

REVOLVING DOOR.

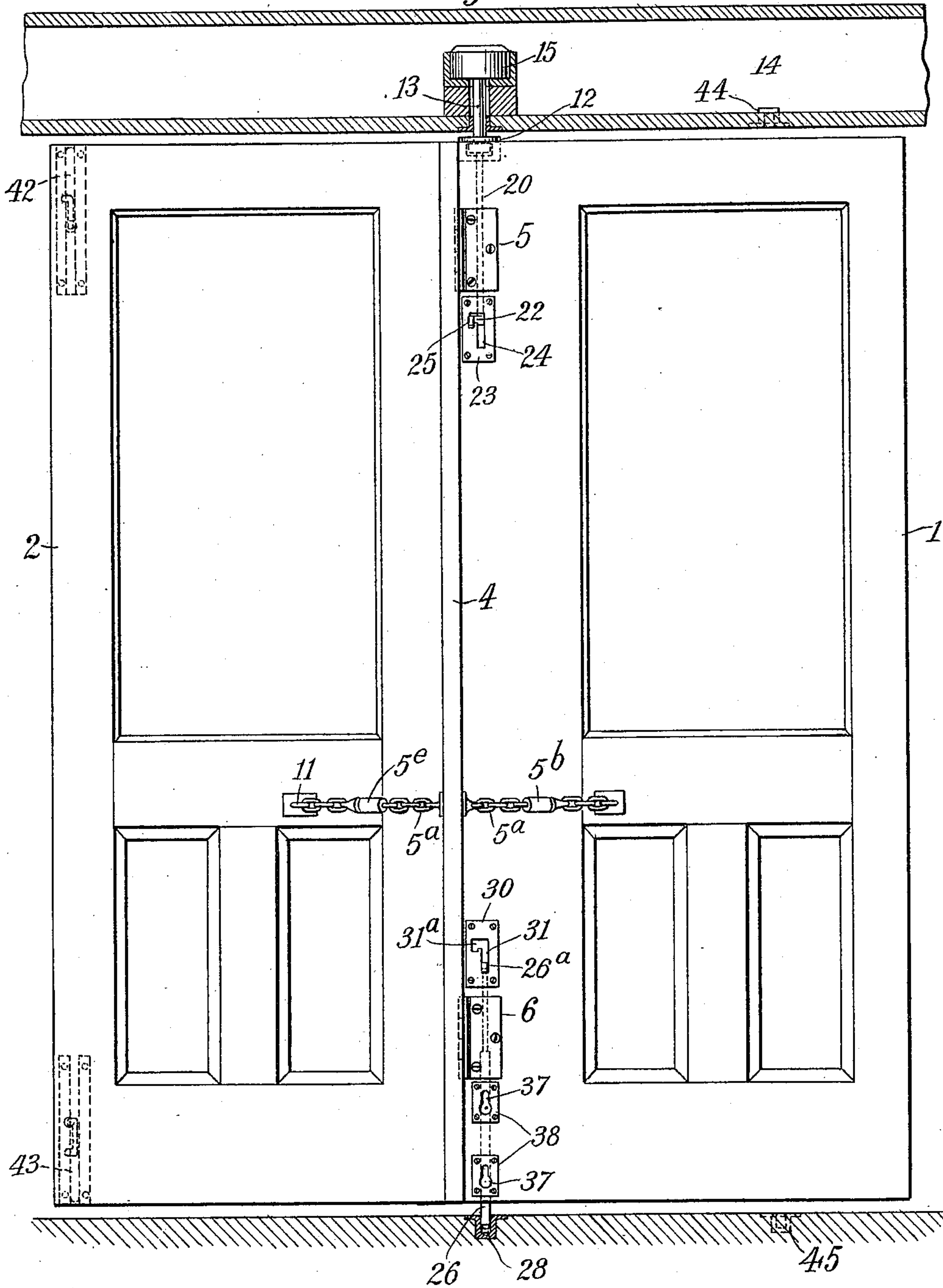
APPLICATION FILED JULY 27, 1907. RENEWED APR. 4, 1910.

975,510.

Patented Nov. 15, 1910.

