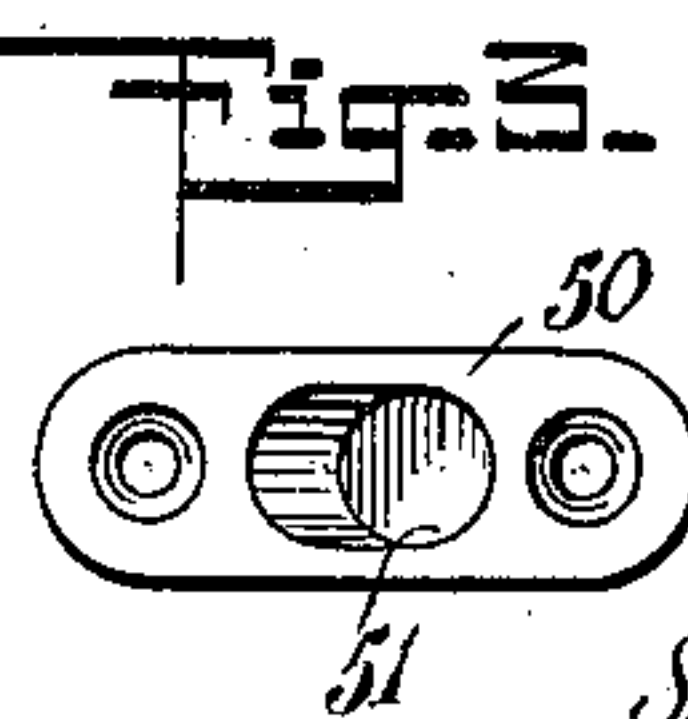
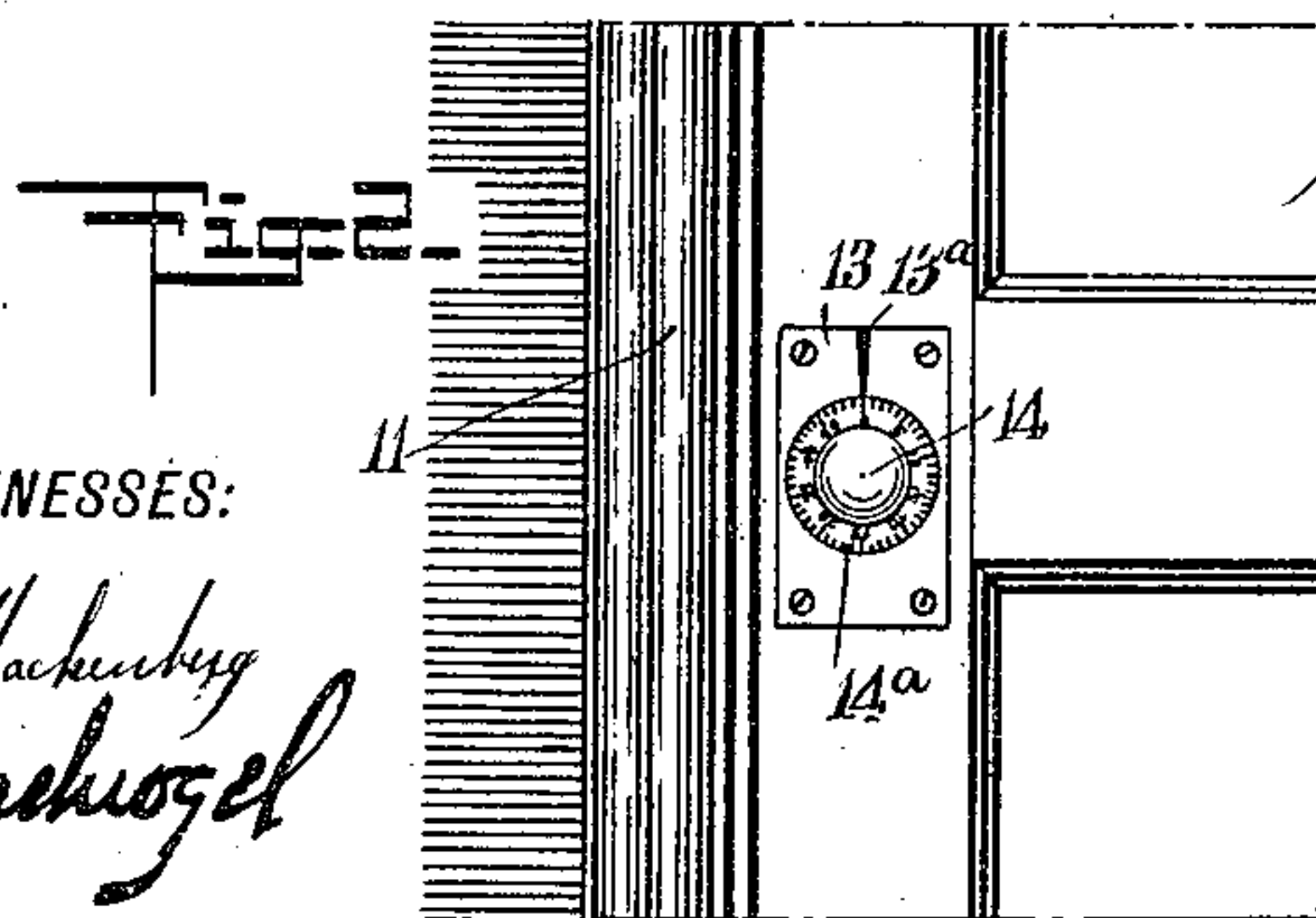
