

No. 682,719.

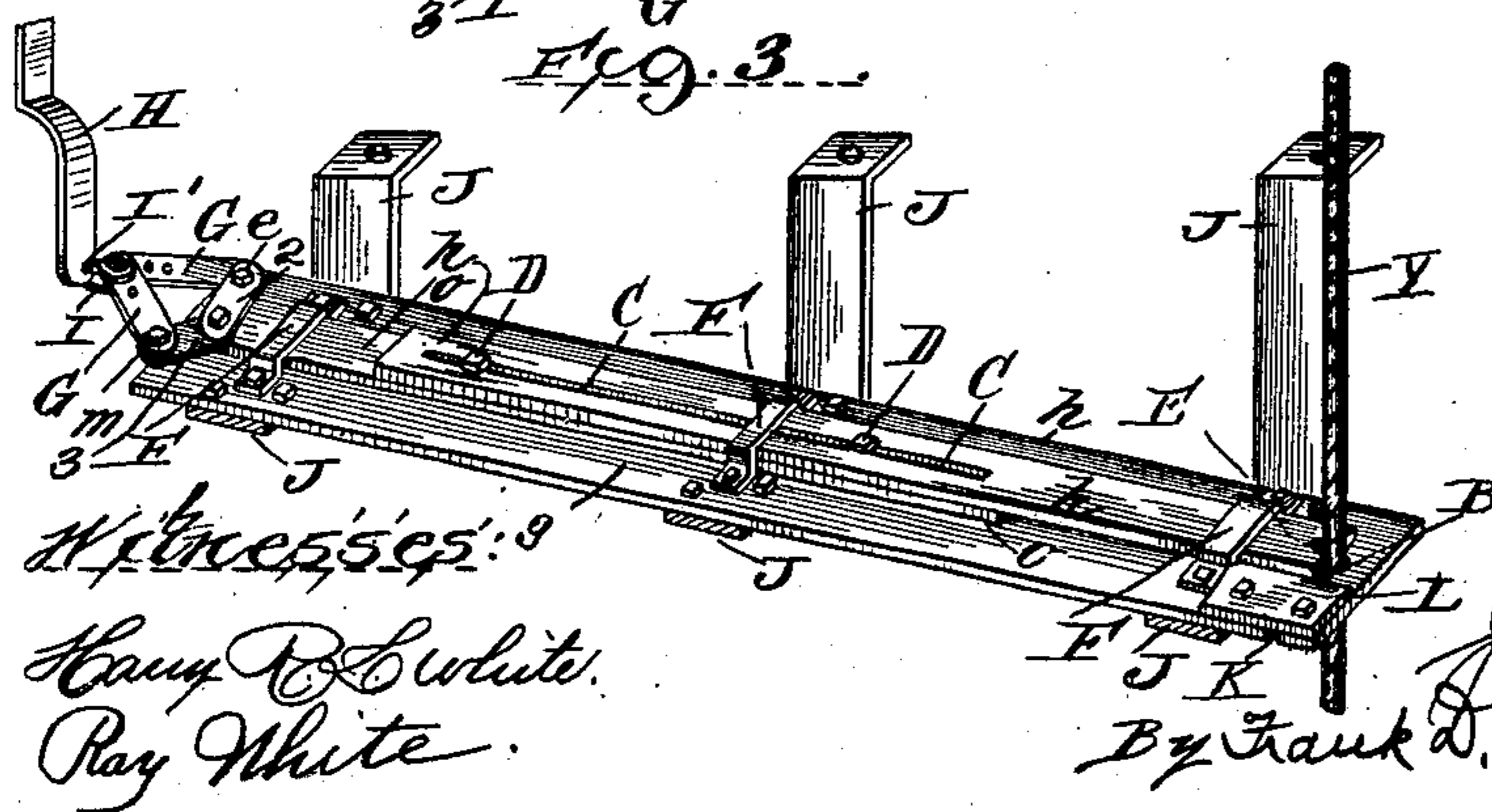
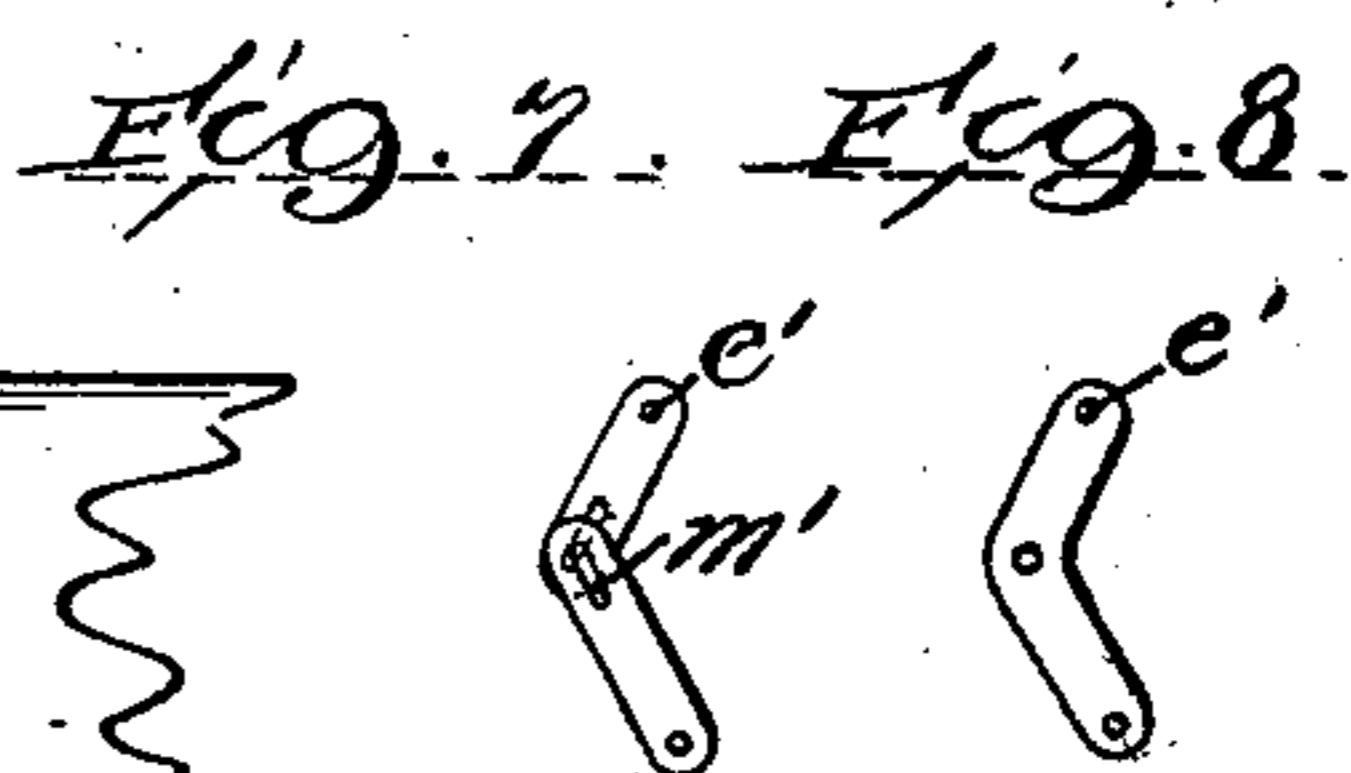
