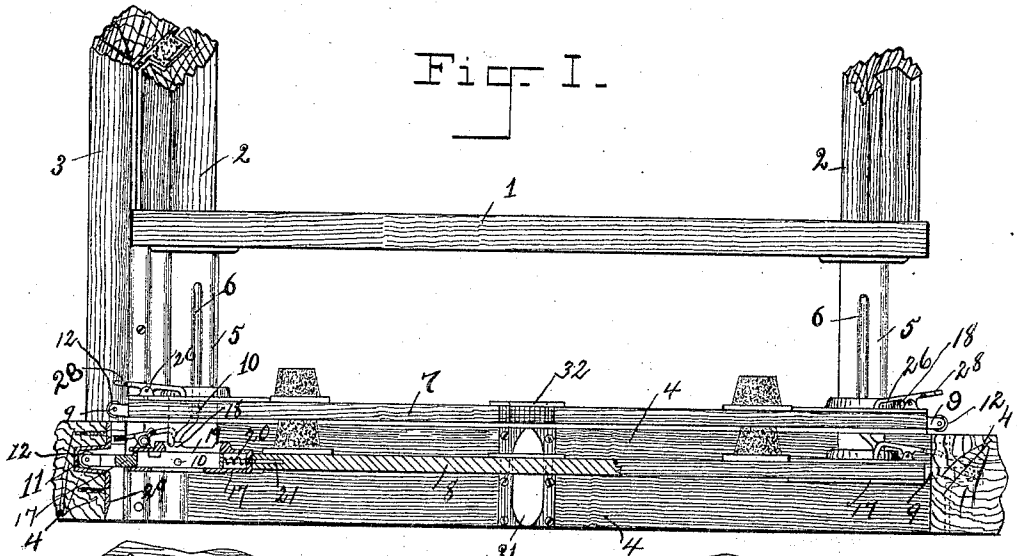
(No Model.) 3 Sheets—Sheet 1.

J. J. McBRIDE.

HATCHWAY DOOR OPERATING DEVICE.

No. 469,317. Patented Feb. 23, 1892.

Fig. I.



