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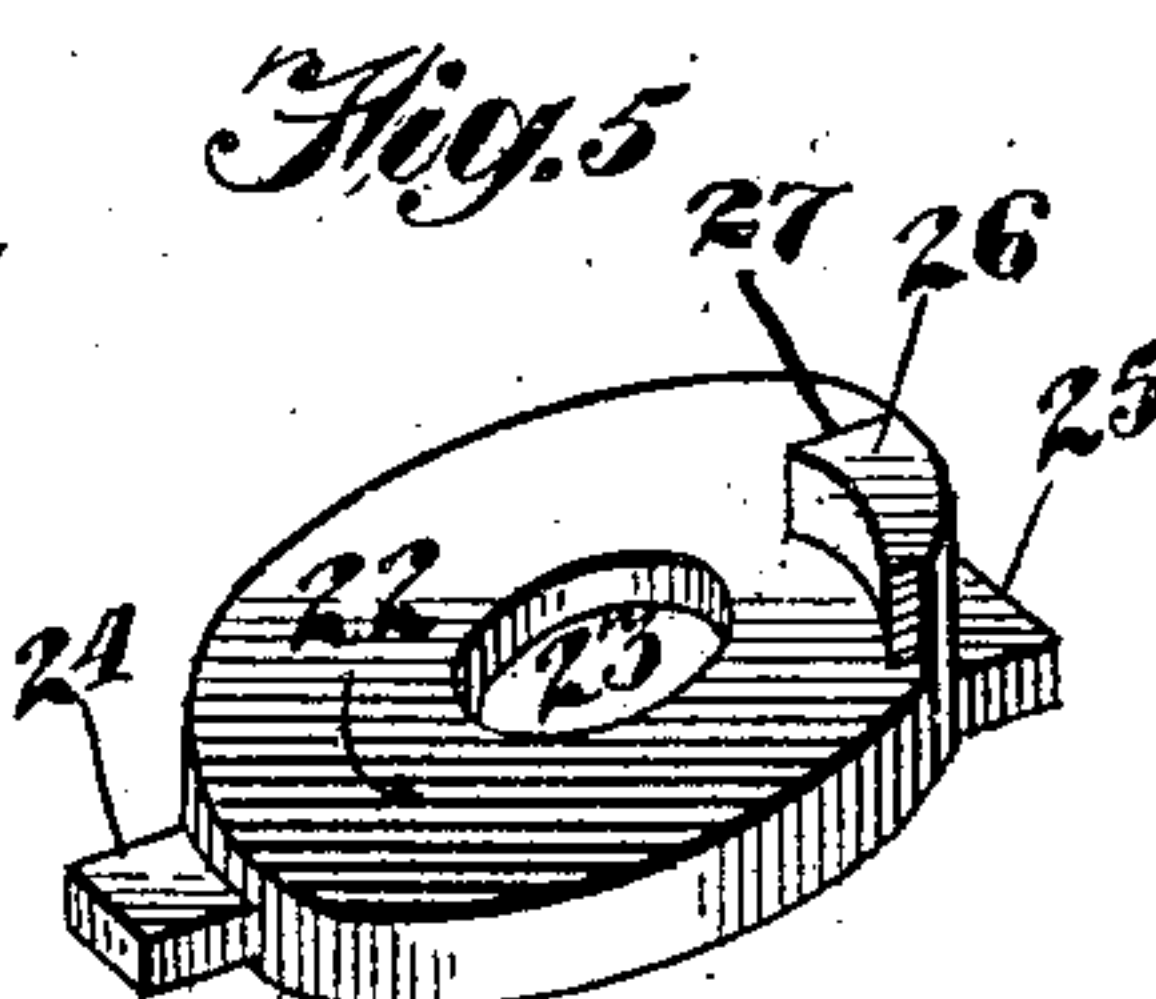
