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E. EICHLER.

LOCK.

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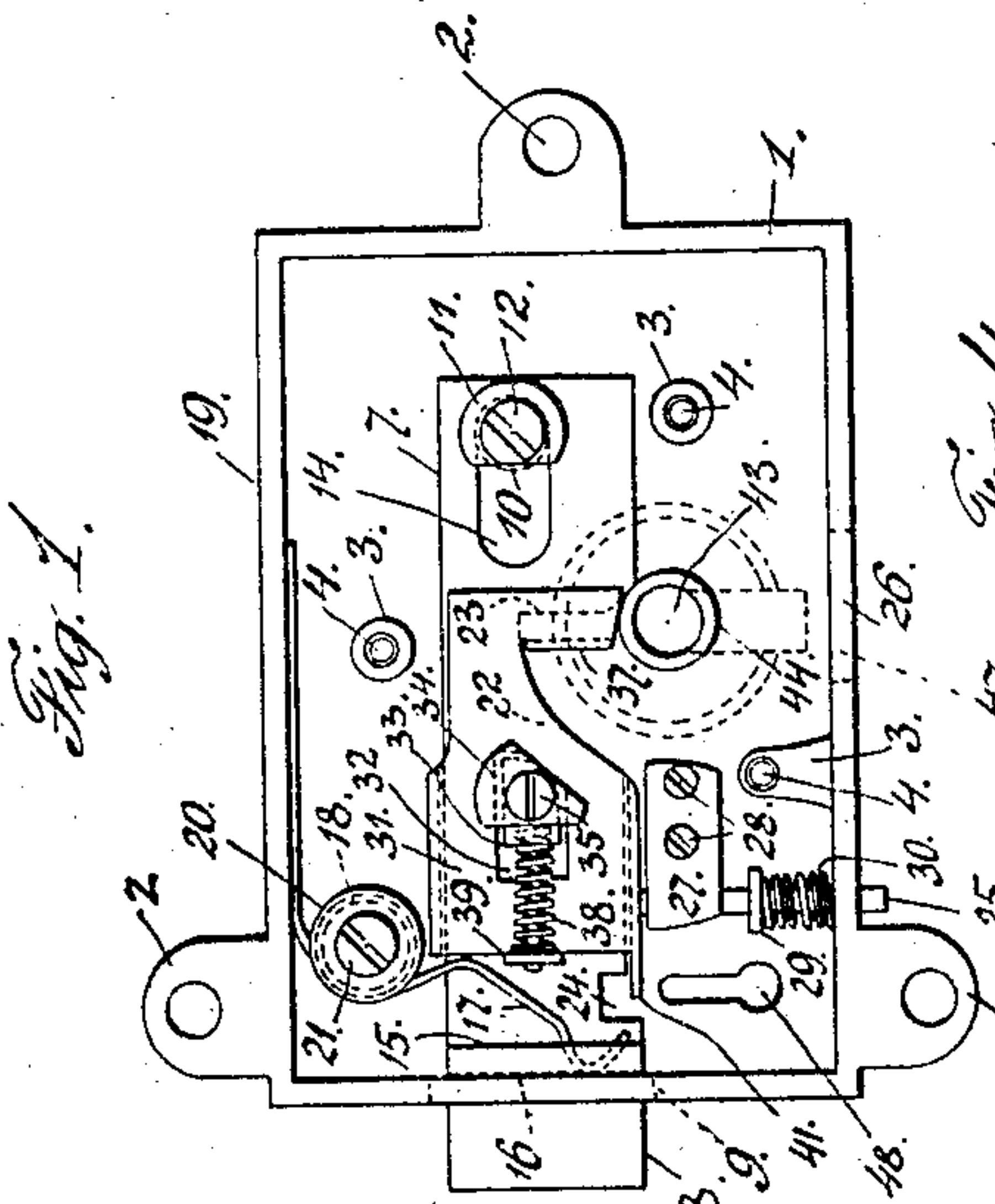
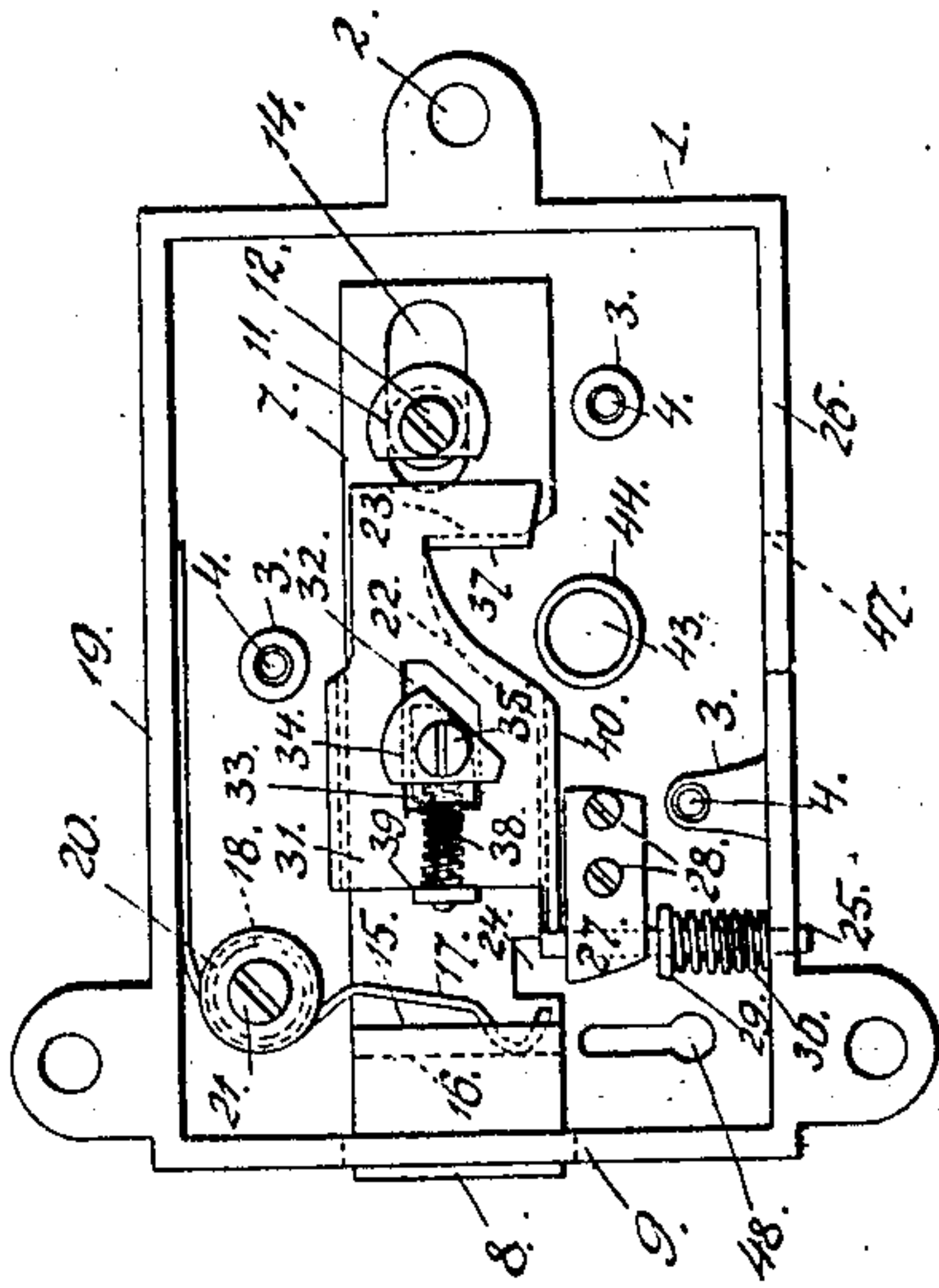
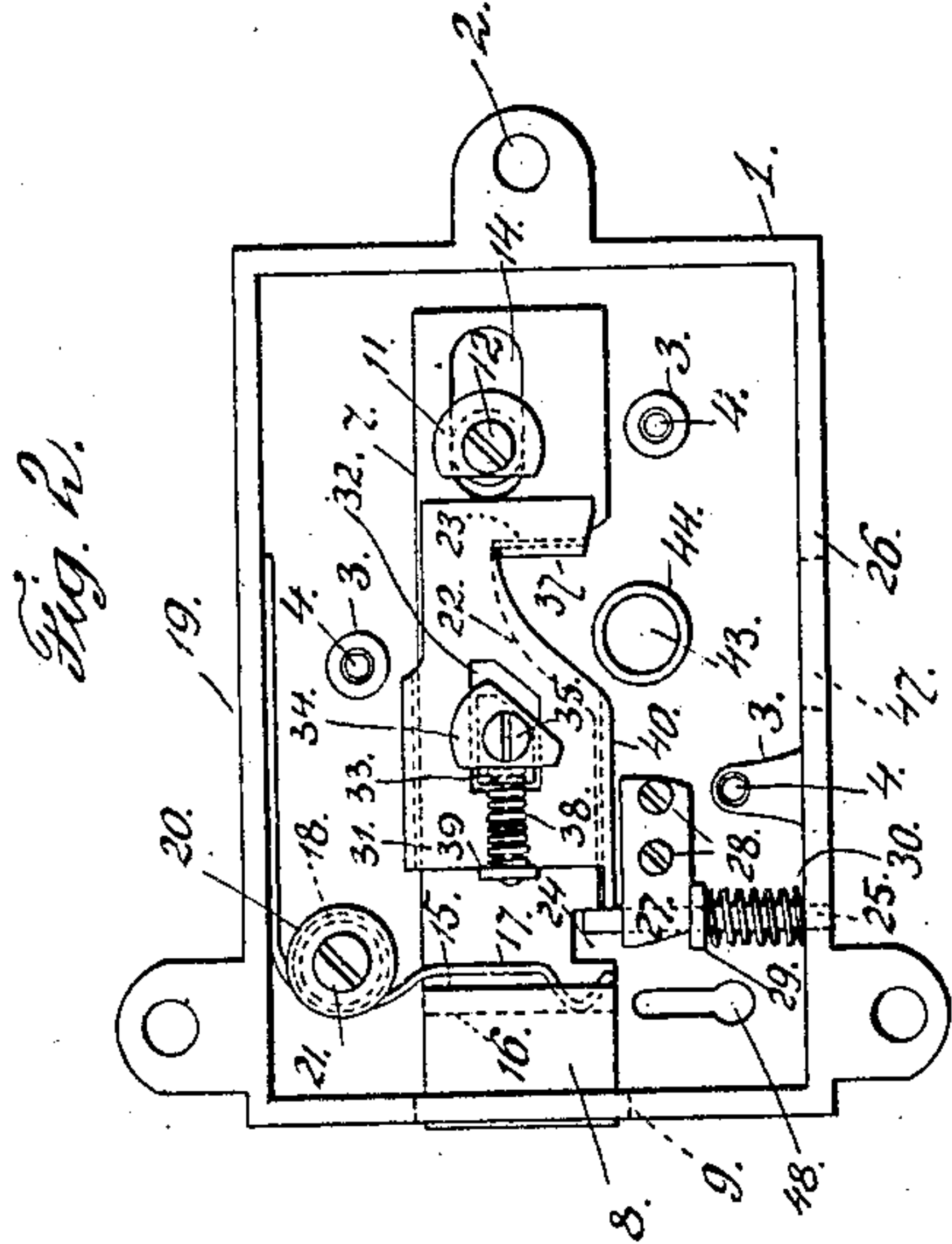


