

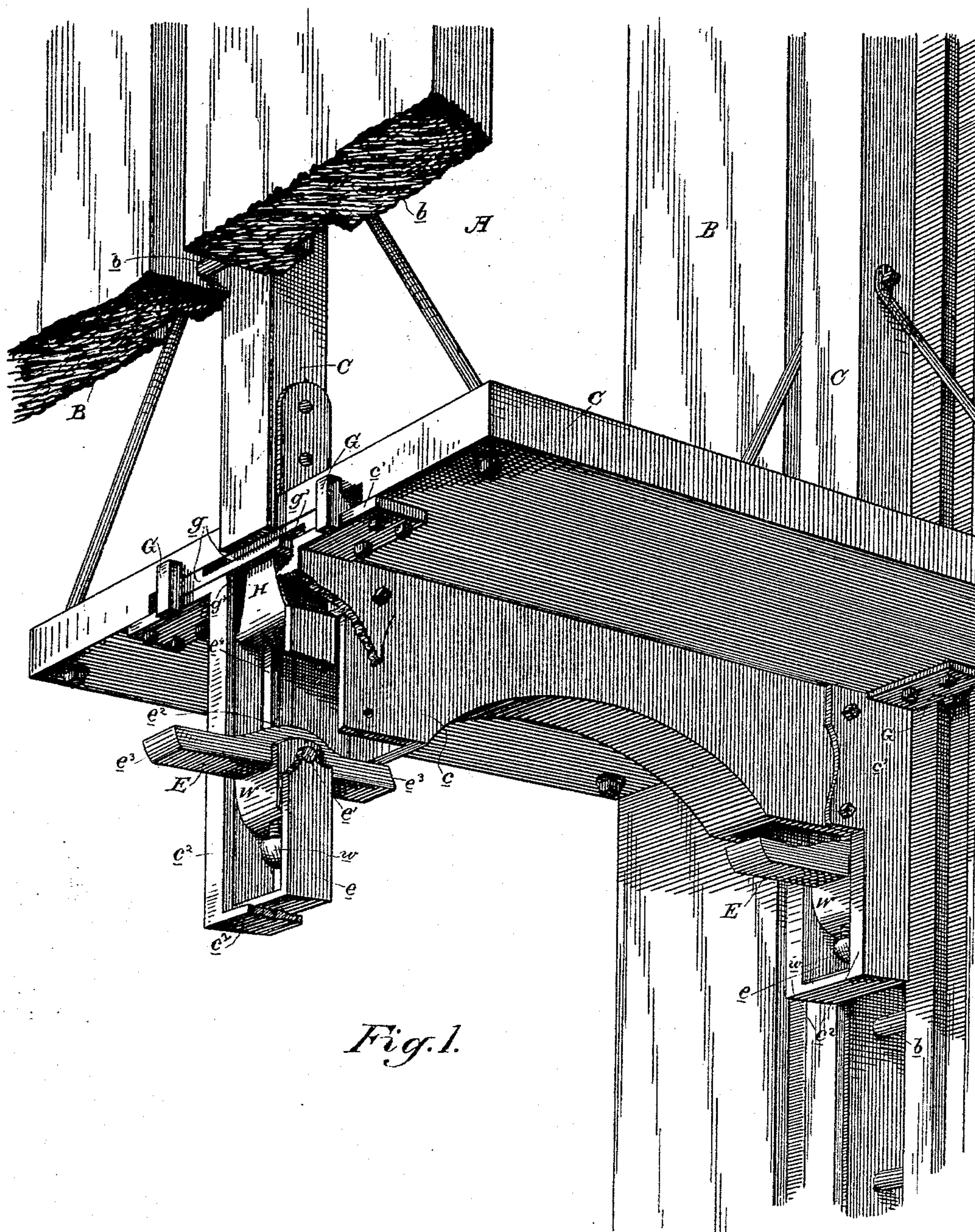
(No Model.)

3 Sheets—Sheet 1.

H. ALBERT.  
ELEVATOR SAFETY DEVICE.

No. 412,059.

Patented Oct. 1, 1889.



