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PATENTED JULY 31, 1906.

J. A. ANDERSON.
PLUNGER GUIDE FOR ELEVATORS.
APPLICATION FILED SEPT. 27, 1905.

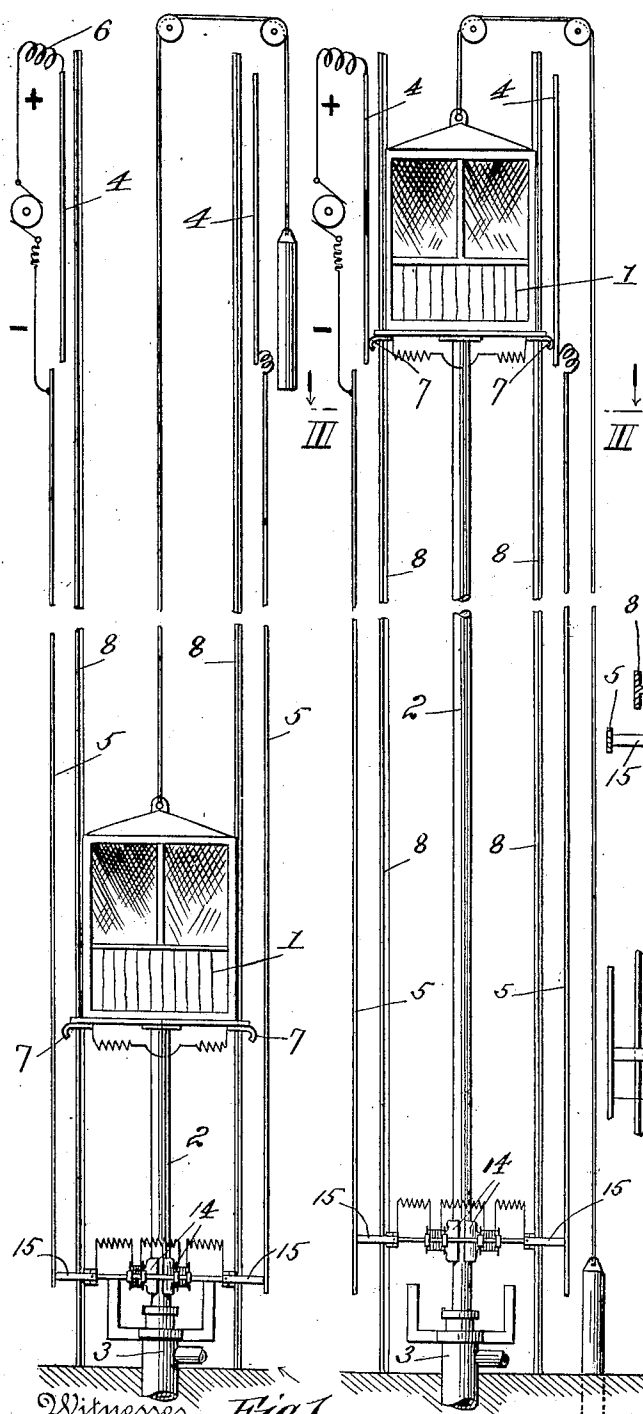


Fig. 2.

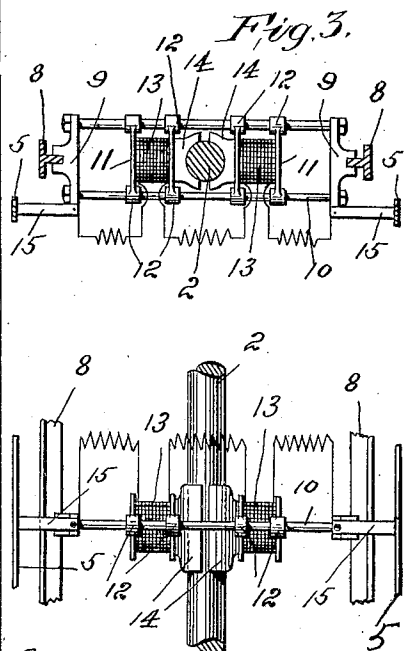


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

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PLUNGER-GUIDE FOR ELEVATORS.

No. 827,282.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed September 27, 1905. Serial No. 280,279.

To all whom it may concern:

Be it known that I, JAMES A. ANDERSON, a citizen of the United States, residing in the borough of Manhattan, county of New York, city and State of New York, have invented certain new and useful Improvements in Plunger-Guides for Elevators, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of an elevator-shaft, showing the guide of the elevator-car at the lower end thereof; Fig. 2, a similar view showing a car at the top of the shaft and the guide connected to the plunger; Fig. 3, a horizontal sectional view on the line III III of Fig. 2, and Fig. 4 a side elevation of the guide.

It has been found in actual practice that the plungers used for lifting elevator-cars in that form of elevators known as "plunger-elevators" sway and vibrate to an alarming extent when the car has been raised to a considerable height. Many of these plungers are from two hundred to three hundred feet long and from four to eight inches in diameter. As usually constructed they are not stayed or braced or guided in any manner between the top of the plunger tube or casing and the top of the elevator-shaft, whether said shaft be fifty feet high or three hundred feet high. This swaying of the plunger soon wears the packing in the top of the plunger-casing and makes it impossible to keep said casing tightly packed, requiring frequent re-packing and causing many interruptions in the operation of the elevator.

