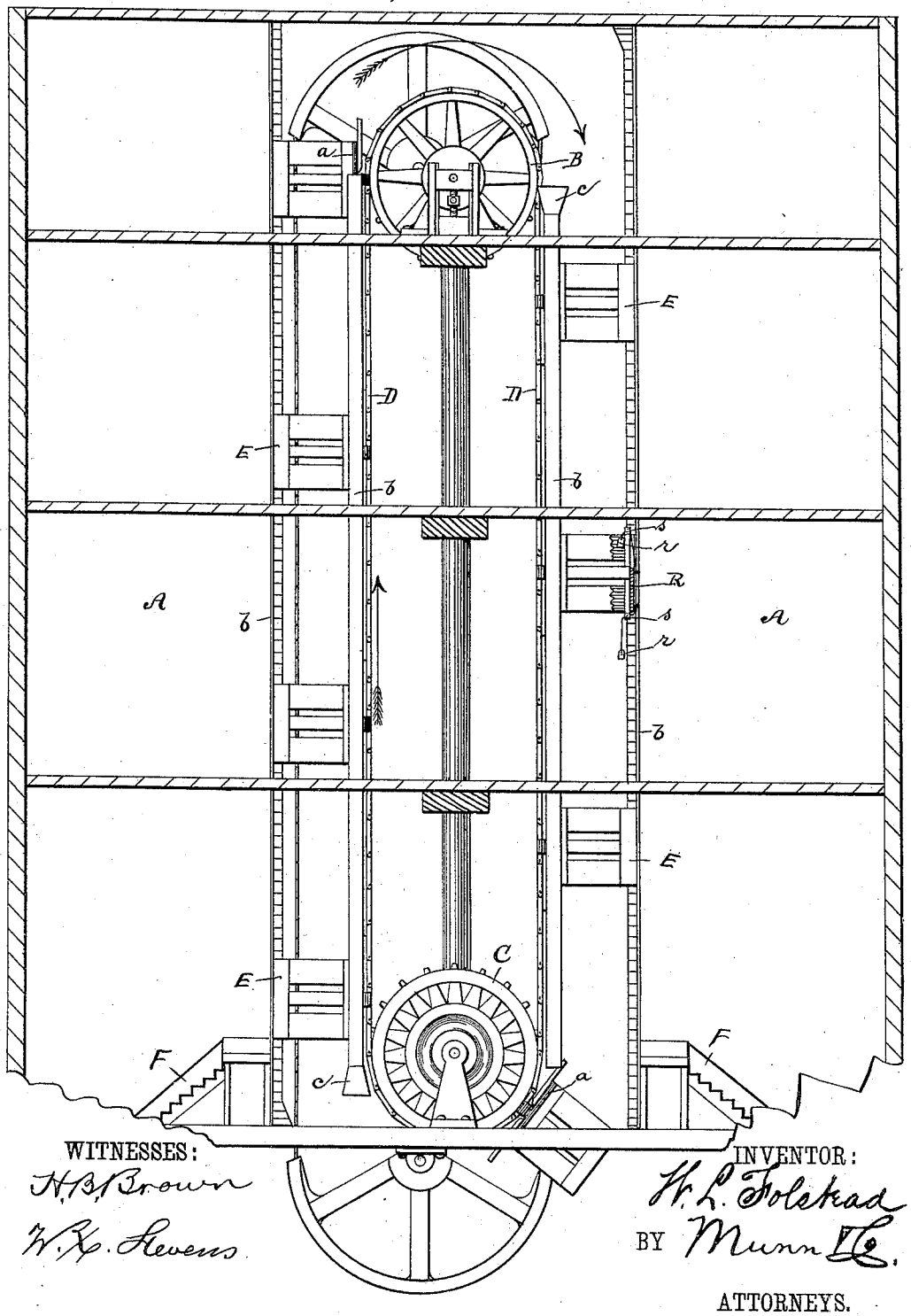
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W. L. FOLSTEAD.

ELEVATOR.

No. 309,449. Patented Dec. 16, 1884.

Fig. 1.



