

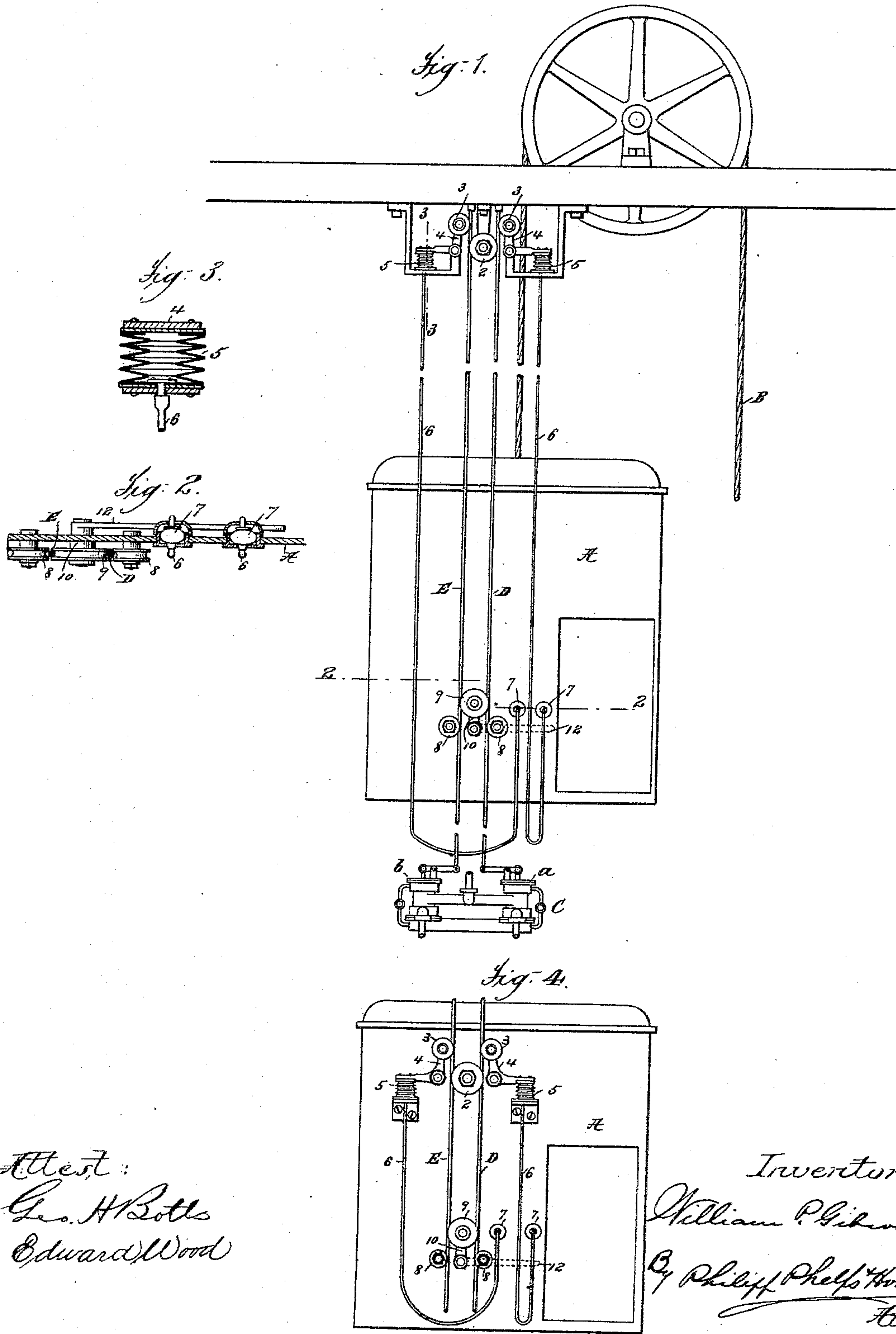
(No Model.)

W. P. GIBSON.

VALVE OPERATING MECHANISM FOR ELEVATORS.

No. 412,334.

Patented Oct. 8, 1889.



UNITED STATES PATENT OFFICE.

WILLIAM P. GIBSON, OF NEW YORK, N. Y.

VALVE-OPERATING MECHANISM FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 412,334, dated October 8, 1889.

Application filed January 5, 1889. Serial No. 295,551. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. GIBSON, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Valve-Operating Mechanism for Elevators, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a means for operating the valve or other device which controls the movements of an elevator-car by means of combined mechanical and fluid (pneumatic or hydraulic) connections, it being the object of the invention to provide a simple, reliable, and economical apparatus by which the valve or other device for controlling the movements of the car can be operated by fluid-pressure derived from the car by the compression of a collapsible bulb, and which shall at the same time provide means by which the valve or other device can be operated positively by means of mechanical connections in case for any reason the fluid-connections should fail to operate satisfactorily at any particular time.

In the accompanying drawings, Figure 1 is a diagrammatic view of an elevator-car equipped with means for operating the valve or other device which controls the movements of the car according to the present invention. Fig. 2 is an enlarged horizontal section taken on the line 2 of Fig. 1. Fig. 3 is an enlarged vertical section taken on the line 3 of Fig. 1. Fig. 4 is a view similar to Fig. 1, showing a modification, which will be hereinafter explained.

