(No Model.)

L. M. HOSEA.

ELEVATOR VALVE CONTROLLING MECHANISM.

No. 430,125. Patented June 17, 1890.

Fig. 1.

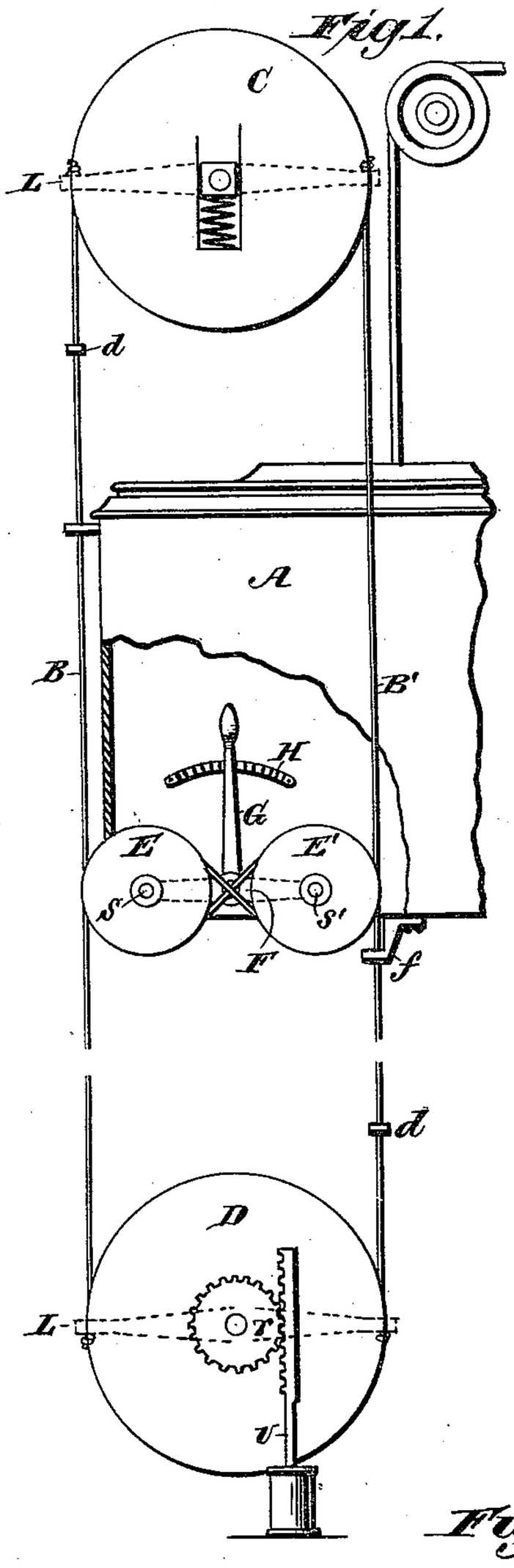


Fig. 2.

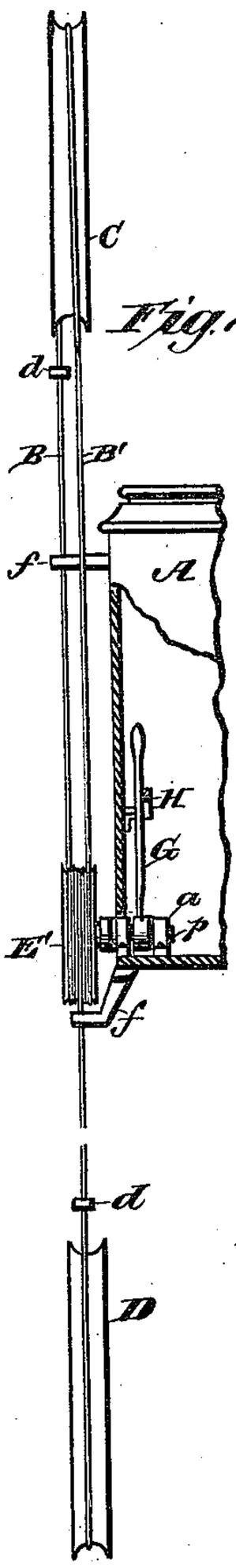


Fig. 3.

