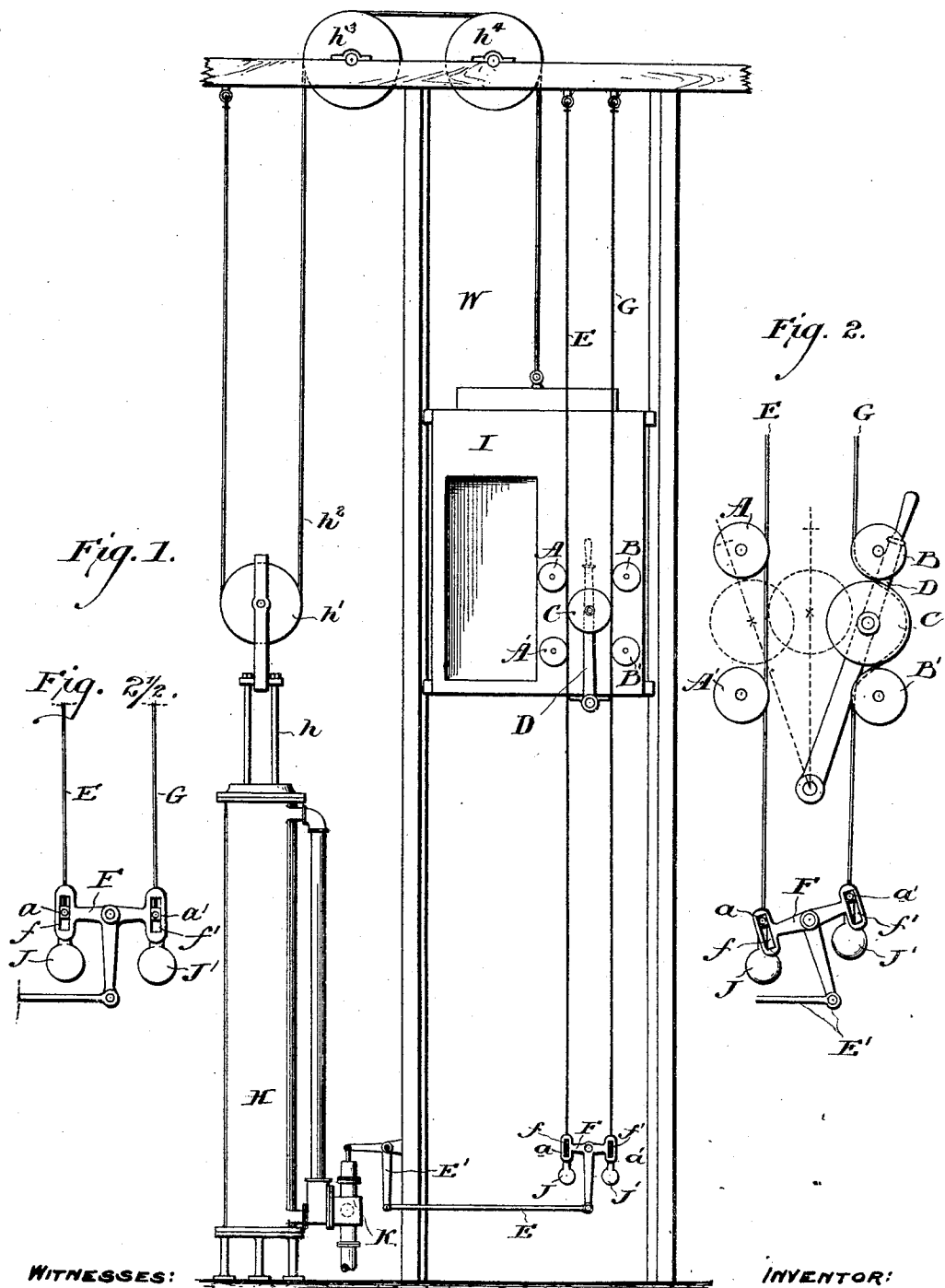


(No Model.)

F. E. HERDMAN.
ELEVATOR.

No. 480,847.

Patented Aug. 16, 1892.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF INDIANAPOLIS, INDIANA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 480,847, dated August 16, 1892.

Application filed January 21, 1892. Serial No. 418,791. (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 Elevating Apparatus, 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 relates specifically to improved mechanism for controlling the elevator-operating mechanism of an elevator.

My improvements will be described as applied to a hydraulic elevator, although they may be applied equally to a steam or electric elevator.

In the drawings, Figure 1 is a front elevation of elevator, elevator-operating mechanism, &c. Fig. 2 is a detached enlarged view, in operation, of my improved mechanism for controlling the elevator-operating mechanism. Fig. 2½ is a detached enlarged view showing my elongated slot modification.

H is the hydraulic cylinder; *h*, the piston-rods connected to the traveling sheave *h'*; *h*², the lifting-cable, which passes over the pulleys *h*³ *h*⁴ and is connected to the car I, which travels in the shaft W.