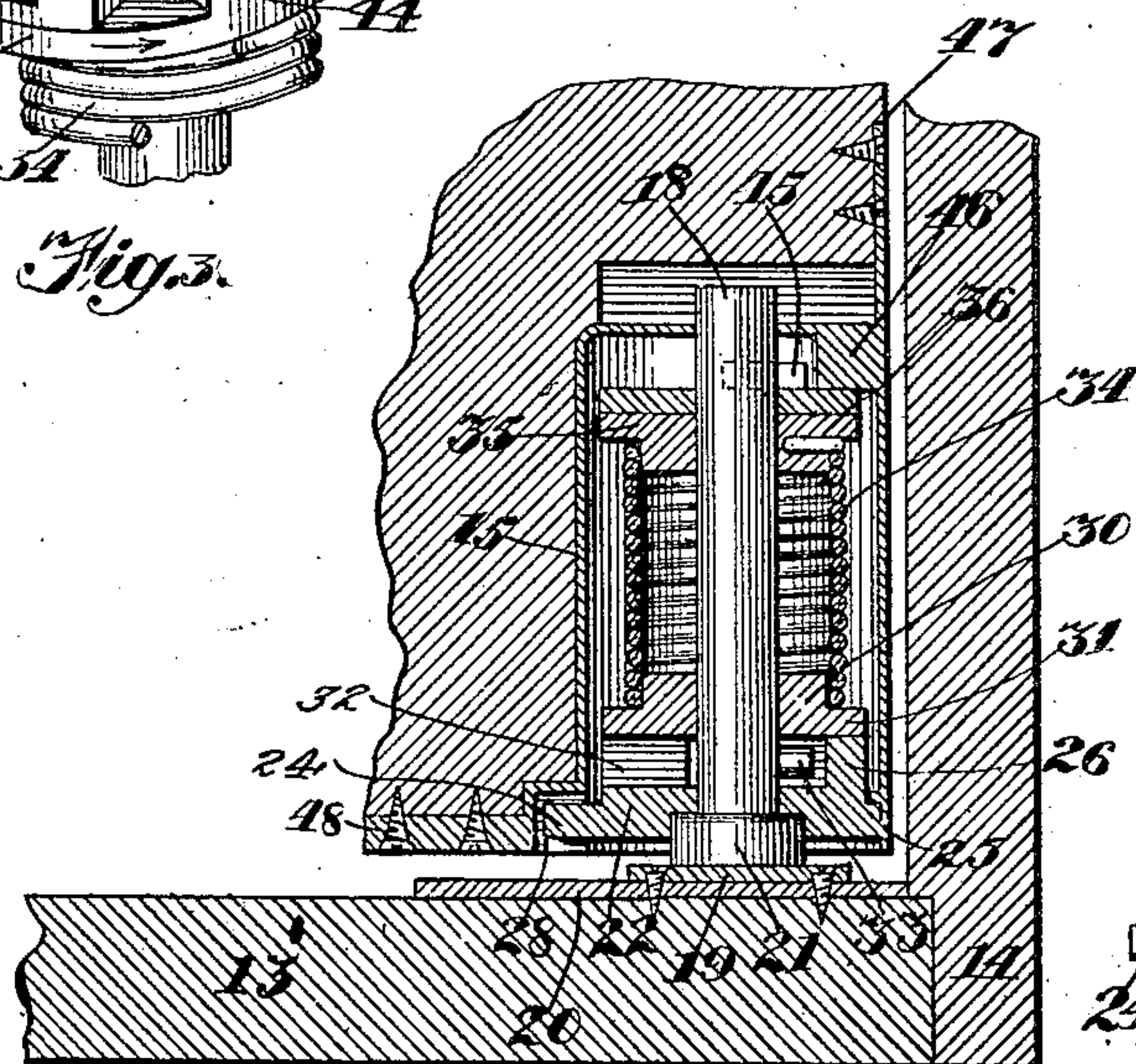
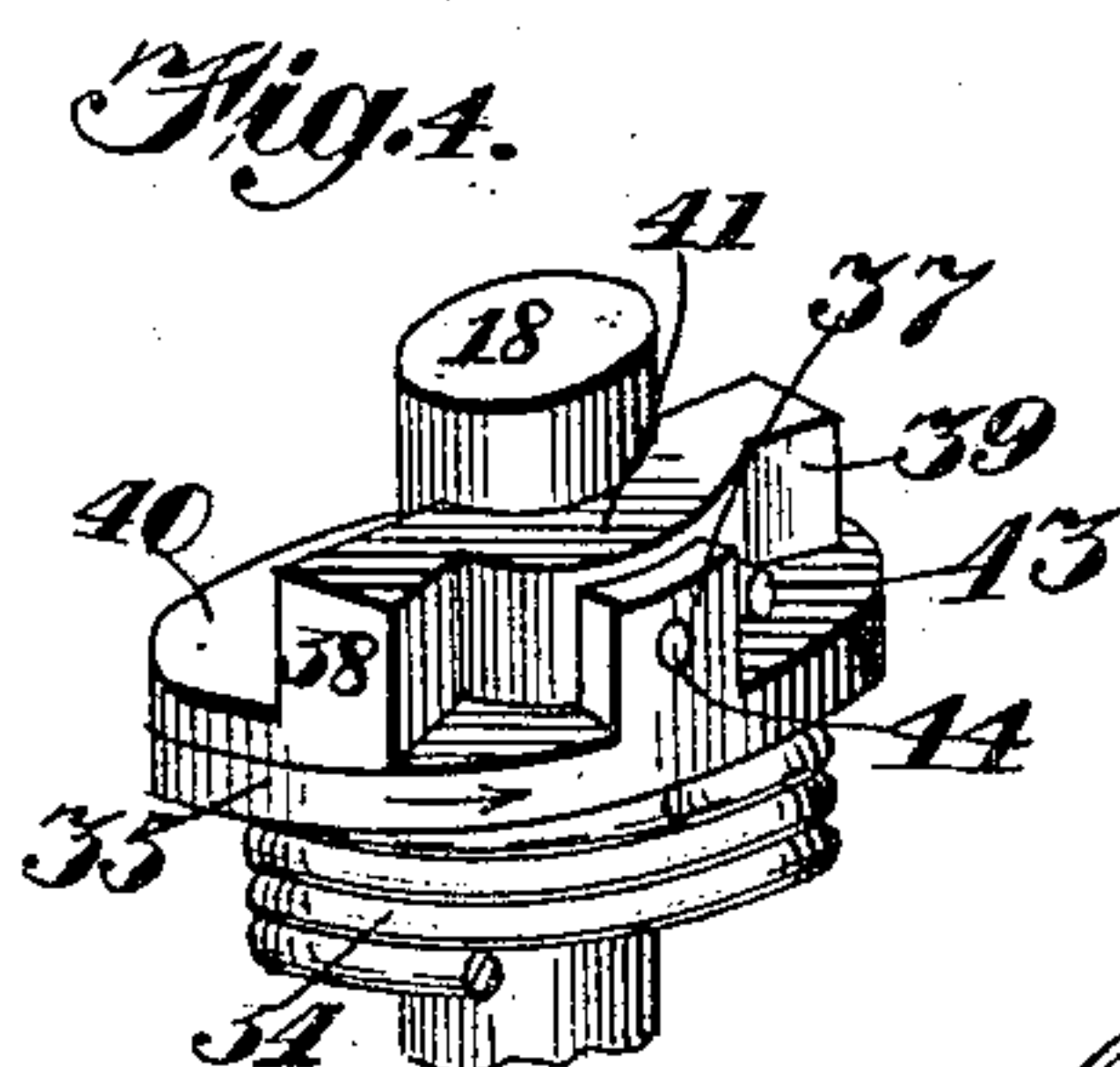
