(No Model.)

E. S. MATTHEWS.

ELEVATOR CONTROLLING MECHANISM.

No. 481,580. Patented Aug. 30, 1892.

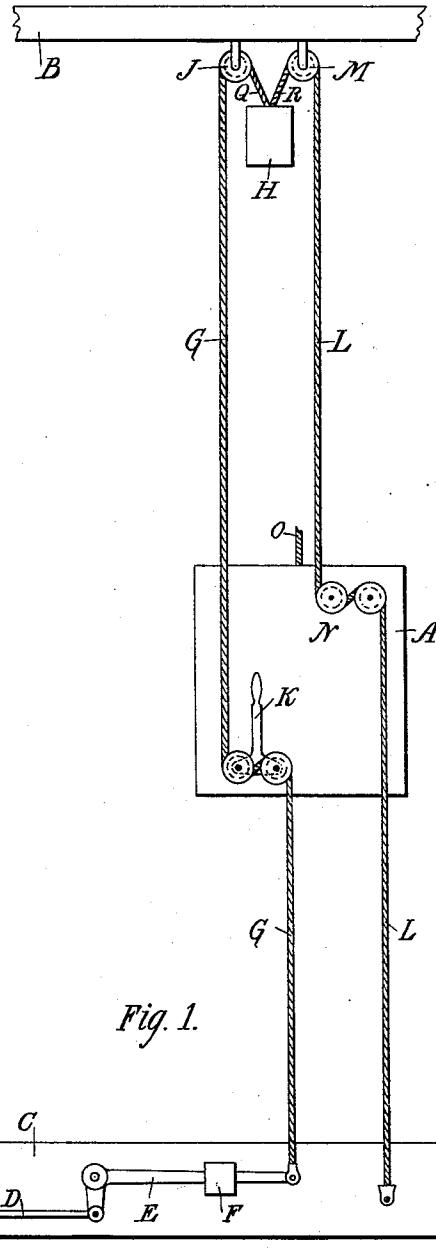

Fig. 1.

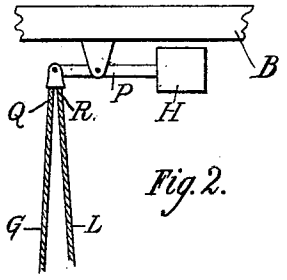

Fig. 2.

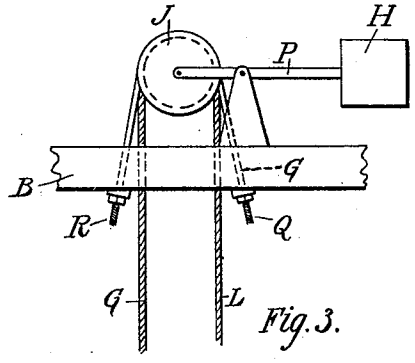

Fig. 3.

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EDWIN S. MATTHEWS, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO JAMES L. HAVEN, OF SAME PLACE.

ELEVATOR-CONTROLLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 481,580, dated August 30, 1892.

Application filed June 8, 1892. Serial No. 436,027. (No model.)

To all whom it may concern:

Be it known that I, EDWIN S. MATTHEWS, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Elevator-Controlling Mechanism, of which the following is a specification.

This invention pertains to improvements in control-rope arrangements for elevators, and is designed to provide for automatically maintaining the tension of a single standing control-rope. Where a single standing control-rope is employed for an elevator, the stretch of the rope and also its changes in length, due to expansion and contraction, result in disturbing the normal or neutral position of the valve or other control-piece which the rope operates. It is the object of my invention to obviate this evil.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of an elevator-car provided with a single standing control-rope in connection with an automatic tension device exemplifying my invention, the tension in this case being given by a tension-weight hung upon the upper end of the control-rope which turns over a sheave; Fig. 2, an elevation at the tension-weight, showing a modification in the plan of attaching the weight to the rope, this modification involving a pivoted lever having the control rope attached to one part and the weight to another part; and Fig. 3, a similar view of another modification in the plan for attaching the tension-weight, the weighted lever in this case lifting upon a sheave at the end of the control-rope, whose upper end is anchored to the beam-work.