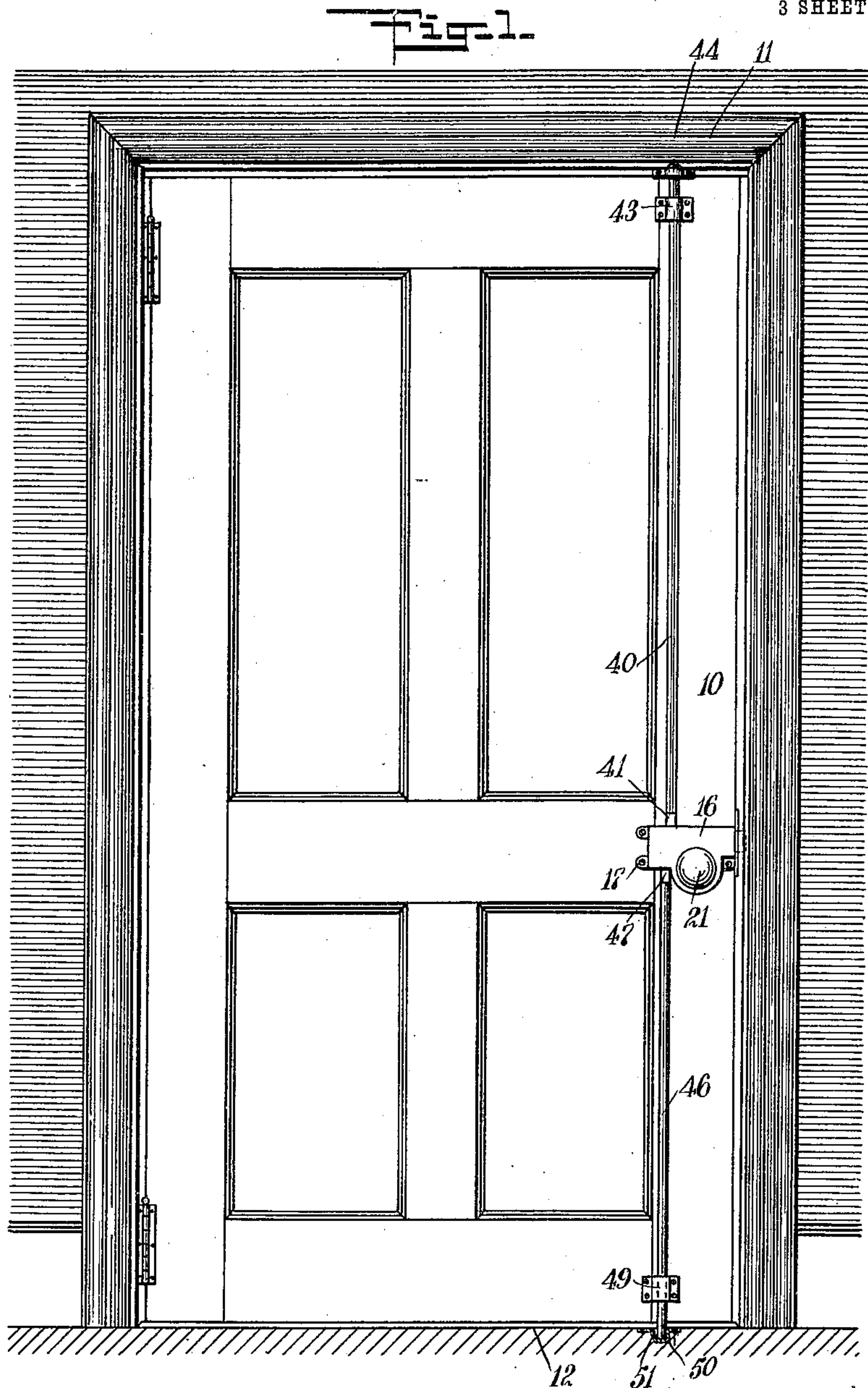


