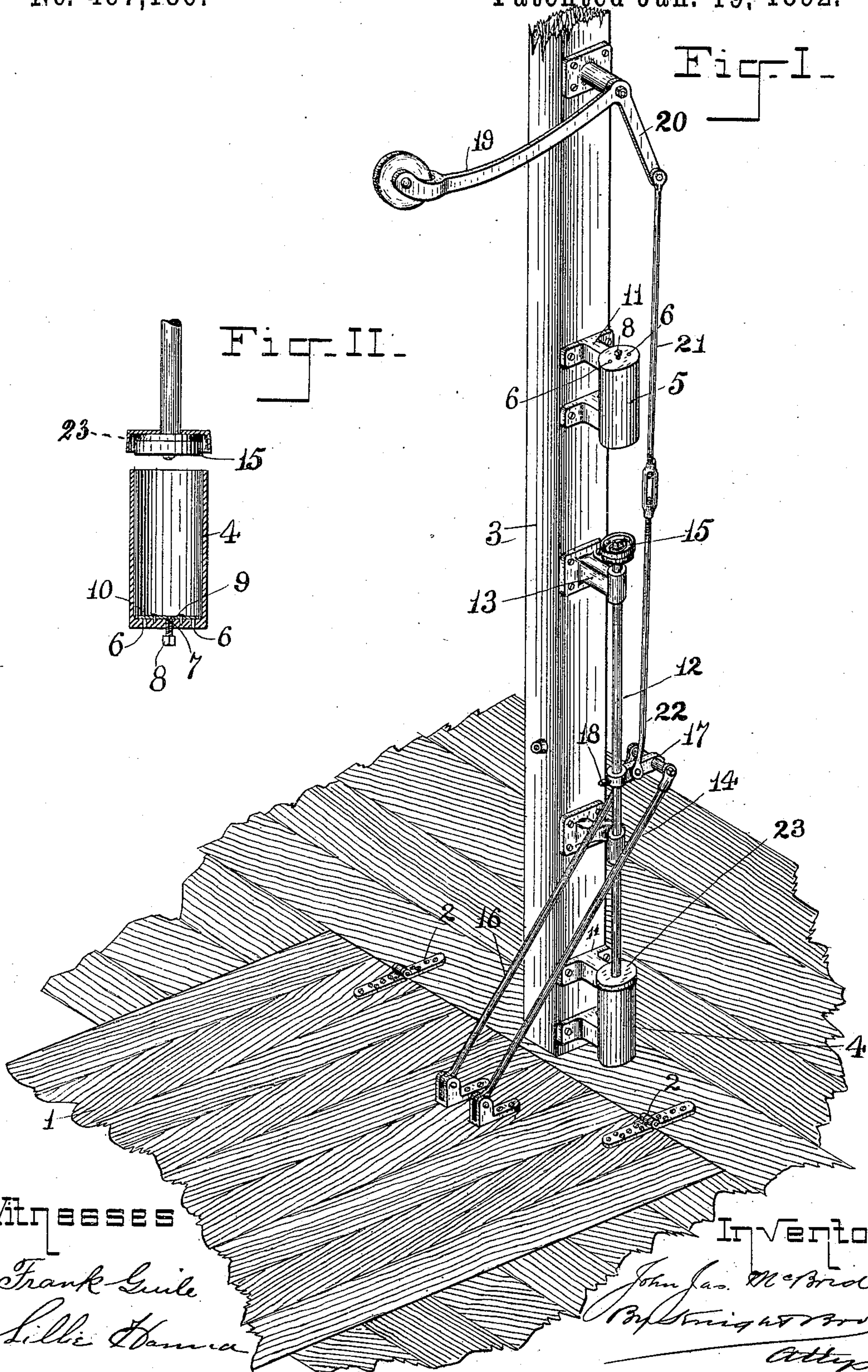


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Witnesses

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UNITED STATES PATENT OFFICE.

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HATCH-DOOR.

SPECIFICATION forming part of Letters Patent No. 467,186, dated January 19, 1892.

Application filed December 13, 1890. Serial No. 374,576. (No model.)

To all whom it may concern:

Be it known that I, JOHN JAMES McBRIDE, a citizen of the United States, residing at Ridgefield Park, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Hatch-Doors, of which the following is a specification.

