Aug. 2, 1938. T. M. HAGENBOOK 2,125,498

PIVOT LIFT AND HOLD-DOWN FOR REVOLVING DOORS

Filed April 8, 1937 2 Sheets-Sheet 1

FIG. 1

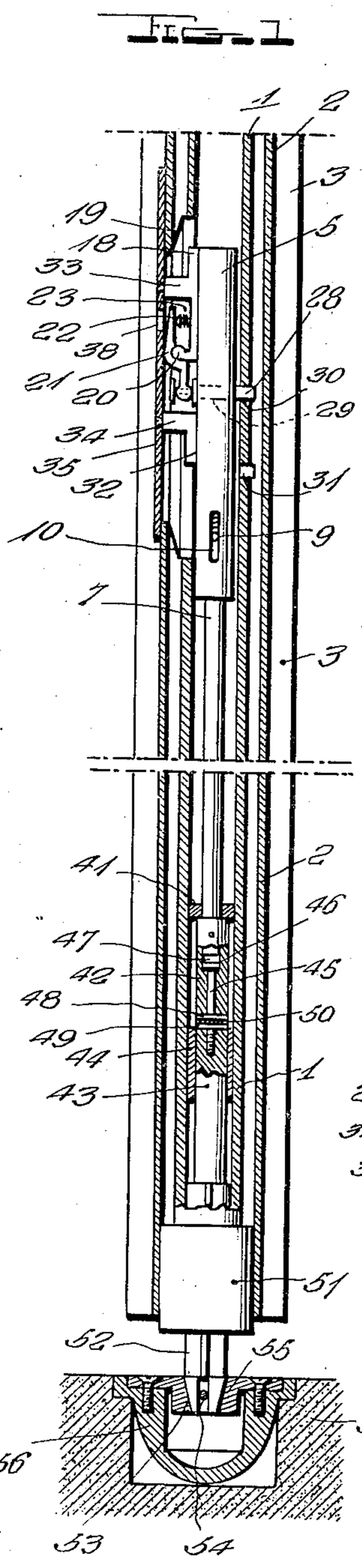

FIG. 6

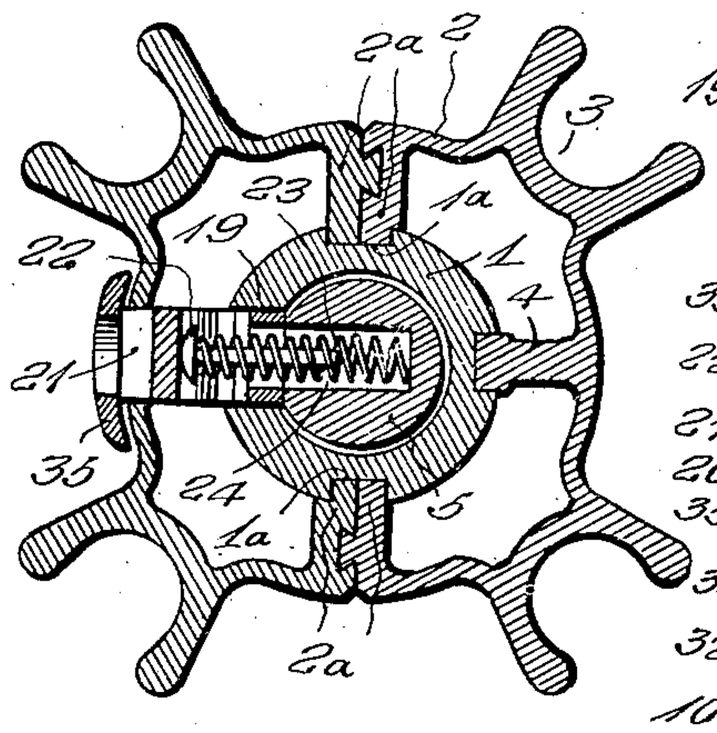

FIG. 7

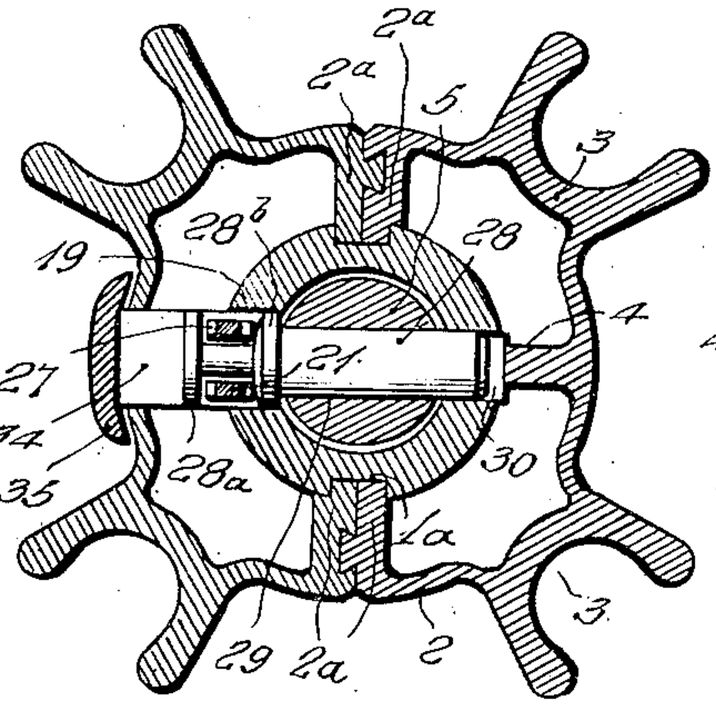

FIG. 2

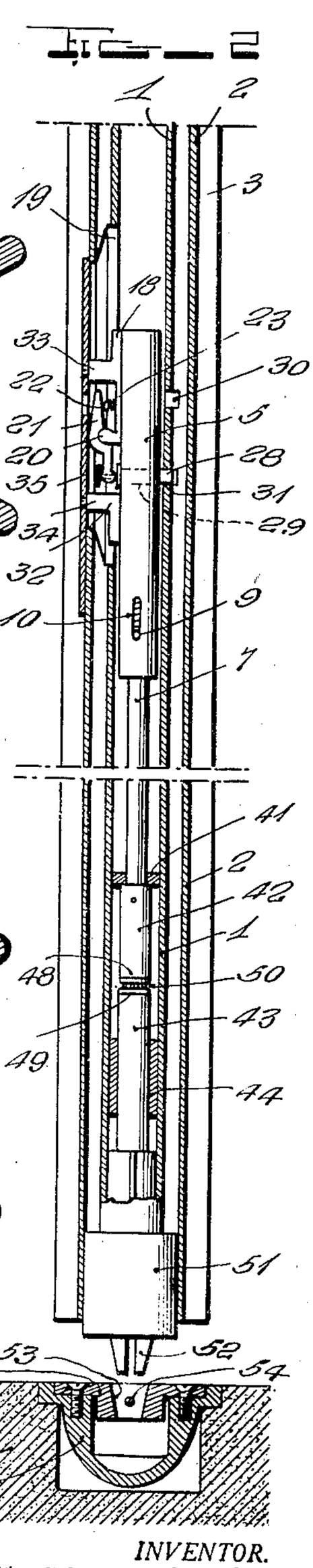

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FIG. 3

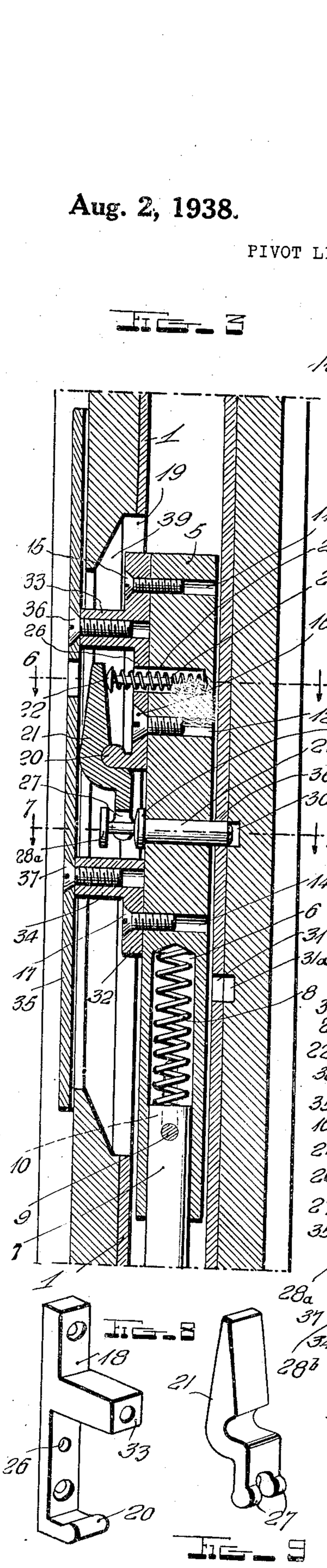

FIG. 9

FIG. 10

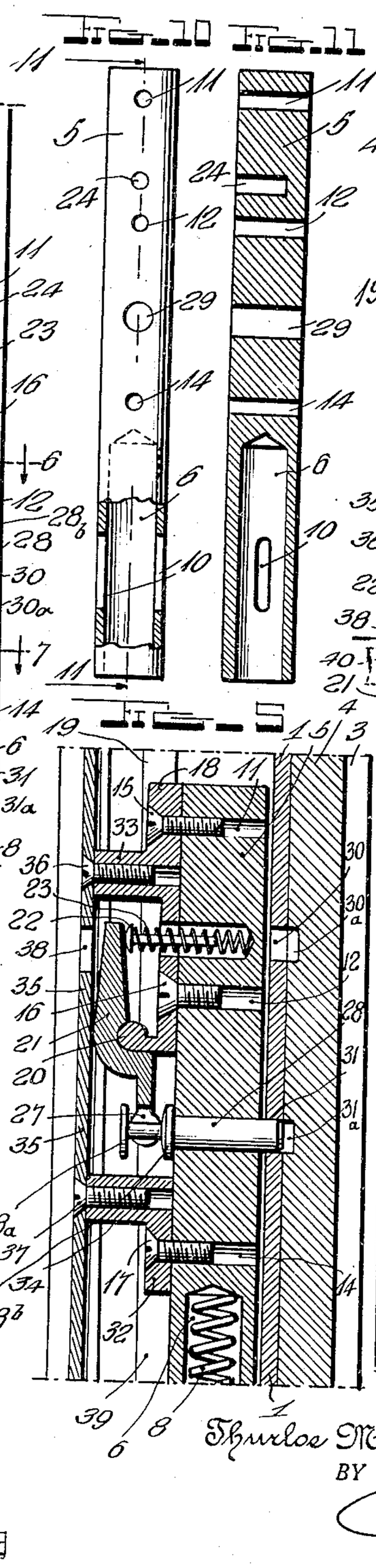

FIG. 11

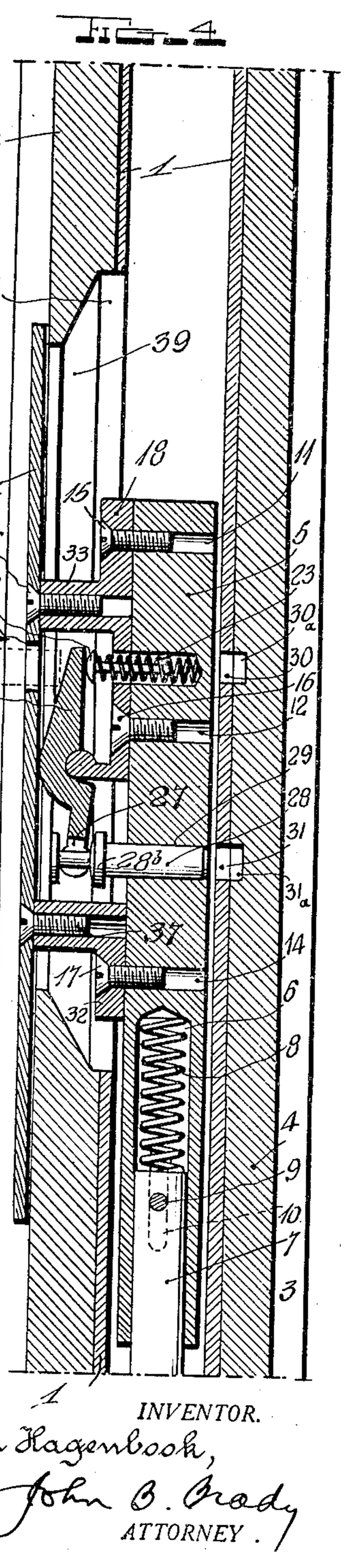

FIG. 4

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PIVOT LIFT AND HOLD-DOWN FOR REVOLVING DOORS

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Application April 8, 1937, Serial No. 135,781

11 Claims. (Cl. 20—18)

My invention relates broadly to revolving door mechanism and more particularly to a construction of pivot lift and hold-down for revolving doors.

One of the objects of my invention is to provide an improved construction of pivot lift and hold-down for revolving doors which may be readily operated upon the insertion of a suitable tool through an aperture aligned with a pivoted lever device for effecting the withdrawal of a locking pin from engagement with a recess in one limiting position to allow movement of the pivot lift to the other opposite limiting position and engagement of the locking pin in the recess located at the other prearranged recess.

