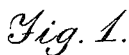


2 Sheets—Sheet 1.

No. 419,041.

Patented Jan. 7, 1890.



Witnesses.
Mattie J. Jackson.
Geo. W. White

Inventor.
Lina Goodell.
by Alban, Andrew, his atty.

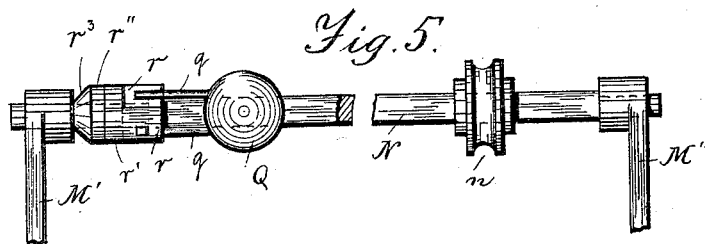
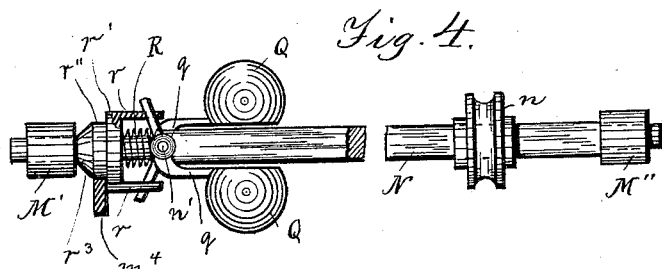
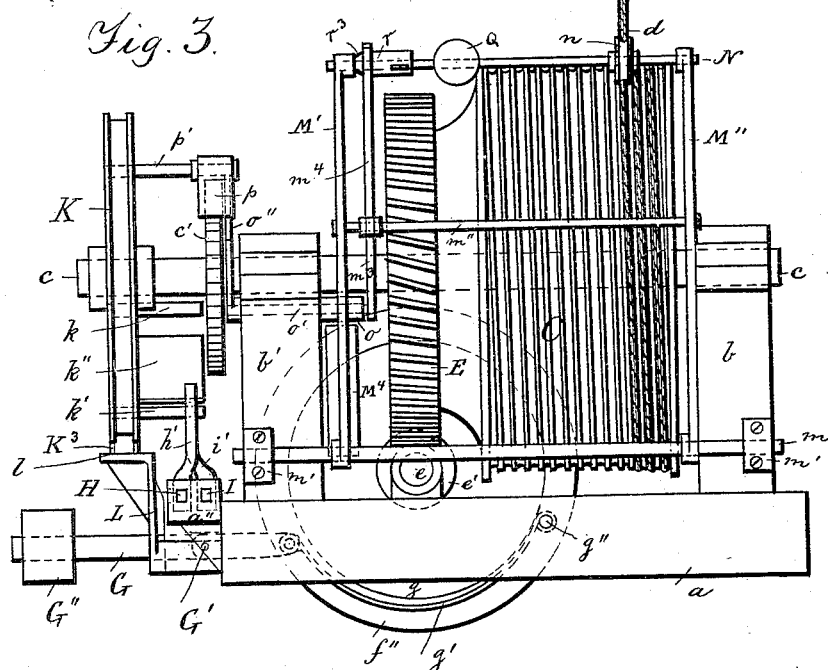
(No Model.)

2 Sheets—Sheet 2.

Z. GOODELL.
ELEVATOR.

No. 419,041.

Patented Jan. 7, 1890.



Witnesses.
 Mattie J. Jackson.
 Geo. W. Whitet.

Inventor.
Fina Goodell
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UNITED STATES PATENT OFFICE.

ZINA GOODELL, OF SALEM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO
ABNER C. GOODELL, JR., OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 419,041, dated January 7, 1890.

Application filed June 15, 1889. Serial No. 314,516. (No model.)

To all whom it may concern:

Be it known that I, ZINA GOODELL, a citizen of the United States, and a resident of Salem, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Elevators, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in elevators; and it has for its object to provide novel mechanism for the purpose of automatically stopping the drum in case the downward movement of the car should happen to be accidentally stopped by some obstruction in the well, and thus preventing the rope from getting tangled around or between any of the parts of the machine and preventing injury to the rope or to the machine or any of its parts.

The invention also has for its object to provide novel mechanism for automatically arresting the downward motion of the car, if the speed of such downward motion should be increased above the desired normal one, as may happen by the breaking of the downward-motion belt or from other causes.

To accomplish these objects my invention consists in the arrangement or combination of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 represents a side elevation of an elevator or hoisting device provided with my improvements. Fig. 2 represents a plan view, and Fig. 3 represents an end view, of the same. Figs. 4 and 5 represent, respectively, in plan and side elevation, the governor for automatically stopping the rope-drum if the car should descend too rapidly.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, Figs. 1, 2, and 3, *a* represents the base of an ordinary elevator or hoisting device, having standards or bearings *b b'*, in which is journaled the drum-shaft *c*, to which the grooved rope-drum *C* is secured. *d* represents the wire hoisting-rope, one end of which is secured to the drum *C*, and having its other end secured to the elevator-car, after

being guided over an overhead wheel or sheave, as is common in machines of this kind, the car and upper wheel being, however, not shown in the drawings.

