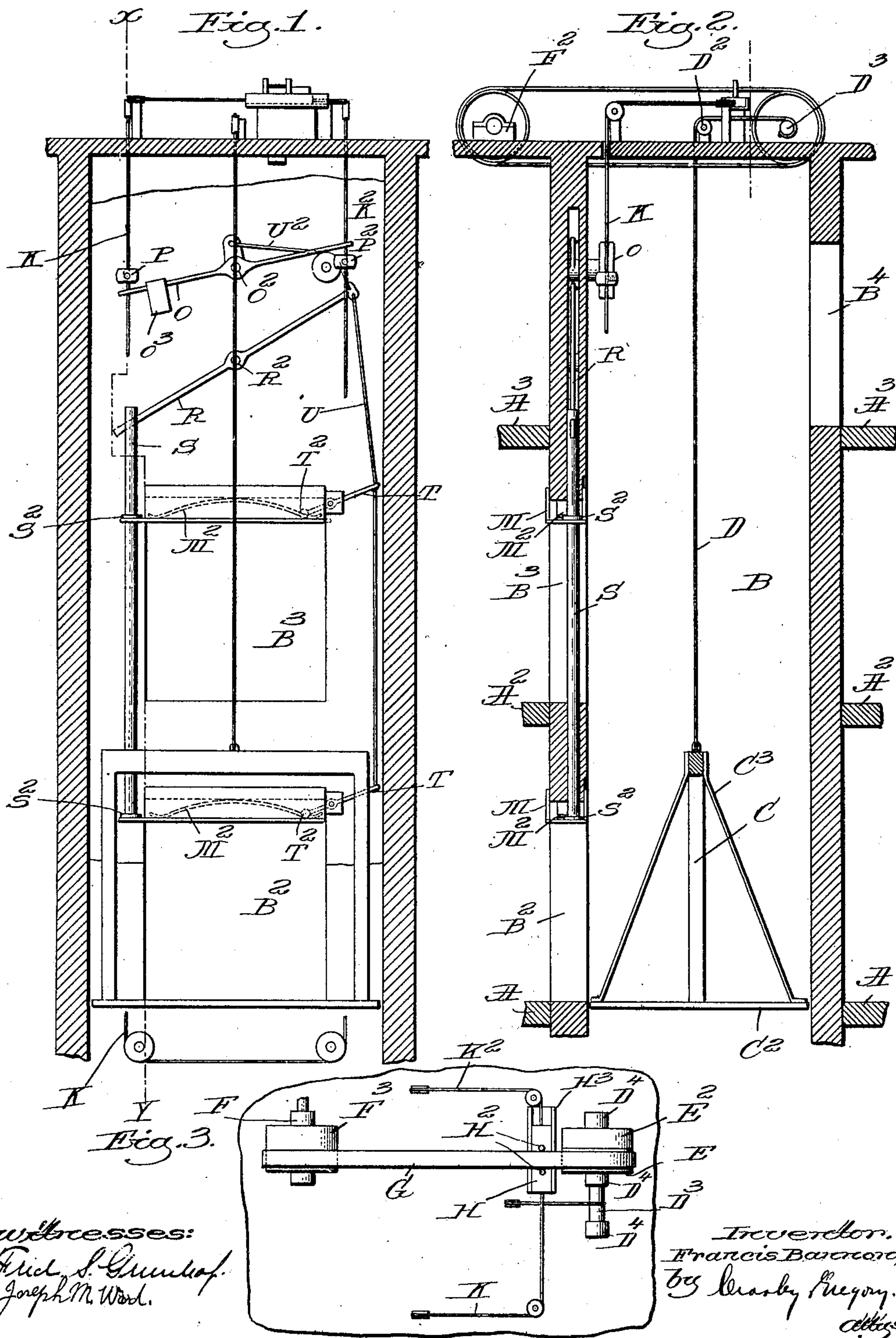


F. BANNON.
SAFETY DEVICE FOR ELEVATORS.
APPLICATION FILED MAR. 10, 1908.

925,074.

Patented June 15, 1909.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 4.