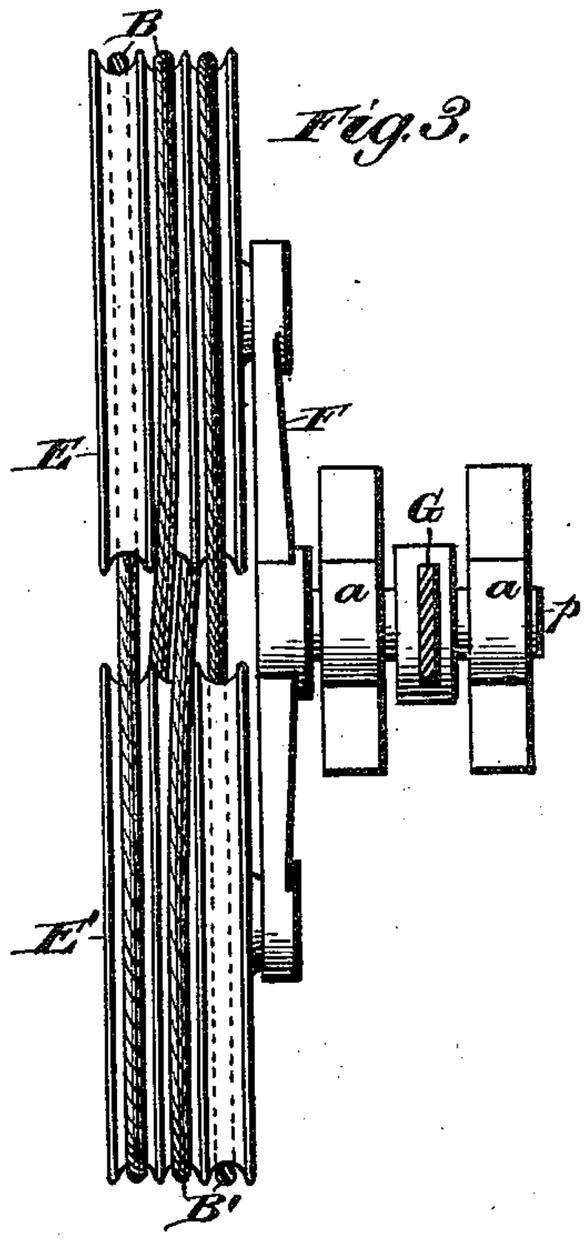
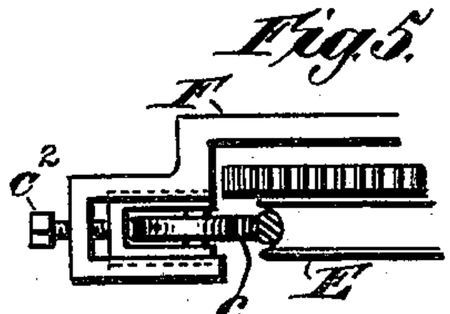


Fig. 4.

Fig. 5.



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LEWIS M. HOSEA, OF CINCINNATI, OHIO.

ELEVATOR-VALVE-CONTROLLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 430,125, dated June 17, 1890.

Application filed January 23, 1890. Serial No. 337,815. (No model.)

To all whom it may concern:

Be it known that I, LEWIS M. HOSEA, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Elevator-Valve-Controlling Mechanisms, of which the following is a specification.

My invention relates to means for controlling the valve mechanism of "lifts" or "elevators" from the moving cab or platform, its object being to provide an inexpensive and efficient mechanism for keeping the valve by which the motive power is governed constantly under the control of the attendant on the moving cab.

