(No Model.) 3 Sheets—Sheet 1.

F. E. HERDMAN.

ELEVATOR.

No. 519,118. Patented May 1, 1894.

Fig. 1.

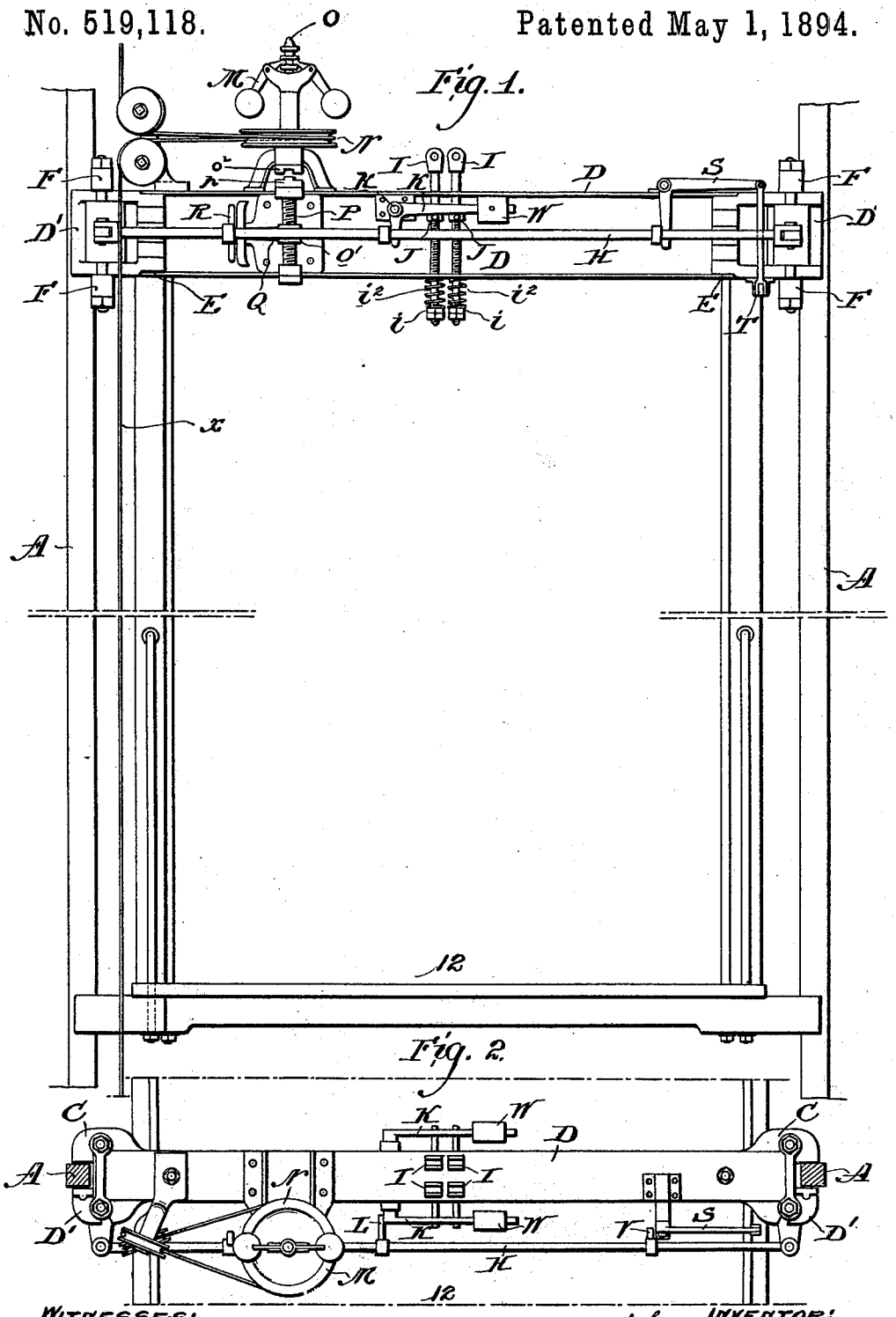

Fig. 2.

