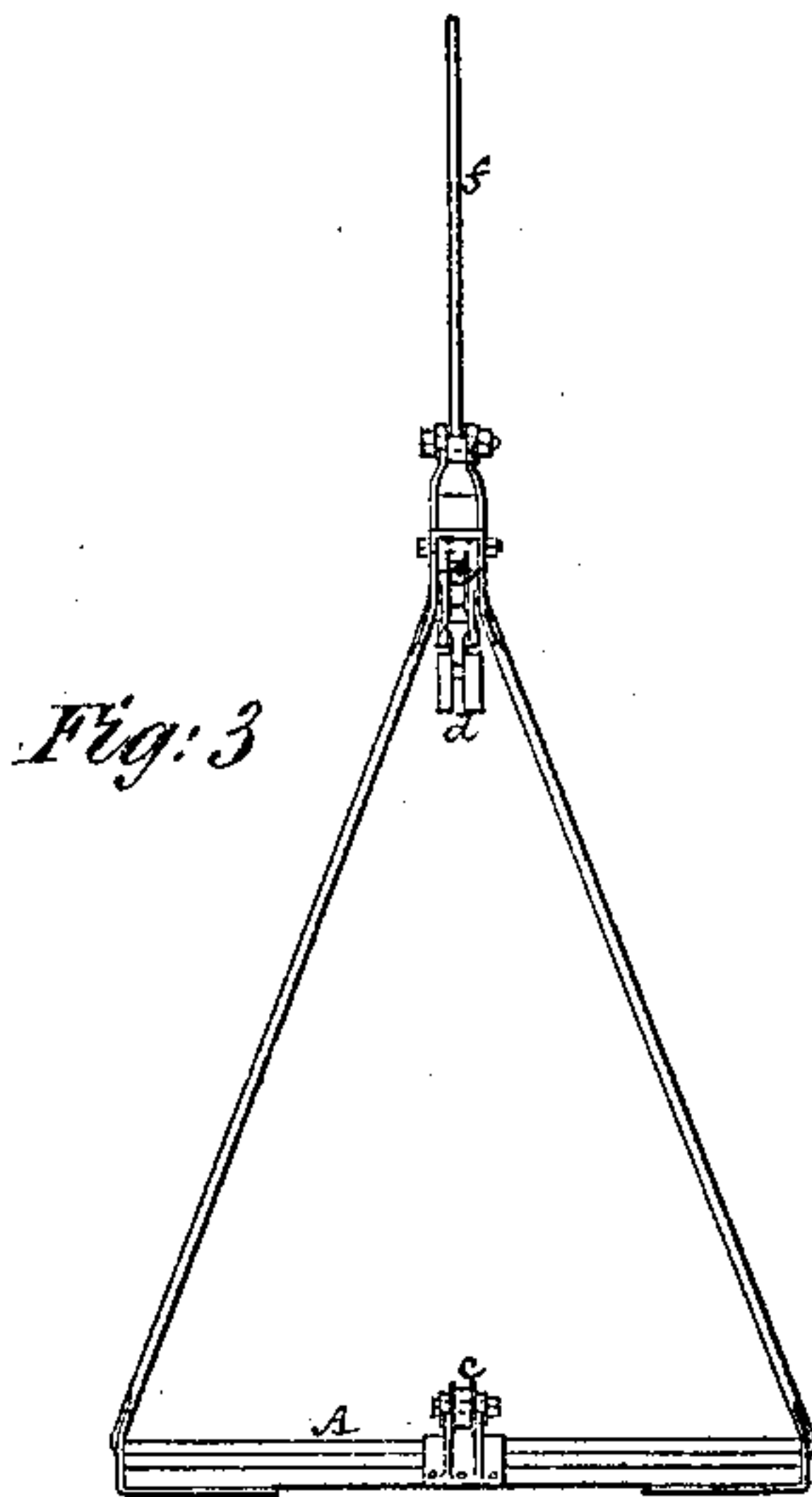