Fig. 4.

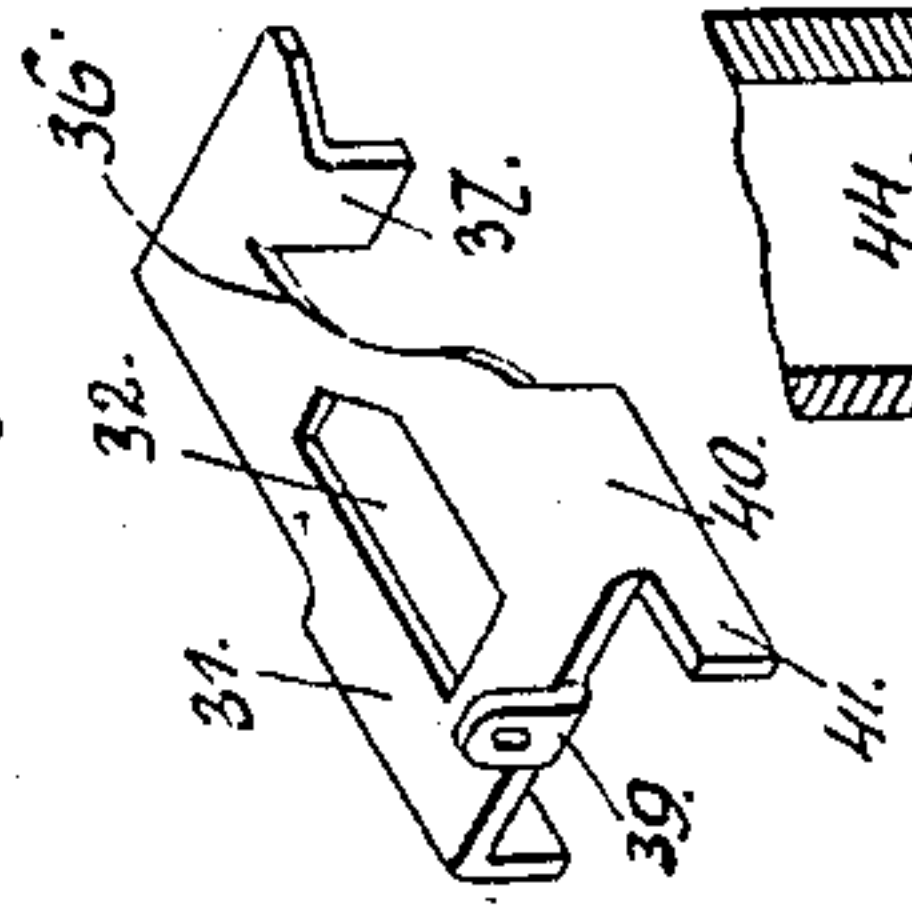


Fig. 5.

