

W. P. NEUBERT.
ELECTRIC SWITCH LOCK.

APPLICATION FILED SEPT. 10, 1908.

Patented Mar. 9, 1909.

3 SHEETS—SHEET 1.

914,447.

Fig. 1.

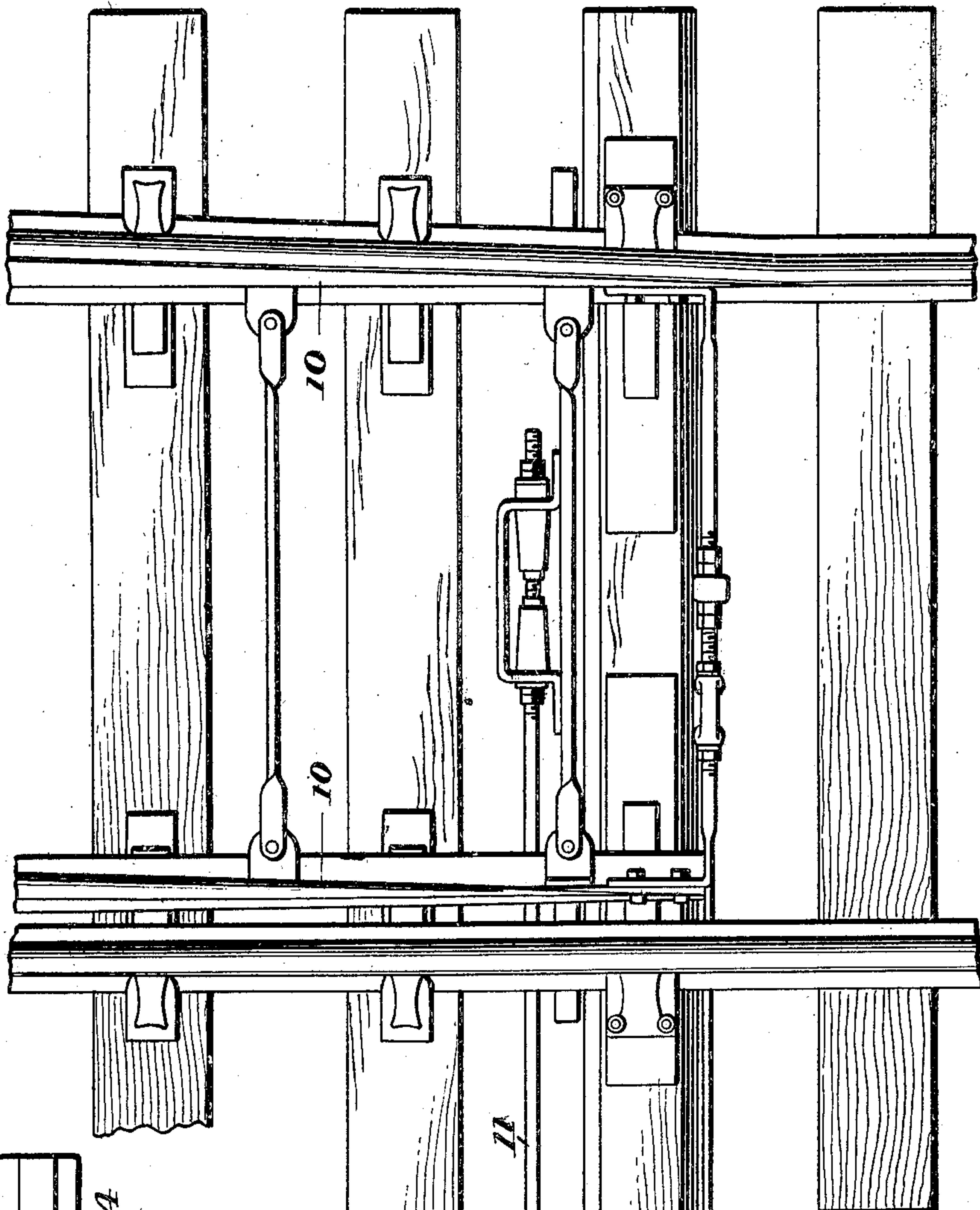