Another object of my invention is to provide a construction of a fulcrumed lever device disposed within the tubular housing of the shaft of a revolving door and manually displaceable against the action of a spring device removing a locking pin carried by a member connected with the pivot lift of a revolving door, from either of two recesses in the tubular shaft of the revolving door and allowing the pivot lift to be shifted from a hold-down position to a retracted position and vice versa.

Still another object of my invention is to provide an improved construction of pivot lift and hold-down for revolving doors in which a member connected with the pivot lift is vertically shiftable within the tubular shaft of a revolving door and wherein the member carries a rockable lever device engaged at one end with a locking pin and engaged at the opposite end by a spring actuated device tending to maintain the locking pin in engagement with recesses in the interior wall of the tubular shaft and operative to maintain the pivot lift either in a projected position or a retracted position.

A further object of my invention is to provide a construction of pivot lift and hold-down for revolving doors in which a fulcrumed lever device is pivotally mounted on a member connected with the pivot lift and shiftable interiorly within the tubular shaft of a revolving door, one end of the lever device being bifurcated and engaging the head of a laterally shiftable locking pin, the other end of the lever device being spring pressed for normally tending to thrust the locking pin into engagement with either of two recesses in the interior side wall of the tubular shaft, the lever device being depressible inwardly by means of a tool insertable through the housing of the tubular shaft for withdrawing the locking pin from engaged position and allowing movement of the pivot lift to the opposite limiting position thereof.

Other and further objects of my invention reside in the simplified and improved construction of pivot lift and hold-down for revolving doors as set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is a vertical sectional view showing the improved pivot lift and hold-down of my invention in projected position for normal operation of the revolving doors with certain of the parts shown partially in side elevation; Fig. 2 is a vertical sectional view of the pivot lift and hold-down showing the pivot lift in retracted position in which the revolving doors may be moved to one side of the drum of the revolving door or the position in which the pivot lift is adapted to be projected for centering the revolving doors with respect to the lower support for the revolving doors with certain of the parts shown partially in side elevation; Fig. 3 is an enlarged cross sectional view showing the latching mechanism of my invention with the locking pin engaged in its extreme upper position for maintaining the pintle in retracted position; Fig. 4 is an enlarged cross sectional view showing the latching mechanism under control of the actuating tool with the locking pin displaced from latching position for shifting the pintle to projected position, the view showing the fulcrumed lever about to be released under control of the hand tool whereby the spring means operative against one end of the lever is effective to eject the locking pin into the lower recess in the tubular shaft of the revolving door; Fig. 5 is a cross sectional view of the latching mechanism and showing the manner in which the locking pin enters the lower recess in the interior side wall of the tubular shaft when released by the actuating tool; Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 3 with the actuating spring and spring pressed stop illustrated in elevation; Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 3 showing the transversely shiftable locking pin in elevation; Fig. 8 is a perspective view of the fulcrumed member which is connected with the pivot lift; Fig. 9 is a perspective view of the rockable lever device employed for controlling the locking pin in the latching mechanism of my invention; Fig. 10 is an elevational view partially broken away and shown in section and illustrating the central member which is shiftable within the hollow tubular shaft of the revolving door for