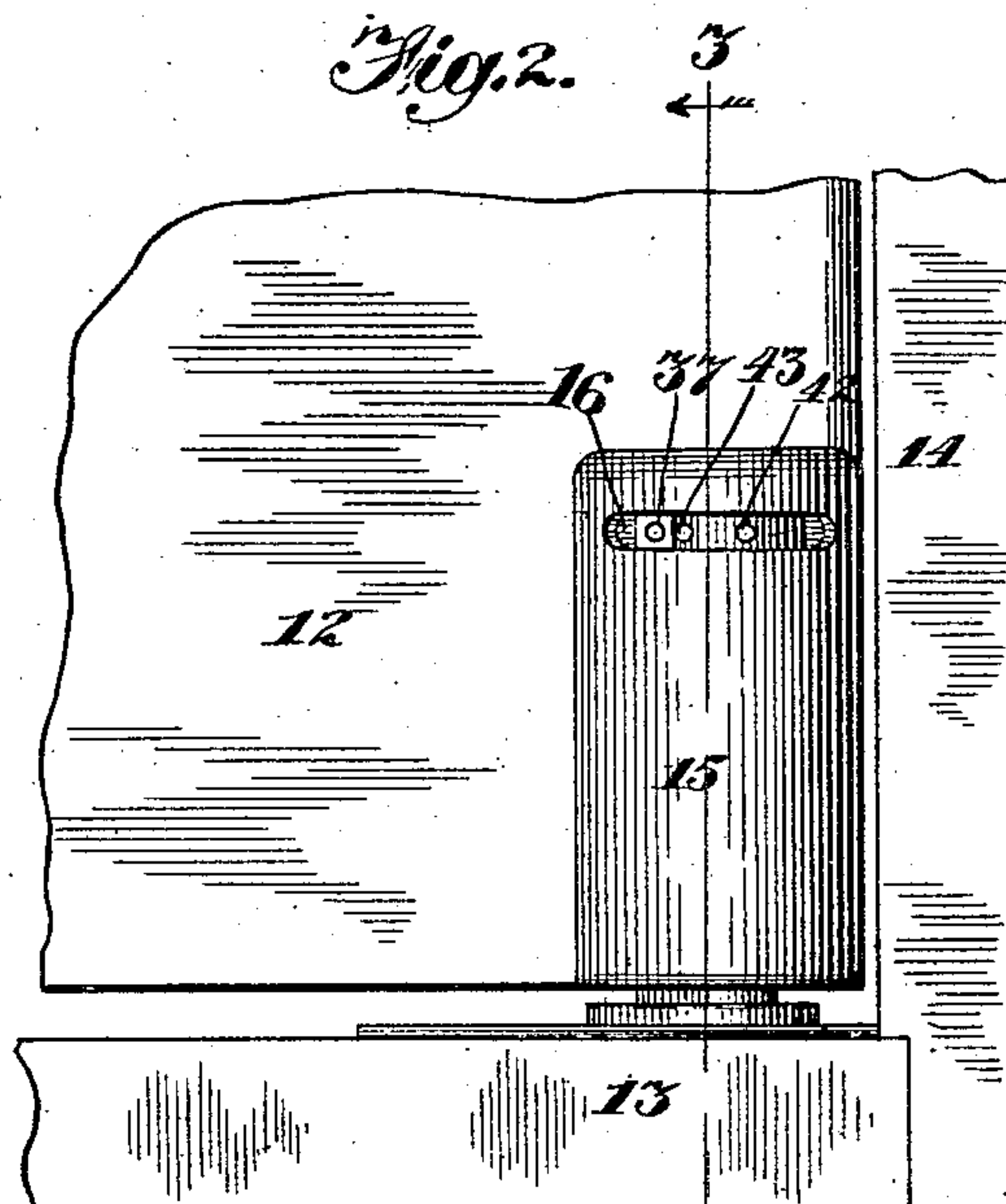
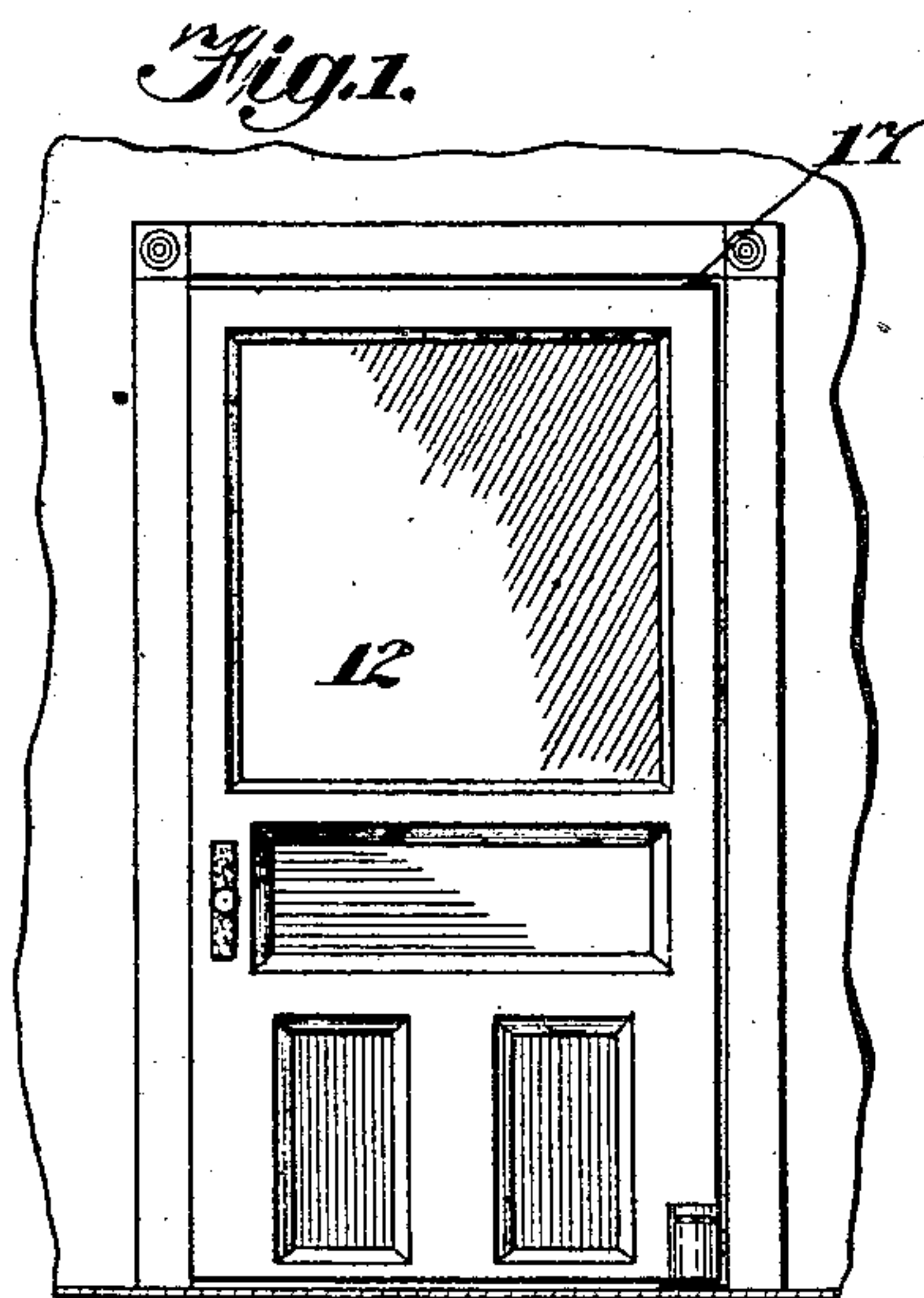
PATENTED MAR. 3, 1908.

