(No Model.) 3 Sheets—Sheet 1.

M. J. O'DONNELL, W. C. SMITH & H. BOUND.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 478,169. Patented July 5, 1892.

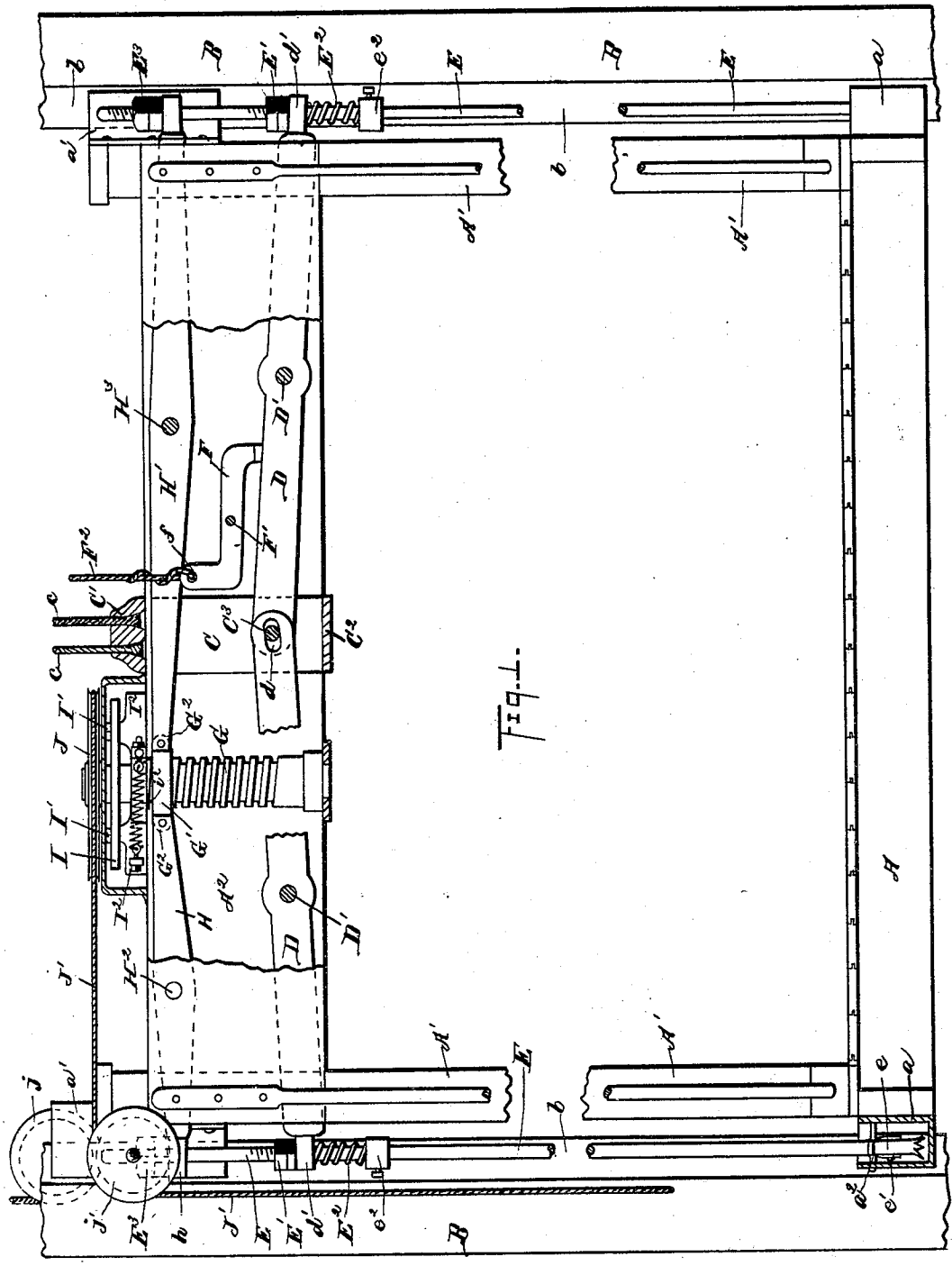

Fig. 1.

