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PATENTED OCT. 2, 1906.

M. COSSEY.

DOOR SUPPORTING AND OPERATING DEVICE.

APPLICATION FILED MAY 13, 1905.

2 SHEETS-SHEET 1.

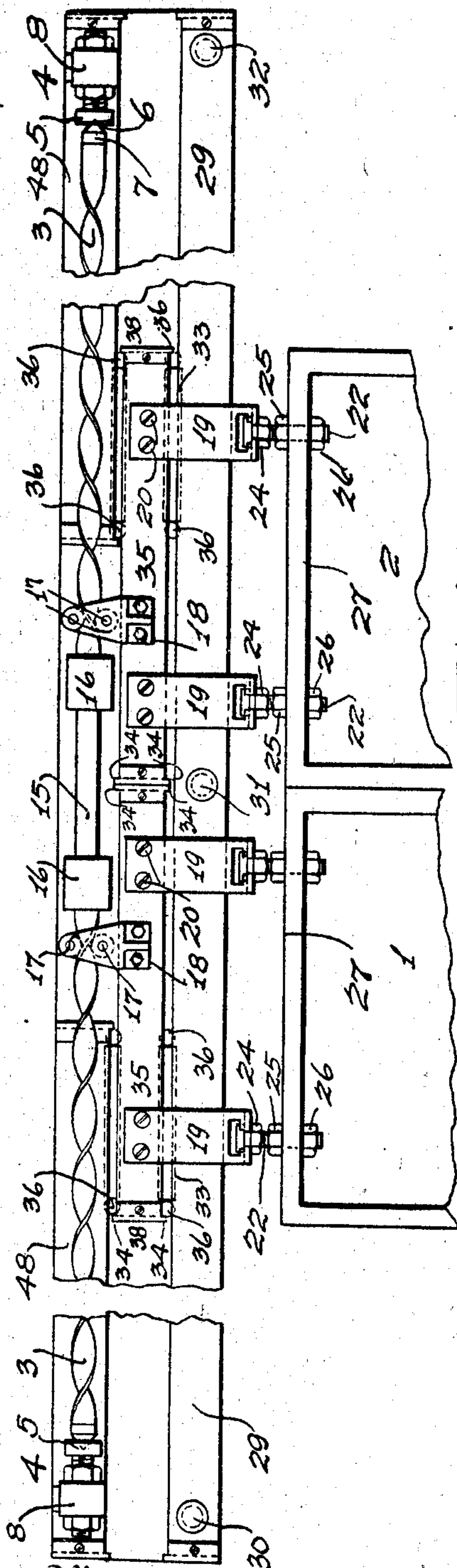


Fig. 1

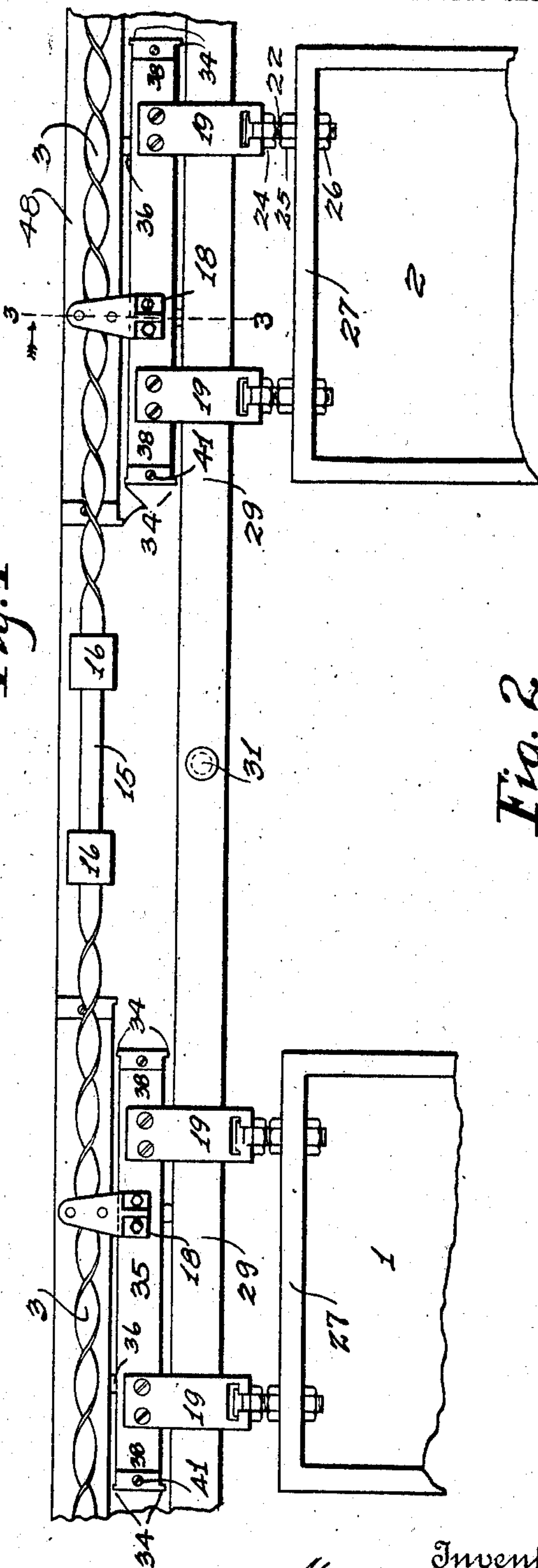


Fig. 2

Witnesses

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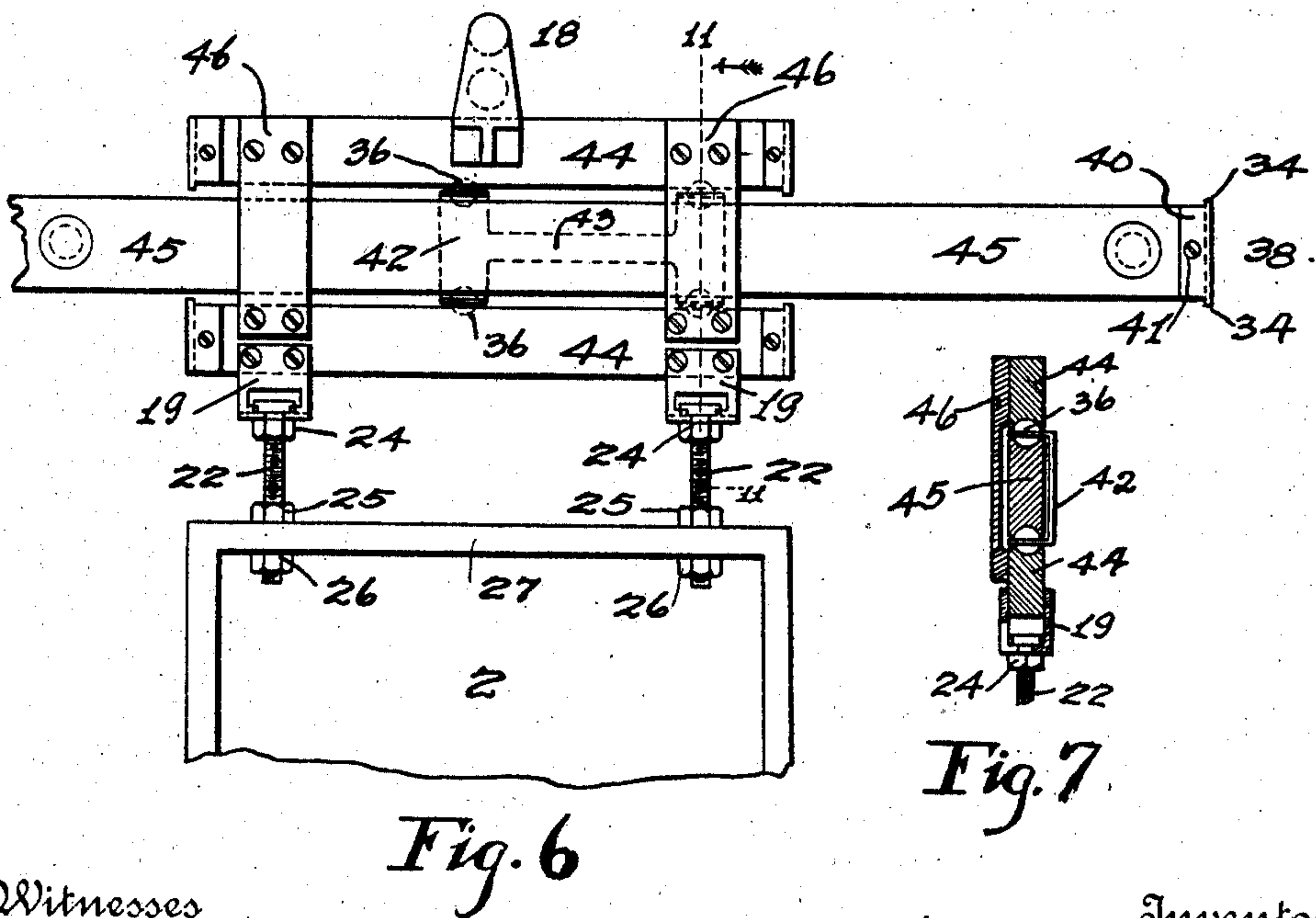
