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## ELEVATOR.

No. 321,567. Patented July 7, 1885.

Fig 1.

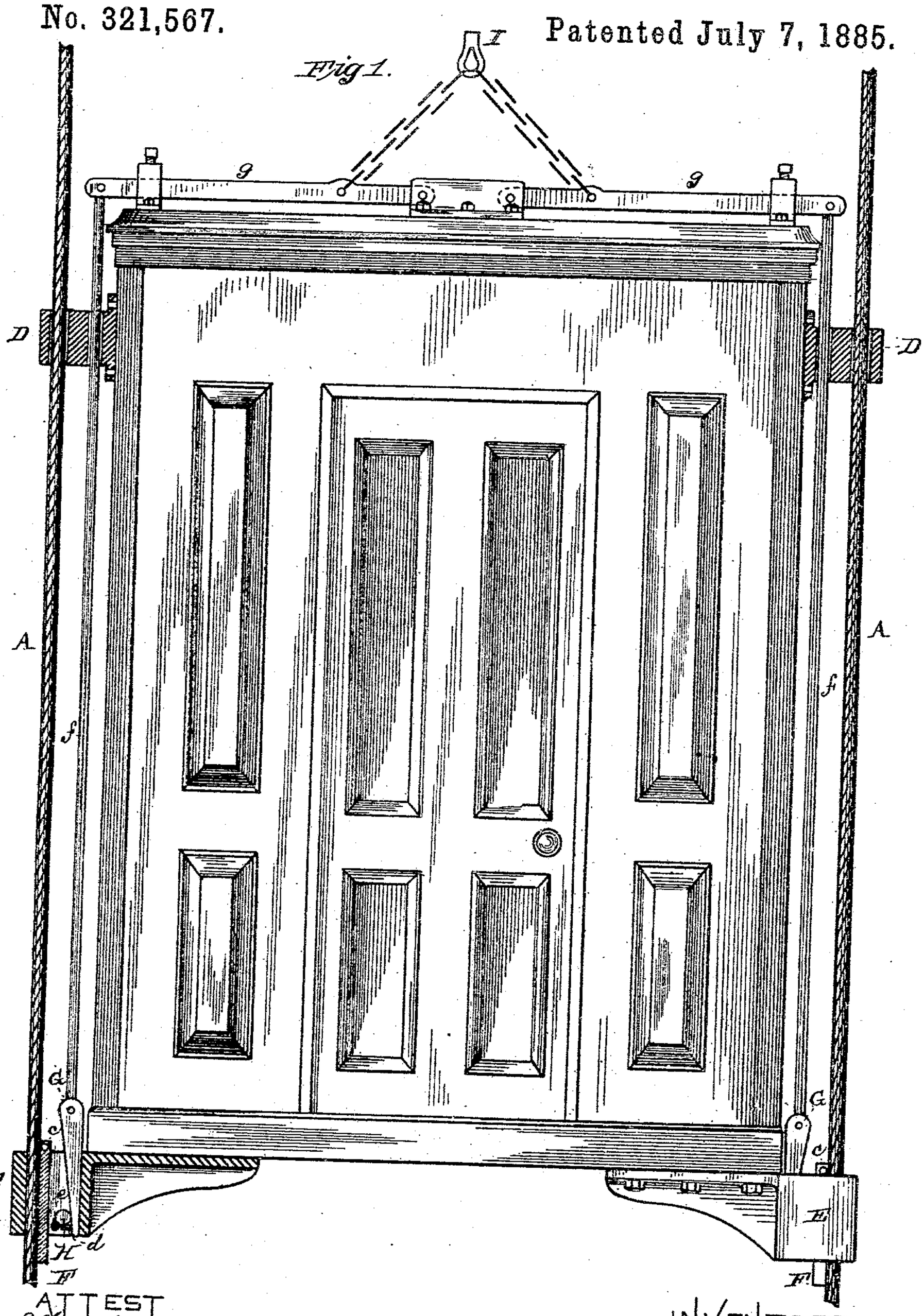


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Fig. 2.