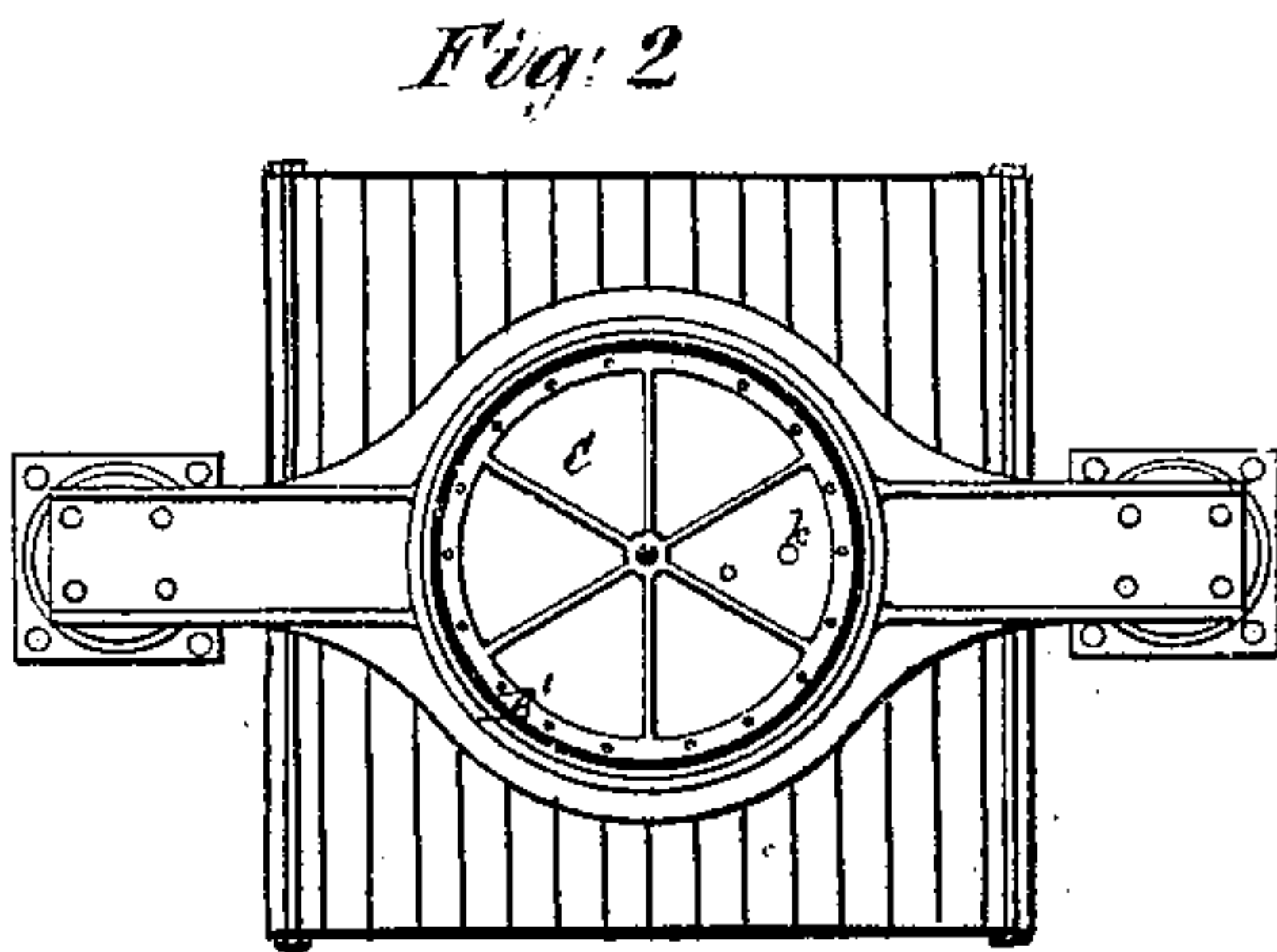
