

(No Model.)

F. P. HINDS.

AUTOMATIC SAFETY GUARD FOR ELEVATORS.

No. 322,452.

Patented July 21, 1885.

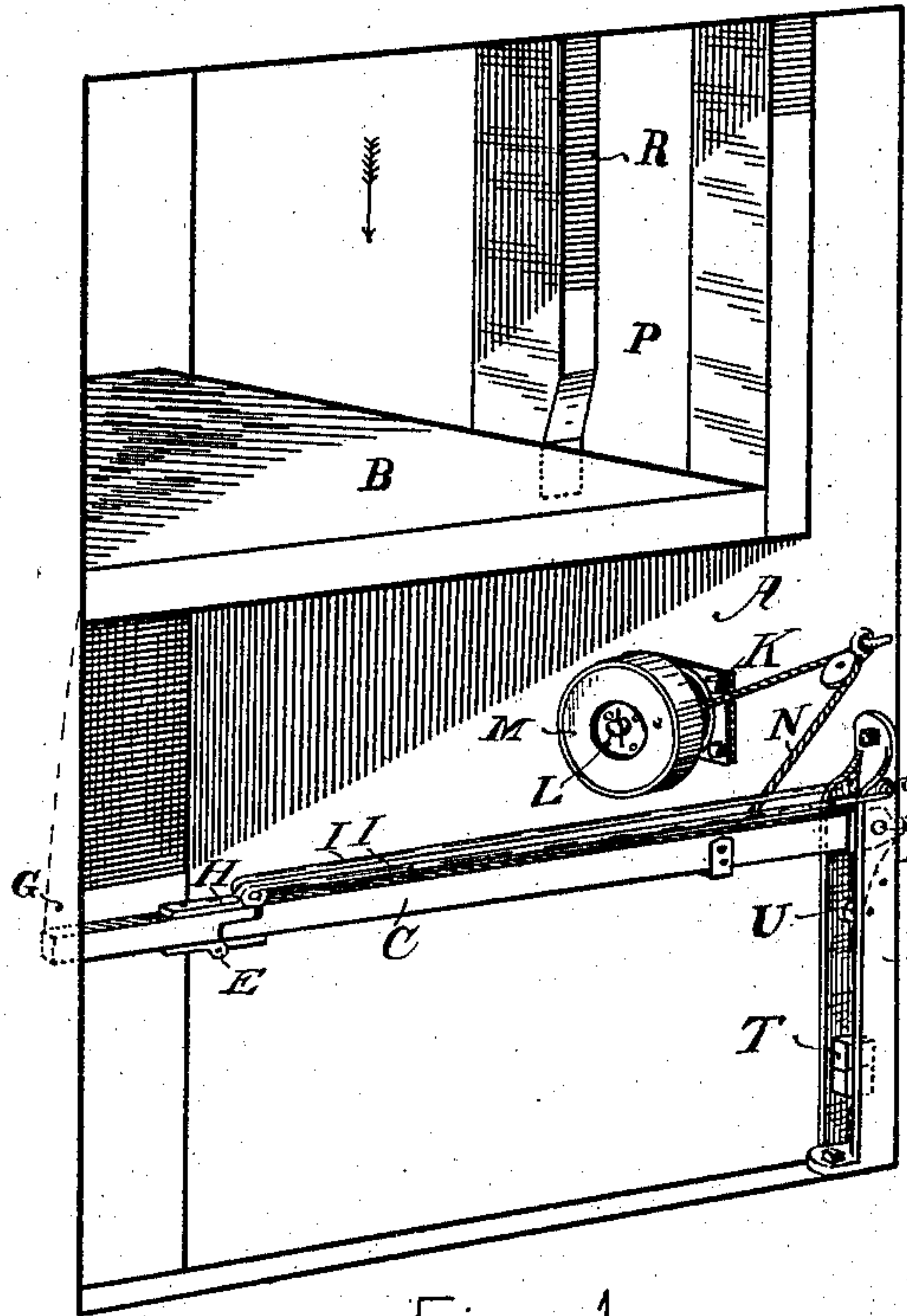


Fig. 1.