3 SHEETS—SHEET 1.

Fig.1



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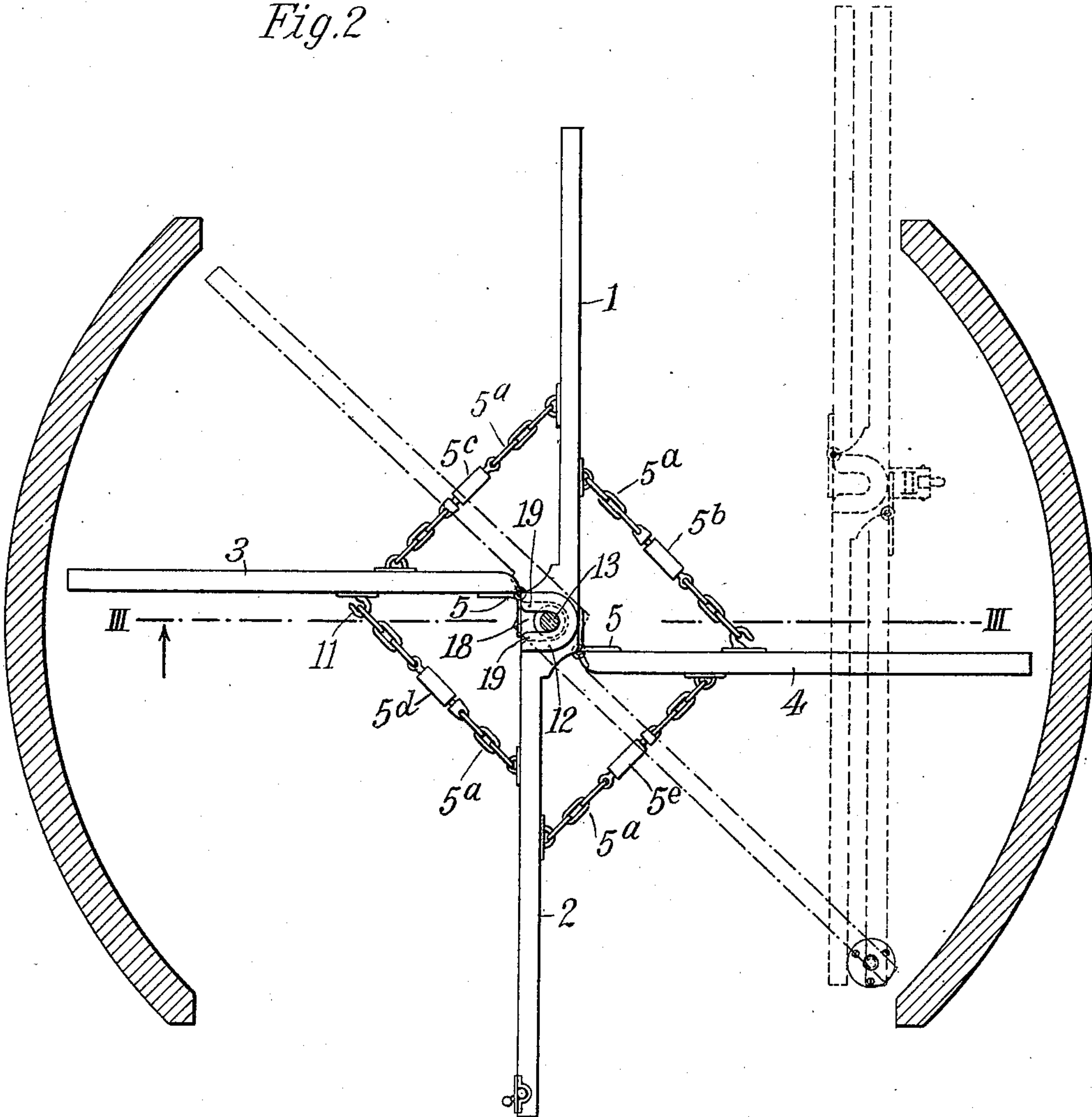
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3 SHEETS—SHEET 2.

Fig. 2



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3 SHEETS—SHEET 3.