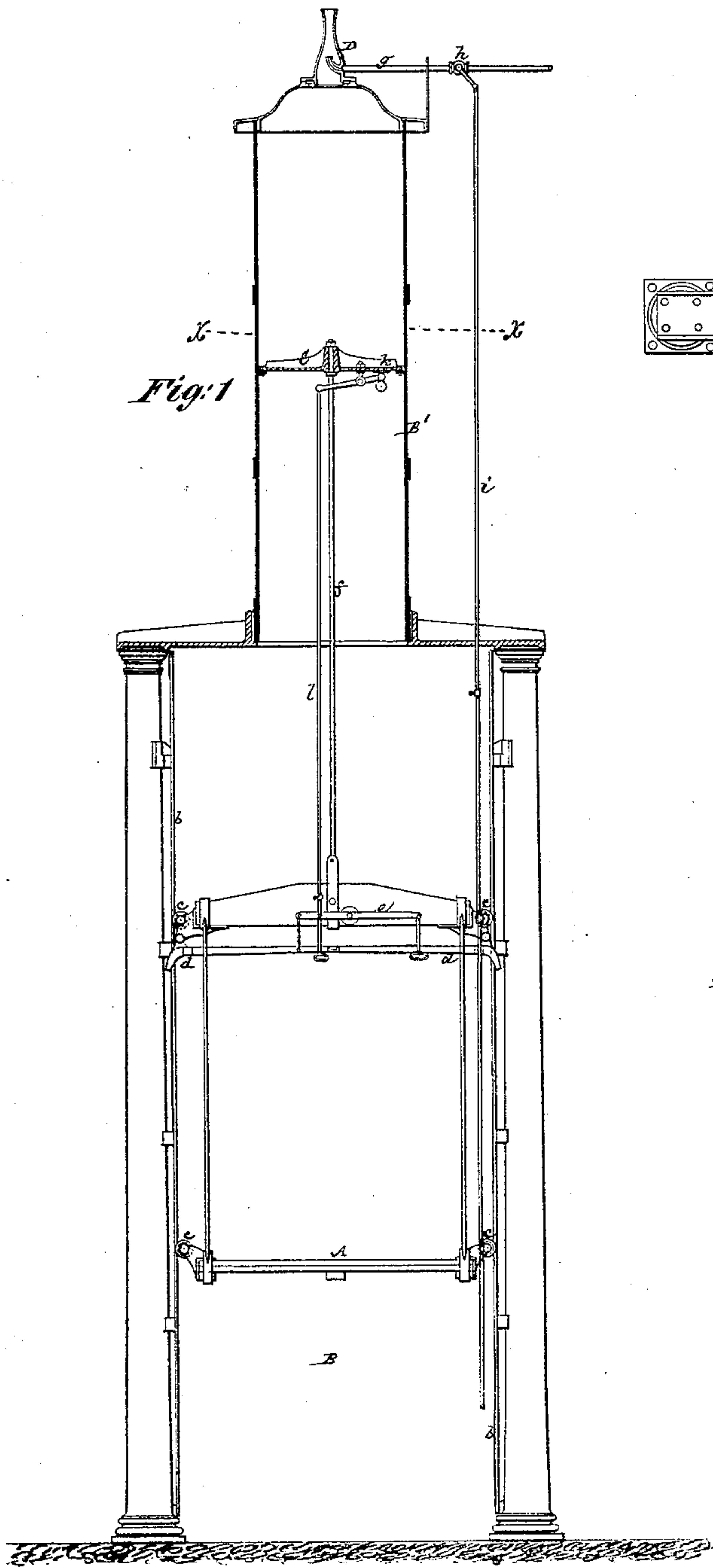


