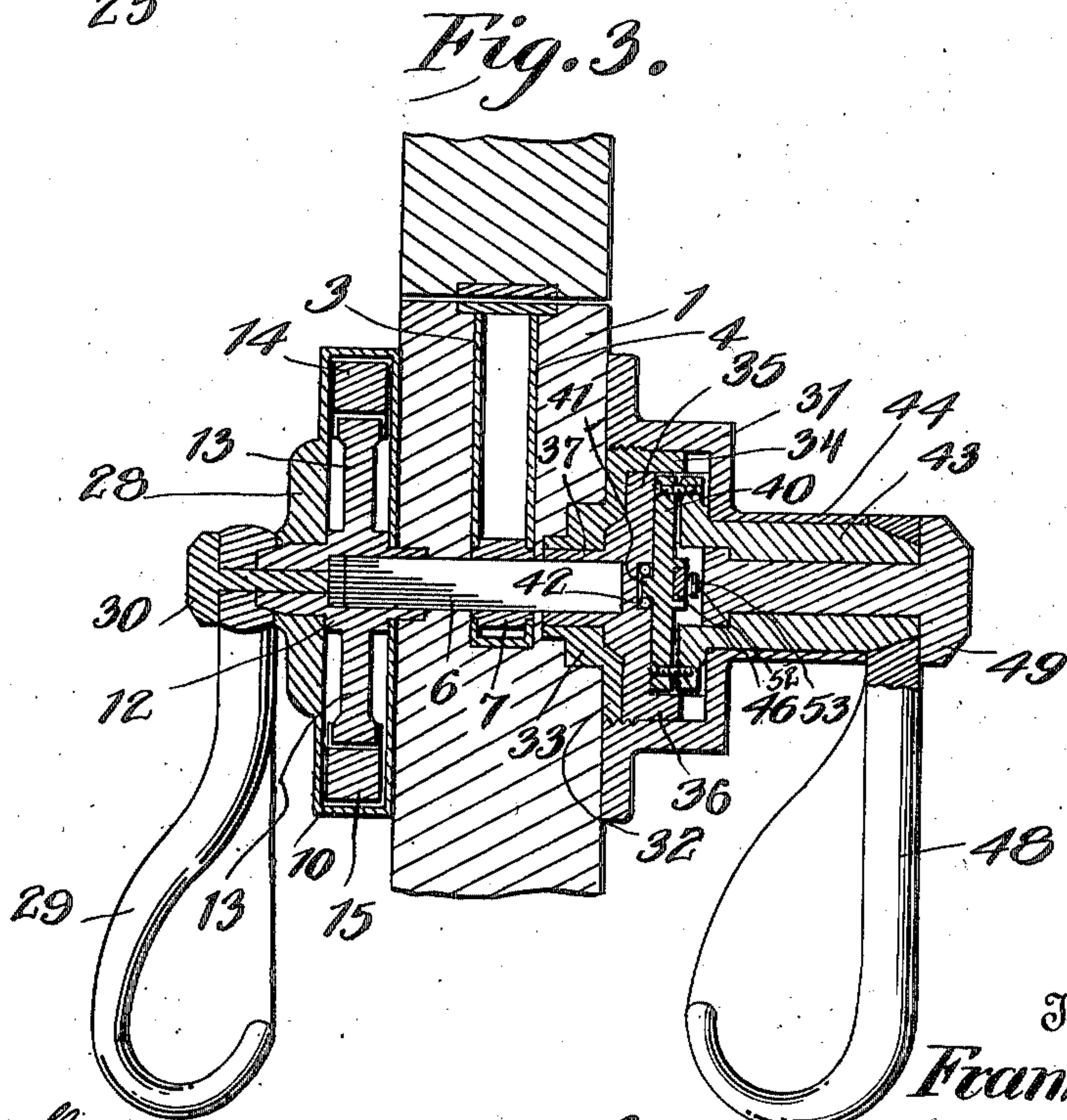
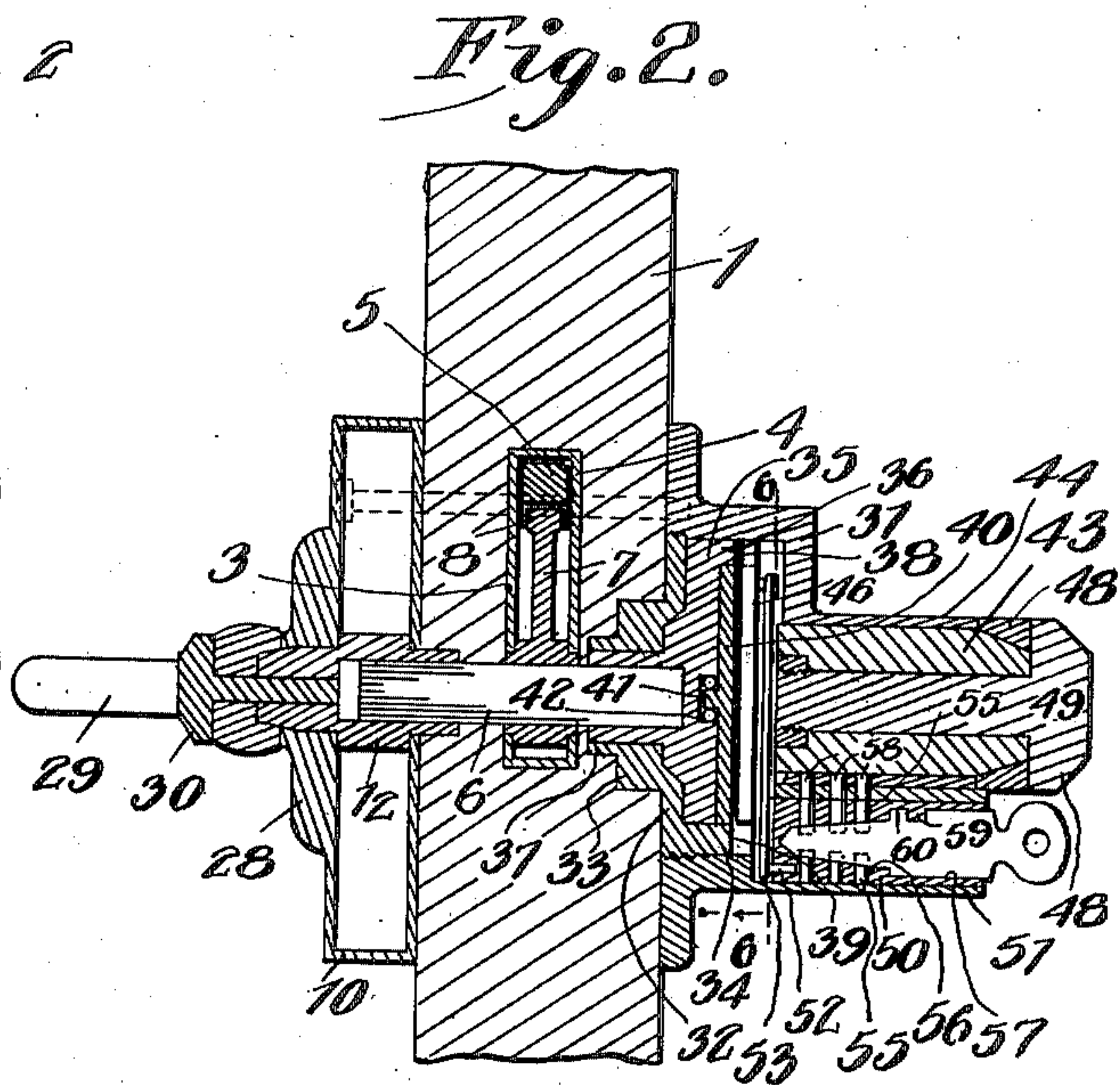