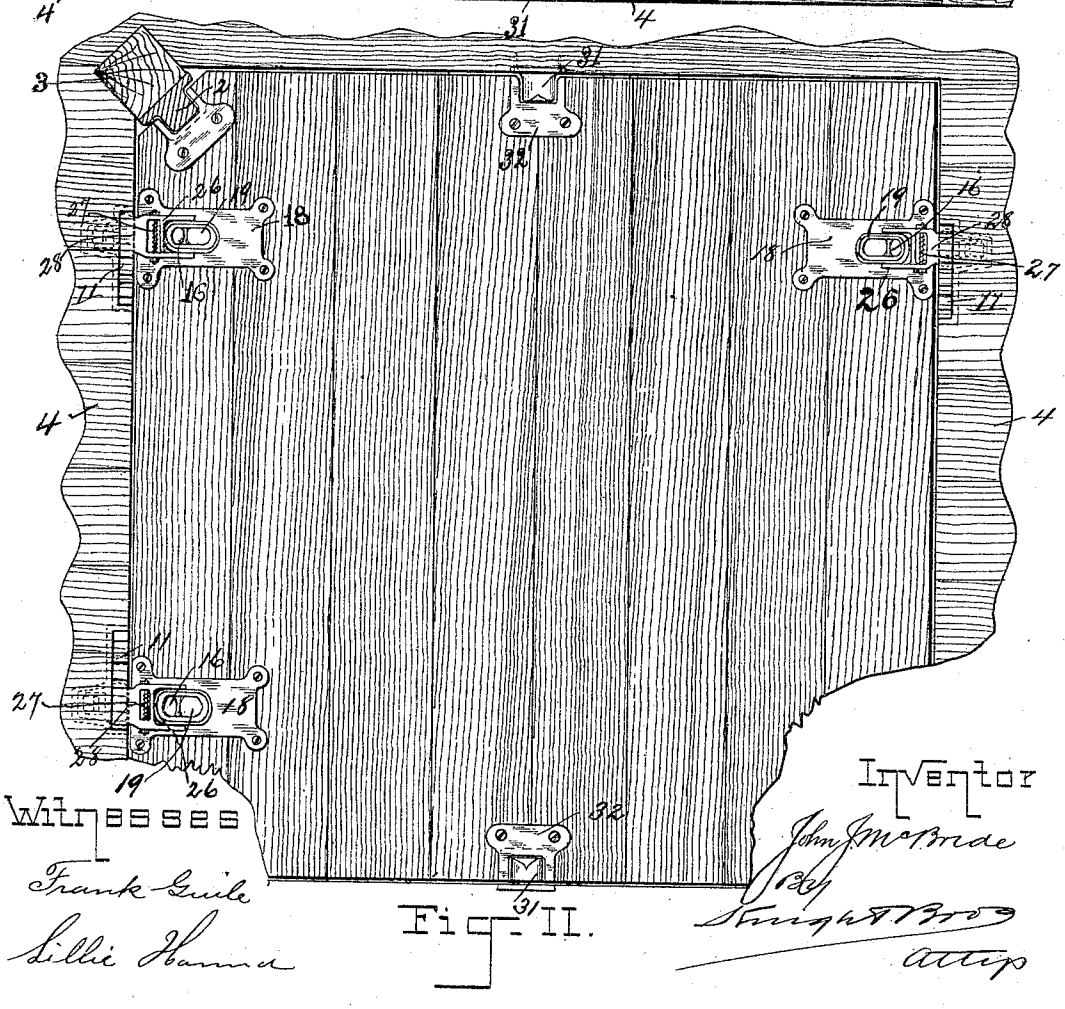


Fig. II.

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Fig. III.

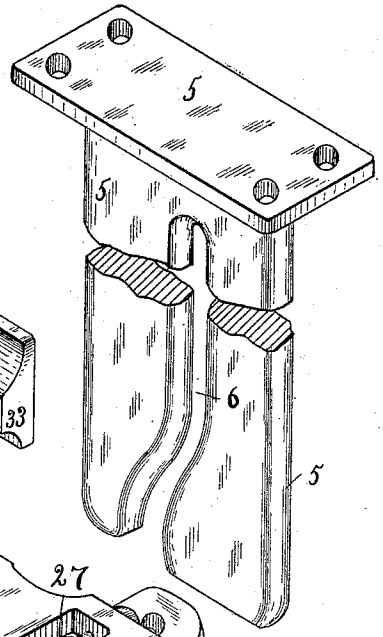


Fig. IV.

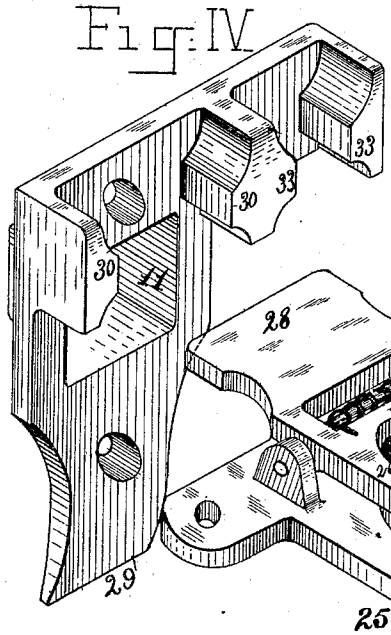


Fig. V.