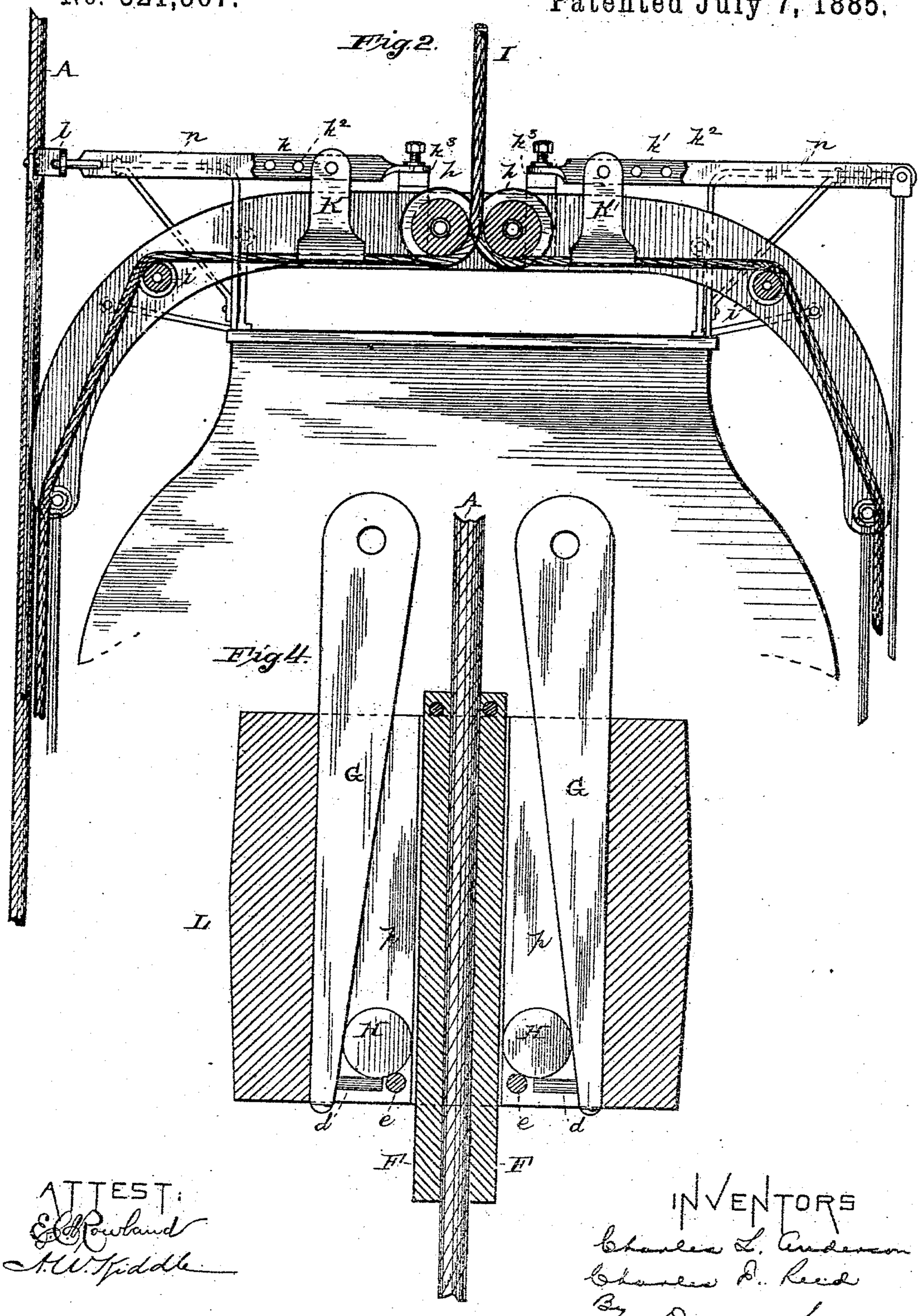


Fig. 4.

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## ELEVATOR.

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Fig. 3.