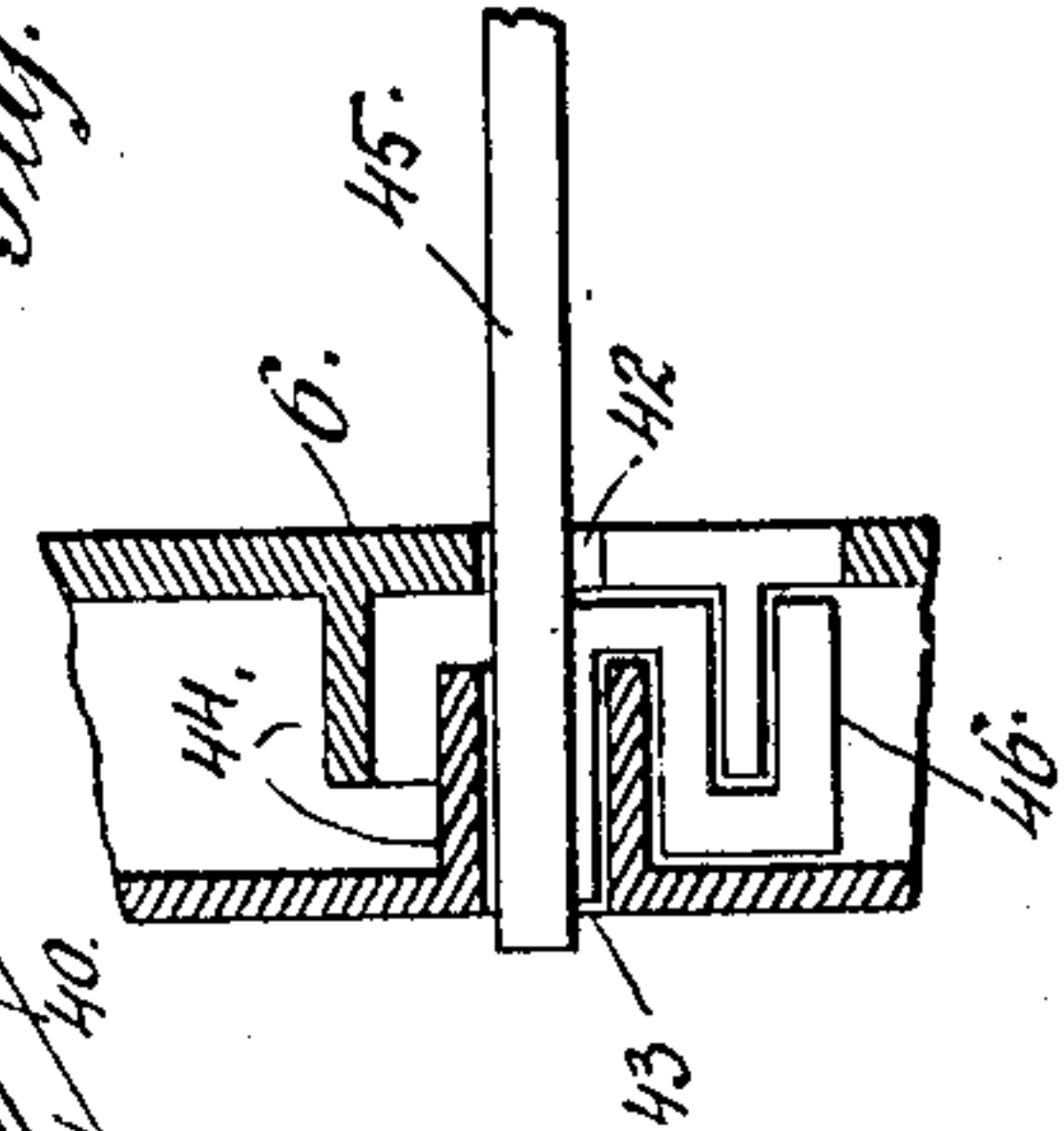