To the drum *C* or its shaft *c* is secured the usual worm-wheel *E*, which is actuated by the worm *e'*, secured to the driving-shaft *e*, which is journaled in suitable bearings in the frame or base *a* in the ordinary manner.

To the worm-shaft or driving-shaft *e* is secured the fast pulley *f*, and on either side of the latter are loosely journaled on said shaft the pulleys *f'* and *f''*, as usual.

g is the brake-drum, secured to the worm-shaft *e*. *g'* is the brake-strap, secured in one end at *g''* to the base or frame *a*, or to any other stationary part, and having its other end secured in a suitable manner to the weighted brake-lever *G*, that is hung at *G'* and has attached to its free end the weight *G''*, as usual.

H and *I* are the shipper-bars, guided in bearings *a' a''* on the frame *a*, and provided with the usual belt-shippers *h* and *i*, as shown in Figs. 1, 2, and 3.

K is the shipper-wheel, which is actuated by means of a wire rope, said wheel being loosely journaled on the drum-shaft *c* and provided with pins *k k'* and curved plate *k''*, for actuating the projections *h'* and *i'* on the respective shipper-bars *H* and *I* in the usual manner. The wheel *K* has on its circumference a notch or recess *K'*, and projections *K'' K³* on each side of such recess, as shown in Fig. 1, adapted for actuating the brake-lever *G*, there being for this purpose employed, as usual, a lever *L*, pivoted at *a³* to the base *a*, said lever having its upper end *l* forced against the periphery of the wheel *K* by the brake-lever *G*, that presses on top of its shorter end, as is common in devices of this kind.

The machine as above described is well known in the art, and is only shown and described for the purpose of illustrating my improved automatic safety drum-stopping device, which is constructed as follows:

In bearings *m' m'*, secured to any stationary part of the machine, is located the shaft *m*, having secured to it the upwardly-projecting arms or levers *M' M''*, in the upper

ends of which is journaled the shaft N, as shown in the drawings. The said shaft carries the grooved roller *n*, which is adapted to turn with said shaft, but is free to move longitudinally thereon, the shaft being for this purpose preferably made square in section, as shown in detail in Figs. 4 and 5, and the hub of the roller *n* having a perforation corresponding to the shape of said shaft; but this is not essential, as the shaft may be cylindrical and provided with a longitudinal groove or a spline and the bore of the hub of the grooved roller *n* made accordingly, or in any other suitable or equivalent manner. The grooved roller *n* is normally caused to bear against the hoisting-rope *d* by means of the weighted lever or arm *M*³, attached to or forming a part of one of the levers *M'* *M''* or any of their connections, and provided with an adjustable weight *M*⁴, as shown in Figs. 1, 2, and 3.

m'' is a stay or rod secured to the rock-levers *M'* *M''*, and on said rod is pivoted the link, rod, or lever *m*³, as shown in Figs. 1, 2, and 3, said lever having its inner end connected to a crank *o*, attached to a pin or shaft *o'*, journaled in the standard *b'* or other suitable stationary part of the machine, and to said pin *o'* is attached the arched plate *o''*, which is normally held in the position shown in Fig. 1 by the influence of the taut rope *d*, acting on the pulley *n* and its connections to the crank *o*, and when in this position it serves to hold a pawl *p* raised from engagement with the teeth of the ratchet-wheel *c'*, that is secured to the drum-shaft *c*. The pawl *p* is pivoted on a pin or stud *p'*, secured to the shipper-wheel K.

b'' is an arched plate similar to the arched plate *o''* and forming a continuation of the latter, so as to permit the pawl *p* to ride over such plates when the wheel K is oscillated in starting or stopping the drum C without engagement with the toothed ratchet-wheel *c'*; but the said arched plate *b''* is stationary at all times, and is for this purpose secured to the standard *b'* or any other suitable part of the machine.

The operation of this device is as follows: During the descent of the elevator-car the drum C, worm-wheel E, and ratchet-wheel *c'* rotate together in the direction shown by arrow in Fig. 1. The down belt is during this motion on the fast pulley *f*, being guided onto the latter by the belt-shipper *i*, as shown in Figs. 1 and 2, and the friction on the brake-drum *g* is relieved by the projection *K*³ on the wheel K, acting on the lever L, by which the latter is tripped sufficiently to raise the outer end of the weighted brake-lever G, as shown in Figs. 1 and 3. As long as the rope *d* is taut the pawl *p* is held disengaged from the ratchet-wheel *c'* by means of the grooved pulley *n* and its connection to the arched plate or shield *o''*, as shown in Figs. 1, 2, and 3. If during such descent of the car the latter should be accidentally arrested by any ob-

struction in the well, or otherwise, the rope *d* will instantly slacken, causing the levers *M'* *M''* to be swung toward the left in Fig. 1 by the influence of the weight *M*⁴, and causing the curved plate *o''* to be lowered sufficiently to allow the pawl *p* to drop between two of the teeth on the ratchet-wheel *c'*, by which a rotary motion is at once imparted to the shipper-wheel K, causing it to move in the same direction as the drum C until it has caused the shipper-bar I and its shipper *i* to move sufficiently toward the right in Fig. 1 for guiding the down belt onto the loose pulley *f''*, by which the drum C is stopped from rotation, and at the same time the brake put on the drum *g* by the release of the weighted lever G'', caused by the upper end of the lever L entering the recess *K'* on the shipper-wheel K, thus automatically stopping the drum C and preventing its rope *d* from entanglement, as above described.