P. W. MACKENZIE.

Elevating or Hoisting Apparatus.

No. 149,236.

Patented March 31, 1874.



WITNESSES.

Fred Hayner  
Fred Busch

per

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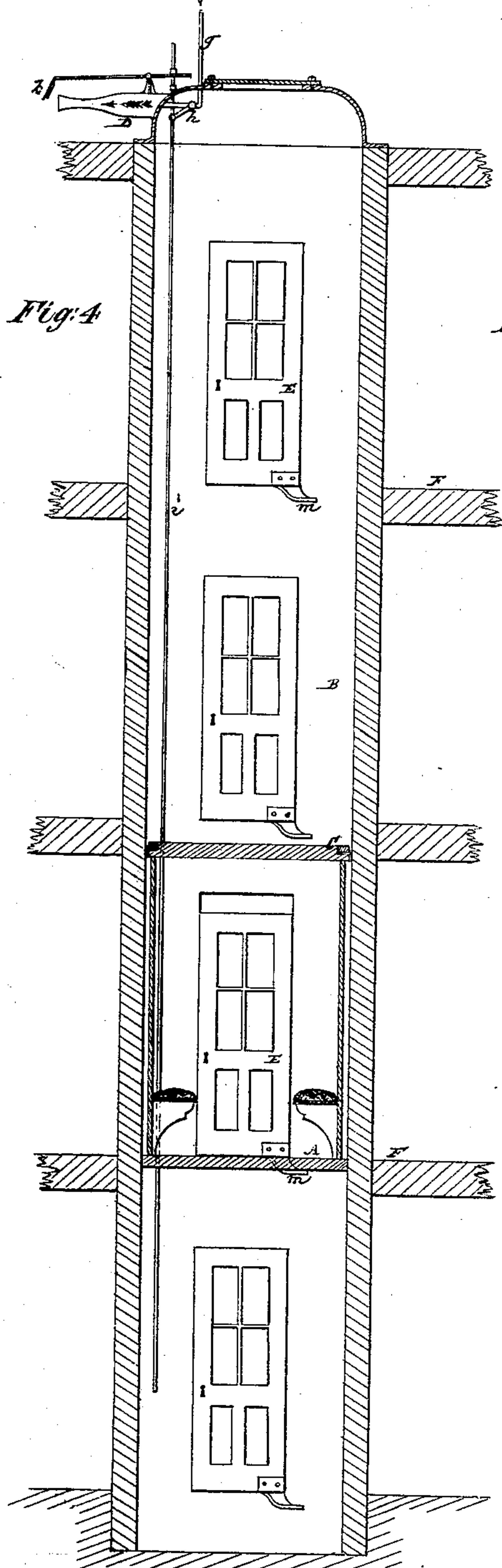


