

(No Model.)

2 Sheets—Sheet 1.

I. M. HILL.

SAFETY ATTACHMENT FOR ELEVATORS AND ELEVATOR GATES.

No. 528,878.

Patented Nov. 6, 1894.

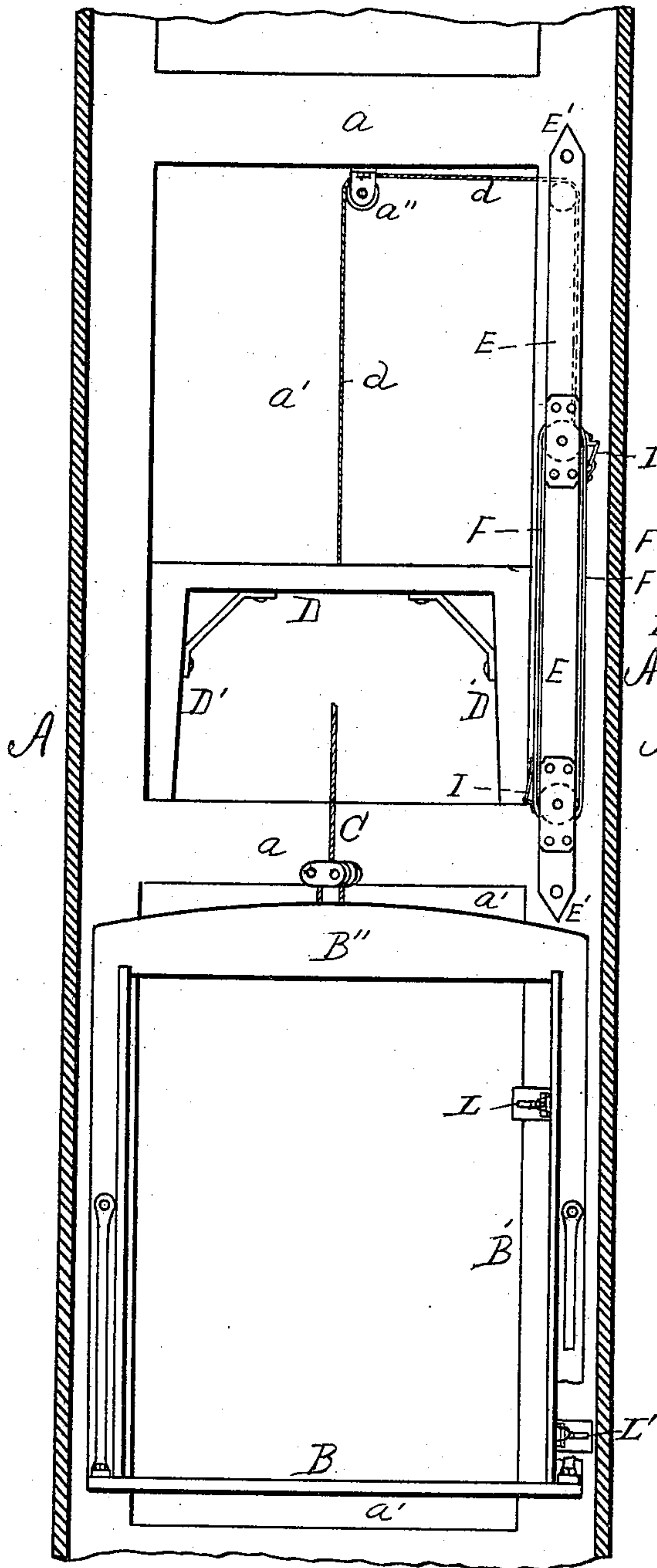


FIG. 1.