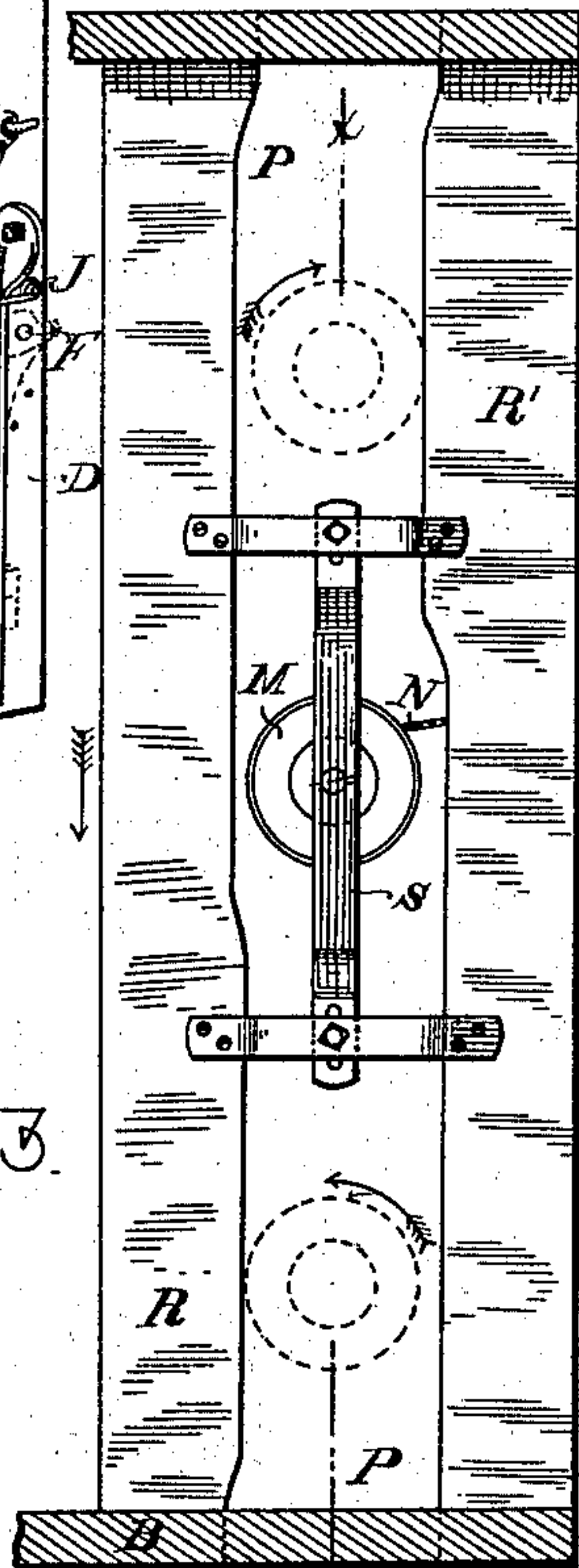


Fig. 3.

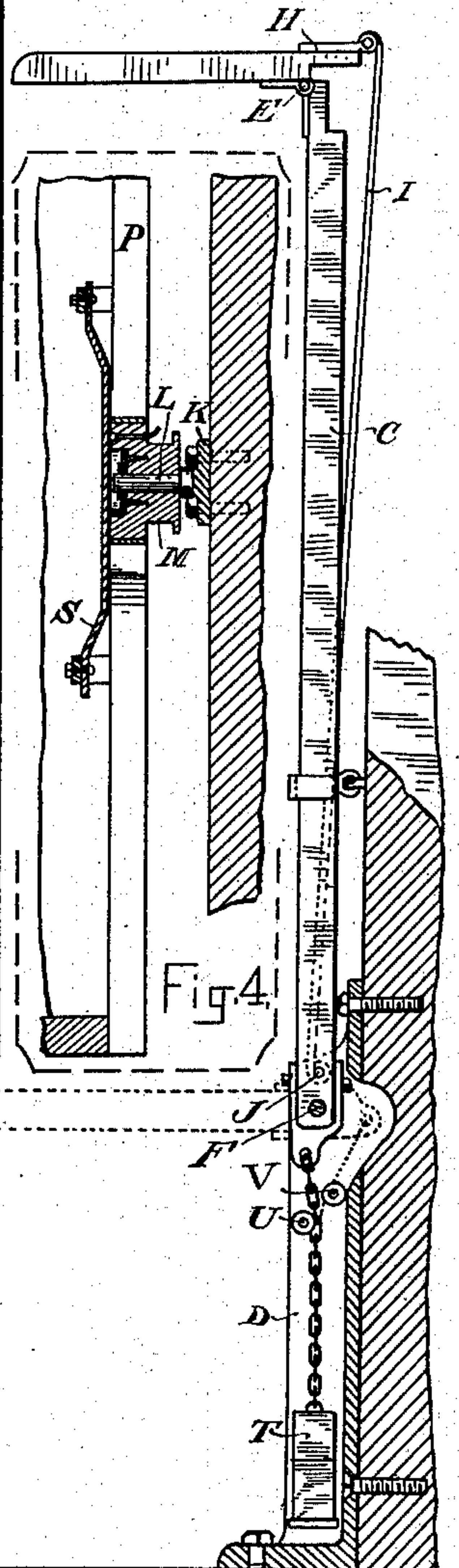


Fig. 4.