Fig. 4

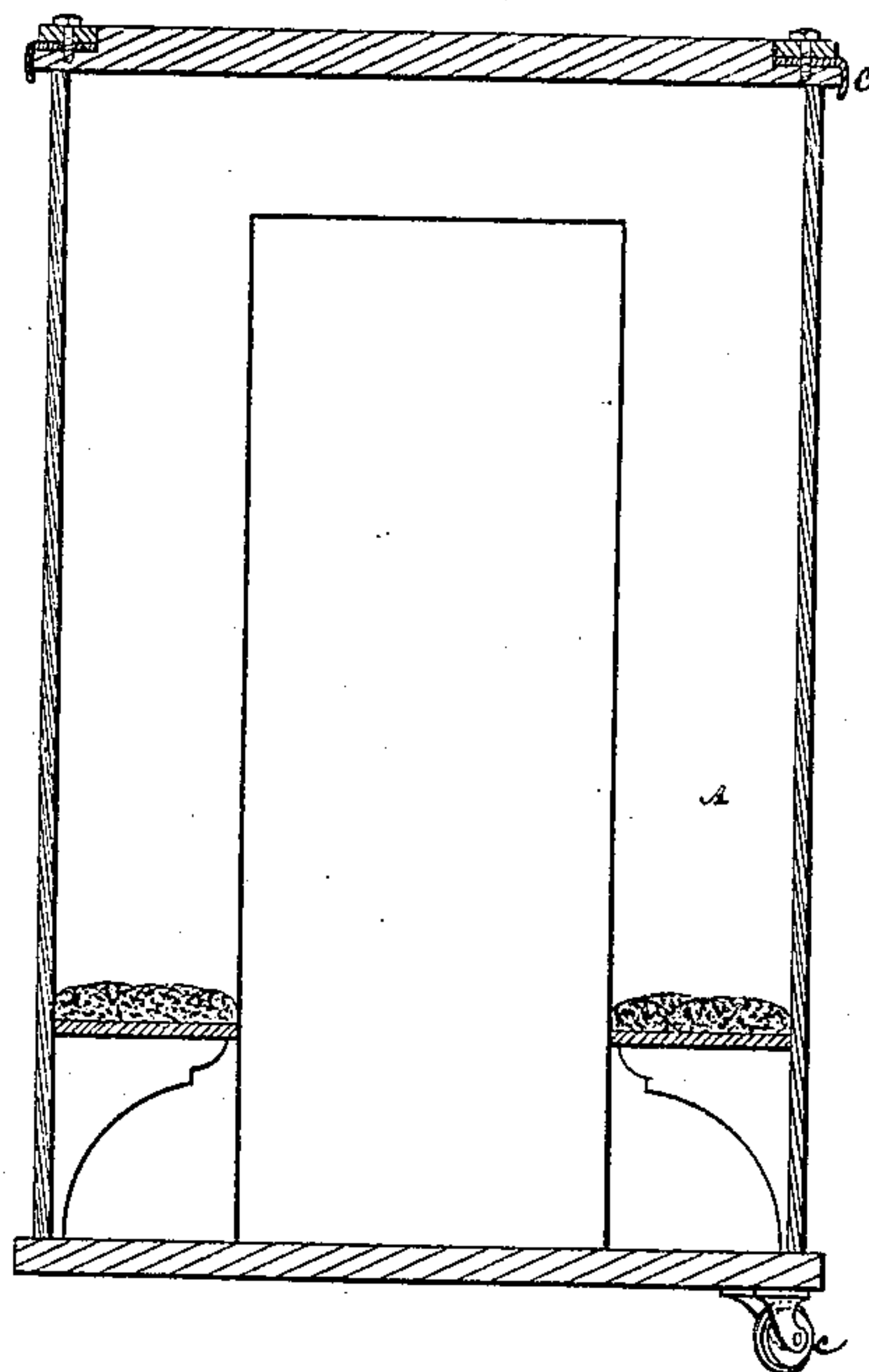


Fig. 5

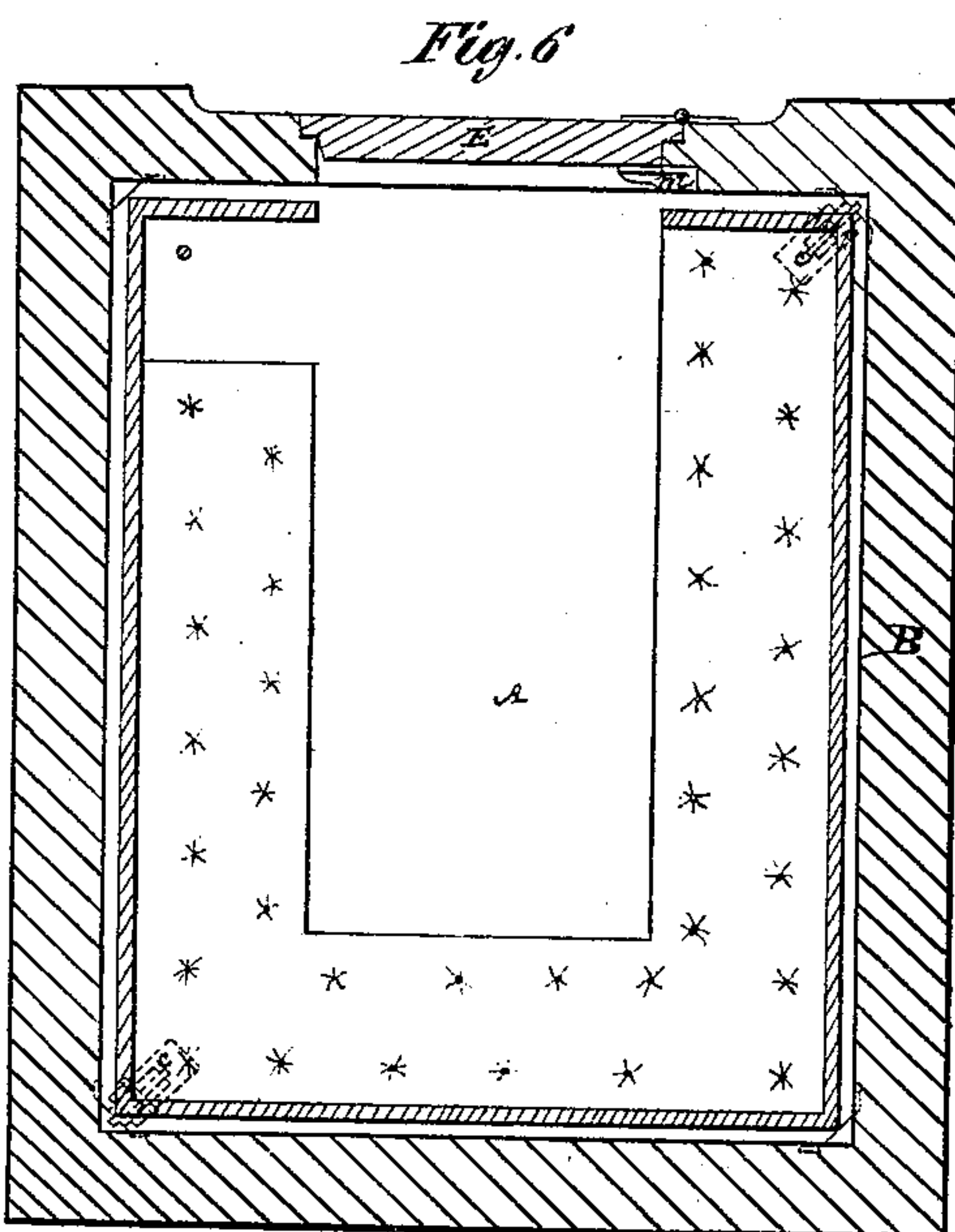


Fig. 6

WITNESSES.

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*P. W. Mackenzie*  
per *Brown & Elder*  
attorneys



# UNITED STATES PATENT OFFICE.

PHILIP W. MACKENZIE, OF BLAUVELTVILLE, NEW YORK.

## IMPROVEMENT IN ELEVATING OR HOISTING APPARATUS.

Specification forming part of Letters Patent No. **149,236**, dated March 31, 1874; application filed March 2, 1874.

*To all whom it may concern:*

Be it known that I, PHILIP W. MACKENZIE, of Blauveltville, in the county of Rockland and State of New York, have invented certain Improvements in Elevating or Hoisting Apparatus, of which the following is a specification:

This invention is applicable alike to passenger and to goods elevators; and consists, generally, in a combination of a steam-blast exhaust-jet device applied to the hoistway or cylinder mounted thereon, with a piston attached to the traveling platform or car of the elevator, or with a car constructed to operate as a piston, whereby, on introducing steam to the jet device, air is exhausted from above the piston, which works within the hoistway or its cylindrical or other extension, and the car or platform is raised by atmospheric pressure. The descent of the car or platform may be effected by gravity, subject to control by checking the admission of air to the upper side of the piston.