WITNESSES

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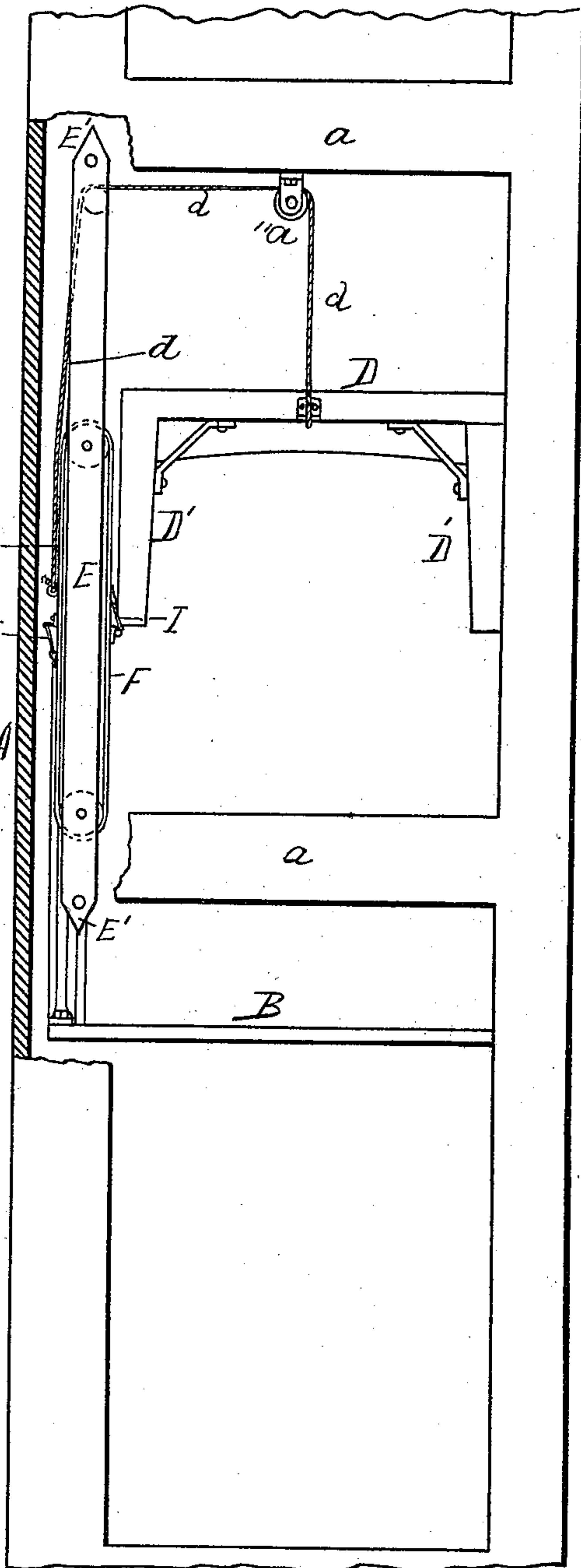


FIG. 2.

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(No Model.)

2 Sheets—Sheet 2.

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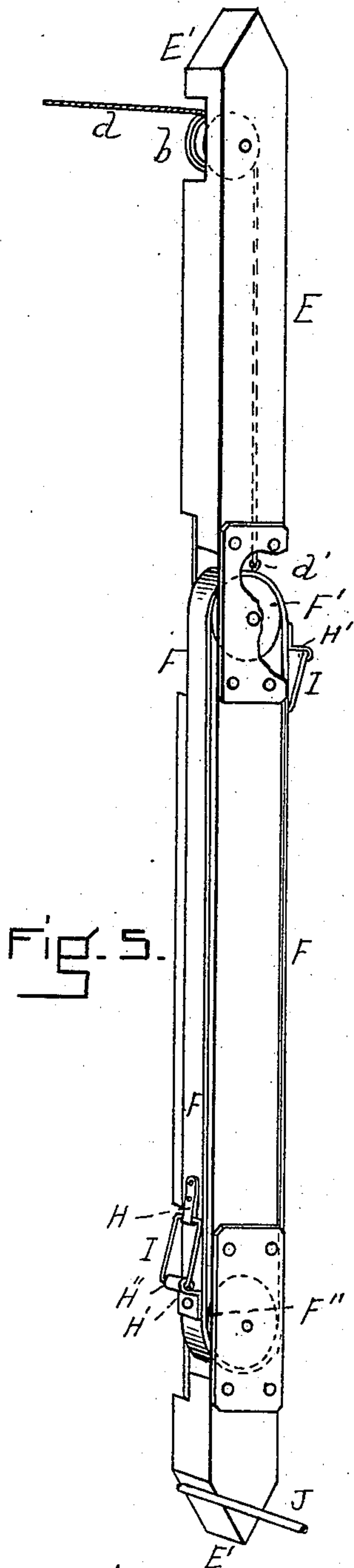


Fig. 5.

