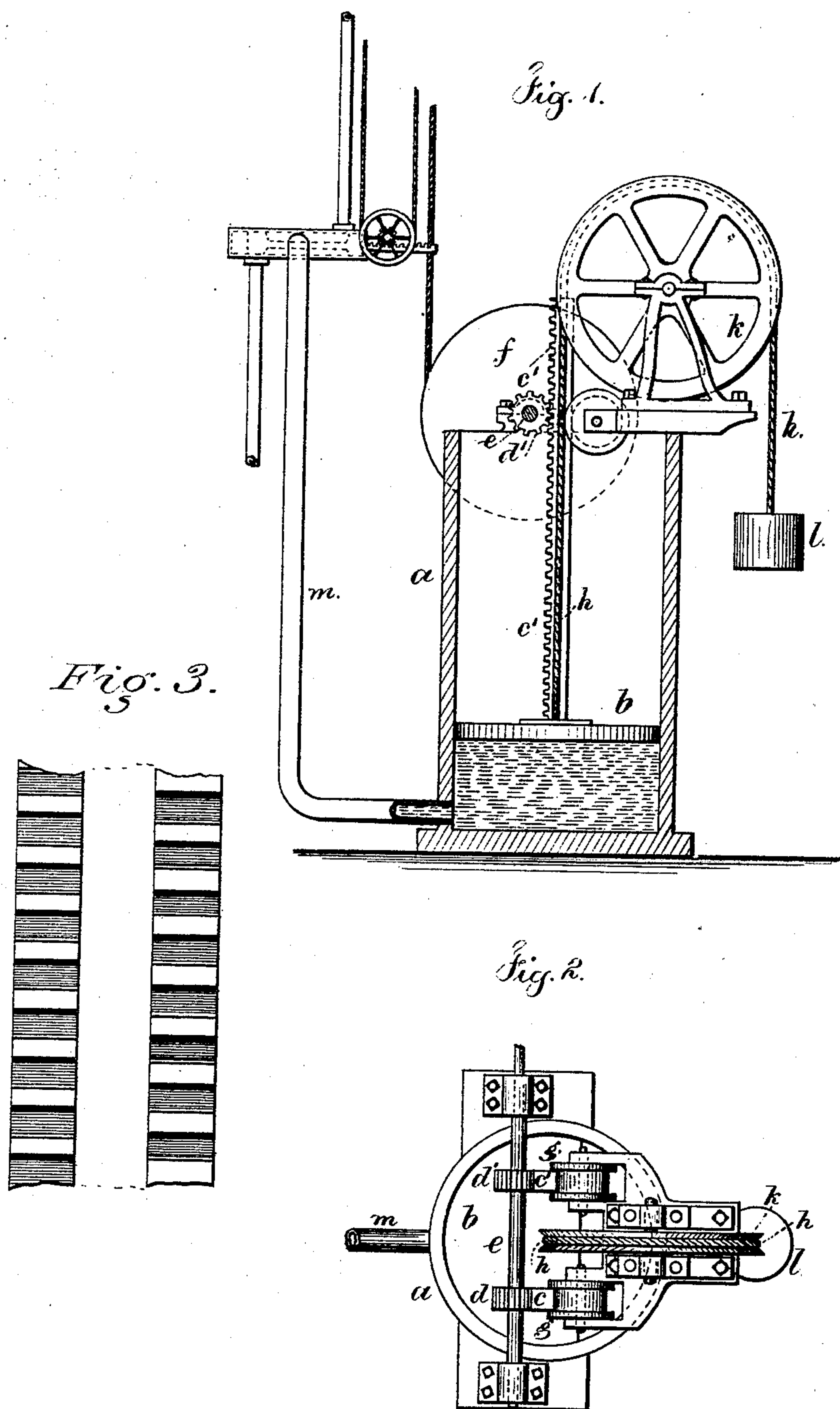


S. H. BEVINS, E. P. BARKER & W. H. PHILLIPS.
Hydraulic-Elevator.

No. 223,272.

Patented Jan. 6, 1880.



WITNESSES.

Chas. H. Smith
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INVENTORS.