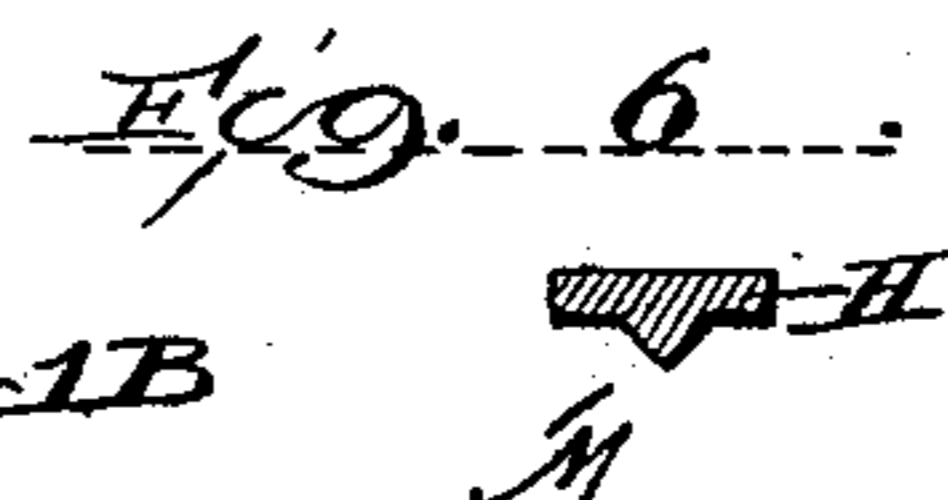
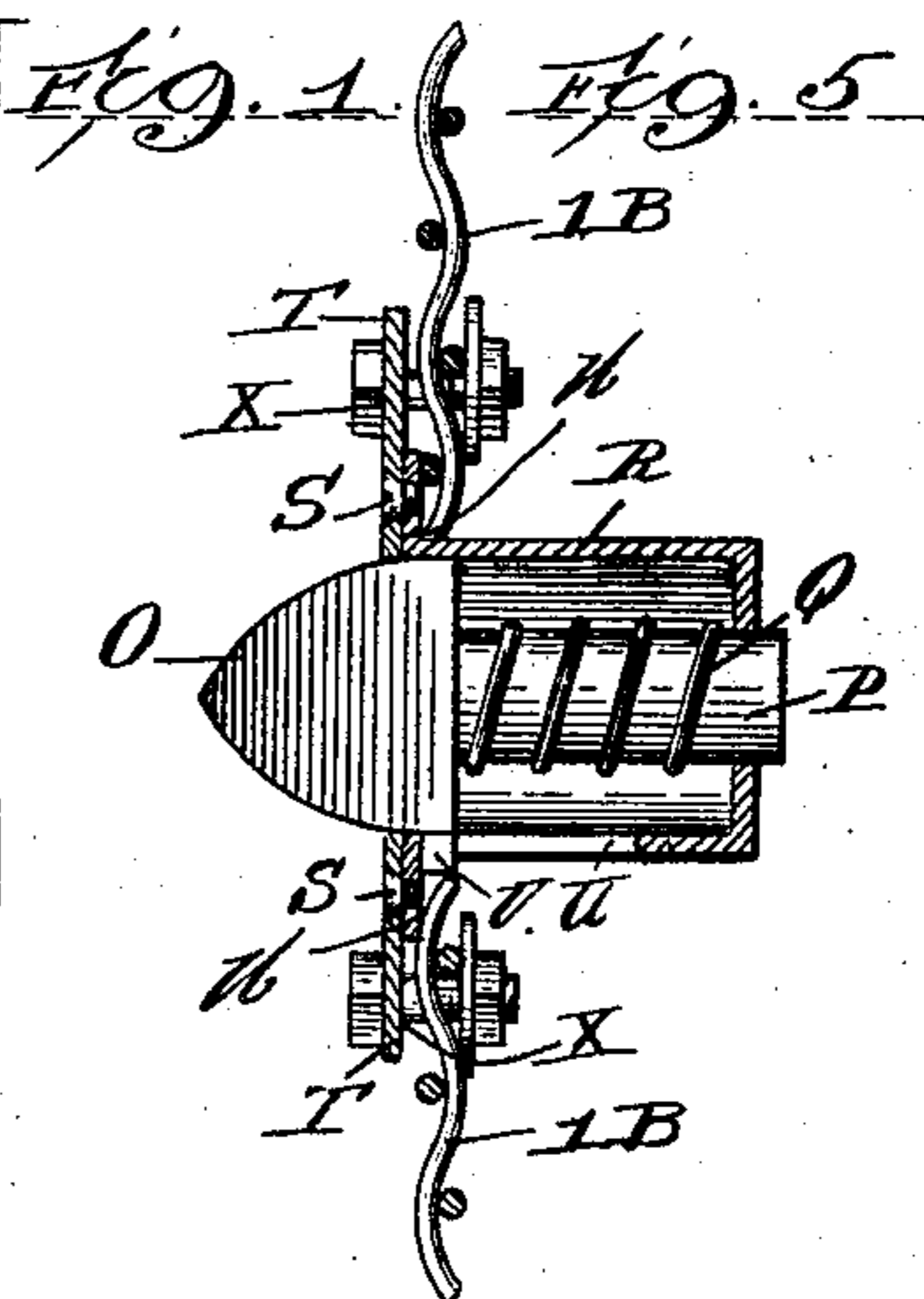