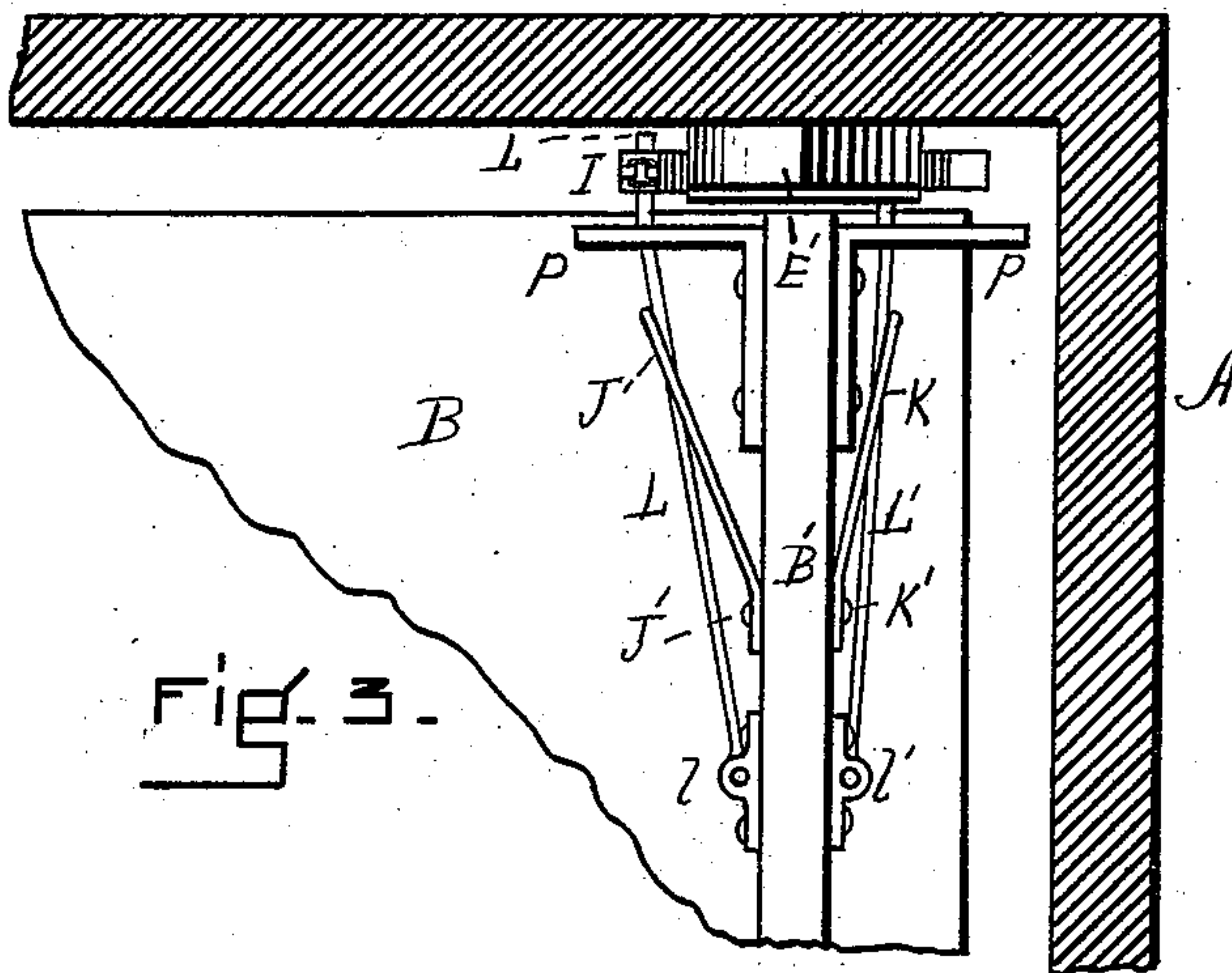


Fig. 3.

