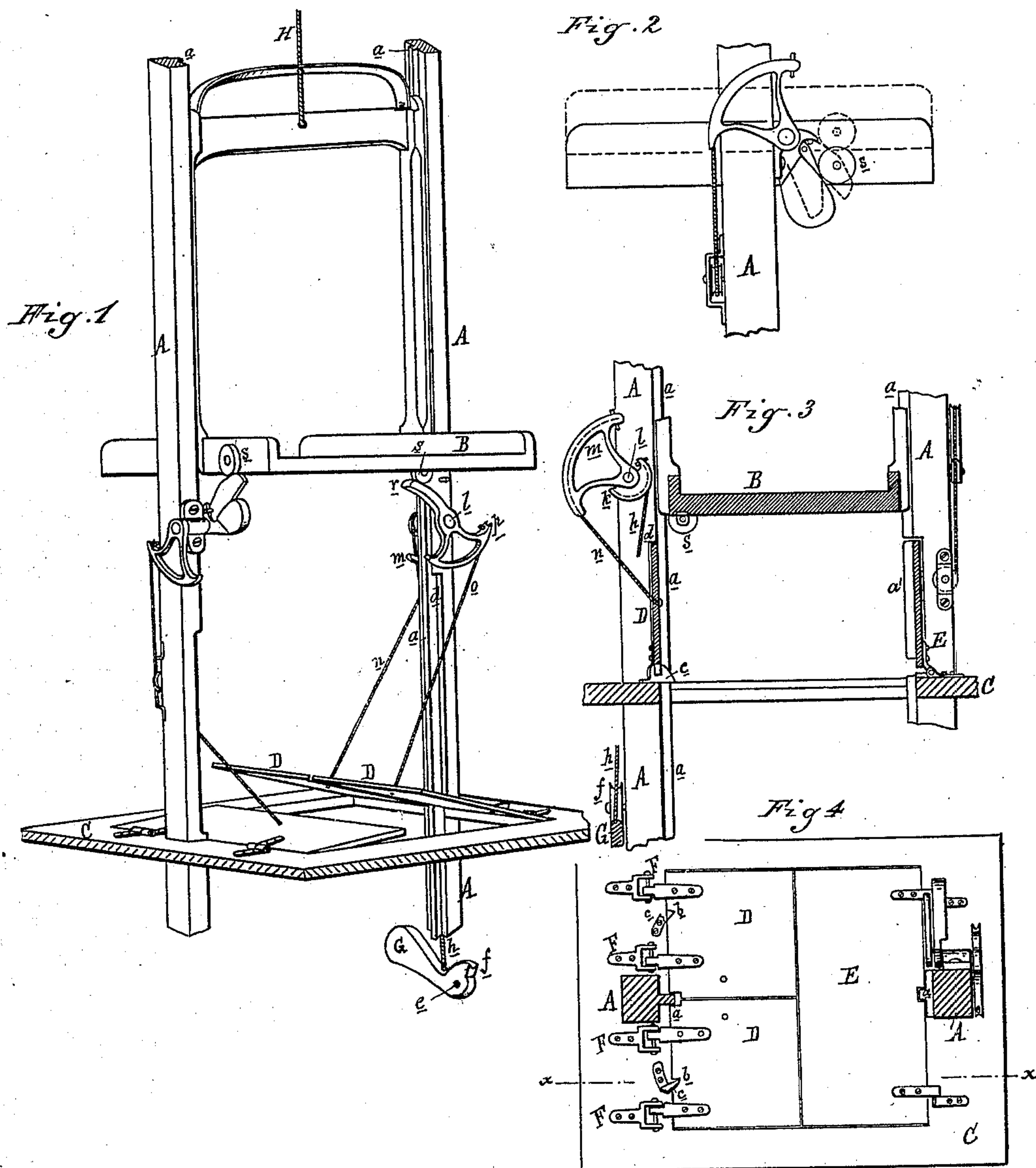


C. F. MURDOCK & F. G. BEACH.
Elevator-Hatchway.

No. 222,198.

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CHARLES F. MURDOCK AND FRANKLIN G. BEACH, OF DETROIT, MICHIGAN.

IMPROVEMENT IN ELEVATOR-HATCHWAYS.

Specification forming part of Letters Patent No. 222,198, dated December 2, 1879; application filed April 1, 1879.

To all whom it may concern:

Be it known that we, CHARLES F. MURDOCK and FRANKLIN G. BEACH, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Elevator-Hatchways, of which the following is a specification.

The nature of our invention relates to new and novel improvements in the construction and operation of elevator-hatchway closers; and the invention consists in the peculiar construction of the various details and their several combinations, as more fully hereinafter described.

Figure 1 is a perspective, in section, being broken off at top and bottom, showing the elevator-platform, the first floor of the building above the cellar. Fig. 2 is an enlarged detail, showing the construction and operation of the counter-balance, which may be employed upon any floor as a modification of the counter-balance shown in Fig. 1. Fig. 3 is an elevation of the reverse side shown in Fig. 1 and in section on the line *xx* in Fig. 4. Fig. 4 is a top plan of a section of the first floor, showing the closers in place when not open for the passage of the elevator.