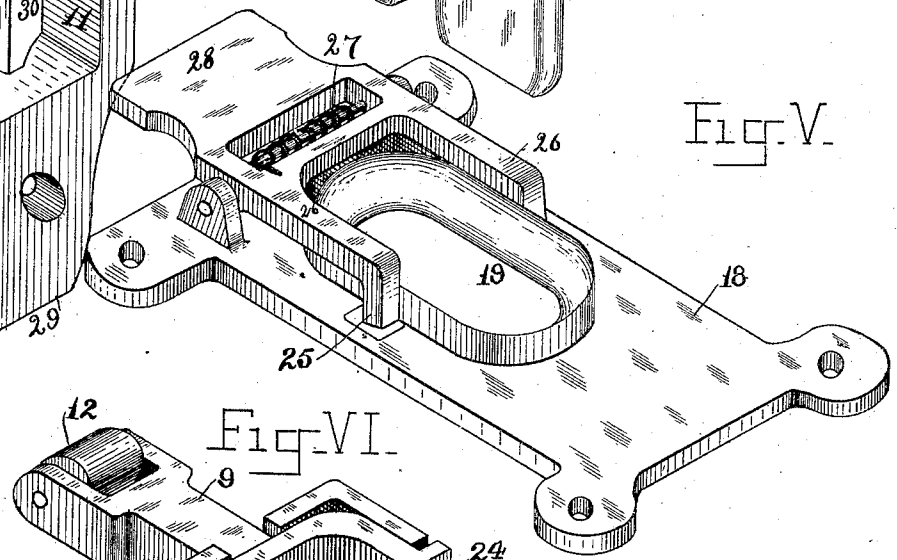
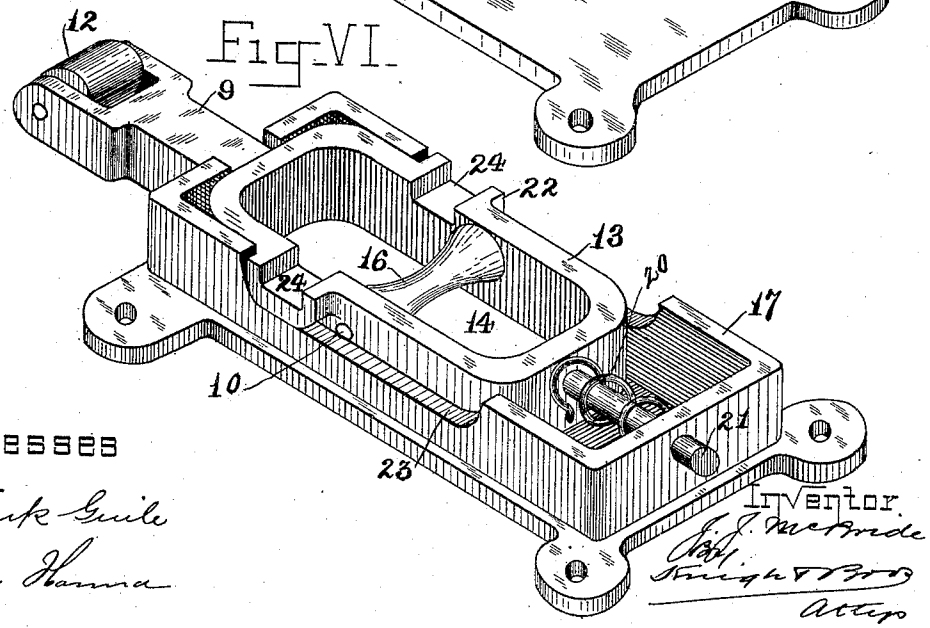


Fig. VI.



Witnesses

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HATCHWAY DOOR OPERATING DEVICE.

No. 469,317. Patented Feb. 23, 1892.

Fig. VII.

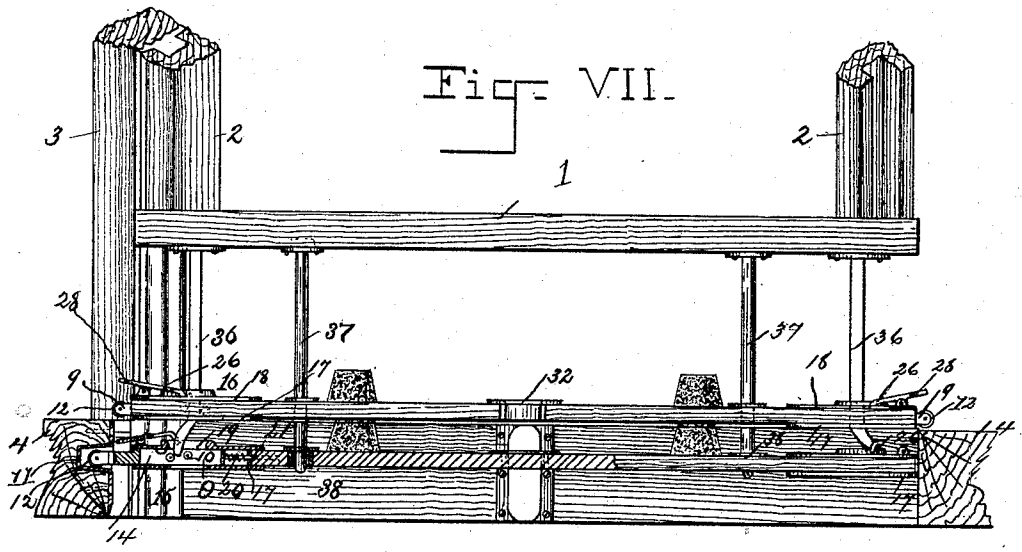
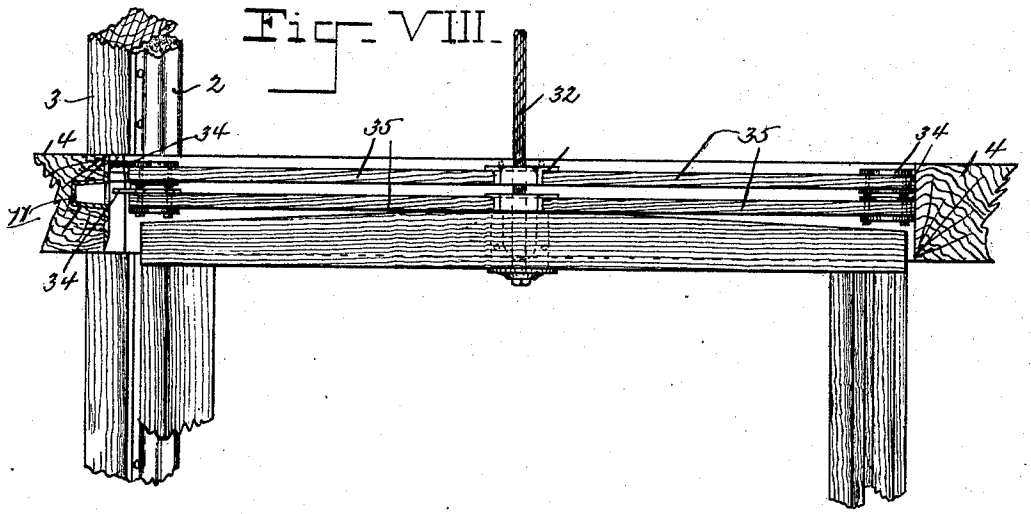