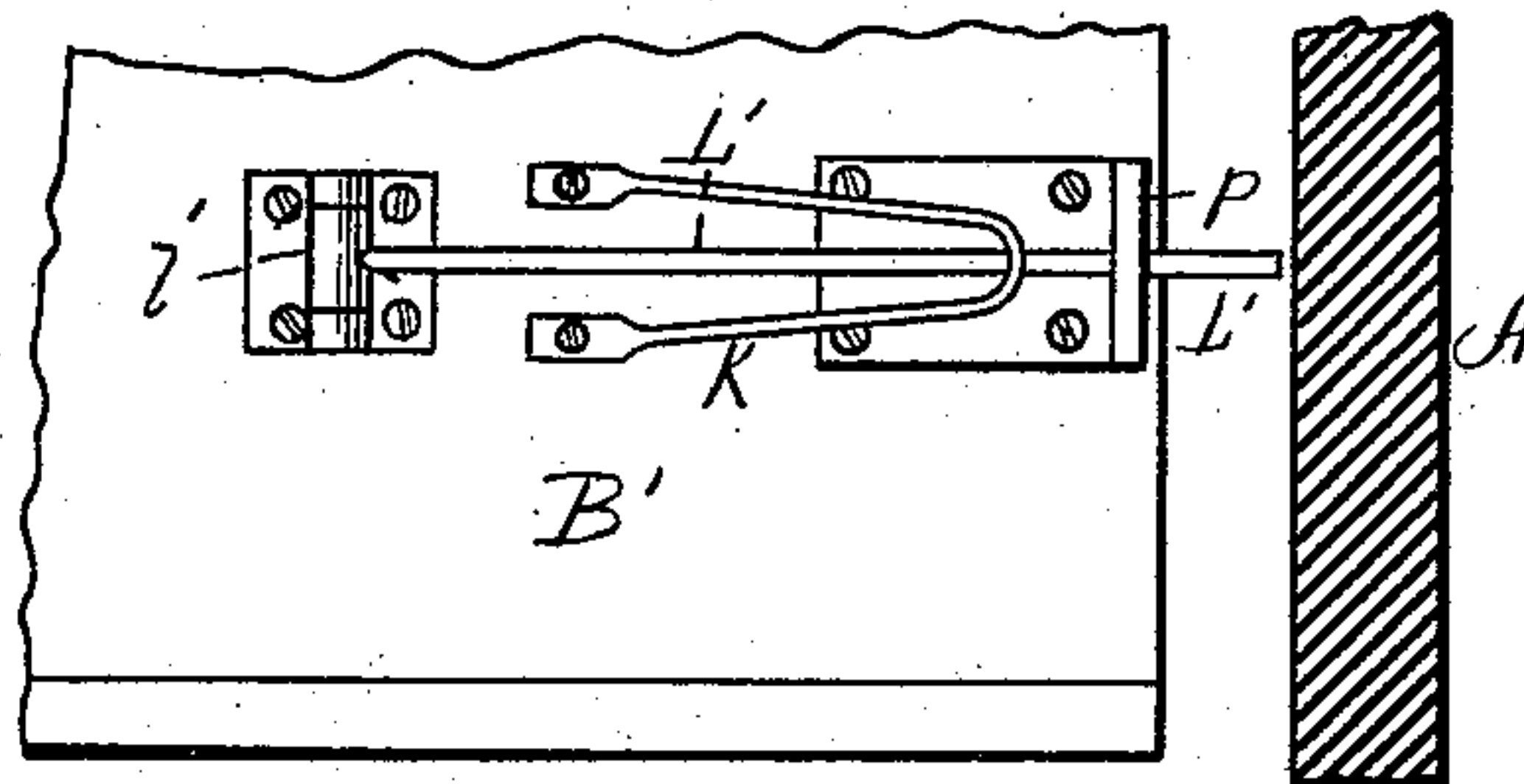
