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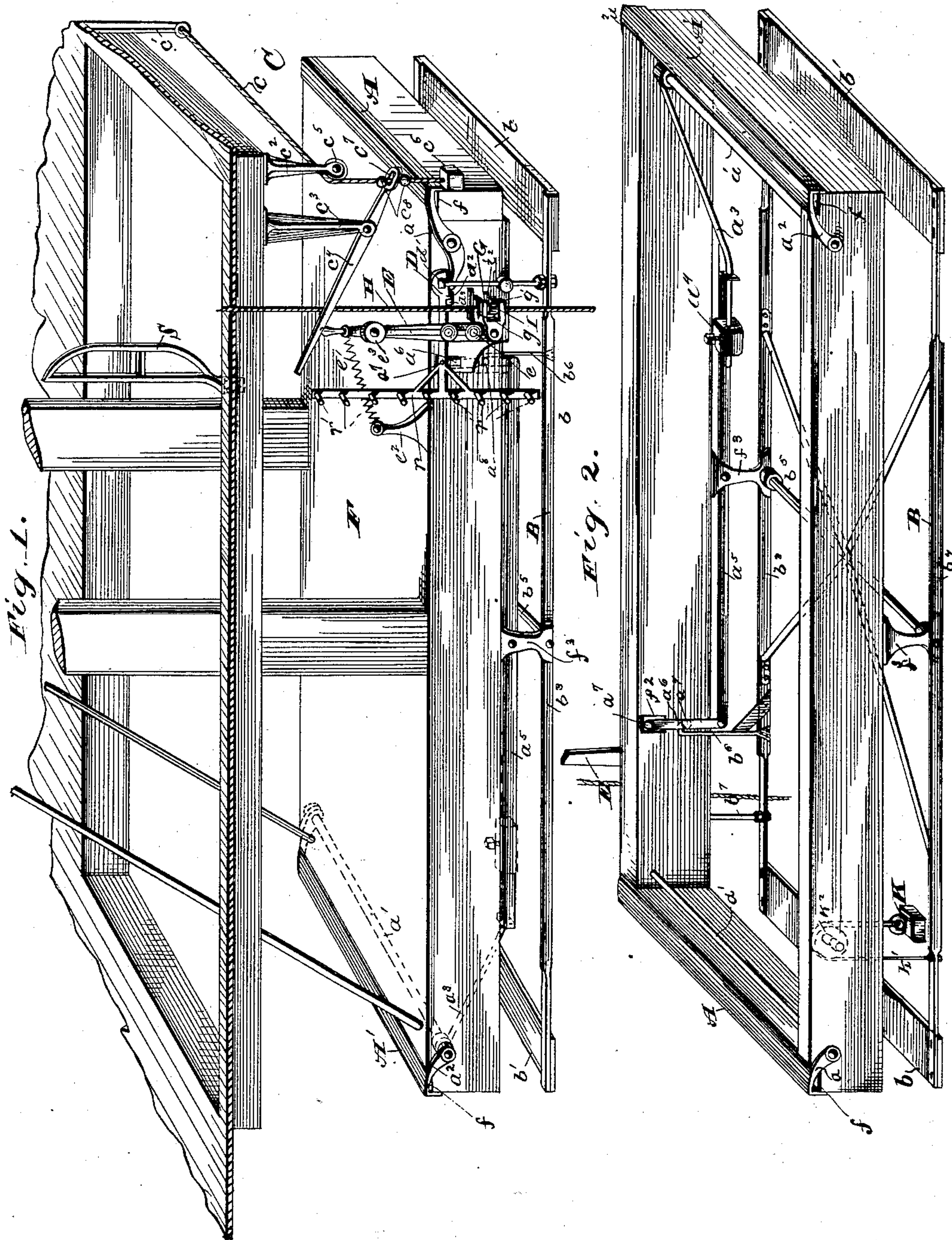
2 Sheets—Sheet 1.

L. SENIOR.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 367,450.

Patented Aug. 2, 1887.



