(No Model.)

L. D. HAWKINS & J. H. WEBSTER.

STOP FOR ELEVATORS.

No. 267,649. Patented Nov. 14, 1882.

FIG. 1.

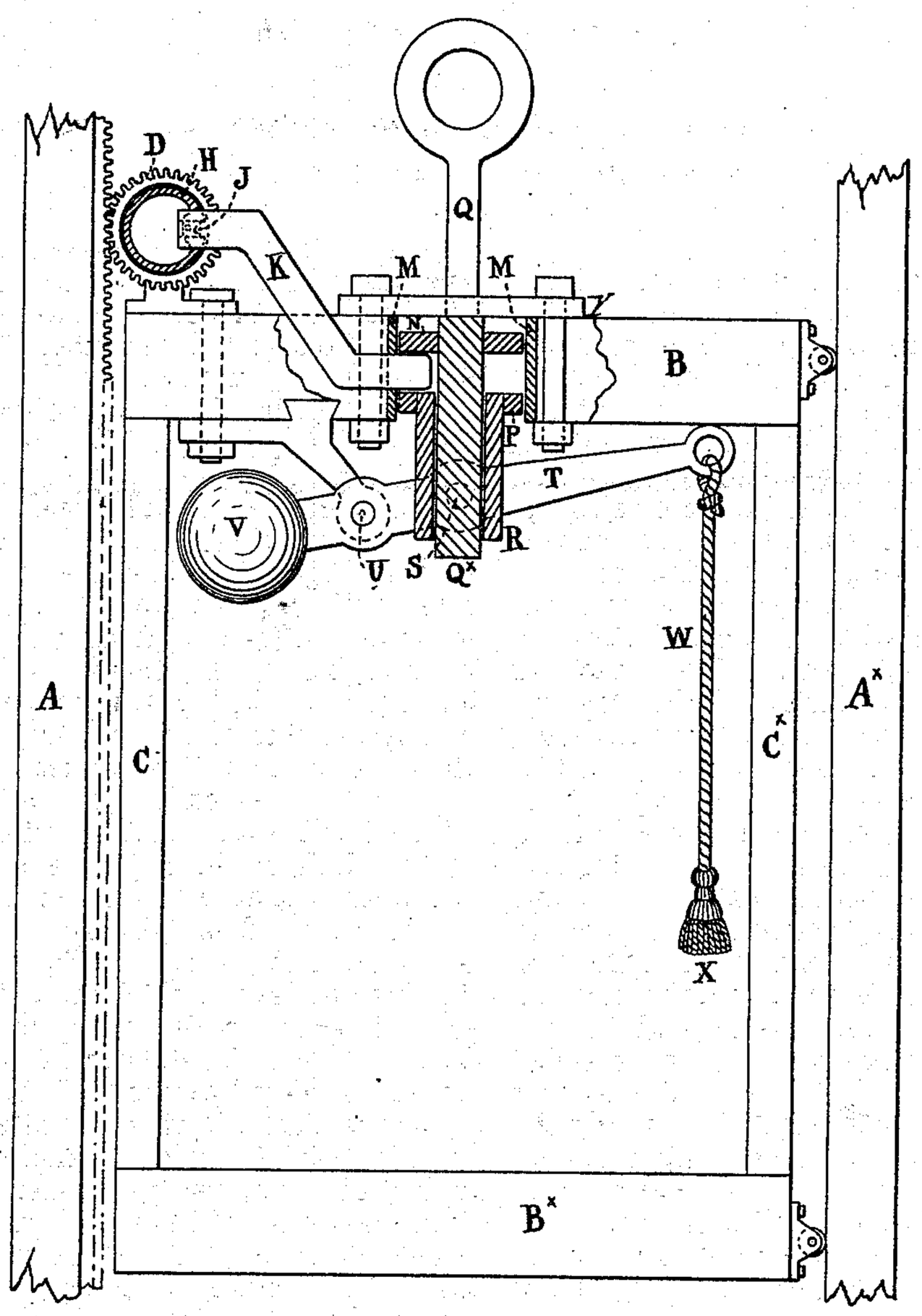


FIG. 2.

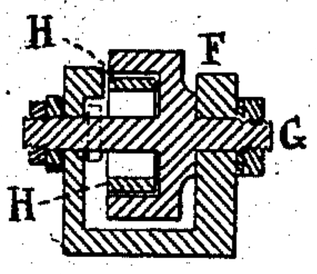


FIG. 3.

FIG. 4.