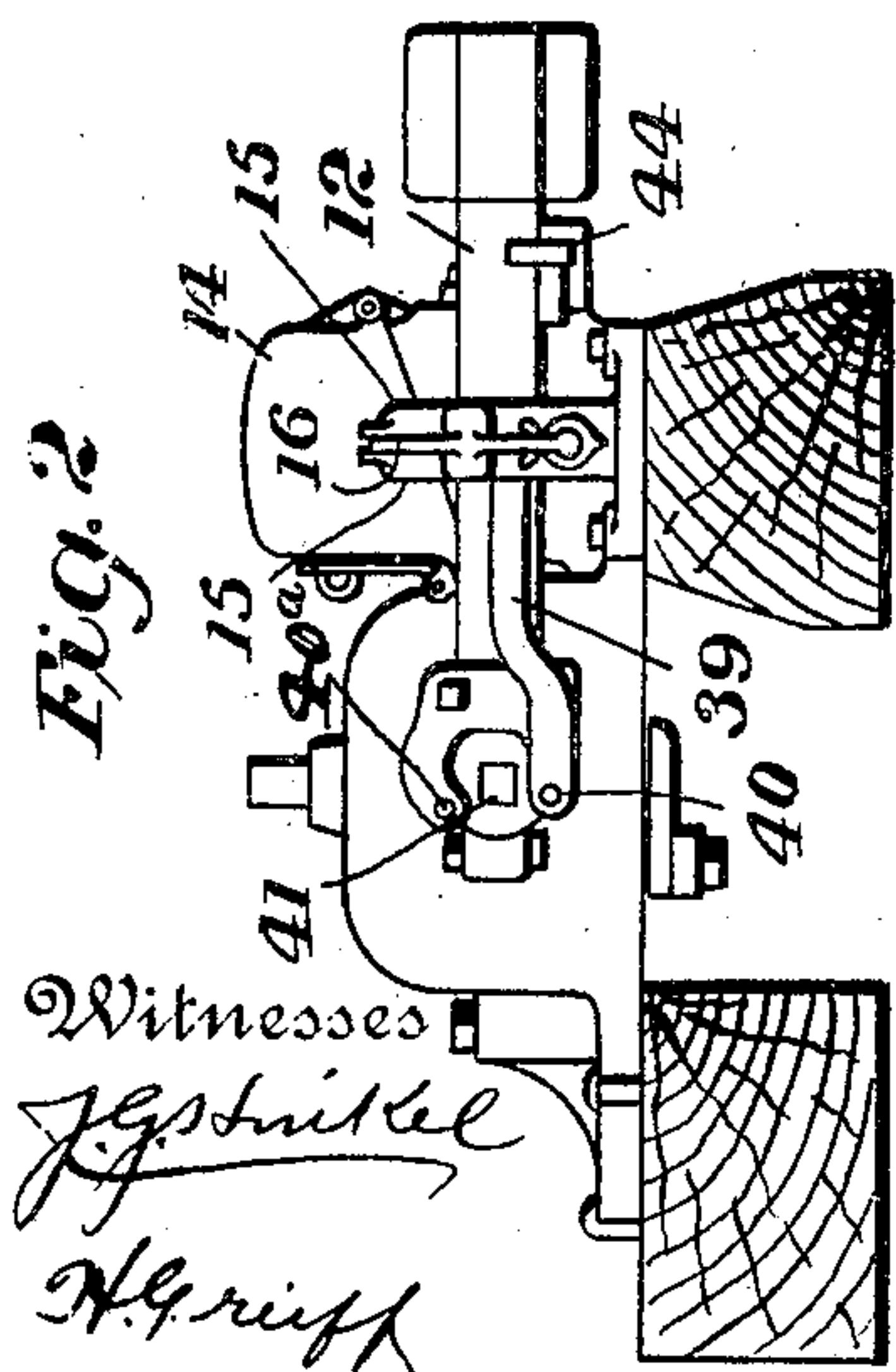
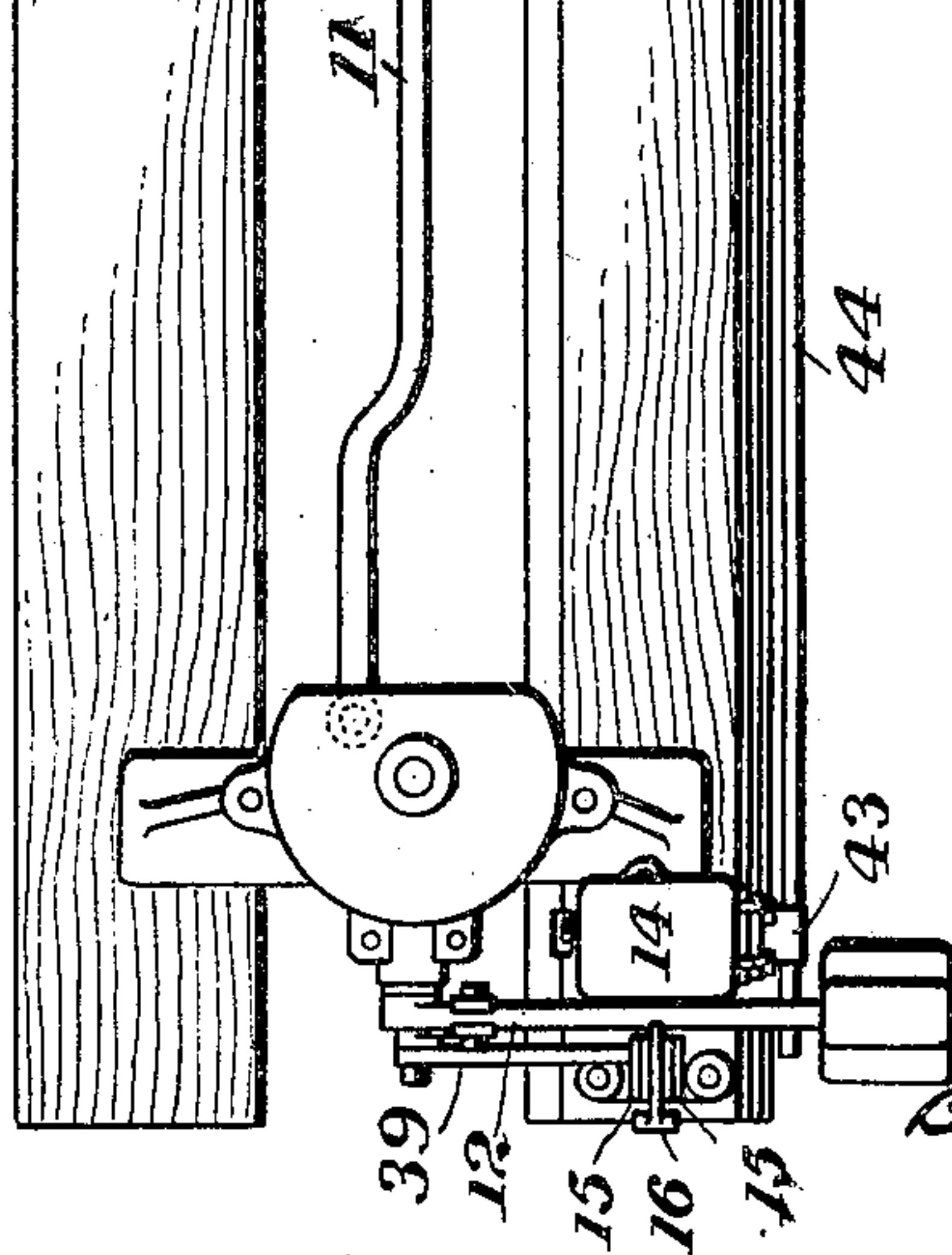


Fig. 2



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3 SHEETS—SHEET 2.