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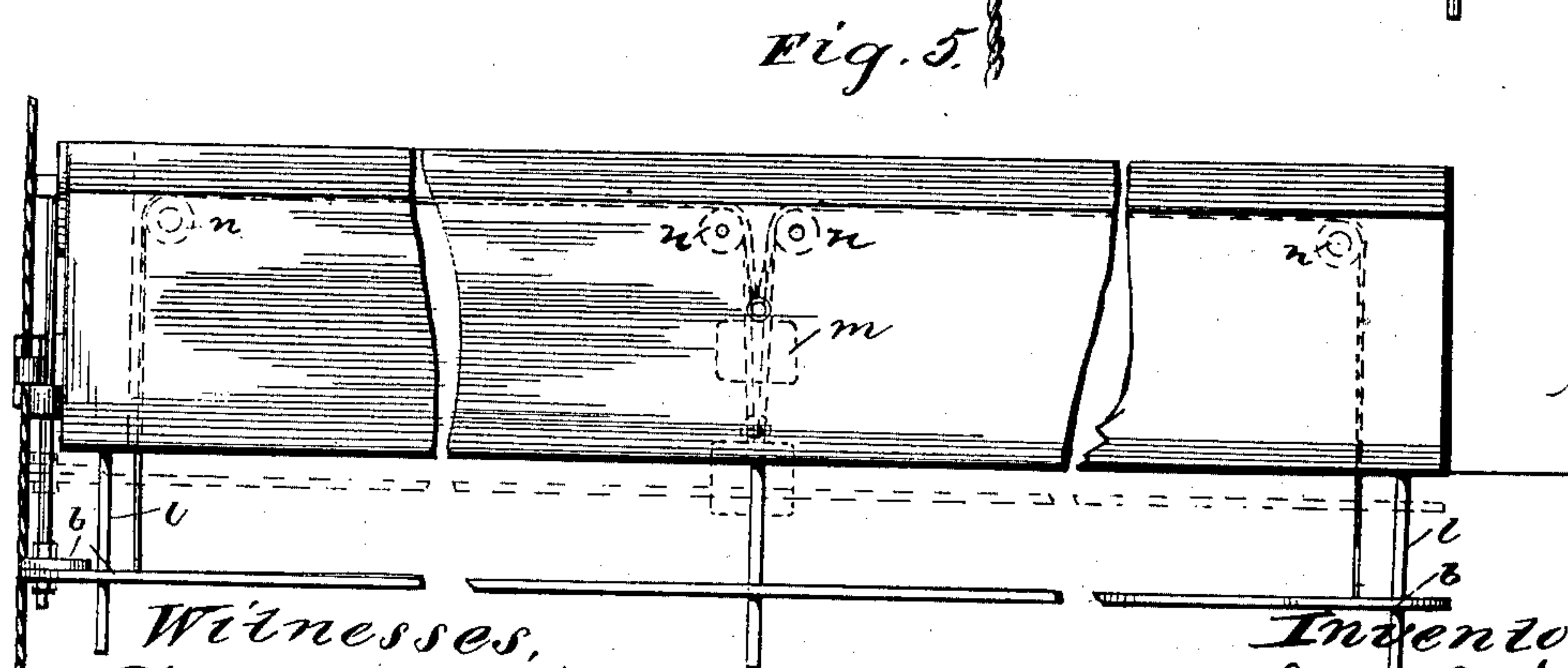