Witnesses.
Bell S. Evans
W. R. Edelen.

Inventors.
Martin J. O'Donnell
William C. Smith
Henry Bound.
By Leggett and Leggett Attorneys.

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M. J. O'DONNELL, W. C. SMITH & H. BOUND.

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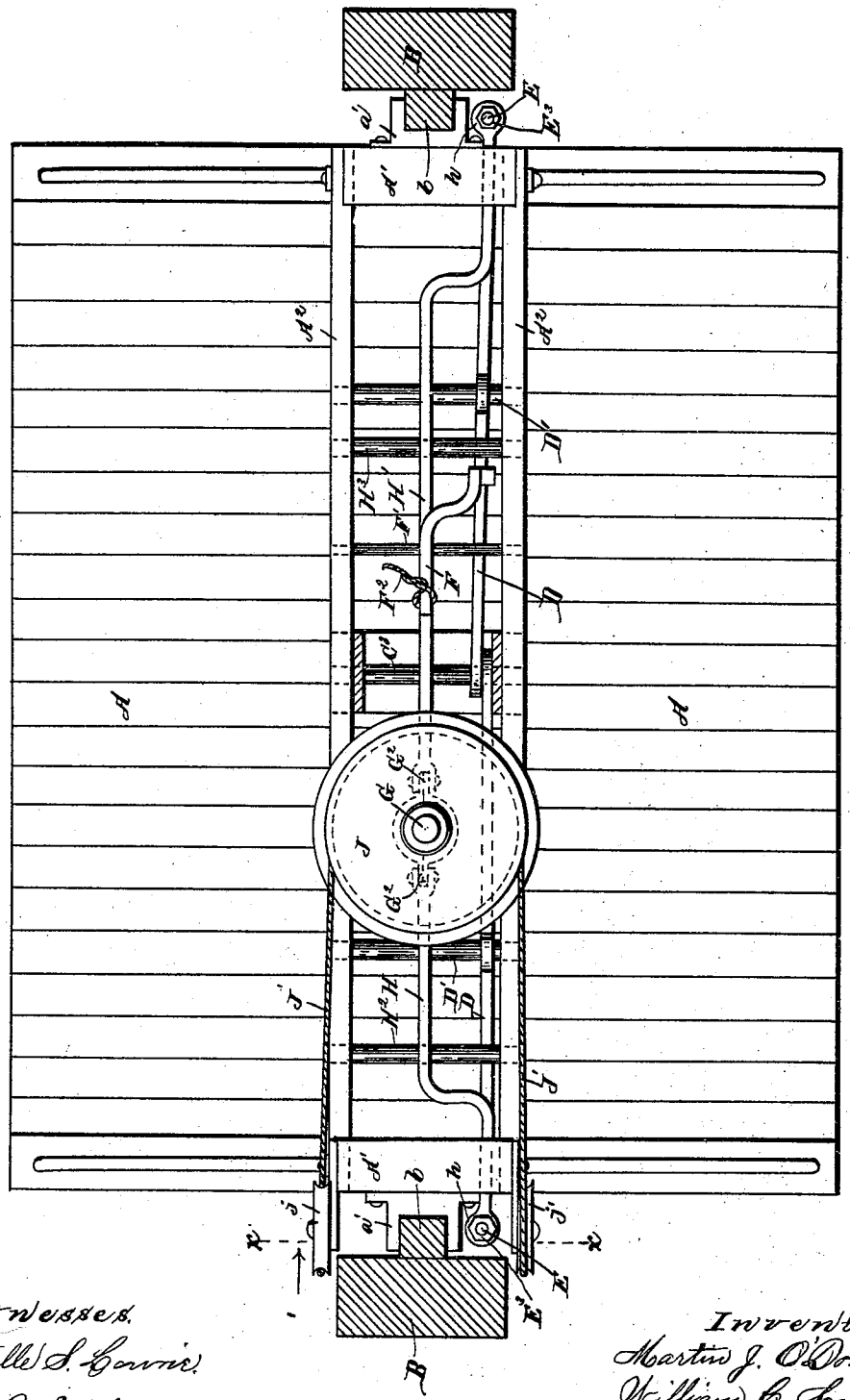

FIG. 2.

