

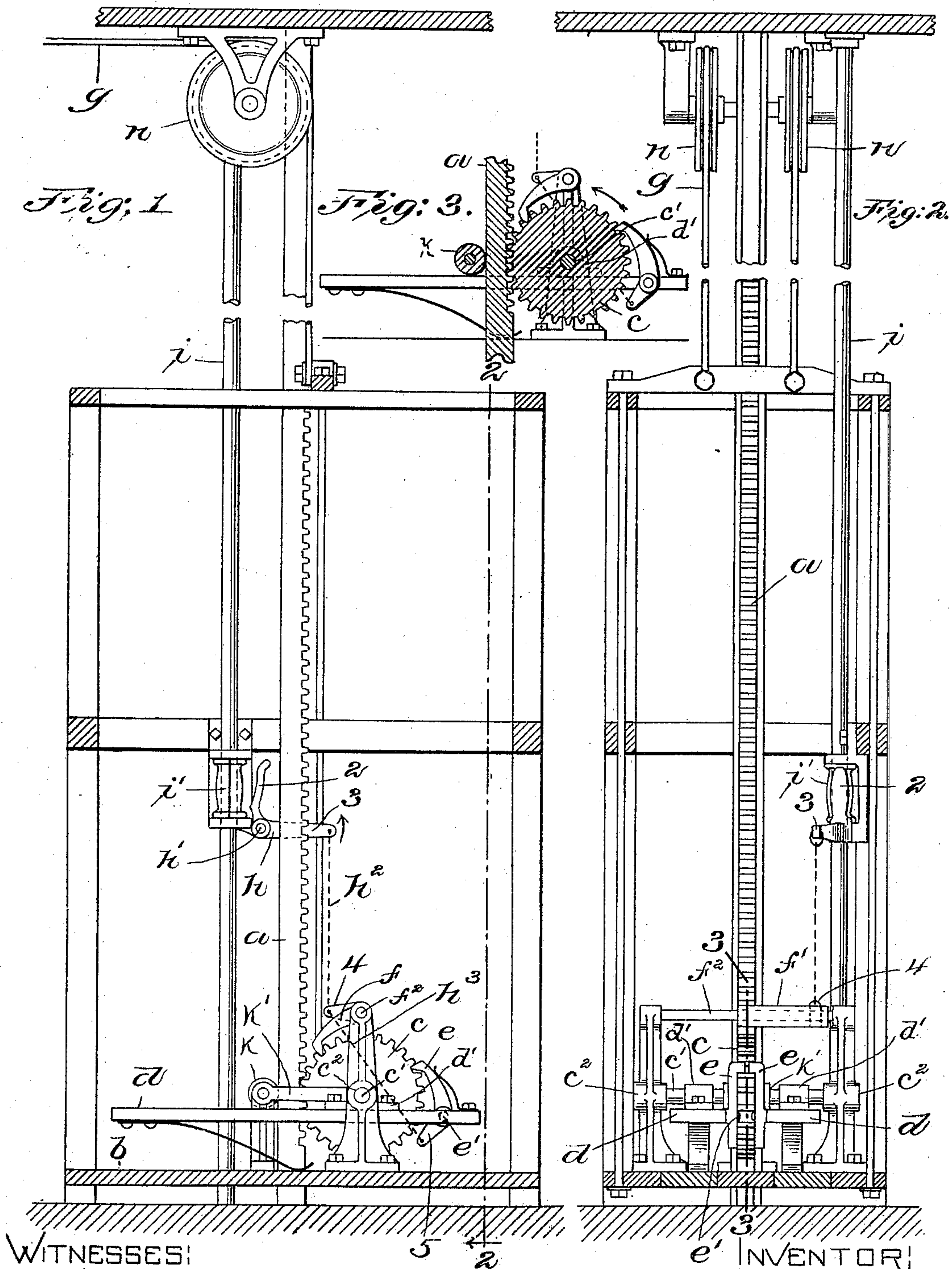
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Patented Aug. 12, 1902.