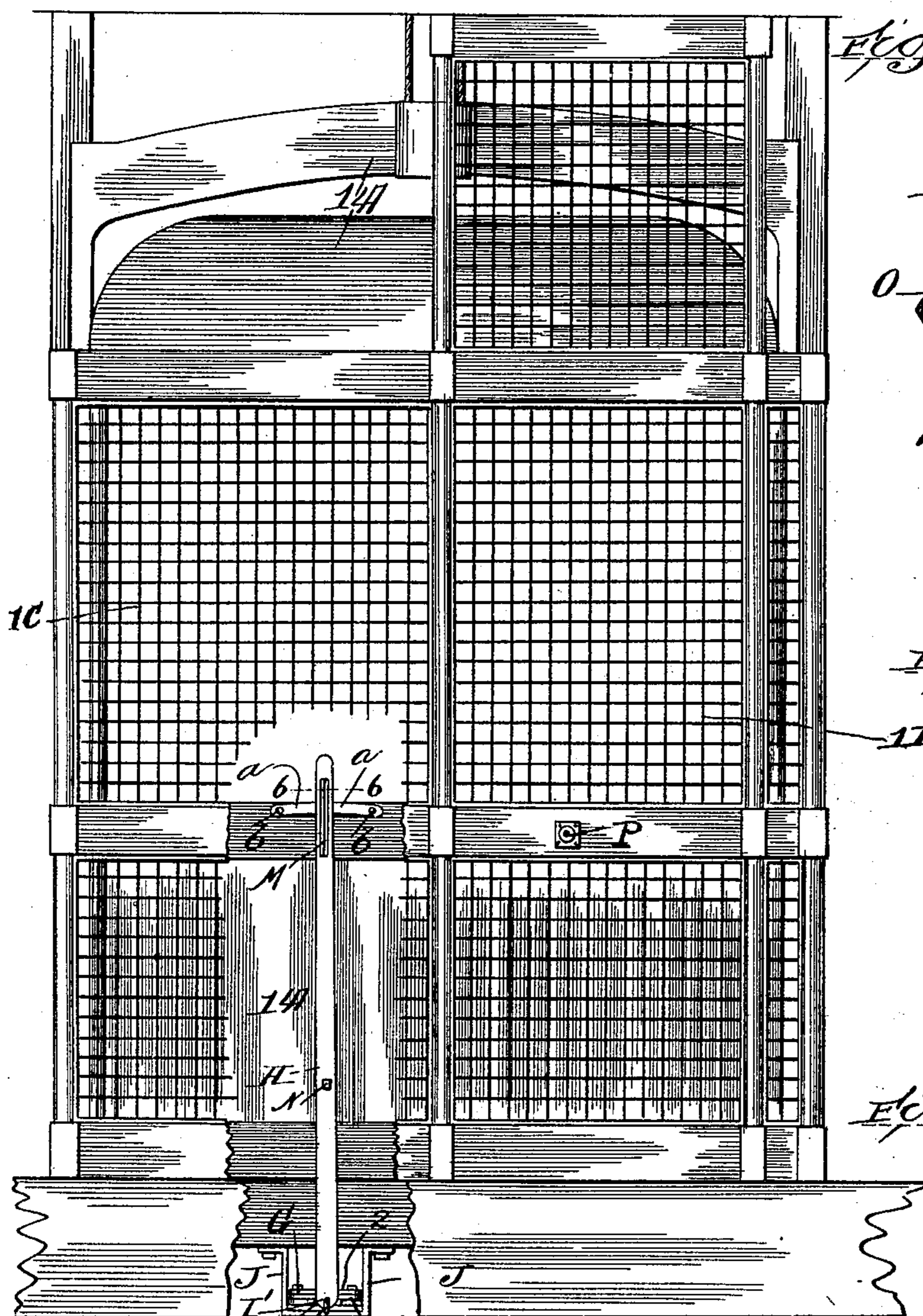
Patented Sept. 17, 1901.