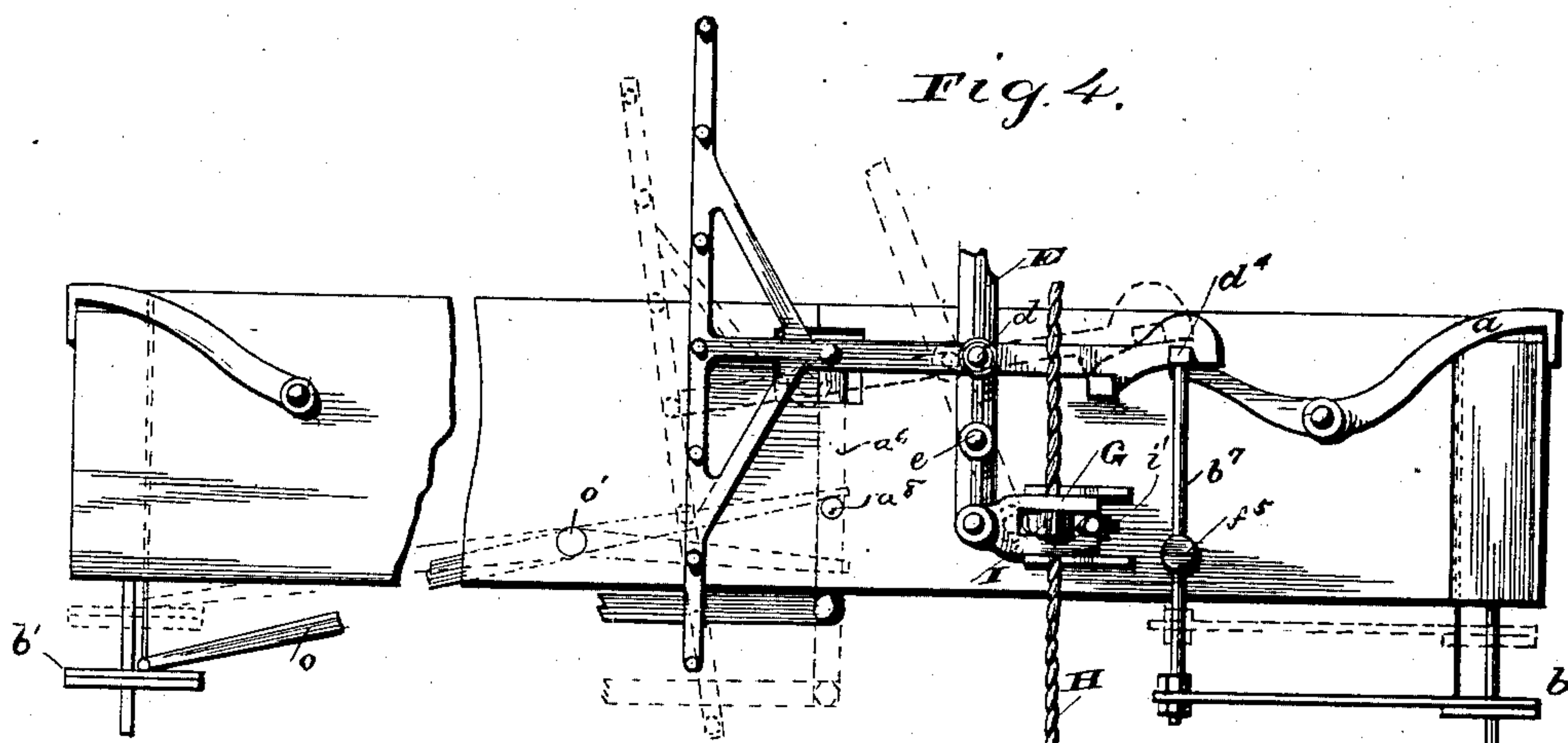
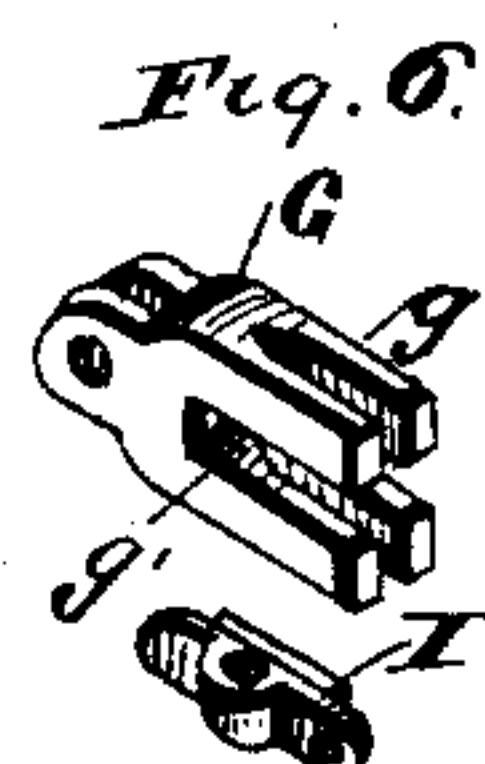