Fig. 3

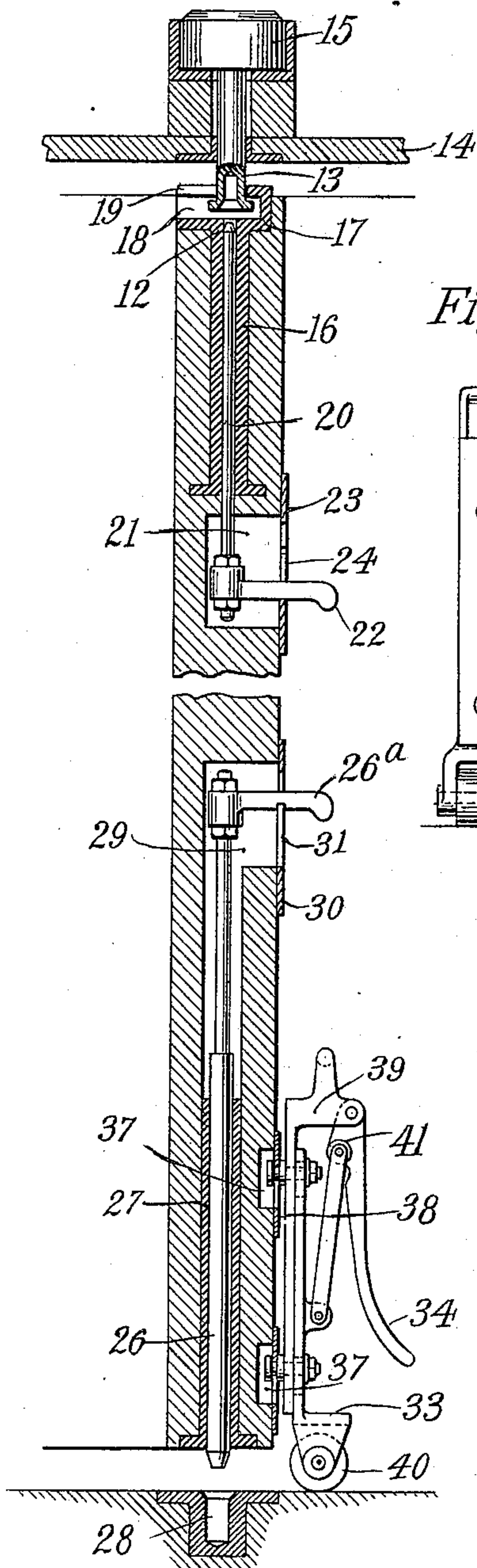


Fig. 5

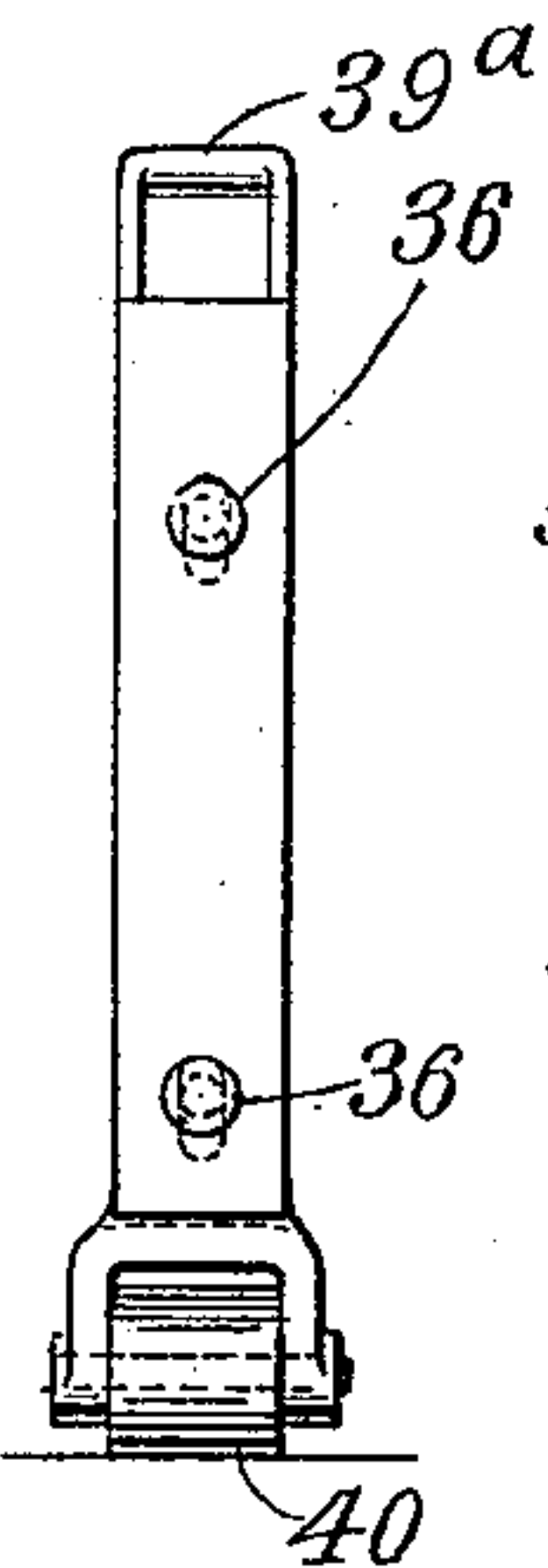