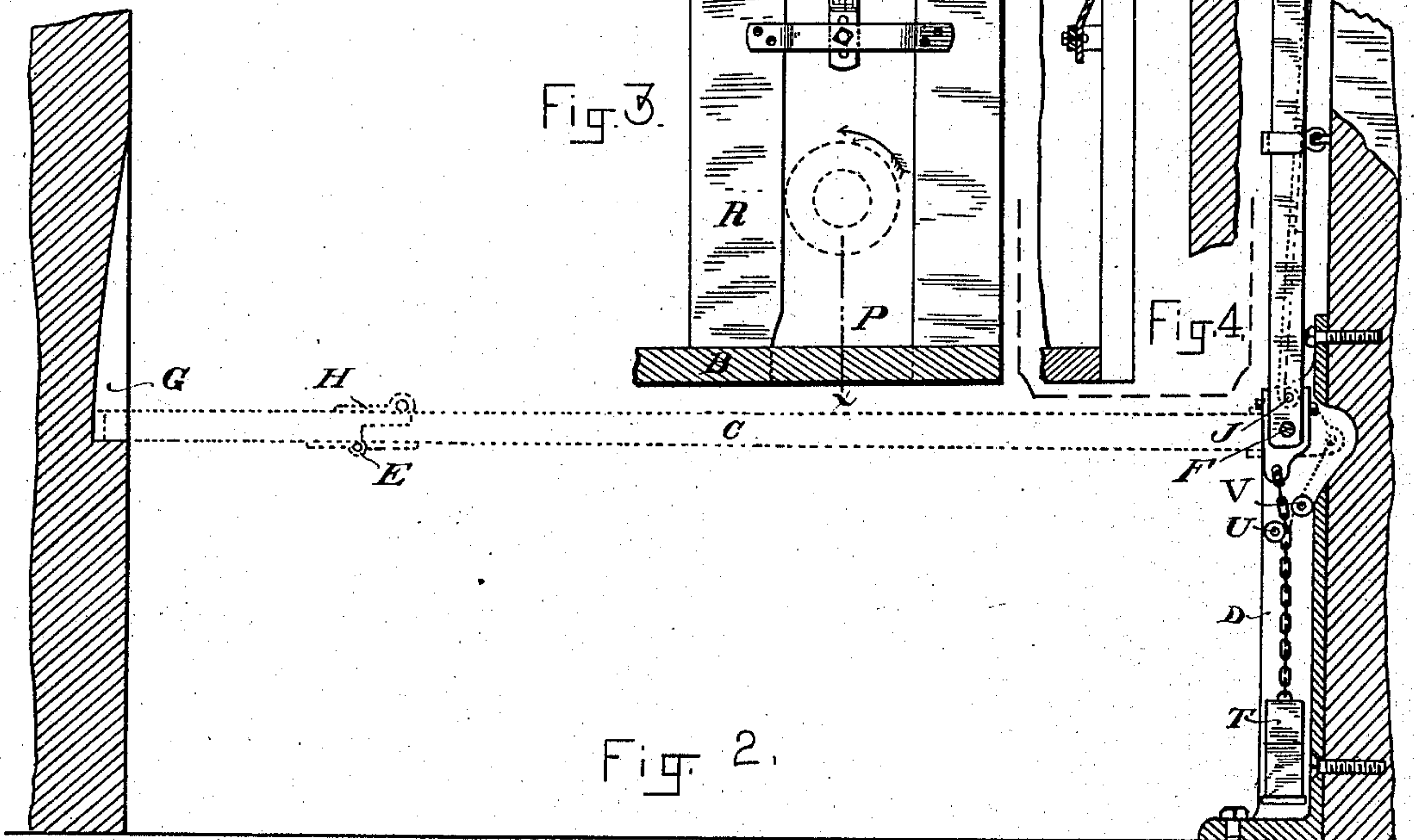


Fig. 2.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY-GUARD FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 322,452, dated July 21, 1885.