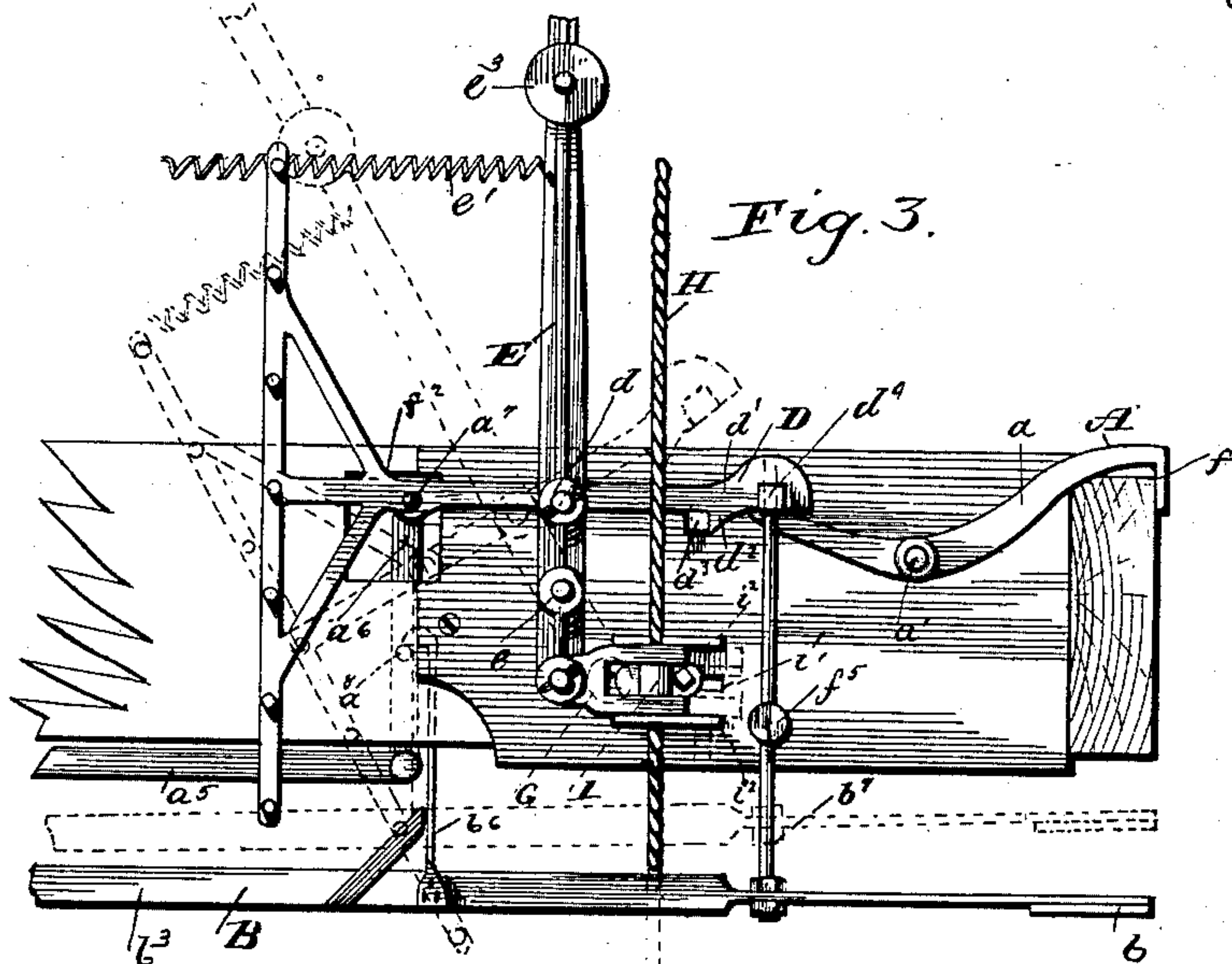
2 Sheets—Sheet 2.