Fig. 4

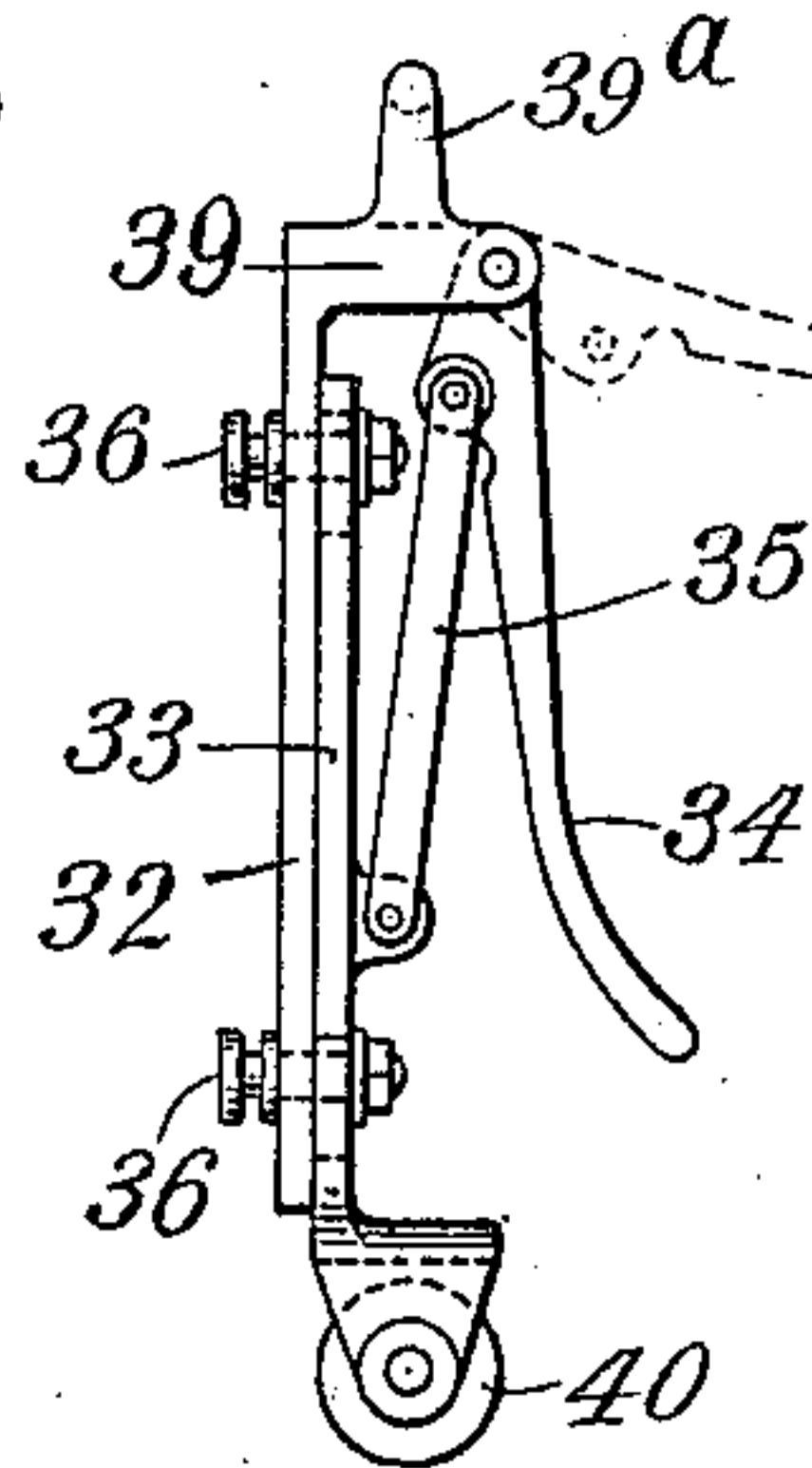


Fig. 6

