No. 883,416. PATENTED MAR. 31, 1908.

F. M. MERRILL.

ELECTRIC ALARM FOR LOCKS.

APPLICATION FILED JUNE 11, 1907.

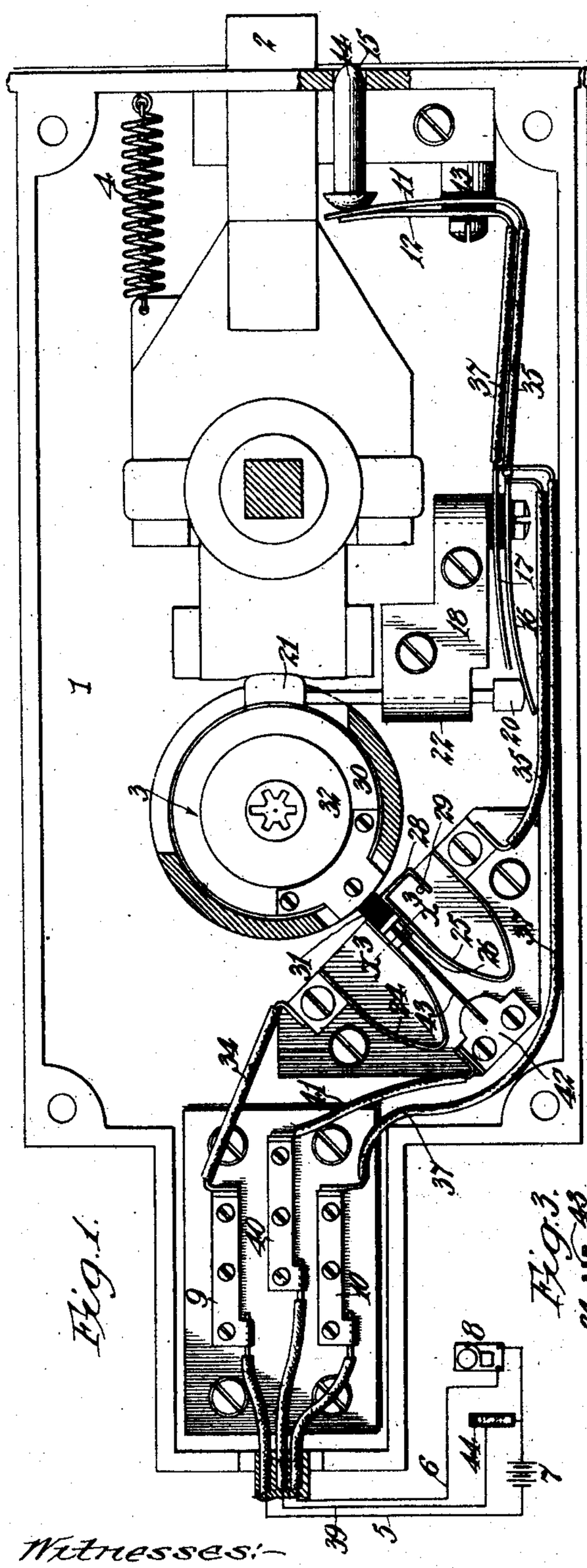

Fig. 1.