WITNESSES:
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Frank S. Brasen

INVENTOR:
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by his atty
G. P. Harding

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

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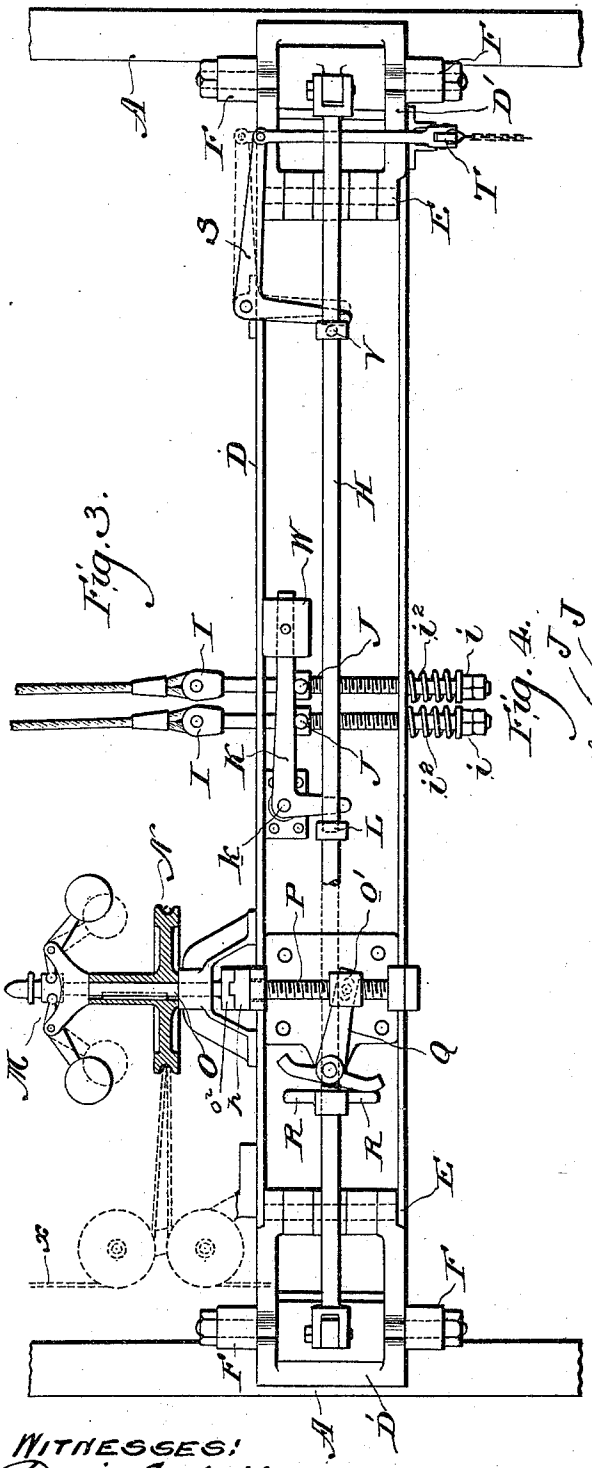

Fig. 3.

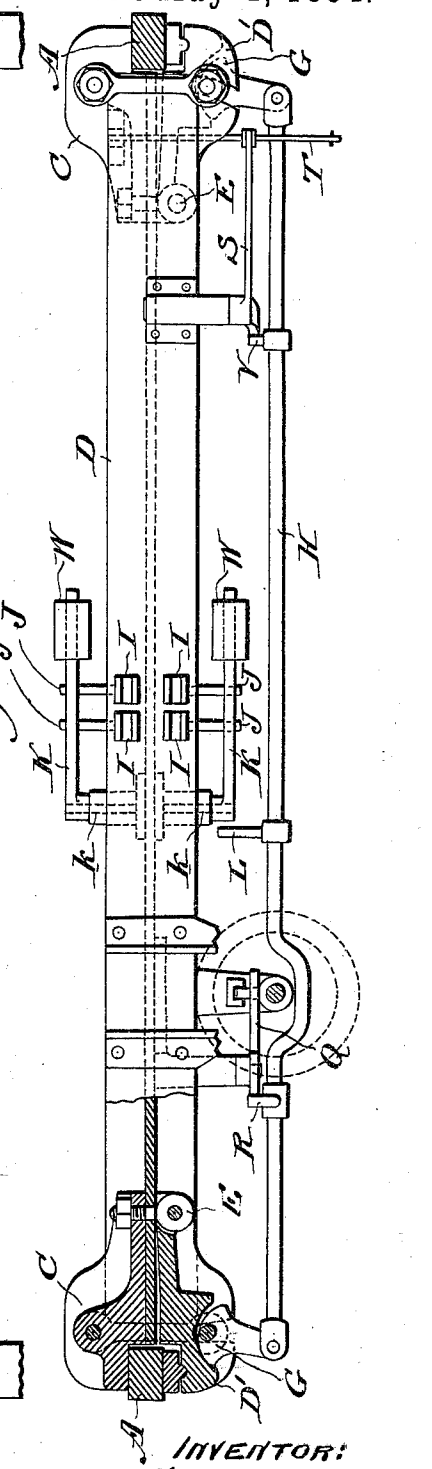

Fig. 4.