J. H. KUGHLER, SR.
SAFETY APPLIANCE FOR ELEVATORS.

(Application filed Apr. 3, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

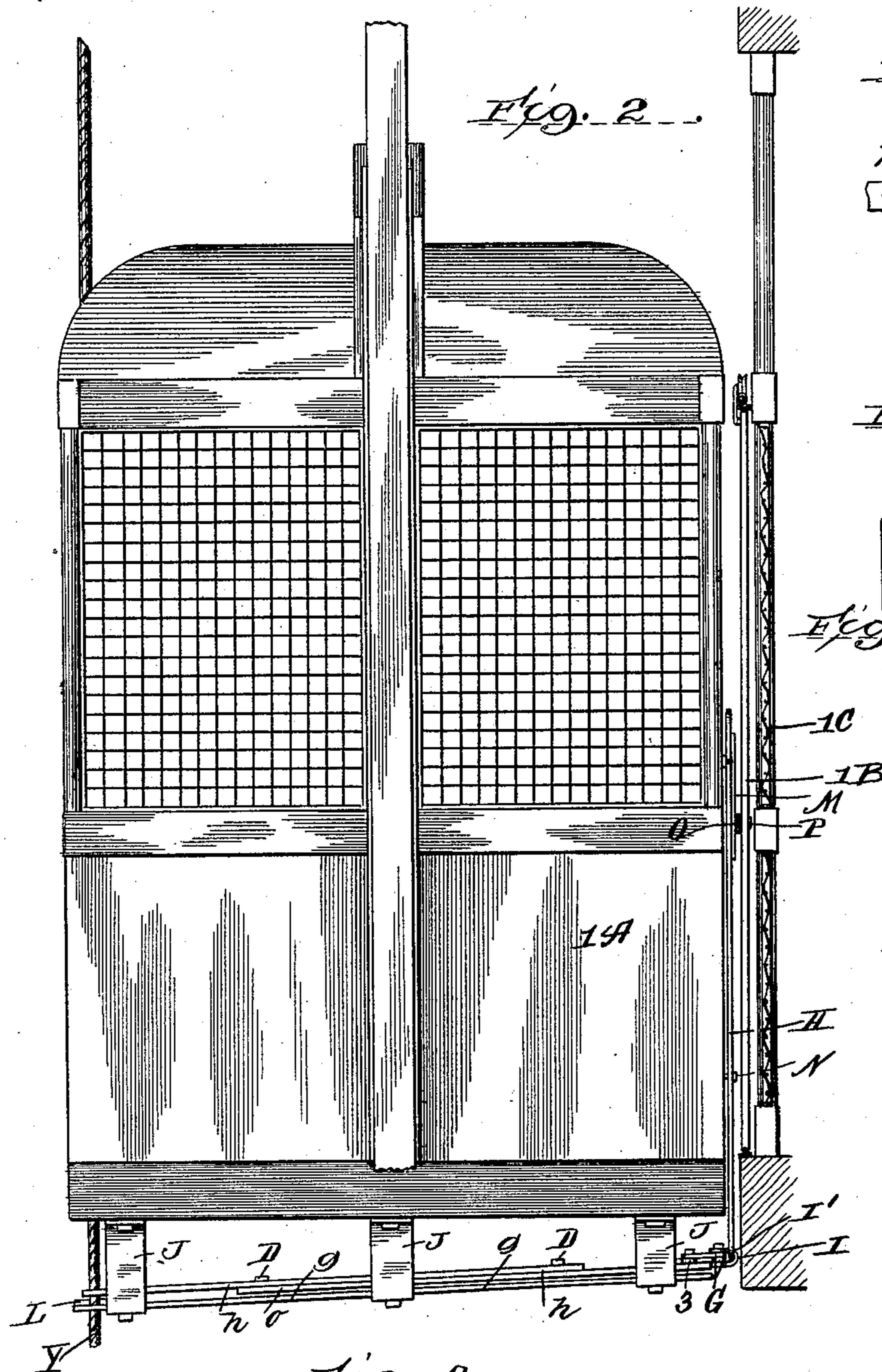


Fig. 9.