Fig. 4.

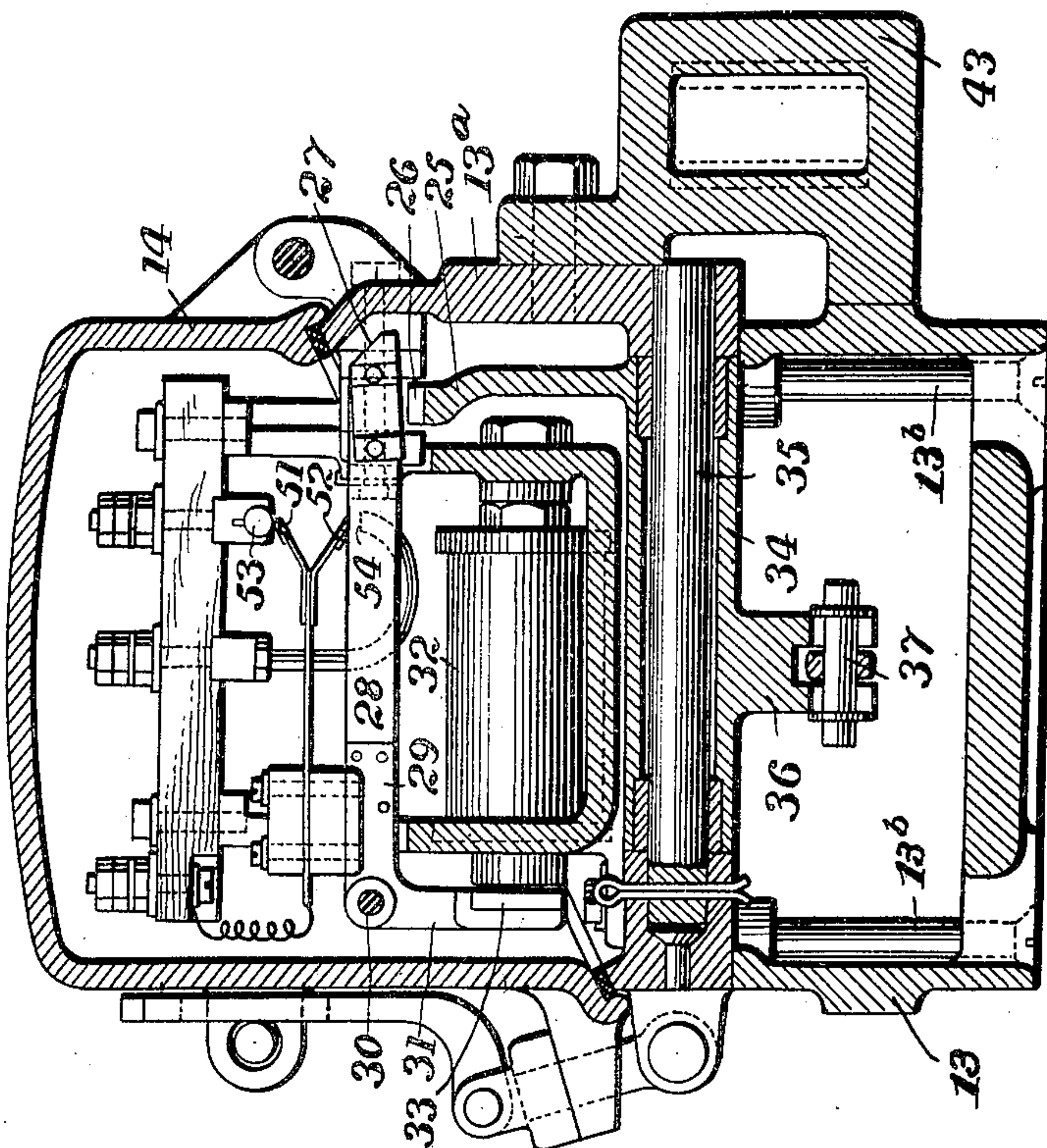
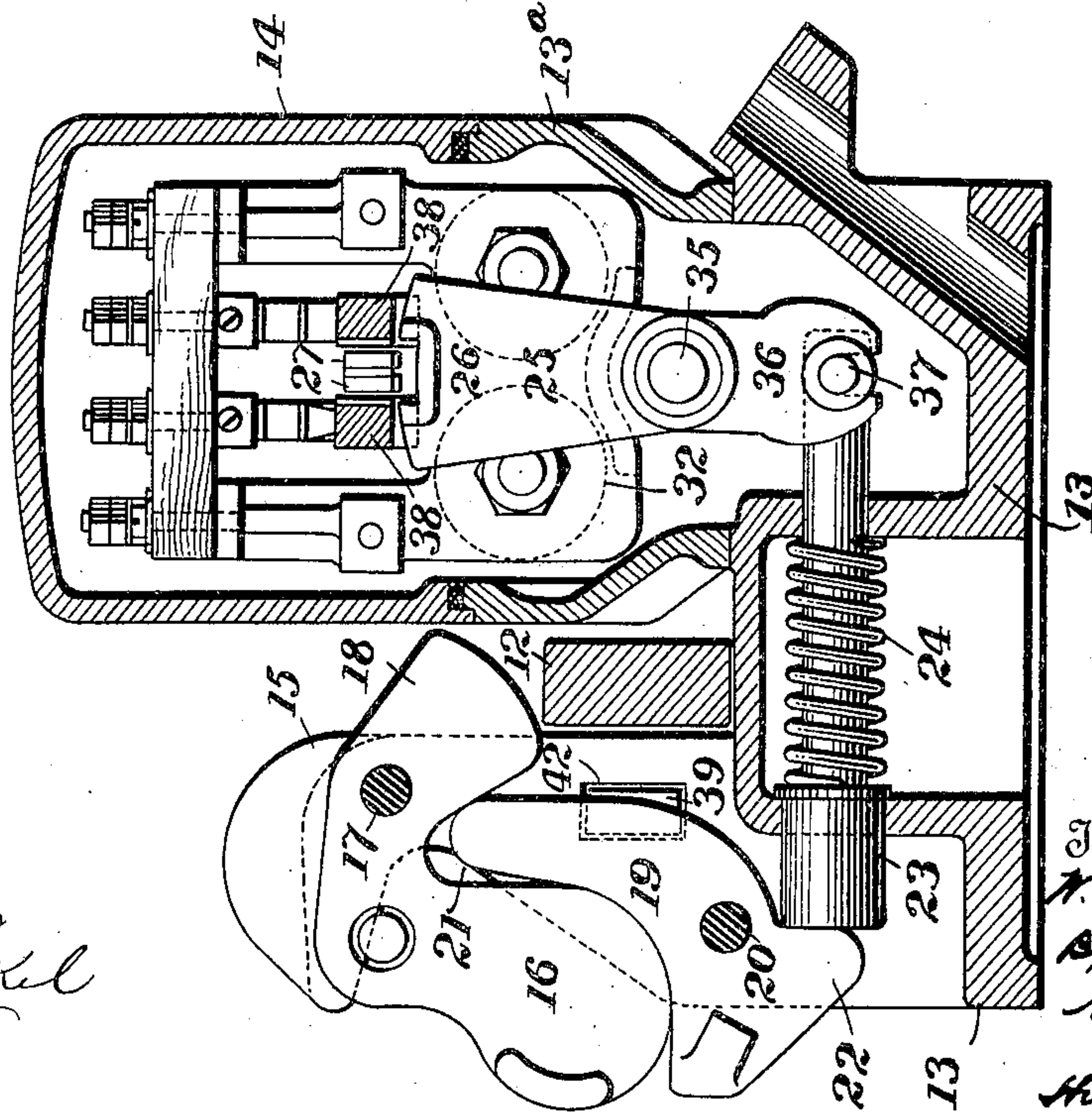