W. W. HUBBARD.
ELEVATOR OPERATING MECHANISM.

(Application filed Apr. 12, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WILLIAM W. HUBBARD, OF MANCHESTER, NEW HAMPSHIRE.

ELEVATOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 706,826, dated August 12, 1902.

Application filed April 12, 1902. Serial No. 102,555. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBARD, of Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Elevator-Operating Mechanism, of which the following is a specification.

This invention has for its object to provide means for advantageously utilizing the weight of a person on an elevator-car or lift in imparting upward movement to the car; and it further has for its object to provide means for regulating the descent of the car or lift.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a lift-operating mechanism embodying my invention, the lift being shown in section. Fig. 2 represents a section on line 2 2 of Fig. 1 and an elevation of the mechanism at the left of said line. Fig. 3 represents a section on line 3 3 of Fig. 2.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents an elongated vertical rack-bar, which is rigidly secured in a space corresponding to the elevator well or passage of a building and extends vertically the distance which the elevator or lift hereinafter described is intended to traverse.

b represents a structure which is movable relatively to the rack-bar *a* and is here shown as having the general construction of an elevator car or platform; but inasmuch as this structure may be variously modified and may be made in any form adapted to support one or more persons in either a standing or a sitting position I prefer to designate it as a "lift."

c represents a gear which is mounted upon a shaft *c'*, journaled in bearings suitably affixed to the lift, the said gear meshing with the teeth of the rack-bar *a*. Suitable means are employed for guiding the lift and the gear *c* to maintain the engagement of the gear with the rack-bar.

d represents a lever which is adapted to oscillate on the shaft *c'*, the lever as here shown having a box *d'*, which extends over the shaft

c'. (See dotted lines in Fig. 3.) To one arm of said lever is pivoted, at *e'*, a pawl *e*, which engages the gear *c*, as shown in Figs. 1 and 3. The other arm of the lever *d* is preferably longer than the arm carrying the pawl *e* and constitutes a treadle adapted to be depressed by a person carried by the lift.

It will be seen that when the treadle end of the lever *d* is depressed the pawl *e* is raised and imparts to the gear *c* a partial rotation in the direction indicated by the arrow in Fig. 3. During this operation the shaded portion of the gear *c* (shown in Fig. 3) constitutes a secondary lever, having its fulcrum on one or more of the teeth of the rack-bar *a*. Said rack-bar is, as already stated, rigidly supported independently of the lift, so that the weight of a person applied to the treadle end of the lever *d* and operating to raise the pawl *e* is in effect supported by the fixed fulcrum—namely, the teeth of the rack-bar—the lift being therefore for the time being relieved of the weight of the operator. The lift is suitably counterbalanced by a weight (not shown) connected with a cord *g*, secured to the lift and passing over a suitable system of guide-pulleys *n*. It will be seen, therefore, that by providing two levers *d*, each equipped with a pawl *e*, as shown in Fig. 2, a person on the lift by standing on the treadle ends of the two levers and moving his feet and legs alternately can readily impart an upward movement to the lift, said movement being practically unretarded by the weight of the operator.

To prevent backward rotation of the gear *c* and downward movement of the lift, I provide a stop-pawl *f*, which, as here shown, is affixed to the sleeve *f'*, mounted to turn loosely on a rod *f''*, affixed to supports on the lift. A stop-pawl *f* automatically engages the teeth of the gear *c*.

Means are provided whereby the operator may simultaneously disengage the pawls *e* and *f* from the gear *c* to permit the descent of the lift. I here show as such means a bell-crank lever *h*, pivoted at *h'* to a support which moves with the lift, the arm 2 of said lever serving as a handhold or grip, a chain *h''*, connecting the other arm 3 of said lever with

an arm 4, attached to the sleeve f' , and a chain h^3 , connecting the arm 4 with arms 5, formed on the pawls e . When the arm 3 is raised, it imparts movement through the described connections to the pawls f and e and disengages said pawls simultaneously from the gear c . Means are also provided for enabling the operator to control the descent of the lift, said means, as here shown, comprising a fixed elongated vertical friction member, secured beside and extending parallel with the rack-bar a , and a cooperating friction member, suitably engaged with the lift and adapted to be pressed against the fixed member to create a retarding friction. The member i' may be composed of two sections collectively forming a handpiece or handle surrounding the member i and adapted to be pressed thereon by the hand of the operator. In this embodiment of my invention I show as a means for preventing separation of the gear c from the rack a an anti-friction-roll k in rolling contact with the back of the rack-bar a , and links k' , connecting the trunnions of the roll k with the shaft c^2 , supporting the gear c .