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UNITED STATES PATENT OFFICE.

SETH H. BEVINS, EDWARD P. BARKER, AND WILLIAM H. PHILLIPS, OF
NEW YORK, N. Y.

HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 223,272, dated January 6, 1880.

Application filed April 10, 1879.

To all whom it may concern :

Be it known that we, SETH H. BEVINS, EDWARD P. BARKER, and WILLIAM H. PHILLIPS, of the city and State of New York, have
5 invented an Improvement in Hydraulic Elevators, of which the following is a specification.

In passenger and freight elevators the car has been moved by the action of water upon
10 a piston within a cylinder, and a rack on the piston has been used to revolve a pinion, shaft, and drum, by which the car is drawn up as the piston rises, and it descends as the piston moves toward the bottom of the cylinder. In
15 elevators of this character the rack is liable to become misplaced and the piston to bind in the cylinder; and if the car becomes obstructed in its descent so that its motion is arrested while the valve for the escape-water is open,
20 the piston may continue to descend, leaving the rope slack, so that the car falls if the obstruction is removed, or else the water running out of the cylinder allows the piston to descend suddenly when the obstruction is removed from the car or platform, thus causing
25 great strain, and often breaking some part of the apparatus. These difficulties sometimes arise with passenger-elevators, but more frequently with platform-elevators for freight.

30 We make use of two racks on the piston acting upon two pinions on the shaft of the drum, the teeth of one pinion being in line with the spaces in the next pinion, the teeth of the racks occupying a similar position,
35 whereby the parallel movement of the piston is maintained, and any unequal movement as the teeth enter and leave the rack is avoided.

The piston and racks are counterpoised, so that the piston will not descend by gravity
40 and force the water out of the cylinder and produce slackness in the rope, and the water-discharge is higher than the highest point to which the piston can be raised. Thereby air cannot pass into the cylinder, and there is a
45 column of water outside the cylinder that is higher than that inside the cylinder. Thereby the water has to be forced out of the cylinder by the action of the weight upon the pinions, rack, and piston.

50 In the drawings, Figure 1 is a vertical section of the hydraulic cylinder and appliances, and Fig. 2 is a plan of the same.

The cylinder *a* is of suitable size, and with-

in it is the piston *b*, with two rack-bars, *c c'*, connected with the piston and acting upon the
55 two pinions, *d d'* on the shaft *e* to revolve the hoisting drum or wheel *f*. By placing the teeth of one pinion in line with the spaces of the other pinion and the rack-teeth in the same positions, the movement of the car or
60 platform is rendered more uniform than heretofore.

g are the rollers behind the racks *c c'* to hold the same into contact with the pinions *d d'*.

The rope or chain *h* is connected at the center of the piston, and passes over the wheel *k*
65 to the weight *l*, that is sufficiently heavy to counterpoise the piston and racks, or nearly so, in order that they may not descend by their own weight alone.

It is intended that the weight of the car shall be sufficient to move the piston downwardly as the car descends, the outlet-valve from the hydraulic cylinder *a* being open; but
70 to prevent the water continuing to run out by gravity when the valve is open, if the car becomes jammed or stopped, we employ the delivery water column or pipe *m*, that rises to a level as high as the highest water-level in the
75 cylinder *a*, so that the said cylinder *a* may be always filled with water to the under side of the piston.

The valve that controls the escape of water from the cylinder may be placed at any desired point in rising delivery water-column.
85

We claim as our invention—

1. The combination, with the hydraulic-elevator cylinder and piston, of two racks on the piston and two pinions on the shaft of the
90 hoisting-drum, the teeth of one being in line with the spaces of the other to maintain the parallel movement of the piston and uniform movement of the car, substantially as set forth.

2. The combination, with the hydraulic-elevator cylinder and rack, of a counterpoise to
95 the piston and racks, for the purposes and as set forth.

Signed by us this 7th day of April, A. D. 1879.

SETH H. BEVINS.
E. P. BARKER.
WM. H. PHILLIPS.

Witnesses:

WILLIAM G. MOTT,
GEO. T. PINCKNEY.