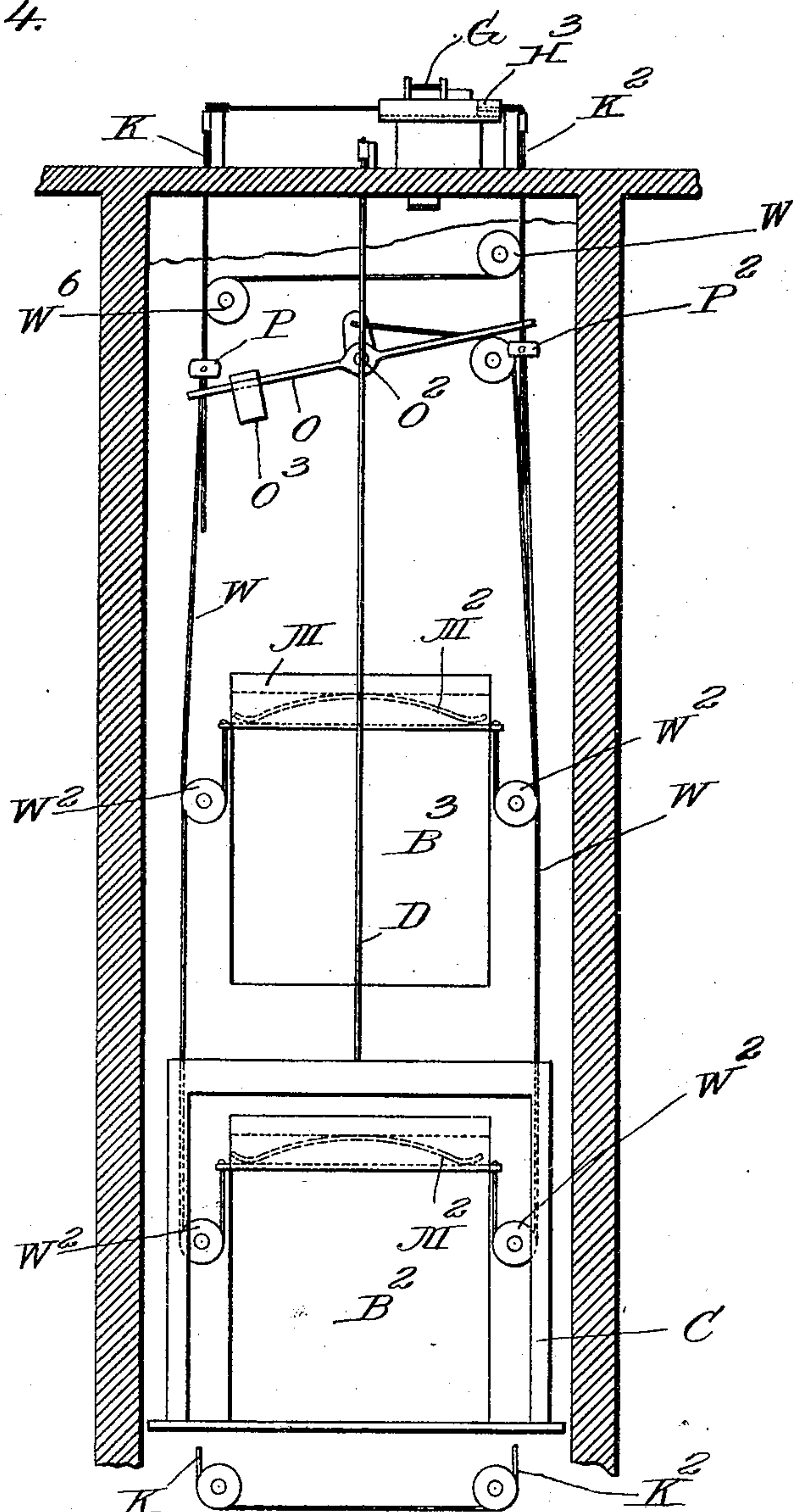
