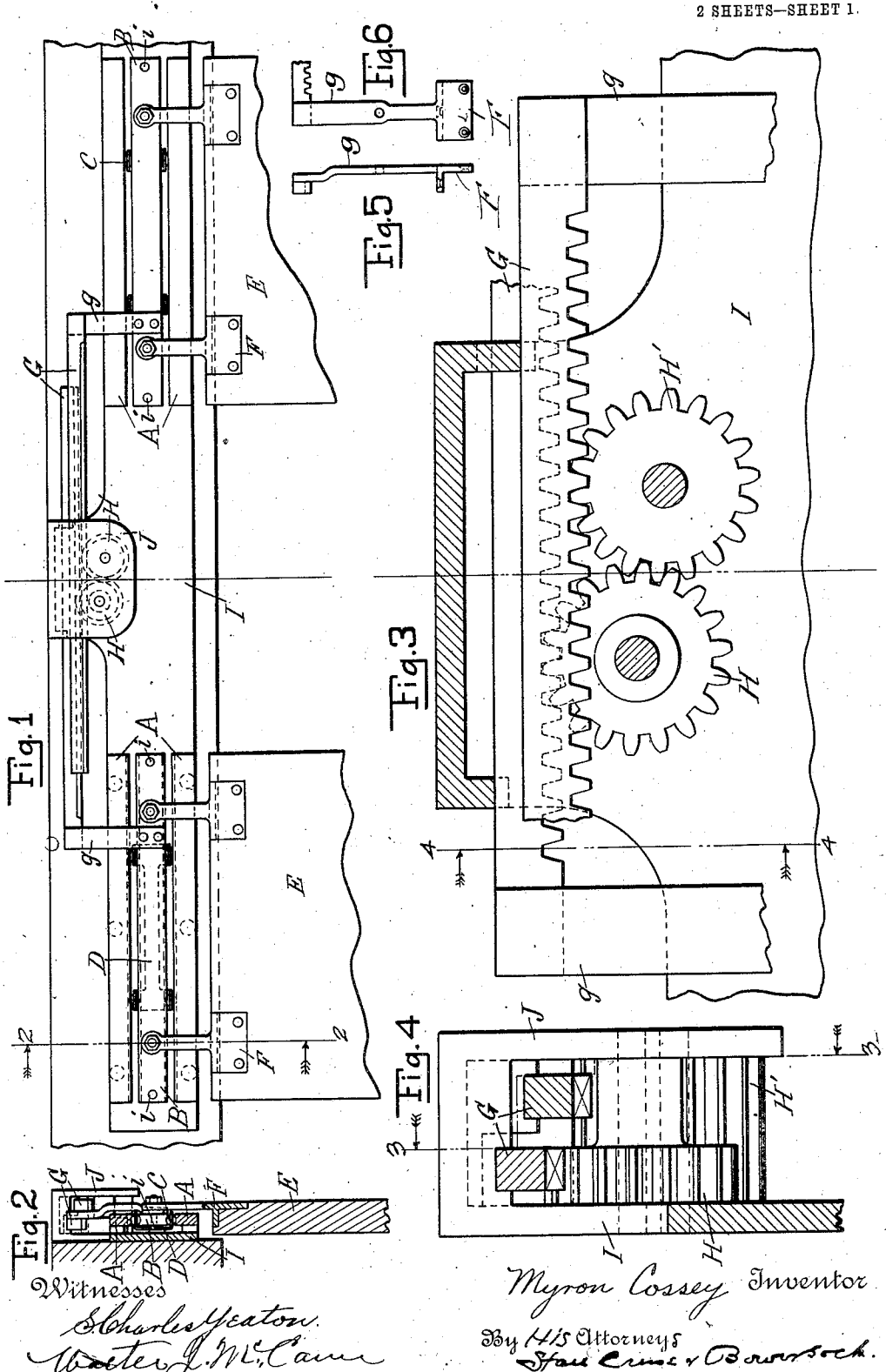
No. 832,458. PATENTED OCT. 2, 1906.