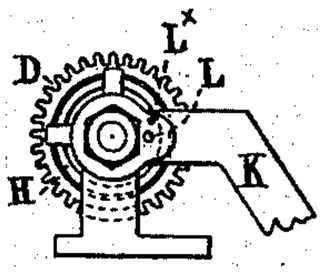
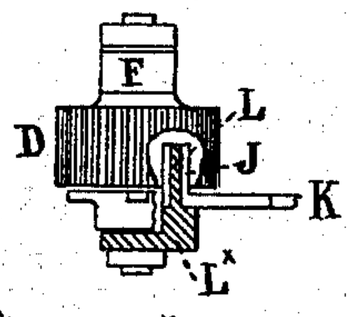


FIG. 5.



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UNITED STATES PATENT OFFICE.

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STOP FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 267,649, dated November 14, 1882.

Application filed September 25, 1882. (No model.)

To all whom it may concern:

Be it known that we, LORENZO DOW HAWKINS, a citizen of the United States, residing at Stoneham, in the county of Middlesex and State of Massachusetts, and JOHN HASKELL WEBSTER, also a citizen of the United States, residing at Boston, Suffolk county, State of Massachusetts, have invented a new and Improved Stop for Elevators, the same being applicable also for other purposes than elevators, of which the following is a specification.

The nature of our invention is that of one or more cog-wheels fixed to the top (or bottom) of an elevator-cage, and gearing into a rack (or racks) placed on the inside of the elevator-posts or well, with one or more levers attached, the latter acting in connection with a bolt or hook, to which the elevator hoisting rope or wire is attached, the cog-wheel or wheels being provided respectively with a friction-ring actuated by the lever above named, the whole arranged so that, the friction-ring expanding when the rope or wire breaks, or if the machinery or belt gets disarranged, the rotation of the cog-wheel bearing it ceases and the cage cannot move up or down. A device is added by which the pulling of a rope actuates a lever and produces the same result of stopping the cage; and the object is to provide a thoroughly safe and effectual means of preventing accidents on elevators from breaking or disarrangement of the machinery which lifts and lowers the cage, or the disarrangement or breaking of the belt.

In the drawings, Figure 1 is a side view of an elevator, partly in section, furnished with our device with two posts. Fig. 2 is a vertical section of a portion of the device. Fig. 3 is a view of a part of the device, as hereinafter explained, as are also Figs. 4 and 5.

In the drawings, A $A^{\times}$, Fig. 1, are two elevator-posts, the left-hand one furnished with a metallic rack, E, firmly secured to its inner side.

B $B^{\times}$, Fig. 1, are respectively the upper and lower cross-beams of an elevator-cage.

C $C^{\times}$, Fig. 1, are two of the upright side beams of the cage.

D, Fig. 1, is a cog-wheel, held to a standard, F, Fig. 2, by a short shaft, G, Fig. 2. The standard is attached to the upper side of the upper elevator cross-beam, B. The cog-wheel D is seen in Fig. 2, which is a vertical cross-section, to be a flat plate, round the periphery of which is attached a flange, bearing on its outside the cogs. In the recess formed by the flange lies the friction-ring H, (H H, Fig. 2,) which is made of metal, preferably of cast-steel, and fits closely to the inner side of the flange, the space between the ring and the flange being only enough to permit of the free rotation of the cog-wheel D. The ring H is seen in Figs. 1 and 3 to have a break at one side, at which point the ends are thickened, as seen best in Fig. 3, and an open space is left between them. Into this space passes a solid block of metal, J, Fig. 1, which exactly but not tightly fits into it, and is called the "tightener-block." It is held in place by a pin, L, Figs. 4 and 5, which is borne by a button, $L^{\times}$, Figs. 4 and 5, which button is pierced and held by the shaft of the cog-wheel and hangs between the standard F and the nut on the end of the shaft. This tightener-block J is borne by a crooked lever, K, Fig. 1, called the "tightening-lever," which passes horizontally a short distance, then diagonally downward, then, bending to a horizontal course, goes through a slot in the metallic cylinder M M, Fig. 1, (seen in vertical section,) which is called the "slide-cylinder," and is sunk perpendicularly in the middle of the upper cross-beam, B, and there firmly fastened. The lever K then passes between two metal plates, N the upper and P the lower "catch-plate," (so called,) and there ends. The upper catch-plate, N, is a circular plate fitting loosely, so as at need to slide up and down, in the cylinder M M. Through this catch-plate N, and firmly attached to it, passes the perpendicular bolt Q, called the hanging bolt, which bears at its top a loop, to which the elevating and lowering wire or rope is attached. Above the catch-plate N the bolt Q passes through a perforated plate, Y, Fig. 1, and is made smaller above the plate, which latter is firmly fastened to the upper cross-beam, B. This hanging bolt Q passes downward through the cylinder M M (and thus through the cross-beam B) to the point $Q^{\times}$. The lower catch-plate, P, surrounds and is firmly attached to a cylinder, R, called the "bolt-sleeve," which is placed in the slide-cylinder M M, its axis being coincident with it. This cylinder R car-