Witnesses.
Belle S. Connie.
W. R. Edelen.

Inventors.
Martin J. O'Donnell
William C. Smith
Henry Bound.
By Leggett and Leggett Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

M. J. O'DONNELL, W. C. SMITH & H. BOUND.

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Fig. 4.

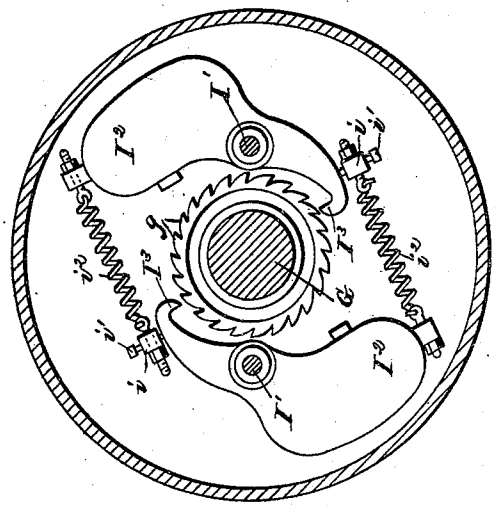


Fig. 5.

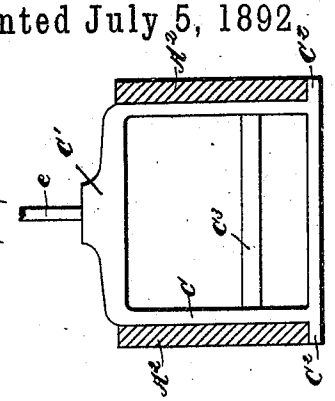
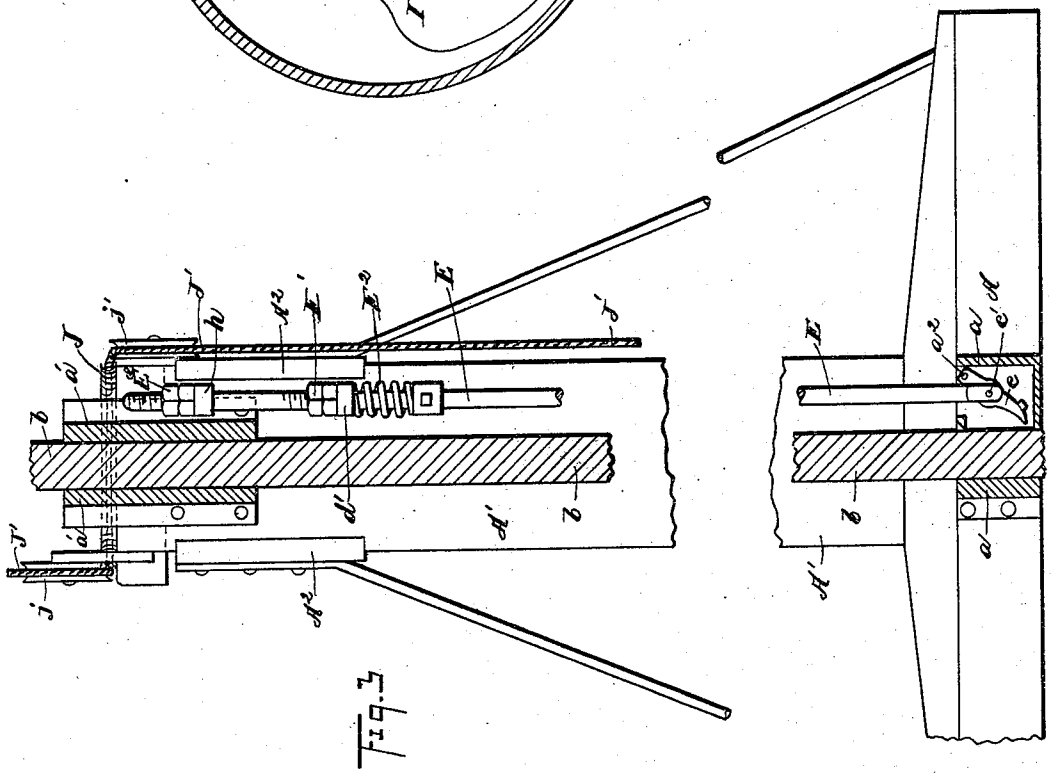


Fig. 7.