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THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

3 Sheets—Sheet 3.

F. E. HERDMAN.

ELEVATOR.

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Fig. 5.

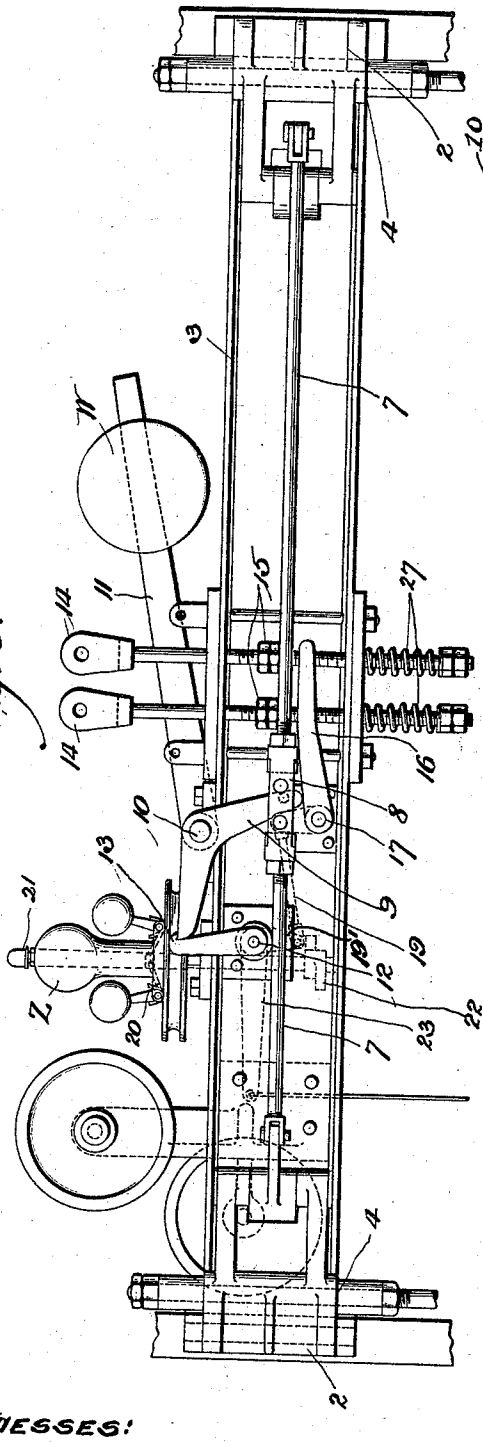
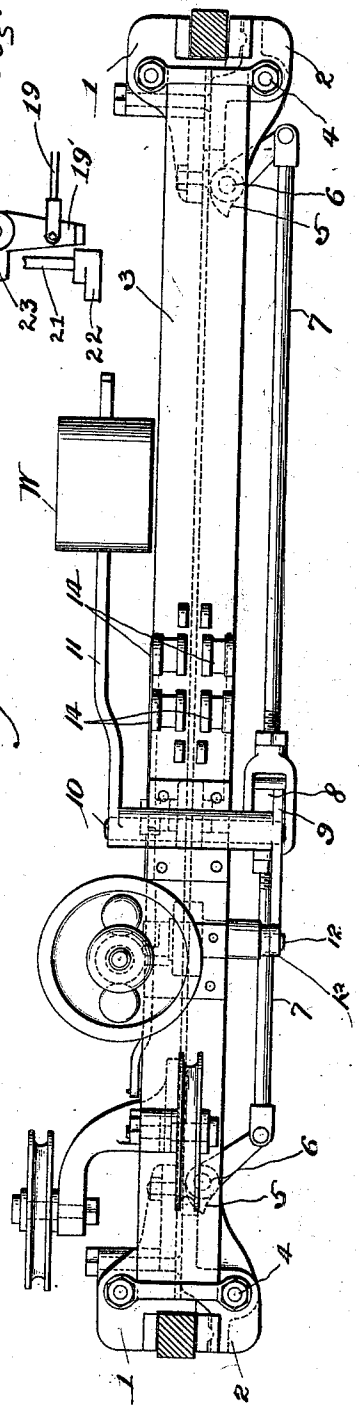


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF INDIANAPOLIS, INDIANA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 519,118, dated May 1, 1894.