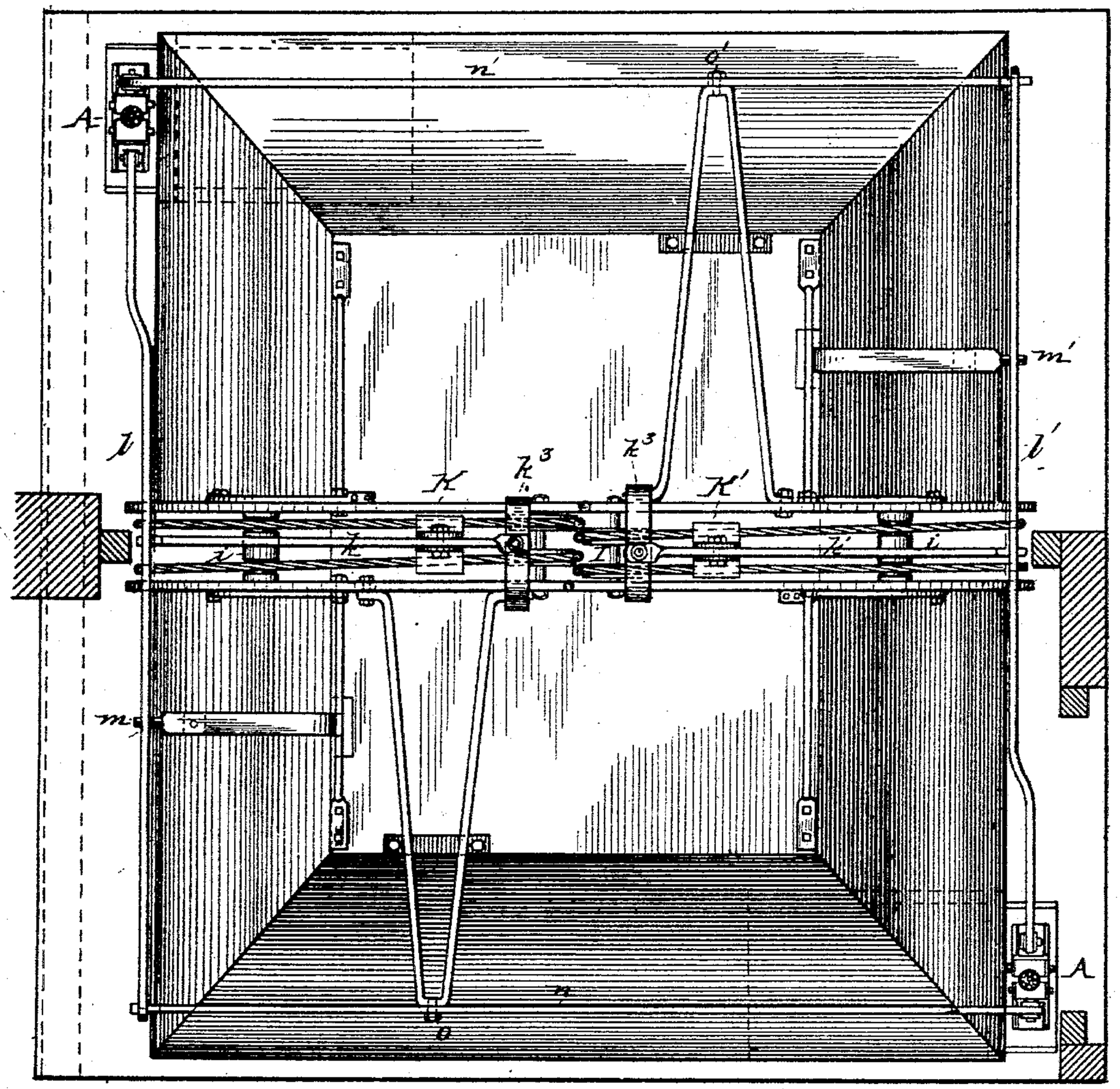
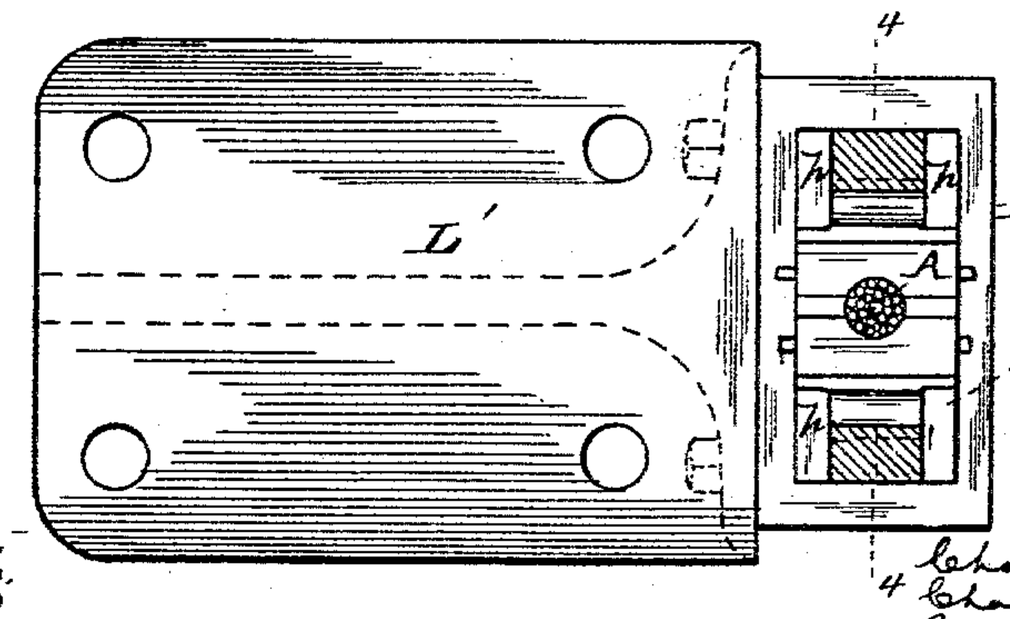



Fig. 5.