A. L. STUMP & F. BRUCKER.

SPRING HINGE.

APPLICATION FILED JAN. 26, 1903.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 8.

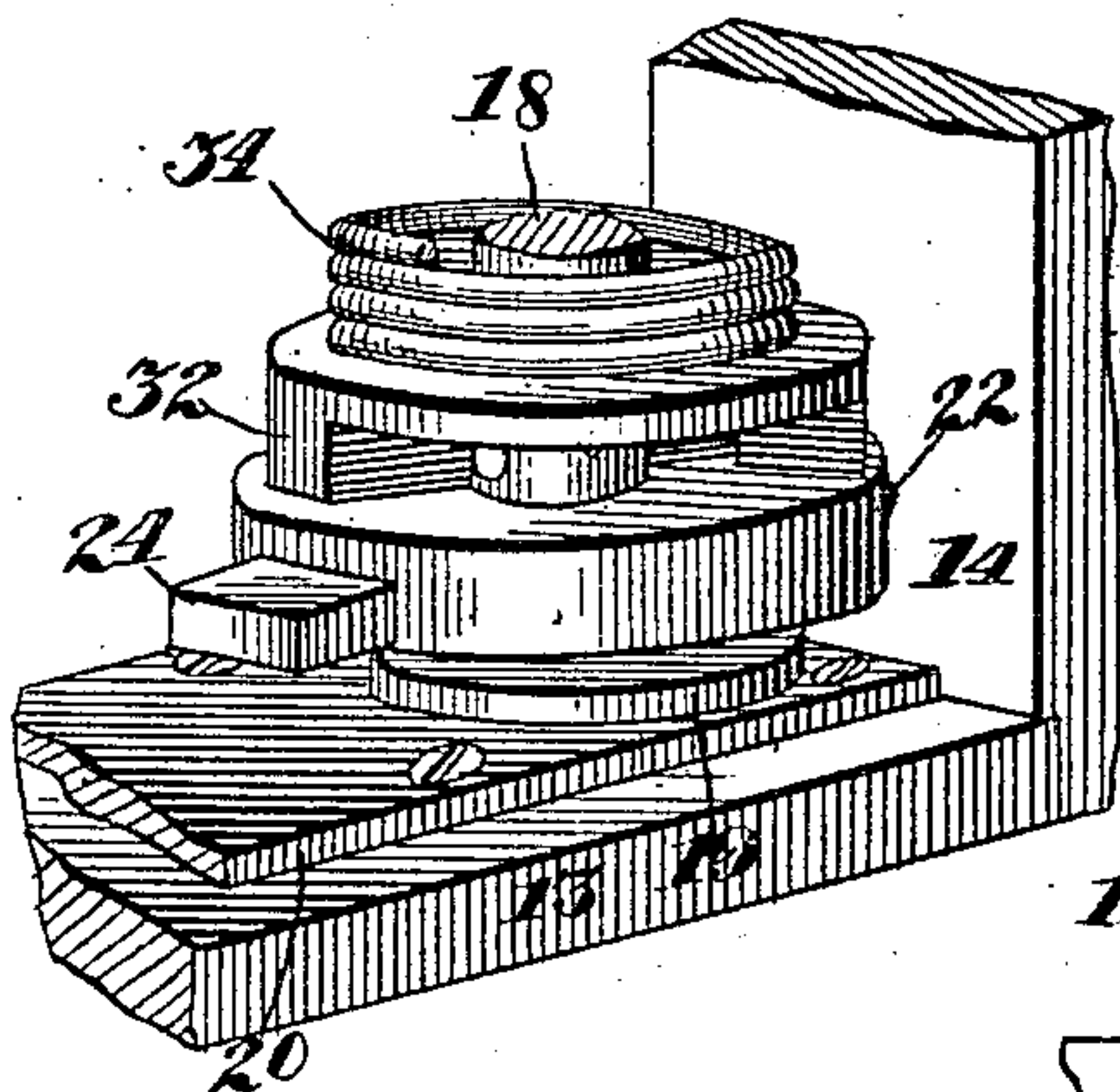


Fig. 7.