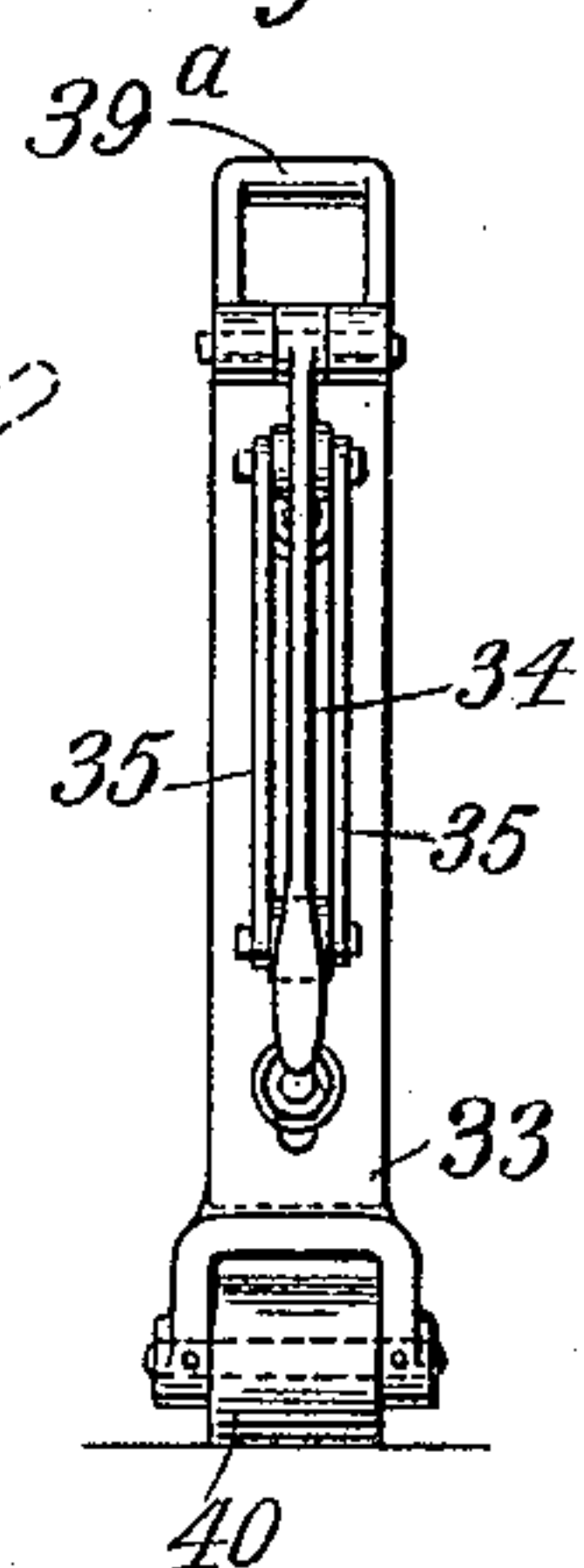
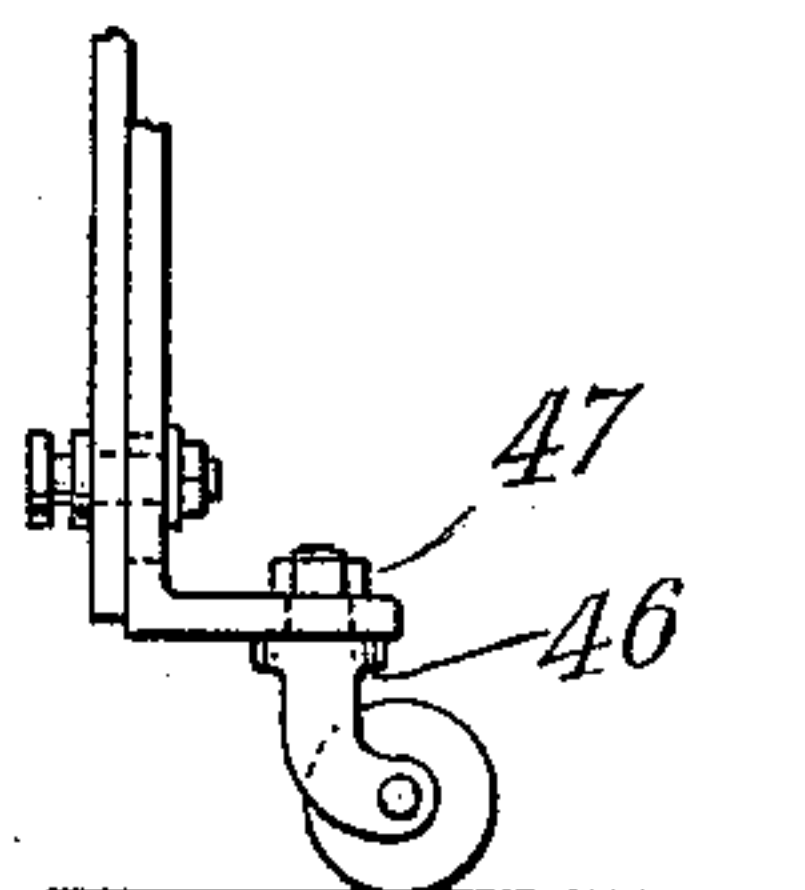


