

No. 653,132.

Patented July 3, 1900.

H. G. CARLETON.
CIRCUIT CONTROLLER.

(Application filed Sept. 23, 1899.)

(No Model.)

Fig. 1.

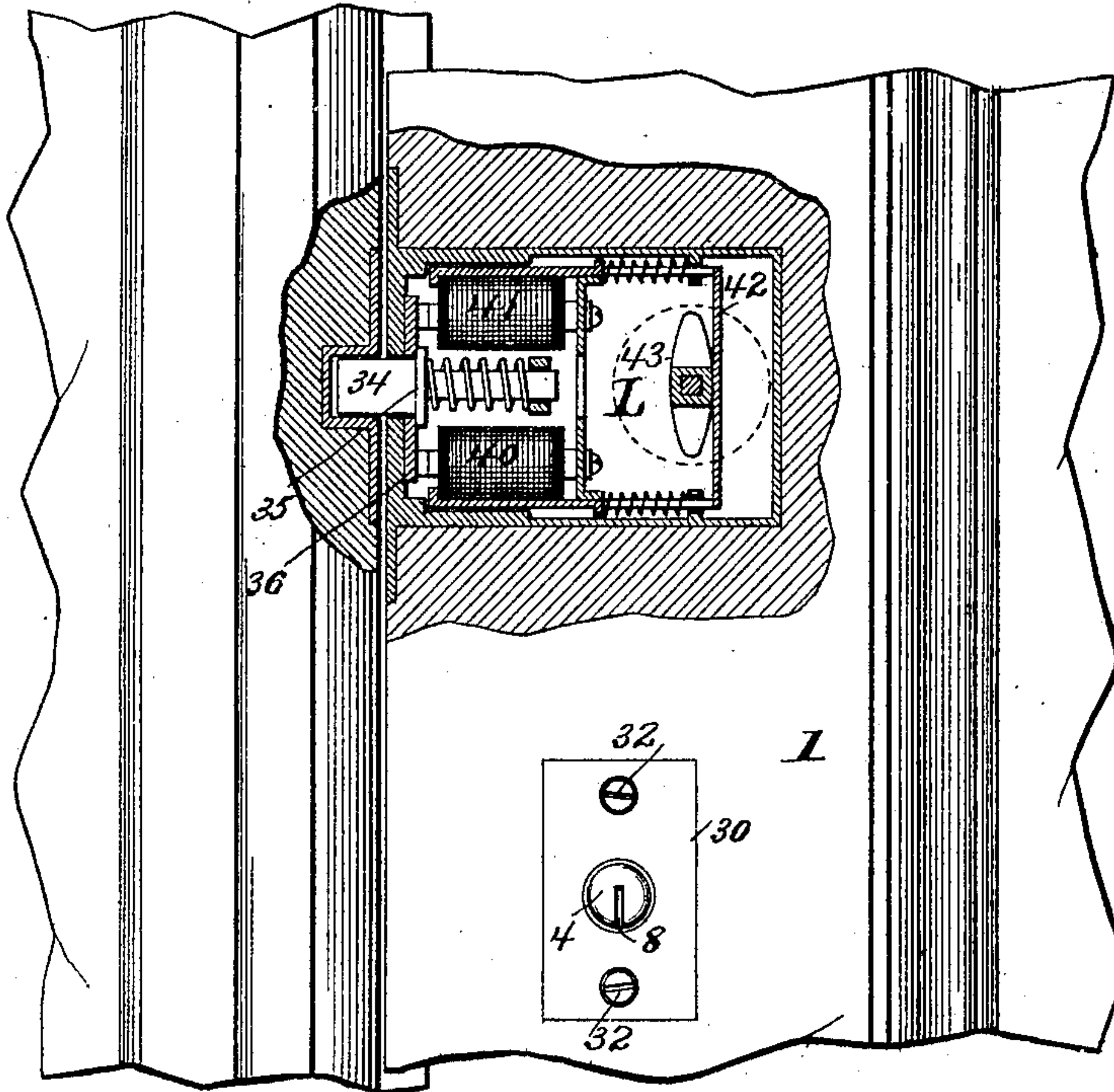


Fig. 3.