Application filed May 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN P. HINDS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Automatic Safety-Guards for Elevators, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

My invention relates to automatic safety-guards for elevators; and it consists in the construction and combination of the divers devices embodied therein, as hereinafter more fully and particularly set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view showing an elevator-guard embodying my invention, and representing the car descending from an upper story and approaching my improved devices, arranged to be operated thereby to raise and lower the entrance guard or bar. Fig. 2 is an enlarged sectional side view of the guard shown in its vertical and open position; also by dotted lines in its horizontal and closed position. Fig. 3 is a view of a detached portion of the side of the car, as seen from the inside thereof, showing the irregular groove or channel which runs up and down the side of the car, and serves to operate the guard-wheel as the car moves up and down the well; also showing the retaining-spring, by which the guard-wheel or pulley is kept from turning when not in contact with the sides of said groove. Fig. 4 is a vertical section taken as on line $x x$, Fig. 3, through the guard-operating wheel or pulley and retaining-spring.

A represents one of the side walls of the elevator-well. B is the elevator-car, which may be raised and lowered by any of the well-known means usually employed for that purpose. A jointed bar or guard, C, is pivoted to a standard or bracket, D, secured at one side of the entrance or doorway leading to the car, and is arranged to be raised and lowered by turning it on its pivoted support to open and close the passage-way to the car, as shown in Figs. 1 and 2.

The peculiar construction and arrangement of bar C, and the novel means employed for actuating it, constitute the chief features of

my present invention. Bar C is in two parts, pivotally connected at E. The long arm of this jointed bar is pivoted in bracket D at F; and when the bar is serving as a guard, as in Fig. 1, the outer end of the short arm rests in a notch or recess, G, in the opposite side of the doorway. A plate, H, having ears to which rods II are pivotally attached, is secured to the short arm of the guard, as shown. These rods I are also pivoted to bracket D at J. By means of rods I thus pivoted, the short arm of the guard, when the bar is raised to its vertical position, as shown in Fig. 2, is turned to the horizontal position shown, thus shortening the bar to accommodate it to low-studded doorways where the height is not in proportion to the width, as is frequently the case, particularly in freight-elevators. To the wall A is firmly secured an iron plate, K, having a projecting spindle, L, Fig. 4, upon which is mounted loosely the guard-wheel or pulley M, secured lineally thereon by a pin through the outer end of the spindle, as shown. The outer portion of this wheel serves as a friction-pulley, operated, as will be described, by the groove on the side of the car, while the inner portion is reduced in diameter, and serves as a drum upon which the guard chain or cord is wound when the pulley is thus operated. The chain N is secured at one end to the drum or pulley, and, being passed over or through a suitable intermediate guide, is attached at its opposite end to the guard C, as shown in Fig. 1.

Upon the side of the elevator-car adjacent to pulley M an irregular vertical groove or channel, P, is formed. This groove in the planking upon the side of the car is formed with reference to the movement of the car and the fixed position of pulley M, so that the axis of the pulley will be central to the path of the groove as the latter passes by the movement of the car up and down over and in contact with the periphery of the pulley. When the car in descending upon the pulley, as represented in Fig. 1, has reached the position where the pulley is within groove P, the side R, Fig. 3, of said groove will be in contact with the periphery of the pulley, as indicated by the dotted circle representing the pulley at that point, and as the car continues its de-