D is a lever pivoted to the car, and A B A' B' are sheaves fastened to the car I.

E and G are the shipper-ropes, the upper ends of these ropes being secured to the framework at the top of the elevator-shaft. The ropes E and G extend through or outside of the car from the top to the bottom of the elevator-shaft and have at their lower ends the weights J and J'. The positions of the sheaves A and A' are such that in the positions shown in Fig. 1 they just touch the rope E, and the positions of the sheaves B B' are such that they just touch the rope G. To the lever D is attached a stud carrying a grooved sheave C, which is between the sheaves A A' and B B' and touches both ropes E and G. The weights J J' at the end of the respective ropes hold said ropes tight.

F is a lever placed at the bottom of the shaft, having slots *f f'* at each end.

a a' are pins connected, respectively, to ropes E and G, these pins resting, respectively, in slots *f* and *f'*.

E and E' are two bell-crank levers connecting the lever F with the hydraulic-cylinder valve K. Throwing the lever to the right, as shown in Fig. 2, shortens the cable G, which elevates the lever F, thus operating in one manner on the valve K. The slot in the other end of the lever enables it to fall to that end. Throwing the lever to the opposite side elevates the rope E, lifting that end of the lever F and producing an opposite effect upon the valve of the hydraulic cylinder.

I do not intend to limit myself to the connection shown between the valve of the hydraulic cylinder and the lever F. It can readily be seen that in consequence of this movement of the lever D to the right or to the left a movement of the lever F can be obtained, which can be readily transmitted to the elevator-operating mechanism, whether steam, hydraulic, or electric, and in this way maintain perfect control of the same. By throwing the lever to the right the lower end of the rope G is thrown up, and the pin *a'*, which travels in the slot *f'*, passes upward until it reaches the top of the slot, when further shortening of the rope G draws that end of the lever upward. The other end of the lever F dropping, (the slot *f* allowing it to drop,) the rope E remains the same, and in consequence the pin *a* remains in the same position. The lever F can be thrown in this direction until the top of the slot *f* strikes the pin *a*, when further movement is prevented. This gives motion to the valve in one direction. To throw the valve on the center, the lever D is thrown to the center, the weight J' straightening the rope G and at the same time bringing the lever F to the horizontal position.

Should the weight J' fail to straighten the rope G and bring the lever F to the horizontal position, by throwing the lever D in the opposite direction—that is, to the left—the lever F will be forced to a horizontal position by the rope E. When it is desired to throw the valve in the direction opposite to that above described, the movement of the lever D to the left will accomplish it. This arrangement wherein the weights in straightening the rope bring the lever F to the horizontal position requires that the lever D should be kept thrown to the right or left, as required, while the car is in motion, thus keeping one

or the other of the cables bent during such time. This is necessary, for the reason that when the lever D is brought to the center the weight on the end of the rope straightens it and brings the lever F to the center, thus stopping the machine.

Fig. 2 $\frac{1}{2}$ shows a slight modification of the device shown in Fig. 1, the only variation being in the length of the slots $f f'$, which are lengthened to such an extent that when the lever F is in a horizontal position the pins A and A' will be in or near the center of the slots. In this case when it is desired to operate the elevator-car it is unnecessary to hold the lever D against the rope to maintain the car in motion, for when the lever has been thrown sidewise in either direction sufficient to open the valve it can be brought to the center, and while the rope straightens in the same manner as before described in the case of a shorter slot the slot is of sufficient length to allow the weight to drop and the rope to straighten without forcing the lever F to a horizontal position, the car therefore continuing in motion. This arrangement of course requires the lever to be thrown in the opposite direction to stop the elevator, as by that means only can the lever F be brought to a horizontal position.

The first arrangement has this advantage—that all that is necessary to stop the elevator is to bring the lever D to the center, while in the latter arrangement the lever D must be thrown entirely to the opposite side; but the latter arrangement has the advantage of al-

lowing the cables to hang perfectly straight while the car is in motion, thus obviating the wear on the cables which exists when the cables are bent constantly around the sheaves, as in the first arrangement.

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

1. In an elevating apparatus, in combination, a traveling car, shipper-ropes, sheaves, as A A', in proximity to one of the shipper-ropes, sheaves, as B B', in proximity to the other shipper-rope, a lever, as D, a sheave, as C, carried by said lever and adapted to be forced against either shipper-rope, a weight at the end of each shipper-rope, a lever, as F, provided with slotted ends, pins on the said shipper-ropes which rest in said slots, and intermediate mechanism between said lever and the operating mechanism.

2. In an elevating apparatus, in combination, a traveling car, shipper-ropes, means on the car for drawing up either shipper-rope, a weight at the end of each shipper-rope, a lever, as F, provided with slotted ends, pins on the said shipper-ropes which rest in said slots, and intermediate mechanism between said lever and the operating mechanism.

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

FRANK E. HERDMAN.

Witnesses:

G. P. SCHMITELANE,
B. O. BAILEY.