M. COSSEY.

DOOR SUPPORTING AND OPERATING DEVICE.

APPLICATION FILED NOV. 21, 1905.

2 SHEETS—SHEET 1.



Witnesses
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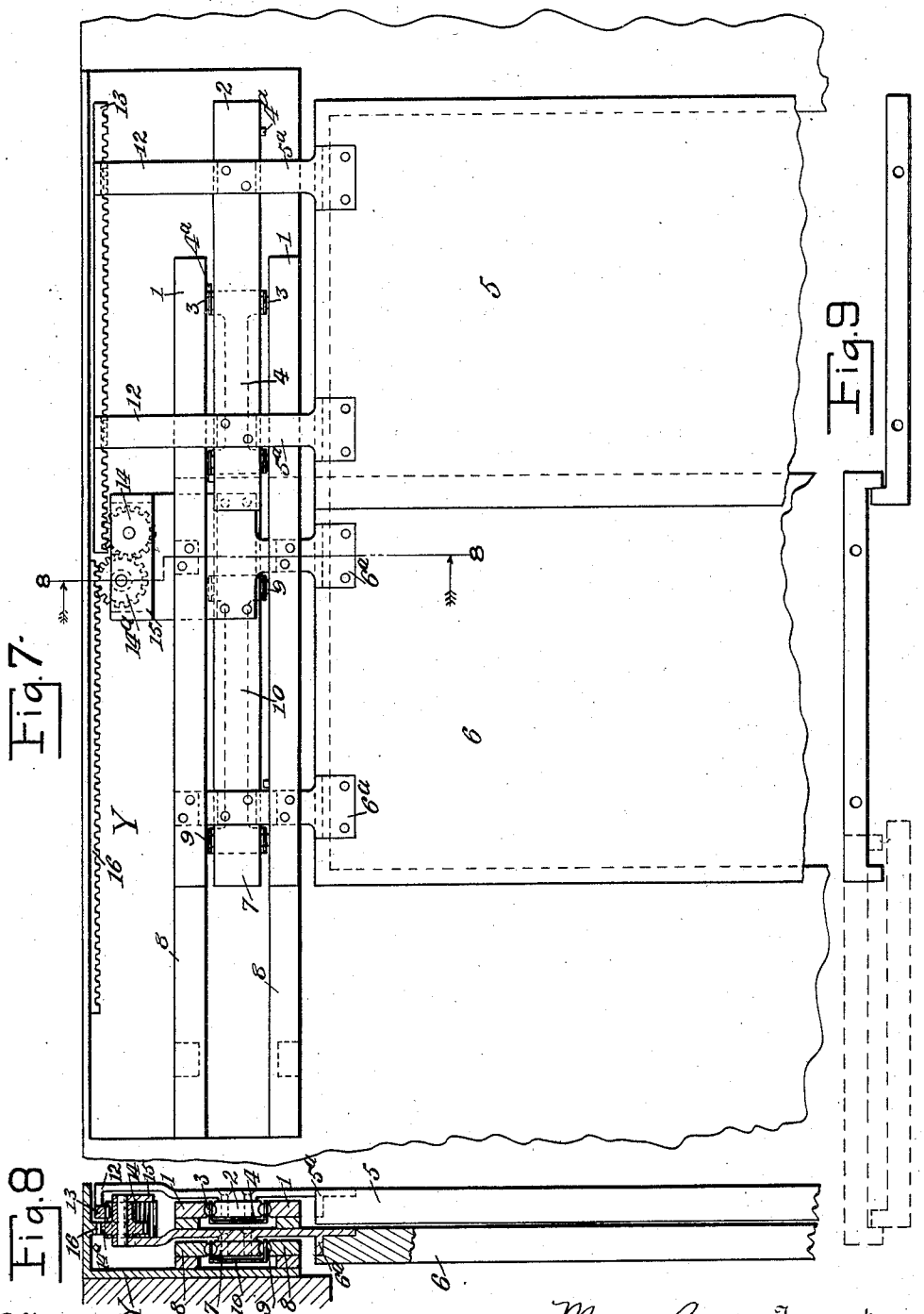


Fig. 7.