S. N. FRIEDMAN.  
BOLT MECHANISM FOR DOORS.  
APPLICATION FILED JAN. 6, 1910.

993,235.

Patented May 23, 1911.

3 SHEETS—SHEET 1.



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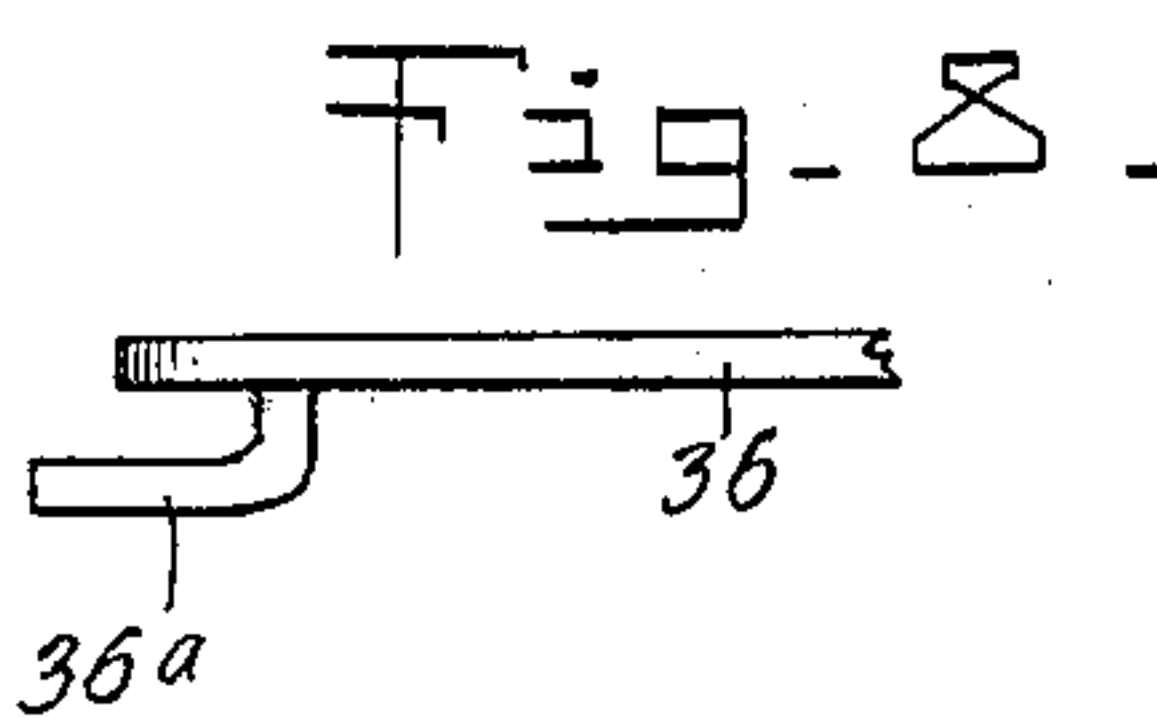
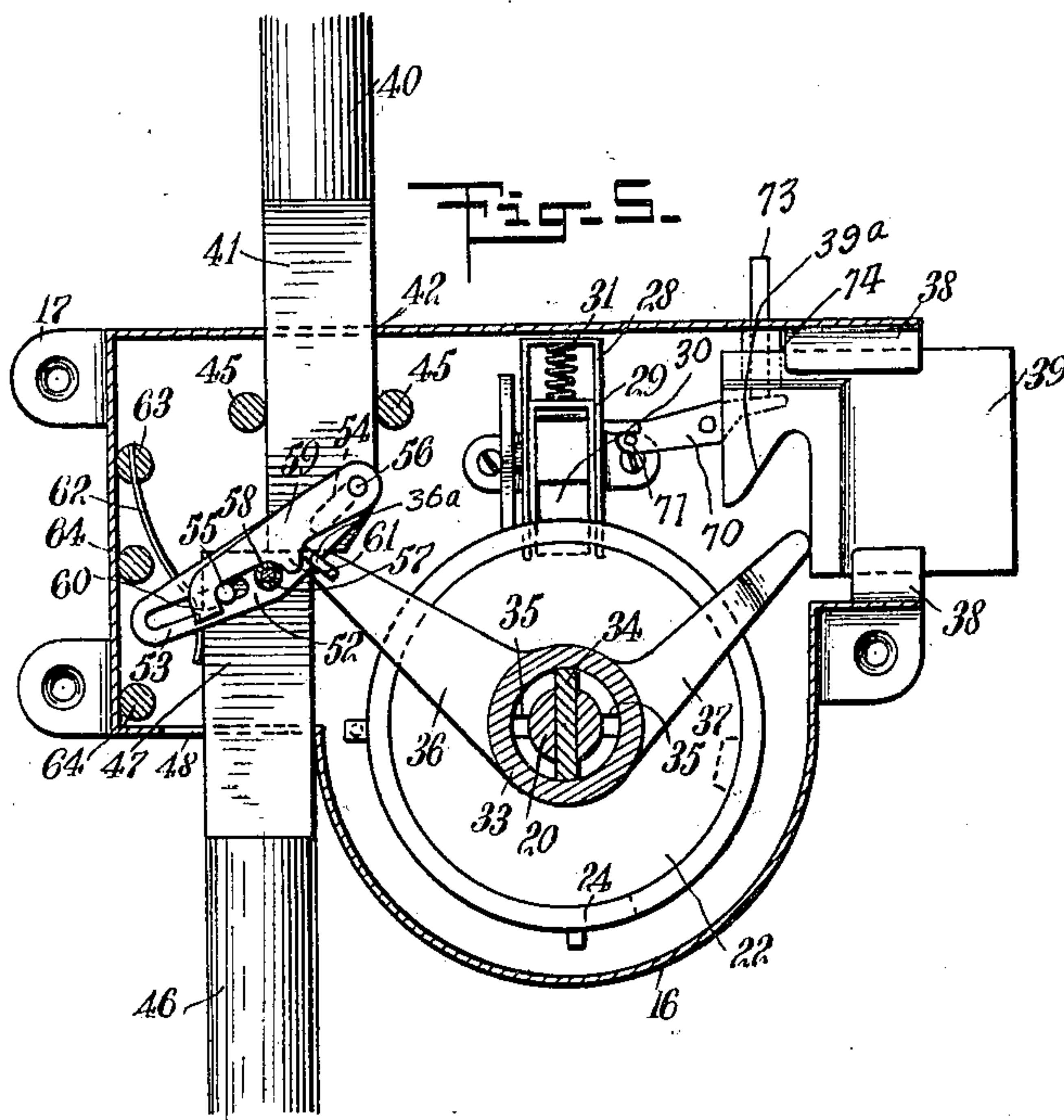
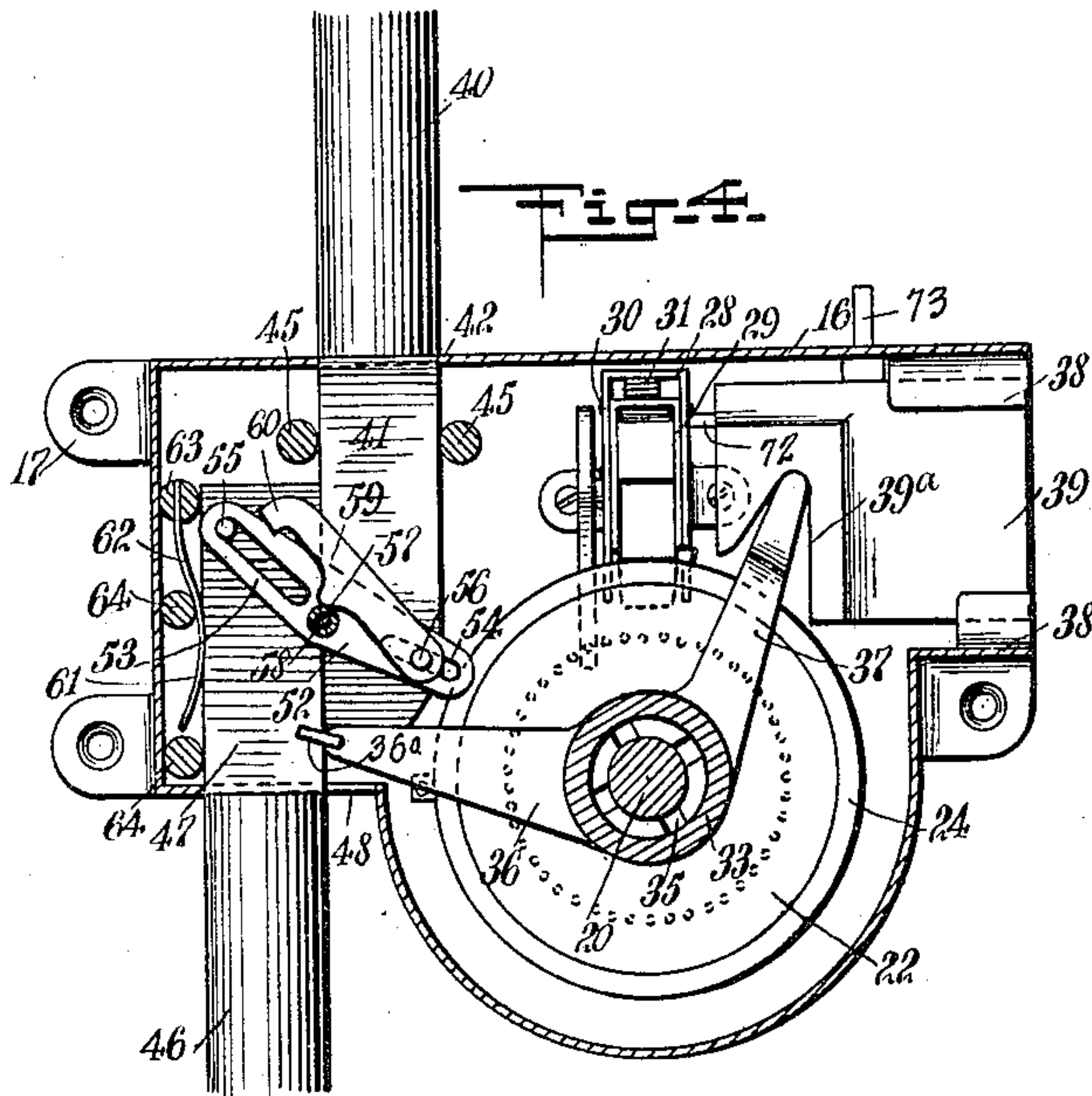
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3 SHEETS—SHEET 2.