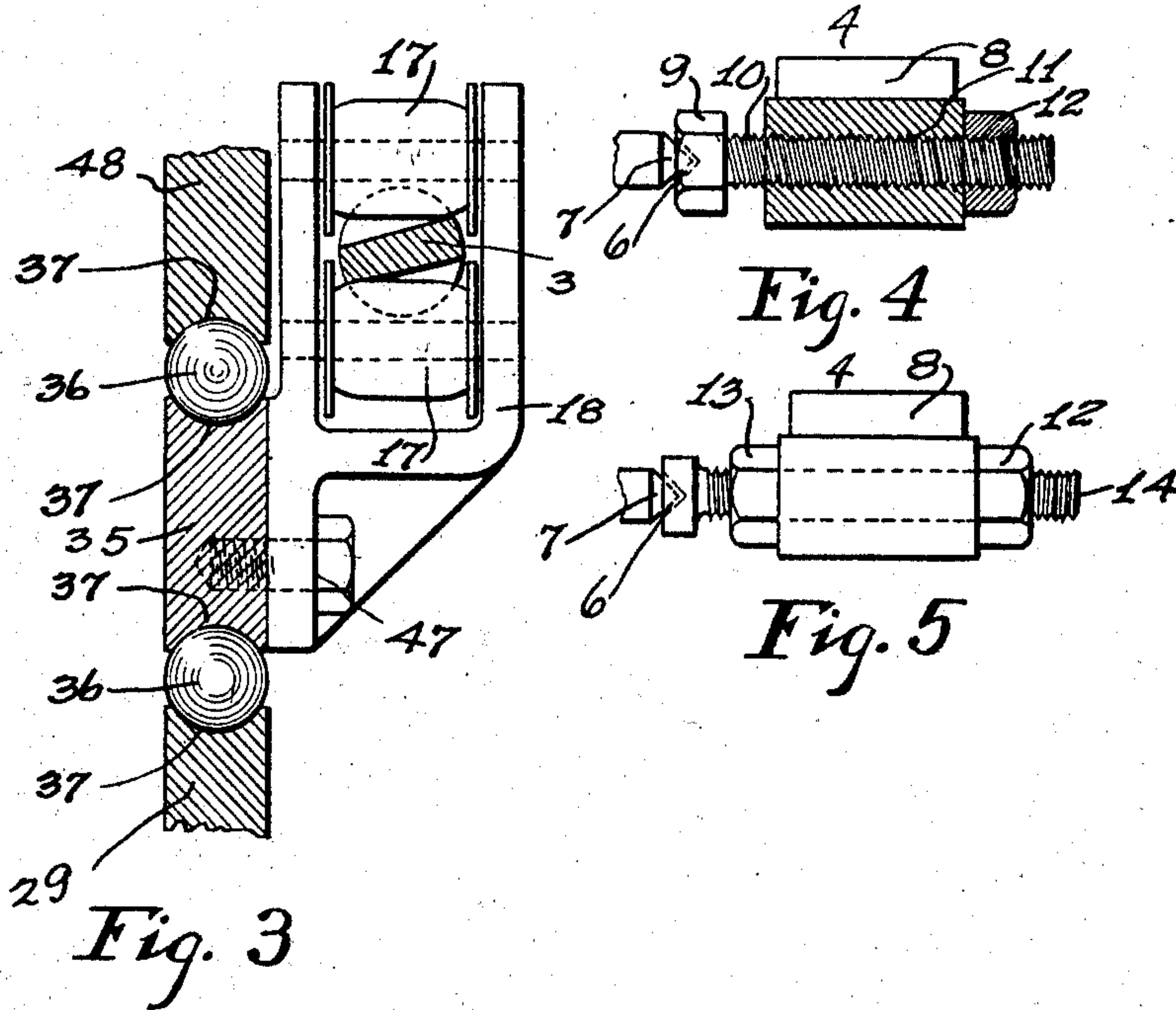
Inventor
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By his Attorneys
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UNITED STATES PATENT OFFICE.