transmitting motion to the pivot lift; and Fig. 11 is a longitudinal sectional view through the shiftable member illustrated in Fig. 10 taken on line 11—11 thereof.

The purpose of my invention is to overcome the difficulties that have heretofore arisen in pivot lifts for revolving doors. Because of the fact that the assembly of the shaft of the revolving door has considerable weight it is necessary to provide a method of holding the pivot that will be strong enough to carry the entire weight of the shaft assembly. The reason for this provision is that in the erection of the revolving door it is necessary to stand the shaft assembly vertically and in event that the weight of the shaft is accidentally thrown onto the pivot, it is essential that the rest of the pivot mechanism be strong enough to carry this load. My present invention constitutes an improvement over the invention set forth in my application Serial No. 120,818, filed January 15, 1937 for Pintle control mechanism for revolving doors.

The central tubular shaft of the revolving door is shown at 1. For purposes of simplification I have not shown the revolving door hardware which is mounted adjacent the central tubular shaft 1. The tubular housing for the central tubular shaft is indicated at 2 including the longitudinally extending recesses 3 and the radially disposed spacer members 4. Suitable connections are provided between housing 2 and shaft 1 by means of interconnected radially disposed web members shown generally at 2*a* extending into grooves 1*a* in the exterior wall of tubular shaft 1. The top of central tubular shaft 1 is carried in the usual trolley structure of the character set forth more fully in my copending application Serial No. 35,395 filed August 8, 1935. The lower end of the central tubular shaft 1 contains the pintle structure set forth more fully in my copending application Serial No, 115,431, filed December 11, 1936. The mechanism for operating the pivot lift and hold-down is arranged intermediate the upper and lower hardware members and relatively below the midway position between the hardware members. Centrally within the central tubular shaft 1, I provide the central member 5 having a socket portion 6 in the lower end thereof into which the upper end of member 7 which connects to the pintle, extends. Coil spring 8 provides means tending to continuously eject member 7 for maintaining the pintle in the lower support. A pin 9 carried by member 7 extends through the slot 10 in member 5 for limiting the position to which member 7 is projected and to provide positive means for lifting the pintle from the lower support when the revolving doors are collapsed and ready for movement in collapsed position adjacent one side of the drum of the revolving door.

Member 5 is provided with transversely extending apertures 11, 12 and 14 which are screw threaded to receive screws 15, 16 and 17. Screws 15 and 16 pass through the fulcrum member 18 maintaining said member in position with respect to member 5. The fulcrum member 18 has a width slightly narrower than the slot 19 in the central tubular shaft 1 to allow vertical shifting movement of member 5. The fulcrum member 18 has a horizontally extending portion 20 which serves as a pivot means or fulcrum for the lever arm 21 as shown. The lever arm 21 bears against the spring pressed stop 22 at one end. The spring pressed stop 22 is continuously urged outwardly by means of coil spring 23 maintained in transversely disposed socket 24 in member 5 and through the aligned aperture 26 in fulcrum member 18. The limiting stop 22 acted upon by coil spring 23 tends to continuously urge the lever 21 outwardly, causing the lower end of the lever to move inwardly. The lower end of lever 21 is bifurcated as indicated at 27 to allow the passage of lock pin 28 which is slidably mounted in the transversely extending passage 29 in member 5. The passage 29 has a bore slightly larger in diameter than the diameter of lock pin 28 so that the lock pin is capable of reciprocation into and out of engagement with the upper aperture 30 or lower aperture 31 in central tubular shaft 1 with which the recesses 30*a* and 31*a* in housing 2 are aligned. The lock pin 28 constitutes a selector pin which may be ejected into either upper aperture 30 or lower aperture 31 in shaft 1 for maintaining the pivot lift either in a retracted or a projected position. The head or locking pin 28 is flanged at 28*a* and 28*b* for engaging opposite sides of the bifurcated end of lever member 21 while allowing rocking movement between the end of lever member 21 and the end of the lock pin 28 thereby facilitating the reciprocatory movement of the locking pin.