To this end it consists in a mechanism embodying as a leading principle of construction and operation two ropes carried in vertical parallel lines in the path of the elevator, attached at opposite sides to an oscillating lever or wheel at the top of the "well," and to a valve-moving lever or wheel at the bottom, and actuated by pulleys upon the cab, said pulleys being geared or otherwise interconnected to rotate normally in opposite directions only and engaging the ropes at diametrically-opposite points of their peripheries. The valve-ropes may be a single endless rope suspended at its upper bight upon an idler-pulley at the top of the well, and at its lower bight around a similar pulley connected with the valve at the bottom of the well. The rope at each side enters upon and leaves its adjacent pulley at the same relative point in opposite vertical directions, and may pass thence at opposite sides of said pulley in a reversed loop or bight around the opposite pulley; or each rope may engage with but one of the pulleys, the pulleys in such case being independently interconnected—as, for example, by spur-gearing. In the movements of the cab the pulleys travel up and down the ropes freely, rotating in opposite directions; but upon changing the angular relation of the two pulleys as a pair to the ropes (by the use of a manipulating-lever or other mechanism upon the cab) one of said ropes is temporarily elevated and the other depressed, thereby controlling the valve, and the two maintained in such new relations without interfering with the vertical travel of the engaging pulleys.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a general diagram side elevation of an elevator-cab, valve-ropes, and connections, and a preferred form of valve-controlling mechanism constructed according to my invention; Fig. 2, a partial front elevation of the cab, (somewhat enlarged,) showing an edge or side elevation of the valve-controlling devices; Fig. 3, a plan elevation of the controlling-pulleys, showing the relation of the valve-ropes thereto; Fig. 4, a side elevation of a slightly-modified constructive form of my invention; Fig. 5, a partial plan view of the same, showing the construction of the pressure device, and all the figures herein exhibiting constructive forms in the application of the same principle of operation.

Referring now to the preferred form of the invention illustrated in Figs. 1, 2, and 3, A designates the cab. B B′ designate the valve-ropes or the vertical portions of a single endless rope suspended over a sheave C at the top of the elevator-well, and carried around a similar sheave D at the bottom of the well. To the latter sheave may be connected a rack-and-pinion device *r*, or any suitable connections, moving the valve-stem *v*. Where separate ropes are used, levers L (indicated by dotted lines) may be substituted for the sheaves C and D, and the ropes secured to corresponding opposite ends of said levers above and below.

Upon the moving cab two sheaves E E′ are mounted in a horizontal line between and in the plane of the vertical ropes B and B′. These sheaves are carried upon terminal studs *s s′* at the face of a lever F, rigidly secured to a central pivot-stud *p*, carried in bearings *a a* upon the cab. This construction permits the pulleys E E′ to be carried outside of the cab A, while the stud *p* projects through for the convenient attachment of a manipulating-lever G inside, which may work over a rack-bar H in the usual manner. The pulleys E E are each, preferably, formed with three parallel peripheral grooves for the engagement and passage of the ropes. (More clearly understood by referring to Fig. 3.) Tracing rope B downward from its upper terminal

engagement it engages the outer groove (farthest from the cab) of pulley E, around the under side of said pulley, thence upward across the outer groove of pulley E′ and completely around the same, thence to the central groove of pulley E, around its under side, and leaves the pulley E at the same relative outer point adjacent to its entrance and in the same direction—to wit, downward, to its terminal engagement. The rope B′ is traced in substantially the same manner, but in relatively opposite grooves, so that there is no contact or interference of the ropes, and the change of alignment in reaching relatively opposite grooves in opposite pulleys may be facilitated by slightly "canting" the pulleys in opposite directions in the well-known manner of cable constructions.

The operation is as follows, the cab being at rest and adjustment being such that when the lever G stands vertical the valve-lever L is in mid-position and the valve closed. The lever G being now thrown, for example, to the right, the rope B will be pulled upward and the rope B′ will be pulled downward, the pulleys E E′ being prevented from rotation by the interconnection of the ropes upon the pulleys E E in opposite directions. This movement of the valve-ropes opens the valve and causes the elevator-car to move upward. The pulleys E and E′, being free to rotate in opposite directions, (though not in the same direction,) travel freely up the ropes, and the lever G may be at any time drawn back partly or wholly to its original position, and the valve thus regulated or again closed. It will be seen that the movement of the cab does not affect the control of the valve-ropes, since the effect is merely to rotate the pulleys E E′ in opposite directions equally; but that any change in the angular relations of the pulleys as a pair to the valve-ropes involves a rotation of the pulleys in the same direction, and consequently a shifting of the ropes vertically in relation to each other.