WITNESSES:

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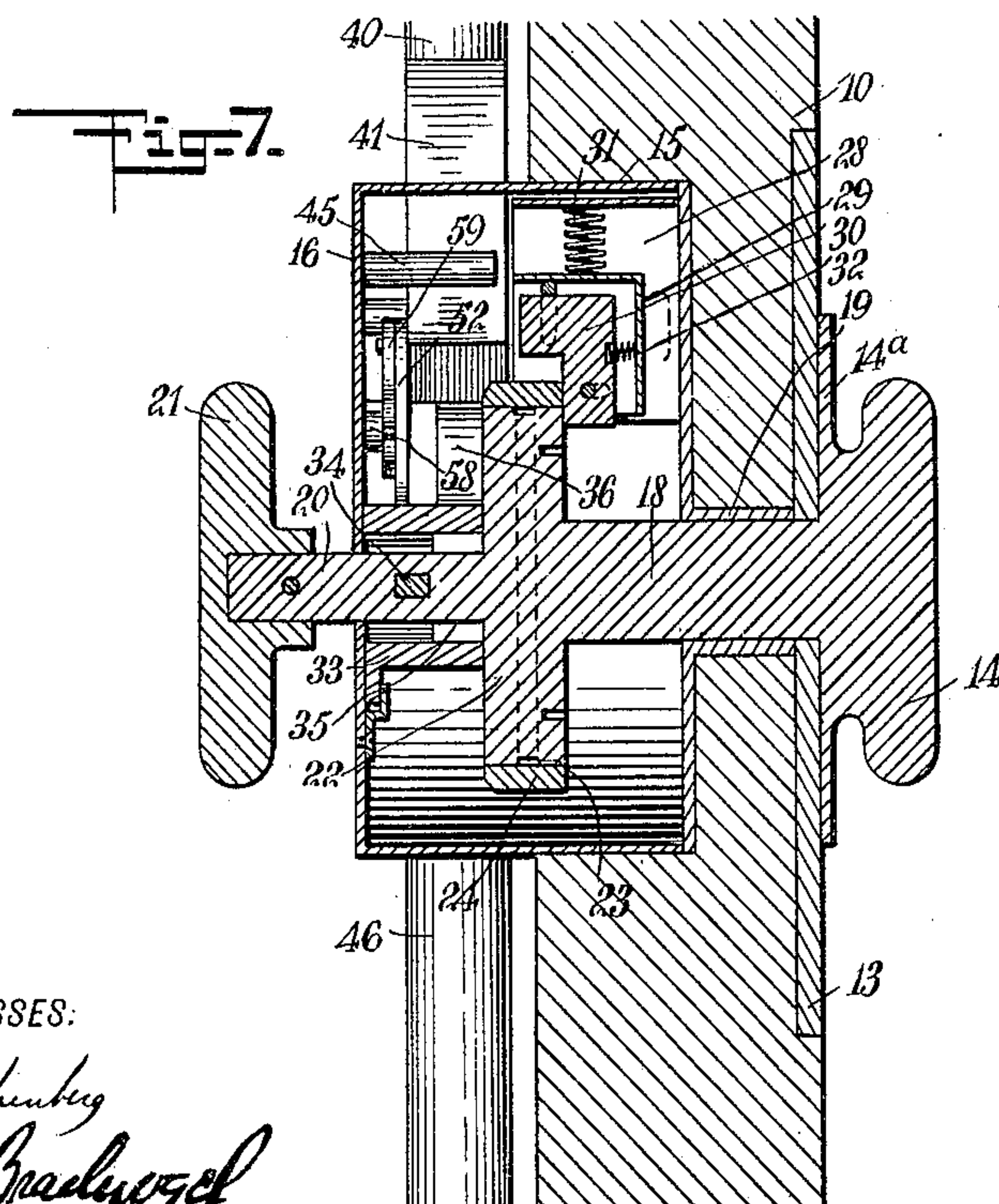
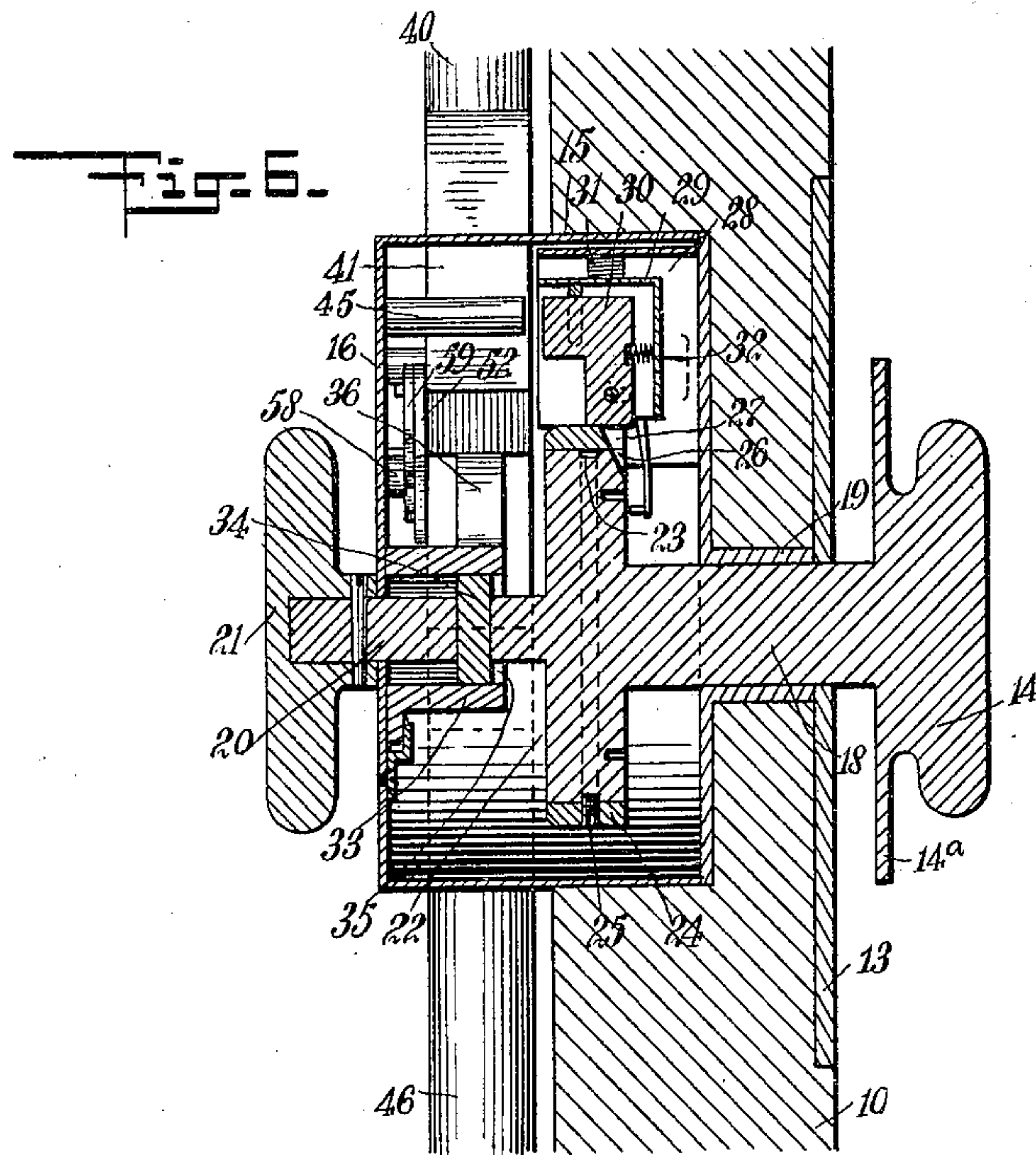


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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

SAMUEL N. FRIEDMAN, OF NEW YORK, N. Y.