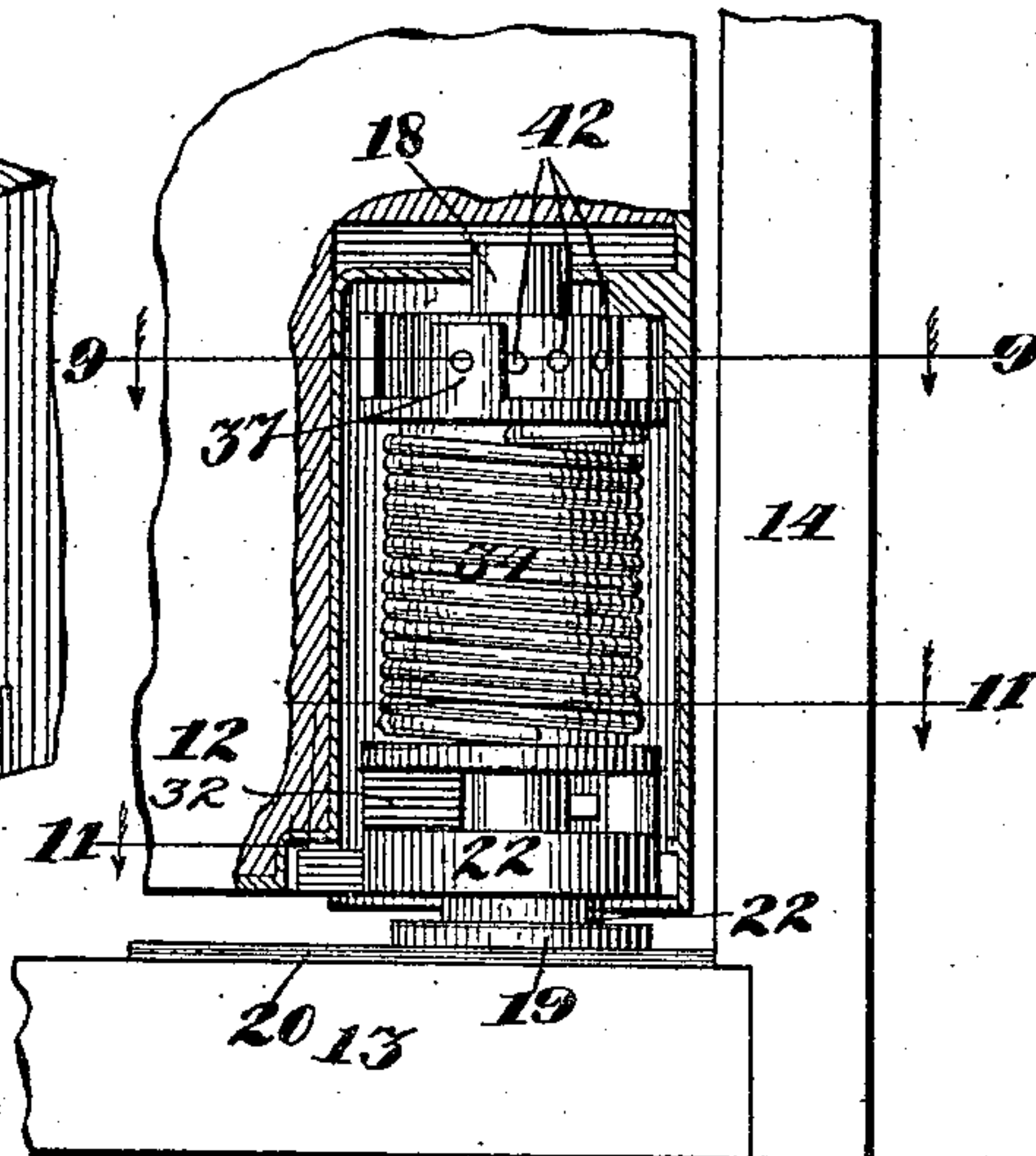


Fig. 9.

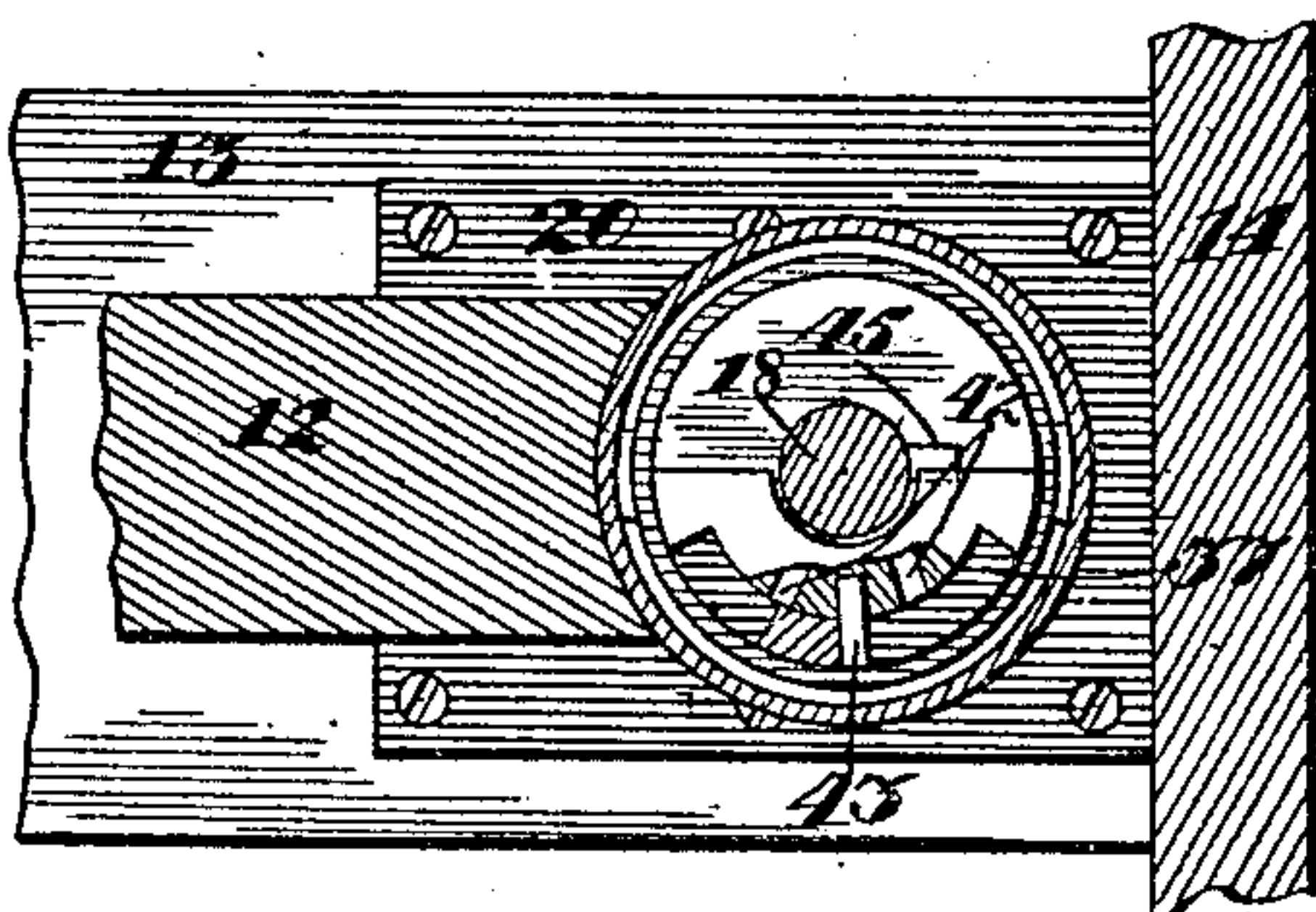


Fig. 10.