5 scent the frictional contact between the side R
 of the groove and the periphery of pulley M
 will cause the pulley to be rotated in the direc-
 tion indicated, and the chain N to be wound
 upon its drum, and thereby guard C will be
 raised to its vertical position, as shown in Fig.
 2, and thus the passage-way to the car will be
 unguarded and opened at the time the car
 reaches its proper place at the landing to re-
 10 ceive freight or passengers. The frictional
 contact-edges R of the groove may be covered
 with leather or other suitable material to pro-
 duce a proper friction-surface thereon. It is
 necessary or desirable to allow a free move-
 15 ment of the car to some extent (according to
 the construction and manner of using the ele-
 vator to which this guard is applied) without
 moving the guard. Therefore groove P is so
 widened at its middle portion, as shown in
 20 Fig. 3, that its sides do not come in contact
 with pulley M for a limited distance, accord-
 ing to the requirements of the elevator to
 which it is applied. During this interval of
 rest of pulley M in groove P a spring, S, is
 25 employed to act against the front face of the
 pulley, Figs. 3 and 4, with sufficient force and
 duration of frictional contact to retain the
 pulley in the position which it was left in by
 the side of the groove last in contact with it,
 30 and thus to restrain it from turning and
 yielding to the strain of the guard, which is
 so arranged as to have a tendency to fall from
 its vertical into its horizontal position. This
 spring is secured at its ends to two bars ex-
 35 tending across groove P, attached to the in-
 ner face of the planking, as shown in Fig. 3,
 and moves with the car, being bent backward
 into the groove, and arranged so as to come in
 contact with the pulley at the proper time to
 40 accomplish the purpose stated. As the car
 moves downward, and spring S is thereby car-
 ried past and out of contact with pulley M,
 side R' of groove P comes into contact with
 the periphery of the pulley, as indicated by
 45 the upper dotted circle in Fig. 3, and by such
 frictional contact turns the pulley in the direc-
 tion there indicated, thereby unwinding chain
 N, and allowing the guard to gradually fall
 into its horizontal guarding position. (Shown
 50 in Fig. 1.) The several stories being provided
 with like guards, the car passes downward,
 leaving the doorway just passed guarded, as de-
 scribed, and encounters and operates in like
 manner the guard on the next floor below, and
 55 in its upward movement, by a reversal of the
 order of contact with and direction of rotation
 of the guard-pulleys, it accomplishes the suc-
 cessive opening and closing of the guards on
 the various floors in the manner described.
 60 Guard C is counterweighted in brackets D
 to facilitate its movement. A weight, T, is
 suspended by a chain from the end of said
 bar, Fig. 2, the chain passing between and
 alternately over two small pulleys, so ar-
 65 ranged that when the bar is vertical the chain
 draws over pulley U with a tendency to throw

the bar forward; but as the bar falls it changes
 the position of the chain so that it draws over
 pulley V, as indicated by a dotted line, and
 thus, by its attached weight T, it counter- 70
 acts the falling bar, restraining its movement
 downward and relieving the strain thereof on
 chain N, and also serves to facilitate the rais-
 ing of the bar. The diameter of pulley M
 and the length of chain or cord wound upon 75
 its drum are proportioned to the length of
 one of the contact sides R of groove P, and
 the requisite amount of take-up to raise bar
 C by winding from its horizontal to its verti-
 cal position. 80

In addition to its being unusually simple,
 cheap, durable, and reliable, this friction
 safety-guard movement is much superior, in
 point of safety, to a positive movement oper- 85
 ating by means of gearing or other unyielding
 devices, as in all such guards there is liability
 of persons and things being accidentally caught
 in the movement of the guard, in which case my
 device, although being operated with suffi- 90
 cient power by said frictional contact of the
 car and guard-pulley to secure perfect action
 of the guard, yet in case of such accidental
 obstruction it will yield by the slipping of the
 car upon the pulley, and thus avoid damage
 or injury to the article or person so obstruct- 95
 ing it, or injury to or derangement of the
 guard itself, whereas a positive movement of
 the guard under like circumstances would
 most likely be attended with serious conse-
 quences. 100

I claim—

1. The combination of a movable guard,
 adapted to extend, when closed, across the
 passage-way to an elevator-car, with a com-
 bined friction-wheel and drum mounted upon 105
 a fixed axis, a car provided with means for
 actuating said wheel by direct frictional con-
 tact, and a cord directly connecting the wheel
 and drum with the guard, whereby the move- 110
 ment of the car causes the rotation of the
 wheel, the winding and unwinding of the cord,
 and the raising and lowering of the guard,
 substantially as described.

2. The combination of a movable guard, C,
 a friction pulley or drum, M, mounted upon 115
 a fixed spindle, a connecting cord or chain,
 N, suitably guided, and a car constructed
 with a groove, P, arranged to actuate the fric-
 tion-pulley as the car moves up and down the
 elevator-well, and thereby to raise and re- 120
 lease the guard, all substantially as and for
 the purposes specified.

3. The combination of car B, provided with
 a groove, P, pulley M, mounted upon a fixed
 axis arranged to project into the path of said 125
 groove, and spring S, secured to the car and
 arranged to engage the front face of said pul-
 ley in the manner and for the purpose speci-
 fied.

4. A guard, C, jointed, as at E and piv- 130
 oted as at F, and provided with rods I, piv-
 oted to the short arm of the guard, as at H,

and to a fixed standard, as at J, whereby the guard, when raised to its vertical position, will have its short arm turned to a horizontal position, as and for the purpose specified.

5 5. In combination with the tilting guard C, operated as described, the counter-weight T, suspended from the end of the guard by a

connecting-chain, which acts alternately on pulleys U and V, as and for the purposes specified.

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Witnesses:

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