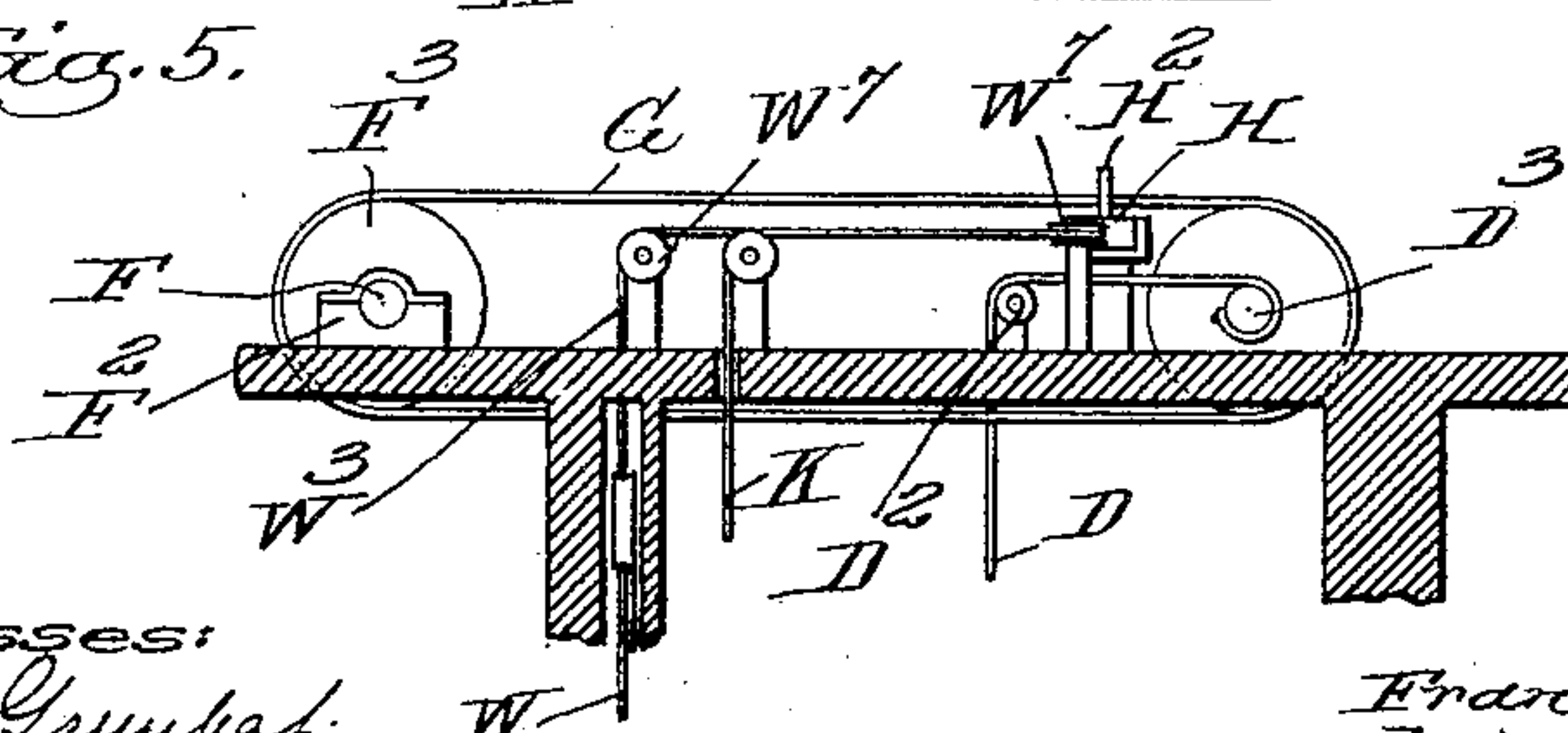