MYRON COSSEY, OF NEW YORK, N. Y.

DOOR SUPPORTING AND OPERATING DEVICE.

No. 832,457.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed May 13, 1905. Serial No. 260,208.

To all whom it may concern:

Be it known that I, MYRON COSSEY, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, 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 devices for supporting and operating a plurality of sliding doors so as to cause them to move in the same or opposite directions and either at the same or different rates of speed and at the same time relieve the operating mechanism from all strains other than that caused by the force required to move the doors laterally.

The accompanying drawings show some of the forms which my improvements may take.

In the drawings, wherein the same reference-numerals have been used to designate corresponding parts, Figure 1 shows a front elevation with doors closed and certain parts broken away. Fig. 2 is a front elevation with doors partly open and certain parts broken away. Fig. 3 is a vertical section, partly in elevation, along the line 3 3 in Fig. 2. Figs. 4 and 5 show different forms of end-bearing supports. Fig. 6 is a front elevation of a portion of a modified construction, and Fig. 7 is a vertical cross-section through the line 11 11 on Fig. 6.

In the drawings, 1 and 2 designate sliding doors. The doors in this particular instance are connected to slide in opposite directions and at the same speed. The mechanism for accomplishing this comprises a screw-rod 3. This screw-rod in the particular form illustrated consists of a strip of metal twisted to form spirals running along its length. It will be noted that the two halves of the rod have been twisted in opposite directions, so as to form one half of the strip into right-handed spirals and the other half into left-handed spirals. The purpose of forming the two halves in this instance with different spirals is, as hereinafter explained, to compel the doors to move in opposite directions.

The screw-rod 3 just described is rotatably mounted in fixed bearings, preferably located both at the center of the rod and at the two ends. The end bearings 4 4 comprise members 5, hollowed out to form cups 6, into which the conically-pointed ends 7 of the screw-rod extend and against the bottom of which said ends have their bearing.

Figs. 4 and 5 show preferred methods of

adjustably supporting the end bearings in the brackets 8. In Fig. 4 the cupped part of the bearing is shown formed in the head 9 of the bolt 10. The screw-threads on said bolt engage corresponding threads 11 in the hole in the bracket. A jam-nut 12 is provided, internally threaded to engage the bolt-threads, and is adapted to be screwed against the side of the bracket to secure the bolt rigidly in position after it has been adjusted to bring the cup in its head in proper bearing contact with the end of the screw-rod. The construction shown in Fig. 5 differs from that just described in that a second nut 13 is provided to engage the screw-threads on the cup side of the bolt 14, which nut, like the nut 12 on the other side, is adapted also to be screwed against the face of the bracket to additionally lock and secure the cupped member to the bracket. Obviously the bolt 14 need not be screw-threaded where it engages the hole in the bracket. The center also of the screw-rod will preferably be provided with a supporting-bearing by forming on said rod near its middle a cylindrical portion 15, Figs. 1 and 2, which turns within and is supported by a sleeve or sleeves 16, secured to the door-frame in any suitable manner.