In the accompanying drawings, which form a part of this specification, A represents the vertical ways; B, the elevator, and C the floor, and all of the usual construction, except as hereinafter described.

D D are a pair of doors or hatchway-closers, each one of which is designed to cover or close one-quarter the opening through the floor for the passage of the elevator. It will be noticed in Fig. 4 that when closed down upon such opening the doors not only fit the opening, but at adjoining sides are close together, to the exclusion of currents of air. The object in view in dividing these doors as described is to avoid the necessity of cutting away the slides *a* on the inner faces of the ways in order to let the doors assume a vertical position, as shown in Fig. 3, wherein *a'* represents such portion of the slide cut away and attached to the under side of the door D, in order to let the latter, when in vertical position, stand out of the way of the passage of the elevator, and at the same time present a continuous slide or guide. In order to avoid this difficulty we hinge each of the doors D

to the floor by means of hinges F, so constructed, as shown in Fig. 4, as to allow each of the doors, when slightly raised from their seat in the floor, to have a lateral play outwardly from the center.

A notch, *b*, is cut in each of the doors coincident with the cam-plate *c*, which is secured to the floor, the parts being so arranged that as the doors are raised from their seat in the floor the cam-plates entering said notches will force each door laterally outward from the ways A a sufficient distance to pass, when in vertical position, the slides of guides *a* and drop into a recess, *d*, in the vertical ways, allowing the elevator to pass freely, and avoiding the necessity of cutting the guides *a* as the doors are dropped to assume their normal position as hatchway-closers. The cam-plates, engaging with the notches above described, force the inner edges of the two doors toward each other until they meet.

G is a counterbalance-weight, pivoted at *e* to the side of one of the ways A, or to any other convenient point, and is provided with a segmental grooved end, *f*. A cord or rope is secured to this counter-balance, which leads up through the floor by the side of the way. This rope *h* has its opposite end attached to the segment *k*, which is attached rigidly to the shaft *l*, which is journaled through the way A. To this shaft is also secured the grooved segmental spider *m*, to which the rope *n* is secured, its opposite end being secured to one of the doors D. Upon the other end of this shaft *l* there is also secured a similar grooved segmental spider, *p*, to which a rope, *o*, is secured, with its opposite end secured to the other door D. These two spiders are rigidly attached to the shaft coincident with each other, so that they will act simultaneously together. The spider *p* is prolonged, as shown in Fig. 1, such prolongation being a curved arm, *r*.

If preferred, although we do not consider it desirable, the rope *h* and the counter-balance G may be dispensed with, as shown, and said counter-balance may be attached to the arm *r*, as shown in Fig. 2.

A small friction-wheel, *s*, is secured to the platform of the elevator B, at such point as, at proper times, will bring it in contact with the upper side of this arm *r*.

In practice, the elevator being below the floor and the opening therein closed by the doors D, the elevator is drawn up, by means of the rope H, until the upper end of the elevator-frame strikes the lower sides of the doors, and the further progress of the elevator in that direction, assisted by the counter-balance G, throws the doors into a vertical position. (Shown in Fig. 3.) As the elevator passes through the opening the doors remain in vertical position until the floor of the elevator has passed the position occupied by the spiders *m p*, when the operation of the counter-balance G would have a tendency to violently close the doors, were it not for the action of the wheel *s*, coming in contact with the upper side of the arm *r*, which allows the doors to close only as the car progresses upward, as shown clearly in Fig. 1. In lowering the car the wheel just referred to strikes the outer end of said arm, depressing it in the downward progress of the car, and, by the devices shown, open the doors again for its further passage. After the car has passed through the opening the doors close by their own weight, a rapid closing being prevented by the counter-balance and the under sides of the doors coming in contact with the upper end of the car-frame.

It will be noticed that by means of the devices hereinbefore described, the doors are opened slowly at first, when the speed is accelerated until they have reached nearly their vertical position, when the motion grows slower until they have fallen into the recess *d*, thereby avoiding any jerking or slamming which would have a tendency to do injury, and the doors are closed by a reverse of the motions described; and these motions may be accelerated or diminished in speed by setting the wheel upon the car at different points, and

lengthening or shortening the arm *r* in like proportion.

What we claim as our invention is--

1. In combination with a car operated between ways A and slides or guides *a*, a hatchway-closer consisting of the doors D D, adapted to completely close the opening in the floor, and arranged to stand, when open, against the inner face of the ways A, in recesses *d* therein, on each side of the guides or slides *a*, thereby allowing a free passage of the car, and avoiding the necessity of cutting the guides, substantially as described.

2. In elevator-hatchway closers consisting of the doors D D, the combination of the hinges F, which allow a lateral movement of said doors, with the cam-plates *c* and notches *b* in said doors, by means of which, whenever said doors are opened or closed, such lateral movement is compelled.

3. In combination with a car or platform of an elevator, the true-grooved segments *m k*, with the ropes *h n*, and counter-balance G, constructed, arranged, and operated substantially as and for the purposes described.

4. In combination with an elevator car or platform, B, and a floor, C, the devices herein described for operating the doors D, consisting of the true segments *m p k*, the arm *r*, ropes *h o n*, counter-balance G, and the wheels *s*, the parts being constructed and arranged to operate substantially in the manner and for the purposes set forth.

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Witnesses:

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