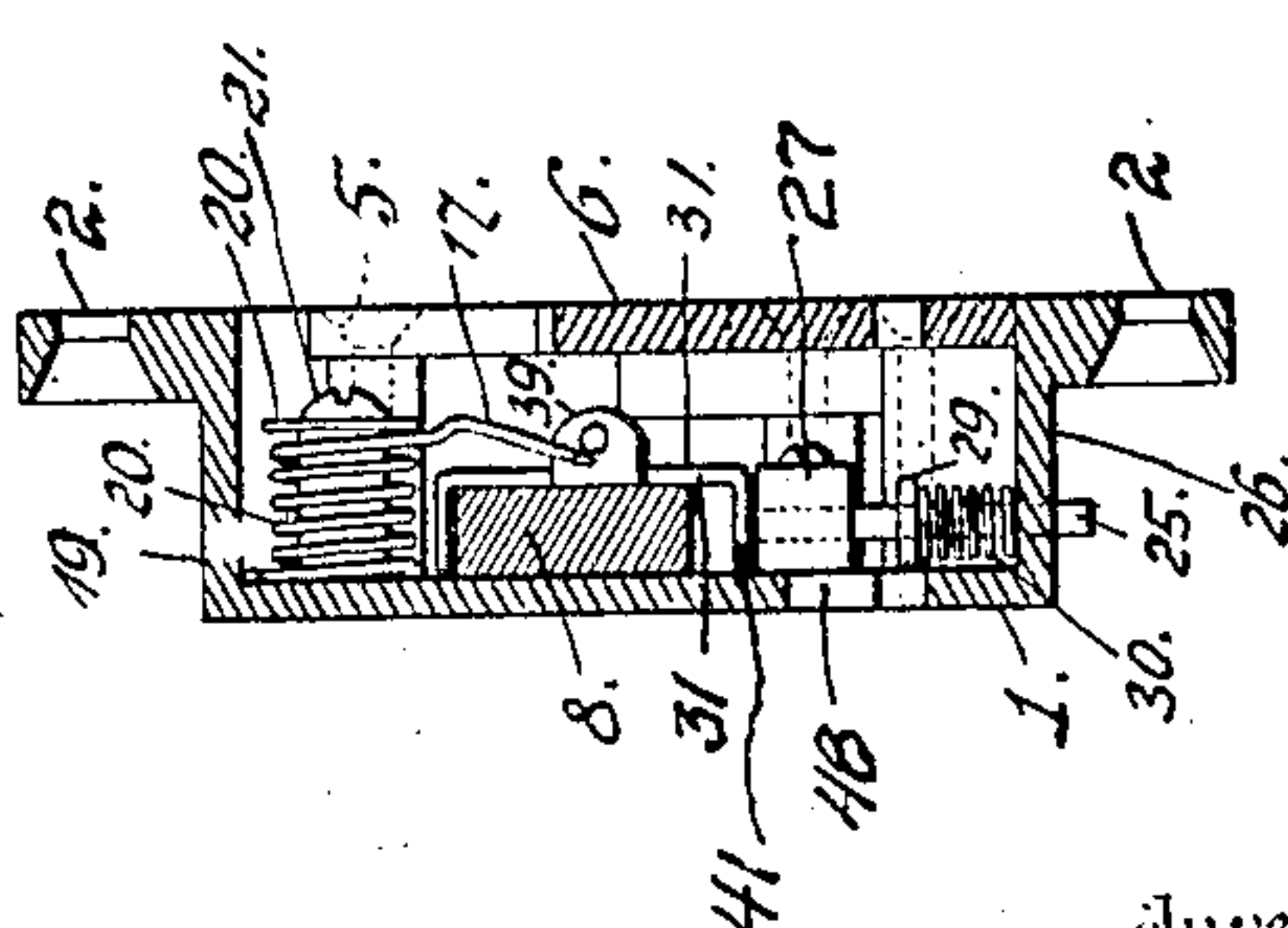


Fig. 3.