*Fig. 1.*

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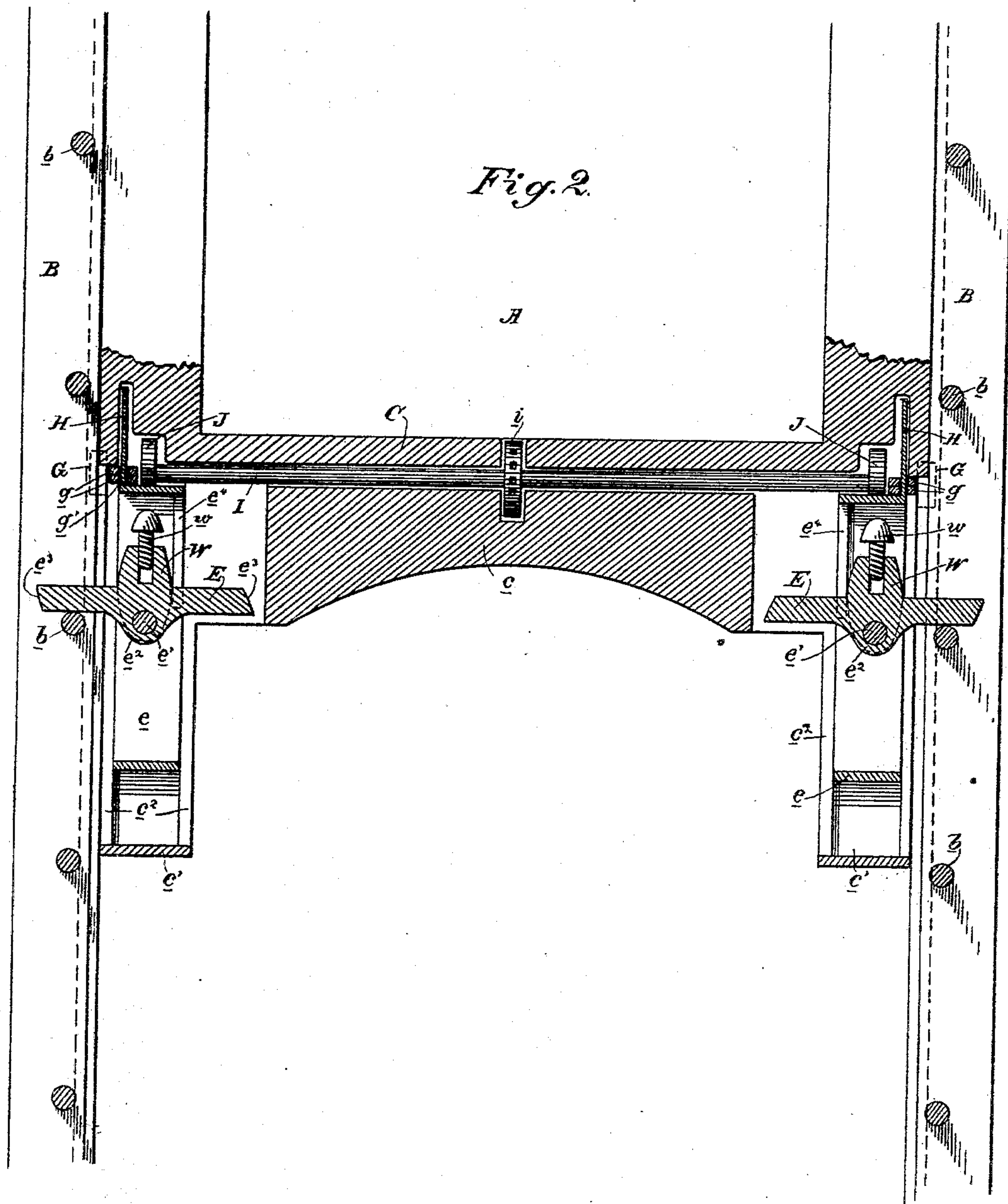
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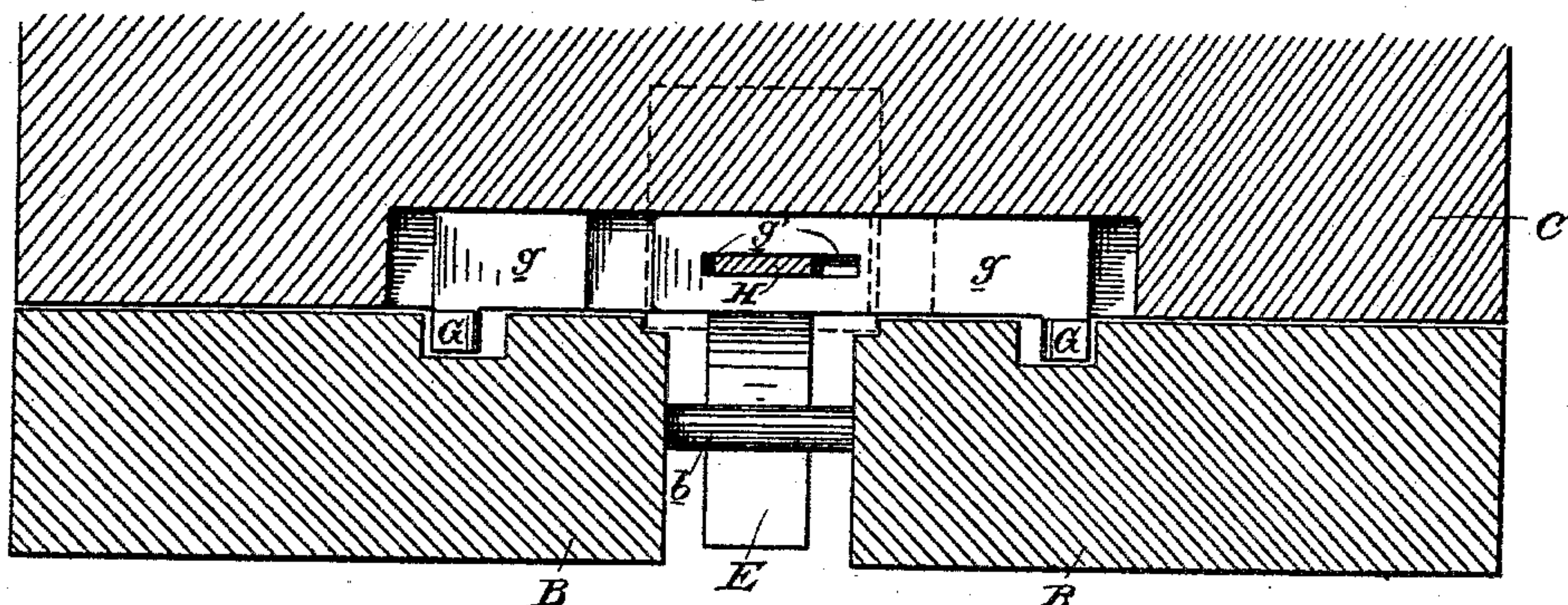
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H. ALBERT.  
ELEVATOR SAFETY DEVICE.

