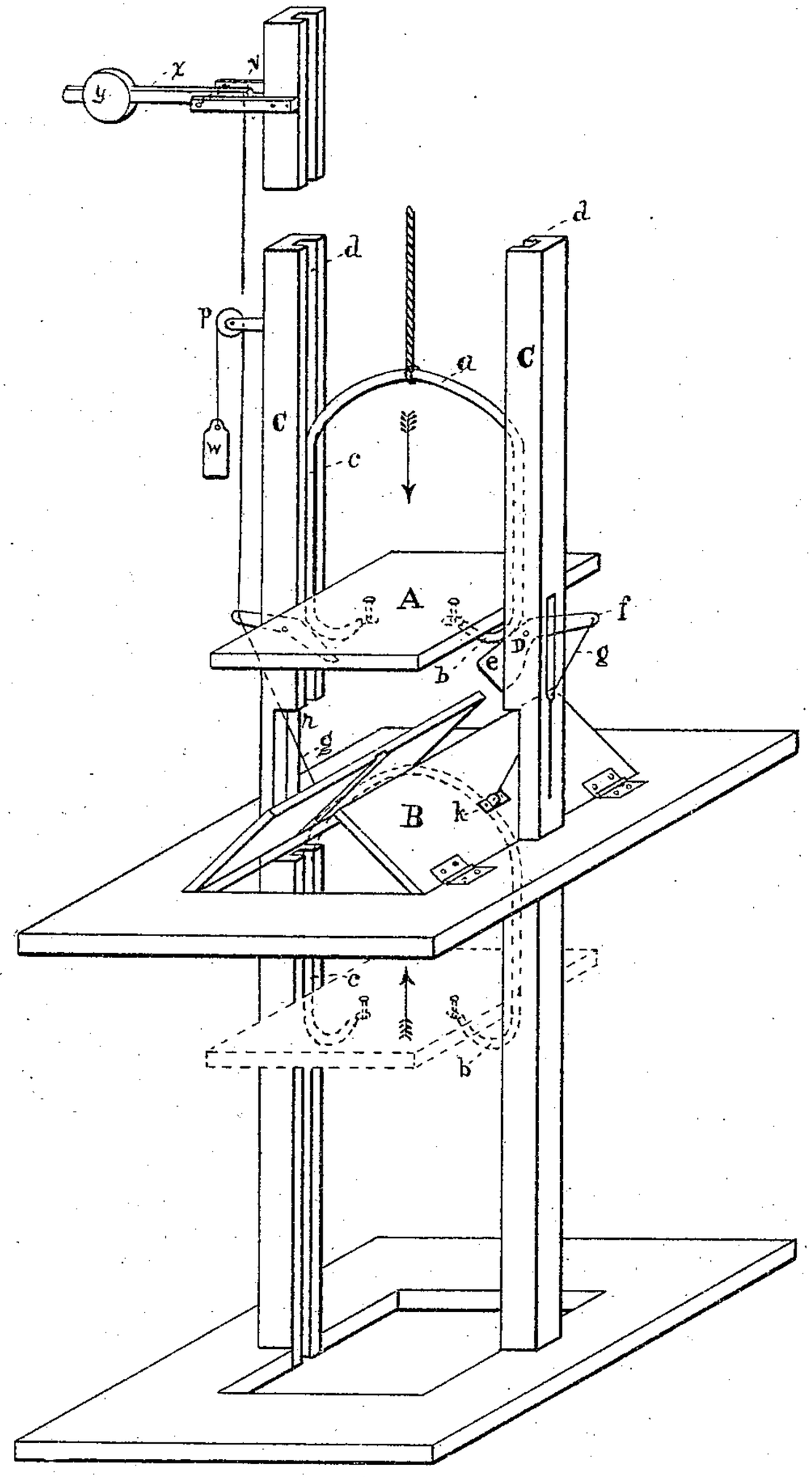
G. C. HOWARD.

Self-Closing Hatchways.

No. 152,376. Patented June 23, 1874.



Witnesses.

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GEORGE C. HOWARD, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SELF-CLOSING HATCHES.

Specification forming part of Letters Patent No. **152,376**, dated June 23, 1874; application filed October 24, 1873.

To all whom it may concern:

Be it known that I, GEORGE C. HOWARD, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Self-Closing Hatch-Doors, of which the following is a specification:

Elevators as commonly constructed have an open hatchway extending from the top to the bottom of the building. This mode of construction presents a twofold source of danger, both from fire and accident. While an open hatchway is always liable to cause some serious accident to life or limb, it may be, also, the means of spreading a small fire into a conflagration. If a fire break out in a lower story, the open hatchway acts as a huge chimney, drawing the flames up through the entire building, and causing wholesale destruction.

The object of my invention is to furnish a closed hatchway on each floor of a building, the hatch-door being open only while the cage is passing through. These doors are opened and closed by attachments on the cage operating while it is passing up and down through the hatchways. These attachments are self-acting, and require no attention from the one who may be working the elevator. When the cage is rising, the doors are lifted and folded back at a uniform speed by the parabolic curve, attached to the top of the cage. The doors are held open by the guides on the cage, and a pair of levers attached to the doors and bearing against the guides on the cage. After the cage has risen sufficiently high to clear the doors, these levers come in contact with the curved irons on the bottom of the cage, and, sliding on these, allow the doors to fall uniformly and easily into their place. In lowering the cage, the bottom curved irons, striking the bent levers, open the doors at a uniform rate of speed, and the cage, passing through, holds them open until they rest upon the upper curve, which lowers them easily and noiselessly into their original position.

To enable others who may wish to make and use my invention, I will describe its construction and mode of working in connection with the annexed drawing.

The cage A is provided with guides *c*, which slide in grooves *d* in the upright posts C. The upper cage, A, is shown coming down, and the lower dotted one going up, the doors B being, in each case, in the same position.

As the cage passes up, the parabolic curve *a* lifts the doors B and folds them back into the recess *r* in the post C. The lifting of the doors raises the rods *g*, which, being attached to the levers D at *f*, throws the end *e* of the lever D down. As the cage passes up, these ends *e* rest against the guides *c* on the cage, and holds the doors B open until the levers D rest upon the curved irons *b*. The ends *e* of the lever D then slide on these irons *b*, and the doors are gradually lowered into their places. When the cage comes down again, the lower curved irons *b* strike the ends *e* of the bent levers D, lifting the outer end *f*, which, by means of the rod *g*, raises the doors B, which are kept open by the guides *c* on the cage A, pressing against the ends *e* of the levers D.

When the cage passes down far enough to clear the levers D, the doors rest upon the parabolic curve *a*, and, sliding upon this, the doors B are lowered into place and the hatchway closed.

The doors often require to be balanced, to enable them to be easily opened. To do this, there are the following methods: The lever D may be balanced either by a weight cast on the end *e* of lever D, or by a weight and cord, *w*, over a pulley, *p*, or by a lever or beam, *x*. From the end *v* a cord is fastened to the lever D. The lever *x* is balanced by a shifting weight, *y*.

The rod *g* is connected at one end to the lever D, at *f*, by a pin-joint, and at the other, by a similar joint, to a bracket, *k*, which is bolted to the door B.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The levers D, connected to the upper surfaces of the divided hatch, and located at each side of the car, in combination with the bow *a* above the car, and the curved cams *b b* below the car, as and for the purposes specified.

2. The combination of the doors B, rods *g*, levers D, and balancing-weights *w* or *y*, substantially as specified.

Witnesses: GEO. C. HOWARD.

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