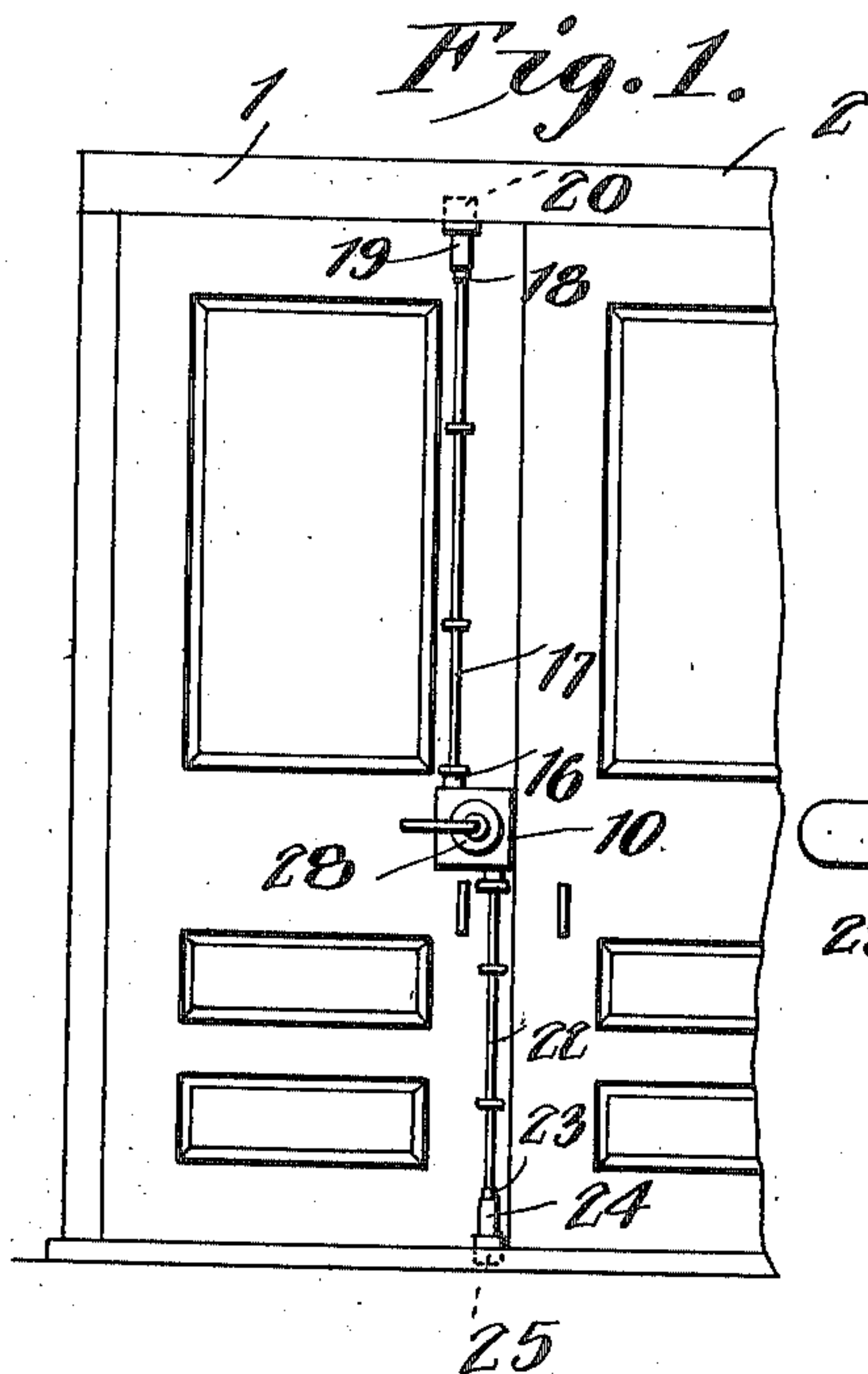