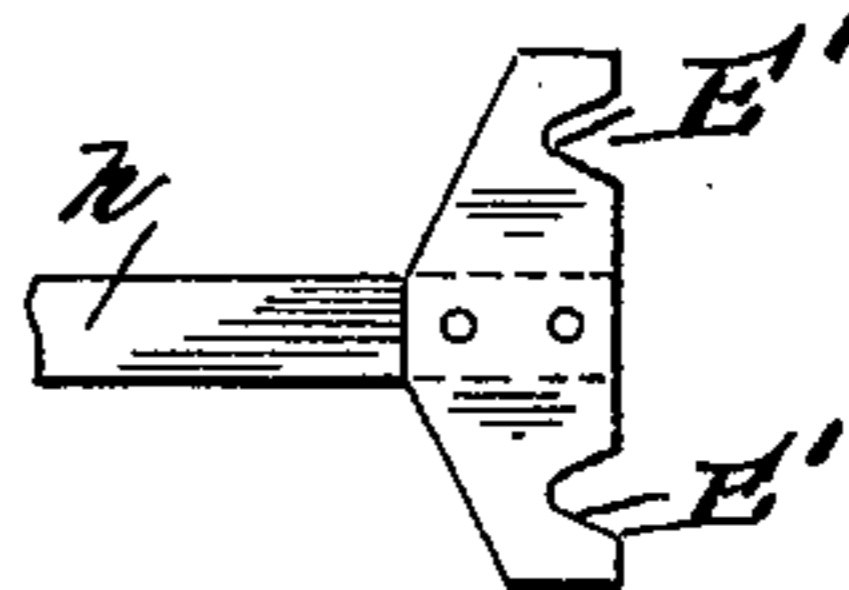


Fig. 10.

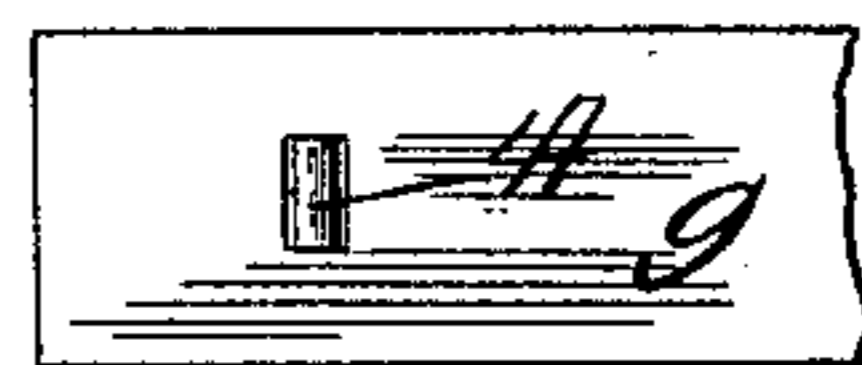


Fig. 11.

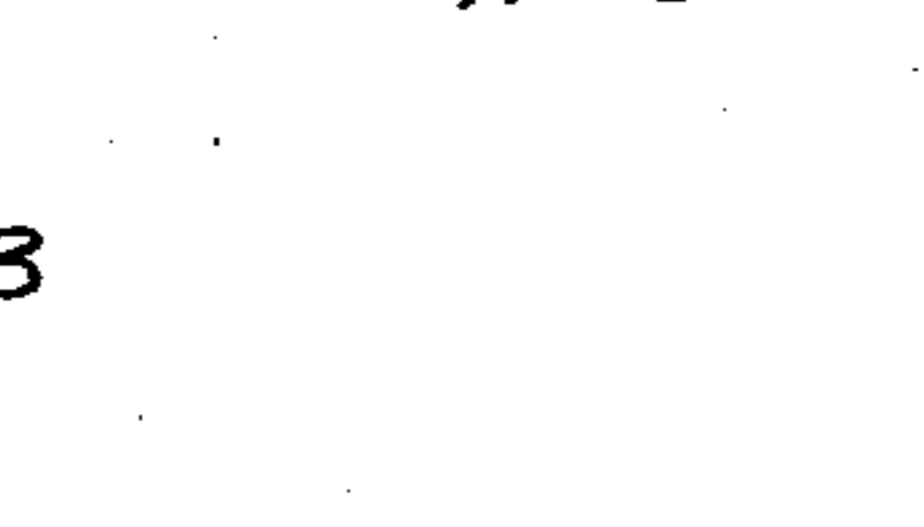


Fig. 12.