Application filed April 11, 1893. Serial No. 469,959. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. HERDMAN, a citizen of the United States, residing at Indianapolis, county of Marion, and State of Indiana, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the stoppage of the car when the speed is too high or when one of the cables breaks and consists in certain details of mechanism as will hereinafter be fully described.

In the drawings:—Figure 1 is a view showing my improved attachment in connection with the elevator. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged side elevation partly in section of the upper frame work of the elevator. Fig. 4 is an enlarged plan view of Fig. 3 partly in section. Fig. 5 is a view similar to Fig. 3, showing modified arrangement of safety devices embodying my invention. Fig. 6 is a plan view of the same. Fig. 7 is a detached view showing the relation between cam 22 and catch 13.

12 is the elevator car.

A A are the elevator guides.

D is a beam which is attached to the elevator car either on the upper side, as shown, which is a preferable form, or the same may be attached to the under side of the elevator car. At each end of this beam are rigidly attached the jaws, C, which jaws extend on one side of each guide, A. Also to each end of the beam are attached jaws, D′, on the opposite side to that to which the jaws C are secured. These jaws, D′, instead of being rigidly attached, as are the jaws, C, are pivoted at the point E. A link, F, is secured to the jaws, C, and the other end of the link, F, is connected to the cam or eccentric, G, which cam or eccentric, G, in turn, bears against the adjacent concave portion of the jaw, D′. The cams or eccentrics on each end of the beam, D, are connected together by means of link, H. As can be seen, a movement of the link, H, in either direction from the center, forces the jaws, C and D, on each side toward each other and against the guides, and if the movement be sufficient a tension between the jaws and the guides can be obtained, which will check or stop the elevator as desired.

I, I, are forked rods which extend through the beam, B, and have at their lower end nuts, *i*, between which and the lower part of the beam are secured the springs i^2. To these rods, I, are secured the lifting cables. On these rods, I, are placed the pins, J, shown in Fig. 3, upon which pins, in a normal condition of the elevator, rests the horizontal arm of the bell crank, K, there being two pins projecting on each side of the beam and a corresponding bell crank on each side of the beam. To the horizontal arm of these bell cranks is attached the weight, W, and the vertical arm is in line with the finger, L, which projects from the link, H. If the cable on either side should break, its rod, I, would fall, which would allow the weight, W, to act, moving the horizontal member of the bell crank, K, downward, and the bell crank, being pivoted at the point, *k*, the vertical arm would swing against the finger, L, moving the link, H, and causing the jaws, D′, to move toward the jaws, C, and closing the jaws upon the guide, A, and the jaws will be brought in sufficient contact with the guides to stop the elevator car.

My improvement can also be used on the same elevator with a device whereby it may be automatically thrown into action if the speed be increased too rapidly. For operating this I use the following mechanism: M is a centrifugal governor which is operated by a rope, K, which passes around the pulley, *x*, upon the shaft of the governor, the ends of the rope being permanently fixed to the top and bottom of the elevator shaft. When the governor reaches the speed for which it is adjusted, the balls fly out, which depresses the spindle O. On the lower end of the spindle O, is the clutch member o^2 which, when said arm is depressed, engages the coacting clutch member, *p*, upon the threaded rod, P, so as to cause said rod to revolve. Upon this rod is the nut, *o*′, which is connected with the bell crank, Q, so that in whichever direction the car may be traveling, as the governor operates it throws, by means of the screw, P, this bell crank in one direction or the other. In whichever direction it may be thrown it

comes in contact with one of the fingers, R, attached to the link, H, thereby moving the arm, H, and closing the jaws. As a further means of operating this safety device at any time that the car should become uncontrollable and it is desired to stop it, I employ the following mechanism: S is a bell crank which is connected to the lever, T, which lever, T, has at its end a cord passing down (or up) into the car. The vertical member of this bell crank lever is in line with a pin, *v*, upon the link, H, so that if the operator pulls the cord the bell crank, S, is operated so as to pull the vertical member so that it will strike the pin, *v*, operating the bar, and thus throwing the jaws against the rod and stopping the car.