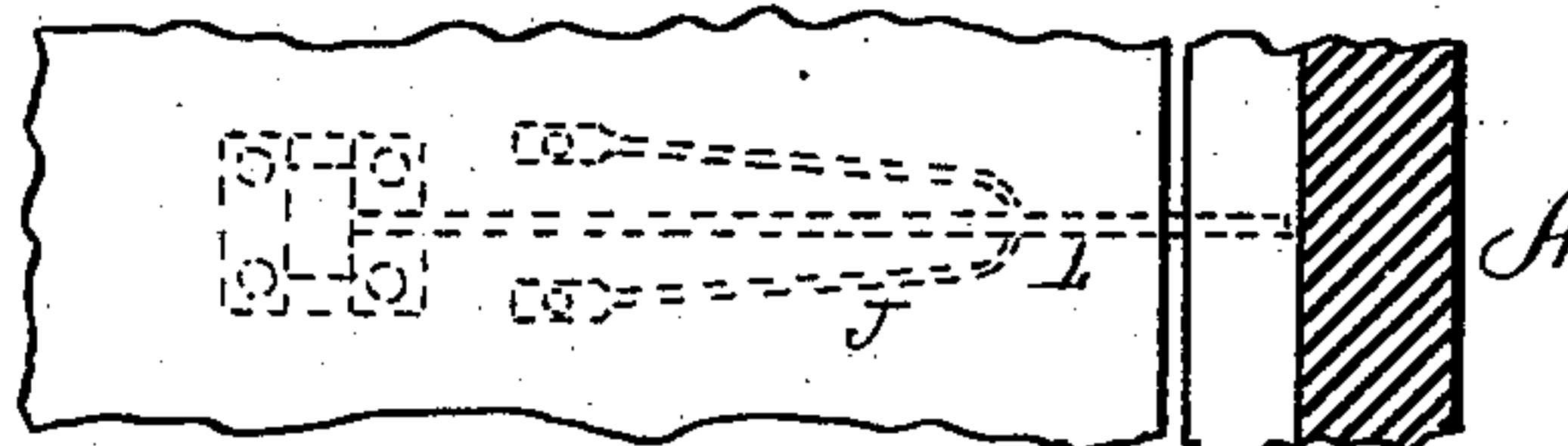