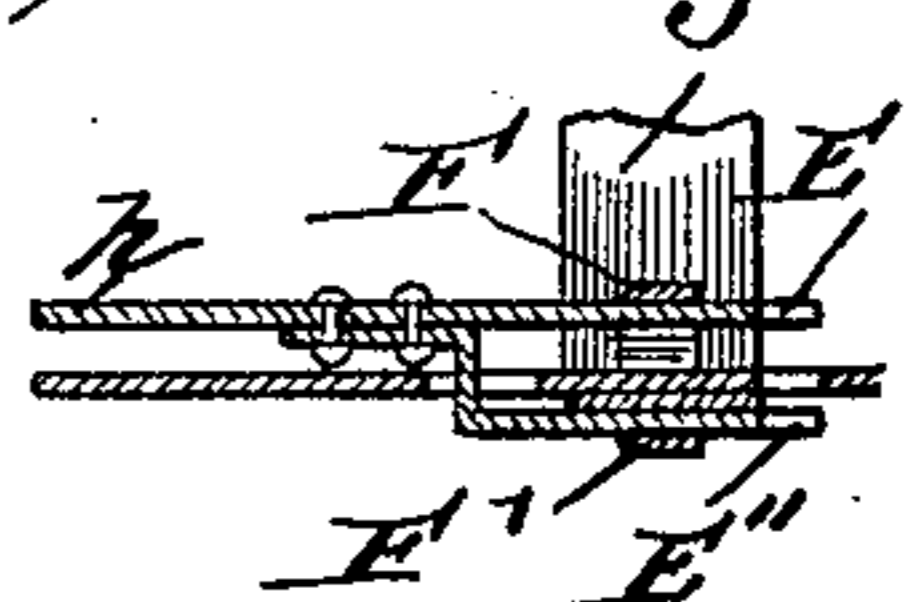
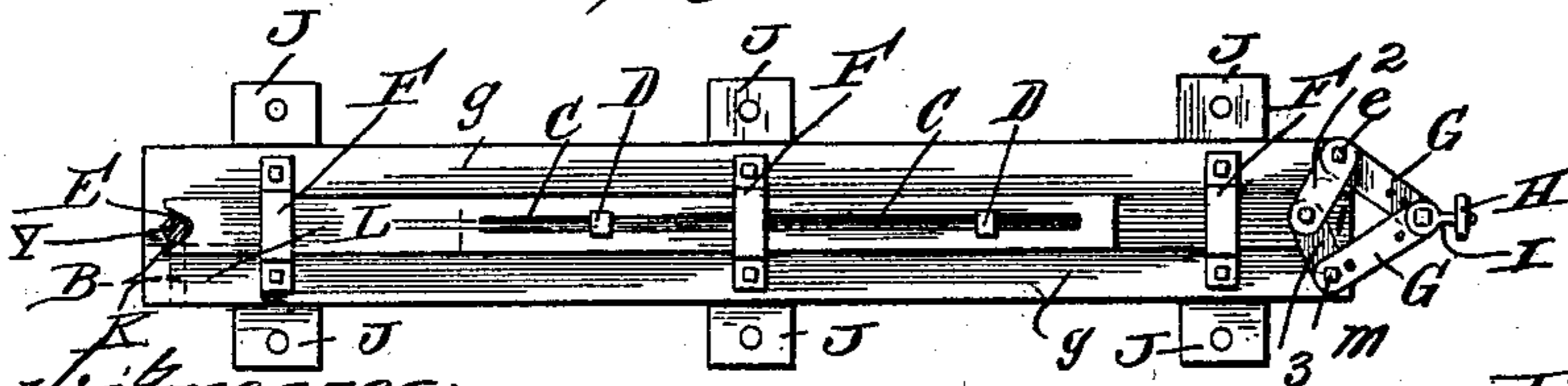


Fig. 4.



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SAFETY APPLIANCE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 682,719, dated September 17, 1901.

Application filed April 3, 1901. Serial No. 54,108. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. KUGHLER, Sr., a citizen of the United States, and a resident of Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Safety Appliances for Elevators, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings.

My invention relates to safety appliances for elevators; and its object is to prevent the loss of life and injury to persons due to the starting of the elevator either up or down before the door in the elevator-shaft is closed. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of an elevator-shaft, having a portion of the grating inclosing the same broken away, so as to expose a portion of the mechanism carried by the elevator-truck, which appears back of said grating. Fig. 2 is a side elevation of an elevator-truck having my invention applied thereto and showing an edge view of the front structure of the elevator-shaft and sliding door therein. Fig. 3 is a perspective view of the clamping mechanism of my invention, showing the manner of its support and connection with the actuating-lever, which latter is shown as having its upper portion broken away. Fig. 4 is a plan view of the same with the clevis of the clamping-bar attached thereto. Fig. 5 is a section through a portion of the sliding door of the elevator-shaft and the trip-bolt attached thereto. Fig. 6 shows a transverse section through the upper portion of the actuating-lever of my invention, taken on line 6 6, Fig. 1. Figs. 7 and 8 are detail views showing modified forms of links for the clevis of my invention. Fig. 9 is a plan view of a modified construction of the cable-engaging end of the clamp-bar, having the major part of its length broken away. Fig. 10 is a plan view of one end of the bed-plate which supports the clamping-bar. Fig. 11 is a side edge view of the same and the portion of the clamping-bar supported thereby. Fig. 12 is a plan view of yet another modified construction of the cable-engaging end of the clamp-

bar, having the major part of its length broken away.

The scheme of my invention contemplates the use of the door of the elevator-shaft to actuate mechanism attached to and carried by the elevator cage or truck 1^A for clamping the starting rope or cable to prevent the said cage or truck from moving away from the floors or stations at which it may be stopped until the door 1^B of the elevator-shaft 1^C is closed. For this purpose I secure to the inner side of the said elevator-door 1^B a pyramidal-headed bolt O, which is normally shot outward from its housing R by means of a coil expansion-spring Q, surrounding its extension P, which latter is of reduced dimensions and preferably has its end opposite said head extended through a suitable guide-opening in the rear end of said housing. The lower side of the housing R is provided with a longitudinal slot U, down through which the lug V extends from the head O of the bolt to limit the movement thereof. The housing R is box-shaped and has its rear edges flanged and secured to a suitable front plate T by means of screws S, the whole arrangement being secured to the rear of the door in such manner and in such position that as the door is opened the head O of the bolt will yieldingly contact with an angular-shaped longitudinal ridge M, secured to or made integral with the upper end of a lever H. This lever H is fulcrumed at a point N to the front of the elevator-cage, as shown in Fig. 1, and when the head O of the bolt contacts therewith it imparts to said lever a limited movement, which is determined by the stop-pins *b b*, projecting forward from the plate *a*, secured to the front of the elevator-cage near the upper end of the lever, as shown. When said lever strikes against either pin, the bolt yields and rides over the ridge M. Lever H is of the first class, and it is so fulcrumed that the lower shorter branch or arm thereof extends down below the floor of the elevator-cage and has its lower extremity suitably connected by means of a clevis I and a series of links G G, 2, and 3 to one end of a longitudinally-reciprocal clamping-bar, which may be made in one piece throughout its entire length or may consist, as shown in the drawings, of

