(No Model.)

H. GRAVES.

ELEVATOR.

No. 262,291. Patented Aug. 8, 1882.

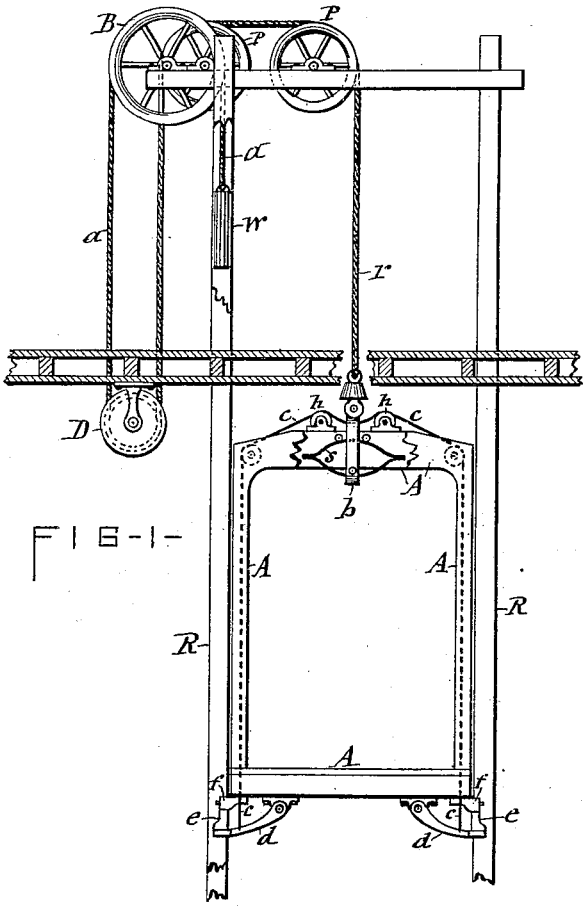

FIG-1-

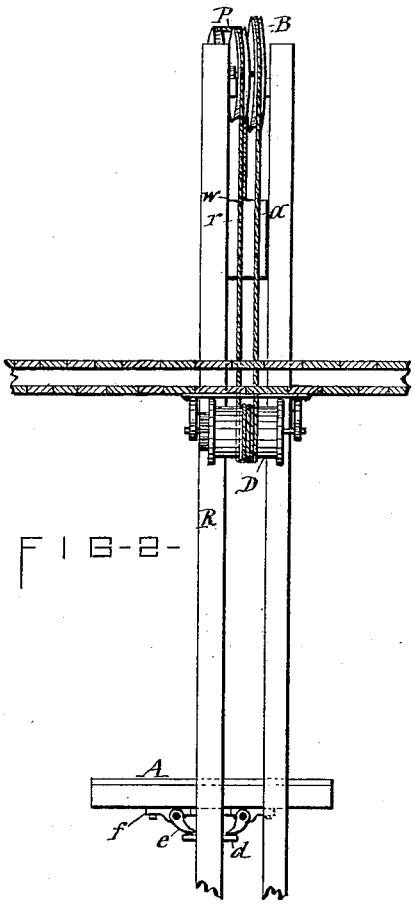

FIG-2-

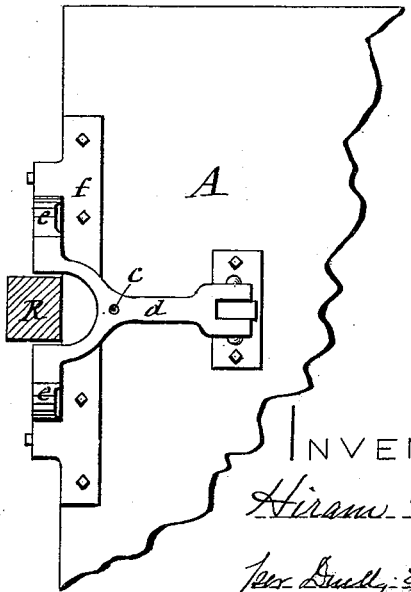

FIG-3-

WITNESSES —

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UNITED STATES PATENT OFFICE.

HIRAM GRAVES, OF SYRACUSE, NEW YORK.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 262,291, dated August 8, 1882.

Application filed April 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, HIRAM GRAVES, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Elevators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The nature of this invention consists in a novel arrangement, with a power-elevator, of a counterpoise operating directly on the drum or pulley which transmits the elevating power to the car or platform, by which arrangement the weight of the car or platform can be overbalanced without affecting the tension of the elevating-cable.

The invention also consists in a novel arrangement of a safety-clutch for arresting the descent of the car or platform in case of accidental breakage or disconnection of the elevating-cable, all as hereinafter more fully explained, and set forth in the claims.