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS BANNON, OF BURLINGTON, MASSACHUSETTS.

SAFETY DEVICE FOR ELEVATORS.

No. 925,074.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed March 10, 1908. Serial No. 420,152.

To all whom it may concern:

Be it known that I, FRANCIS BANNON, a citizen of the United States, and a resident of Burlington, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Safety Devices for Elevators, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to a safety device for an elevator and has for its purpose the securing of the stopping of the elevator car whenever an object carried by the upwardly moving car projects into the well opening.

Serious accidents have occurred to persons riding on elevators, and in particular freight elevators, by the foot, leg, or other portion of the body being caught between the platform of the upwardly moving car and the lintel of the door opening in the wall of the elevator, and much injury has been done to the elevator and articles carried thereon by the articles protruding and being caught in like manner.

The object of this invention is to prevent such injury and such accidents by securing the immediate stopping of the car whenever an object protrudes into the well opening so as to be caught between the car and the lintel.

The invention involves a controller within the well opening and preferably a vertical yielding cap-piece or lintel, and means to stop the car by engagement of this controller with an object projecting into the well opening and moving upwardly with the car.

The invention will more fully appear from the accompanying description and drawings and will be particularly pointed out in the appended claims.

The drawings illustrate a portion of a building showing an elevator well, an elevator car therein, and so much of the mechanism concerned therewith as secures the lifting of the elevator car and the features of this invention. The mechanism shown for lifting the elevator car is of a simple type, and the mechanism for securing the lowering of the elevator car is not shown, not being involved herein.

In the drawings, Figure 1 is a vertical elevation of the interior of the elevator well and adjacent walls, looking toward one of the walls containing the door openings. Fig. 2

is a vertical section through the elevator well taken transversely of Fig. 1, and on the line $x-y$ of said figure. Fig. 3 is a top plan view of the construction shown in Figs. 1 and 2. Fig. 4 is a view similar to Fig. 1 of a modification; Fig. 5 is a vertical section of a portion of the construction shown in Fig. 4 and taken transversely thereof.

The construction illustrated is that of a simple form of freight elevator. The floors of the building are represented at A, A^2, A^3 . Opposite walls of the elevator well B are shown as provided with door openings, three of such openings being shown at B^2, B^3, B^4 .

The elevator car is shown at C , comprising the common form of flat platform C^2 , and upright frame C^3 .

A rope D extends upwardly from the elevator car over an idler pulley D^2 , to a winding shaft D^3 , so that as the rope D is wound or unwound upon the shaft D^3 the car is raised or lowered.

The means for raising and lowering the car are here shown as of a very simple form, and for convenience are shown at the top of the elevator well. The shaft D^3 , mounted in suitable bearings D^4 , carries a fast pulley E , and a loose pulley E^2 . A shaft F is mounted in suitable bearings F^2 , and driven from any suitable source of power. This shaft F is provided with a pulley F^3 , and a belt G runs from the pulley F^3 to the fast and loose pulleys E and E^2 .

A belt shifter is provided by means of which the belt G is shifted on the pulley F and from the fast to the loose pulley as desired. This belt shifter is shown as consisting of a sliding plate H , having upwardly projecting pins H^2 , between which the belt passes, so that as the plate H is slid in one direction or the other in a guideway H^3 the belt G will pass from one to the other of the pulleys E, E^2 .

The belt shifter is shown as operated from the car by means of ropes K, K^2 , connected at opposite ends to the slide H^3 , and passing over idler pulleys down through the elevator well on opposite sides. These ropes are usually connected or form one continuous rope, as shown at the bottom of Figs. 1 and 3, so that upon pulling upwardly or downwardly upon one or the other of these ropes the belt G will be shifted in the desired direction to stop the car or cause it to be raised.

At or near the top of each opening in the

elevator wall which is passed by the car is mounted a controller which in its preferred form is embodied in a vertically yielding cap-piece or lintel. Such cap pieces M are shown in connection with the openings B², B³, as consisting of hollow, box-like frames, preferably simulating the usual upper finish of the frame of the opening, and having a limited up and down movement. These cap-pieces are preferably held downward by some form of spring, a curved spring M² being illustrated. This spring is of sufficient strength to maintain the cap-piece in normal position, but yields readily whenever any object is caught between the cap-piece and the car of the elevator.