F. LAHR.
DOUBLE DOOR LOCK.
APPLICATION FILED DEC. 10, 1908.

947,641.

Patented Jan. 25, 1910.

3 SHEETS—SHEET 1.



Witnesses
W. H. Rockwell
C. H. Giesbauer.

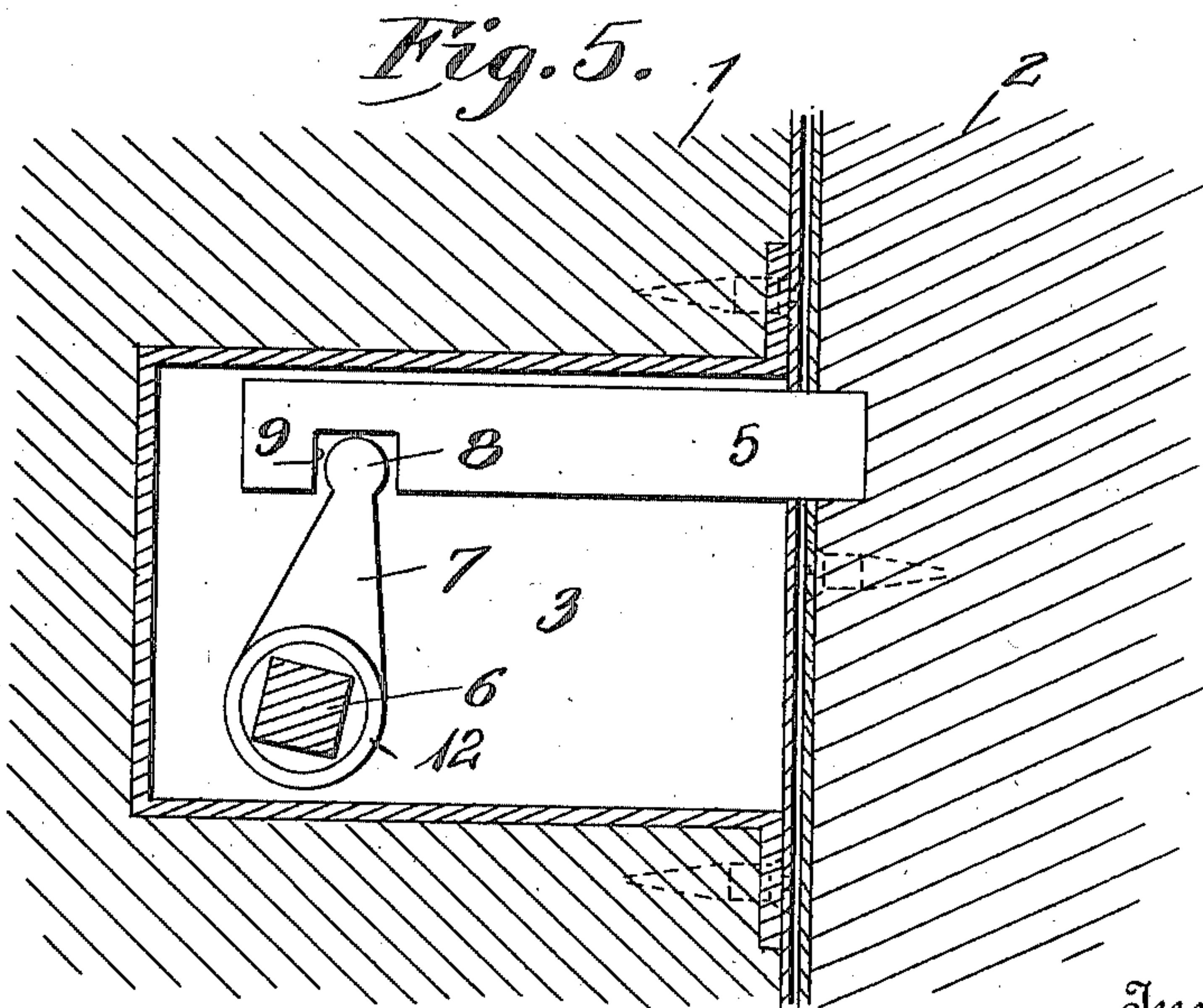
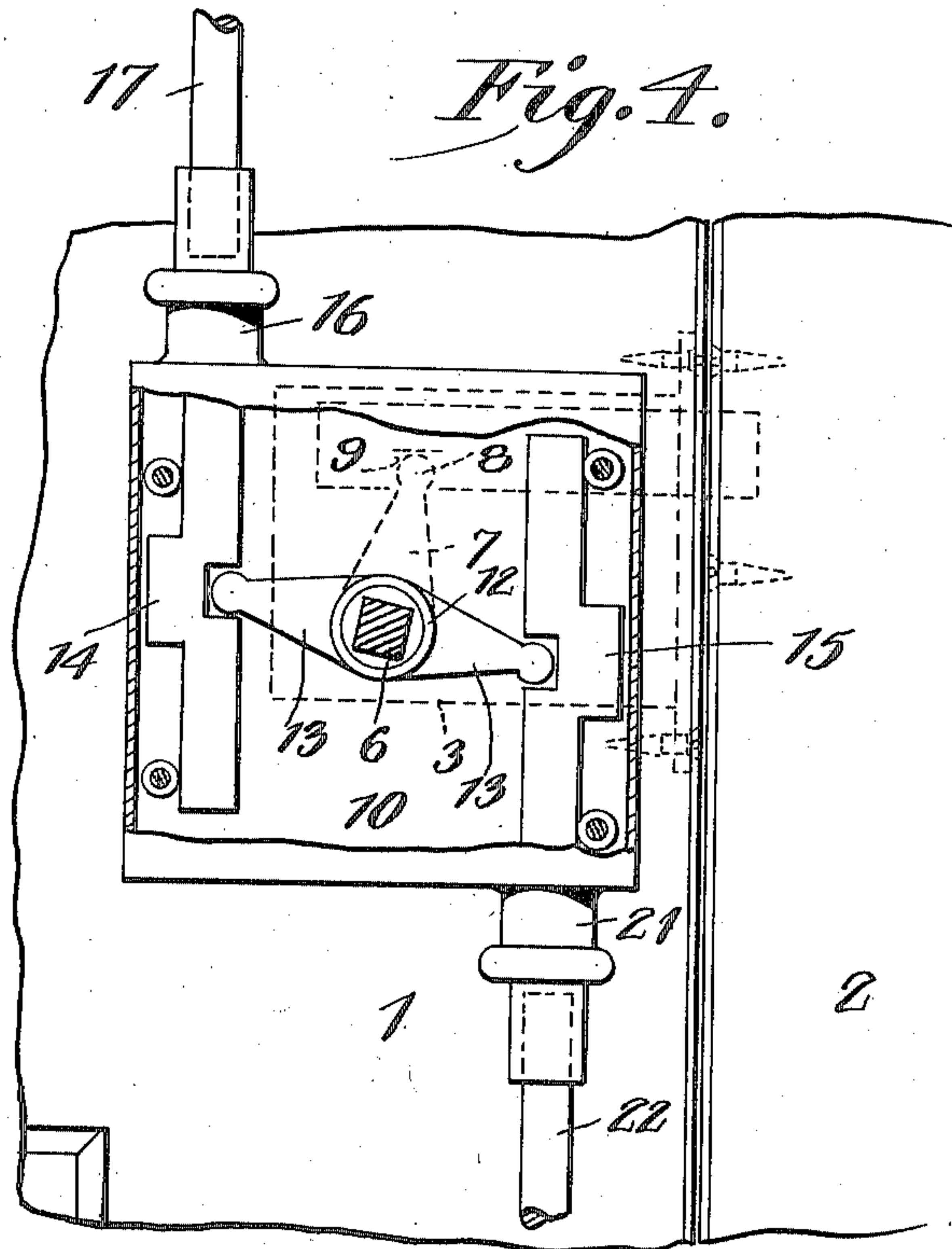
Inventor
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3 SHEETS—SHEET 2.