The invention relates to hatch-doors which are used principally in connection with freight-elevators for closing the hatches automatically at all times, except at the moment of passage of the cab through each floor, whereby not only is the danger of accident lessened, but the spread of fires from floor to floor due to the rush of air through the elevator-shaft is impeded.

It is customary to open hatch-doors by means actuated from the cab. This action is exceedingly rapid therefor, and the result is the subjection of the door to sudden shocks and slams, which, if not eased in some way, would not only quickly destroy the door, but become unbearably noisy, especially in closed-shafts, where the vibration makes it desirable to prevent even slight noise.

Hitherto various expedients have been devised for easing the slam by means of springs and counter-weights; but so far there has been devised nothing which was applicable to all cases which might arise and which would perfectly arrest the door at both limits of its movement without shock or noise.

My invention consists in the novel application to this purpose of air-cushions or dash-pots. Such air-cushions or dash-pots have been, I am aware, used before my invention in various mechanical contrivances; but, so far as I know, no one has ever devised a plan whereby they can be successfully applied for preventing the slam of hatch-doors. These doors usually hinge vertically, and two slams very different in character have to be overcome, one when the door is falling down with its whole weight to close the hatch and the other when it is thrown back to vertical position when struck by the cab.

The above will indicate generally the subject of my invention, which further includes

certain mechanical details hereinafter fully described with reference to the accompanying drawings and pointed out in the claims.

In said drawings, Figure I is a perspective view of a hatch-door having my invention applied thereto. Fig. II is a sectional view through the lower dash-pot, showing the plunger about to enter or leave the same.

1 may represent a hatch-door, hinged at 2 to the floor and adapted to close the hatch.

3 is a guide or other stationary part of the building.

4 5 are dash-pots. The former open at top and the latter at bottom, and both have in their closed ends air-inlets 6 6 and air-vent 7, the latter closed to any extent desired by a set-screw 8, having customary graduating-groove 9. A flexible valve 10, fixed to the closed end of the dash-pot, overlaps the air-inlets 6, but does not obstruct the entrance to vent 7. These dash-pots are placed in line with each other, and, owing to the small amount of space usually at the command of the manufacturer of hatch-doors, they are usually arranged vertically, one above the other, being provided with brackets 11, which are screwed or bolted to the post 3.

12 is a plunger-rod sliding in bearings in guide-hangers 13 14, the latter of which has a goose-neck fixed to the post 3. The said rod bears at each end a plunger 15, at such distance apart that one will operate in the lower dash-pot 4 when the door 1 is nearly closed and the other in the upper dash-pot 5 when the door reaches a nearly vertical position over its hinges. The door 1 being connected to the rod 12, when the former is opened by any means it will allow the said rod and cause the upper plunger to enter the dash-pot 5, checking the movement of the door as it reaches a vertical position. The air slowly issues from the vent 7 as the door attains a position at rest over its hinges. When the car has passed and the door falls, the upper plunger will be pulled down out of the upper dash-pot, the air entering the latter freely through the air-inlets 6 6, and the lower plunger will enter dash-pot 4, cushioning the descent of the door in a well-known manner.

My arrangement for connecting the door to the rod 12 is such as to give the cab control of the door until it has thrown the latter entirely back out of position. The door 1 is connected to the rod 12 by rods 16 16, whose connections at each end are hinged ones and which are ranged one on each side of the rod 12, so as to prevent torsional effect. A horizontal arm 17 is interposed between the upper ends of rods 16 16 and the rod 12, so as to throw the connection of the rod 16 considerably to the rear of the rod 12. Thus when the rod 12 reaches its uppermost position and the door 1 comes nearly vertical the rods 16, owing to their inclination, will still exert an effective pull on the door instead of tending simply to pull the door off its hinges, which would be the case if their connection with the door and to the rod 12 were nearly in the same plane as the door-hinges. The arm 17 is adjustable on the rod 12, and may be fixed by screws 18 at a point necessary to regulate the entrance of the plungers into their respective dash-pots.

19 is the lever, arranged to be struck by the cab-bow when the latter is descending to open the door and to ease its closure by traveling over the under cab-bow when the cab is ascending. It has an arm 20, connected by rod 21, bent at 22 to clear the upper dash-pot and plunger and hinged at its lower end to the arm 17. The connection of the door-operating lever 19 with the door is thus made by way of the door-cushioning mechanism.

