do not touch the rack-teeth $p p$, and so the guide-frame slides freely up and down in the ways A A, all as indicated by black lines, fig. 1. But should anything give way above, so that the weight should no longer be suspended thereby, the spring o would draw the bolt M downward, and thereby force the

sliding-dogs *s s* out, so as to engage with the notches of the racks *p p*, and thereby prevent the descent of the guide-frame *N*, and the consequent falling of the weight, all as indicated by red lines in fig. 1. Guide-straps *u u* are employed to keep the dogs *s s* in place, and hold them firmly to the head of the guide-frame *N*.

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

In combination with a hoisting machine, the toggle-arms *I I*, arranged and operating in connection with the belt-shipper *H*, brake-lever *F*, and brake *G*, substantially as and for the purpose herein specified.

The above specification of my improvement in hoisting apparatus signed by me this 2d day of February, 1867.

HENRY CHATFIELD.

Witnesses:

H. S. BARBOUR,
Jno. H. BARBOUR.