Fig. 7



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UNITED STATES PATENT OFFICE.

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REVOLVING DOOR.

975,510.

Specification of Letters Patent.

Patented Nov. 15, 1910.

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To all whom it may concern:

Be it known that we, FREDERICK CLYMER, a citizen of the United States, residing at Belmar, in the county of Monmouth and State of New Jersey, and JULIUS DEGEN, a citizen of the Swiss Republic, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Revolving Doors, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

Our invention relates to so-called revolving doors, more particularly to the pivot devices on which the door revolves and to the mechanism for moving the door, with its wings collapsed, to the side of the housing in which it revolves.

The chief object of the invention is, briefly stated, to provide for these purposes devices and mechanism which shall be of the simplest character, inexpensive to manufacture, and withal thoroughly effective.

The invention, which consists in the novel features of construction and combination of elements set forth in the appended claims, will be more readily understood from a description of a structure embodying it, and for this purpose we have selected the structure which exhibits what we consider the best mode of applying the invention. This embodiment is illustrated in the annexed drawings, in which—

Figure 1 shows the door in elevation, with the side walls of the housing removed. Fig. 2 is a plan view with the top or roof of the housing removed, showing the upper pivot devices in horizontal section. Fig. 3 is a vertical section on line III—III of Fig. 2, looking in the direction of the arrow, showing the pivoting device, and also the mechanism or device for moving the collapsed door to the side of the housing when desired. Figs. 4, 5 and 6 are side, rear, and front views respectively, of the device or mechanism for moving the door to the side of the housing. Fig. 7 is a side view of a modification of the device shown in Figs. 4, 5 and 6.

In the structure illustrated, the door comprises two wings, 1, 2 rigidly secured together, and two wings 3, 4, mounted on the former by means of hinges 5, 6, so that the door can be collapsed by folding the last-mentioned wings upon the others, as shown

in dotted lines in Fig. 2. To maintain the folding wings in their radial positions they are connected to the non-folding or "permanent" wings by chains, 5^a, in which are turnbuckles, 5^b, 5^c, 5^d, 5^e, to take up slack in the chains and keep the wings rigid relatively to each other. When it is desired to collapse the door the diametrically opposite turnbuckles 5^b and 5^d are loosened sufficiently to permit their chains to be disengaged from the hooks 10, 11, whereupon the wings 3 and 4 can be swung over to the permanent wings as will be readily seen.

To enable the door to revolve in its housing, upper and lower pivoting devices are provided at the axis of the door, connecting the door respectively with the roof and with the floor of the housing. In the structure shown, the door is suspended from or carried by the upper pivoting devices. These comprise a socket member 12, engaging the head of member 13 depending from the roof 14 of the housing and rotatable in a suitable bearing 15. The socket member may be a simple casting, consisting of a tubular shank 16 and a head 17 at the top thereof, having a slot 18, open at one side of the head and provided with overhanging flanges 19, which rest on the head of the member 13 and support the door. It will now be seen that if the door be lifted slightly after the wings 3 and 4 are folded a slight lateral movement of the door will disengage the socket member from the head of the pivot member 13, thus disconnecting the door from the roof of the housing.

In order to prevent accidental disengagement of the parts 12 and 13, a sliding bolt 20 is provided, extending through the socket member 12 into an aperture in the bottom of the pivot member 13, thereby locking these parts together, as will be readily understood. Below the socket member is a recess 21 in the door, to accommodate a handle 22, secured on the bolt and projecting through a face plate or escutcheon 23 over the recess. The aperture 24 in the face plate, through which the handle 22 extends, is in the form of an inverted L, having a notch 25 at the end of its horizontal portion, in which the handle normally rests. When the pivoting members 12 and 13 are to be unlocked, to permit disengagement from each other, the handle is raised out of the notch, thrown over to the vertical portion

of the aperture, and then pulled down, thus retracting the bolt from the pivot member 13.