Fig. 3.



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3 SHEETS—SHEET 3.

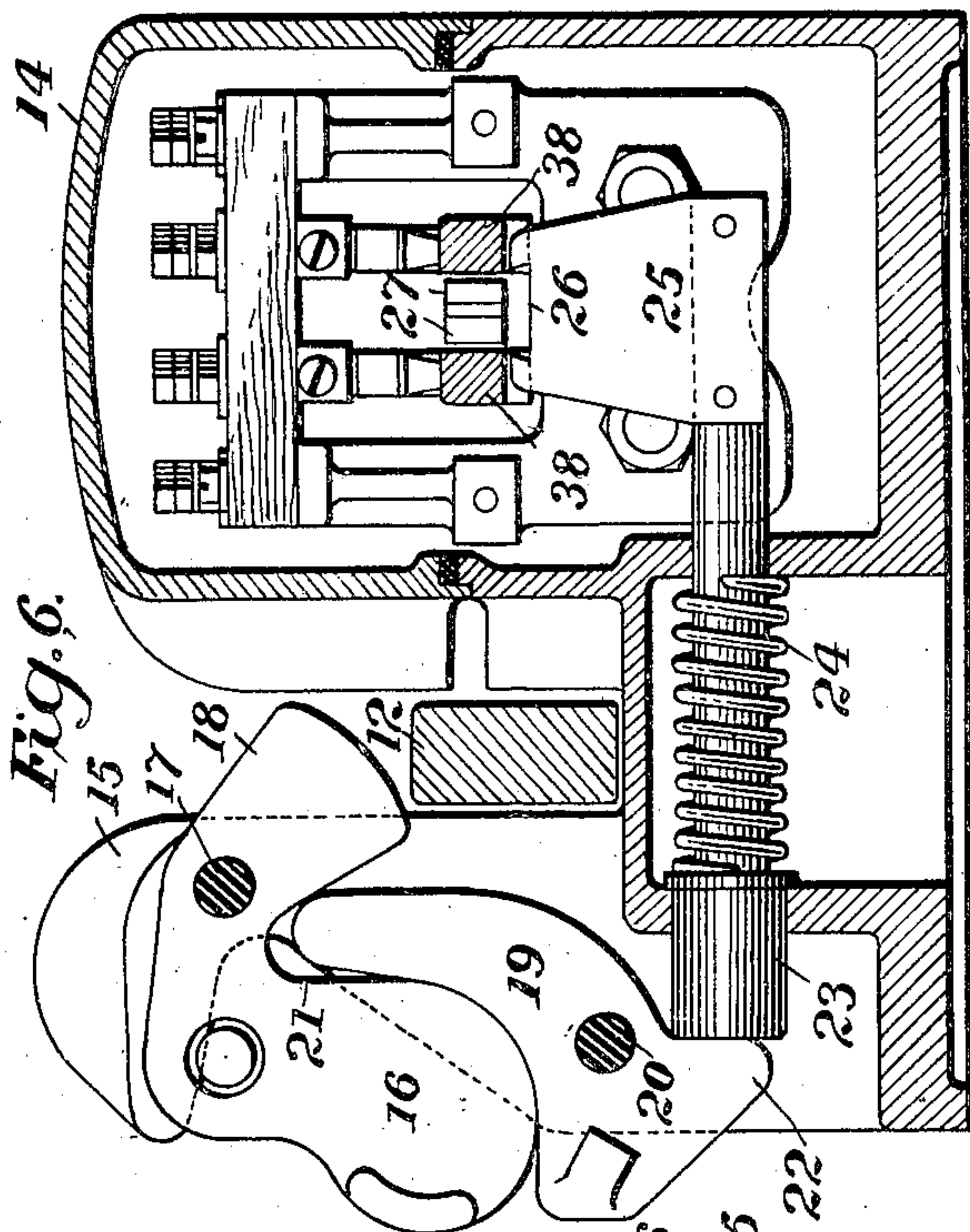