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UNITED STATES PATENT OFFICE.

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LOCK.

No. 882,303.

Specification of Letters Patent.

Patented March 17, 1908.

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To all whom it may concern:

Be it known that I, ERNST EICHLER, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Locks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to locks, and the invention relates more particularly to locks for doors of fire alarm and patrol boxes, especially the former.

The invention has for its object to dispense with the use of tumblers and similar pivoted members, commonly employed in a lock for operating the lock bolt thereof, and prevent the lock from being "picked" or surreptitiously unlocked.

My invention aims to provide a novel trap for locking a key in the door of a fire alarm box, after the door has been opened. It is a well known fact that considerable trouble has been experienced with traps and devices heretofore used, necessitating the breaking of doors and keys and even the locking mechanism in order to remove the keys from the doors. My invention obviates the above trouble by providing positive means for releasing a key, said means being arranged to be easily manipulated by an auxiliary key, after the door of a box has been opened. To this end I use simple and inexpensive parts easily arranged within a lock casing, the principal part of my invention constituting a trap, for holding the bolt of a lock in an unlocked position, until the trap is released by an auxiliary key. In connection with the trap a movable spring held slide is used, which is moved prior to the locking bolt, whereby the locking bolt will be placed in condition to receive the trap, and prevent either said trap or locking bolt being moved or the key removed from the lock casing, until the auxiliary key is inserted in the lock casing from the inner side of the door of a box.

The detail construction of my lock will be presently described and then specifically pointed out in the appended claims.

In the drawings, Figure 1 is a plan of the lock, illustrating the locking bolt thereon in a position which it would assume when holding a box door in a closed position, Fig. 2 is a simi-

lar view illustrating the locking bolt withdrawn and the trap as holding said bolt, Fig. 3 is a cross sectional view of the lock, illustrating a lock plate in position, Fig. 4 is a perspective view of the slide used in connection with the lock, Fig. 5 is a detail sectional view of the lock, illustrating the main key opening thereof, together with a part of the key, and Fig. 6 is a plan of a lock with the bolt thereon withdrawn and the trap door about to release said bolt.

To put my invention into practice, I provide a rectangular or other suitably shaped casing 1, having a plurality of pierced projecting lugs 2 by which the lock casing is secured to the inner side of the door (not shown) of a fire alarm or patrol box. The casing 1 is provided with a plurality of posts 3 having threaded openings 4 for receiving screws 5 employed for holding a back plate 6 in the lock casing 1, the outer side of said back plate lying flush with said casing.

In the lock casing is slidably mounted a bolt 7, having a beveled end 8 extending into an opening 9 formed in the end of the casing 1. The opening 9 serves as a guide for the protruding end of the bolt, while a post 10, washer 11 and a screw 12 serve to guide the opposite end of the bolt 7, said post being carried by the casing 1 and extending through an elongated opening or slot 14 provided therefor near the inner end of the bolt 7.

The beveled end 8 of the locking bolt 7 is made of a greater thickness than the remainder of the bolt, thereby providing a shoulder 15, which is recessed as at 16, to receive the end of a spring 17, wound around a post 18 carried by the lock casing, the other end of said spring bearing against the top wall 19 of the lock casing 1. A washer and a screw 21 are employed for retaining the wound portion of the spring 17 around the post 18. The tension of the spring is exerted to normally hold the beveled end 8 of the locking bolt in an extended or locking position.

The lock bolt 7 has its lower edge cut away, as at 22, providing a vertical shoulder 23, and is also provided with a notch 24 for the reception of a vertically disposed trap pin 25, said pin being guided by the lower wall 26 of the lock casing and a block 27 secured in said casing by screws or similar fas-

tening means 28. The trap pin 25 is provided with a collar 29 and interposed between said collar and the lower wall 26 of the lock casing is a coil spring 30, said spring surrounding the trap pin and normally exerting a tension sufficient to elevate said trap pin, when released.

The trap pin is normally held out of engagement with the lock bolt 7 by a metallic inverted channel-shaped slide 31, said slide being formed with an elongated opening 32 for a post 33, said post being provided with a cap 34 and a screw 35 to prevent the slide from raising or being accidentally displaced.

The slide near its rear end, on the lower longitudinal edge thereof, is cut and sheared as at 36, to provide an inwardly-projecting lug 37, and to also provide clearance for the bit of the key as will presently appear. The lug 37 normally lies parallel with the shoulder 23 of the lock bolt and is retained at a prescribed distance from said shoulder by a small coil spring 38 interposed between the post 33 and the upwardly extending lug 39, carried by the forward end of the slide 31.

