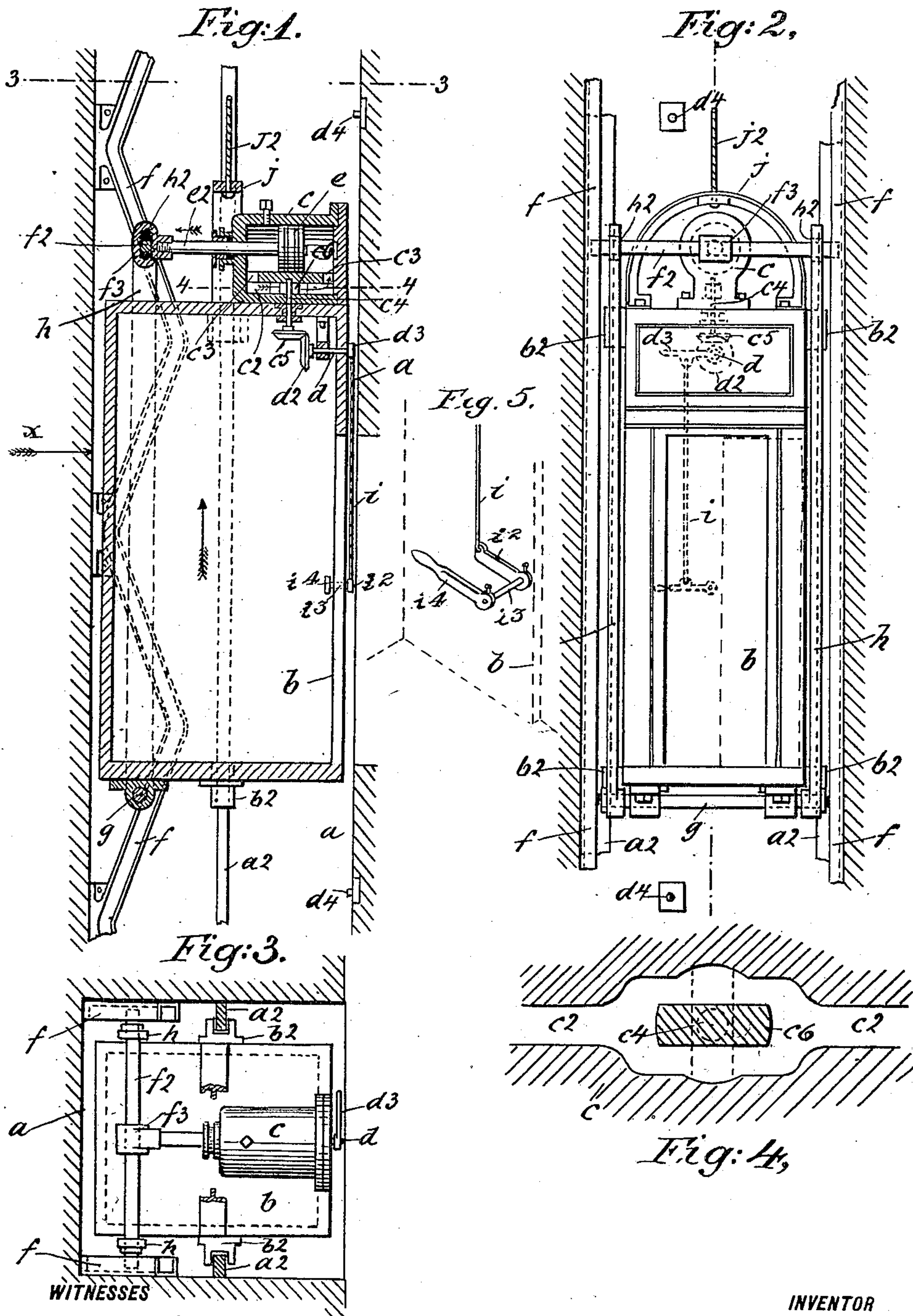


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PATENTED JULY 10, 1906.

A. V. A. McHARG.
SAFETY APPARATUS FOR ELEVATORS.

APPLICATION FILED FEB. 8, 1906.



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SAFETY APPARATUS FOR ELEVATORS.

No. 825,337.

Specification of Letters Patent.

Patented July 10, 1906.

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To all whom it may concern:

Be it known that I, ARTHUR V. A. McHARG, a citizen of the United States, residing at Edgewater, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Safety Apparatus for Elevators, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to elevators; and the object thereof is to provide an improved safety and speed-regulating device for ordinary elevator-cars, which apparatus is automatic in operation at all times and also under the control of the operator; and with this and other objects in view the invention consists in an apparatus of the class specified constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a vertical sectional view taken through an elevator-car and the shaft in which said car is movable, said car and shaft being provided with my improved apparatus. Fig. 2 is a sectional view of the shaft and a side view of the car looking in the direction of the arrow x of Fig. 1; Fig. 3, a transverse section on the line 3 3 of Fig. 1; Fig. 4, a sectional view of a detail of the apparatus which I employ, said section being taken on the line 4 4 of Fig. 1; and Fig. 5, a perspective view of a detail of the construction for operating the apparatus by hand.

In the drawings forming part of this specification I have shown at a an ordinary elevator-shaft, the opposite side walls of which are provided with guides a^2 , and mounted in said shaft and movable therein is an elevator-car b of the usual or any preferred construction, and said car is provided at its opposite sides with guide-shoes b^2 , which fit on and are movable on the guides a^2 .