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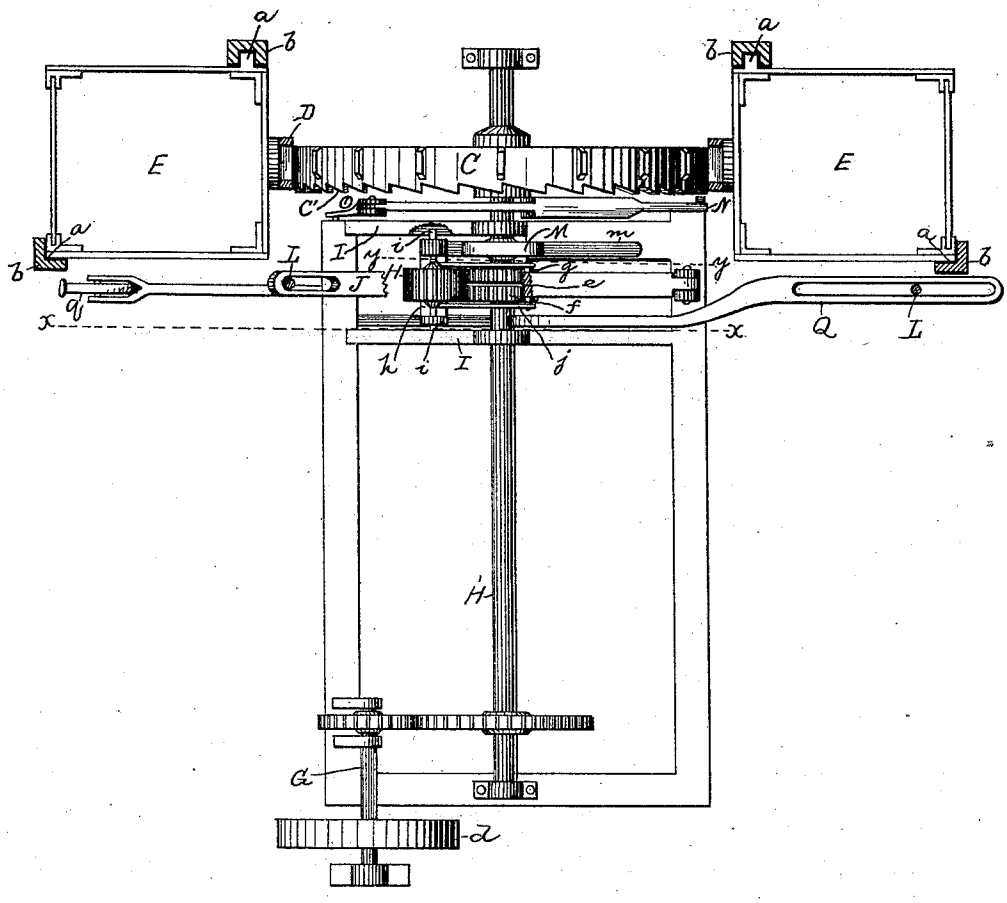
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fig. 2.



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fig. 3.

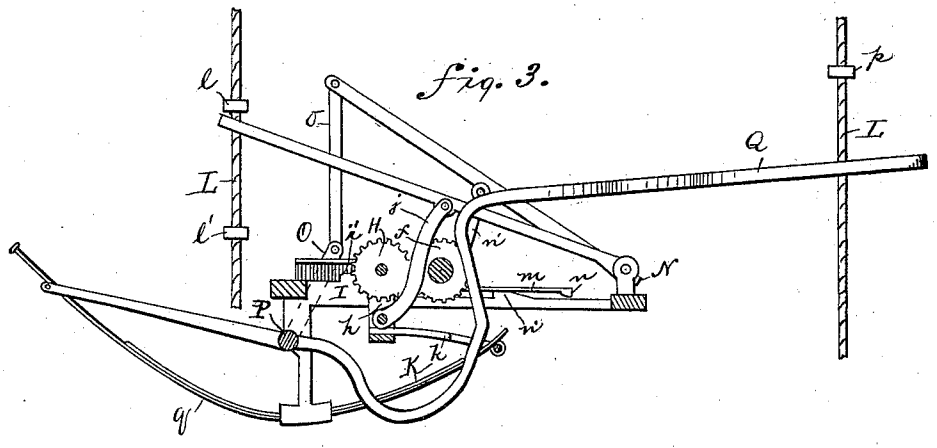
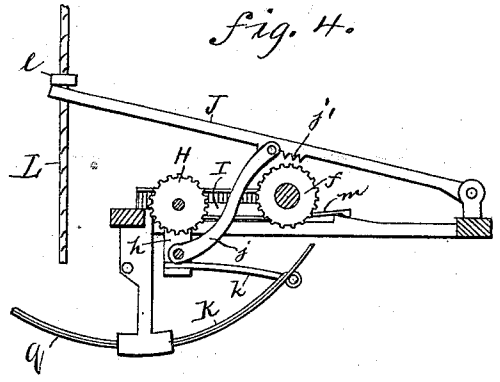


fig. 4.