Fig. VIII.



Witnesses

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UNITED STATES PATENT OFFICE.

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HATCHWAY-DOOR-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 469,317, dated February 23, 1892.

Application filed March 14, 1891. Serial No. 385,100. (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, county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Hatch-Doors, of which the following is a specification.

My invention relates to traveling hatch-doors, or, as they are called in the trade, "carrying-doors"—meaning doors which pass with the elevator-cab from floor to floor of the building, one door being left behind at each floor by the cab in either its upward or downward movement. As the elevator-cab moves upward it lifts the doors which are in place in the hatch-openings one after the other until when the cab reaches the top floor it has supported on top of it a number of doors corresponding to the number of floors through which it has passed. On the return downward movement of the cab it successively leaves these upper doors behind it, while it picks up and carries under it another set of doors until when it reaches the bottom of the shaft it has under it a number of doors corresponding to the number of floors through which the cab has passed in its downward movement.

To this end my invention consists in certain constructions, which will now be fully explained in connection with the accompanying drawings, and then pointed out in the claims.

In said drawings, Figure I is a view, partly in elevation and partly in section, through an elevator hatch and cab embodying my invention. Fig. II is a plan view of the hatch-door. Fig. III is a perspective view of a key. Fig. IV is a perspective view of a socket-plate. Fig. V is a perspective view of a cover-plate and catch. Fig. VI is a perspective view of a housing and bolt. Fig. VII is a view similar to Fig. I, illustrating certain modifications. Fig. VIII is a view of the upper part of the cab and the upper hatch-doors.

The cab or platform 1 has usual guides 2 running on corner or through guide posts 3, which latter pass from top to bottom of the shaft through the floors 4. Projecting from the bottom of the cab 1 are four vertical keys 5, which have the open grooved slot 6. (Shown in Figs. I and III.)

In Fig. I, I have shown two doors 7 8, door 7 having its bolts 9 held back by the engagement of their cross-pins 10 with the upper straight part of the slots 6, while door 8 has its bolts 9 projected engaging with metal sockets 11 in the edges of the hatch-opening. Four bolts corresponding to the four keys 5 and so placed as to be operated by said keys are provided on each door. The construction of the bolts and allied mechanism can be best gained from the detached perspective views, Figs. III, IV, V, and VI. Each bolt 9 has on its outer end an anti-friction roller 12. The central part of the bolt is expanded in the form of an eye 13, having an opening 14 through it traversed by the cross-pin 10, which is surrounded by an anti-friction roller 16. This roller is preferably concaved, as shown, and the faces of the key forming the edges of the slot 6, which engage the opposite sides of said roller are correspondingly convexed. In this manner I am enabled to have the keys stronger than they would otherwise be with the same amount of metal used and get an even bearing between the roller and slot edge, even should the key 5 not enter the opening 14 of the eye 13 exactly parallel. The bolt 9 is mounted in a housing 17, bolted to the edge of the door and having a removable cover 18 with an eye 19, corresponding to the eye 14, but not so large as the latter. A coil-spring 20, surrounding a guide-pin 21 on the rear end of the bolt 9, tends to project the bolt. The forward part of the bolt hangs in its housing by means of trunnions or arms 22, and the housing is cut away, as shown at 23, to afford an elongated seat whereon the said arms can slide. The upper edge of the eye 13 and the arms 22 have sockets 24, in which engage the toes 25 of catch 26, having spring 27 and arm 28. The catch is pivoted on the cover 18, and the action of its spring is such as to normally depress the toes 25. The socket-plate 11 has an inclined lip 29 below it and a pair of lugs 30 above it. Supposing the elevator-cab 1 to be near the upper end of the shaft and descending, having passed one floor, so that a door 7 has been unlocked and is hung upon the keys 5, as shown in Fig. I, when it reaches the next door 8 the keys 5 enter the corresponding eyes in the several