The slide plate is provided with laterally-extending flanges on its longitudinal edges, and one of these flanges is provided with an extension 41 normally closing the lower edge of the notch 24 and preventing the spring pressed trap pin 25 from entering said notch or contacting with the bolt 7, until the slide 31 is moved and the lock bolt 7 drawn inwardly into the lock casing.

The plate 6 is provided with a key hole 42 alining with an opening 43 formed in the opposite side of a lock casing. These openings are surrounded within the lock casing by sleeves 44 constituting means for preventing keys, other than the proper ones, from being inserted in the lock casing. I have illustrated a key 45 having a bit 46 as placed in the lock casing (see Fig. 5). The lower wall 26 of the lock casing is provided with an opening 47 allowing dirt, carried into the lock casing by a key to pass from said lock casing. The casing is also provided with a key hole 48 directly beneath the lock bolt and at one side of the block 27, this key hole accommodating a release key employed for manipulating the trap pin 25.

The operation of the lock is as follows: Assuming the door of a fire alarm box is held in a closed position by the beveled end 8 of the lock bolt 7, and it is desired to open the door, the key 45 is inserted in the lock casing and turned to the left, until the edge of the bit 46 impinges the lug 37 of the slide 31. A further movement of the key 45 moves the slide 31 until the lug 37 engages the shoulder 23 of the lock bolt. This movement of the slide 31 places the spring 38 under tension and moves the extension 41 from beneath the notch 24 of the lock bolt 7. A still further movement of the key 45 moves the lock

bolt 7 inwardly, until the extension 41 releases the trap pin 25, at which time, said pin is moved upwardly into the notch 24 of the lock bolt, this being accomplished by the coil spring 30 which has been normally held under tension. The upward movement of the trap pin 25 is limited by the collar 29 engaging the block 27. The inward movement of the lock bolt 7 has placed the spring 17 under tension, whereby when said lock bolt is released, said spring will move the lock bolt to its normal position shown in Fig. 1 of the drawings. Since the trap pin 25 holds the lock bolt in a withdrawn position, it will be impossible to remove the key 45 from the lock casing so long as the lock bolt 7 is withdrawn. This is due to the fact that the cut away edge 36 of the slide 31 prevents a rearward movement of the key bit 46 and it is impossible to force the slide or bolt outwardly on account of the trap pin 25. As soon as the door has been opened, the release key (not shown) can be inserted in the key hole 48 and rotated to engage the collar 29, and lower said collar and the trap pin 25. Immediately upon the trap pin passing out of the notch 24 and releasing the extension 41, which is frictionally held in engagement with said trap pin by the spring 38, the spring 17 returns the lock bolt 7 to its normal position, while the spring 38 returns the slide 31 to its normal position. The movement of these two elements permits of the key 45 being removed from the lock casing, and after the release key has been removed from the key hole 48, the door of the box can be closed. Since the lock bolt 7 is held by a spring, a door equipped with the lock can be closed and held in a locked position without the use of a key. It will therefore be apparent that I have devised a spring lock having a novel trap for locking a bolt in a withdrawn position and retaining the bolt actuating key in the lock casing.

The key for insertion in the key-hole 48 which key has not been shown, and has been herein termed as the release key is often known as an "officer's" key, while the key 45 is generally known as a "citizen's" key. As it is often desirable that an officer, or other authorized person may obtain access to a fire alarm box without trapping his key therein, it is my usual practice in constructing the locks to form the lug 37 shorter than the width of the shoulder 23 on the lock bolt, so that the officer's or release key can be inserted in key-hole 42, and as the bit thereof is so shaped that it will clear or miss the lug 37, the lock bolt alone is thrown back or withdrawn, whereas when a citizen's key is inserted the bit thereof will engage the lug 37 and thus draw back both the slide 31 and the bolt 7, and trap such key.

The simplicity of construction entering into my invention not only provides an inex-

pensive lock, but insures positive action of the same, and thereby reduces the expense of maintenance in connection with the many locks used upon fire alarm and patrol boxes.