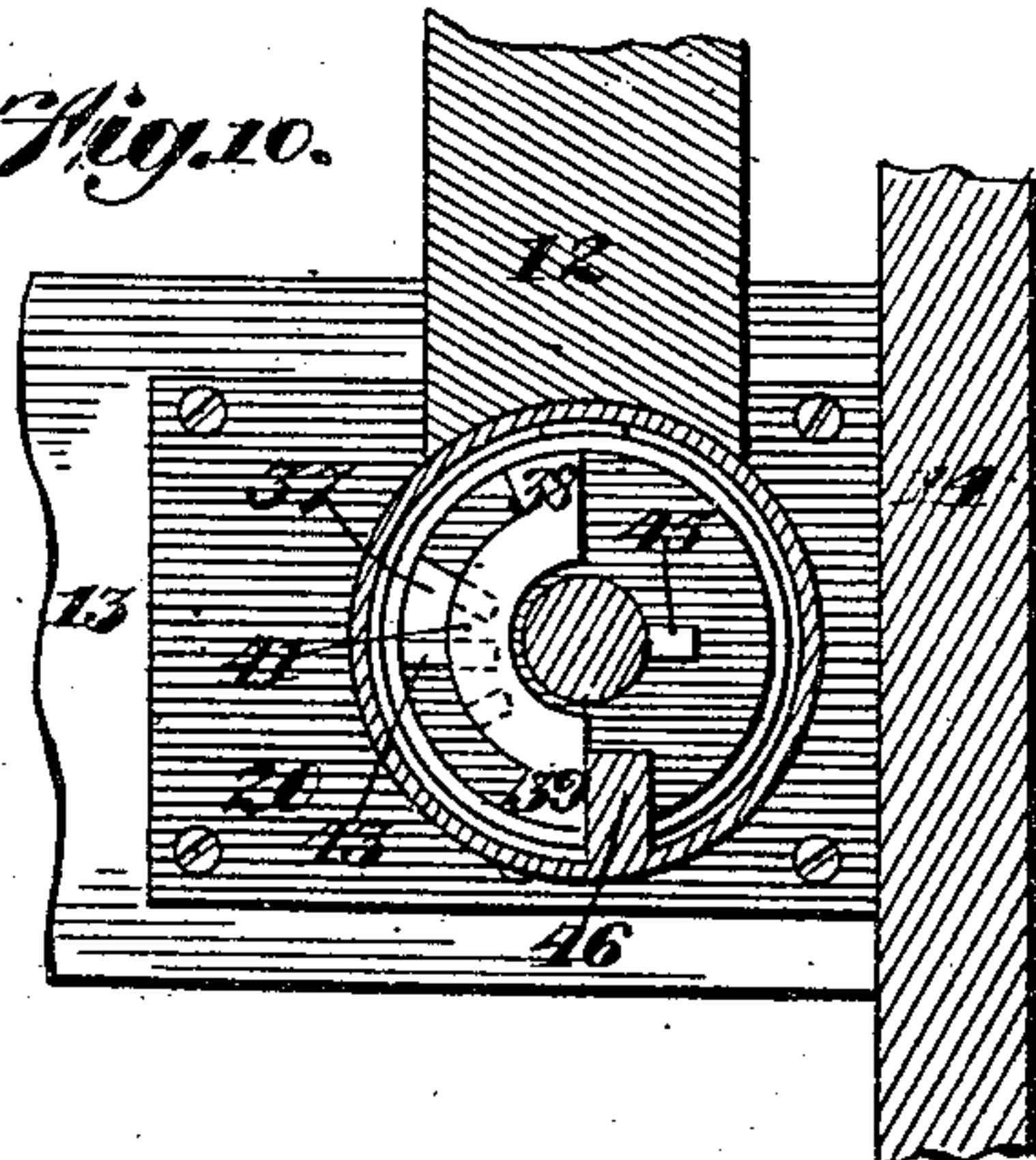
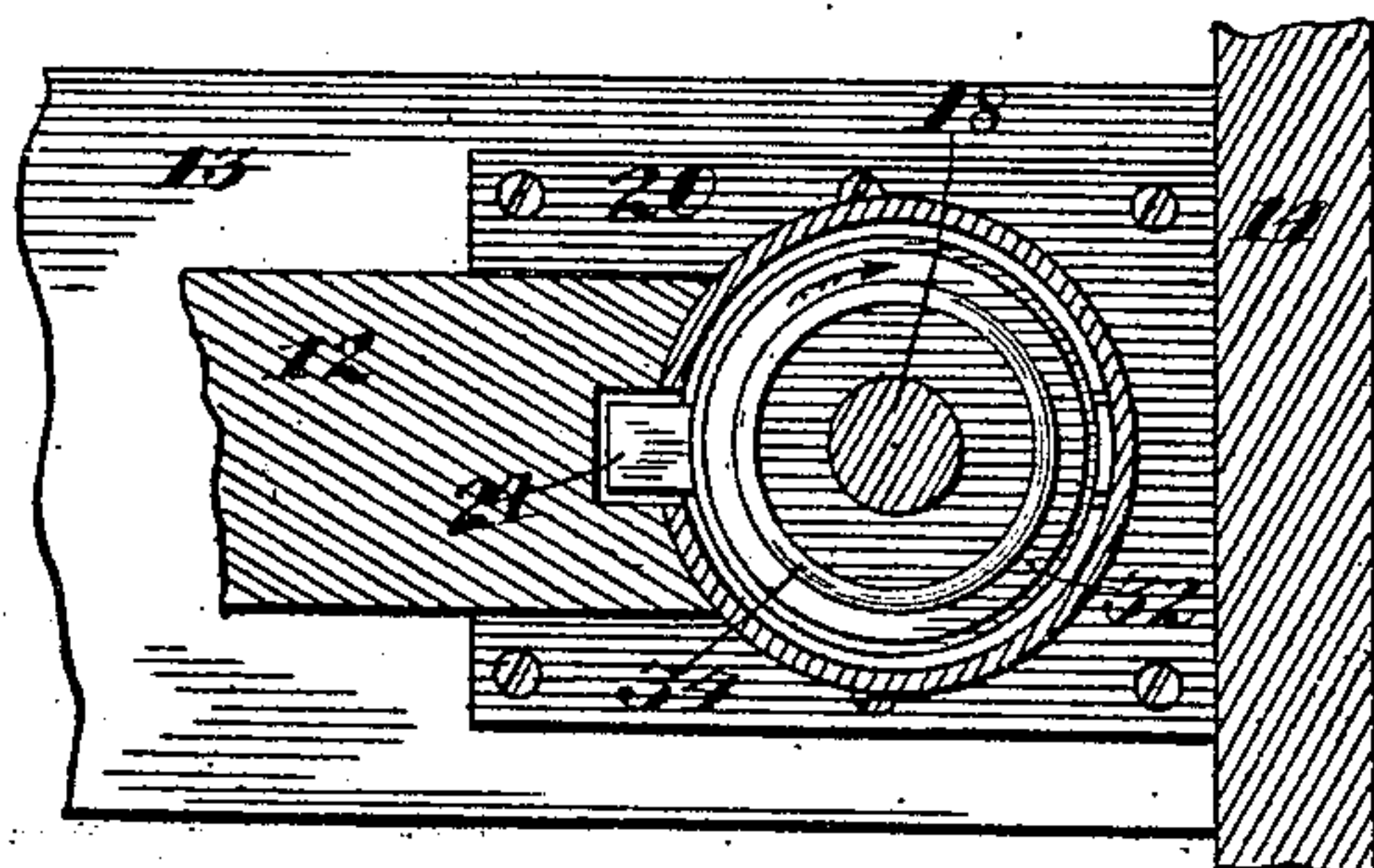


Fig. 11.



