W. K. MARVIN.

ELEVATOR.

No. 182,280. Patented Sept. 19, 1876.

Fig. 1.

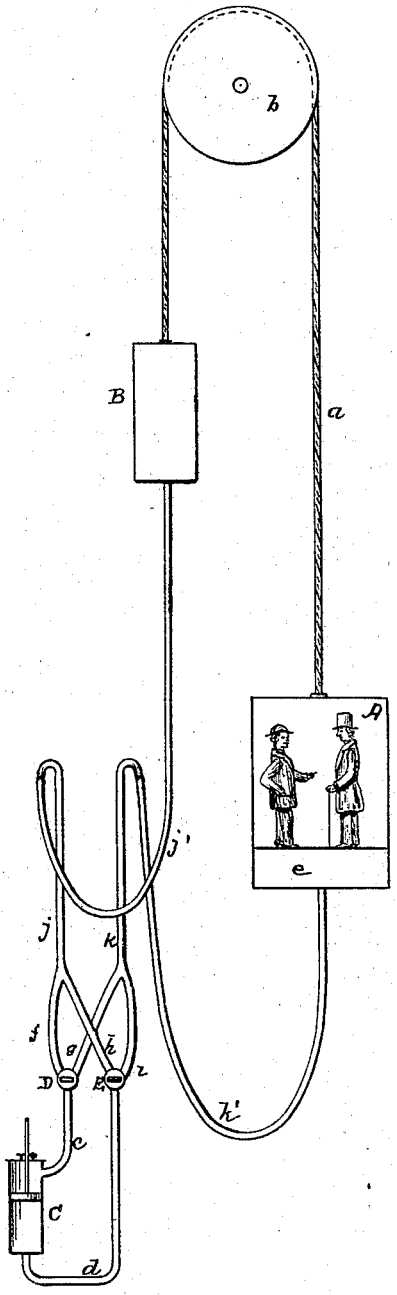
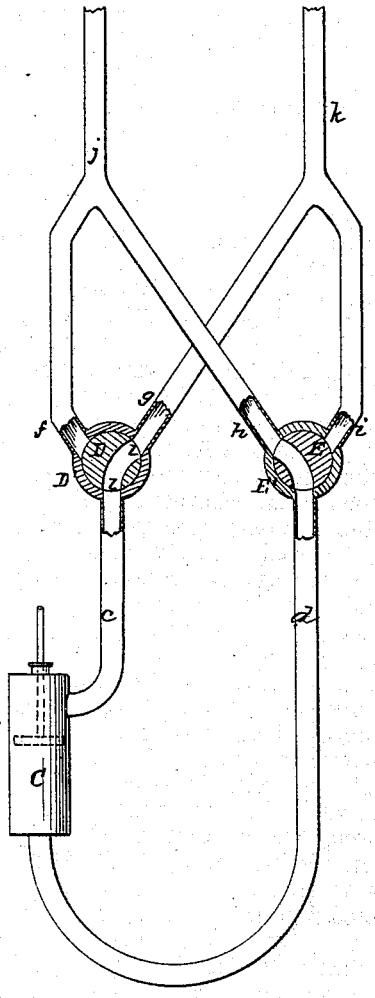


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

WALTER K. MARVIN, OF NEW YORK, N Y.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. **182,280**, dated September 19, 1876; application filed August 12, 1876.

To all whom it may concern:

Be it known that I, WALTER K. MARVIN, of the city, county, and State of New York, have invented certain new and useful Improvements in Elevators, of which the following is a specification:

In Letters Patent No. 109,331, dated November 15, 1870, I have described and claimed an elevator in which are combined a car balance-box, weight, and means for transferring more or less of the weight from the car to the balance-box, or vice versa, whereby, by shifting the weight, the car may be caused to ascend or descend, as occasion may demand.

My present invention involves the same general principle, and is an improvement on the plan described in my said Letters Patent.

Instead of using a chain, or other solid body, as a weight, I now propose to use a liquid—such as water—which may be transferred from balance-box to balance-box, or from balance-box to car, or vice versa, as desired.

In using the phrase from "balance-box to balance-box" I mean to indicate that in lieu of applying the weight in one direction directly to the car, as in my former Letters Patent, this weight may be carried by a second balance-box, connected with the car in such manner as to operate to move the car in a direction opposite to that in which the other balance-box operates, which would, in effect, be equivalent to directly weighting the car itself.

I have indicated in the accompanying drawing one way in which my invention may be carried into effect.

Figure 1 is a diagram representing so much of an elevator as needed to illustrate my invention. Fig. 2 is a sectional plan, on an enlarged scale, showing the arrangement of the valves.

A is the car, movable vertically in suitable guides, suspended by a rope, *a*, which passes over a pulley, *b*, and is attached to the balance-box B, which also is movable vertically in suitable guides. In this case the car itself is provided with a suitable tank, *e*, to receive the water needed to overbalance the weight represented in the balance-box B. C is a pump, operated by any suitable power. From one end of the pump-cylinder leads a pipe-section, *c*, which connects with the force side of the pump. From the other end leads a pipe-section, *d*, which connects with the suction side of the pump. These sections terminate in rotary valves D E, from whose cylinder seats or shells D′ E′ branch two pipes, *f g* and *h i*, each set being equidistant from the point where their respective intermediate pipes *c d* enter the shells D′ E′. The pipe *f* of the valve D and the pipe *h* of valve E converge and merge into one pipe, *j*. In like manner the pipes *g i* converge and merge into one pipe, *k*. Each valve D or E is a two-way valve, whose communicating ports *l* are separated by a distance equal to that which separates each intermediate pipe *c d* from either of its branch pipes *f g* or *h i*. The valves are to be so connected and geared that, when the valve D is turned to bring its pipes *c g* into communication, the valve E will be turned to bring the pipes *d h* into communication. Pipe *g* leads into pipe *k*, which communicates, through flexible tubing *k′*, with the tank on the car. Pipe *h* leads into pipe *j*, which communicates, through flexible tubing *j′*, with the balance-box. Supposing, therefore, the tank and balance-box to contain water, and the pump to be in operation, the result of this position of the valves would be to draw the water from the balance-box, and to force it into the tank on the car, thus decreasing the weight of the former, and increasing the weight of the latter. On the other hand, reverse the position of the valves, which can be done by giving them about a quarter-turn in the other direction, so as to put *c* in communication with *f*, and *d* with *i*. This will have the effect of drawing water from the tank on the car, and forcing it into the balance-box.

The transfer of water can at any time be arrested entirely by giving the valves about one-eighth of a turn, bringing its ports opposite the solid sides of their seats intermediate between the openings therein.

The valves are to be connected with, and operated by, a hand-rope, arranged with relation to the car similarly to the hand-rope in my before-mentioned Letters Patent, as will be understood without further explanation. I also propose to use a brake substantially in the way indicated in my said Letters Patent.

I have indicated one way in which my in-

vention may be carried into effect. It is manifest, however, that the arrangement and construction of the connections may be varied considerably without departure from my invention.

What I claim, and desire to secure by Letters Patent, is—

In an elevator in which the car is caused to ascend and descend by the shifting of a weight, as described, the combination of the balance-box or reservoir, the counter-balance reservoir, either on the car or in a separate box, conduits connecting said reservoirs, and a forcing apparatus adapted to transfer the liquid through said conduits from one to the other of the reservoirs, the combination being and acting as set forth.

In testimony whereof I have hereunto signed my name this 7th day of August, A. D. 1876.

WALTER K. MARVIN.

Witnesses:
B. F. LEE,
A. POLLOK.