L. SENIOR.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 367,450.

Patented Aug. 2, 1887.



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UNITED STATES PATENT OFFICE.

LUKE SENIOR, OF CLEVELAND, OHIO.

SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 367,450, dated August 2, 1887.

Application filed July 17, 1886. Serial No. 208,235. (No model.)

To all whom it may concern:

Be it known that I, LUKE SENIOR, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety Attachments for Elevators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to safety attachments for elevators, and is an improvement on the device patented to me and Otto C. Berchtold April 6, 1886, No. 339,484.

In said patent is described and claimed an attachment for elevators secured to the edge of the platform and connected with the shifting cable in such manner that when the attachment is depressed—as by the foot of a passenger or an article of merchandise—the connecting mechanism engages the shifting cable and the elevator speedily stops.

The present invention comprehends improvements on the mechanism by which this result is accomplished, as well as additional safety attachments connected with other parts of the elevator, which materially diminish the liability to accident and promote safety in its operation.

To this end the invention consists in the construction and combination of parts hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of an elevator-platform and a hatchway in a floor carrying my safety attachments. Fig. 2 is a perspective of the mechanism inside the platform, with the ends of the platform reversed so as to show the connections with the locking-lever. Fig. 3 is an enlarged side elevation of the front section of the platform and the safety mechanism. Fig. 4 is a side elevation, and Fig. 5 a front elevation, of a modified form of safety attachment beneath the platform. Fig. 6 is a detail of the clutch and guide-plate for the shifting cable.

Specifically considered, the invention embodies three distinct and separate attachments—viz., the plates A A', the pivoted frame B, and the cord C—each centering through a

chain of intermediate mechanism on the dog D, which controls the clutch-lever E, and having the purpose and function hereinafter described.

F represents the elevator-platform (shown in Fig. 2) with the top removed to disclose the inner mechanism. This platform is rabbeted at *f* along its front and rear top edges, and the plates A A', preferably made of metal, are adapted to occupy the rabbeted edges. The said plates or bars are normally held slightly above the rabbets or recesses, the plate A by means of lever *a*, pivoted on the rod *a'*, extending transversely across the platform, the inner end of the lever resting beneath the head of the dog D, and the plate A', through the arms *a*², outside the platform, the arm *a*³, inside, carrying a counter-weight, *a*⁴, and connected with a pivot-bar, *a*⁵, operating a link, *a*⁶, which has a pin, *a*⁷, engaging with the rear extension of the dog. The arms *a*² and *a*³ are rigid with the rod *a'*, and the adjustable counter-weight *a*⁴ serves as a balance in the chain of mechanism with which it is connected to hold the plate A' suspended above its seat. The side of the platform is necessarily slotted, as at *f*², to permit the pin *a*⁷ in the link *a*⁶ to extend through to the dog and give it the required vertical movement. The pivot-bar *a*⁵ is supported at about its center on a suitable bracket, *f*³, suspended from the platform.

The dog D is pivoted on the lever E at *d*, and is provided with a head, *d'*, having a catch, *d*², adapted to engage a pin or projection, *d*³, on the side of the platform when all the parts are set for operation.

The lever E is fulcrumed on the side of the platform at *e*, and is pivotally connected with the clutch G, secured to its lower end. At its upper end is a spring, *e'*, attached at its opposite end to a short standard, *e*², on the edge of the platform. The clutch G is constructed with right angled open slots *g g'*, the vertical slot *g* having a V-shaped form at its inner end, adapting the clutch to wedge itself on the shifting cable H, upon which it is designed to act.

I represents a guide-plate for the shifting cable adjustably secured in a slot, *i'*, in the platform and so located that when the clutch is in working position the plate I will rest between the horizontal arms of the clutch in the

slot g' , while the shifting cable passes at right angles thereto through the slot g . The clutch G is held in position by guideways i^2 in the platform.

