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DOOR.

APPLICATION FILED MAR. 12, 1918.

Patented Aug. 20, 1918.

2 SHEETS--SHEET 2.

1,276,191.

Fig. 4

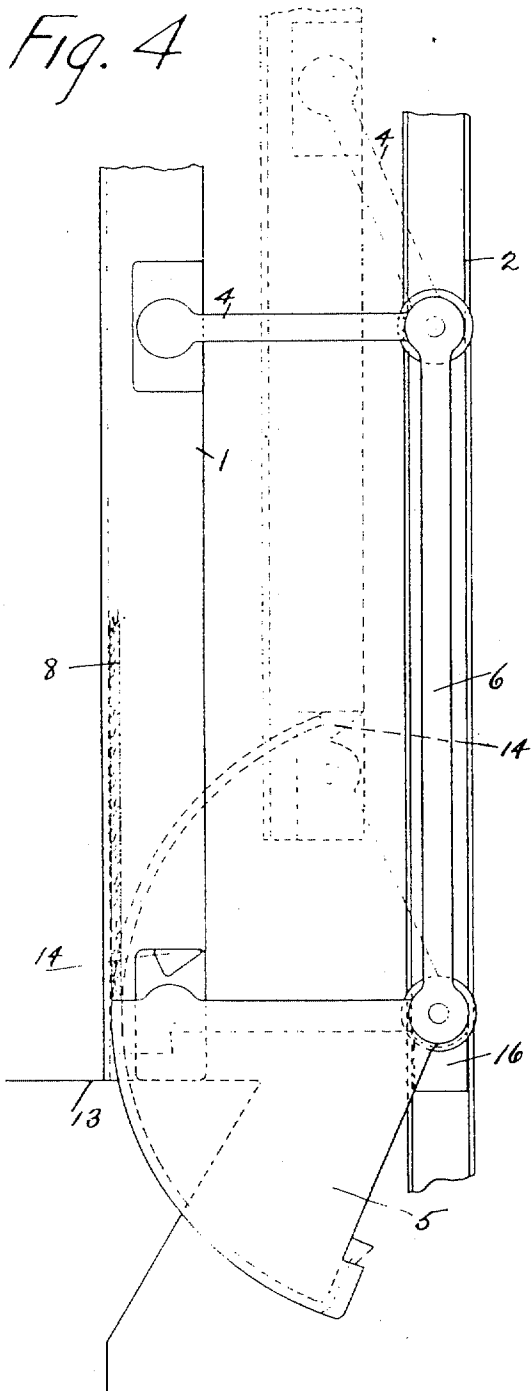
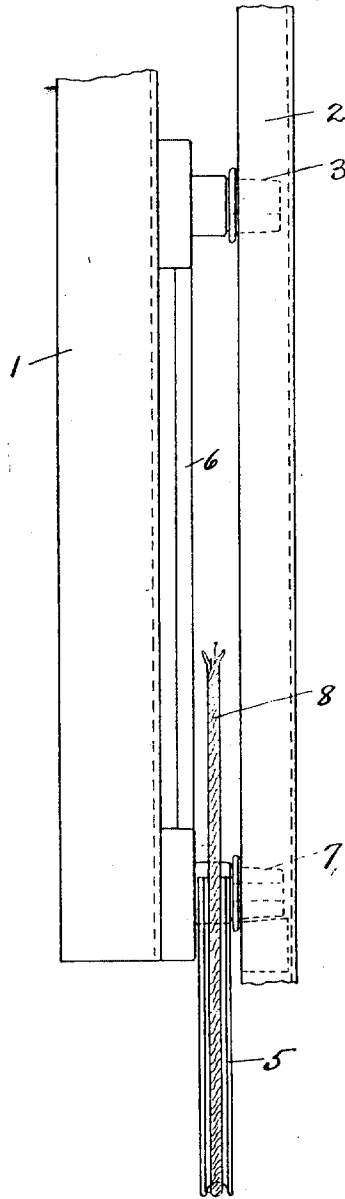


Fig. 5



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DOOR.

1,276,191.

Specification of Letters Patent. Patented Aug. 20, 1918.

Application filed March 12, 1918. Serial No. 221,999.