In the accompanying drawings, which form part of this specification, Figure 1 represents a sectional elevation of a freight-elevator for short lifts, having the main or general features of my invention applied; Fig. 2, a horizontal section at the line *x x* of the same, and Fig. 3 a side view of the hoisting-platform, detached. Fig. 4 is a sectional elevation of a passenger-elevator constructed in accordance with my invention, and Figs. 5 and 6 vertical and horizontal sections, respectively, upon a larger scale, of the passenger-car used in said elevator.

Similar letters of reference indicate corresponding parts.

Referring, in the first instance, to Figs. 1, 2, and 3 of the drawings, A represents the traveling platform or cage, and B the hoistway, formed of columns provided with vertical guides *b b*, for rollers *c c*, attached to the cage or platform, to run against; also, provided with safety pawls or dogs *d d*, operated by a hand-lever, *e*. Attached to the top of the cage, as by a rod, rope, or chain, *f*, is a piston, C, arranged to work in a cylinder, B', open at its bottom, and mounted on and forming a continuation, as it were, of the hoistway. This cylinder is covered at its top, and fitted at

such part with a steam-blast exhaust-jet device, D, the pipe *g* of which, that supplies the steam, establishes the flow outwardly from the cylinder, thereby exhausting the air above the piston C, so that the platform A is raised by atmospheric pressure.

The steam may be let on and shut off from the jet device, and its flow regulated, as required, therethrough by a cock, *h*, controlled by a rod, *i*, arranged to extend down the hoistway. When steam is shut off from the jet device, then the cage or platform A is free to descend by gravity, and the speed of its descent may be regulated or checked by a valve, *k*, in the piston, arranged, when open, to admit air to the upper side of the piston, and operated by a rod, *l*, which may be fitted with a stop, to bear down on the lever which actuates the safety pawls or dogs, so that when the valve is fully opened, the latter are also thrown into action.

In Figs. 4, 5, and 6 of the drawing, the same principle of operation is carried out in a substantially similar manner, more particularly applicable to a passenger-elevator; but in this case the hoistway B is boxed up or closed in, more especially at its sides and top, and thereby made to form the cylinder or chamber in which the piston C, attached to the car A, works; or said car may be constructed to form the piston. D is the steam-blast exhaust-jet device with its steam-supply pipe *g* applied to the top of the hoistway, and serving to exhaust the air in the hoistway from above the car or its attached piston.

The flow of steam through the pipe *g* is established, or shut off and regulated, as in the previous arrangement herein described, by a cock, *h*, controlled by a downwardly-extended rod, *i*, and which may be fitted at its upper end with stops operating, when the cock *h* is opened, to open a valve, *k*, applied to the mouth of the jet device D, and after the steam-cock *h* has been shut, serving, if necessary, to close or partly close the valve *k*, and so to check or shut off the admission of air to the top of the piston C, for the purpose of checking or arresting the descent of the car, in like manner as if said valve *k* were applied directly to the piston. The bottom of the hoistway B may also be constructed to establish an

air-cushion, which will stop the car before reaching the bottom.

E E are the doors leading to the several floors, F F, of the building. These doors are hung to open outward, and are each fitted with a step or stop, *m*, which, when the door is opened, or till it is fully closed, pass under or lock with the car to hold it from moving, thus preventing any untimely motion of the car, and avoiding accident consequent thereon.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of a steam-blast exhaust-jet device, with a piston attached to the car or traveling platform of an elevator, and working within a close cylinder or chamber, from which the air above the piston is exhausted by the action of the jet device, to effect the raising of the car or platform, substantially as specified.

P. W. MACKENZIE.

Witnesses:

HENRY T. BROWN,  
MICHAEL RYAN.