The modification shown in Figs. 4 and 5 involves a slight change in mechanical construction, but not of principle. The pulleys E^2 and E^3 in this case are provided with an intermeshing set of gear-teeth or other means of compelling their rotation in opposite directions independently of the ropes B B′ themselves.

In Fig. 4 I have indicated in full lines the intermeshing gear-teeth and in dotted lines a crossed belt connection, either of which may be used. I have also shown the valve-ropes in dotted lines as passing each independently around but one—that is, its adjacent pulley—and in full lines the ropes are shown as passing directly downward, touching the pulleys respectively only at single opposite points. In the latter construction the holding-lever F is extended at each side beyond the peripheries of the respective pulleys, each being bent over in yoke form, as indicated in the detail view, Fig. 5, as a holding-guide for a small yoke-frame, in which is journaled a grooved roller *c*. The roller is thus held in the plane of its pulley and against the rope, and by an adjusting-screw c^2, threaded through the back of the guide-yoke, the pressure upon the valve-rope tending to hold it against its operating-pulley, may thus be regulated to prevent slipping.

The construction and arrangement of the valve-controlling apparatus herein described facilitates the use of the automatic safety devices formerly employed in hand-ropes similarly arranged; and to this end I attach stops *d d* upon the ropes at the top and bottom of the well-hole and engaging guides *f f* upon the cab, by which the elevator may be automatically stopped at the upper and lower limits of its travel. To the same end I omit the usual holding-catch engaging the hand-lever G with the rack-bar H, or provide a catch device that holds by friction only which may be overcome by a sufficiently strong pull upon the rope.

I have not thought it necessary to introduce these details into the drawings, as many devices commonly known and in use will answer the purpose.

What I claim is—

1. The valve-controlling mechanism for elevators embodying the combination of the valve-ropes, an oscillating suspending device above, an oscillating valve-moving connection below, and the interconnected sheaves upon the cab between the ropes and engaging therewith, substantially as set forth.

2. In elevator-valve-controlling mechanism, the combination of an oscillating suspending device, valve-controlling ropes depending thence in two vertical lines to opposite terminals, a valve-mover, and a traveling controlling device consisting of two sheaves engaging the ropes at diametrically-opposite points and interconnected to rotate in opposite directions between and upon the lines of a rope, and an oscillating frame upon the cab carrying said sheaves, substantially as set forth.

3. In combination with an elevator-cab and its valve-controlled actuating mechanism, a valve-controlling pulley system upon the cab, embodying two engaging pulleys interconnected to rotate in opposite directions, an oscillating lever carrying said pulleys, and two valve-ropes extending in parallel lines from an oscillating suspending device in the well above to the pulleys at respectively opposite sides of the pulleys, each rope engaging and disengaging its adjacent pulley at the same relative point, both ropes extending thence in a continuation of their vertical lines to engagement at opposite sides of a valve-mover below, substantially as described.

4. The combination and arrangement, in elevator valve-controlling mechanism, of the valve-ropes having an oscillating suspending device and a corresponding connection with an oscillating valve-mover and the loose-pulley

system upon the cab, each rope, respectively, entering from above and passing under its adjacent pulley around the opposite pulley, back over the first pulley, and downwardly in the projection of its original path, whereby the engagement of each pulley with its rope is effected, and the interconnection of the pulleys with each other is also effected, by the ropes themselves, substantially as described.

5. In an elevator mechanism, the combination, with the valve rope or ropes, an oscillating support above, and an oscillating valve-mover below, of a rope-shifting device consisting of two pulleys mounted upon an oscillating lever and interconnected with each other to rotate in unison and in opposite directions, each pulley being separately engaged by a valve-rope, whereby said pulleys are oppositely rotated in unison during their vertical travel without disturbing the relation of the ropes to each other, but so that a change in the angular relation of the pulleys will shift the ropes in opposite vertical relations to each other, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

LEWIS M. HOSEA.

Witnesses:

PERCY B. HILLS,

JAMES A. RUTHERFORD.