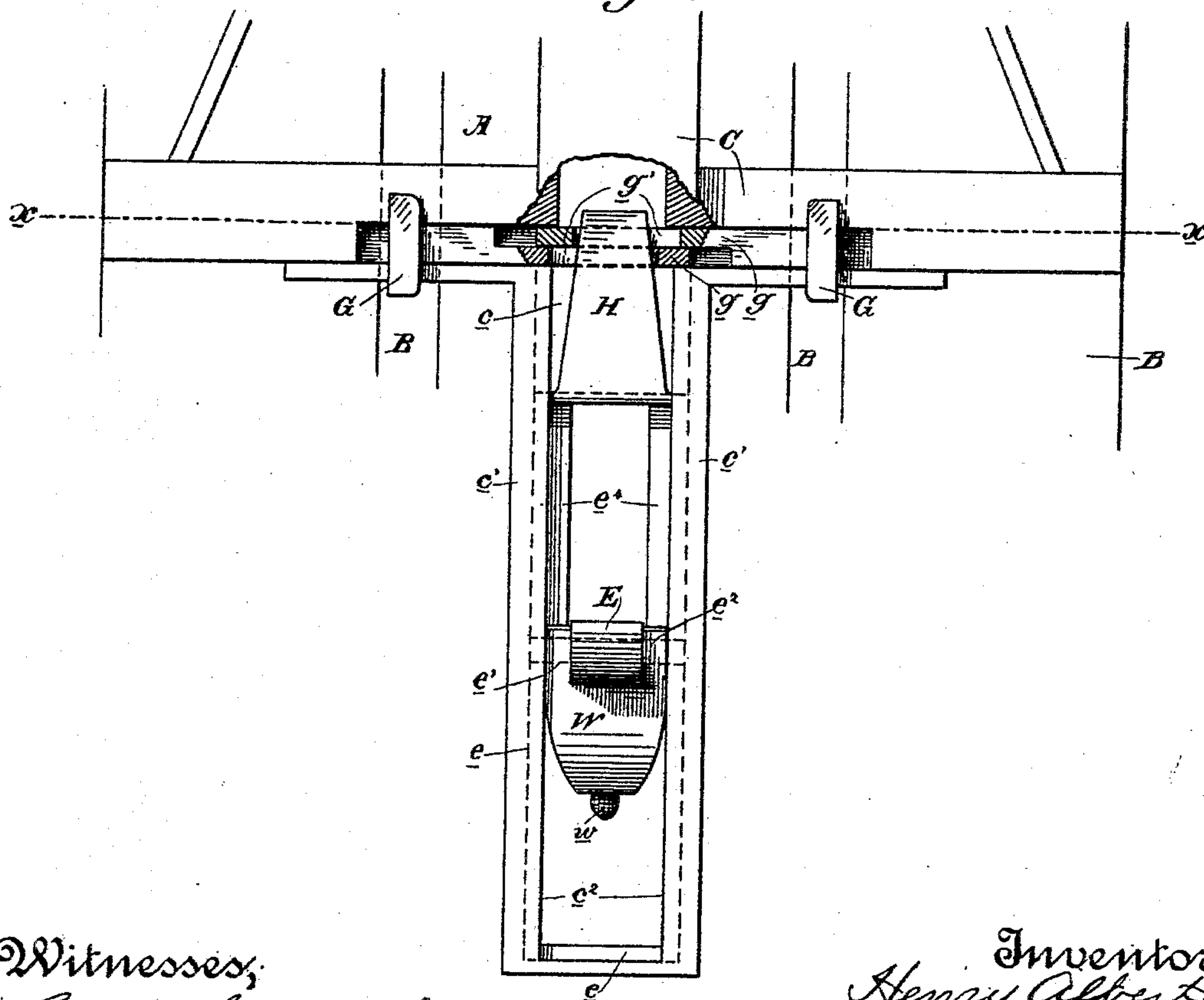
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*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