Fig. 6.

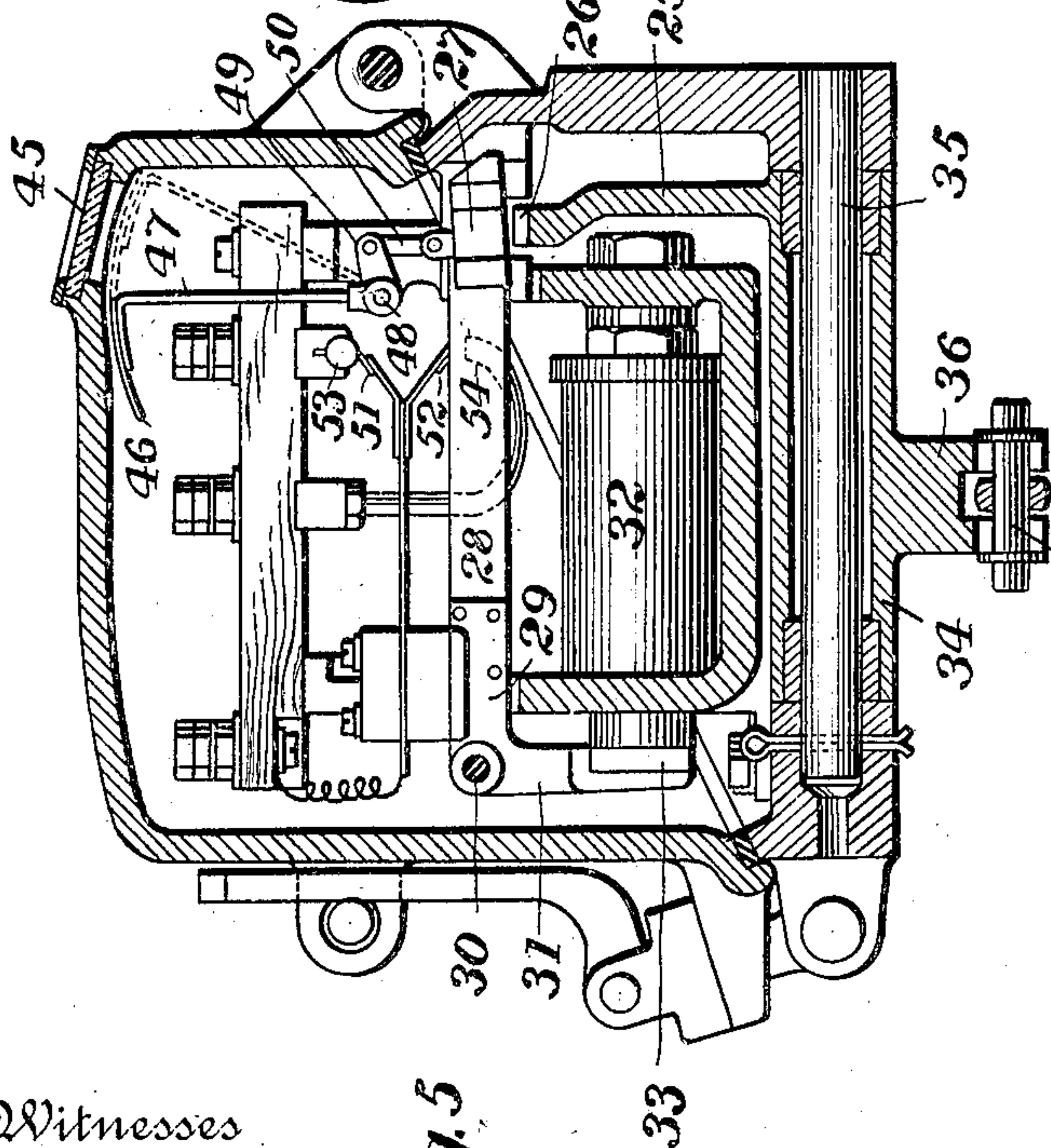


Fig. 5.

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Fig. 8.