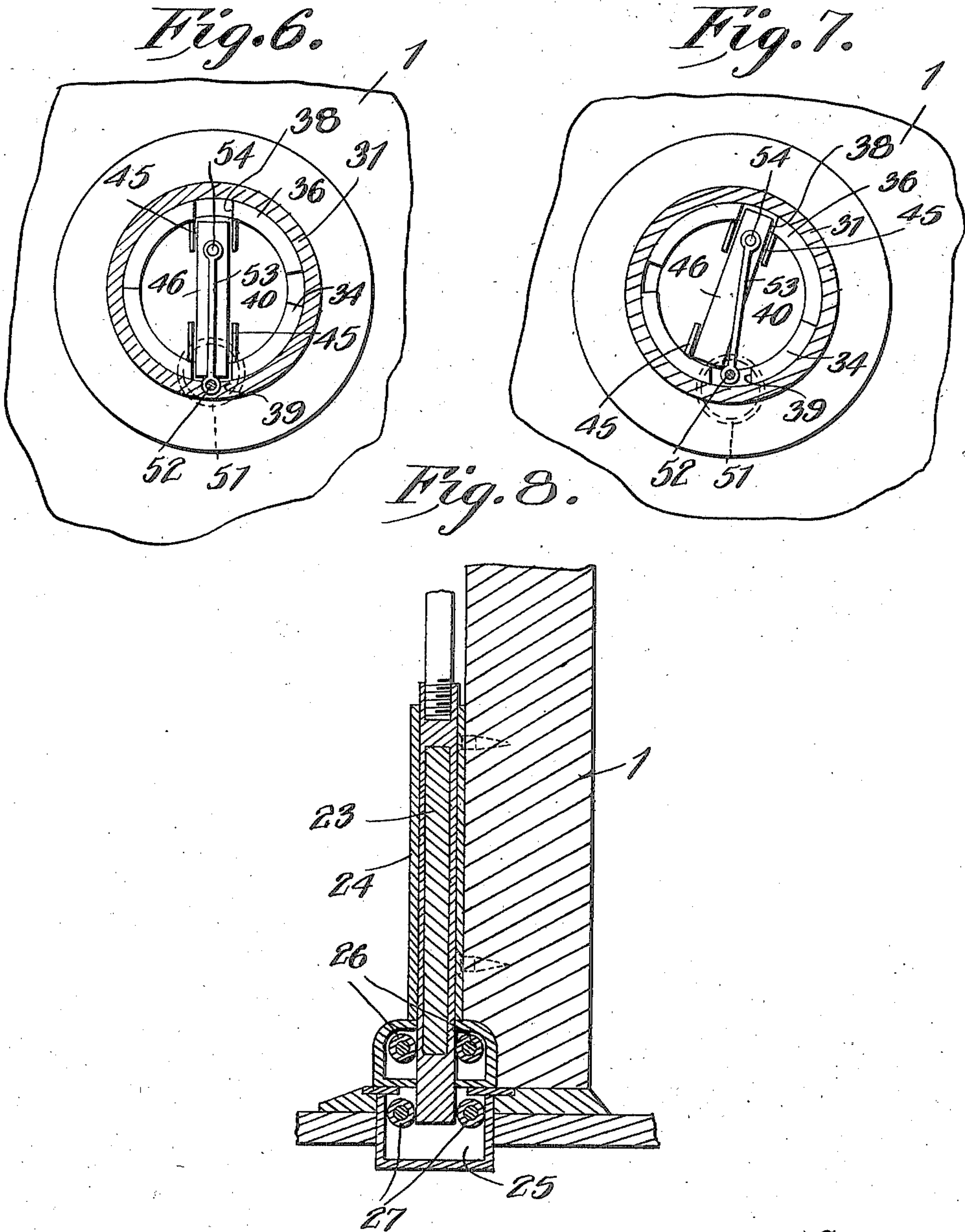
Witnesses
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK LAHR, OF WADSWORTH, OHIO.