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## ELEVATOR.

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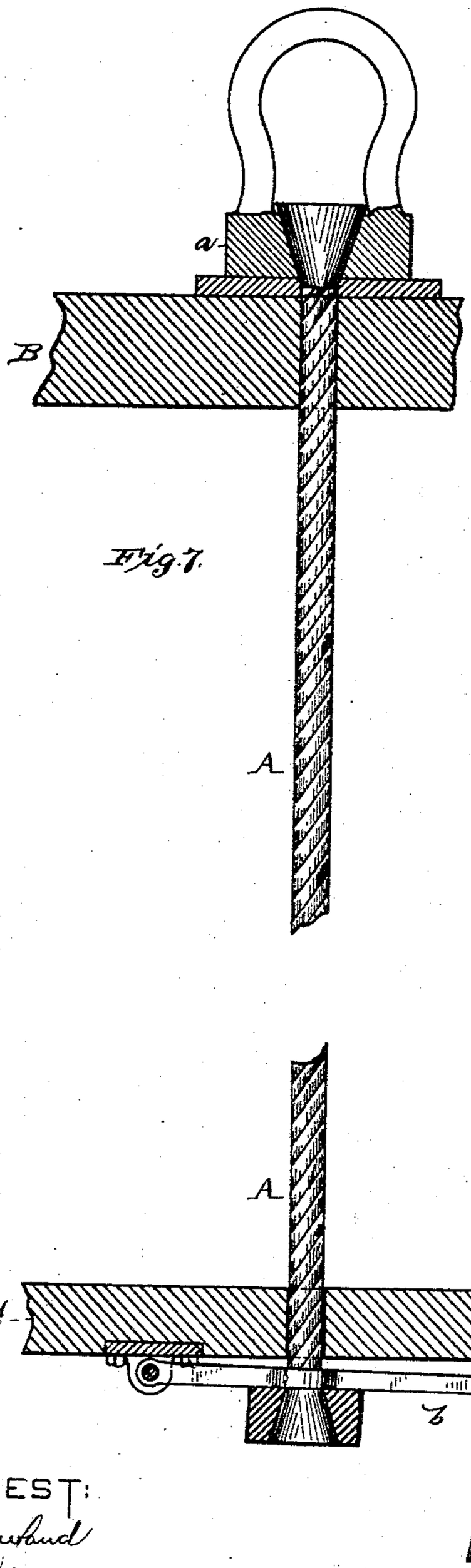


Fig. 7.

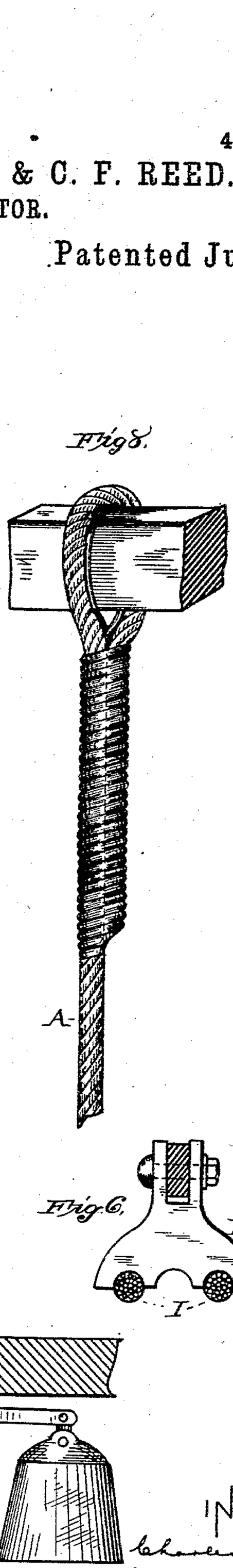


Fig. 8.




Fig. 6.

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# UNITED STATES PATENT OFFICE.