Fig. 9.

Fig. 8.

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MYRON COSSEY, OF NEW YORK, N. Y.

DOOR SUPPORTING AND OPERATING DEVICE.

No. 832,458. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed November 21, 1905. Serial No. 288,392.

To all whom it may concern:

Be it known that I, MYRON COSSEY, a citizen of the United States, residing at 208 Cornelia street, borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Door Supporting and Operating Devices, of which the following is a specification.

My invention relates to improvements in door-hangers, and more particularly to hangers for two or more doors where the movement of one door results in the automatic movement of one or more additional doors.

In the accompanying drawings I have illustrated the preferred form of my invention and one modification, although other methods of utilizing the same invention under both the same and different conditions will readily suggest themselves to those skilled in the art.

Referring now to the drawings, in which similar reference characters designate corresponding parts, Figure 1 is a front elevation of a construction embodying my invention. Fig. 2 is a vertical cross-section taken on the line 2 2 of Fig. 1. Fig. 3 is a detail of Fig. 1, partly in section, to show racks and gears exposed. Fig. 4 is a vertical section of Fig. 3 through the plane 4 4, but with the front bearings for the gear shown in full. Fig. 5 and Fig. 6 are detailed modifications later to be described. Fig. 7 is a front elevation of a modification of my invention. Fig. 8 is a vertical section taken through the broken line 8 8 of Fig. 7; and Fig. 9 is a modified detail, which will later be described.

Referring now to the drawings, Figs. 1 to 6, inclusive, A A designate what I may call "outside" tracks or bars, and B B what I may call "intermediate" tracks or bars, to have movement relative to said outside bars. The bars A A constitute one element and the bar B another element, and one of these elements is designed to have movement with respect to the other. In this particular form the bar B is the movable element, and the door or other closure will be suspended from it, as hereinafter more particularly described. C designates antifriction devices, such as balls, arranged on both sides of the intermediate bar and between it and the outside bars. D designates ball-carriers and spacing devices adapted to maintain the balls in proper relative positions with regard to each other. E designates two doors each suspended, respectively, by hangers F from one of the intermediate bars B. G G designate two racks connected, respectively, to the said intermediate bars B in any suitable manner, as by connecting-strips *g*, a modified form of which is shown in Figs. 5 and 6, which is simply a combination in one piece of said member *g*, together with the inner connecting-strips F. Gearing with one of these racks is a gear-wheel H, which in turn meshes with another gear-wheel H′, which in its turn meshes with the other rack. One construction for accomplishing this result is that shown in Fig. 4, where the gear H is narrower than the gear H′. As shown, these gears are of substantially the same diameter, and the axis of one gear occupies a lower horizontal plane than that of the other in order to prevent the rack which meshes with the higher gear from engaging the lower gear, and the higher gear is narrower than the lower one to allow the lower rack to pass. I designates a plate or frame upon which are secured the fixed bars A and which has at its central upper portion a projection bent to form a box or casing J, adapted to provide, in conjunction with the plate I, proper bearings for the gears H and H′ and also to cover and protect them from dirt, at the same time permitting the passage through the same of the inner ends of the racks G G. Upon the movable bars B are shown stops *i*, which may engage stops on the plate I (not shown) to limit the movement of the doors.

In the specific form illustrated the middle bars B are shown as movable and the outer bars A as fixed. Obviously, however, this construction may be reversed or inverted and the central bar made fixed and the outer bars movable. In this case of course the connections F and *g* will be changed from the middle bar to the outer bars and preferably to the lower of the outer bars.