Fig. 4.

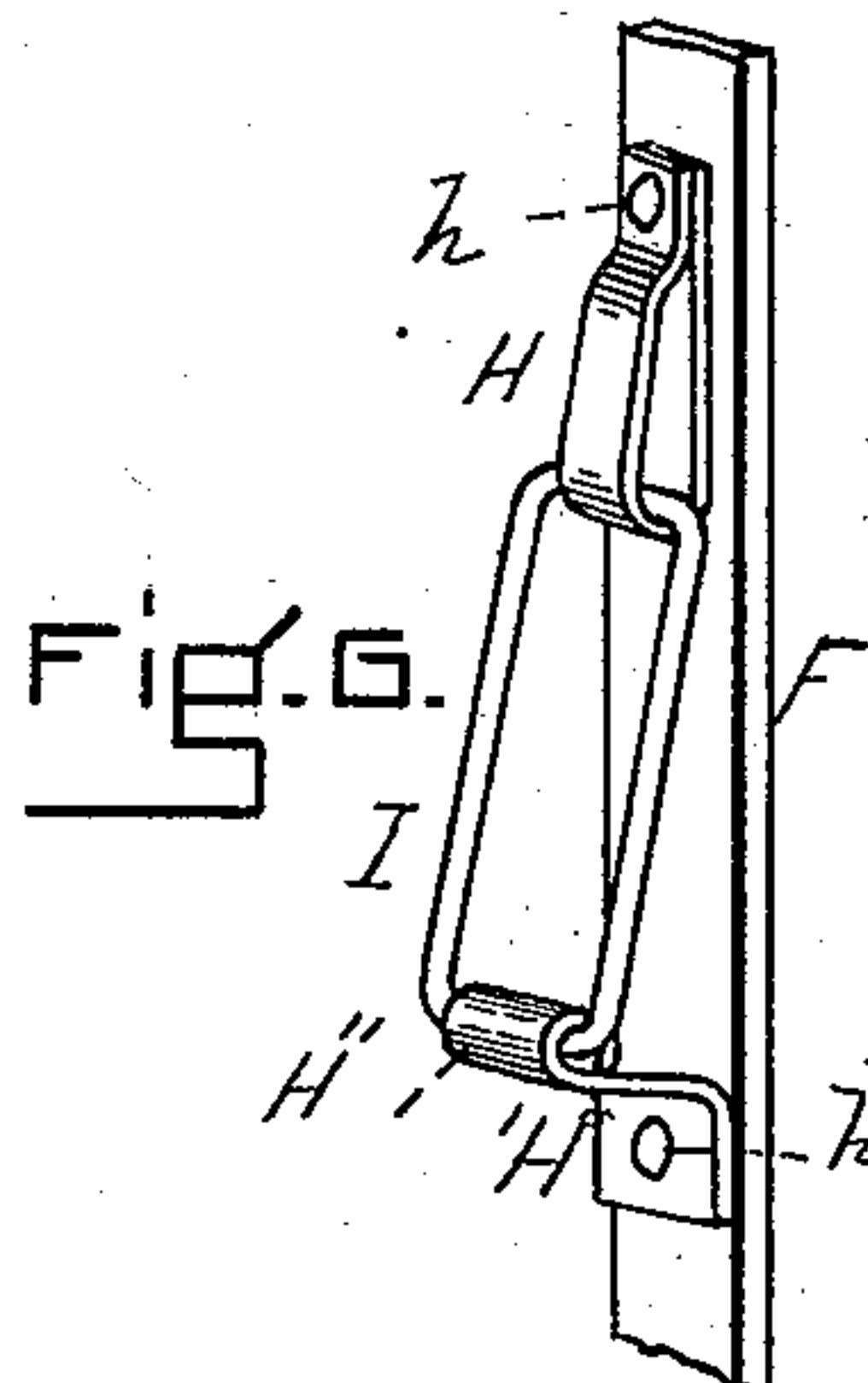


Fig. 6.