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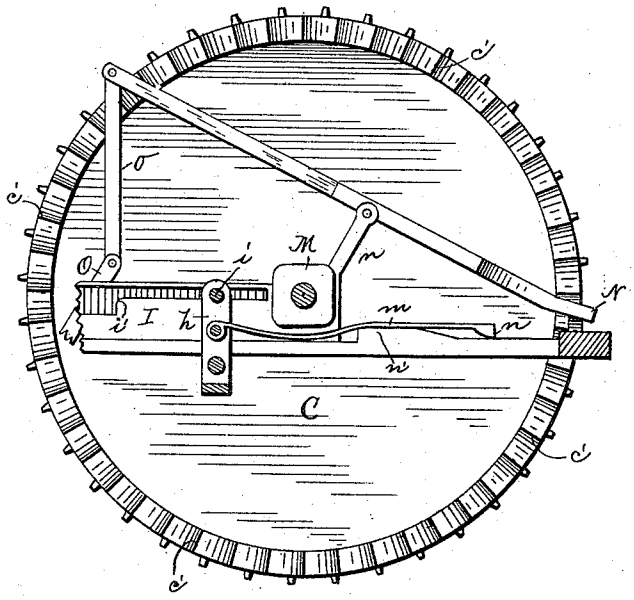
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Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER L. FOLSTEAD, OF RICHMOND, VIRGINIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 309,449, dated December 16, 1884.

Application filed May 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, WALTER LEE FOLSTEAD, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Elevators, of which the following is a description.

This invention relates to that class of elevators which are used for carrying persons or merchandise from one story to another of a house; and it has for its object to provide means whereby a series of cars attached to an endless chain or belt may be adapted to carry loads both up and down at the same time, thereby balancing one load by another to some extent, and requiring less power to operate the elevator; further, to provide means for connecting and disconnecting with a continuously-running power; to stop the elevator at will and to hold it, and to work the elevator by hand-power temporarily in case the machinery power is not available.

To this end my invention consists in the construction and combination of parts forming an elevator, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a three-story house with the front removed to show my elevator. Fig. 2 is a plan view of the lower story. Fig. 3 is a transverse vertical section at *x x* of Fig. 2, showing the gears engaged. Fig. 4 is a transverse vertical section at *x x* of Fig. 2, showing the gears disengaged. Fig. 5 is a transverse vertical section at *y y* of Fig. 2.

A represents the house. B is a rag-wheel mounted in the loft or garret, and C is a rag-wheel mounted in a lower story, or in the cellar. D is a chain hung to run on the two rag-wheels to carry cars E. The cars are hung upon the chain at distances corresponding to the spaces between the floors or stories, so that when a car is stopped at one story there will be a car at each other story. The chain, when in motion, runs continually in the direction of the arrows. To adapt each car to carry passengers down on one side and up on the other side, I have made each car double—that is, it is a car adapted to do service either side upward. To this end each car has a room or box extending both upward and downward from one common floor central between the two compartments. Each car is secured to a single link of the chain, so that the chain may bend freely in passing over the wheels, and the cars are kept level by being provided with ribs *a*, which run in grooves in the corner posts, *b*. The grooves are discontinued where the cars pass over the wheels, and are bell-mouthed at *c c* to receive the ribs when they come over. As the lower story of a house is usually higher studded than the upper stories, I provide steps F, by which to enter the lower cars when other cars are stopped on a level with other stories.

G represents the main shaft, which is kept constantly running in one direction by any suitable power, which may be received on the pulley *d*.

H′ is a counter-shaft which is permanently geared to run with shaft G. This counter-shaft is in line concentric with the shaft of the lower rag-wheel, C, the two shafts parting at *e*.

f is a gear-wheel on the counter-shaft, and *g* is a similar gear-wheel on the rag-wheel shaft.

H is a gear-wheel having a face sufficiently broad to engage the teeth of both wheels *f* and *g* at once. Wheel H is mounted in a frame, *h*, fitted with studs *i* to slide in grooves in a stationary frame, I, by the action of the lever J and connecting-rods *j*, so that the wheel H may thereby be engaged with or disengaged from the wheels *f* and *g*. The studs *i* pass over and engage shoulders *i′* in the frame I, to hold the gear-wheel H disengaged from the wheels *f* and *g*.

K is a spring fixed at one end to the stationary frame, and attached at the other end, by means of a rod, *k*, to the sliding frame *h*, thereby actuating the gear H to remain in engagement.