To all whom it may concern:

Be it known that we, FRANK W. DITTMAN, a citizen of the United States, residing in Fordham, in the city, county, and State of New York, and EDMUND W. BAGGOTT, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Doors, of which the following is a specification.

Our invention relates to an improvement in doors or gates and has particular reference to hatchway doors and the like which are capable of being raised to pass the sill of the door-opening at the next floor.

Devices for this purpose, and as heretofore constructed, have usually been of a flexible type, traveling in curved or inclined guides so that as the door is raised it will be flexed to pass the projecting door-sill at the next landing. Necessarily, such devices must be of a more or less flimsy construction and, therefore, are not well able to withstand the rough usage to which such devices are subject. Another inherent defect of such devices is that they are soon fractured from frequent flexures due to traveling in the curved guideways; and, further, such devices are not reliable in operation as they frequently jam in the guides and for that reason the hatchway may be left only partially closed, oftentimes resulting in serious accidents.

In addition to the doors or gates referred to above, fireproof doors of some sort must be provided to comply with the fire underwriters' laws and building regulations of the various States. Such doors may be either rigid or flexible, as may be desired, but are universally maintained in an open position, except in case of fire when they are supposed to automatically close. Obviously, so far as successfully overcoming fire hazards in buildings is concerned, such structures are defective, as doors for this purpose should be maintained closed at all times, except, of course, when it is desired to have access to the hatchway at any particular floor.

To this end, therefore, we have provided a door which will do the work heretofore accomplished by the two devices referred to above, and which possesses the additional

advantage that, while it is capable of passing the door-sill at the next landing, it may be made rigid, if desired, and be guided in a plain, straight track. The door of the present application is always maintained closed, except when access is desired to the hatchway at a particular floor landing and, as the door is guided in a straight track, the danger of jamming in the guides, which has been so troublesome with the hatchway doors heretofore in use, is eliminated.

We have shown our invention applied to a hatchway, but it is to be understood that this application is merely illustrative, as obviously the invention is capable of use in other situations.

In the accompanying drawings, Figures 1 and 2 show an embodiment of our invention in front and side elevation, respectively,

Fig. 3 is a plan view thereof, while

Figs. 4 and 5 are enlarged views of the apparatus of Fig. 2.

Referring to the drawings in detail, 1 designates a door which may be made of metal, or other suitable fireproof material. Vertical guides 2 are provided for the purpose of receiving rollers 3 mounted on the end of a pair of arms or cranks 4, pivotally attached to the door 1, one crank at each side. A pair of quadrants 5 are provided at each side of the door and are pivotally secured thereto. A portion of each quadrant is operatively connected to each of the cranks 4, already referred to, by links 6, the quadrant carrying a roller 7, similar to the rollers 3, already referred to, traveling in the guides 2. In other words, each side of the door is operatively connected to the guides 2 by cranks 4, quadrants 5 and links 6. Secured to one of the quadrants 5 is a counterweight cable 8 passing over a sheave 9 and secured to counterweight 10. The other quadrant has secured to it a counterweight cable 11 passing over sheaves 12 and 13 and secured to the counterweight 10, just referred to. The counterweight is about equal to the weight of the gate 1 so that the gate may be raised and lowered with facility.

The door is shown in Figs. 2 and 4 in closed position resting on the door-sill or jamb 13. The gate may be raised and low-

ered by power or manually-operated means, as may be desired.

Assuming now that it is desired to manipulate the gate from the full line position of Figs. 2 and 4 to the dotted line position, the first upward movement of the gate causes the cranks 4 and quadrants 5 to be rotated about their respective connections to the links 6 with the result that the door is moved or retired horizontally from the door-sill 13 until the quadrants 5 engage the stops 14 on the door, it being understood, of course, that there are two of these stops, one on each side of the door. At this time, the parts will be in the position shown in Fig. 4, for instance, in dotted lines, and the door may be moved upwardly to clear the door-sill 15 at the next landing, as shown in Fig. 2, the rollers carried by the ends of the cranks 4 and quadrants 5 traveling in the guides 2. It should be noted at this time that the counterweight cables 8 and 11 are secured to the lower part of the quadrants 5, so that as the quadrants are swung about their pivotal connections to the links 6, the leads of the cables 8 and 11 will be always in a straight line, which is an obvious advantage in that there is no liability of the cables creeping off their respective sheaves. Now, when the door is operated in the reverse direction, it will slide freely down by the door-sill 15, the rollers on the cranks 4 and quadrants 5 traveling downwardly in the guides 2 until the rollers on the quadrants 5 engage stops 16 provided in each guide. As soon as this takes place, the door will be moved outwardly again to assume the full line position in Figs. 2 and 4 and close the hatchway opening.