The goose-neck 14 permits the use of a straight rod 16 between the rod 12 and the supporting-post 3; but, if desired, the said rods 16 may be bent to avoid bracket 14 where the parts are contracted in size to occupy limited room.

The door 1 is normally closed.

Means for keeping the dirt and dust out of the lower dash-pot 4, which will be effected while the door is closed, will therefore sufficiently prevent the fouling of the air-passages in said dash-pot. I therefore provide a removable cover 23 for the lower dash-pot, through which the rod 12 slides freely, and which is arrested by the top of the dash-pot 4 when the plunger 15 enters the latter, but which is lifted with said plunger when the latter leaves the dash-pot, as shown in Fig. II.

Instead of using two distinct rods 16, I may use one rod, simply forking it to surround the rod 12.

Instead of having the dash-pots fixed, as here shown, they may be carried by the rod 12, and the plungers may be fixed, this involving a simple inversion of the parts.

Usual or any desired counterbalancing devices (not shown) for the door are employed.

The weight of the mechanism is so disposed that when the door is in vertical open position the downward pressure on arm 17 will tend to throw the door off of the perpendicular,

so that it will close without the assistance of a spring.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination, with a hatch and a door hinged to the hatch, of the support, hangers secured to the support, a rod sliding in the hangers, connecting device between the door and the sliding rod, and a plunger and a dash-pot located at the lower end of the sliding rod, substantially as described.

2. The combination, with a hatch and a door hinged to the hatch, of the support, hangers secured to the support, a rod sliding in the hangers, connecting device between the door and the sliding rod, the brackets secured to the support, dash-pots secured to the brackets, and plungers secured to the ends of the sliding rod, substantially as described.

3. The combination, with a hatch and a door hinged to the hatch, of a support, hangers secured to the support, a rod sliding in the hangers, connecting device between the door and the sliding rod, the brackets secured to the support, dash-pots secured to the brackets, plungers secured to the ends of the sliding rod, the lever having an arm, and a rod coupling the arm to the connecting device, substantially as described.

4. The combination of the hinged hatch-door 1, the dash-pot, a sliding rod 12, a plunger thereon adapted to enter said dash-pot, and hinged rods connecting said rod 12 with said door, substantially as set forth.

5. The combination of hinged hatch-door 1, rod 12, having arm 17, a plunger, a dash-pot, and the rods 16, connecting the arm 17 to the door 1, substantially as set forth.

6. The combination of the door 1, the plunger, plunger-rod, the dash-pot, the rods connecting the plunger-rod to the door, and a lever adapted to be operated by the cab, connected to said plunger-rod for opening the door and easing its ascent, substantially as set forth.

7. The combination of the door 1, the dash-pot 4, open at top and having suitable inlets, vent, and valve, the dash-pot 5 in line therewith, open at bottom and having similar inlets, vent, and valve, the plunger-rod having at each end a plunger adapted to enter said dash-pots at opposite extremities of its movement, and connections between said plunger-rod and door, substantially as set forth.

8. The combination of the door 1, the dash-pots 4 5, the plunger-rod 12, having plungers 15, the arm 17, adjustable on said rod 12, and the rods 16, hinged to said arm 17 and to the door 1, substantially as set forth.

9. The combination of the open-top dash-pot 4, the plunger-rod 12, and the cover 23, adapted to be lifted from the dash-pot as the plunger leaves the latter, substantially as set forth.

10. The combination of the hinged hatch-door, the door-operating lever, the sliding rod connected to the door, the arm on the sliding rod, and the rod connected to the arm and to the lever, substantially as set forth.

11. The combination of a hatch-door, a dash-pot, a sliding rod having a plunger fitting the dash-pot, and an arm, connection between the hatch-door and the outer end of the arm, the lever having an arm, and the rod connected at its upper end to the arm of the lever and at its lower end to the arm of the sliding rod, substantially as described.

12. The combination of a hatch-door, a dash-pot, a sliding rod having a plunger fitting in the dash-pot, and an arm, rigid rods connected to the hatch-door and to the outer end of the arm, the lever having an arm, and the rod connected at its upper end to the arm of the lever and at its lower end to the arm of the sliding rod, substantially as described.

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