L is the hand rope, rod, or chain passing through all the stories of the house, within reach of the operator, or of a person in any of the cars, and through the lever J.

l and *l′* are balls on the rope L, adapted to engage the lever J, whereby the latter may be raised or lowered to engage or disengage the operating-wheel *g* and drive-wheel *f*.

M is the brake-wheel fixed on the shaft of the rag-wheel C, and *m* is a spring-brake attached at one end to the sliding frame *h*, and provided at its other end with a knob, *n*, adapted to engage a knob, *n′*, on the stationary frame. Sliding the frame *h* to disengage

the wheels *f g* H draws the brake-spring *m* into engagement with the brake-wheel. If the lever be pressed down harder, the brake will be harder applied, and if the lever be borne clear down it will wholly prevent any further running of the elevator by engaging teeth *j'* in the teeth of the operating-wheel *g*. By this means the elevator may be firmly held from running either way. The brake-wheel M has slightly-rounded corners, but is otherwise nearly square in order that the spring *m* may offer more resistance to its revolving. The rag-wheel C is provided with teeth *c'* on the edge of its rim, to be engaged by a spring-pawl, N, which is pivoted on a fixed bracket and connected with an arm, O, of a rock-shaft, P, by means of a rod, *o*.

Q is a lever fixed to shaft P, to be operated directly by hand, or to be operated by the ball *p* on the rope L. By this means the elevator may be run by hand in case of emergency, a spring, *q*, returning the pawl N and lever Q, the ball *p* working the lever only one way. The ball *p* engages the lever Q enough to operate pawl N before the ball *l* engages the lever J, so that the elevator may be operated by hand without engaging the power-driver. When the ball *l* is raised to engage the power-drivers, the ball *p* will have worked the lever Q once; but that does no hurt, as it assists to start the elevator in the right direction. When fully under way, the teeth *c'* will run ahead of the pawl N and not be affected thereby.

R is a sliding door or gate adapted to close either of the apartments of a car, it being balanced by balls *r*, attached to cords running over pulleys *s*.

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

1. The combination, with two rag-wheels mounted one above the other in a house, and an elevator-chain mounted on said wheels, of a driving-shaft, H', in line with the shaft of one of the rag-wheels, a gear-wheel, *f*, on the end of shaft H', a gear-wheel, *g*, on the rag-wheel shaft, of similar size and adjacent to wheel *f*, and a gear-wheel, H, hung in a frame, *h*, adapted to slide to and from the wheels *f* and *g*, substantially as described, whereby the wheels *f* and *g* may be engaged by the wheel H, for the purpose specified.

2. The combination, with the gear-wheel *g*, mounted on an elevator-shaft, a gear-wheel, *f*, on a driving-shaft in line with said elevator-shaft, and a gear-wheel, H, adapted to engage the wheels *f* and *g*, of a frame, *h*, having studs *i*, a frame, I, having grooves in which the said studs *i* may slide, a lever, J, pivoted to a fixed bearing, the rope L, having balls *l* and *l'* adapted to engage the lever J, and the rods *j*, connecting the lever J with the frame *h*, substantially as shown and described.

3. The combination, with the lever J, the connecting-rods *j*, the frame *h*, and the gear-wheel H, mounted therein, and the studs *i* on frame *h*, of the frame I, having grooves to receive the studs *i*, and shoulders *i'* in the said grooves, and the spring K, attached to frame *h* by means of rod *k*, substantially as and for the purpose specified.

4. The combination, with the drive-wheel *f*, the elevator gear-wheel *g*, the connecting-wheel H, and frame *h*, of the lever J, provided with teeth *j'*, adapted to engage the teeth of wheel *g*, and the rods *j*, connecting the lever J with the frame *h*, as shown and described.

5. The combination, with the lever J, the sliding frame *h*, the gear-wheel H, carried thereby, and the gear-wheels *f* and *g*, adapted to be connected by wheel H, of the spring *m*, attached to frame *h*, and the nearly-square wheel M on the elevator-shaft, substantially as shown and described.

6. The combination, with the rope L and the ball *p* thereon, of the lever Q, fixed to the rock-shaft P, the rag-wheel C, provided with teeth *c'* in the edge of its rim, the pivoted spring-pawl N, and the rod *o*, connecting it with an arm, O, of rock-shaft P, and the returning-spring *q*, as shown and described.

WALTER L. FOLSTEAD.

Witnesses:
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SOLON C. KEMON.