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UNITED STATES PATENT OFFICE.

ABRAHAM L. STUMP AND FRANCIS BRUCKER, OF SHELBY, OHIO, ASSIGNORS TO SHELBY SPRING HINGE COMPANY, OF SHELBY, OHIO, A CORPORATION OF OHIO.

SPRING-HINGE.

No. 880,596.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed January 26, 1903. Serial No. 140,556.

To all whom it may concern:

Be it known that we, ABRAHAM L. STUMP and FRANCIS BRUCKER, both citizens of the United States, residing at Shelby, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to spring-hinges, and has particularly to do with what are known as floor-hinges,—i. e., hinges in which the spring is operated through connection with the floor instead of with the door-frame.

Our objects are to avoid cutting into the floor in order to provide a pocket to accommodate the spring; to provide an improved spring-hinge so constructed as to be capable of being adjusted to regulate the tension of the spring without the removal of the hinge from the door or the removal of the door from its supports; to provide an improved housing for the hinge; to provide a cheaper and more substantial construction of hinge, and to provide certain other improvements which will be hereinafter set forth. That which we regard as new is set forth in the claims.

Generally stated, our improved hinge comprises a stationary post, non-rotatably secured to the floor, preferably by means of a floor-plate. Said post serves as a lower pivot for the door, which is supported at its upper end by a suitable pivot-pin arranged in line with said post. Mounted upon said post and inclosed in a suitable housing carried by the door, at the lower, inner corner thereof, is the spring, which surrounds the post above mentioned, and is adapted to be put under tension when the door swings in either direction, by means of actuating devices, one at each end of the spring, which are operated by engagement with the housing, as will be hereinafter described. The spring is held under its normal tension by pins which are carried by and project from the post, and are engaged by lugs carried by disks or hubs, to which the opposite ends of the spring are secured. The operating devices above referred to, which, in the construction shown, consist of rotary disks, engage the lugs of the hubs in such manner as to put the spring under tension, one of said operating devices being arranged to operate when the door swings in one direction, and

the other when it swings in the opposite direction. The construction is such that the spring may be adjusted, as hereinbefore stated.

In the accompanying drawing,—Figure 1 is a front view of a door equipped with our improved spring; Fig. 2 is an enlarged view of the lower inner corner of the door and its casing, showing the arrangement for adjusting the tension of the spring; Fig. 3 is a vertical section on line 3—3 of Fig. 2; Fig. 4 is a perspective view of the upper end of the post and the adjacent operating devices; Fig. 5 is a perspective view of the lower operating device; Fig. 6 is an edge view thereof; Fig. 7 is a side elevation of the hinge and its mounting, the housing being broken away; Fig. 8 is a perspective view of the lower portion of the hinge and the supporting devices therefor; Fig. 9 is a horizontal section on line 9—9 of Fig. 7, showing the door in its closed position; Fig. 10 is a similar view, showing the door open; Fig. 11 is a horizontal section on line 11—11 of Fig. 7.

Referring to the drawings,—12 indicates the door, 13, the door-sill, and 14, the jamb or casing of the door.

15 indicates the housing, which is in the form of a cylinder open at its lower end, and is secured in the lower, inner corner of the door, as shown. The housing is provided with a horizontal slot 16, near its upper end and at one side, as shown in Fig. 2, to provide for adjusting the tension of the spring, as will be hereinafter described.

17 indicates the upper pivot of the door.

18 indicates the lower pivot post, which, as shown in Fig. 3, is provided with a bottom-plate 19 secured to a floor-plate 20. The post 18 is preferably formed integral with the plate 19, the latter being rigidly secured to the floor-plate 20, by screws or other suitable devices. The floor-plate 20 is in turn secured to the floor, by screws or equivalent means.

21 indicates a cylindrical bearing surrounding the lower portion of the post 18, and preferably formed integral therewith. The bearing forms a support for and receives the weight of the door. If it be desired to have a ball bearing, the bearing 21 may be made in the form of a ball-race, to carry balls on which the door is carried.

22 indicates the lower operating-device,

which is in the form of a disk provided with a central opening 23, adapted to fit on the post 18 and to bear on the bearing 21, as shown in Fig. 3. The disk 22 is provided with two laterally-projecting lugs 24, 25, preferably at diametrically opposite points, as shown in Fig. 6. It is also provided with an upwardly-projecting lug 26, preferably of the form shown in Fig. 5, having a square or vertical face 27 at one end. The lug 24 is adapted to fit into a recess 28 in the housing 15, as shown in Fig. 3; while the lug 25 is adapted to fit in a correspondingly-shaped notch or recess 29, also carried by the housing, as shown in Fig. 3. The object of this construction is to provide for rotating the disk 22 when the door swings.

30 indicates a hub which is mounted on the post 18 above the disk 22, and rests thereupon. The hub 30 is provided with a radial flange 31, which projects over the lug 26, and with a downwardly-depending block 32, which rests on the upper surface of the disk 22, as shown in Figs. 3 and 8. The block 32 extends through an arc of about one hundred and eighty degrees, and is adapted, when the door is in its closed position, to lie opposite and adjacent to the square face 27 of the lug 26, so that if the disk 22 is swung in the direction indicated by the arrow in Fig. 5, the lug 26 bears against the adjacent surface of the block 32, rotating the hub 30.

33 indicates a pin, which is carried by the post 18 near its lower end and engages one side of the block 32, as shown in Fig. 3, thereby preventing the hub 30 from rotating upon the post 18 in the direction indicated by the arrow in Fig. 11.

34 indicates a coiled spring mounted upon the post 18. The lower portion of the spring 34 fits upon the hub 30, which projects into it a short distance, as shown in Fig. 3, and the lower end of said spring is fixedly secured to said hub, preferably by extending one end of it into a suitable hole in said hub, as shown in Fig. 7.

