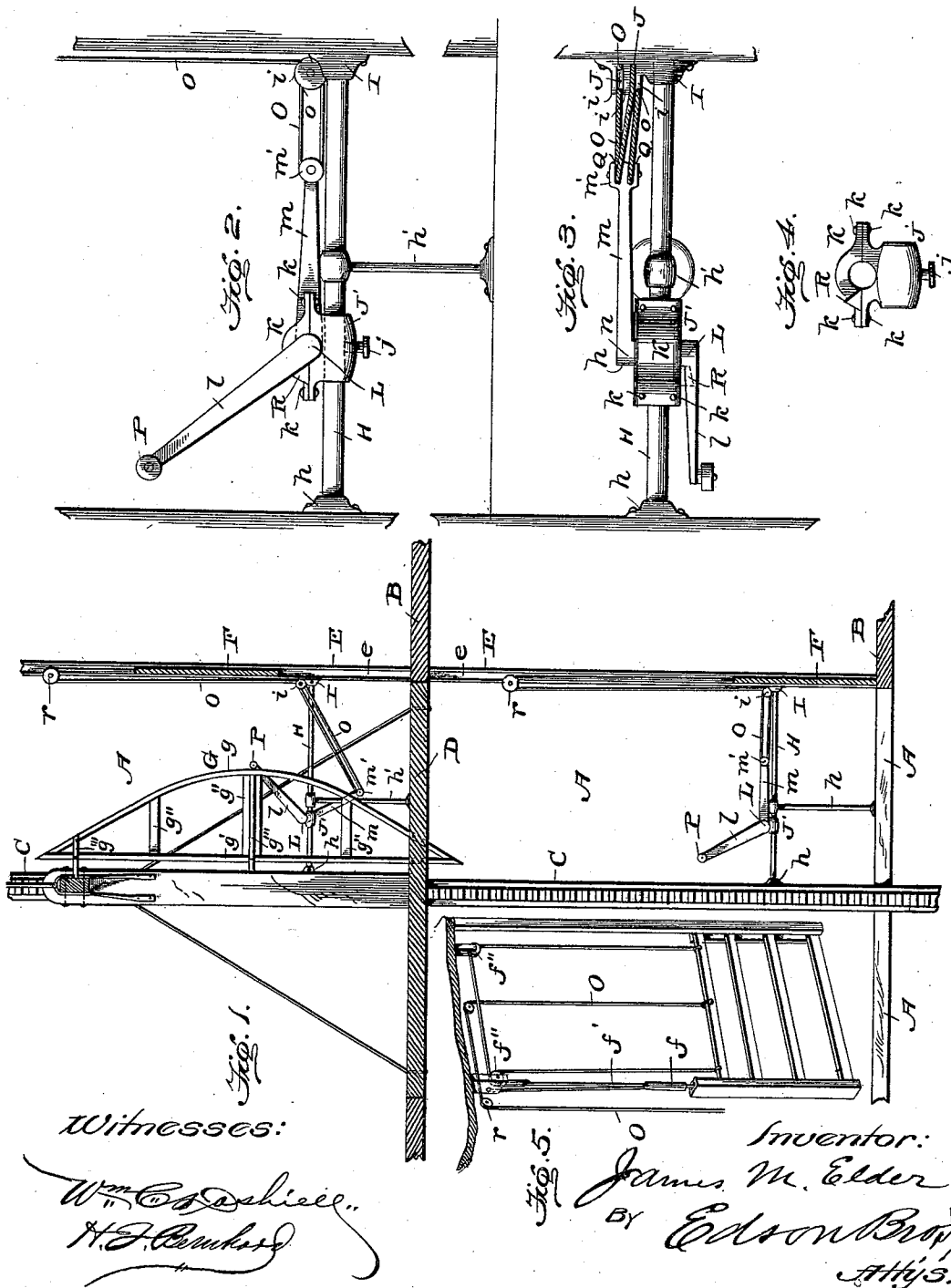


(No Model.)

J. M. ELDER.
AUTOMATIC HATCHWAY.

No. 521,107.

Patented June 5, 1894.



UNITED STATES PATENT OFFICE.

JAMES M. ELDER, OF INDIANAPOLIS, INDIANA.

AUTOMATIC HATCHWAY.

SPECIFICATION forming part of Letters Patent No. 521,107, dated June 5, 1894.

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To all whom it may concern:

Be it known that I, JAMES M. ELDER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Automatic Hatchways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in automatic hatchways of that class which employ a vertically movable door or gate guided between suitable ways at the side of the hatchway, and the novel features of the invention reside in the mechanism by which the door or gate is opened and closed as the elevator-cage or platform rises or falls in the hatchway.