DOUBLE-DOOR LOCK.

947,641.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed December 10, 1908. Serial No. 466,846.

To all whom it may concern:

Be it known that I, FRANK LAHR, a citizen of the United States, residing at Wadsworth, in the county of Medina and State of Ohio, have invented certain new and useful Improvements in Double-Door Locks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in double door locks.

The object of the invention is to provide a lock of this character having means whereby a locking bolt is operated to fasten two doors together and to simultaneously operate fastening bolts at the upper and lower ends of one of the doors.

A further object is to provide means whereby the bolt operating mechanism may be locked and unlocked from the outside of the door.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of the inner side of a portion of the two doors showing the arrangement of the locking bolts on the inner side of one of said doors; Fig. 2 is an enlarged vertical cross sectional view through one of the doors and the locking mechanism thereon taken on a line with the operating shaft and handle; Fig. 3 is a horizontal sectional view through the same parts and a portion of the adjacent door; Fig. 4 is a vertical longitudinal sectional view through the casing of the top and bottom bolt operating mechanism on the inside of one of the doors; Fig. 5 is a vertical longitudinal sectional view through one of the doors and the mortise case showing the bolt which locks the doors together and the means for operating the same; Fig. 6 is a vertical cross sectional view, showing the arrangement of the key-operated clutch mechanism by means of which the bolt operating mechanism is locked and unlocked and connected with the handle and showing the clutch mechanism in a locking position; Fig. 7 is a similar view of the

same parts showing the clutch mechanism in position to connect the handle with the bolt operating mechanism; and Fig. 8 is a vertical sectional view through the lower portion of one of the doors, the threshold and sill and the lower bolt and casing.

Referring more particularly to the drawings, 1 and 2 represent the double doors. In the door 1 is formed a mortise 3 in which is arranged a mortise case 4 containing a locking bolt 5 for fastening the two doors together and also containing means for operating said bolt. Arranged through the door and the mortise case is a bolt operating shaft 6 on which within the mortise case is fixedly mounted a bolt operating lever 7, said lever having a curved or rounded outer end 8 which is adapted to be engaged with a notch 9 in the bolt 5 as clearly shown in Fig. 5 of the drawings.