## BOLT MECHANISM FOR DOORS.

993,235.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed January 6, 1910. Serial No. 536,642.

*To all whom it may concern:*

Be it known that I, SAMUEL N. FRIEDMAN, a subject of the German Emperor, and a resident of the city of New York, borough  
5 of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Bolt Mechanism for Doors, of which the following is a full, clear, and exact description.

10 This invention relates to bolt mechanisms for securing doors and the like, and has reference more particularly to a device of this kind provided with locking bars, and means for projecting and retracting the bars, the  
15 bars when projected being alined and engaging end to end.

The object of the invention is to provide a simple, strong and durable bolt mechanism which can be used with doors or other clo-  
20 sures of different kinds, which can be easily manipulated, an unauthorized unlocking of which can not be accomplished without great difficulty, which can be controlled by means of a suitable computation or permutation  
25 device, and which can be easily mounted in position upon, and removed from, a door or the like.

The invention consists in the construction and combination of parts to be more fully  
30 described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of ref-  
35 erence indicate corresponding parts in all the views, and in which—

Figure 1 is a rear elevation of a door having an embodiment of my invention applied thereto; Fig. 2 is a front elevation of a part  
40 of the door, showing the outside of the bolt mechanism; Fig. 3 is a plan view of a keeper or socket employed with my bolt mechanism; Fig. 4 is a longitudinal section of the device; Fig. 5 is a similar view showing cer-  
45 tain of the parts in different positions; Fig. 6 is a transverse section of the device; Fig. 7 is a similar view showing certain of the parts in different positions; and Fig. 8 is an enlarged fragmentary plan view of a  
50 detail of construction.

Before proceeding to a more detailed explanation of my invention, it should be clearly understood that while certain of the improved features shown in the present  
55 form of my bolt mechanism can be advantageously employed with the lock disclosed in

my United States Patent No. 952,797, they can also be used in connection with other forms of locks. I have reference more particularly to the locking bars which, when  
60 projected, are alined, and thus assist in securing each other against accidental displacement or unauthorized retraction, and means for operating them, as will appear more clearly hereinafter. 65

Certain of the details of construction form no part of my invention and can be altered in accordance with individual preference and special conditions, without departing  
70 from the underlying spirit of the invention.

Referring more particularly to the drawings, I have shown, for example, an ordinary door 10 mounted in the door frame 11, and when closed, arranged above the sill 12. The door, at the customary place, has the lock  
75 mounted thereon presenting at the outer side of the door an escutcheon 13 on which appears the knob 14 having integral therewith a dial 14<sup>a</sup>. Upon the dial are engraved or otherwise indicated scale graduations and  
80 numerals by means of which the combination is operated. The escutcheon has a mark 13<sup>a</sup> which coöperates with the dial in the usual manner. At the inner side of the door  
85 is a recess 15 in which is mounted the lock case 16 preferably provided with laterally disposed ears 17 by means of which it is screwed or otherwise fastened to the door.  
The lock spindle 18, preferably integral with the knob, is rotatably mounted in a sleeve  
90 19 positioned in an opening of the door, and extends into the case, having an extension 20, preferably of round cross section, which projects through the rear wall of the case and carries the inner knob 21 mounted there-  
95 on in any suitable manner.

The spindle 18 adjacent to the extension 20 carries a tumbler wheel or disk 22 having a peripheral groove 23 and carrying a tumbler ring 24 which has a set screw 25  
100 movably engaging in the groove 23. It will be understood that the tumbler ring is movable peripherally with respect to the tumbler disk, and coöperates with the latter as is set forth in my above-referred to pat-  
105 ent. The tumbler disk and the tumbler ring have respectively, notches 26 and 27. A U-shaped guide bracket 28 is mounted within the case and movably carries a shoe 29 in which is positioned a block 30 having  
110 a limited guided movement. The shoe and the block are held respectively by springs



31 and 32, and which are like the corresponding elements in the form of my lock shown in the patent referred to above. The block controls the tumbler disk and ring, so that when the notches 27 and 26 are alined and are in predetermined positions, the spindle can be moved in the direction of its length, as in that case the block slides upward through the inclined grooves and is displaced with the shoe 29, against the tension of the spring 31.

A hub 33 is movably mounted upon the extension 20 of the spindle within the case. The extension has a transverse keeper 34 mounted in an opening thereof, with the ends projecting laterally. The hub at the inner end, has slots or recesses 35 each adapted to receive an end of the keeper 34, when the spindle is in a predetermined position shown in Fig. 6, that is, when the tumbler disk and the tumbler ring have been positioned so that their notches are alined to permit the movement of the spindle in the direction of its length. This movement is effected by pulling outward upon the knob 14. It will be understood that when the spindle is pulled outward, the hub 33 is constrained to turn with the spindle. It has two substantially opposite, preferably tapered arms 36 and 37, which are rigid therewith, and which serve purposes to appear hereinafter.