The operation of my preferred form of construction is as follows: As soon as one of the doors E (for instance, the right-hand door) is moved away from the center the rack connected therewith and moving therewith rotates the gear-wheel H′ in a clockwise direction. This results in the gear-wheel H being rotated in the opposite direction, which causes the other rack and door to move away from the door and rack first mentioned. In the specific form illustrated, therefore, so soon as either door is moved at a given speed by manual or other pressure the other door is caused to move in the opposite direction at the same

speed. Obviously by varying the size or diameter of either one of the gear-wheels H H', so as to make one of the same of greater diameter than the other, the door which is manually moved can be made to move at either a greater or less rate of speed than the other.

The same invention may well be applied to doors moving in the same direction and at varying rates of speed, or, in other words, to a plurality of doors where one or more of the same move in the same direction with, but faster than and past, one or more of the other doors. I have illustrated one construction embodying such an application of my invention in Figs. 7 and 8 of the accompanying drawings. Referring now to those figures, 1 designates two outside tracks, 2 an intermediate track, 3 antifriction devices, 4 spacing device, and 4^a stops, all of substantially the same construction as already described. 5 designates a door which is adapted to move past and faster than another door 6. The door 5 is connected by hangers 5^a or in any other suitable manner to the intermediate bar 2. The door 6 is somewhat similarly connected, as by hangers 6^a, to another intermediate bar 7, arranged between a second set of outside bars 8 8 and similarly provided with antifriction devices 9 and a spacer 10. Rigidly secured to the intermediate bar 2, as by connecting-strips 12 12, (shown as forming part of the hangers 5^a,) is a rack 13, which engages a gear-wheel 14, which is in mesh with a second gear 14^a. These gears are similar to the gears shown in Fig. 1. Referring again to the said hangers 6^a, the one shown on the left-hand side is situated behind the movable tracks 1 1 and in front of the movable track 10, being rigidly secured to all three. The right-hand hanger shown is somewhat different in construction, besides being similarly secured to the three tracks. It also extends above and at its top is provided with a rectangular box 15, open at top and bottom, which acts as bearings for the said gears 14 and 14^a. In mesh with the gear 14^a is a second rack 16, which is rigidly and immovably secured to a framework Y, to which framework are also secured the tracks 8.

As a result of the above construction, the door 6 being moved, (say in a left-hand direction,) the tracks 1 1 and 10 being rigidly secured thereto by the hangers 6^a 6^a will consequently move with it, as will also the gears 14 and 14^a, rotatably fixed in the bearings at the top of the right-hand hanger 6^a. The gear 14^a being in mesh with the rigid rack 16 will also have a clockwise rotation, which will drive the gear 14 counter-clockwise, which will in turn cause the rack 13 and the track 2 and the door 5, attached thereto by means of the hangers 5^a, to move in a left-hand direction also. The gears 14 and 14^a being of equal size, the travel of rack 13 relative to the gears will equal the travel of gears relative to the rack 16, and as the speed of the rack 13 relative to rack 16 is made up of both these speeds it will travel relatively to rack 16 with twice the speed of the gears. Consequently the door 5, rigidly secured to rack 13, will travel with twice the speed of door 6, rigidly secured to the gears.

The fixed and movable bars, though shown horizontal, can, if desired, be tilted slightly to facilitate closing or opening the doors.

Fig. 9 shows a ready means for determining or limiting the travel of the two sections. Briefly, it is composed of two bars, one having a projection on each end and the other a projection on one end only adapted to engage either projection on the other bar. One of these bars is secured to the top of each section of the door, and the projections will coact, as shown, the dotted view showing the position of the bars when the door is open, the view in full the position when closed. As any movement of any one section (irrespective of whether sections are two or more in number) must necessarily result in a movement of each other section, and, furthermore, as each section will always be moving at a rate of speed either greater or less than that of each other section, it is obvious that the coacting of any two projections arranged, respectively, on any two sections and at any point in the travel thereof will result in bringing all sections to an immediate stop.