The objects of my invention are to lift the gate or door a proper distance above the landing to permit of access to the elevator-cage or platform without hinderance from the door, to simplify the construction of the door-operating mechanism, and to make the same strong and durable.

With these ends in view, the invention consists in the construction and combination of parts which will be hereinafter fully described and claimed.

I have illustrated the preferred embodiment of my invention in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of my automatic hatchway mechanism, showing the landings or floors in section. Fig. 2 is an enlarged detail view, in side elevation, of the lever, the guide-bracket, and the parts associated therewith. Fig. 3 is a plan view of the devices shown in Fig. 2, and Fig. 4 is a detail view of the bearing in which the lever is fulcrumed. Fig. 5 is a perspective view of the gate showing also the end connecting it with the counterweight and a portion of the cord or rope connecting with the operating mechanism.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A denotes the elevator hatchway, and B, B, are the floors or landings through which the hatchway extends as is usual in warehouses, buildings, and other structures. On both sides of the hatchway

are provided the vertical guides or ways, C, C, between which operates the elevator-cage or platform, D, all of which parts are of the usual construction.

Between the landings or floors B, B, are erected the gate-guides, E, in which are provided the usual guides or ways, e, and in these guides or ways, e, between each floor is fitted a gate or door F. This gate is arranged to slide or move vertically in the guides or ways and to rise a suitable distance above the floor, B, to enable a person to pass to or from the elevator-cage or platform, D, and this gate or door may be hung to enable it to move freely by means of the counterweight f, to which is connected the cord f', which is secured to a stationary part at one end, then passes around a pulley or through an eye on the counterweight, and is then secured to cords which run over guide pulleys f'' journaled near the upper ends of the guides E, and at their other ends are secured to the gate.

The elevator cage or platform D carries a vertically disposed cam, G, which extends alongside of one of the uprights on said cage, and this cam has the curved side g which extends outward from one end of a straight side, g' and then extends inward toward the opposite end of said straight side; and said curved side of the cam is braced by the transverse struts, g'', which are firmly attached to the straight and curved sides, suitable metallic straps, g''', being fastened to the braces or struts and the straight side g' of the cam, whereby the cam is made very strong and durable.

H is a horizontal bar or rod which is arranged between the elevator-guide, C, and the gate-guide, E, and at one side of the elevator shaft or well. One end of this horizontal bar is rigidly attached to the elevator-guide, as at h, and the other end of said bar or rod is fitted in a socket of the guide bracket, I, presently referred to. This transverse bar or rod is braced or stayed by means of the upright, h', so as to make the bar strong enough to stand the strain and properly support the operating lever, the upper end of the upright being fastened in a sleeve which is rigidly attached to the rod and the lower end of said upright being fitted in a step-bearing fixed to the floor or landing, B.

The guide bracket, I, is in the form of a casting with a socket for the reception of the end of the bar or rod, H, and with parallel ears or flanges, *i*, see Fig. 3, which are spaced apart 5 to accommodate the set of guide pulleys or sheaves, J, J, which are journaled in said ears or flanges, *i*. On this rod or bar, H, is fixed a clamp, J', which has its upper side constructed to form one half of the bearing, 10 K, the other half of said bearing being matched with the lower half on the clamp and being detachably fastened thereto by means of the bolts, *k*. This clamp J', may be held in place in any suitable way, as for instance by means 15 of a set screw fitted to work in the clamp and bind against the bar H, as shown by Figs. 2 and 4. In this bearing, K, is fulcrumed the operating lever L which is disposed in the path of the cage-cam, G, and has connections 20 with the gate or door through the medium of the cord or rope O. This lever is made in the form of a two-armed lever, one arm, *l* being arranged out of line with the other arm, *m*, and said arms, *l*, *m*, being joined by a trun- 25 nion, *n*, all of the parts being preferably cast or otherwise formed of a single piece of metal. The trunnion, *n*, is about midway between the two arms of the lever, and it is rounded to adapt it to fit snugly, and work freely, 30 in the bearing K, whereby the lever is fulcrumed at an intermediate point of its length. The arm, *l*, of the lever carries a contact-shoe, P, which is in the path of the cam, G, and this shoe is preferably in the form of a 35 friction roller which is journaled on a pin attached to the end of the arm, *l*, although the form of the shoe may be changed or varied. The other arm, *m*, of the lever is constructed with an enlarged head, *m'*, which is recessed 40 or cut out to provide spaces to accommodate the guide pulleys or sheaves, Q, which are loosely journaled in the head *m'*.

One end of the cord or rope, O, is attached to the guide bracket, as at *o*, and it extends 45 around one of the pulleys, Q, then back to one of the pulleys, J, then across to the other pulley, Q, then back to the remaining pulley, J, thence upward alongside of the gate-guide, E, over a guide pulley, *r*, and thence attached 50 to the vertically sliding door or gate, F.