The connections between the respective doors and the screw-rod comprise, generally speaking, any member or device which when one of the doors is moved compels the screw-rod by its engagement therewith to rotate or, vice versa, compels the door to slide when the rod is rotated. In the construction illustrated this connection comprises a pair of rollers 17 17, mounted one on each side of the screw-rod, said rollers being supported on suitable bearings in the brackets 18, connected with the doors. The rollers of each pair are mounted suitably close together so as to twist or compel rotation of the screw-rod when they are moved along said rod and, vice versa, to be themselves forced along the rod when the rod is rotated. Thus when door 1 is moved to the left into the position shown in Fig. 2 the rollers attached thereto will compel the screw-rod to rotate and by its rotation and its engagement with the rollers belonging to the other door 2 will compel said other door to slide. In the construction illustrated the door 2 will move in the opposite direction from door 1, since the two halves of the screw-rod are oppositely spiraled.

It should be stated that to move the doors

in the same direction it is only necessary to provide spirals on the rod 3 all of the same kind, either all right-handed or all left-handed. It should further be stated that the doors
5 will move with the same speed when the pitch of the spirals in the two halves of the screw-rod is the same and that they can be made to move at different relative speeds by making the pitch in the several portions of
10 the rod different.

It is preferable, but not essential, that the members actually engaging and compelling rotation of the screw-rod should be rollers, since non-rotary members will compel said
15 rotation, although, of course, with greatly-increased friction. The rollers are therefore to be much preferred. Moreover, it is not essential that there should be paired members, one on either side of the screw-rod, since a single
20 member will suffice where, for example, as shown, the doors slide on fixed guides which hold said member in constant operative engagement with the screw-rod.

Referring now to the various means shown
25 in Figs. 1 and 2 and also in Figs. 6, 7 for supporting and guiding the doors to enable them to slide freely, but to prevent their having any tilting or vertical movement, I have illustrated two modifications of the general
30 type of door-hanger heretofore patented by me in my United States Letters Patent No. 632,224, of August 29, 1899. In Figs. 1 and 2 I show what I may call two "intermediate" bars or tracks 35 35, each supported between
35 two outside tracks 29 and 48. Antifriction devices 36 are provided on each side of these intermediate tracks and between them and the adjacent outside tracks, Fig. 3. The adjacent edges of the intermediate and outside
40 tracks are provided with grooves 37 for the reception of the antifriction devices, which are shown in the form of balls. So far the constructions shown in Figs. 1 and 2 and 3 correspond with that shown in Figs. 6, 7.
45 In Figs. 1, 2, and 3, however, it is the intermediate tracks 35 which are the movable bars and the outside tracks 48 and 29 which are fixed to the structure and are immovable. In Figs. 1, 2, and 3, consequently, the brackets
50 18, carrying the rollers 17, are rigidly secured to the intermediate tracks 35. In the construction shown in Figs. 6, 7 the outside tracks 44 are rigidly connected together and serve as the movable member sliding upon
55 the fixed bar or intermediate track 45. In this latter case the roller-bracket 18 is of course rigidly secured to and moves with the upper one of the outside tracks which now constitute the moving member. Obviously
60 whichever one of these two modifications is employed the movable track or movable tracks, as the case may be, are always absolutely prevented from any vertical twisting or tilting movement and, in fact, from any
65 movement in any direction excepting a sub-

stantially horizontal sliding backward and forward. Under ordinary conditions if anything happens which would tend to jam or tilt either of the doors the twisting will occur at a point intermediate the door and the
70 movable track or tracks. Such a construction practically insures the impossibility of any strain for either supporting the door or of twisting or bending or any other form of pressure being brought to bear upon either
75 the screw-rod or the rollers or other device which engages the same.