Referring to said figures, it is to be understood that A represents an elevator-car of the ordinary form, and B its hoisting-cable. The valve or other mechanism which controls the movements of the car is operated by hydraulic pressure, which is controlled by an auxiliary valve mechanism C.

The valve mechanism C, as herein illustrated, is of the form shown and described in my companion application for Letters Patent filed December 31, 1888, Serial No. 294,995, and need not, therefore, be more particularly referred to herein. It is to be remarked, how-

ever, that this auxiliary valve mechanism may be of any suitable form for the purpose so long as it provides means for controlling the movements of the main valve or other mechanism which controls the movements of the car, so as to cause the car to move in either direction or be brought to rest at the will of the conductor.

The two valves *a b* of the auxiliary valve mechanism are connected either directly or through the medium of levers to the lower ends of a pair of ropes D E, which are suspended from the top of the elevator-shaft. By drawing upward upon the respective ropes the valves *a b* are operated, so as to cause the car to move in reverse directions or come to rest, according as is desired.

Located in any convenient position, preferably at the top of the shaft, is a stationary deflecting-pulley 2, which occupies a position between the ropes D E, with its opposite sides in close proximity to the respective ropes. Located upon the opposite sides of the respective ropes is a pair of movable deflecting-pulleys 3, which occupy a position either above or below the pulley 2, and are each carried upon one arm of a bell-crank lever 4, the opposite arms of the levers being acted upon by a pair of expansible bulbs or sacks 5, which are supported upon suitable brackets or other stationary supports and communicate through small tubes 6 with similar expansible bulbs or sacks 7, carried by the car. The bulbs 5 are so constructed that they will normally remain in a collapsed or comparatively collapsed condition, while the bulbs 7 are so constructed that they will normally remain in an expanded or comparatively expanded condition.

The tubes 6 may be composed entirely of flexible material—as, for example, india-rubber—or they may be in part of rigid material, as lead or other metal, those portions of the tubes which connect with the car being, however, flexible for a sufficient length to permit the car to have the required travel.

The deflecting-pulleys 3 are so arranged that when either pulley is moved inward from its normal position it will press upon the corresponding rope D or E and deflect it inward over the stationary pulley 2, so as to draw

upward upon the rope and operate the corresponding valve of the auxiliary valve mechanism.

The bulbs 5 7 and the tubes 6 connecting them are preferably filled with air, but may be filled with any other fluid or liquid—as, for example, oil or glycerine. If a liquid is used, it will of course, preferably, be of such a nature as not to readily congeal by cold.

The operation of the apparatus when thus organized is as follows: To cause the car to move in either direction, the conductor will press upon the proper one of the bulbs 7 upon the car, so as to collapse or partially collapse the same, and thereby drive the fluid out of the bulb into the pipe 6 and out of the pipe 6 into the bulb 5, thereby expanding the latter bulb and rocking the lever 4, so as to cause the pulley 3 to deflect the corresponding rope D or E, as the case may be, and operate the corresponding valve of the auxiliary valve mechanism to cause the car to move in the required direction. To cause the car to move in the opposite direction, the conductor will press the other bulb 7, with the same result.

The deflecting mechanism composed of the pulleys 2 3 will preferably be located at the top of the elevator-shaft, as shown in Fig. 1; but it may be located upon the car, as shown in Fig. 4. In such case, of course, the ropes D E will pass through or adjacent to the car, so as to be in proper position with relation to the deflecting-pulleys.

In the ordinary working of the elevator the apparatus that has been described will be all that is required for controlling its movements; but it will in practice usually be preferable to provide means by which, in case the fluid-connections become temporarily disordered or fail to operate, the conductor can have positive mechanical control of the valves of the auxiliary valve mechanism. To provide for this, the ropes D E are preferably arranged to pass through or adjacent to the car, and the car is provided with two stationary deflecting-pulleys 8, arranged upon opposite sides of the respective ropes, and with a third movable deflecting-pulley 9, arranged between the ropes and either above

or below the pulleys 8. The pulley 9 is carried upon an arm 10, which projects from a shaft mounted in the side of the car and having a hand-lever 12, by which it can be rocked, so as to move the pulley 9 in either direction, and thus deflect either one of the ropes D E. By this means, in case the fluid-connections fail to operate, or in case of an emergency, the conductor can by operating the hand-lever 12 control the valves of the auxiliary valve mechanism positively. In the ordinary operation of the elevator, however, the lever 12 and the deflecting-pulleys 8 9 will remain idle.

The term "fluid," as herein used, is adopted for convenience, and is to be understood as including both gases and liquids—such, for example, as air and water, oil, or glycerine.

The term "bulb," as applied to the collapsible and expansible devices 5 7, is also used merely for convenience, and is to be understood as including any form of collapsible and expansive device by which pressure can be transmitted from the car to the column of fluid and from the column of fluid to the deflecting-pulleys.

What I claim is—

The combination, with the elevator-car and the auxiliary valve mechanism for controlling its movements, of ropes suspended from the top of the elevator-shaft and connected to said auxiliary valve mechanism to operate the same, a deflecting mechanism consisting of deflecting-pulleys for deflecting said ropes to cause the car to move in opposite directions, expansible bulbs connected to act upon said deflecting mechanism to deflect the respective ropes, collapsible bulbs carried by the car, and tubes containing a fluid and connecting the bulbs upon the car with the respective bulbs of the deflecting mechanism, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. P. GIBSON.

Witnesses:

J. J. KENNEDY,
G. M. BORST.