A spacer member 32 is secured to member 5 by means of screw 17 in alignment with member 18 and in a position capable of vertical movement in slot 19 in tubular shaft 1.

Members 18 and 32 each carry radially projecting interiorly screw threaded lugs 33 and 34 which serve as separators and mounting means for the cover plate 35. Cover plate 35 is apertured for the passage of screws 36 and 37 which engage the screw threads in the radially extending lug members 33 and 34. The cover plate 35 is apertured at 38 directly in alignment with the upper end of lever member 21.

In the operation of the pivot lift and hold-down of my invention, a suitable tool is inserted through aperture 38 in the plate member 35 for depressing the upper end of lever arm 21 against the outward force exerted by coil spring 22. This movement ejects locking pin 28 from a position engaged in either of the apertures 30 or 31 in the hollow tubular shaft 1, whereby member 5 may be shifted vertically from one limiting position to another limiting position.

The tool shown generally at 40 in Fig. 4, which is inserted through aperture 38 for depressing lever member 21 for ejecting locking pin 28 also serves as a means for moving member 5 vertically with respect to the tubular shaft 1.

The dimensions of cover plate 35 are such that the adjacent slots behind cover plate 35 will always be completely covered by plate member 35. That is to say, the member 4 is slotted at 39 along outwardly converging lines and throughout a width sufficient to allow vertical movement of member 18 and 32, while limiting the space through which dust, moisture, or other foreign matter might tend to enter the central tubular shaft 1.

The structure of my invention is particularly advantageous because no bending moment is exerted against the locking pin. The only substantial force to which locking pin 28 is subjected is a slight shearing moment. However, locking pin 28 has a high shear strength which far exceeds the tensile or compression strength of member 5. The strength of locking pin 28 is such that member 5 would be deformed in the aperture 29 through which locking pin 28 passes before the locking pin 28 would fail.

Spring 23 is constructed of such size that lever member 21 can only be displaced by the application of a substantial force on the tool inserted through aperture 28. The advantage of this is that the unauthorized person is thus prevented from actuating the pivot lift and hold-down.

The tool which is employed for actuating lever member 21 in ejecting locking pin 28 may be a combination device, also employed for controlling the position of the roller latching panic release mechanism in the revolving door hardware. It is impossible for the unauthorized person to actuate the pivot lift and hold-down by any application of a light weight member such as a pencil or by means of the finger.

The return of locking pin 28 is wholly automatic after an ejecting operation of pin 28 has been accomplished. As soon as the pivot lift is shifted to a position in which the lock pin 28 is aligned with either aperture 30 or 31 the locking pin automatically enters the apertures maintaining the pintle in the position to which the mechanism has been shifted.

The member 7 passes through a gasket member 41 centered within the tubular shaft 1 and resting upon the shoulder formed by member 42. The pivot lift 43 is centered within hollow tubular shaft 1 by sleeve member 44 and is connected with member 42 through threaded member 45. Threaded member 45 is provided with a head 46 shiftable within limits in the socket recess 47 in member 42. Bearing plates 48 and 49 are provided between member 42 and pivot lift 43 providing an annular race way for the ball bearings indicated generally at 50. The lower end of the tubular shaft 1 is centered with respect to the shaft housing 2 by sleeve member shown generally at 51. The pintle 52 has a frusto-conical shaped end with a transverse slot therein engageable with the correspondingly tapered recess 53 and the transversely extending member 54 in the lower supporting plate 55. The lower supporting plate 55 is mounted in the base member 56 which in turn is supported in the foundation shown generally at 57.