Witnesses.
Belle S. Lurie.
W. R. Edelen

Inventors.
Martin J. O'Donnell
William C. Smith.
Henry Bound.

By Leggett and Leggett. Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MARTIN J. O'DONNELL, WILLIAM C. SMITH, AND HENRY BOUND, OF CLEVELAND, OHIO.

SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 478,169, dated July 5, 1892.

Application filed May 10, 1890. Renewed May 6, 1892. Serial No. 432,081. (No model.)

To all whom it may concern:

Be it known that we, MARTIN J. O'DONNELL, WILLIAM C. SMITH, and HENRY BOUND, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety Attachments for Elevators; and we do hereby 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 pertains to make and use the same.

Our invention relates to improvements in safety attachments for elevators in which a governor operated by the motion of the elevator governs the safety-dog, causing the latter to stop the elevator in case the latter descends faster than its normal speed.

Our invention also relates to details of construction hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, portions being broken away to reduce the size of the drawings. Fig. 2 is a plan partly in section. Fig. 3 is an end elevation partly in section. Fig. 4 is an enlarged plan, partly in section, in detail. Fig. 5 is an edge view of yoke C detached.

The elevator in the main may be of ordinary construction, comprising a platform A and stiles A′, connecting the platform with the cross-beams A^2 A^2.

B B are the guide-posts, to which are attached the guides or ways *b b*, the latter being preferably of hard wood. To the outer sides of the stiles, at the top and bottom thereof, are attached metal shoes *a a′*, these shoes embracing ways *b*.

C is a metal yoke the body of which fits between beams A^2, the yoke having a hub or member C′ of considerable thickness for attaching the hoisting-cable *c*. This yoke at the bottom has laterally-projecting toes C^2, that engage the lower edges of beams A^2.

D D are levers located and operating between beams A^2, these levers being fulcrumed, respectively, on lateral pins D′, these pins connecting with beams A^2. The inner ends of levers D overlap each other side by side and are provided with elongated holes *d*, that accommodate a lateral pin C^3, this pin connecting with yoke C. The outer ends of levers D extend through mortises in the stiles and terminate in heads *d′*, pierced vertically for receiving with an easy fit, respectively, the upright rods E, these rods being provided with jam-nuts at E′ next above heads *d′*.

F is a lever fulcrumed on pin F′, the latter connecting with beams A^2. Lever F has an eye at *f* for attaching cable F^2. The other end of the lever is offset laterally, as shown in Fig. 2, so that the end thereof rests on the adjacent lever D. Cable F^2 extends to the top of the elevator-shaft, where it passes over a suitable sheave or sheaves, (not shown,) this cable having attached the ordinary counter-balance. (Not shown.)

To shoes *a* are pivoted at a^2 safety-dogs *e*, the side walls of these shoes having openings that admit of the toothed lower end of the dog engaging the way *b*. The lower ends of rods E are forked and embrace dog *e*, to which the rods are pivoted at *e′*. Springs E^2 are coiled around rods E, the upper ends of these springs engaging the under side of lever-heads *d′*. The lower ends of these springs rest upon collars e^2 of rods E, the tension of these springs tending to depress the rods. With the rods in their normal or depressed positions dogs *e* are held back, so as not to engage the ways. Hence so long as the hoisting-cables remain intact the dogs remain inoperative so far as being controlled by the hoisting-cable and cable F^2. In case the hoisting-cable should break the draft on cable F^2, through the medium of lever F, would depress the inner ends of levers D, causing the outer ends of these levers to move upward, whereby rods E would be elevated, causing the dogs to engage the ways and stop the descent of the elevator. It not infrequently happens that although the hoisting-cables do not break, yet through some imperfection of the motor or the governing mechanism thereof the elevator descends so rapidly as to endanger the lives of the operator and passengers. To remedy this difficulty, we provide a governing mechanism as follows: G is an upright screw-threaded spindle journaled above and below in suitable boxes connected with beams A^2. This spin-