5 The operation of this attachment is as follows: Suppose while the elevator is ascending a passenger accidentally steps near the edge and rests his foot on either the plate A or A' . The mechanism connecting these plates with
10 the dog and clutch may be so finely and sensitively adjusted that a few ounces placed on either plate will lift the dog off the pin d^3 , throw the clutch into engagement with the cable, and speedily stop the elevator. If the
15 weight comes onto the plate A , the operation is through the lever a , which lifts the head of the dog off the pin d^3 , when the spring e' comes instantly into action, drawing the lever E back and forcing the clutch onto the shifting cable.
20 If the weight comes onto the plate A' , it depresses the rear end of the dog through the arms, pivot-bar, and link connecting it therewith, which releases the dog from the pin d^3 , when the operation of the lever and clutch is
25 repeated as before. These parts are so constructed and arranged that when the lever is pressed forward by hand the dog automatically locks on pin d^3 , while at the same time the shifting cable is released from the grasp of
30 the clutch and is free to be operated by hand. If in loading the elevator an article projects over the edge upon either plate, the plate will be depressed and the clutch will grip the cable, so that the elevator cannot be started till the
35 obstruction is removed.

Attachment B is designed to afford protection and insure safety beneath the elevator. To this end I provide a light rectangular frame, preferably of metal, and about the size
40 of the platform and consisting of end plates, b b' , and side rails, b^3 b^4 , with suitable braces extending from side to side. This frame is pivoted at its center on brackets or hangers f^3 —say eight or ten inches in length, (more or
45 less)—a rod, b^5 , passing through said brackets serving as the pivot-point of the frame. On one side of the frame, Fig. 2, is a hooked arm, b^6 , rigidly fixed to the frame and adapted, through its hook, to engage a projection, a^8 ,
50 on the inner side of the link a^6 , and in front of said arm is a corresponding arm or standard, b^7 , which may extend beneath the frame, as shown in Fig. 4, and passing through a guide-loop, f^5 , on the side of the platform, rests at its
55 top immediately beneath a lug, d^4 , on the head of dog D . A balance-weight, k , attached to a cord, k' , passing over a sheave, k^2 , on the platform and at its opposite end to the frame, serves to balance the frame and to steady and
60 equalize its movements.

With this attachment at the bottom of the platform there is corresponding security against accident to that above described and connected with the top of the platform. If,
65 for example, an obstruction is met in the descent of the elevator which comes in contact with and raises the end of the frame b' , the

arm b^6 will depress the link a^6 and release the dog from the projection d^3 , when the clutch will instantly fly into action, and, grasping
70 the shifting cable as before, stop the elevator at least by the time the said end b has been raised to touch the platform.

It is desired to have the operating mechanism throughout the structure so arranged that
75 the platform will not move more than eight or ten inches at most after the dog has been sprung, and as all the several attachments center on the dog, and in releasing it effect the gripping and fastening of the cable, the re-
80 sult will be the same whichever attachment is brought into operation, and the elevator will stop within the limited distance above specified. If the opposite end, b , be raised, the standard b^7 will raise the dog, when a like
85 effect will follow.

In Figs. 4 and 5 I have shown a modification of bottom attachment to the platform, in which the frame is divided into two separate sections,
90 the plate b moving in guide-rods l , pendant from the platform and having a counterweight, m , passing over sheaves or pulleys n to balance the section, and the rear plate, b' , resting in similar guides with weights and
95 pulleys, and having a lever, o , pivoted at o' , and resting at one end on the said plate and at the other on the projection a^8 on the link a^6 . The action thereafter in respect to both sections is the same as above described.

The part C consists in an attachment to be
100 made at the end or side of the hatchway, and is designed to prevent accident in case an article projects beyond the platform and would otherwise be liable to be caught beneath the
105 floor above as the elevator ascends. I provide against danger or accident on this account by supporting a rope, c , on two hangers, c^2 c^3 , depending, say, six or eight inches (more or
110 less) below the joist or floor to which they are attached. The rope is fastened to the hanger c' , and, passing over a pulley, c^5 , in the hanger c^2 , is kept taut by a weight, c^6 , at its end. Another hanger, c^3 , supports a lever, c^4 , hav-
115 ing an eye, c^7 , in one end, through which the rope c passes, knots or their equivalents c^8 on the rope below the eye serving to raise the lever when the rope is drawn up. The opposite end of the lever is adapted to strike any
120 one of a series of pins, r' , on a rack, r , attached to the dog D . It will thus be seen that when the elevator rises, if an article projects over the edge of the platform sufficiently to catch on the edge of the hatchway, it will strike the
125 rope c , and the rope, being borne up, will quickly depress the long end of the lever c^4 , which in turn will release the dog and stop the elevator-platform before it enters the hatchway. It will depend on the elevation of the
130 article above the surface of the platform and its action on the rope whether the lever c^4 strikes one or another of the pins r' , the rack being provided with such number of these pins as to be ready for action until the danger-point has been passed.