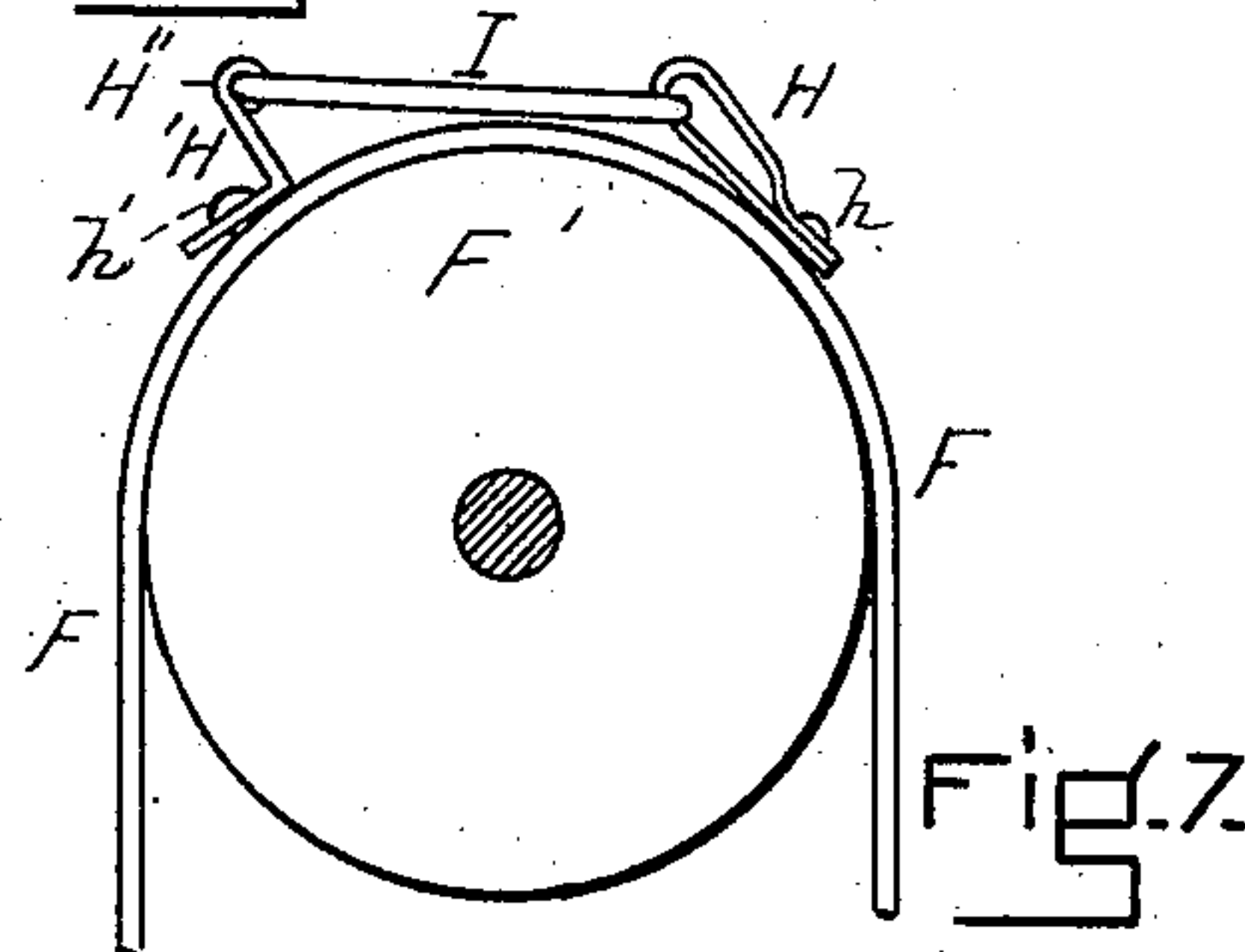


Fig. 7.

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UNITED STATES PATENT OFFICE.

IRA M. HILL, OF BOSTON, MASSACHUSETTS.

SAFETY ATTACHMENT FOR ELEVATORS AND ELEVATOR-GATES.

SPECIFICATION forming part of Letters Patent No. 528,878, dated November 6, 1894.

Application filed March 23, 1894. Serial No. 504,805. (No model.)

To all whom it may concern:

Be it known that I, IRA M. HILL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Safety Attachment for Elevators and Elevator-Gates, of which the following is a specification.

This invention relates to a device or safety attachment for elevators and elevator gates, whereby gates normally closing the entrances to the well at the different floors are automatically raised as the elevator car passes the floors, whether going up or down, and closed as soon as the elevator car has passed, whereby admission may be had to the well when the elevator car is at any given floor, and admission is impossible when the elevator is not at a floor.

The nature of the invention is fully described below, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in vertical section of an elevator well with the elevator car and elevator gate in elevation and my attachment applied thereto, the elevator car being at a floor, and the view being from the inside, looking out. Fig. 2 is a view partly in section and partly in elevation of the elevator well with my improvement applied thereto, the view being from the outside, and the elevator car approaching a floor. Fig. 3 is a horizontal section of a corner of the well and a plan of a portion of the car, showing the devices for operating the gate. Fig. 4 is a detail in elevation and vertical section of a portion of the car provided with the operating devices. Fig. 5 is an enlarged view in perspective of the gate operating mechanism and the housing therefor removed. Fig. 6 is a detail in perspective showing a portion of the belt provided with the device engaged by the lifting rods upon the car. Fig. 7 is a detail in side elevation showing the portion of the belt illustrated in Fig. 6 passing over the pulley.

Similar letters of reference indicate corresponding parts.

A represents the walls of the elevator well; B B' B'' the floor, side uprights, and cross

piece respectively of the car, and C the ordinary hoisting rope.

a represents the floors, and a' the entrances or passages to the elevator well at said floors.