Having fully described my invention, what I claim and desire to secure by Letters Patent, is:—

1. A lock consisting of a casing having openings formed therein, a spring pressed movable lock bolt arranged in said casing and normally extending into one of said openings, said lock bolt having its lower edge cut away providing a notch and a shoulder, a movable spring held slide mounted upon said bolt, said slide being cut away to provide a lug lying normally parallel with said shoulder, an extension carried by said slide for normally closing the lower end of said notch, a spring pressed trap pin slidably mounted in said casing for engaging in said notch and holding said bolt in a withdrawn position, a key adapted to be inserted in said casing for first moving said slide and then said bolt, and means for lowering said trap pin and releasing said bolt and said slide.

2. In a lock, a lock casing, a lock bolt slidable therein having a shoulder and also provided with a notch, a plate mounted on the lock bolt having an extension normally projecting over the notch in the bolt and said plate having a lug to engage the shoulder on the lock bolt whereby when engaged by a key the lock bolt is withdrawn and the slide is moved to uncover the notch in the bolt, means for engagement with the notch of the bolt to hold the latter in withdrawn position and in the path of withdrawal of said key, and means whereby the first mentioned means is released to permit of the return of the lock bolt to its normal position.

3. A lock embodying a casing, a spring held lock bolt movably mounted therein, and normally protruding from said casing, said bolt having a notch formed therein, a spring held slide movably mounted upon said bolt, an extension carried by said slide for normally closing the lower end of said notch, a spring pressed trap pin engaging said slide and adapted to enter the notch of said bolt, means for moving said slide and simultaneously moving said lock bolt, and releasing said spring pressed pin, and means for moving said spring pressed pin and releasing said slide and lock bolt.

4. In a spring lock, the combination with a casing, and a key, of a spring pressed lock bolt movably mounted in said casing and normally projecting therefrom, a spring pressed slide movably mounted upon said bolt, a spring pressed trap pin movably mounted in said casing for engaging said lock bolt and holding the same in a withdrawn position, means permitting of said key first moving said slide and then said bolt,

and means for moving said spring pressed pin, and releasing said slide and lock bolt.

5. In a spring lock, the combination with a casing, of a spring pressed lock bolt mounted in said casing and projecting therefrom, a spring pressed slide mounted upon said bolt, and cutaway to permit of a key moving said slide and said bolt, means located in said casing for engaging said bolt to hold same withdrawn and in position to prevent withdrawal of the actuating key, and means for releasing the first mentioned means and allowing said slide and bolt to assume their normal position.

6. A lock comprising a casing, a spring pressed lock bolt arranged therein, a spring pressed trap pin for engaging said bolt and holding the same withdrawn and in position to prevent withdrawal of the actuating key, means for normally holding said pin out of engagement with said bolt, means for releasing said pin, and means for returning said bolt to its normal position.

7. A lock comprising a casing, a spring pressed bolt arranged therein, a trap pin for engaging said bolt and holding the same in a withdrawn position, means for normally holding said pin out of engagement with said bolt, means for releasing the first mentioned means, and means for releasing said pin and allowing the first mentioned means and said bolt to assume their normal position.

8. In a lock, the combination with a spring-pressed lock bolt cut away in one of its longitudinal edges to form a shoulder, of a slide plate mounted for movement on the lock bolt cut away in one longitudinal edge to conform to the cut away portion of the lock bolt and having an inwardly-extending lug projection over the shoulder of said lock bolt, the said slide plate being movable on the lock bolt independently of the latter when actuated until the lug thereof engages the shoulder on the lock bolt and movable in unison with the lock bolt after such engagement, an extension carried by the slide plate normally projecting over a notch formed in the lock bolt, and means acting automatically when the bolt and slide plate are retracted and the said extension withdrawn from over the notch in the lock bolt to engage in said notch and lock the bolt and slide plate in retracted position, the said means remaining inactive when the lock bolt alone is retracted.

9. In a lock, a spring-pressed lock bolt cut away in one of its longitudinal edges to form a shoulder, a spring-held plate mounted for movement on the lock bolt cut away in one longitudinal edge to conform to the cut away portion of the lock bolt and having a lug lying parallel with the shoulder of said lock bolt, said spring-held plate being movable on the lock bolt independently of the latter until the lug of said plate engages the

shoulder of the lock bolt and movable in
unison therewith after such engagement, and
means acting automatically when the lock
bolt is withdrawn to secure the same, the
5 said lock bolt and plate in withdrawn posi-
tion acting to prevent the withdrawal of the
actuating-key.

In testimony whereof I affix my signature
in the presence of two witnesses.

ERNST EICHLER.

Witnesses:

FRED DANNENFELS,
MAX H. SROLOVITZ.