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

1. In a door supporting and operating device, the combination of a plurality of sets of three bars each, the said three bars of each set being parallel and situated one above the other, each set being composed of two members, one of which comprises two outer bars rigidly secured together and the other a central bar, and one of said members being movable with respect to the other; antifriction devices interposed between said central and outer bars, suspending devices for connecting the movable member of each set with a door, the other member being secured against movement; and means including a rack and gear connecting said doors and adapted to impart movement in opposite direction from one door to the other.

2. In a door supporting and operating device, the combination of a plurality of sets of three bars each, the said three bars of each set being parallel and situated one above the other, each set being composed of two members, one of which comprises two outer bars rigidly secured together and the other a central bar, and one of said members being movable with respect to the other; antifriction devices interposed between said central and outer bars, suspending devices for connect-

ing the movable member of each set with a door, the other member being secured against movement; and means including racks in mesh respectively with gears having opposite rotation, whereby the lateral movement of each movable member is controlled by the movement of every other movable member.

3. In door supporting and operating devices, the combination of sets of three bars each, the said three bars of each set being parallel and situated one above the other, each set being composed of two members, one of which comprises two outer bars rigidly secured together and the other a central bar; antifriction devices interposed between said central and outer bars; suspending devices for connecting one of said members of each set with a door, the other member being so secured as to cause relative motion of the first member with respect thereto, and means comprising three members, two of which are racks and the third of which comprises two gear-wheels which are in mesh with the said racks respectively—means for connecting the racks to doors, and fixed bearings for the gears, whereby the lateral movement of the movable member of each set is controlled by the movement of every other of such movable members.

4. In door supporting and operating devices, a fixed plate; two gears in mesh and rotatably secured to said plate; sets of tracks, one set arranged on each side of said gears, each set comprising three bars placed one above the other, the central one movable, the outer two fixed to said plate; racks with teeth extending downward in mesh with and upon the top of said gears respectively, and secured to the said central bars; suspending devices for connecting said central bars with doors, and antifriction devices interposed between the middle and outside bars of each set.

5. In door supporting and operating devices, the combination of means for supporting doors to permit their lateral movement, and means for transmitting movement of one door to the other comprising two gear-wheels having their axes in different horizontal planes, said gear-wheels being meshed with each other, and two independent racks respectively engaging the respective gear-wheels upon the same side, and at least one of said racks being connected to one of the doors.

6. In door supporting and operating devices, the combination with means for supporting doors to permit their lateral movement, of means for transmitting movement of one door to the other comprising two gear-wheels having their axes in different horizontal planes, said gear-wheels being meshed with each other and one being wider than the other, and two independent racks respectively engaging the respective gear-wheels upon the same side and at least one of said racks being connected to one of the doors.

7. In door supporting and operating devices, the combination with means for supporting doors to permit their lateral movement, and means for transmitting movement of one door to the other comprising two gear-wheels having their axes in different horizontal planes, said gears being meshed with each other and one being wider than the other, and two independent racks respectively engaging the respective gear-wheels upon the same side, one of said racks being fixed and the other movable and the movable rack being connected to one of the doors.

8. In door supporting and operating devices, the combination with means for supporting doors to permit their lateral movement, and means for transmitting movement of one door to the other comprising two gear-wheels journaled in a movable support the axis of one gear-wheel being in a lower horizontal plane than that of the other and said gear-wheels being meshed with each other, and two independent racks respectively engaging the respective gear-wheels upon the same side, one of said racks being fixed and the other movable, the movable rack being connected to one of the doors and the other door connected to the movable support for the gear-wheels.

In witness whereof I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

MYRON COSSEY.

Witnesses:
HENRY R. BAUER,
J. C. CONRADI.