The lower pivoting device comprises a bolt 26, sliding in a tubular guide or carrier 27 and normally extending into a socket 28 in the floor of the housing. Like the bolt 20, the bolt 26 is provided with a handle, 26^a, working in a recess 29 and projecting through a face plate 30 having an aperture 31 of the same shape as that in the face plate 23. The handle 26^a, however, rests normally in the vertical portion of the slot, and is dropped into the retaining notch 31^a after the bolt is retracted and disengaged from its socket.

For the purpose of lifting the door so it can be disconnected from the roof of the housing, and to provide a carriage on which the door, when released from its pivotal connections into the housing, can be shifted to the side of the housing or removed entirely therefrom, as desired, we have devised a mechanism in the nature of a lifting jack, which can be detached from the door and stored elsewhere when not in use. This mechanism or lifting jack is illustrated in its preferred form in Figs. 4, 5, and 6, and as there shown it comprises four members, 32, 33, 34, 35. The first is an elongated flat plate having headed studs 36 adapted to engage apertures 37 in escutcheons 38 on the door near the bottom thereof, and having at its top a lateral extension 39. This lateral extension is provided with a handle 39^a by which the jack may be conveniently carried about and hung up when not in use. The second member, 33, is a plate of similar form but having longitudinal slots engaging the rear ends of the studs 36 to permit the members to slide longitudinally relatively to each other, and carrying on its lower end a roller 40 adapted to bear on the floor of the housing. The member 34 is a handle by which the jack can be manually operated, pivoted to the lateral extension of member 32 and connected by the fourth member, namely, links 35, with the roller-member 33.

In using the jack to lift the door, the jack is attached as shown in Fig. 3, the studs 36 entering the enlargements at the bottoms of the slots or apertures in the escutcheons 38. To permit such attachment with the door the handle 34 must be elevated, as shown in dotted lines in Fig. 4 thereby depressing the stud member 32 relative to the roller member 33, as will be readily understood. The handle is now depressed, whereupon the member 32 is raised until the studs 36 strike the tops of the apertures or slots 37. Further movement of the lifting member 32 relative to the door is thereby prevented; but as the handle is depressed farther the lifting member raises the door, as will be readily understood,

until the handle reaches its lowermost position. The parts being properly proportioned, this raising of the door is sufficient to lift the flanges 19 of the socket member 12 off the head of the pivot member 13 without bringing the bottom of the said socket member into more than light contact with the bottom of the socket. The weight of the door being now supported by the jack, the latter is constructed in such a way that the weight of the door, instead of tending to throw the handle up and lower the door again, serves to hold the handle in its lowermost position. This result is secured by pivoting the links 35 to an offset portion 41 on the handle, so that when the latter is in its lowermost position the link-pivot will lie beyond the line joining the point at which the handle is pivoted to the member 32 and the point at which the links are pivoted to the member 33, as clearly shown in Figs. 3 and 4. It will therefore be seen that in the position of the parts as shown in Fig. 3 the weight of the door tends to throw the handle farther toward the door instead of outward and upward. Being disconnected from the roof and floor of the housing the door with its wings collapsed, can be moved over to the side of the housing, the roller 40 supporting the weight of the structure during such movement. But to enable the door to be shifted easily, means are provided in the nature of pivots on which the door can be swung to its open or non revolving position. In the structure illustrated the means referred to consist of two pivot bolts, 42, 43, at the top and bottom of one of the wings near the outer edge thereof, and sockets 44, 45, in the roof and floor of the housing near a side wall thereof, into which sockets the said bolts can be projected. When so extended into their sockets these bolts constitute pivots on which the collapsed door, the weight of which is supported by the lifting jack, can be swung over against the side wall of the casing, as shown in dotted lines in Fig. 2. In order to conceal the lifting jack when the door is in such position and so prevent meddling by unauthorized persons, the sockets 44, 45, are located adjacent the housing side-wall toward which the lifting jack faces, so that when the door is swung over to the wall the jack will be between the two, as clearly shown in Fig. 2. To restore the door to its revolving position the operations described are simply reversed. The door is first swung away from the housing wall until the socket-member 12 engages the pivot-member 13. The bolts 20 and 26 are next shot into place, locking the upper pivoting devices and connecting the door with the floor of the housing, whereupon the door is lowered by raising the handle of the jack. The latter can now be removed, after which bolts 42, 43 are retracted, the folding wings 3, 4 opened, the

chains caught over their hooks 10, 11, and the turnbuckles turned up until the claims are as taut as desired.