lock-cover plates 18, housings 17, and bolts 9 13, and the anti-friction roller 16 of cross-pin 10 enters the grooved slot 6 of each key. The continuing descent of the cab will cause the roller to follow the slot, pressing back the bolt until it is withdrawn from the socket 11, when the toes 25 of catch 26 spring into the sockets 24 and hold the bolt retracted. The combined action of the bolt, the catch, and the lower curved part of the slot of keys 5 will cause the door to be suspended on said keys, and as the cab continues to descend, gathering one door after another, the upper ones will be forced upward, as is shown by the door 7, Fig. I, to allow room for the lower ones. When the cab, having reached the bottom of the shaft, returns upward and passes through the first floor, the lugs 30 of the socket-plates 11 on that floor trip-catch 26, as shown in Fig. I, lifting the toes 25 so as to release the bolt, when the spring 20 projects the latter into the socket, so locking the door in four places simultaneously. The arms 28 and the distance between lugs 30 gradually diminish in width from floor to floor upward, so that the doors of the upper floors will pass through until each has arrived at its proper floor. The sockets 24 on the upper edge of the bolt are preferably made wider than the bottom of toes 25, so that when the anti-friction roller 12 of the end of the bolt 9 strikes the inclined lip 29 of the socket-plate 11 and is pressed back the toes 25 will be out of frictional contact with the edges of sockets 24 and the catch can be tripped with less resistance and noise.

It is very important to the successful operation of this invention that the doors be kept from swinging horizontally in the hatch while being unlocked; otherwise bolts might be pushed farther on one side than on the other and the door on that side would drop. I therefore provide at the sides of the hatch-opening guide-shoes 31, and I bolt to the edges of the doors metal curved guide-plates 32, which grasp the shoes 31 when the door is in the hatch and so resist any tendency to shifting the door laterally while the bolts are being pressed back by the keys. Preferably the socket-plates 11 have in addition to the lugs 30 other lugs 33 33, (one of which may be formed in one with one of the lugs 30, as shown in Fig. IV,) which are of varying distance apart, diminishing downward from floor to floor and serving to receive the supporting-lugs 34 of the upper hatch-doors 35, which are carried on top of the cab, as shown in Fig. VIII.

A modification of my invention is illustrated in Fig. VII, wherein instead of a slotted key 5 6, such as shown in Figs. I and III, I employ a curved bar 36, and the bolts 9 are preferred with two cross-pins and anti-friction rollers 10 16. In this form of the invention it is preferable to use additional guide-pins 37, which enter eyes 38 on the doors.

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

1. The combination of an elevator cab or platform, one or more hatch-doors provided with bolts for supporting said doors in the hatchway, keys on the cab or platform for releasing the bolts and to hold the doors suspended from the cab or platform, catches on the doors for retaining the bolts in their retracted position, and means for tripping the catches to release the bolts at the different floors, substantially as set forth.

2. The combination of an elevator cab or platform, one or more doors, sockets on the edges of the hatches at the separate floors, bolts carried by the doors, keys having curved guides adapted to operate said bolts, and catches on said doors arranged to engage and lock said bolts in retracted position and hold them on said keys, substantially as set forth.

3. The combination of the cab or platform, the keys carried thereby, the door or doors having bolts adapted to support said doors on the separate floors and to be operated by said keys, and a guide-shoe adapted to serve as an abutment to resist horizontal movement of the doors while being unlocked, substantially as set forth.

4. The combination of the cab or platform having the keys 5, provided with the slots 6, with the door having the spring-pressed bolts provided with the sockets 24, the catch-plate having the toes 25, adapted to engage said sockets, and the socket-plates 11, having the lugs 30, all substantially as described.

5. The combination of the cab or platform having the keys 5, provided with slots 6, with the door having the spring-pressed bolts provided with the sockets 24, the catch-plate having the toes 25, of less width than said sockets, and the socket-plates 11, having lips 29, all substantially as described.

6. The socket-plate 11, having a socket for a bolt on a lower door, lugs 30 for tripping the catch of the bolt, and seat-lugs 33 for supporting an upper door, substantially as set forth.

7. The combination of a housing, a spring-pressed bolt provided with sockets 24, the cover-plate having a catch-plate provided with toes 25, the keys, and the socket-plate, substantially as described.

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HENRY I. COE.