HENRY ALBERT, OF CRESCENT CITY, CALIFORNIA.

## ELEVATOR SAFETY DEVICE.

SPECIFICATION forming part of Letters Patent No. 412,059, dated October 1, 1889.

Application filed January 28, 1889. Serial No. 297,825. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY ALBERT, of Crescent City, Del Norte county, State of California, have invented an Improvement in Safety Devices for Elevators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of elevators, and especially to the safety appliances therefor; and my invention consists in improvements in the reversible catches of the kind shown in my patent, No. 360,504, dated April 5, 1887, and also in connection with said catches of novel clamps dependent for their operation upon the reversible catches and adapted to bind upon the sides of the shaft or well timbers, whereby additional security is rendered and much of the weight taken from the catches, all of which I shall hereinafter fully describe.

The object of my invention is to provide a safety appliance for elevators of a character simple in construction and efficient in operation.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of my elevator cage or car, looking at it from below, the rack on one side being broken away. Fig. 2 is a vertical cross-section showing the catches reversed and holding the cage or car. Fig. 3 is a sectional view on the line X X of Fig. 4. Fig. 4 is a detail showing a portion of the cage or carriage, the slotted guides  $c'$ , the clamps G, the catches, the frame  $e$ , and adjunctive parts.

A is the shaft or well, in the sides of which are the racks B, here shown as consisting of separated guides having at intervals the transverse bars  $b$ , forming stops. These racks may, however, be made in other ways, and need not necessarily consist of transverse bars, as blocks or other stops firmly secured to the walls of the shaft, and with which the catches engage, may be employed.

C is the cage or car mounted in the shaft or well and adapted to be raised and lowered by means of suitable hoisting or elevating machinery or devices—such as a suspending rope or cable—secured at its top.

E are the catches. These consist of stout bars pivoted in the sides of the cage or car

and mounted therein in a manner I shall presently describe. Their outer ends intersect the vertical plane of the rack-bars  $b$ , so that they come in contact successively with said bars; but being pivoted they slip by them. These catches are arranged, as will presently be described, so that upon coming in contact too severely with the rack-bars they are reversed, as shown in Fig. 4, end for end by turning through a half-revolution, and are stopped and held in this position, thereby supporting the cage or car.