In the drawings, ignoring for the present all reference to Figs. 2 and 3, A indicates the elevator-car; B, a beamwork at the top of the shaft; C, a beamwork or other fixed work at the base of the shaft; D, the piece to be controlled as the stem of the control-valve; E, a controlling-lever connected with that piece, it being the office of the control-rope to oscillate this lever above or below a normal neutral point; F, a weight upon this lever, tending to move it downwardly; G, the control-rope attached to this lever and extending upwardly past the car and attached, as hereinafter explained, at the top of the shaft; H, a tension-weight connected with the upper end of the control-rope G and tending to maintain that rope in constant tension, the weight of weight H preponderating over that of weight F, so that if the rope be shortened weight F, instead of weight H, will be lifted; J, a sheave over which the control-rope bends at the top of the shaft where the tension-weight H attaches; K, the usual take-up on the car, the device shown being a device in common use and consisting of a pair of sheaves mounted upon a pivoted lever, the control-rope passing under one sheave and over the other, so that if the sheave-lever be rocked in one direction it will take up more of the rope and if rocked in the other direction will let out more, the position of the control-lever E thus depending upon the length thus given to the control-rope by taking up more or less of its length by means of the take-up device K; L, a check-rope connected with the tension-weight H and having its other end fixed at some point, so that the check-rope will be capable of joining the control-rope in supporting the tension-weight H, the exemplification showing this check-rope as bent over a sheave at the top of the shaft and extending down the shaft and secured at the base of the shaft; M, a sheave at the top of the shaft over which the check-rope bends at the tension-weight; N, a pair of idle sheaves upon the car, fixed with relation to each other and engaging bends in the check-rope in substantially the same manner as the sheaves of the take-up device engage bends in the control-rope, and O the usual hoisting-rope attaching to the car.

It is of importance that the check-rope shall be of substantially the same material and size and length as the control-rope. It may be viewed as a rope fixed at one end and sustaining or aiding in sustaining the tension-weight. The control-rope having been once adjusted to proper length, the control-lever E will be in neutral central position when the take-up device K occupies its neutral position of adjustment. If by means of the take-up device the control-rope be given more length, weight F will move the control-lever E downwardly, and if by means of the take-up de-

vice the control-rope be shortened weight F and the control-lever will be lifted. The action may be viewed precisely as if the upper end of the control-rope were fixed at the top of the shaft; but assuming the control-rope to be thus fixed at the top a change in its length, due to expansion or contraction or stretching, will cause the lowering of the control-lever E and disturb the relationship between the neutral position of that control-lever and the neutral position of the take-up device on the car; but in the plan described the control-rope, instead of being fixed at its top, is attached to the tension-weight H. If the tension-weight were supported solely by the control-rope the device would be useless; but the check-rope, having no other office, joins the control-rope in the support of the tension-weight, and the tension-weight may therefore be viewed as being normally a fixture; but if contraction or expansion or stretching changes the length of the control-rope the same causes will effect a similar change of length in the check-rope, and consequently the tension-weight will be moved to a new position, thus keeping the control-rope under uniform tension. Thus, for instance, if the control-rope stretches the check-rope also stretches from the same causes, and the surplus length of the control-rope, instead of resulting in the descent of the weight F, results in the descent of the weight H for such distance as to compensate for the surplus length, the surplus therefore being taken up automatically at the top of the control-rope and maintaining it under proper tension and keeping the neutral points of control and car take-up in proper relationship to each other.

The only office of the sheaves N upon the car is to impose upon the check-rope about the same degree of wear and running work as would be imposed upon the control-rope by its take-up sheaves. The sheaves N are not essential, but are deemed useful for the reason indicated. If employed, they must be fixed with reference to each other.

As before explained, the check-rope may be viewed as a rope fixed at one end and sustaining from that point of fixture its share of the tension-weight. The simplest exemplification of the principle may be realized by imagining the check-rope L extending straight up from the tension-weight to a fixed point far above it. It is hardly possible, however, that such simple arrangement could be employed in practice, as I could hardly imagine a case in which a point for attachment can be found a distance above the top of a shaft equal to the working length of the shaft.

As it is the duty of the check-rope simply to join with the control-rope in the support of the tension-weight, numerous plans may be adopted in effecting the purpose. Thus both ropes, instead of having their respective ends Q and R bent over sheaves and attached to the tension-weight, as in Fig. 1, may be attached to one end of a lever P, bearing the tension-weight at its other end, as in Fig. 2; or, instead of the ends of the ropes being attached to such lever, both ropes may be anchored at the top beam and be bent over a sheave carried by the lever, as in Fig. 3, in which it will be seen that the control-rope goes up to the left of the sheave, then over the sheave and down to an achor-point, and that the check-rope goes up to the right of the sheave, and down to an anchor-point at the left. This latter plan permits by means of nuts on the shanks of the ropes where they are anchored of the length of the ropes being nicely adjusted after being put into position.

I claim as my invention—

1. In a controlling device, the combination, substantially as set forth, of a single standing control-rope, a take-up on the car, a separate weight connected to each end of and straining said rope, a control-piece connected with one of said weights, and a check-rope secured to a fixed point and attached to the other weight and joining the control-rope in the support of that weight.

2. In a controlling device, the combination, substantially as set forth, of a single standing control-rope, a take-up on the car involving sheaves engaging bends in said control-rope, a separate weight connected to each end of and straining said control-rope, a control-piece connected with one of said weights, a check-rope secured to a fixed point and attached to the other weight and joining the control-rope in the support of that weight, and a pair of sheaves in fixed relation to each other on the car and engaging bends in said check-rope.

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