35 indicates an upper hub, similar to the hub 30 and arranged upon the post 18 near its upper portion, as shown. The hub 35 projects into the upper end of the spring 34, as shown in Fig. 3, and is secured thereto, preferably, by extending the upper end of said spring into a suitable socket in said hub. The hub 35 is also provided with an annular flange 36.

37 indicates a lug which projects from the upper surface of the hub 35, near the margin thereof, and is adapted to engage shoulders 38, 39 carried by an operating-plate 40, which rests upon the upper surface of the hub 35. The shoulders 38, 39 are at opposite ends of a cross-head 41, which is preferably formed integral with the plate 40 and extends across the upper surface of the hub 35,

the lug 37 lying between the shoulders 38, 39, as shown in Fig. 4. The lateral surface of the cross-head 41 is perforated with a number of holes 42, as shown in Figs. 7 and 9, and carries an adjusting pin 43 adapted to fit in said holes, as shown in Figs. 4 and 9. The pin 43 projects far enough so that it is adapted to intercept the lug 37, one side of which bears against said pin, as shown in Fig. 4.

The tendency of the spring 34 is to rotate the hub 35 in the direction indicated by the arrow in Fig. 4, consequently the spring acts to press the lug 37 against the pin 43, and it follows that by adjusting the position of said pin the tension of the spring may be adjusted. To facilitate the adjustment of the pin 43, the lug 37 is provided with a hole 44, into which a suitable tool may be inserted for swinging the said lug away from the pin 43, as shown in Fig. 4. The slot 16 in the housing is so placed as to expose the hole 44 and pin 43, as shown in Fig. 2, so that the adjustment of the pin 43 may be effected without removing the door.

45 indicates a pin carried by the post 18, near its upper end and projecting beside the cross-head 41 when the door is closed, as shown in Fig. 9. The pin 45 serves to prevent the upper end of the spring 34 from unwinding, after the manner described in connection with the pin 33. 46 indicates a lug carried in the upper portion of the housing 15, which, when the door is in open position, projects beside the shoulder 39 of the cross-head 41, on the face thereof next to the pin 45, as shown in Fig. 10.

The operation is as follows: When the door is in its normal or closed position, the parts are as shown in Figs. 3, 9, 7 and 11. If the door is swung in the direction illustrated in Fig. 10, the lug 46 presses against the shoulder 39, carrying the cross-head 41 around with it into the position shown in Fig. 10. This movement of the cross-head puts the spring 34 under tension, acting through the pin 43 and lug 37. When the door is released, the parts return to their normal position under the influence of the spring. During this movement the lower disk 22 is swung in the direction indicated by the arrow in Fig. 11; but such action does not affect the lower portion of the spring, since such movement of the disk 22 carries the lug 26 away from the adjacent surface of the block 32. Meanwhile, the lower hub 30 is kept from following the lug 26 by the fixed pin 33. When the door swings in the opposite direction, the lug 26 becomes operative, pressing back against the adjacent surface of the block 32, rotating the lower hub in the direction indicated by the arrow in Fig. 5, consequently putting the spring under tension. At this time the upper hub remains stationary, since the lug 46 moves away from

the shoulder 39, which is prevented from following it by the pin 45. If it be desired to adjust the tension of the spring, it may be done in the manner above described. By 5 extending the hubs into the spring as described, the parts are kept from binding, and, besides, the spring is held properly in its perpendicular position.

As illustrated in Fig. 3, the housing 15 is 10 provided with extended strips 47, 48, which extend vertically and horizontally alongside adjacent portions of the door, for securing said housing in position. These extensions may be of any desired length, and are cast integral with the housing. We thus provide a 15 very substantial and efficient construction. An important advantage of this construction is that the hinge may readily be fitted to doors of different thicknesses; and, besides, 20 it is necessary to cut away only a small corner of the door, so that it is not mutilated materially. Moreover, the housing is very easily applied to the door, and forms a neat finish.

25 While the best results are secured by employing a floor-plate and screwing it to the floor, if desired, an angle bracket may be employed to carry the floor-plate, said bracket being secured firmly to the side of the door-jamb; but we prefer the construction illus- 30 trated.

That which we claim as our invention and desire to secure by Letters Patent is,—

1. In a spring hinge, the combination of a 35 pivot-post, a coiled spring mounted thereon, a hub mounted on said post adjacent to and connected to said spring, said hub having a lug 37, an operating plate mounted on said post adjacent to said hub, said plate having 40 a cross-head 41, a pin 45 carried by said post, a pin 43 carried by said cross-head and engaging said lug 37, and means supporting the opposite end of said spring.

2. In a spring hinge, the combination of a 45 pivot-post, a coiled spring mounted thereon, a hub mounted on said post adjacent to and connected with said spring, said hub having a lug 37, an operating plate mounted on said

post adjacent to said hub, said plate having a cross-head 41, a pin 45 carried by said post, 50 a pin 43 adjustably carried by said cross-head and engaging said lug 37, a cylindrical housing for said hinge, said housing having a slot arranged to expose said pin 43 and parts of said cross-head 41 and lug 7 and means sup- 55 porting the opposite end of said spring.

3. In a spring hinge, the combination of a pivot-post, an operating plate mounted upon said post near the lower end thereof and adapted to non-rotatably and removably en- 60 gage the door, a hub mounted on said post adjacent to said plate, interlocking devices carried by said hub and plate, whereby when said plate rotates in one direction only it will cause said hub to rotate in the same direc- 65 tion, a spring mounted on said post and connected with said hub, and means supporting the opposite end of said spring.

4. In a spring hinge, the combination of a pivot-post, an operating plate mounted upon 70 said post near the lower end thereof and adapted to non-rotatably and removably engage the door, a hub mounted on said post adjacent to said plate, interlocking devices carried by said hub and plate whereby when 75 said plate rotates in one direction only it will cause said hub to rotate in the same direction, a spring mounted on said post and connected with said hub, means supporting the opposite end of said spring, a hub mounted 80 on said post above said spring and connected therewith, an operating plate mounted on said post adjacent to said upper hub, and interlocking devices carried by said upper hub and operating plate, said upper operating 85 plate being adapted to removably and non-rotatably engage the door, said upper and lower operating plates being actuated respectively by the swinging of the door in opposite directions.

ABRAHAM L. STUMP.
FRANCIS BRUCKER.

In presence of—

H. M. HILAMENT,
L. D. MALONE,
FANNY FLETCHER.