The pivot lift and hold-down of my invention has been found to be practical in manufacture and production and successful in operation. I realize, however, that modifications of the structure of my invention may be made and accordingly I do not intend that my invention shall be limited to the particular structure illustrated. I contemplate by my invention all constructions which may be embraced by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A pivot lift and hold-down for revolving doors comprising a hollow tubular shaft, a pintle, a member connected with said pintle and extending interiorly of said hollow tubular shaft, a fulcrum member carried by the aforesaid member, a lever pivotally mounted on said fulcrum member, a locking pin extending transversely through said first mentioned member and connected with one end of said lever member, said locking pin being engageable with spaced recesses in the interior wall of said tubular shaft, and spring means engageable with the opposite end of said lever member and tending to normally shift said lever member into a position for ejecting said locking pin into a position engaging a selected recess in said tubular shaft.

2. A pivot lift and hold-down for revolving doors comprising a tubular shaft for revolving doors recessed at spaced positions in the interior wall thereof, a pintle control member extending centrally through said shaft, a locking pin mounted for reciprocative movement transversely through said member and engageable with the spaced recesses in the interior wall of said tubular shaft for maintaining the pintle control member in either a retracted or a projected position, and a lever member pivotally mounted with respect to said first mentioned member, said lever member being engageable at one end with said locking pin and being spring pressed at the opposite end for normally urging said locking pin to a position engaging the recesses in said shaft.

3. A pivot lift and hold-down for revolving doors comprising a central tubular shaft recessed at spaced intervals interiorly thereof, a pintle control member axially disposed within said shaft, a locking pin extending transversely through said pintle control member and shiftable into and out of the recesses in the interior wall of said tubular shaft, and a rockably mounted lever pivoted with respect to said pintle control member, said lever being engaged at one end with said locking pin and being spring pressed at the opposite end for normally tending to eject said locking pin into the recesses in said tubular shaft.

4. A pivot lift and hold-down for revolving doors comprising a central tubular shaft recessed at spaced intervals interiorly thereof, a pintle control member axially disposed within said shaft, a locking pin extending transversely through said pintle control member and shiftable into and out of the recesses in the interior wall of said tubular shaft, a fulcrum member carried by said pintle control member, a lever pivotally mounted on said fulcrum member and extending through a longitudinally slotted portion of said tubular shaft, one end of said lever member being bifurcated and engaging said locking pin and the other end of said lever member being spring pressed for normally tending to shift said locking pin into the recesses interiorly of said tubular shaft.

5. A pivot lift and hold-down for revolving doors comprising a central tubular shaft recessed at spaced intervals interiorly thereof, a pintle control member axially disposed within said shaft, a locking pin extending transversely through said pintle control member and shiftable into and out of the recesses in the interior wall of said tubular shaft, said central tubular shaft being longitudinally slotted for the passage of the controlling end of said locking pin, a fulcrum member carried by said pintle control member and projecting through the slotted portion of said central shaft, said fulcrum member providing a pivot extending transversely of said pintle control member, and a lever rockably mounted on said fulcrum and engageable at one end of the control end of said locking pin and being spring pressed at the opposite end for normally tending to eject said locking pin into the recesses in said tubular shaft.

6. A pivot lift and hold-down for revolving doors comprising a central tubular shaft recessed at spaced intervals interiorly thereof, a pintle control member axially disposed within said shaft, a locking pin extending transversely through said pintle control member and shiftable into and out of the recesses in the interior wall of said tubular shaft, said central tubular shaft having a longitudinal slot at one side thereof through which the controlling end of said lock-

ing pin extends, a fulcrum member carried by said pintle control member and extending through the slotted portion of said central tubular shaft and providing a pivot extending transversely to the axis of the pintle control member, and a lever member mounted on said fulcrum and displaceable in a longitudinal plane passing through the axis of said pintle control member, one end of said lever member engaging the controlling end of said locking pin and the other end of said lever member being spring pressed for normally urging said locking pin into the recesses in the interior wall of said central shaft.