At each floor is a gate D whose sides D' slide vertically in suitable ways in the sides or jambs of the doorways a' between the floors. Each of these gates is supported by a rope or chain d whose lower end is secured to said gate and which passes over a pulley a'' secured in the well under a floor a, and thence over a pulley b sustained in a long vertical box or housing E (Fig. 5) which is set into the front wall of the elevator well next either edge of the gate, as shown in Figs. 1 and 2. After passing over the pulley b the other end of the cord is secured at d' to an endless band F. This band passes around the pulleys F' and F'' supported in the housing E.

Secured to the outer surface of the band at substantially the points indicated in the drawings, viz: points which divide the band in equal parts, are engaging devices, each consisting essentially of the substantially flat looped strap H secured at h to the belt F, the angle-shaped stiff support H' secured at h' to the belt and projecting to quite a distance from said belt at its looped portion H'', and the link I with its ends caught in said looped portion and in the loop-shaped strap H. By means of this construction, the links I are always at an acute angle with the strap F, the angles being in the same direction with relation to the direction of the movement of the endless band; and provision is made for the accommodation of the mechanism H H' I to the curved circumference of the pulleys F' F''. See Fig. 7.

It will be noticed that the ends E' of the housing E are each brought to a point by means of the bevels shown in the drawings.

L L' are rods or engaging arms pivotally secured at l l' to the inner and outer surfaces respectively of one of the uprights B' of the elevator car.

J K represent respectively loop-shaped spring guards secured at J' K' to the inner and outer surfaces respectively of said upright or side piece B.

The engaging rods L L' extend through suitable guides P secured to the upright B' of the car, and the spring guards J K tend to hold the rods L L' normally in toward the upright B' of the car.

The operation is as follows: When the elevator car is at a floor, the gate at the floor above is dropped as shown in Fig. 1, and the mechanism is in the position shown in Figs. 1 and 5. When the car rises, the inner engaging rod L (see Figs. 3 and 5), strikes the inner bevel at the lower end E' of the housing E, and, as the elevator car continues to rise, slips up over said bevel, being allowed to do so by the yielding of the spring guard J, and moves along the side of the housing E until it strikes that portion of the bent support or bracket H' which extends at right angles from the endless band F. The rod L then lifts the portion H', causing the band F to move around the pulleys F' F'', lifting at the same time the gate D D' at the floor above being approached, by means of the connecting rope d, as shown in Fig. 2, until the elevator car reaches said floor, when the gate is held in a raised position. When the portion H' reaches the upper pulley F' and moves far enough over its circumference to get out of the line of the vertical movement of the engaging rod L, (which occurs after the car has started up from the floor reached as above mentioned,) the band being released, the gate drops as below described and closes the entrance to the well while the elevator car continues to ascend. When the car descends, the rod L', as it approaches a floor, slips down over the outer surface of the upper beveled end E' of the housing E, and engages the device H' I H on the portion of the band on the outer side of the housing, lifting the gate at the floor beneath being approached, by means of the cord d. As the car leaves said floor, and proceeds in its descent, the rod L' releases the link mechanism as the latter passes under the pulley F'', and the gate at the floor above drops again. It is intended,

of course, that each floor should be provided with the gate and attachment above described. The position of the link or engaging mechanism H I H' on the belt being at an angle as shown, allows the outer rod L to slip easily over the inclined link I of the outer descending link mechanism, while the inner link mechanism is being raised by the rod L, and allows, of course, the inner rod L to slip down over the rising inner link mechanism, while the outer rod L is carrying down the outer link mechanism. The former process of course occurs when the car is rising to a floor, and the latter when it is descending to a floor. When one mechanism H' I H has been released by one rod L or L', the other mechanism H' I H bears against the other rod as it descends with the movement of the band, and the drop of the gate is at the same velocity as the rise of the elevator.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the character described, the combination of the endless band F arranged to move around the pulleys F' F'', the vertical housing E supporting said pulleys and provided with the pointed ends E', projections as H' secured to said band as shown, an elevator car provided with a rod adapted to engage said projections and move said endless band, and a gate connected with said band and adapted to be raised by the movement of the latter, substantially as described.

2. The endless band F, the loops H, angle-shaped supports H' provided with the loops H'' at their outer ends, the links I connecting said loops H and H'', and an elevator car provided with a rod adapted to engage said supports H', substantially as set forth.

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Witnesses:

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