The general operation of the catches will be readily understood. When the cage or car is ascending or descending at a safe rate of speed, the ends of the catches slip by the rack-bars and present no obstruction; but in descending, when for any reason too high speed is attained, the catches by their forcible contact with the rack-bars will turn back through a half-turn until their reversed ends rest upon the rack-bars and their further movement is stopped, whereby the descent of the cage or car is arrested.

The catches are mounted on the cage or car in the following manner: Under the platform of the car is a heavy transverse timber  $c$ , to the ends of which are secured the slotted guides  $c'$ . These guides have inwardly-turned edge flanges  $c^2$ , and in their sides and between their flanges are mounted and adapted to slide the frames  $e$ , which carry the catches E. The catches are each pivoted to these frames by a pin  $e'$ , which passes through sockets in the sides of the frame  $e$  and through a hole in the catch, and said pin is held and confined in its seat by the guides  $c'$ , the sides of which inclose the ends of the pin.

The catches have enlarged centers  $e^3$ , (see Fig. 4,) the lower portions of which, carried downwardly, form balancing-weights W, whereby said catches are enabled to remain in proper position when the cage is running normally and are ready for operation at any moment. These weights cause the catches to come to an equilibrium in a horizontal position, so that their outer ends project into the vertical plane of the rack-bars  $b$  and are affected by them.

In order to regulate the return of the catches to equilibrium with more or less celerity and certainty, and thus to vary the rate of speed



allowed by said catches, I insert in the lower ends of the weights the screws *w*, which by being set in or turned out lower or raise the center of gravity in accordance with their position.

In order to make the catches engage the rack-bars *b* with accuracy and prevent their ends from abutting squarely against the rack-bars, as might be the case, I bevel their ends, as shown at *e*<sup>3</sup>.

The carrying-frames *e*, in which the catches are mounted, are provided on their inner sides with stop-flanges *e*<sup>4</sup>, as shown in Figs. 2 and 4, which leave only sufficient width between them for the inner ends of the catches to pass and play freely, but not sufficient width for their enlarged centers *e*<sup>2</sup>, and said centers by coming in contact with the stop-flanges stop the catches from moving farther after they have had their ends reversed and hold them rigidly to support the cage or car.

Mounted in the ends of the platform of the cage or car, in suitable guides therein, are the clamps *G*, having the shanks *g* extending toward and overlapping each other and provided with elongated slots *g*'. The upper end of each of the carrying-frames *e* of the catches is provided with a wedge-shaped cam *H*, which passes upwardly through the slots *g*' of the clamp-shanks. These clamps *G* are adapted to pass on each side of the timbers of the racks *B* and move freely up and down thereon when the cage is moving at a normal rate of speed; but when the descent is too rapid, and the catches *E* are thereby reversed, as above described, and come to a stop, the cage, still moving down on the arrested carrying-frames *e* of the catches, causes the shanks *g* of the clamps *G* to pass down over the wedge-shaped cams *H* of said frames, whereby said shanks are forced in opposite directions and their clamps brought closer together, thus causing them to come in contact with and bind upon the rack-timbers, and it will be seen that the grip of the clamps is gained both from the weight and the momentum of the cage or car, for as soon as the catches come to a state of rest the cage continues for an instant to pass down until its clamps are forced inwardly with binding effect upon the rack-timbers, thereby arresting the cage or car and hanging it up. This clamping affords additional security, and also relieves the catches and rack-bars of much of the strain. The transverse timber *c* on the bottom of the platform serves to strengthen and brace the whole safety appliance, and would of itself, in case the stop-flanges *e*<sup>4</sup> of the carrying-frame gave way, prevent the catches from turning any farther.

Now, in order to release the cage or car when hung up, I may have the following device: Mounted transversely under the platform is a rock-shaft *I*, having a power-wheel projecting into and accessible from the interior of the car. Firmly fixed upon the ends of the shaft are the cams or eccentrics *J*,

which are adapted to bear down upon the carrying-frames *e* of the catches. By turning the shaft the cams or eccentrics bearing on the frames *e* lift the whole cage or car sufficiently to relieve it of the binding effect of its clamps, whereupon it may be readily put in operation again.