The controller or cap-piece may be connected with the mechanism for stopping the operation of the car, or may act to secure that result through any form of mechanism. Two such forms are herein illustrated, the preferred form being shown in Figs. 1, 2 and 3 and another form in Figs. 4 and 5, and this mechanism may be located within the wall of the elevator well so as to leave the well practically free and unobstructed.

A three-arm lever O is pivotally mounted at O² in the wall of the elevator well, and forked at its ends to allow the ropes K, K² to pass therethrough and stops P, P² are attached to the ropes K, K², the one above and the other below the ends of the lever O, so that the lever when moved in one direction will act through the ropes to shift the belt and stop the car. The lever O is preferably weighted as shown at O³ to maintain it normally out of engagement with the stops P, P².

In the preferred form shown in Figs. 1, 2 and 3 lever R is pivoted at R² above the uppermost opening, and has one end loosely engaging a vertical bar S, running past each cap-piece M and provided with a stop S², arranged to rest on the cap-piece when the parts are in normal position. Short levers T are pivoted at each opening on the wall, and rest preferably by means of an anti-friction roller T² upon the cap-piece, and the ends of these levers are connected by a rope or chain U with the end of the lever R, and the same end of the lever R is in turn connected by a rope U² with the short arm of the three-arm lever O. It will thus be seen that whenever any object protrudes into the well opening while moving upwardly with the car that it will come into contact with the cap-piece M, raise it against the action of the spring M², lifting either the bar S or rocking the lever T, or operating both according to where the object strikes the cap-piece, and that thereupon the rope U is pulled downwardly and rocks the lever O, which in turn acts upon the ropes K, K² to shift the belt from the

fast to the loose pulley, at once stopping the car.

In the form of mechanism illustrated in Figs. 4 and 5 ropes W are shown running from each end of the cap-piece M downwardly under idler pulleys W², and then upward around idler pulleys W⁶ and uniting in one rope W³ carried around idler pulley W⁷ and connected to the same end of the slide H² as the rope K². The operation of this mechanism will be apparent for upon the upward movement of the controller M at any point the rope W³ will be pulled downwardly and the belt shifted as before.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A safety device for elevators, comprising an elevator well having the usual opening, a vertically yielding rigid cap-piece for said opening, a car, means for lifting the car, mechanical connections between both ends of said cap-piece and said lifting means whereby upon the engagement with the cap-piece at any point thereof of an object projecting into the well opening and moving upward with the car the movement of the cap-piece acting through said connections will stop the upward movement of the car.

2. A safety device for elevators, comprising an elevator well having the usual opening, a vertically movable cap-piece for said opening, a spring for maintaining said cap-piece in its lowermost position, a car, means for lifting the car, a lever pivoted above said opening and connected with the lifting means, a direct connection between one end of said cap-piece and one end of said lever, an auxiliary lever pivoted near the opposite end of said cap-piece and operable thereby, a connection between the other end of said main lever and the other end of said auxiliary lever whereby upon the upward movement of the cap-piece by an object contacting therewith at any point thereof the said main lever will be rocked to act upon the lifting means and stop the upward movement of the car.

3. A safety device for elevators, comprising an elevator well having a series of the usual openings, a vertically yielding cap-piece for each opening, a car, means for lifting the car, a lever pivoted above the uppermost opening and connected with the lifting means, a rod connected to one end of said lever and extending past and in contact with one end of each cap-piece, whereby upon the upward movement of any cap-piece at that end the rod will be lifted to rock the lever, auxiliary levers pivoted at each of the opposite ends of said cap-pieces and bearing thereagainst, a connection between the ends of said auxiliary levers and the other end of

said main lever, whereby upon the upward movement of the end of the cap-piece adjacent said auxiliary lever said auxiliary lever will be rocked to pull on said connection to
5 operate said main lever, the operation of the main lever in either case acting upon the lifting means to stop the upward movement of the car.

In testimony whereof, I have signed my name to this specification, in the presence of 10 two subscribing witnesses.

FRANCIS BANNON.

Witnesses:

MABEL PARTELOW,
THOMAS J. DRUMMOND.