ries at its lower side, near its lower end, a pin, S, Fig. 1. It also slides up and down upon the hanging bolt Q. This pin S (we sometimes have a corresponding pin on the other side) passes horizontally through a stout bar, T, Fig. 1, called the "stop-bar," which latter is a lever whose fulcrum—a short shaft, U, Fig. 1—is borne by a hanging girder (seen in Fig. 1) to be attached to the lower side of the upper cross-beam. The extreme left-hand end of this stop-bar T is weighted at the point V, and its extreme right-hand end bears a hook or loop, to which is attached a cord, W, bearing a tassel, X.

Operation of the invention: All the respective parts of the invention being in the position shown in Fig. 1, the cage, loaded or unloaded, rises and descends in the usual manner. The machinery being disarranged, however, the heavy hanging bolt Q instantly descends, carrying with it the upper catch-plate, N, which, in its descent, presses down the lower end of the tightening-lever K. Thus the tightener-block J at its end is twisted, the effect of the torsion being to still further separate the ends of the ring H. (Seen in Fig. 3.) This action causes the periphery of the ring to impinge on the inner surface of the flange of the cog-wheel D, thus, through the friction, making it impossible for the wheel D to rotate without accompanying rotation of the ring H, this being prevented by the presence of the tightener-block J, held by the lever K, which lever is held firmly in place by the button and pin L $L^{\times}$. The cog-wheel cannot rotate, and the cogs being geared in the rack, the cage remains suspended until, the rope or wire being replaced and put in motion, the bolt Q is again hoisted upward, and the parts of the device return to the position shown in the drawings. Another means of stopping the ascent or descent of the cage is the stop-bar T. The cord W, being by means of the tassel X pulled downward, draws down the end at the right of the fulcrum of the stop-bar, which brings downward with it the bolt-sleeve R, and thus the lower catch-plate, P, when the lower end of the tightening-lever K, having no support, descends, thus twisting the tightening-block J, and the effects of stoppage of the cage again occur, as above narrated. The tassel X being released, the weighted end V of the lever T throws up again the bolt-sleeve R, pressing up the lower end of the lever K, and the parts of the device are again restored to the relative position shown in the drawings.

We sometimes use two friction-rings—one on each side of our cog-wheel—and also sometimes two sets of cog-wheel, ring, and tightening-lever, and sometime three, four, or more sets. We also sometimes cover the wheel D, &c., with a case or housing; and we sometimes use an eccentric or a cam wheel instead of our tightening-block J; and it is not an essential of our device that the wheel D should carry cogs or work in a rack, as ordinary friction in many cases would answer all purposes. We sometimes use the device without the lever T, and we occasionally use a spring instead of a weight to actuate the lever T, when used. We can dispense with the housing, and, instead of the crooked lever K, we can use a straight shaft or bar, to be twisted by the descent of the hanging bolt Q, and thus actuate the tightener-block J. Sometimes, instead of trusting solely to the elasticity of our friction-ring to resume its normal shape, we hinge it opposite the ends or elsewhere, and close the ends by a spring, or by means of the device that opens it; and we do not confine ourselves in the use of our device to its application to elevators only, as the frictional effect of a close-fitting ring on the inside of a flange of a wheel whose rotation it is desired to limit or to stop, this effect being produced by the torsion of a device placed between the ends of the ring dissevered for that purpose, and the torsion controlled by the action of a lever to the end of which the twisting device is attached. This frictional effect so produced is capable of application to many other purposes.

We claim—

1. The combination of a flanged stop-wheel, whether acting by cogs or by friction, with a broken friction-ring, actuated to produce friction by the contact of its outer surface, expanded by a wedging device placed between the ring ends, with the inner surface of the flange, all substantially as described and shown.

2. In elevators, the combination, with the elevator cage or platform, of one or more racks and flanged cog-wheels, the latter provided with one or more broken rings, and the twisting-block J, or its mechanical equivalent, actuated through the lever K, or its equivalent, by the hanging bolt Q, all substantially as described and shown.

3. In elevators, the combination, with the elevator cage or platform, of one or more racks and flanged cog-wheels, the latter provided with one or more broken rings, and the twisting-block J, or its mechanical equivalent, actuated through the lever K, or its equivalent, by the hanging-bolt Q, with the stop-bar T and its fulcrum, all substantially as described and shown.

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