In the inner side of the door 1 is arranged a casing 10 in which is revolubly mounted a bolt operating mechanism comprising a hub 12 on which is formed opposite radially projecting bolt operating levers 13, the ends of which are curved or rounded and are adapted to engage the slidably mounted operating bars 14 and 15 arranged in said casing 10. The upper end of the bar 14 projects through a guide bearing 16 on the upper side of the casing 10 and has detachably connected thereto an operating rod 17, the outer end of which is detachably connected with an upper fastening bolt 18 which is slidably mounted in a suitable casing 19 secured to the inner side of the door adjacent to its upper edge. The bolt 18 is adapted to be projected into and retracted from a suitable keeper 20 arranged in the upper cross bar of the door frame.

The bar 15 projects through a suitable guide bearing 21 on the lower edge of the casing 10 and has detachably connected thereto an operating rod 22, the lower end of which is connected to a lower fastening bolt 23 which is slidably mounted in a suitable casing 24 secured to the side of the door adjacent to its lower edge. The bolt 23 is adapted to be operated to engage a keeper 25 arranged in the threshold and sill of the door-way. In order that the bolts 18 and 23 may reciprocate freely in their respective casing and keepers, I preferably provide in the outer portions of the casings 19 and 24

pairs of bearing rollers 26 and in the keepers 20 and 25, I provide bearing rollers 27. The ends of the bolts 18 and 23 work between said pairs of rollers thus preventing friction between the bolts and their casings.

The operating rod 22 for the lower bolt is considerably shorter than the rod 17 of the upper bolt so that the weight of the upper bolt and rod is greater than the lower bolt and its connecting rod and in order to compensate for the difference in the weight, I preferably form the lower bolt 23 with a hollow body portion in which is adapted to be placed lead in sufficient quantity to equalize the weight of the upper and lower bolts and their connections.

The hub 12 of the bolt operating mechanism projects through the opposite sides of the casing 10 and on the outer projecting end of the hub is arranged a disk 28 and connected to said outer end of the hub is an inner operating handle 29, said handle being preferably secured to the end of the hub by a cap screw 30 which passes through the inner end of the handle and a screw threaded aperture in the outer end of the hub, as clearly shown in Fig. 3 of the drawings.

On the outer side of the door 1 is arranged a suitable casing 31, in the inner end of which is screwed a stationary member of a three member clutch mechanism, said clutch member comprising a circular plate or disk 32 having on its inner side an apertured boss 33 which is set into the outer side of the door, as shown. The disk or plate 32 is provided on its lower edge with an outwardly projecting segmental flange 34 which extends approximately one-half way around the lower portion of the plate. The intermediate member of the clutch device comprises a plate or disk 35 having on its upper edge a right-angular outwardly projecting segmental flange 36 said flange extending approximately one-half way around the upper portion of the plate 35, as shown. On the inner side of the plate or disk 35 is formed a rearwardly projecting hub 37 which projects through and has a bearing in the apertured boss 33 of the plate 32. In the hub 37 is formed a squared recess with which the outer end of the shaft 6 is engaged, the opposite end of said shaft being engaged with a squared recess in the inner end of the hub 12 of the bolt operating levers 13. In the flange 36 of the plate 35 is formed a centrally disposed notch 38 while in the flange 34 of the plate 32 is formed a centrally disposed notch 39.

Adapted to be engaged with the plate 35 of the intermediate clutch member is a disk 40 of the outer clutch member. The disk 40 is provided on its inner side with a centering stud 41 which is engaged with a centrally disposed recess 42 formed in the face of the disk 35 of the intermediate clutch

member. To the outer side of the disk 40 is secured a tubular operating shank 43 preferably by screws as 40^a. This shank 43 projects through and works in a tubular extension 44 of the casing 31. Slidably mounted between guide lugs 45 on the outer face of the disk 40 is a locking bar 46, said bar being of slightly greater length than the diameter of the disk 40, whereby one end or the other of the bar projects beyond the edge of the disk 40 and engages either the notch 38 in the flange 36 of the intermediate clutch member or the notch 39 in the flange 34 of the stationary clutch member. When the locking bolt 46 is engaged with the notch 39 of the stationary member of the clutch, the outer clutch member is locked against rotation. When the opposite end of the bar 46 is engaged with the notch 38 in the flange 36 of the intermediate member of the clutch mechanism, the movable parts of the clutch and the shaft 6 may be rotated a distance corresponding with the space between the ends of the flanges 34 and 36. By this movement of the clutch members and the operating shaft 6, the bolt operating levers on said shaft are actuated to simultaneously project or retract the bolts of the door.