CHARLES L. ANDERSON, OF NEW YORK, N. Y., AND CHARLES F. REED, OF GREENE, MAINE, ASSIGNORS TO THE ELEVATOR SAFETY AND MOTOR COMPANY, OF NEW YORK, N. Y.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 321,567, dated July 7, 1885.

Application filed March 27, 1885. (No model.)

*To all whom it may concern:*

Be be it known that we, CHARLES L. ANDERSON, of New York city, in the county and State of New York, and CHARLES F. REED, of the town of Greene, in the county of Androscoggin and State of Maine, have invented a certain new and useful Improvement in Elevators, of which the following is a specifiation.

Our invention relates to safety devices for passenger and freight elevators, for preventing the descent of the elevator-car should the hoist-rope or other portion of the hoisting apparatus give way.

The invention is an improvement upon the safety device covered by Patent No. 305,689, dated September 23, 1884. Our object is to provide a more suitable engaging-support for the frictional gripping devices than the rods described in said Patent, and also to improve the efficiency of the gripping devices themselves, and to provide means for connecting the gripping devices with the hoisting apparatus of an elevator, having two or more hoist-ropes passing around the car, so that the safety device can be applied to such an elevator without disturbing or changing the hoisting apparatus, and, when so applied, will be brought into action by the breaking of any one of the two or more hoist-ropes.

In the accompanying drawings, forming a part hereof, Figure 1 is an elevation of an elevator-car, with simple form of hoisting apparatus, the gripping-jaw on one side and the guides on both sides being in section; Fig. 2, a vertical section of the top of an elevator-car with four hoist-ropes; Fig. 3, a top view of this car; Fig. 4, a section on line 4 4 in Fig. 5 of the compound gripping device used with the apparatus of Figs. 2 and 3, the wedges and rollers being in elevation; Fig. 5, a top view of this compound gripping device, the wedges being in horizontal section; Fig. 6, an elevation of one of the supporting saddles for connecting the gripping devices with the hoist-ropes of Figs. 2 and 3; Fig. 7, an elevation of grip-cable, showing end connections in section; and Fig. 8 a perspective view showing a different way of securing the cable at its upper end.

Like letters denote corresponding parts in all the figures.

We employ for each elevator-shaft two or more wire cables, A. These cables are hung from the top of the shaft upon a cross-beam, B, or from any suitable or convenient support which is strong encugh to bear the strain caused by stopping a descending car. The cables may pass through the beam and be secured in eye-blocks *a*, resting on the beam or hung from above, or the cables may be passed around the beam and be properly secured. At the bottom of the shaft the cables pass through floor-timbers C, and are strained by weight-levers *b*. This construction permits of the elongation and shortening of the cables under variations in temperature while maintaining them under strain.

Upon the sides of the car, near the top thereof, (Fig. 1,) are guiding-eyes D, through which the cables pass, while to the bottom of the car are secured the gripping-jaws E. The cables pass through these gripping-jaws, which surround such cables. In each jaw, next to the inner side of the cable, is a loose gib, F, which bears upon the cable the entire width vertically of the jaw, and has a cross-pin, *c*, at its upper end, or an enlarged head to prevent it from dropping out of the jaw. Back of the gib in the jaw is the vertical wedge G, and between the wedge and gib is the friction-roller H. A pin *d* on the lower end of the wedge prevents the roller from dropping out of the jaw, while a cross-pin, *e*, throws the roller normally over against the wedge and out of contact with the gib. The wedges G of the opposite jaws are connected with vertical rods, *f*, hung from horizontal pivoted levers, *g*, on top of car. The hoist-rope I is connected with these levers, and the weight of the car raises the levers and holds up the wedges. Should the hoist-rope break the levers *g*, rods *f*, and wedges G drop by gravity and throw the rollers against the gibs. The gibs ride up a short distance in the jaws with the cables, the gripping strain constantly increasing until the car is stopped. The gibs project far enough below the jaws, as shown, so that when the car is stopped the lower ends of the gibs will not be wholly within the jaws, and the frictional bearing on the cables will be the whole width vertically of the jaws. When the hoist-rope is repaired or replaced, the gripping devices will be released and will drop back to their normal position by the hoisting of the car. The wire cables, as a gripping-support, can be used in elevator-shafts of any height.

To secure strength and insure a positive action of the gripping devices, it is necessary that the gripping-jaws should surround the supports.