Instead of pivoting the jack roller 40 in fixed bearings, as shown in Fig. 4, it may be mounted in rotatable member, as 46, Fig. 7, the spindle 47 of which is offset from the roller shaft as in an ordinary caster. The roller will then always follow the door, thereby making easier the removal of the latter from its housing, as will be readily understood.

It will now be seen that our invention provides operating devices of a very simple character which can be manufactured at comparatively low cost. They are also simple in use and can be manipulated by one person without assistance.

It is to be understood that the invention is capable of other embodiments than that herein shown, but we prefer to employ the particular devices illustrated.

What we claim is:

1. The combination of a housing, a door revoluble therein, upper pivot-devices connecting the door with the roof of the housing and constructed to be disengaged by vertical and lateral movement of the door, and lower pivot-devices detachably connecting the door with the floor of the housing, whereby the door can be removed from its revolving position; and a lifting and transporting device having means detachably engaging the door and having a member provided with a roller bearing on the floor of the housing to enable the device to lift and transport the door; as set forth.

2. The combination of a housing, a door revoluble therein, upper pivot-devices connecting the door with the roof of the housing and constructed to be disengaged by vertical and lateral movement of the door, and a lifting device for lifting the door to accomplish the disengagement of the pivot devices, comprising a member having laterally extending means detachably engaging the door, a member slidable on the first member and having a roller to bear on the floor of the housing, a handle pivoted to one of the members, and links connecting the handle with the other member, as set forth.

3. A lifting device for a revolving door, comprising in combination, a member having a laterally projecting stud adapted to engage detachably a cooperating member on the door, a member slidable on the first and having a roller to bear on the floor below the door, a handle pivoted to one of the members, and a link connecting the handle with the other member, as set forth.

4. The combination of a revolving door adapted to be disconnected from its upper pivot connection by an operation involving lifting the door, said door having an aper-

ture near its bottom, an apertured plate secured over said aperture, and a manually actuated lifting device having a stud engaging said plate in the aperture thereof, as set forth.

5. The combination of a revolving door and a housing therefor, pivot devices connecting the door with the roof of the housing and constructed to be disengaged by an operation involving lateral movement of the door, a vertical bolt at the axis of the door, extending into said pivot-devices and locking the same together, the door being provided with a recess at the lower end of the bolt, a handle in the recess, secured to the bolt and extending outside of the recess, and a plate covering the recess and having an aperture through which the said handle extends, as set forth.

6. The combination of a revolving door, devices above the door for suspending the same, said door being capable of disengagement from said suspending devices by an operation involving a lateral movement of the door, and means for locking the door against such lateral movement, comprising a sliding and turning bolt at the axis of the door extending into the suspending devices, a laterally extending handle on the bolt, to be grasped to retract the bolt and unlock the suspending devices, and a plate carried by the door, provided with an aperture through which said handle extends and having a restraining notch in which the handle rests when the bolt is in its locking position, as set forth.

7. The combination of a housing, a revolving door therein, pivot devices connecting the door with the roof of the housing and constructed to be disengaged by an operation involving lateral movement of the door, a sliding bolt at the axis of the door extending into the said pivot devices to lock the same together, a handle on the lower end of the bolt to retract the same, a second sliding bolt at the axis of the door extending into the floor of the housing and constituting the lower pivot of the door and a handle on the upper end of said second bolt to retract the same, as set forth.

8. The combination of a housing, a revolving door therein, pivot-devices connecting the door with the roof of the housing and adapted to be disengaged by an operation involving vertical and lateral movement of the door, means for locking the door against such lateral movement, and a manually actuated lifting device detachably connected with the door to lift the same, as set forth.

9. The combination with a support, of a revolving door, cooperating devices carried by the support and door for suspending the latter, said devices constructed to be disconnected by an operation involving a vertical

and lateral movement of the door, and removable means carried by the door adapted to engage a floor and thereby impart vertical movement to the door.

- 5 10. The combination with a support, of a revolving door, cooperating devices carried by the support and door for suspending the latter, said devices constructed to be disconnected by an operation involving a vertical
10 and lateral movement of the door, and removable means carried by the door adapted

to impart vertical movement thereto, said means comprising a member constructed to be projected below the lower edge of the door, into engagement with a floor, and 15 manually operated means for projecting and retracting said member.

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