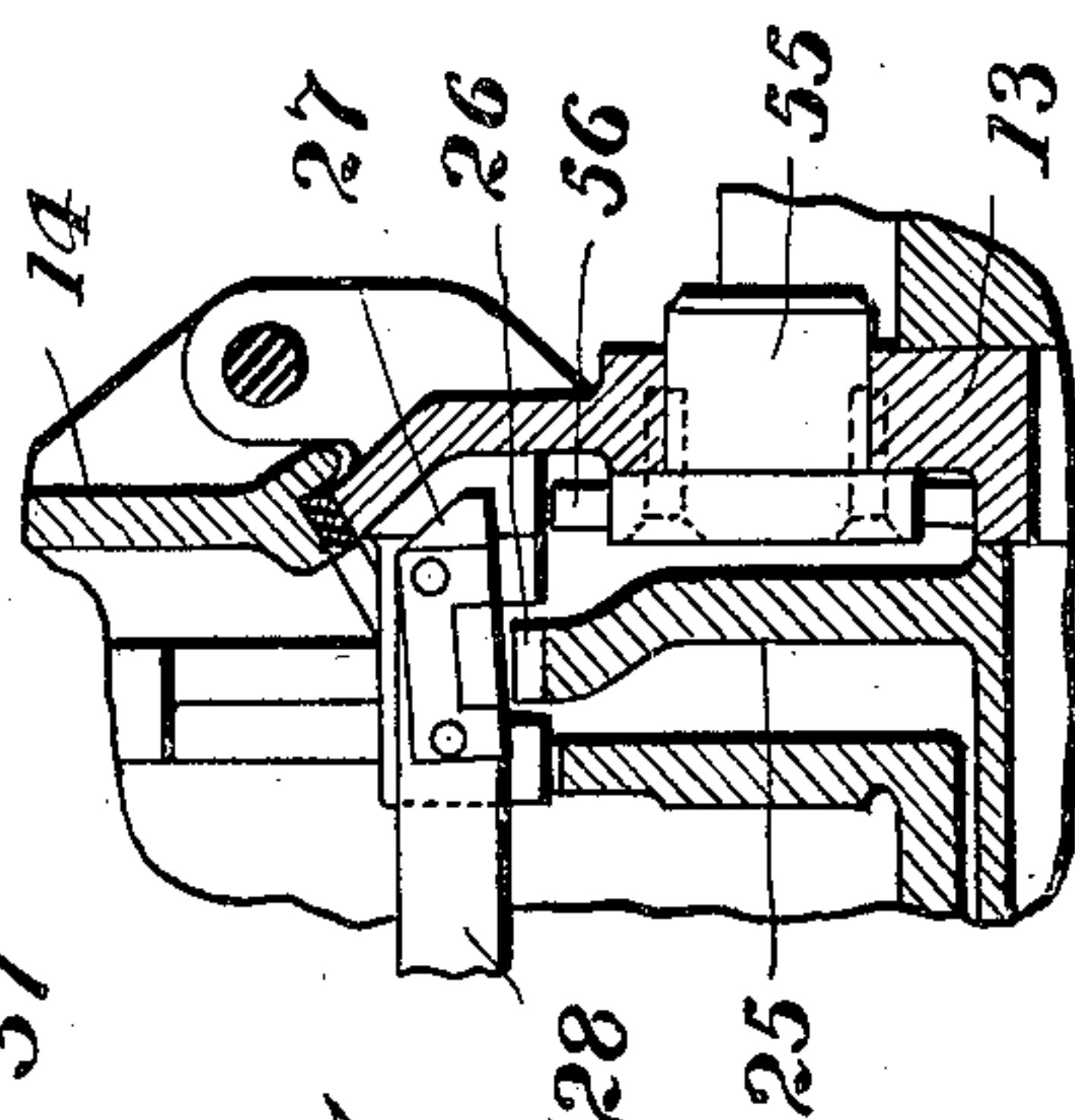
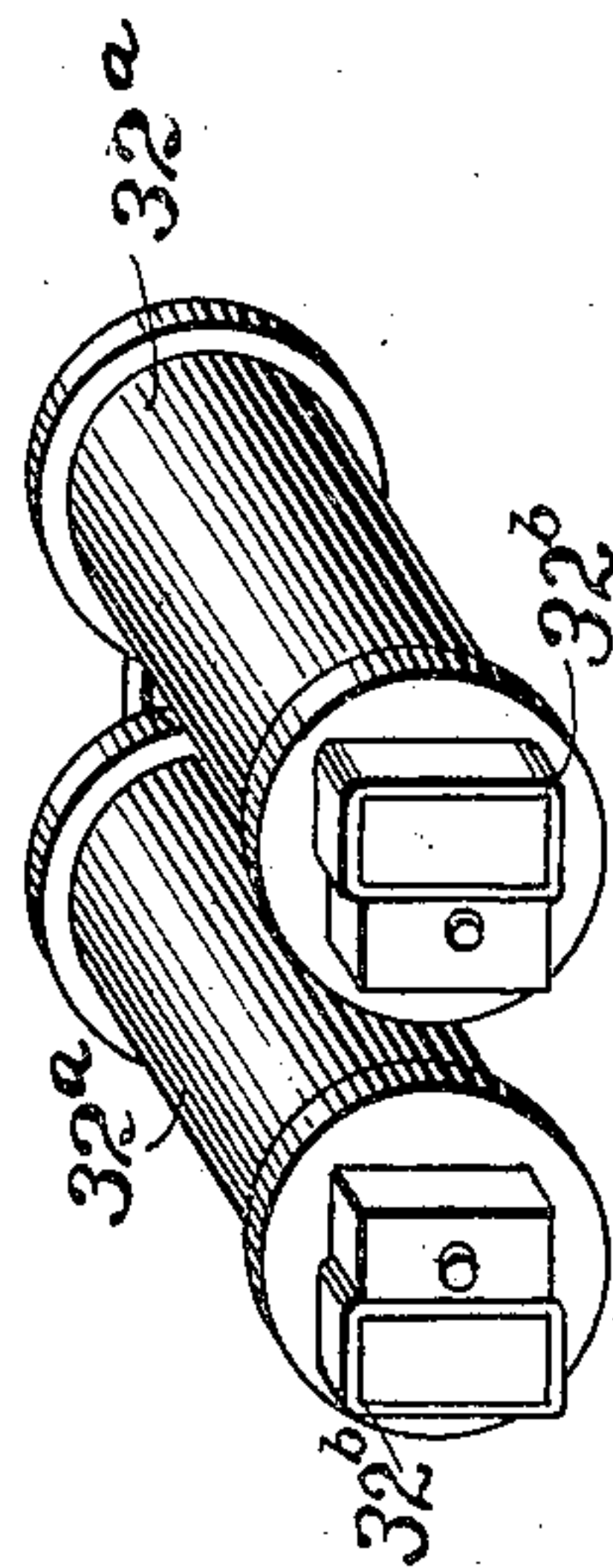


Fig. 7.