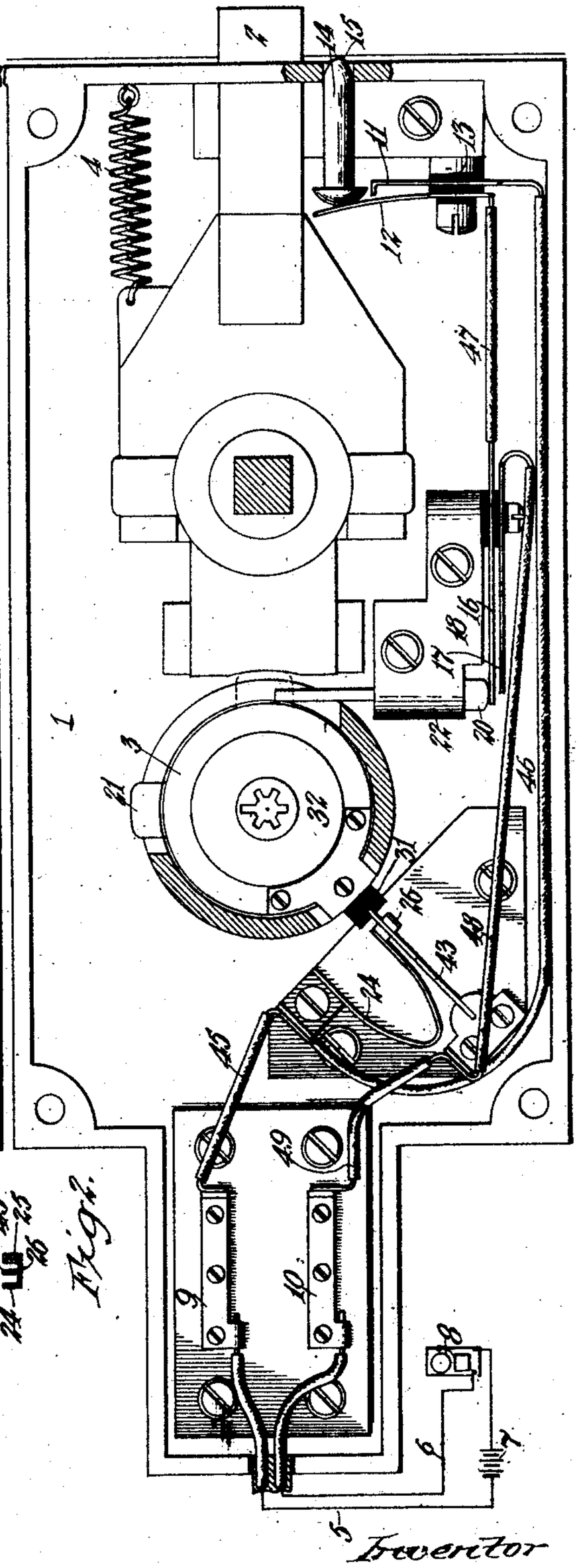

Fig. 2.

Fig. 3.

Witnesses:—

Louis W. Gratz.

Frank La Graham.

Inventor

Frank M. Merrill

By Townsend, Lyon Hackley & Knight

his attys

UNITED STATES PATENT OFFICE.

FRANK M. MERRILL, OF LOS ANGELES, CALIFORNIA.

ELECTRIC ALARM FOR LOCKS.

No. 883,416. Specification of Letters Patent. Patented March 31, 1908.

Application filed June 11, 1907. Serial No. 378,443.

To all whom it may concern:

Be it known that I, FRANK M. MERRILL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Electric Alarm for Locks, of which the following is a specification.

The main object of the present invention is to protect a door or other lock in such manner that tampering therewith in any manner will result in giving an alarm.

A further object of the invention is to provide in connection with a door lock a protective device which will give an alarm in case the controlling member of the lock is tampered with by a device which is incapable of turning the said member, for example, a lock pick.

Another object of the invention is to provide means for giving an alarm in case the door is forced.

Another object of the invention is to provide means for preventing the giving of an alarm in case the door is opened after the controlling member of the lock is operated by key or otherwise.

In the accompanying drawings:—Figure 1 is an inside elevation of the lock with the cover plate removed, showing the embodiment of the invention from closed circuit. Fig. 2 is a similar view of a lock with the alarm connections on normally open circuit. Fig. 3 is a section on line x^3 in Fig. 1.

Referring to Fig. 1, the lock case 1, bolt 2, key-operated bolt-controlled member 3 and bolt-protracting spring or means 4 may be of any usual or suitable construction, the form thereof herein shown being somewhat similar to that in my application Serial Number 377248, dated June 4, 1907.

5, 6 designate the wires of a closed circuit including a battery 7 and alarm 8, these wires leading to terminals 9, 10 on the lock case, from which terminals connections are made to the several circuit-controlling devices in the lock. Said circuit-controlling devices comprise a circuit breaker adapted to be operated by opening of the door, a shunt therefor adapted to be operated by movement of the key-operated member in unlocking the door to disable the said circuit breaker when the door is properly unlocked, and a circuit breaker adapted to be operated by forcible turning of the key-operated member by means other than the proper key.

The circuit controller operated by the opening of the door comprises two contact springs 11, 12, which are supported on an insulating support 13, normally tend to spring apart and are held in contact by a plug or pin 14 passing through the front of the lock, this pin holding said contact springs in contact when the door is closed by reason of the pin being pressed inwardly into position shown in Fig. 1 by contact with the jamb of the door. The end of the pin which engages the jamb is beveled or rounded as at 15, to enable it to be pressed in by the jamb.

The shunt contact device comprises two contact springs 16, 17 mounted on an insulating block 18 and normally held apart by pressure of a pin 20 sliding in a guide 22 formed in the block 18. This pin 20 is normally engaged by an arm or projection 21 on the key-operated bolt-controlling member 3, so that when said member is operated to release the bolt, or unlock the door, the said projection allows the pin to move upwardly under the pressure of the contact spring 16, allowing said contact spring to come into contact with the other contact spring 17, thereby closing a shunt around the circuit breaker 11, 12.