two plates *n* and *o*, the ends of which overlap each other and are adjustably secured together by means of the bolts *D*, which extend down through a longitudinal slot *C* in plate *n* into plate *o*, so that the clamping-bar may be made adjustable longitudinally to adapt it for use in connection with different-sized elevators. This clamping-bar rests upon and is supported by a bed-plate *g*, which is secured to the lower horizontal portion of a series of brackets or hangers *J J*, secured to and depending down from the floor of the elevator cage or truck. I prefer to incline the bed-plate *g* downward from the end adjacent to the lever *H* to the elevator-starting rope or cable *Y*, although this is not essential, and the clamp-bar is retained on the bed-plate and its movements are controlled and directed by the guide-straps *F F F*, substantially as shown.

If desired, the clamp-bar may rest upon the antifriction-rollers *A A A*, (shown in Fig. 10 of the drawings,) so as to reduce the friction, which would otherwise be caused if the clamp-bar rested directly upon the bed-plate.

These antifriction-rollers, however, may be dispensed with. In the end of the bed-plate farthest from the lever *H* it is provided with a suitable opening *B*, through which the starting rope or cable *Y* passes. In order to facilitate the entrance of the starting-rope into opening *B*, a lateral slot *K*, between the same and one edge of the bed-plate, is made. After the insertion of the starting rope or cable into opening *B* it is prevented from independently working its way out of said slot by means of a small plate *L*, bolted to the same. The contiguous end of the clamping-bar terminates at or near this opening *B*, and its end edge is provided with a notch or recess *E*, so that when the said clamp-bar is shot longitudinally toward the opening *B* the starting rope or cable is bit and clamped between the opposing edge of said opening and the end of the clamp-bar. Some elevators employ a looped or endless starting rope or cable, and in this event both stretches of the rope pass up through the elevator truck or cage. In order to apply my invention to such an elevator, I prefer to construct the end of the clamp-bar *n* substantially as shown in Fig. 9 of the drawings, in which a head-plate *f* is shown suitably attached about its center of length to the end of the plate *n* of the clamp-bar, with two notches or recesses *E'* therein, which are located a sufficient distance apart to engage both stretches of the starting rope or cable. Although not shown in the drawings, it is obvious that the employment of this head-plate in order to make it operate requires two suitably-located starting-rope openings *B* in the bed-plate, instead of one.

In Fig. 12 I illustrate yet another modified construction for the rope-engaging end of the clamp-bar. This modification consists in securing to the under side of the plate *n* of the clamp-bar an L-shaped plate, the vertically-

disposed portion of which passes down through a longitudinal slot in the bed-plate and then extends horizontally and longitudinally under said bed-plate to the vertical plane of the end of plate *n*. This would practically provide the clamp-bar with two legs, one above and one below the opening *B* of the bed-plate, so that when said clamp-bar is moved to engage the starting rope or cable it more securely clamps the same between three surfaces, the central one of which pushes against the rope in one direction and the two outer surfaces of which bear against and push the rope in the opposite direction.

It will be apparent that in view of the many different constructions of elevators and the dimensions of the same and the position of the starting rope or cable some adjustable connection must be made between the actuating-lever *H* and the clamp-bar. I can accomplish this in various ways. The means shown in the drawings for accomplishing this result consists of a series of links *G G*, 2, and 3. Links *G G* preferably correspond in construction and dimensions and are provided with a series of clevis-openings therethrough, whereby the two can be pivoted together by an independent bolt at any angle and in any manner desired. One of these links *G* is always swiveled to the lever and at its end farthest from the clevis is pivoted by the same pivot-bolt *e* to which one end of link 2 is pivoted to the bed-plate *g*, and link 2 has its end farthest from bolt *e* pivoted to the contiguous end of the clamp bar or plate *o* thereof, and pivotally connecting the end of link 2 to the end of the other of said links *G* is a short link 3. The pivotal connections between these various links and links 2 and 3 with the clamp-bar is of such a character that both the segmental movements and the straight movements, as of the clamp-bar and the actuating-lever, are accommodated. The connection between the link *G* and the short link 3 is not a pivotal connection, and when the device is in operation these links are not movable relative to each other. Their connection is adjustable to accommodate the relative positions of the starting-rope and the lever; but when the desired adjustment is effected they are tightly clamped together by the bolt *m*, and then they act as one link, whereby movement of the lever *H* is communicated to the clamp-bar. In Fig. 7 the links are shown as slotted, in which case they may be more readily adjusted. In Fig. 8 they are shown as combined into one link. This has the objection that it is not adjustable; but it illustrates the action of the links when clamped together and can be used when the dimensions are known and the links specially made.

I do not desire to be confined to the exact arrangement and construction of the principal mechanism of my invention as heretofore described, because it is evident that in order to make the same a success under the vary-

ing conditions with which they would have to be used considerable latitude would have to be allowed in this respect.