Secured to or connected with the top of the car is a cylinder c , which is arranged transversely of the top of the car and near one side thereof, the front side of the car in the form of construction shown, and said cylinder is provided in the bottom thereof with a longitudinal by-pass c^2 , which communicates at its opposite ends with the corresponding ends of

the cylinder through ports or passages c^3 , and passing vertically through the top of the car and into the by-pass c^2 is a valve-rod c^4 , provided at its lower end with a beveled gear c^5 , and said rod is also provided within the by-pass c^2 with a valve c^6 , which is adapted to open and close the by-pass c^2 , according to the direction in which the valve-rod is turned.

Mounted in the top front portion of the elevator-car is a horizontally-arranged shaft d , provided at its inner end with a beveled gear d^2 , which meshes with the beveled gear c^5 on the valve-rod c^4 , and the outer end of the shaft d is provided with a crank d^3 , and at predetermined points in the top and bottom portions of the front wall of the elevator-shaft and at the limit of the travel of the elevator-car are placed pins, lugs, or projections d^4 , which are adapted to operate the crank d^3 so as to operate the valve-rod c^4 , and thereby stop or prevent any further travel of the car.

Mounted in the cylinder c is a piston e , provided with a rod e^2 , which passes outwardly through the rear end of the cylinder c , and in the opposite sides of the elevator-shaft and adjacent to the back wall thereof are secured zigzag guides f , in which is mounted a transversely-arranged shaft f^2 , with which the piston-rod e^2 is connected, as shown at f^3 , this connection being made by means of a slotted collar in which the shaft f^2 is free to turn.

Secured to the bottom of the car b , transversely thereof, is a shaft g , with the opposite ends of which are connected link members h , which extend upwardly and are provided in their upper ends with bearings or openings h^2 , through which the shaft f^2 passes.

In practice the cylinder c may be filled with any suitable liquid or fluid substance or with air, and the valve c^6 is normally open, so as to permit said liquid, fluid, or air to flow from one end of said cylinder to the other through the by-pass c^2 .

In the operation of the elevator-car or in the vertical movement thereof the piston e is moved in opposite directions by the shaft f^2 , which is movable in the zigzag passages or guides f , and the rapidity of the movement of the piston will depend upon the facility with which the contents of the cylinder c are free to move from one end to the other end thereof. The zigzag guides f being arranged in parallel vertical planes, it will be apparent if the movement of the piston e is stopped at any time the movement of the car in the ele-

vator-shaft will also be stopped, and if at any time the hoisting and lowering apparatus should break the descent of the car will be controlled by the movement of the piston e , and the crank d^3 , if the car should descend too rapidly, would be turned by the pin or projection d^4 in the bottom portion of the shaft and the valve c^6 would be operated so as to close the by-pass c^2 , and the car will be brought to an immediate stop. I also provide a rod i , which is connected with the crank d^3 , whereby said crank and the connecting-gearing which operates the valve c^6 are placed under the control of the operator of the car. The lower end of the rod i , as shown in Figs. 1, 2, and 3, and especially in Fig. 3, is connected with a crank i^2 , secured to a pin i^3 , which passes through the front wall of the car and is provided at its inner end with a crank i^4 , and by means of this construction the valve c^6 may be controlled by the operator of the car whenever desired.

I have also shown at j a yoke-shaped frame or similar device which is connected with the top of the car and with which a suspending and operating cable j^2 is connected; but my invention is in no way limited to any particular form of apparatus for raising the car or raising and lowering the same, the essential features of my invention being in the apparatus herein shown and described for controlling the vertical movement of the car under all circumstances.

When the valve c^6 is fully open, the movement of the elevator-car will be regular and even at all times, the speed of such movement depending on the ease with which the contents of the cylinder c can pass from one end of the cylinder to the other through the by-pass c^2 , and the shape of the zigzag guides f is such as to cause a regular reciprocating motion of the piston e , and this operation will continue as long as the means for raising and lowering the car are in proper operative condition. If any accident should happen, however, or the hoisting mechanism be broken, the downward movement of the car may be regulated or controlled, as hereinbefore described, either automatically or by hand, and under certain conditions the flow of the contents of the cylinder c from one end thereof to the other may be so regulated as to prevent any serious accident even without means for turning the valve c^6 .

In the foregoing operation it will be understood that the shaft f^2 operates as a roller which is free to turn and move in the zigzag

guides f and also in the end of the piston-rod e^2 , and the object of the slot or opening h^2 in the end of the piston-rod e^2 or in the collar by which said rod is connected with the shaft f^2 is to provide means whereby the shaft f^2 may accommodate itself to the arc formed by the links h as they turn on their pivotal connection with the shaft g and enable the piston-rod to move in a straight horizontal line. It will also be understood that the links h serve to hold the shaft f^2 and car together, and my invention is not limited to the particular means herein shown and described for connecting said links with the car.

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

1. In an apparatus of the class described, an elevator-shaft, an elevator-car vertically movable therein, zigzag guides arranged in the shaft at the opposite sides of the car, a cylinder mounted on the car transversely thereof and provided with a by-pass communicating with the opposite ends thereof, a piston mounted in said cylinder and provided with a rod which passes through one end thereof, a transversely-arranged shaft movable vertically in said zigzag guides and with which the piston-rod is connected, and devices connecting the car and said shaft, substantially as shown and described.

2. In an apparatus of the class described, an elevator-shaft, an elevator-car vertically movable therein, zigzag guides arranged in the shaft at the opposite sides of the car, a cylinder mounted on the car transversely thereof and provided with a by-pass communicating with the opposite ends thereof, a piston mounted in said cylinder and provided with a rod which passes through one end thereof, a transversely-arranged shaft movable vertically in said zigzag guides and with which the piston-rod is connected, and link members connected with the car and with the opposite ends of said shaft, the by-pass of the cylinder being also provided with a valve, and means for operating said valve, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 6th day of February, 1906.

ARTHUR V. A. McHARG.

Witnesses:

F. A. STEWART,
C. E. MULREANY.