The circuit breaker which guards or protects the key-operated member 3 comprises two springs 24, 25, each, for example, bent in U-shape and having free ends normally in proximity, the end of spring 24 having a U-shaped lateral extension 26 which extends over into contact with the other spring. Said other spring 25 is bent around to form a shoulder 28, normally engaging with a pin 29 on the case, limiting movement of the spring. Between the two springs 24, 25 extends an arm 31 of insulating material on a ward device 30 surrounding the key-operated member 3, said ward device being of any suitable construction so as to normally resist the rotary motion of the key-operated member until certain key-operated tumbler devices are brought into proper position to enable release. Such ward and tumbler devices form no part of my present invention and are not herein shown. The ward member 30 is rotatably mounted in a containing cylinder 32 so as to be capable of turning through a limited distance, the projection of said ward member extending through a slot in said cylinder. If the proper key be inserted and the tumblers of the lock thereby

released from the ward member 30, the rotation of the key will not cause any substantial rotary strain on the ward member 30, but if the wrong key be inserted, or if it be attempted to force the lock by a pick, then the rotary pressure will be exerted on the member 30, causing the arm or lug 31 thereof to bear against one or the other of the springs 24 or 25 according to the direction of attempted rotation. In either case the spring toward which the arm 31 is moved, will be separated from the other spring, and the circuit will be broken. The circuit from terminal 9 leads through wire 34 to contact springs 24, 25, wires 35, contact springs 11, 12, wires 37, to terminal 10. The contact springs 16, 17 are connected to the respective wires 35, 37. In case there are a plurality of door locks so protected and it is desired to annunciate or indicate the particular one which has been attacked, a supplementary circuit 39 is provided, connected to a connection 40 from which the wire 41 leads to a metal plate 42 carrying a spring 43 extending between the U-shaped arm 26 of the contact spring 24, so that in the motion of either one of said arms, as above stated, the U-bend 26 of the arm 24 will come in contact at or on the other side with the contact spring 43, closing connection from the line 9 to the line 39 and thence through the indicator or annunciator indicated at 44.

When the door is closed and locked, the alarm circuit is closed and the annunciator circuit is open, the shunt at 16, 17 is open, pin 14 is pressed in by the jamb, closing contact at 11, 12 and the arm 31 of the ward member 30 is in a position allowing the contact springs 24, 25 to contact with each other, and to break connection with the contact spring 26. If it be attempted to pick the lock, or to open the same with the wrong key inserted in the key-operated member 3, the ward member will be turned as above stated to open the circuit and give the alarm and at the same time close the circuit to the annunciator line 39. If the door be forced open, the pin 14 will be released from the jamb, allowing the contact springs 11, 12 to separate, opening the alarm circuit and giving the alarm. When the door is opened in the proper manner by first inserting the proper key and turning the bolt-controlling member 30, the arm 21 on said member is moved from the pin 20, which allows the contact springs 16, 17 to come into contact, closing the shunt connection around the contact springs 11, 12, so that if the door be then opened the alarm circuit will not be broken.

The invention is equally applicable on open circuit, as shown in Fig. 2, wherein the parts are of the same construction as above referred to, except that all of the contacts in this case are normally open circuited, and the connections are as follows. From the line terminal 9 through wire 45 to contact spring 24 and through wire 46 to contact spring 11 of the pair which guards the forcing of the door. From the other contact spring 12 of this pair, wire 47 leads to contact spring 16 of the disabling pair of contacts operated by the key-controlled member, the other contact 17 of said pair being connected by wire 48 to contact spring 43 of the pair of contacts to guard the movement of the ward member, this connection being continued by wire 49 to the line terminal 10. With this open circuit the annunciator connection may be made directly to either one of the lines 5, 6 and no third connection is required. It will be noted that the pairs of protective contacts 11, 12 and 24, 26 are connected in parallel in this case that the closer of either one of them will operate to close the alarm circuit and that the key-controlled pair of contacts for disabling or rendering inoperative the door guard contacts are in series with the latter, so that when the said disabling contacts are open circuited the door guard contacts are inoperative.

What I claim is:—

1. The combination with a door lock having key-operated controlling means, an electric burglar alarm comprising an alarm circuit, a circuit controller connected thereto and responsive to the opening of the door, and means for disabling said circuit controller responsive to the movement of the key-operated means.

2. The combination with a door lock having a key-operated controlling member and a ward member for normally preventing movement of the controlling member, of an electric alarm circuit and a circuit controller therefor responsive to movement of the ward member, and an annunciator circuit also controlled by said circuit controller.

In testimony whereof, I have hereunto set my hand at Los Angles, California, this 29th day of May 1907.

FRANK M. MERRILL.

In presence of—

ARTHUR P. KNIGHT,
FRANK L. A. GRAHAM.