What I claim as new is—

5 1. The combination with an elevator cage or truck, the starting rope or cable, devices for clamping said rope, and means for actuating the same which are supported by said cage or truck, of a sliding door for the elevator-shaft, a normally shot rearwardly-projecting bolt which is adapted to engage the actuating means when said door is being opened or shut, as and for the purpose set forth.

15 2. The combination with an elevator cage or truck, the starting rope or cable, longitudinally-extensible reciprocal devices for clamping said rope or cable, and a lever fulcrumed to said cage or truck and adapted to actuate said clamping devices, of a sliding door for the elevator-shaft, and a normally shot rearwardly-extending bolt which is adapted to engage said lever when said door is being opened or shut, as and for the purpose set forth.

25 3. The combination with an elevator cage or truck, the starting rope or cable, horizontally-disposed reciprocal devices for clamping said rope or cable, and a vertically-disposed lever fulcrumed to said cage or truck, and adapted to actuate said clamping devices, of a sliding door for the elevator-shaft, and a normally shot rearwardly-extending bolt which is adapted to engage said lever when said door is being opened or shut, as and for the purpose set forth.

35 4. The combination with an elevator cage or truck, the starting rope or cable, horizontally-disposed longitudinally-extensible reciprocal clamping devices, and a vertically-disposed lever fulcrumed to the front of said cage or truck having its lower end suitably articulated with said clamping devices, of a sliding door, and means carried thereby which are adapted to engage said lever when said door is being opened or shut, as and for the purpose set forth.

45 5. The combination with an elevator cage or truck, the starting rope or cable, a bed-plate suitably supported below said cage or truck having an opening in one end through which said starting-rope passes, and a longitudinally-extensible reciprocal clamping-bar carried thereby for clamping said rope, means for actuating said clamping-bar which are supported by said truck, of a sliding door for the elevator-shaft, and devices carried thereby which are adapted to engage said actuating means when said door is being opened or shut, as and for the purpose set forth.

55 6. The combination with an elevator cage or truck, the starting rope or cable, a horizontally-disposed bed-plate attached to and suitably supported below said cage or truck having an opening in one end through which said starting-rope passes, a longitudinally-extensible reciprocal clamping-bar carried by said bed-plate, and means for reciprocating the

same which are supported by said cage or truck, of a sliding door for the elevator-shaft, and devices carried thereby which are adapted to engage said actuating means when said door is being opened or shut, as and for the purpose set forth.

7. The combination with an elevator cage or truck, the starting rope or cable, a horizontally-disposed bed-plate suitably supported by said cage or truck, having an opening therein through which said starting rope or cable passes, a longitudinally-reciprocal clamping-bar carried thereby, a vertically-disposed lever fulcrumed to the front of said cage or truck, and devices connecting the lower end of the same to said clamping-bar whereby the oscillatory movement of the lower end of said lever imparts a reciprocal movement to said bar, of a sliding door for the elevator-shaft, and devices carried thereby which are adapted to engage said lever when the door is being opened or shut.

8. The combination with an elevator cage or truck, the starting rope or cable, a horizontally-disposed bed-plate having an opening therein from which said starting rope or cable passes, a vertically-disposed lever fulcrumed to the front of said cage or truck, and adjustable devices for connecting the lower end of said lever to said clamping-bar whereby the oscillatory movement of the lever imparts a reciprocal movement to the clamping-bar, of a sliding door for the elevator-shaft, and devices carried thereby which are adapted to engage said lever when said door is being opened or shut.

9. The combination with an elevator cage or truck, the starting rope or cable, a bed-plate supported by said cage or truck, having an opening therein through which the starting rope or cable passes, a clamping-bar carried thereby and consisting of two longitudinally-adjustable plates suitably secured together, a vertically-disposed lever fulcrumed to the front of said cage or truck, adjustable devices connecting the lower end of said lever and said clamping-bar whereby the oscillatory movement of the former imparts a reciprocal movement to the latter, of a sliding door for the elevator-shaft, and suitable devices carried thereby which are adapted to engage said lever when said door is being opened or shut.

10. The combination with an elevator cage or truck, the starting rope or cable, a bed-plate supported by said cage or truck, having an opening therein through which said rope or cable passes, a vertically-disposed lever fulcrumed to the front of said cage or truck, a series of suitably arranged and articulated links pivotally connected to said clamping-bar, and a clevis connecting said links to the lower end of said lever whereby the oscillatory movement of the latter imparts a reciprocal movement to said clamping-bar, of a sliding door for the elevator-shaft, and

suitable devices carried thereby which are adapted to engage the lever when said door is being opened or shut.

11. The combination with an elevator cage or truck, the starting rope or cable, a bed-plate supported by said cage or truck, having an opening therein through which said starting rope or cable passes, a reciprocal clamping-bar carried thereby, a vertically-disposed lever fulcrumed to the front of said cage or truck having a longitudinally-disposed ridge projecting forward from its upper branch or arm, and suitable devices con-

necting the lower end of said lever to said clamping-bar whereby the oscillatory movement of the former imparts a reciprocal movement to the latter, of a sliding door for the elevator-shaft, a normally shot rearwardly-extending yielding bolt carried by said door and adapted to engage the ridge of said lever when said door is being opened or shut, as and for the purpose set forth. 15 20

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