In shafts of considerable height the rods of the patent referred to cannot be handled in one piece, and when in position produce a noise as the elevator-car moves. The wire cables, being flexible, are comparatively noiseless, can be handled in one piece the required length, and are strong.

The cables may be used as guides for the car, as well as for a gripping-support, although the eyes D might be used when the car has other guides than the cables.

For the elevator car shown in Figs. 2 and 3 four hoist-ropes, I, are employed. These pass under wheels *h*, secured to the top of the car at its center, and then pass horizontally over rollers *i*, and down around the sides of the car to the bottom of the same.

We support our gripping-wedges by saddles K K′, resting upon the horizontal portions of these hoist-ropes, between wheels *h* and rollers *i*. Each saddle rests upon two of the hoist-ropes. Levers *k k′* are pivoted in these saddles, such levers having a number of pivot-holes, $k^2$, so that the saddles can be adjusted to the proper points on the ropes. The inner ends of these levers are secured loosely to supports $k^3$, so that the levers can move vertically and laterally, and can rock on such supports to a limited extent. The outer ends of levers *k k′* are secured to levers *l l′*, arranged at right angles to *k k′* above the sides of the car. Levers *l l′* are fulcrumed at joints *m m′*, and at the ends of their longer arms are connected by vertical rods with the wedges of the diagonally-opposite compound gripping devices. The ends of the shorter arms of levers *l l′* are connected with other levers, *n n′*, fulcrumed at *o o′*, which levers *n n′* are connected by vertical rods with the other wedges of the compound gripping devices. If any one of the hoist-ropes should break—say one under saddle K—that saddle would tilt sidewise, lowering the outer end of lever *k*, and dropping wedges of both gripping-jaws through levers *l* and *n*. The breaking of both ropes under K would permit it to drop with the same effect as that just described; hence any injury to the hoist-rope under either saddle serves to throw in two wedges of the opposite gripping-jaws and to grip upon both cables. An injury or slackening up of hoist-ropes under both saddles would throw in the four wedges. The compound gripping device used with this form of elevator yet remains to be described. It is shown in detail in Figs. 4 and 5. The jaw L of this device is a rectangular box open at top and bottom, and cast or wrought of steel or iron, which box is secured to a bracket-casting, L′, by which the gripping-jaw is attached to the bottom of the car. The cable passes centrally through box L, and on each side of the cable is a loose gib, F. Back of the gibs the corners of the box are provided with plates, *p*, which form shoulders, against which the gibs bear when forced back. If the box is cast of iron or steel, these shoulders *p* will be cast in one piece with the rest of the box. Between the plates *p*, at each side of the box, is a wedge, G, and roller, H. When both wedges are dropped at the same time, both gibs are forced forward upon the cable and grip it securely between them; but should one wedge only be dropped it will force the corresponding gib forward upon the cable, while the other gib will be forced back solidly against the shoulders formed by plates *p*. This distance, however, being only enough for the parts to clear normally—say, one-eighth of an inch—the gripping-action is quickly accomplished.

What we claim is—

1. The combination, with an elevator-car, of a safety gripping-support, gripping-jaws on the car surrounding such support, a loose gib in said jaws, and devices held out of action by the hoisting apparatus and acting when released to force the gib against the gripping-support, substantially as set forth.

2. The combination, with an elevator-car, of a safety gripping-support, gripping-jaws on the car surrounding such support, the loose gib, the roller, and the wedge connected with the hoisting apparatus, substantially as set forth.

3. The combination, with an elevator-car having hoist-ropes extending around the sides of the car, of saddles riding on horizontal sections of the hoist-ropes, and connections between such saddles and the safety device for throwing such safety device into action when a hoist-rope breaks or slackens, substantially as set forth.

4. The combination, with an elevator-car having hoist-ropes extending around the sides of the car, of saddles riding on horizontal sections of said ropes, levers pivoted in said saddles, and the two sets of cross-levers connecting the saddle-levers with the safety devices, substantially as set forth.

5. The combination, with an elevator-car and safety gripping-support, of the gripping-jaws and the double set of gripping devices in said jaws acting upon opposite sides of the said gripping-support, substantially as set forth.

6. The combination, with an elevator-car and safety gripping-support, of the gripping-jaws surrounding said support, loose gibs within said jaws on opposite sides of the support, and two sets of rollers, and wedges for forcing such gibs against the support, substantially as set forth.

This specification signed and witnessed this 19th day of March, 1885.

CHARLES L. ANDERSON.
CHARLES F. REED.

Witnesses:
H. W. SEELY,
N. W. KIDDLE.