In the end of the extension 43 of the outer clutch member is arranged the outside door handle 48, said handle being operatively connected to the extension 43 by a cap bolt 49 which has a screw threaded engagement with the tubular extension, as shown.

The locking bolt 46 is reciprocated between the pairs of guide lugs 45 on the disk 40 by means of a key actuated operating mechanism comprising a cylindrical plug 50 which is mounted to turn in a cylindrical casing 51 forming a part of the casing 31 on the outside of the door. The plug 50 is provided on its inner end with an eccentrically arranged crank pin 52 to which is connected the lower end of a pitman rod 53, the upper end of which is connected to a stud 54 projecting from the outer side of the bolt 46 adjacent to its upper end as clearly shown in Figs. 6 and 7 of the drawings.

The plug 50 is provided with a series of oppositely disposed locking pins 55 which are in sockets 56 formed in the opposite sides of the plug, as shown. The lower ends of the sockets 56 communicate with a key-way 57 formed in the plug whereby when a key is inserted into said key-way, the edges of the key will engage the lower ends of the pins 55 and project the latter outwardly so that their outer ends will be flush with the outer surface of the plug. In the upper side of the casing 51 is arranged a series of locking pins 58 which are slidably mounted in passages provided therefor in the casing and are adapted to drop into the outer ends of the sockets 56 when the key is removed

from the plug thereby locking the plug against rotation in the casing. By this construction the plug can not be turned in either direction unless the key has first been inserted in the key-way to project the pins 55 in the sockets 56 which operation will cause the pins 55 which are opposite to and engaged by the pins 58 to force said pins out of the sockets 56 and back into their own passages thus permitting the plug to be turned by the key. The plug is provided on its inner side with a segmental rib 59 or other suitable baffling projection which is adapted to be engaged by a suitable recess 60 formed in the key whereby none but the proper key can be engaged with the plug to operate the same.

In the operation of the lock, when the plug is in position wherein the locking bar 46 is in engagement with the notch in the flange of the stationary clutch member, the outer portion of the clutch connection between the outside door handle and the operating shaft is locked and cannot be operated by the outside handle. The shaft, however, may be operated at any time by the inside door handle which connects with the shaft through the hub of the bolt operating levers 13. In order to enable the operating shaft to be turned by the handle on the outside of the door, it is necessary to apply the key to the plug to turn the latter into the position to retract the bolt 46 from the locking notch 39 in the flange of the stationary clutch member and to project the opposite end of the bolt into the notch 38 in the flange 36 of the intermediate member of the clutch mechanism, thus connecting the outer clutch member to which the handle is connected with the intermediate member and through said intermediate member with the operating shaft thus enabling said shaft to be turned by the outer handle to operate the bolt actuating levers on the shaft and thereby retract or project the bolts to lock or unlock the door.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

Having thus described my invention, what

I claim as new and desire to secure by Letters-Patent is:

1. In a double door lock, a series of locking bolts, an operating shaft, bolt operating levers arranged on said shaft, an inner door handle operatively connected to said shaft, an outer door handle, a clutch connection between said outer door handle and the outer end of said shaft, said clutch connection comprising an inner stationary clutch member, an intermediate clutch member operatively connected to said shaft, an outer clutch member operatively connected to said handle, and means for effecting a locking engagement between said outer and intermediate clutch members.

2. In a double door lock, a series of locking bolts, an operating shaft, bolt operating levers arranged on said shaft, an inner door handle operatively connected to said shaft, an outer door handle, a clutch connection between said outer door handle and the outer end of said shaft, said clutch connection comprising an inner stationary clutch member, an intermediate clutch member operatively connected to said shaft, an outer clutch member operatively connected to said handle, a locking mechanism between said outer and intermediate clutch members, and key-actuated means for operating said locking mechanism.

3. In a double door lock, a series of fastening bolts, a bolt actuating mechanism, an inner door handle operatively connected thereto, an outer door handle, a clutch connection between said outer door handle and said operating mechanism, said clutch connection comprising an inner stationary clutch member, an intermediate movable clutch member operatively connected with said bolt operating mechanism, an outer clutch member operatively connected with said outer handle, a locking bolt carried by said outer clutch member, a key plug, means whereby said plug is connected with said bolt to reciprocate the latter and thereby lock said outer clutch member into engagement with the intermediate clutch member, and means whereby said key plug is locked against operation.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK LAHR.

Witnesses:

ERWIN L. METTING,
S. H. HOCKENSMITH.