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UNITED STATES PATENT OFFICE.

WALTER P. NEUBERT, OF SWISSVALE BOROUGH, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ELECTRIC SWITCH-LOCK.

No. 914,447.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed September 10, 1908. Serial No. 452,470.

To all whom it may concern:

Be it known that I, WALTER P. NEUBERT, a citizen of the United States, residing in the borough of Swissvale, county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Electric Switch-Locks, of which the following is a specification.

My invention relates to switch locks and particularly to an electrically controlled switch lock.

It is specially designed for use with any common form of throw-over lever for operating the switch.

I will describe preferred embodiments of my invention and then point out the novel features in claims.

In the accompanying drawings, in which similar reference characters indicate like parts, Figure 1 is a plan view of a switch and its operating mechanism. Fig. 2 is a side view of the operating mechanism. Fig. 3 is a view partly in section and partly in elevation showing the lever locking mechanism. Fig. 4 is a similar view taken at a right angle to Fig. 3. Fig. 5 is a view similar to Fig. 4 showing a modification. Fig. 6 is a view similar to Fig. 3 showing a further modification. Fig. 7 is a sectional view of a key release for the locking dog. Fig. 8 is a perspective view of a modified form of magnets for controlling the locking dog.

The switch rails are indicated by 10, the switch rod by 11 and the switch operating lever by 12, these parts being of any preferred construction and connected together in any desired manner so that the movement of the lever will operate the switch rails.

The electric locking mechanism is contained in a suitable supporting casing which is adapted to be secured to a railway tie adjacent the switch points. The casing comprises two parts 13, 13^a which are detachably connected together by bolts 13^b and with a cover 14, which is hinged to the part 13^a. The openings for the bolts 13^b in the two parts are symmetrically arranged with reference to the vertical center planes extending at right angles through the casing. The advantage of having the containing casing in two parts 13, 13^a is that the device can be used for right and left hand applications. For example in Figs. 1 and 2 the casing is assembled for a left hand application, that is the hand latch 16 which must be operated be-

fore the operating lever 12 is moved, is farthest from the switch rail, which relation of parts is always followed in practice. If now the whole mechanism of Fig. 1 for moving and locking the switch were moved to the right of the switch without any change, the hand latch 12 would be nearest the rail and in releasing the operating lever 12 the operator would have to reach over the operating lever. To avoid this it is only necessary to remove the connecting bolts 13^b and turn the part 13^a and cover 14 through an angle of 180° and again connect the two parts. The symmetrical arrangement of the bolt openings permits of this.

When the switch is closed, as shown in Fig. 1, the operating lever 12 will rest on a portion of the casing 13 adjacent a pair of spaced standards 15, 15, which may be integral with the casing or otherwise rigidly secured thereto. A hand latch 16 is pivoted to the standards 15 and 17 at its nose 18 overhangs the lever 12 and prevents the latter from being lifted.

19 (see Fig. 3) is a lever pivoted at 20 to the standards 15, and its upper end projects into a space 21 between the handle and the nose portion of the hand latch and engages the nose portion. An end 22 of the lever 19 engages one end of a sliding rod 23 which is mounted in the support 13, and a spring 24 normally holds the rod in one of its extreme positions as shown in Figs. 3 and 6. The other end of the rod is connected to the lower end of a locking plate 25, the upper end of which is provided with a notch or recess to receive a locking dog. Preferably this dog will comprise two metal plates 27 secured rigidly to opposite sides of one end of a bar 28, which is preferably of non-magnetic material. The other end of this bar is connected to one arm 29 of an angle lever which is pivotally supported at 30, and the other arm 31 of said angle lever carries the armature 33 of the magnet 32. When the magnet is energized it will attract its armature and lift the dog 27 out of the notch 26 in the plate 25 and leave said plate free to move, and when the magnet is deenergized the dog 27 will drop onto the top of plate 25 and into the notch 26 when the latter is moved into alignment therewith.

The plate 25 may be connected to the sliding rod 23 in different ways: Thus in Fig. 6 the plate is riveted or otherwise rigidly se-

cured to the rod to move with it in straight lines. In Figs. 3, 4 and 5 the plate 25 is provided with a sleeve 34 which is journaled on a shaft 35 fixed in the support 13^a. The sleeve 5 has a depending arm 36 which is bifurcated to receive the forward end of the rod 23 and also slotted transversely to receive a pin 37 carried by the rod 23. In this construction the plate 25 will rock on the shaft 35 when 10 the rod 23 is moved.

As long as the dog 27 is in the notch 26 the rod 23 will prevent the hand latch 16 and lever 19 from being moved sufficiently to permit the lever 12 being operated. Any strain 15 on the dog 27 caused by an attempt to move the hand latch when it is in the notch 26 will be taken up by the guides or lugs 38 which are part of the fixed frame or support, thus preventing this strain being transmitted to 20 the armature or its pivotal support.