It will be apparent from the foregoing description that the door in operation is retired from the door-sill traveling in a horizontal and vertical direction, but with the door maintained in position throughout its range of movement parallel to its initial position and that the door may be moved upwardly past the door-sill at the next landing without any flexing of the door or without the use of curved or inclined guides of any sort. Inasmuch as there is no binding action throughout a whole cycle of operation of our device, jamming of the door is eliminated, which, of course, is a great advantage, as we have already pointed out, over existing devices as the hatchway will always be fully protected. The counterweighting of the door may be adjusted to suit varying conditions, but, as we have outlined above, we prefer to have it almost exactly counterbalanced, particularly with a door which is operated by hand.

While we have illustrated and described the preferred embodiment of our invention, it is to be understood that we do not wish to be limited to the exact details of con-

struction described, as obviously various departures could be made therefrom within the scope of the present invention.

What we claim is new and desire to secure by Letters Patent of the United States is:—

1. The combination of a vertically movable rigid elevator hatchway door and pivoted link mechanism controlling the movement of the same whereby when a force is applied to the door in the plane of the door to open the same, the door will be constrained to be moved continuously in one vertical direction, and during a portion of its movement outwardly from the door opening.

2. The combination of a vertically movable door, and pivoted link mechanism interposed between the door and its guide, whereby when a force is applied to the door in the plane of the door to open the same, the door will be constrained to be moved continuously in one vertical direction, and during a portion of its movement all portions of the door simultaneously moving outwardly from the door opening.

3. The combination of a vertically movable hatchway door, a counterweight therefor, a plurality of means to which the counterweight rope is directly attached to prevent canting of the door when in operation, said means constraining the door to be moved continuously in one vertical direction and in a direction away from the door sill during a portion of its movement, when being actuated to open position.

4. The combination of a vertically movable door, links interposed between the door and its guide for operating the same, sectors carried by said links, and a counterweight for the door secured to said sectors.

5. The combination of a vertically movable hatchway door, links interposed between the door and its guide, and so positioned that the face of the door toward its hatchway is free from projections, said links constraining the door when a force is applied to it in the plane of the door, to be moved continuously in one vertical direction and also outwardly from the hatchway opening during the first portion of the vertical movement of the door.

6. The combination of a vertically movable hatchway door, links carried thereby, having one of their ends secured to the door and their other ends operatively connected to each other, rails on which the latter ends of the links travel, said links constraining the door when actuated by a force applied to the door in the plane of the door to travel continuously in one vertical direction, and during a portion of its movement outwardly from the door opening swinging about the points of attachment of the links to each other.

7. The combination of a hatchway door, links carried thereby, means pivotally secured to said links and maintaining them spaced from each other, said links controlling the movements of the door to cause the same to be moved continuously in one vertical direction when the door is actuated by a force applied thereto in the plane of the door, and simultaneously during a portion of said vertical movement to be retired from or moved toward the hatchway opening, the links at the limit of their movement to move the door toward the hatchway being substantially at right angles to the face of the door.

8. A guideway, a traveler sliding in the guideway, a door, a transverse link connecting the door to said traveler, and means

actuating the door in a direction generally parallel to said guideway, whereby movement of the door in its plane will cause a movement transverse to said plane. 20

9. The combination of a vertically movable elevator hatchway door, a straight stationary track or guideway for the door and links interposed between the door and the guideway, whereby when a force is applied to the door in the plane of the door to open same, the door will be constrained to move continually in one vertical direction and during a portion of its movement all parts of the door simultaneously moving away from the door opening in a plane transverse to the plane of the door. 25 30

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