At one end, the lock case has an opening at which are mounted guides 38. Between the guides is slidably mounted a bolt 39 having at the inner end a recess 39<sup>a</sup> adapted to receive one of the arms 36, 37, so that when the hub is turned by means of the spindle, the bolt can be projected or retracted into operative or inoperative positions.

I employ a locking bar 40 having the lower end 41, which is preferably of angular cross section, extending movably into the lock case through an opening 42. The bar 40 is mounted to slide in a guide bracket 43 fastened upon the door and when projected has the upper end seating in a socket or keeper 44 mounted upon the door-frame at the top thereof. Within the lock case are spaced guide pins 45, between which the bar slides. A similar locking bar 46 has an end 47 preferably of angular cross section extending movably through an opening 48 into the case, and extends movably through a guide bracket 49 mounted upon the inner side of the door near the bottom thereof. A socket member 50 is set into a recess of the door-sill and has a depression or pocket 51 adapted to receive the lower end of the bar 46. One side of the pocket or depression is inclined so that when the end of the bar is forced into the socket, the bar is laterally displaced by the engagement of the end thereof with the inclined face of the pocket.

The adjacent ends of the bars are operatively connected by a link 52 which at the ends has slots 53 and 54 receiving respectively, pins 55 and 56 of the bars. The link is pivoted by means of a suitable pivot pin 57 carrying a sleeve 58, to a wall of the case. A dog 59 is movably mounted at one end upon the pin 56 and at the free end has a laterally disposed hook or nose 60 and intermediate its ends a cam projection 61. The dog serves a purpose which will be set forth hereinafter. A leaf-spring 62 has one end secured to a support 63 within the case and engages at the side of the end 47 of the locking bar 46, tending normally to force the locking bar toward the spindle. Stop guides 64 are mounted within the case and serve to limit the lateral movement of the locking bar 46 and to direct its movement in the direction of its length.

It will be understood that the bar 40 is slidable in the direction of its length, while the bar 46 is capable not only of this movement but also of a bodily, lateral one. In this way the bars when projected in the operative, locking positions, are alined, and engage end to end, so that they thereby are held against accidental or unauthorized displacement. In order to open the lock, the proper combination can be set by means of the knob and the dial, and the spindle then pulled out so that the keeper 34 engages the recesses 35. The hub can then be turned so that the arm 37 retracts the bolt 39 and the arm 36 pushes the locking bar 46 laterally against the tension of the spring 62. This displaces the bars from alinement, and owing to their operative connection by means of the link 52, which is pivoted at a fixed point of the case, causes them to be moved inward and downward into the inoperative positions, out of engagement with their respective sockets. The dog 59, when the bars are projected, is positioned with its hook or nose 60 in engagement at the pin 55 of the bar 46, to hold the bars against lateral displacement.

The arm 36 has an offset finger 36<sup>a</sup>, which extends outwardly beyond the link 52 and the dog 59, to engage the cam projection 61, so that when the arm 36 is actuated, the dog 59 can be displaced to permit the lateral movement of the bar when the dog is disengaged from the pin 55. The arm 36 has a certain amount of play so that the offset finger 36<sup>a</sup> can operate to release the dog 59 before the latter begins to force the bar 46 transversely of its length. The lateral movement of the bar 46 is limited by the stop guides 64. It will be understood that the retracting movement of the locking bars is assisted gravitationally as the bar 40 is heavier than the bar 46 and thus tends to move downward and pull the bar 46 upward by means of the link 52.



To project the bars, the spindle is turned in an opposite direction, and the upward movement of the arm 36 raises the bar 40, and the latter through the link 52, projects the bar 46. The spring 62, at the same time moves the bar 46 laterally into a position under the bar 40, as is shown most clearly in Fig. 5.

To permit the lock to be operated from the inside of the door I employ a lever 70 pivoted within the lock casing, and having a lateral extension 71 engaging a stud 72 of the block 30. A manually-operable pin 73 is movably mounted in a guide 74 within the casing, and projects from the casing, so that it can be depressed. At the lower end it engages the lever 70 so that when the pin is depressed, the lever is actuated to raise the block 30, to release the tumbler ring, so that the lock can be opened without setting up the combination. The knob 21 at the inner side of the door, after the push pin 73 is operated, is pulled out to bring the spindle into operative engagement with the hub, *i. e.*, to carry the ends of the keeper 34 into the slots or recesses 35.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

1. A bolt mechanism comprising locking bars, means for projecting said bars lengthwise into locking position, and means for bodily moving one of said bars into substantial alinement with the other of said bars after said bars have been projected, whereby said bars will directly engage each other.

2. A bolt mechanism comprising locking bars, means for projecting and retracting said bars, and means for bodily moving one of said bars after said bars have been projected, whereby said bars will engage end to end.

3. A bolt mechanism comprising locking bars, means for projecting said bars lengthwise into locking position, and means for bodily moving one of said bars transversely of its length after said bars have been projected, whereby said bars will be substantially alined and will engage end to end.

4. A bolt mechanism comprising movable locking bars, a link operatively connecting said bars, and means for projecting and retracting said bars, said bars when projected, engaging end to end.

5. A bolt mechanism comprising a locking bar movable in the direction of its length, a second locking bar movable in the direction of its length and transversely of its length, whereby said bars are adapted to engage end to end when projected into locking positions, a manually-operable spindle, an arm controlled by said spindle and adapted to engage one of said bars to project the same, said bars having an opera-

tive connection, whereby a movement of one in the direction of its length effects a corresponding movement of the other, and means for moving said second bar transversely of its length.