It is the object of this invention to provide a guide and stay which will be picked up by the plunger after the car has been lifted a predetermined distance, the guide then moving upward with the plunger and remaining attached thereto until the plunger is lowered sufficiently to bring the stay and guide down to the top of the plunger-casing or to any other desired point where it may be found desirable to have the guide released from the plunger. By this means the plunger is free to move through the packing or stuffing box into the plunger-casing and yet will be stayed at the desired point or points as it is forced upward from the casing.

Referring to the various parts by numerals, 1 designates the elevator-car, 2 the plunger, and 3 the plunger-casing, which in the usual arrangement of elevators of this type ex-

tends into the ground and terminates at the bottom of the elevator-shaft. In the elevator-shaft are arranged two upper vertical conductor-bars 4 and two lower conductor-bars 5. As shown, the upper conductor-bars 4 terminate about midway the ends of the elevator-shaft and the lower conductors 5 extend near to the lower ends of the upper conductors. A feed-wire 6 is connected with one of the upper bars 4. On the elevator-car is arranged a pair of contact-shoes 7, which are adapted to engage the bars 4 when the car has reached a point about midway the height of the elevator-shaft. These shoes are electrically connected together. The conductor-bar 4, which is not directly connected to feed-wire 6, is electrically connected to the adjacent lower bar 5, so that when the shoes 7 are engaged with the bars 4 current passes down to the bar 5, as will appear hereinafter.

The elevator-shaft is provided with the usual vertical guide-bars 8, which are engaged by guide-shoes 9. These shoes are connected together by horizontal rods 10, which extend on opposite sides of the plunger. Mounted to slide on these rods are transverse magnet-supporting bars 11, said bars being provided at their ends with sleeves 12, which are adapted to slide on the rods 10. Carried by these bars are magnets 13, whose pole-pieces 14 are arranged close to the plunger. Secured to each shoe 9 is a contact 15, which is at all times engaged with the adjacent conductor-bar 5.

The operation of the apparatus will be readily understood from the foregoing, but may be briefly described as follows: When the car during its upward movement has brought the contact-shoes 7 into engagement with the lower ends of the conductor-bars 4, current will pass through wire 6 and its connected bar 4, through the shoes 7, the opposite bar 4 and its connected conductor-bar 5, through the magnets 13 and back through the opposite conductor-bar 5 to the generator. The instant the magnets are energized they will be drawn inward, so that their pole-pieces will grip the plunger-rod and cause the guide as a whole to thereafter move up and down with the plunger as long as the circuit is maintained through the contact-shoes 7. When the car has descended sufficiently to carry the contact-shoes below the conductor-bars 4, the circuit will be interrupted and the magnets demagnetized,

thereby releasing the guide from the plunger. It will thus be seen that when the car has reached a predetermined height the magnets will be energized and the guiding-frame rigidly clamped to the plunger, so that it will move up and down therewith and effectually stay it until the current is broken by the contact-shoes carried by the car leaving the feed-bars 4 in the downward movement of the car. It will be readily understood that as many of these guiding and staying devices as desired or found necessary may be used and that said guides may be picked up and released at any point in the travel of the car. By the application of my guiding and staying devices the plunger is strengthened proportionately to the distance between said guides. For instance, a plunger-rod six inches in diameter extending vertically for a distance of two hundred feet is liable to deflection laterally in proportion to the weight on the upper end thereof and is easily overloaded. The application of guides at predetermined points gives to the plunger the stability of a section of six-inch rod of the length between said guides. Furthermore, the application of these guides will make it possible to dispense with the use of counterweights to balance the plunger and car, thereby avoiding the danger of accident by the breaking of the counterweight-cables. In this arrangement of the apparatus the weight of the plunger and car can be taken up in a hydro-pneumatic balancing-tank in connection with a pump, a much simpler and cheaper method than balancing the car with weights.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A plunger-elevator comprising a car, a plunger-guiding device normally disconnected from the car and the plunger, and electrical means for causing said guide to move upward with the plunger when the car has reached a predetermined height.

2. An apparatus of the class described comprising a car, a plunger for lifting said car, a guiding means normally disconnected from the plunger and electrical means actuated by the car when it has reached a predetermined height to cause the guiding means

to move with the plunger, and to be released therefrom when the car passes below said predetermined height.

3. A guide for a plunger-elevator comprising a guiding-frame, electrically-actuated means carried thereby to connect the guide to the plunger.

4. A guide for a plunger-elevator comprising a guiding-frame, a magnet carried thereby, and means whereby said magnet may be caused to clamp the guiding-frame to the plunger.

5. A guide for a reciprocating plunger comprising a casing, a plunger therein, a guide normally free from the plunger, and electrical means to connect the guide to the plunger when said plunger has moved a predetermined distance out of the casing.

6. An apparatus of the class described comprising a car, a plunger for lifting said car, a guiding means normally disconnected from the plunger and carrying electromagnetic gripping means, and electrical means actuated by the car when it has reached a predetermined height to cause said gripping means to grasp the plunger and to move upward therewith and to be released therefrom when the car passes below said predetermined height.

7. A guide for a plunger-elevator comprising a guiding-frame, electromagnetic clutching means carried by said frame and means whereby said clutching means will be caused to clamp the guiding-frame to the plunger at a predetermined point in the movement of the plunger.

8. A guide for a plunger-elevator comprising a guiding-frame, a pair of slidably-mounted magnets carried by said frame, armatures carried by said magnets and adapted to grasp the plunger and means whereby said magnets will be caused to clamp the plunger at a predetermined point in the movement of the plunger.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 26th day of September, 1905.

JAMES A. ANDERSON.

Witnesses:

W. H. RUBY,
WM. R. DAVIS.