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

1. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the reversible catches having their outer ends extending within the plane of the rack-bars or stops and adapted to come in contact therewith, said catches having enlarged centers, and sliding frames having fixed stops with which the enlarged centers of the catches come in contact when said catches are reversed, substantially as described.

2. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the slotted guides secured to the cage or car, the pivoted reversible catches mounted in frames in said guides and having their outer ends extending within the plane of the rack-bars and adapted to come in contact therewith, said catches having enlarged centers, and said frames having fixed stop-flanges with which said centers come in contact when the catches are reversed, substantially as herein described.

3. In an elevator, the cage or car and the rack-bars or stops in the shaft or well, in combination with the slotted guides on the cage or car, the frames, the reversible catches pivoted in said frames and having their ends projecting into the plane of the rack-bars or stops and adapted to come in contact therewith, the balancing-weights formed with the catches and forming enlarged centers therefor, and the said frames having stop-flanges with which the weights are adapted to come in contact and hold the catches when they are reversed, substantially as described.

4. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the reversible catches *E*, pivoted in frames on the cage or car and having enlarged weighted centers whereby they are held in position, the said frames having stop-flanges with which the weighted centers come in contact to hold the catches when they are reversed, and the adjustable screw in the lower part of the weights for regulating the catches, substantially as described.

5. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the slotted guides *c*', secured to the cage or car, the carrying-frames *e*, mounted in said guides, the reversible catches *E* in the carrying-frames, having weighted enlarged centers, the pivot-pins *e*', passing through the sides of said frames and intervening catches and confined by the guides, and said frames *e* having stop-flanges with which



the said centers come in contact, substantially as herein described.

6. In an elevator, and in combination with the cage or car and the shaft-timbers in which it moves, the sliding frames *e*, the oppositely-moving clamps *G*, carried thereby and playing on each side of the shaft-timbers, the wedge *H*, carried by the frames *e* and adapted to actuate the clamps to cause them to bind on the shaft-timbers, and stops, substantially as described.

7. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the vertically-movable reversible catches pivoted in the sliding frames with their outer ends extending within the plane of the rack-bars or stops and adapted to come in contact therewith to hold the catches in a reversed position, the movable clamps in the ends of the cage or car and embracing the rack-timbers, and power mechanism—such as the wedge-shaped cams—between the vertically-movable catches and the clamps, whereby when the catches are arrested the clamps are forced together to bind on the rack-timbers, substantially as herein described.

8. In an elevator, the cage or car and the reversible pivoted catches *E* carried thereby and operating as described, in combination with the sliding frames *e*, by which the catches are carried, the oppositely-moving clamps embracing the guide-timbers of the shaft or well and having slotted shanks, and the wedge-shaped cams engaging said shanks and carried by the sliding frame of the catches, substantially as described.

9. The safety appliance for elevator cages or cars, comprising the sliding frames *e*, mounted in guides in the cage or car and having stop-flanges on their inner sides, the reversible catches *E*, pivoted in and carried by said sliding frames and having enlarged cen-

ters adapted to come in contact with the flanges of the frames, whereby the catches are held when reversed, the oppositely-moving clamps on the ends of the cage or car for embracing the sides of the well or shaft-timbers, said clamps having slotted shanks, and the wedge-shaped cams on the top of the frames *e*, engaging said slotted shanks, substantially as described.

10. In an elevator, and in combination with the cage or car and the rack-bars or stops in the shaft or well, the slotted guides *c'*, secured to the cage or car, the sliding frames *e*, mounted in said guides, the reversible catches pivoted in the frames and having their outer ends extending into the plane of the rack-bars or stops and adapted to come in contact therewith, said catches having enlarged and weighted centers, and said sliding frames being provided with stop-flanges with which the enlarged centers of the catches are adapted to come in contact to hold said catches when reversed, the oppositely-movable clamps in the ends of the cage or car and embracing the rack-timbers, said clamps having overlapping slotted shanks, and the wedge-shaped cams on the sliding frames *e*, engaging the slotted shanks and operating the clamps, substantially as described.

11. In an elevator provided with safety-clamps, the means for relieving the cage or car of the binding effect of the clamps, consisting of a rock-shaft having eccentrics or cams on its ends adapted to raise the cage or car by fulcruming on the catches, substantially as described.

In witness whereof I have hereunto set my hand.

HENRY ALBERT.

Witnesses:

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G. W. BROWN.