To hold the lever, L, in its proper position for the cage-cam, G to act thereon as the elevator rises or falls in the hatchway, and when the gate or door F is lowered, I provide a stop, 55 R, which is rigid with the bearing K or the clamp J' and is arranged in the path of the long arm, *l*, of the lever, L.

This being the construction of my hatchway, the operation may be described as follows: The gates, F, are normally lowered or 60 closed across the hatchway, and the levers, L, stand in the position shown by Fig. 2 with the pulleys, Q, close to the pulleys, J, in the guide brackets. As the elevator cage or platform rises or falls in the hatchway, the cam 65 G strikes the shoe on the lever L and turns the latter so as to force the pulleys, Q, away

from the pulleys, J, and draw on the cord or rope, O, to lift the gate F by the time the shoe rides against the middle of the cam and the 70 platform, D, arrives opposite to the landing. If it is desired to have access to the landing or floor above which the gate is raised, the elevator cage is stopped so that the access 75 can be had to or from the elevator-cage; but if the latter continues to rise or descend, the cam passes with the cage beyond the floor and the weight of the gate causes it to descend and return the lever L to its normal 80 position. As the cage continues to move, and reaches the next floor, the lever L on this floor is operated to raise the gate when the cage D reaches the level of the floor and 85 to lower the gate when the elevator passes beyond the floor.

I am aware that changes in the form and proportion of parts and in the details of construction of the mechanism herein shown and described as an embodiment of my invention 90 can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention. 95 As for instance, I may use any desired number of pulleys constituting the two sets of pulleys in the lever and guide-bracket, respectively, according as I may deem it necessary to increase the distance the gate moves 100 in proportion to the throw of the lever. Furthermore, the gate may be simply guided in ways and the weights dispensed with, so that the whole weight of the gate is utilized to cause its descent; and, further, the lever may 105 be built up in two, three or more sections, as may be found expedient or advisable.

The cam, G, may have the middle part of its curved side, *g*, made substantially vertical in order that when the elevator-cage arrives on a level with the floor, or slightly passes 110 the same, the gate may remain practically at rest, and hence the gate may be influenced by the lever only when the cam approaches or passes the floor or landing.

Having thus fully described my invention, 115 what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic hatchway, the cam having its curved front side and its rear side 120 braced by intermediate struts, combined with a sliding gate, the horizontal bar, a bracket in which one end of said horizontal bar is fixed, the vertical brace for the horizontal bar, the clamp fixed to the bar and having the 125 bearing, the lever fulcrumed in the bearing, a cam contact shoe at one end of the lever for said cam to ride against, the pulleys journaled in the bracket and the lever, and a cord or rope passing around said pulleys on the lever and bracket and attached at one end to a gate 130 and at its other end to said bracket, substantially as and for the purposes described.

2. In an automatic hatchway, the combination with a sliding door, and a cam on the

elevator cage, of the bracket fixed on one side of the hatchway and provided with the duplex guide pulleys and a socket, a horizontal bar fitted in said socket of the bracket, a sleeve clamped to said bar and provided with a bearing, a lever having its arms arranged out of line with each other and joined at their contiguous ends by a trunnion which is fitted in said bearing, a cam-contact shoe at one end of the lever, and a multiplying cord passing back and forth around alternate guide pulleys on the bracket and lever and having one end attached to the bracket and the other end to the gate, substantially as and for the purposes described.

3. In an automatic hatchway, the combination with a sliding gate and a cam on the elevator cage, of a fixed bracket provided with duplex guide pulleys, a lever provided at one end with a cam contact shoe and at its other end with duplex guide pulleys, a fixed bearing in which the lever is fulcrumed, a stop supported by the bearing and arranged in the path of one arm of said lever to limit the throw of the lever in one direction and hold the same in a position where its cam-contact shoe is in

the path of the cage-cam, and a continuous multiplying cable passing back and forth around alternate guide pulleys on the fixed bracket and lever having its respective ends attached to the bracket and to the gate, substantially as and for the purposes described.

4. In an automatic hatchway, the combination with a sliding gate and a cam carried by an elevator cage, of a fixed horizontal bar, a fixed bracket having duplex guide pulleys journaled therein, a bearing clamped to the horizontal bar, a lever fulcrumed to said bearing and carrying a cam-contact shoe and duplex guide pulleys at its respective ends, and a continuous multiplying cable passing back and forth around alternate guide pulleys on the bracket and lever and having its respective ends attached to the gate and bracket, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. ELDER.

Witnesses:

M. L. ILES,
A. R. HEISKELL.