In connection with the construction shown in Figs. 6 and 7 it will be understood that the rollers in the bracket 18 cooperate with the
80 screw-rod (not shown) in the same way previously described in connection with Figs. 1 and 2.

Any suitable means may be employed for connecting the door and the movable mem-
85 ber of the supporting devices. In the present case I have shown a U-shaped member 19, secured to the movable member of the supporting devices by screws 20 and connected to the door by a threaded bolt 22, which ex-
90 tends through a top bar 27 on the door, and nuts 25 and 26 on the bolt engage the bar 27 on opposite sides. Another nut 24 on the bolt engages the member 19. In Figs. 1 and 2, 30, 31, and 32 indicate the location of devices
95 for securing the immovable member of the supporting devices to the door frame or wall. Ball-spacers 33 are preferably used in the form of pipes or rods in the arrangement shown in Figs. 1 and 2, so as not to interfere
100 with the reciprocation of the U-shaped members. With this form of spacer I preferably use a stop member 38 on each end of the middle bar 35. Each member has side lugs 40,
105 secured to the bar 35 by screws 41, and two stops 34, one above and the other below, to prevent the balls 36 from running out of the grooves 37.

Having thus described my invention, what I claim as new, and desire to secure by Let-
110 ters Patent, is—

1. In door supporting and operating devices, the combination with a plurality of supporting devices each comprising two out-
115 side bars rigidly connected together forming one element, and an intermediate bar slidably supported between the two outer bars and constituting another element, one of these elements being movable with respect to the other, means for connecting each mov-
120 able element to a door, and operating devices comprising a screw-rod supported to rotate and connections between the movable elements and said screw-rod for transmitting movement of either movable element to all
125 the other movable elements.

2. In door supporting and operating devices, the combination of a screw-rod, a plurality of sliding doors, means intermediate
130 said doors and said rod to transmit motion

from any one door to each of the other doors, and additional means for preventing the transmission of strain from the doors to said rod.

5 3. In door supporting and operating devices, the combination of a screw-rod, a plurality of sliding doors, means connecting said doors and said rod to transmit motion from any one door to each of the other doors, and
10 means comprising three tracks with relative movement between the intermediate track and the two outside tracks and arranged to support the doors and prevent transmission of strains to said screw-rod.

15 4. In door supporting and operating devices, the combination of a screw-rod; a plurality of sliding doors; guides for supporting the entire weight of the doors and permitting the doors to slide but holding them rigid in
20 other directions; means carried by said doors comprising members cooperating with said screw-rod to compel rotation thereof when said doors are moved, and vice versa to move said doors when the rod is rotated.

25 5. In door supporting and operating devices, the combination of a screw-rod; a plurality of sliding doors; means carried by said doors comprising rollers cooperating with said rod to compel rotation thereof when said
30 doors are moved, and vice versa to move said doors when the rod is rotated, and means for supporting the entire weight of the doors and preventing the transmission of strains to said rod.

6. In door supporting and operating de- 35
vices, the combination of a screw-rod consist-
ing of a strip of metal twisted to form spirals
along its length; a plurality of sliding doors;
and means carried by said doors comprising
40 pairs of rollers cooperating with said rod, one
on each side thereof, to compel rotation of the
rod when said doors are moved, and vice
versa to move said doors when the rod is ro-
tated, and means for supporting the entire
45 weight of the doors and preventing the trans-
mission of strains to said rod.

7. In door supporting and operating de-
vices, the combination with two sliding
doors, of two sets of supporting devices, each
comprising three bars with relative move- 50
ment between the two outside bars and in-
termediate bar, each set having its movable
member connected to and entirely support-
ing one door, a screw-rod having two parts
provided respectively with right and left spi- 55
rals, and engaging devices coacting with said
spirals and connected respectively each with
the movable member of one set of supporting
devices, to drive the doors in opposite direc-
60 tions.

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

MYRON COSSEY.

Witnesses:

HENRY R. BAUER,
J. C. CONRAD.