dle is provided with an easily-fitting nut G′ having ears G^2 for attachment to levers H H′, these levers or the ears, or both, having holes for the connecting pin or bolt, the holes being slightly elongated in the direction lengthwise of the levers. Levers H H′ are fulcrumed, respectively, at H^2 H^3 on lateral pins connected with beams A^2. These levers extend through mortises in stiles A′, the outer ends of these levers terminating in heads *h*, pierced vertically for receiving rods E aforesaid, these rods next above head *h* being provided with jam-nuts at E^3. With such construction it is evident that if spindle G is turned in the direction to depress nut G′ rods E will thereby be elevated and cause dog *e* to engage the ways. On the upper end of the spindle is mounted loosely disk I and sheave J, these two members being rigidly connected—for instance, by suitable studs—so that they revolve in unison. A small cable J′, or rope, if preferred, is permanently attached to the timbers at the top of the elevator-shaft, and from thence leads down and under sheave *j*. From thence this cable leads around sheave J, and from thence leads over sheave *j′*, the axial studs of sheaves *j j′* being attached to the elevator. From sheave *j′* cable J′ extends down to near the bottom of the elevator-shaft, where it is provided with a weight (not shown) for holding the cable taut. With such construction it is evident that disk I and sheave J will rotate when the elevator is in motion. To disk I are pivoted at I′ centrifugal weights I^2 I^2. Operating in the same plane with these centrifugal weights is a small ratchet-wheel *g*, the latter being keyed fast to spindle G. The inner ends of these weights terminate in hook ends I^3, adapted, respectively, to engage the teeth of wheels *g*. Lugs *i* of disk I are provided with adjusting-screws *i′*, whereby hook ends I^3 are held in close proximity to the teeth of the ratchet-wheel. Coil-springs i^2 connect, respectively, with weight I^2 and with lugs *i*, the tension of these springs tending to hold the centrifugal weight from flying outward, except when disk I is revolved above its normal speed. The arrangement is such that if the elevator descends too rapidly, thereby causing an abnormal speed of disk I, weights I^2 from centrifugal force will throw outward, thus causing the hook ends of these weights to engage the ratchet-wheel and turn spindle G in the direction to depress nut G′. This, and by means of the connecting mechanism already described, will cause dog *e* to engage ways *b* and stop the descent of the elevator. This governing mechanism is quite sensitive, so that a slight increase in the speed of the elevator above its normal speed will result in stopping the descending elevator. We have, then, safety-dogs adapted to stop the descending elevator in case the hoisting-cable should break and a separate governing device for rendering the dog operative in case the elevator descends faster than its normal speed.

We are aware that it is not new to employ safety-dogs adapted to engage the elevator-ways upon the breakage of the hoisting-cable, and hence we do not claim such mechanism broadly, but only claim our peculiar construction thereof.

What we claim is—

1. The combination, with an elevator-car, ways between which the car travels, operating-rods, and dogs actuated by the operating-rods, of a screw, a nut thereon, levers engaging the nut and connected to the operating-rods, a pulley loose on the screw, dogs for locking the pulley to the screw when an abnormal speed of the car is attained, and means for rotating the pulley while the car is in motion, substantially as set forth.

2. The combination, with an elevator-car, ways, operating-rods, dogs, and two sets of levers fulcrumed on the car and connected with the rods, of an operating-lever adapted to engage one set of levers in case the hoisting-cable is broken to apply the dogs, a screw operatively connected with the other set of levers, a governor on said screw, adapted to rotate the latter when an abnormal descent is attained, and a stationary cable or rope connected with the car and adapted to keep the governor in motion, substantially as set forth.

In testimony whereof we sign this specification, in the presence of two witnesses, this 2d day of May, 1890.

MARTIN J. O'DONNELL.
WILLIAM C. SMITH.
HENRY BOUND.

Witnesses:
CHAS. H. DORER,
WILL B. SAGE.