My invention is not limited to the form and relative arrangements of the essential parts of the invention here shown, and the same may be variously modified without departing from the spirit of my invention. I believe myself to be the first to combine a fixed vertical rack-bar and lift movable relatively to the rack-bar and pivotally connected with the lift and carrying a pawl which constitutes an extension of the lever, and a gear also pivotally connected with the lift and engaged both with the pawl and the rack-bar, said gear constituting a secondary lever which when in operation is fulcrumed on the rack-bar, thereby relieving the lift of the weight which depresses or operates the lever. This combination of elements enables movements of the body which are equivalent to those required in walking to be utilized in raising the body and the lift or elevator on which it is supported, the mechanism of my invention, including the stop-pawl f , preventing the loss in the operation of this mechanism of the power which in walking is lost by the settling of the body of the walker in taking each step.

It will be seen that in case the rope that balances the car should break the car cannot fall while the pawls are in engagement with the gear.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

1. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair of primary operating-levers each formed as a treadle pivoted on the lift and carrying a pawl which constitutes an extension of the

lever, and a gear journaled on the lift and engaging both the pawls and the rack, said gear constituting a secondary lever which has the fixed rack for its fulcrum, whereby the weight of a passenger on the lift exerted alternately on the two primary levers and applied to rotate the gear is supported wholly by the rack and caused to raise the lift, the latter being relieved of the weight of the passenger while the lift is rising.

2. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair of primary operating-levers each formed as a treadle pivoted on the lift and carrying a pawl constituting an extension of the lever, a gear journaled on the lift and engaging both the pawls and the rack, said gear being rotatable in a forward direction by the levers and pawls, and means for preventing backward rotation of the gear.

3. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair of primary operating-levers each formed as a treadle pivoted on the lift and carrying a pawl constituting an extension of the lever, a gear journaled on the lift and engaging both the pawls and the rack, said gear being rotatable in a forward direction by the levers and pawls, a stop-pawl pivoted on the lift and adapted to prevent backward rotation of the gear, and means for simultaneously disengaging the pawls from the gear to permit the descent of the lift.

4. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair of primary operating-levers each formed as a treadle pivoted on the lift and carrying a pawl constituting an extension of the lever, a gear journaled on the lift and engaging both the pawls and the rack, said gear being rotatable in a forward direction by the levers and pawls, a stop-pawl pivoted on the lift and adapted to prevent backward rotation of the gear, means for simultaneously disengaging the pawls from the gear to permit the descent of the lift, and means for retarding the descent of the lift.

5. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair of primary operating-levers each formed as a treadle pivoted on the lift and carrying a pawl constituting an extension of the lever, a gear journaled on the lift and engaging both the pawls and the rack, said gear being rotatable in a forward direction by the levers and pawls, a stop-pawl pivoted on the lift and adapted to prevent backward rotation of the gear, means for simultaneously disengaging the pawls from the gear to permit the descent of the lift, and brake mechanism comprising a fixed vertical elongated friction member and a complementary sliding friction member movable with the lift and adapted to cooperate with the said fixed member.

6. The combination of a fixed vertical elongated rack, a vertically-movable lift, a pair

of primary operating-levers each formed as a
treadle pivoted on the lift and carrying a
pawl constituting an extension of the lever,
a gear journaled on the lift and engaging
5 both the pawl and the rack, said gear being
rotatable in a forward direction by the levers
and pawls, an antifriction-roll in rolling con-
tact with the back of the rack, and tension-

rods connecting said roll with the axis of the
gear.

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

WILLIAM W. HUBBARD.

Witnesses:

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