In the annexed drawings, Figure 1 is a front view of an elevator provided with my improvements; Fig. 2, a side view of the same, and Fig. 3 an enlarged plan view of the under side of the safety-clutch.

Similar letters of reference indicate corresponding parts.

A denotes an elevator car or platform of ordinary construction, and *r* is the elevating-cable, which is connected to the top of the car A and extended over a pulley or pulleys, P, at the top of the elevator-shaft, and thence to the drum D, upon which it is wound, and which, by suitable gearing, receives motion from the motive power and transmits motion to the elevating-cable.

The car A of all power-elevators has heretofore been counterpoised by means of an extra rope or cable attached to the top of the car and extended over pulleys at the top of the elevator shaft or way and provided on its free end with a weight which had to be somewhat lighter than the car in order to maintain the elevating-cable at a tension and allow the car to descend by its gravity. Hence more or less dead weight had to be carried and a corresponding extra amount of power was required. To obviate this defect I apply the counterpoise to the drum or pulley which carries or transmits motion to the elevating-cable in the following manner: I wind the counterpoise-rope *a* around the drum D in a reverse direction from that of the elevating-cable *r* and extend it over a pulley, B, at the top of the elevator-shaft, and connect to its free end a weight, *w*, as heavy or even heavier than the car A, so as to effectually relieve the motor of all the dead weight of the car, and, if desired, also of a portion of its load. It will be observed that by this arrangement the elevating-rope *r* is maintained at a uniform tension and the car is allowed to descend by gravity.

In order to avoid the danger of entanglement of the cable *r*, incident to accidental stoppage in the descent of the car and simultaneous continuation of the rotation of the drum D, I make the elevating-cable *r* and counterpoise-cable *a* of one continuous piece, wound around the drum D a sufficient number of times to obtain the requisite frictional hold thereon, said drum being deprived of all rigid fastening for the cable. If then the car encounters obstructions in its descent, the resultant slack on the cable *r a* allows the drum D to rotate without carrying with it the said cable, the latter slipping on the drum and remaining dormant in its position.

To arrest the descent of the car in case of accidental breakage or disconnection of the elevating-cable, I employ the following instrumentalities: To the end of the elevating-cable *r*, I connect a pendent double strap or stirrup, *b*, which passes between the usual double head-block of the car and rests with its lower end against the bottom of an expansive spring, *s*, upon the top of which the car A is supported by its head-block. Through the upper end of the doubled strap *b* passes a rope, *c*, which is extended over pulleys *h h* upon the head-block at opposite sides of the strap *b*, and thence down the uprights or posts of the car and through the bottom of the same, underneath which said rope is connected with a lever, *d*, hinged to the under side of the car or platform A. This lever *d* is bifurcated to reach around to opposite sides of the vertical guide-rail R, and upon each of the extremities of the bifurcated lever rests the free end of the dog *e*, pivoted

to a stout metal bar, *f*, which is rigidly secured to the bottom of the car and is provided at its center with suitable bearings against opposite sides of the guide-rail, so as to effectually guide the bottom of the car.

The operation of the described safety-clutch is as follows: The car A, being supported by the spring *s*, causes a compression of said spring, and thus allows the strap *b* to draw partly up above the head-block of the car. In case the elevating-cable *r* breaks or becomes disconnected from the strap, the spring *s* is allowed to distend and the liberated lower half thereof draws down the rope *c*, which passes through the strap and over the rollers *h h*, as before described. Said draft on the rope *c* draws up the free end of the lever *d*, and this in turn throws up the dogs *e*, which are sharpened on the extremities and engage the sides of the guide-rail R and grip the same to such an extent as to effectually arrest the descent of the car A.

Having described my invention, what I claim is—

1. The combination, with the car A, cable *r*, and safety-grips adapted to engage the two guide-rails of the elevator-way, of the strap *b*, spring *s*, pulleys *h h*, and the rope *c*, passed through said strap and over the pulleys *h h*, and connected at its two extremities with the safety-grips respectively at opposite sides of the car, substantially as set forth and shown.

2. The combination, with the car A and cable *r*, of the strap *b*, spring *s*, pulleys *h h*, bifurcated levers *d d*, dogs *e e*, resting on the levers *d* and adapted to engage opposite sides of the guide-rails R R, and the rope *c*, passing through the strap and over the pulleys *h h*, and connected at its extremities with the levers *d d*, all constructed and combined substantially in the manner described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 14th day of April, 1882.

HIRAM GRAVES. [L S.]

Witnesses:
C. H. DUELL,
WM. C. RAYMOND.