If desired, additional cords or ropes may be arranged in the hangers between the cord *c* and the ceiling, so as to catch obstructions that may be projected over the platform after passing the cord *c*.

When the elevator or platform occupies the hatchway and freight is being received or discharged, it is desirable that the clutch should be held out of engagement with the shifting cable. To this end I provide a metallic piece, *S*, having its front edges rounded and shaped, substantially as shown, to bear against a pulley, *e*³, on the lever *E* and hold said lever in a vertical position and the clutch free from the cable, notwithstanding any disengagement of the dog by reason of pressure upon the plate *A* or *A'*. The piece *S* is fixed rigidly at the side of the hatchway, and is so placed as not to interfere with the mechanism carried by the platform, with which it has no proper connection. When the platform rises and clears the hatchway, if no weight remains on either plate *A* or *A'*, the dog will lock and the elevator continue to rise; but should there be weight resting on one or both of the plates, the moment the lever clears the piece *S* the clutch will grip the shifting cable and the elevator will stop.

It is manifest, of course, that in a construction representing so many details and elements many changes and variations may be made without departing from the spirit of the invention.

I have shown and described complete working attachments, and do not deem it necessary to suggest modifications or changes beyond those already described.

In case an elevator is constructed to receive freight and passengers on only one side, with the other sides closed and protected, the safety attachments herein described may be arranged on one side only, otherwise they will be arranged according to the sides that are exposed, whether two or more.

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

1. In an elevator, a platform, a cable, and mechanism for gripping the cable, in combination with a safety device attached to the platform and constructed to throw the gripping mechanism into operation when an obstruction is met in the descent of the platform, substantially as set forth.

2. In an elevator, a platform, a cable, and a clutch to engage the cable, in combination with a pivoted safety device attached to the bottom of the platform and connected with the clutch, whereby the clutch is caused to engage the cable and stop the elevator when the safety device strikes an obstruction, substantially as set forth.

3. In an elevator, a safety attachment consisting of plates or bars arranged transversely beneath the platform and in line with its open sides, in combination with mechanism extending to the shifting cable and adapted to engage the same, whereby the upward movement of the cross-plates causes the elevator to be stopped, substantially as set forth.

4. In an elevator, a safety attachment having vertically-movable plates or bars supported on the under side of the platform, in combination with balancing mechanism connected with said plates, a lever adapted to lock the shifting cable, and means connected with the movable plates or bars for operating the lever, substantially as set forth.

5. In an elevator, a platform and a frame having plates or bars supported on its under side, in combination with a shifting cable, a clutch, and rods or links between the plates or bars and clutch to throw it in engagement with the cable, substantially as set forth.

6. In an elevator, a platform having vertically-movable plates or bars attached to its bottom, in combination with a shifting cable, an operating-lever having a clutch for the cable, means for operating the clutch, and a dog to lock the clutch normally out of engagement, substantially as set forth.

7. In an elevator, a safety device arranged on the edge of the hatchway, in combination with a shifting cable, and a clutch on the platform to grip the cable when the safety device is moved, substantially as set forth.

8. In an elevator, a flexible attachment on the edge of the hatchway, having a lever or bar connected therewith, in combination with a cable, and clutch mechanism on the platform operated by the aforesaid lever, substantially as set forth.

9. In an elevator, a shifting cable, and clamping mechanism on the platform for the cable, in combination with a safety device on the lower edge of the hatchway, and intermediate devices for throwing the clamping mechanism into action, substantially as set forth.

10. In an elevator, a lever having a clutch adapted to lock the shifting cable, in combination with a device arranged to bear against the lever and hold the clutch out of locking position when the platform occupies the hatchway, substantially as set forth.

11. In an elevator, a shifting cable, and a lever and clutch on the platform, in combination with a device above the hatchway to bear against the lever, substantially as set forth.

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Witnesses:

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