7. A pivot lift and hold-down for revolving doors comprising a central tubular shaft recessed at spaced intervals interiorly thereof, a pintle control member axially disposed within said shaft, a locking pin extending transversely through said pintle control member and shiftable into and out of the recesses in the interior wall of said tubular shaft, the central tubular shaft being slotted for the passage of the controlling end of said locking pin, a fulcrum member carried by said pintle control member and providing a pivot extending transversely of the axis of said pintle control member, a lever device pivotally mounted on said transversely extending pivot and operative for movement in a vertical plane passing through the axis of said pintle control member, one end of said lever device engaging the controlling end of said locking pin and spring means carried by said pintle control member and effective against the other end of said lever device and tending to shift said lever device to a position in which said locking pin tends to normally engage the recesses in said central shaft.

8. A pivot lift and hold-down for revolving doors comprising a central tubular shaft, a pintle control member extending axially through said shaft, a housing for said shaft, said shaft and housing being recessed at spaced intervals at one side thereof and having aligned slots therein in the opposite side thereof, a lever member transversely pivoted with respect to said pintle control member and extending through the aligned slots in said shaft and housing, a plate member supported in spaced relation to said pintle control member and extending over the aligned slots in said shaft and housing and enclosing said lever member, a locking pin transversely slidable through said pintle control member and engageable with the recesses in the wall of said central shaft, one end of said lever member engaging said locking pin, spring means engageable with the opposite end of said lever member for normally urging said lever member to a position in which the locking pin engages the recesses in the central tubular shaft, said plate member being apertured for the passage of a tool engageable with said lever member in a position counteracting the effect of said spring means upon said lever member and effecting a withdrawal of said locking pin from the recesses in said tubular shaft.

9. A pivot lift and hold-down for revolving doors comprising a central tubular shaft, a pintle control member extending axially through said shaft, a housing for said shaft, said shaft and housing being recessed at spaced intervals at one side thereof and having aligned slots therein in the opposite side thereof, a lever member transversely pivoted with respect to said pintle control member and extending through the aligned slots in said shaft and housing, a plate member supported in spaced relation to said pintle control member and extending over the aligned slots in said shaft and housing and enclosing said lever member, a locking pin transversely slidable through said pintle control member and engageable with the recesses in the wall of said central shaft, one end of said lever member engaging said locking pin, spring means carried in a transversely extending recess in said pintle control member and operative against the opposite end of said lever member for normally urging said lever member to a position in which the locking pin engages the recesses in the central tubular shaft, said plate member being apertured for the passage of a tool engageable with said lever member in a position counteracting the effect of said spring means upon said lever member and effecting a withdrawal of said locking pin from the recesses in said tubular shaft.

10. A pivot lift and hold-down for revolving doors comprising a tubular shaft, a pintle retractable and projectable through said tubular shaft, a pintle control mechanism connected with the pintle, a housing for said tubular shaft, said tubular shaft and housing being longitudinally slotted through one side thereof adjacent said pintle control member and having recesses opposite said slots extending into the interior wall of said tubular shaft, a pair of spacer members carried by said pintle control member and projecting through the aligned slots in said central shaft and said housing, a plate member carried by said spacer members and substantially closing the slot in said housing, a locking pin transversely slidable through said pintle control member and selectively engageable with the recesses in said central tubular housing, a lever member transversely pivoted with respect to said pintle control member, one end of said lever member engaging said locking pin, and spring means carried by said pintle control member and operative against said lever member for normally ejecting said locking pin into the recesses in said tubular shaft, the spring pressed end of said lever member being aligned with an aperture in said plate member for allowing the insertion of a tool engageable with the end of said lever member for counterbalancing the effect of said spring means and allowing the withdrawal of said locking pin from the recesses in said central shaft member.

11. In a pivot lift and hold-down for revolving doors, in combination with a revolving shaft and a retractable pintle therefor, spring pressed lever means mounted on a pintle actuating member and engageable with a transversely movable locking pin carried by said member and operative with respect to said shaft.

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