Figs. 5 and 6 illustrate a modified arrangement of safety devices, in which the same clutch mechanism is operated by either the excessively rapid rotation of the governor, the breaking of a cable, or the pulling of a chain by the operator in the car, to throw the weight into action and stop the elevator. 1, 1, are the clutches or fixed jaws, permanently fixed to the I-beam 3. 2, 2, are the movable jaws or brakes hinged at 4, 4. 5, 5, are the cams operating the movable jaws or brakes and pivoted thereto at 6, 6, the other end of each of said cams being connected by the rod 7, provided with a slot 8 for the reception of one end of the bell crank lever 9, which is fast on a shaft 10. At the other end of this shaft is keyed a lever 11, carrying at its free end the weight W. Fixed to the shaft 12, is the catch or weight controller 13. The end of the bell crank lever 9 not engaging in the slot 8 is held down by said catch or weight controller 13, thus drawing the weight up out of action. To the shaft 12 is secured the lever 23, at the free end of which a chain, rope or other operative connection is attached and passed into the car within reach of the operator. The forked rods 14, to which are attached the cables, have on them the nuts 15, in such position that they will normally rest above and clear of the bell crank lever 16, which is pivoted to the shaft 17. This bell crank at 18 has pivoted to it the connecting rod 19, which in turn is connected to an arm 19′ on the shaft 12. The balls of governor Z are attached to the collar 20 of the governor shaft 21, having at its lower end the cam 22. Should one of the cables break, its rod, 14, will fall, the springs 27 accelerating its downward movement. The nuts 15, coming in contact with lever 16 will depress it, and through rod 19, the catch or weight controller 13 is lifted and the bell crank 9 freed. The weight W then falls drawing to the left the lower arm of said bell crank 9, operating the jaw-connecting rod 7 to the left, operating the cams 5, 5, and thus causing the jaws 2, 2, to grip the guide and stop the car. Excessive speed of the car, causing excessive speed of the governor, will cause the balls to fly out, drawing up the shaft 21 and the cam 22, which, normally directly underneath arm 19′, will consequently raise said arm and through it the catch 13. This relieves the weight W, the car being stopped as just described. When the operator in the car desires to operate these safety devices, he pulls down the lever 23, draws the catch or weight controller 13 to the left and relieves the weight to stop the car.

Variations in the details of mechanism herein shown and hereinbefore described will occur to the skilled mechanic and I do not therefore restrict myself to the precise mechanism which I herein describe and preferably use to carry out my invention.

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

1. In combination with the guides of an elevator, of jaws adjacent to each of said guides and adapted to grip said guides, jaw operating devices, a connection between the jaw operating devices on opposite sides of the elevator shaft, lifting cable, a device attached to the elevator car, to which said cable is secured, and intermediate mechanism between said device and the connection between the jaw operating devices, substantially as described, whereby when the cable breaks the arm is operated.

2. In combination with the guides of an elevator, of jaws adjacent to each of said guides and adapted to grip said guides, jaw operating devices, a connection between the jaw operating devices on opposite sides of the elevator shaft, lifting cable, a beam secured to the elevator car, a rod passing through said beam and secured so as to be movable vertically, the lifting cable being secured to the said rod, and intermediate mechanism substantially as described between the connection between the jaw operating devices and the rod.

3. In an elevator the combination with the car and a beam secured to said car, of jaws secured to said beam at each end thereof and adjacent to the elevator guides and adapted to grip said guides, one of said jaws being pivotally connected to the beam, cams or eccentrics to operate the pivoted jaws, a connection between said cams or eccentrics on opposite ends of the beam, a lifting cable, a device attached to the elevator car to which said cable is secured, an intermediate mechanism between said device and the connection between the jaw operating devices, substantially as described, whereby when the cable breaks the arm is operated.

4. In an elevator the combination with the car and a beam secured to said car of a pair of jaws secured to said beam at each end thereof and adjacent to the elevator guides and adapted to grip said guides, one of each pair of said jaws being pivotally connected to the beam, cams or eccentrics to operate the pivoted jaws, a connection between said cams or eccentrics on opposite ends of the beam, a lifting cable, a rod passing through

said beam and secured so as to be movable vertically, the lifting cable being secured to said rod, and intermediate mechanism substantially as described between the connection between the jaw operating devices and the rod.

5. In combination with the guides of an elevator, of jaws adjacent to each of said guides and adapted to grip said guides jaw-operating devices, a connection between the jaw-operating devices on opposite sides of the elevator shaft, a governor and connection between said governor and the connection between the jaw-operating devices.

6. In an elevator, in combination, an elevator car, guides for the car, brakes adapted to engage said guides, lifting cables, a weight, a weight-controller, a governor, operative connection between the governor and the weight controller, operative connection between the lifting cables and the weight controller, and connection between the weight and the brakes.

In testimony of which invention I have hereunto set my hand.

FRANK E. HERDMAN.

Witnesses:
G. E. WEISSENBURGER,
E. MESSHAM.