6. A bolt mechanism comprising a case, a spindle, an arm controlled by said spindle, locking bars having parts guided in said case, and a link operatively connecting said bars, said link being pivoted to said case, said arm being adapted to engage one of said bars to move it in the direction of its length, said bars when projected engaging end to end.

7. A bolt mechanism comprising a locking bar movable in the direction of its length, a second locking bar movable in the direction of its length and transversely of its length, a spring tending to move said second locking bar transversely of its length in one direction, an operative connection between said bars whereby the movement of one in the direction of its length effects a corresponding movement in the other, and normally operable means for moving one of said bars in the direction of its length.

8. A bolt mechanism comprising a locking bar movable in the direction of its length, a second locking bar movable in the direction of its length and transversely of its length, a spring tending to move said second locking bar transversely of its length in one direction, a link pivotally movable about a fixed fulcrum and operatively connected with each of said bars, and a manually controllable arm adapted to move said first locking bar in the direction of its length.

9. A bolt mechanism comprising a case, a spindle journaled in said case and having at the outside thereof a knob whereby it can be manipulated, locking bars having parts slidably mounted in said case, one of said bars being movable transversely of its length, a link operatively connecting said bars and pivoted to said case, a spring engaging one of said bars and normally forcing it transversely of its length toward the other of said bars, and an arm controlled by said spindle and adapted to engage one of said bars to project it.

10. A bolt mechanism comprising locking bars mounted to slide and adapted to be projected and retracted, said bars when retracted having parts positioned side by side and when projected engaging end to end and in substantial alinement, and means for projecting and retracting said bars.

11. A bolt mechanism comprising locking bars mounted to slide and adapted to be projected and retracted, said bars when retracted having parts positioned side by side and when projected engaging end to end and in substantial alinement, a link operatively connecting said bars, and a manually operable spindle having an arm controlling one



of said bars to project the same, said last-mentioned bar tending gravitationally to assume a retracted position.

12. A bolt mechanism comprising locking bars mounted to slide and adapted to be projected and retracted, said bars when retracted having parts positioned side by side and when projected engaging end to end and in substantial alinement, a link operatively connecting said bars and having a fixed pivotal point, a spring normally pressing one of said bars transversely of its length toward the other of said bars, and a manually-operable spindle having an arm controlling one of said bars to project the same, said last-mentioned bar tending gravitationally to assume a retracted position.

13. A bolt mechanism comprising locking bars mounted to slide and adapted to be projected and retracted, said bars when retracted having parts positioned side by side and when projected engaging end to end and in alinement, a movable member controlling one of said bars, a manually-operable spindle normally inoperative with respect to said member and movable into operative engagement therewith, and an operative connection between said bars.

14. A bolt mechanism comprising slidable locking bars adapted to engage end to end when projected, an operative connection between said bars whereby a movement of one of said bars in the direction of its length effects a corresponding movement in the other of said bars, a manually-operable rotatable spindle movable in the direction of its length, a hub associated with said spindle and normally inoperative with respect thereto, said spindle having a part adapted to engage said hub, operatively to connect said hub and said spindle when said spindle is moved into a predetermined position, and an arm carried by said hub and adapted to project one of said bars.

15. A bolt mechanism comprising slidable locking bars, an operative connection between said bars, a rotatable spindle movable in the direction of its length and manually operable, a hub loosely mounted upon said spindle, said spindle having a keeper adapted to be brought into operative engagement with said hub to secure said spindle and said hub together, an arm rigid with said hub and operatively engaging one of said bars, and a spring normally forcing one of said bars toward said arm, one of said bars being movable transversely of its length, whereby said bars when projected can engage end to end.

16. A bolt mechanism comprising a locking bar movable in the direction of its length, a second locking bar movable in the direction of its length and transversely of its

length, a link operatively connecting said bars, a dog movably associated with one bar and adapted to hold the other bar against displacement when said one bar is in a predetermined position, and means for projecting and retracting said bars.

17. A bolt mechanism comprising a locking bar movable in the direction of its length, a second locking bar movable in the direction of its length and transversely of its length, a spring tending to move said locking bar transversely of its length in one direction, a link pivotally movable about a fixed fulcrum, said bars having pins engaged by said link, one of said bars having a dog adapted to engage said pin of the other of said bars to hold said bars relative to each other, said dog being movable into an inoperative position when said bars are retracted, and means for projecting and retracting said bars.

18. A bolt mechanism comprising locking bars mounted to slide and adapted to be projected and retracted, said bars when retracted having parts positioned side by side and when projected engaged end to end and in substantial alinement, means for projecting and retracting said bars, and a dog movably associated with one of said bars and adapted to hold said bars relatively fixed when said bars are projected, said dog having means whereby it rides into an inoperative position when said bars are being retracted.

19. A bolt mechanism comprising a case, a locking bar slidably mounted and having a part guided within said case, a second locking bar slidably mounted and having a part guided within said case, said bars when retracted having said parts side by side, a spring engaging one of said bars and forcing the same transversely of its length toward the other of said bars, a link operatively connecting said bars, a fixed pivot pin for said link, a dog pivotally associated with one of said bars and adapted to engage the other of said bars to hold said bars fixed when the same are projected, said dog riding into an inoperative position against said pivot pin when said bars are being retracted, a manually operable spindle, arms operatively associated with said spindle, one of said arms controlling one of said locking bars, and a bolt controlled by the other of said arms.

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

SAMUEL N. FRIEDMAN.

Witnesses:

JOHN K. BRACHVOGEL,  
PHILIP D. ROLLHAUS.