In elevator-motors it sometimes happens when the down belt is on the fast pulley *f*, as shown in Fig. 1, that the downward motion of the car is unduly increased above the desired normal speed, and for the purpose of automatically stopping the car in such case I use, in connection with the device already described, an auxiliary device controlled by a governor, as follows: To the shaft N is pivoted at *n'* the ball-levers *q* *q*, to the ends of which are attached the balls Q Q, as is common in ball-governor devices. The levers *q* *q* are suitably connected to wings *r* *r* on a block or hub *r'*, loosely journaled on the shaft N, and between said hub and the pivot *n'* is located on the said shaft a coiled spring R, as shown in detail in Fig. 4. The hub *r'* has a cylindrical extension *r''*, terminating as a tapering or conical end *r*³, the smaller end of which is normally held against the upper end of the lever *M'* by the influence of the spring R when the shaft N is at rest or rotated with a normal speed. The link or lever *m*³ has an upwardly-projecting arm *m*⁴, which is normally made to rest against the outer surface of the cylindrical collar *r''*, as shown in Figs. 1, 2, 3, and 4. In case the speed of the drum C should increase above its normal one during the descent of the car, a corresponding increase of speed will be imparted to the shaft N by the rope *d* bearing against the grooved roller *n*, causing the balls Q Q to expand, and causing the block *r'*, with its collar *r''* *r*³, to be moved toward the right in Figs. 4 and 5, and causing the upper end of the arm *m*⁴ to be moved by its own gravity and that of its connections against the reduced end of the shaft N, thereby actuating the crank *o* and the curved plate *o''* in the same manner as hereinabove described, and causing the pawl *p* to engage between two of the teeth on the ratchet-wheel *c'*, by which a rotary motion is imparted to the shipper-wheel K in the direction shown by arrow in Fig. 1 until the down belt is shipped onto the loose pulley *f''* and the brake applied to the

drum *g*, as above mentioned, causing the hoisting device to be automatically stopped. When the hoisting device is thus automatically stopped, the pawl *p* is held in engagement with the ratchet-wheel *c'*, thus preventing the shipper-wheel *K* being turned, except in the direction shown by arrow in Fig. 1, by which the drum is set in motion for hoisting the car and the operative parts of the safety device returned to their normal positions (shown in the drawings) by means of the now taut rope *d* acting on the roller *N* and its connecting mechanism to the pawl *p*. The device thus serves as a positive stop for preventing the starting of the car downward after being stopped by the automatic device, it being first necessary to start the car upward, after which the obstruction in the well can be removed and the car operated up or down, as usual.

What I wish to secure by Letters Patent, and claim, is—

1. In an elevator, the combination of the cable-drum, a rotating shipper-wheel loosely mounted on the drum-shaft, a shipper-bar operated by the shipper-wheel, a ratchet-wheel fixed on the drum-shaft, a pawl pivoted to the rotating shipper-wheel, a plate which is movable to cause the pawl to engage and disengage the ratchet-wheel, a pivoted lever-frame having a shaft, a grooved roller slidable along the shaft and engaging the cable, and a lever and crank connection between the lever-frame and the plate to move the latter and lift the pawl on the shipper-wheel from engagement with the ratchet-wheel when the cable slacks, substantially as described.

2. In an elevator, the combination of the

cable-drum, a ratchet-wheel fixed on the drum-shaft, a shipper-wheel loose on the latter, a pawl curved by the shipper-wheel and engaging the ratchet-wheel, a movable pawl-support for causing the pawl to engage and disengage the ratchet-wheel, a pivoted and weighted lever-frame having a shaft, a roller movable along the shaft and engaging the cable, and means connecting the lever-frame with the pawl-support, substantially as described.

3. In an elevator, the combination of the cable-drum, the ratchet-wheel fixed to the drum-shaft, a shipper-wheel loose on the latter, a pawl carried by the shipper-wheel and adapted to engage the ratchet-wheel, a pawl-support for causing the pawl to engage and disengage the ratchet-wheel, a swinging lever-frame having a shaft, a roller on the shaft which engages the cable, a lever-connection between the swinging lever-frame and the pawl-support, a centrifugal governor on the shaft carrying the roller which engages the cable, and a lever connecting the governor with the lever-connection between the swinging lever-frame and the pawl-support to move the latter and cause the pawl to engage the ratchet-wheel when the speed of the cable-drum is unduly increased, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 13th day of April, A. D. 1889.

ZINA GOODELL.

Witnesses:

NATHL. A. HORTON,
WM. A. HORTON.