The magnet 32 may be energized from any suitable controlling circuit, which may be a track circuit, or a circuit with its controller and source of current in a telegraph office, 25 station or signal tower and using either direct or alternating current in the circuit. In the event that alternating current is used in the circuit the form of magnet 32^a in Fig. 8 is employed. The copper ferrules 32^b act to 30 retard the demagnetization of the magnet cores due to the change in polarity of the alternating current. This arrangement is well known in the art of alternating current magnets. When the magnet is energized the dog 35 27 will be lifted and the hand latch may then be turned on its pivot until the nose 18 is moved entirely out of the path of the lever 12, and the latter may then be swung over to operate the switch. The movement of the 40 hand latch will cause the lever 19 to force the rod 23 inwardly against the force of the spring 24, and this will cause the plate 25 to move and bring the notch 26 out of alignment with the dog 27. If the magnet is now 45 deenergized the dog will drop onto and rest upon the upper edge of the plate 25 and when the latter is returned to its normal position will drop into the notch 26.

In order to lock the hand latch 16 and the 50 plate 25 in what may be termed open position, I provide a lock rod 39, see Figs. 2 and 3. This rod is pivoted at one end on a stud 40 mounted on the lever 12 slightly below and to the left of the center of switch lever 55 shaft 41. This rod is loosely supported at its free end in an opening 42 in one of the standards 15 with its end normally in close proximity to the lever 19. When the hand latch 16 has moved sufficiently to clear the 60 lever 12 the lever 19 will have moved sufficiently to clear the lock rod 39 and when the operating lever 12 is moved upwardly the rod 39 will be moved endwise in front of the lever 19 and thus lock it against any return 65 movement under the influence of the spring

24 and the rod 39 will remain in locking position even though it may move, until the lever 12 is returned to normal position. The lever 12 thus controls the return of the plate 25 to locking position, and as soon as 70 the lever 12 has been returned to normal position the rod 39 will be clear of the lever 19 and the spring 24 will restore the parts to normal or locking position. When the mechanism is used for a right hand applica- 75 tion the lever is pivoted on the stud 40^a. In making the change of the electric lock from a left hand to a right hand application, the rod 23 is disconnected from the arm 36.

The support 13^a may be provided with a 80 bracket 43 to guide and support a lock bar 44 connected to the switch rails, and provided with a notch or recess at one end to receive the switch lever 12 when the latter is in normal position and thus lock the 85 switch rails against movement. See Figs. 1, 2 and 4.

In Fig. 5 I have shown the cover 14 provided with a glass closed opening 45 beneath which an indicator 46 will be moved when 90 the dog 27 is in the notch 26. The indicator 46 is connected to a rod 47 pivoted at its lower end at 48 and provided with an arm 49 connected by a link 50 to the dog 27.

The movement of the bar 28 of non-mag- 95 netic material may be utilized to move the movable contacts 51 and 52 into and out of engagement with fixed contacts 53 and 54, respectively, to close and open circuits which may be employed to indicate whether or not 100 the lever 12 is locked, or for signaling or other purposes.

In Fig. 7 I have shown means for mechanically lifting the dog 27 out of the notch 26. These means comprise a lock 55 the bolt 56 105 of which will normally lie close to or be just in contact with the dog 27 when at its innermost position, and when a key (not shown) is turned in the lock the bolt will be moved outward and the dog will be lifted clear of 110 the notch 26. The lock will preferably be of such construction that the key cannot be withdrawn after it has been turned to move the bolt outwardly until it has been turned back again and moved the bolt inwardly. 115

Without limiting myself to the precise details of construction illustrated and described, I claim:

1. The combination with switch rails and an operating lever, of a pivoted hand latch 120 normally preventing upward movement of the lever, a spring actuated sliding rod, a plate connected to said rod to move therewith and provided with a notch, an electrically controlled dog for engaging said 125 notch, and a pivoted lever for transmitting movement between the hand latch and the sliding rod.

2. The combination with switch rails and an operating lever, of a pivoted hand latch 130

normally preventing the upward movement of the lever, a sliding rod, a plate connected to the rod and provided with a notch, a pivoted dog normally engaging the notch, electric means for lifting the dog out of said notch, a lever for transmitting movement from the latch to said notched plate when the said dog is lifted out of the notch, and locking means controlled by the movement of the operating lever for holding the said notch out of alinement with the said dog.

3. The combination with switch rails and an operating lever, of a manually operated locking mechanism for the lever, a pivoted dog for controlling the said locking mechanism, electric devices for releasing the said dog, and a key lock the bolt of which can also release said dog independently of said electric devices.

4. The combination with switch rails and an operating lever, of locking mechanism for said lever, a dog for controlling the movement of the locking mechanism, devices controlling the movement of the dog, a casing inclosing the dog, fixed contacts within the casing, and other contacts movable with the dog into and out of engagement with the fixed contacts.

5. The combination in an electric switch lock of a supporting casing made in two parts and detachably connected together

through symmetrically arranged connecting means, an electrically controlled lock in said casing, a switch lever and a manually operated locking mechanism for said switch lever, the operation of which to release the switch lever is governed by said electrically controlled lock.

6. The combination with switch rails, of an operating lever, therefor, means for preventing upward movement of said lever under certain conditions, a sliding rod operable in one direction by said means, a notched plate movable by said rod, an electrically controlled dog co-acting with said notch, and means for taking up strain on said dog transmitted thereto by an attempt to move the lever with the dog in the notch.

7. The combination with switch rails, a lock bar connected therewith and provided with a notch, an operating lever for said switch adapted in one position of the switch to fit in said notch and an electrically controlled lock for said lever.

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

WALTER P. NEUBERT.

Witnesses.

M. D. HANLON,
W. E. FOSTER.