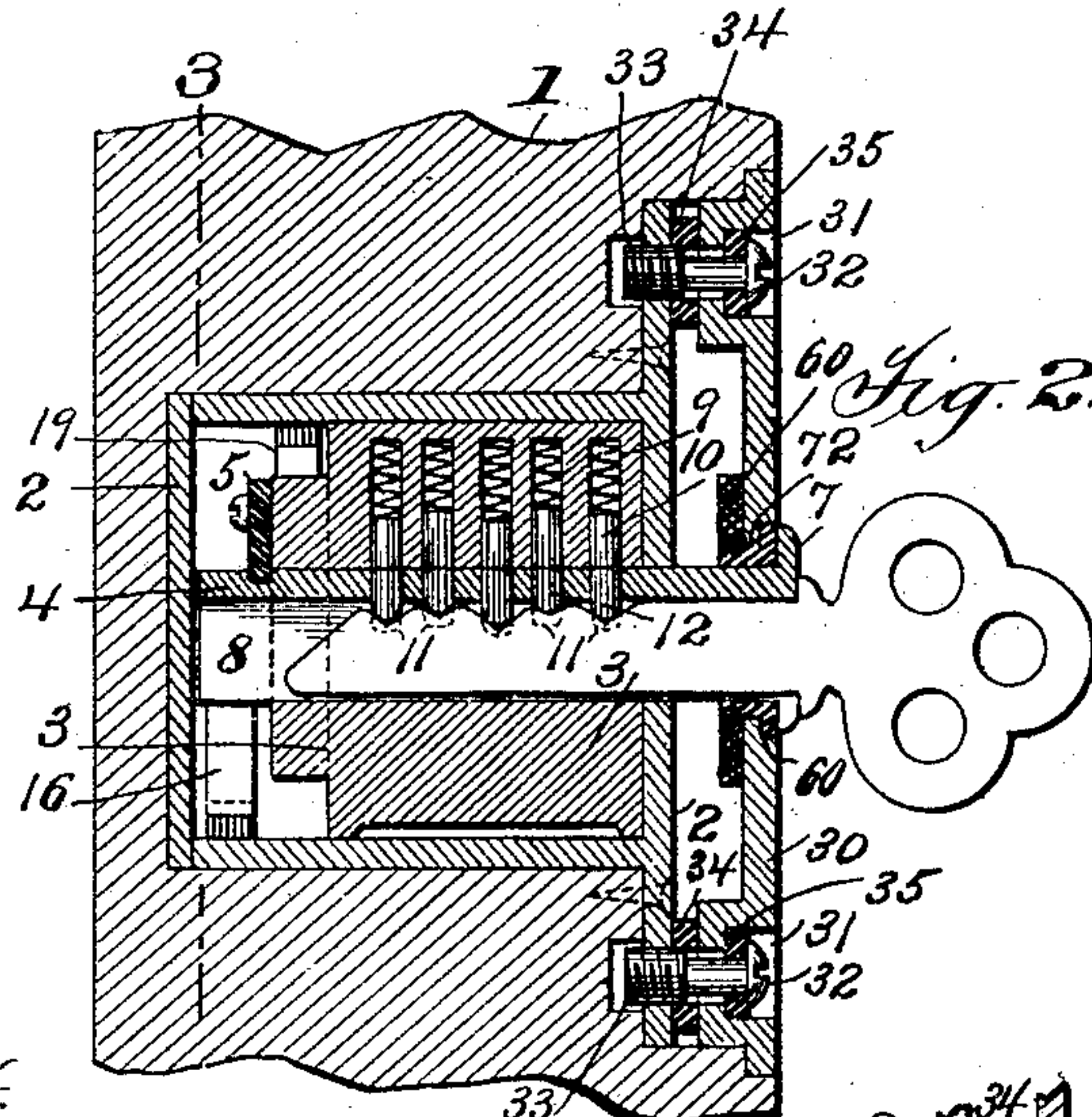
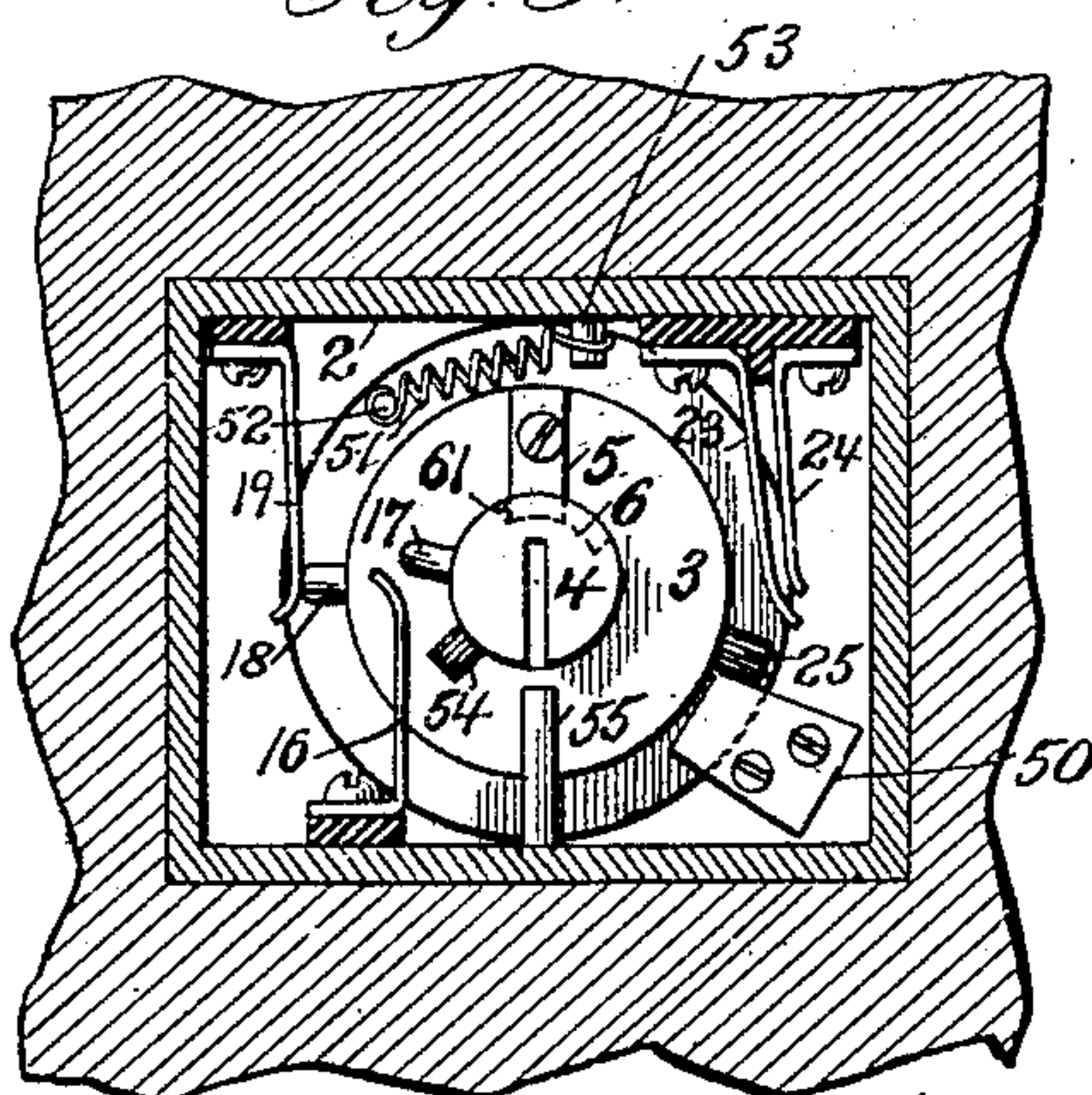
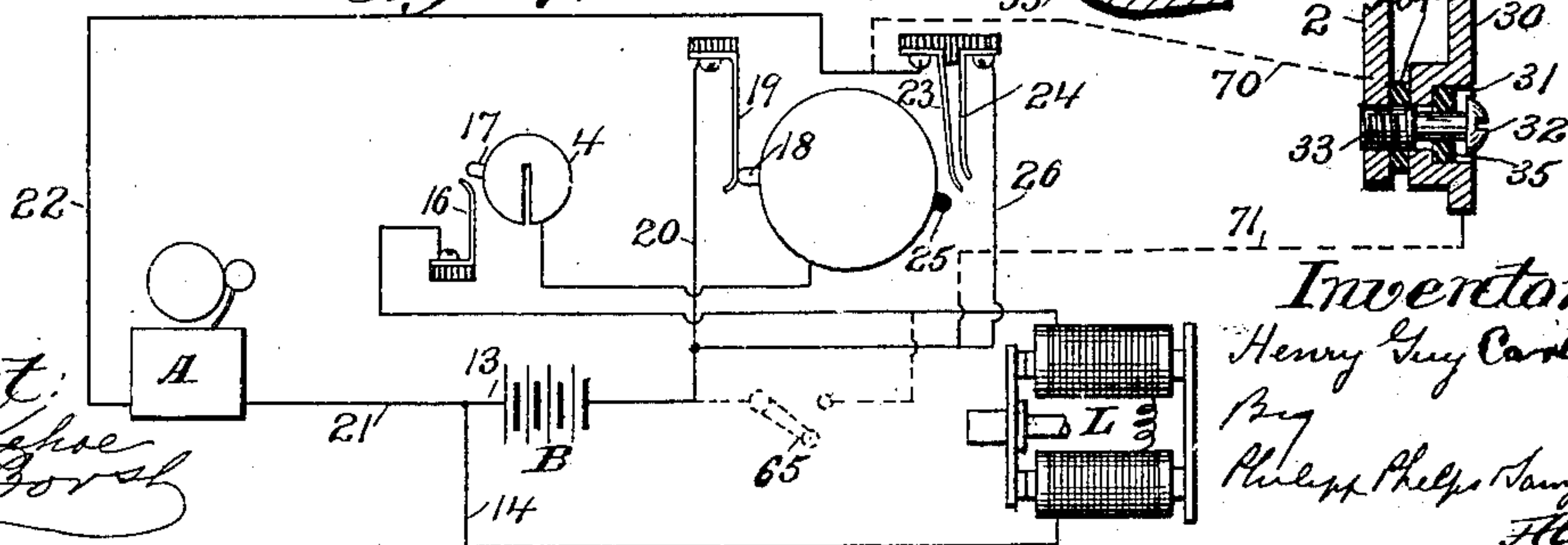


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY GUY CARLETON, OF NEW YORK, N. Y., ASSIGNOR TO THE CARLETON ELECTRIC COMPANY, OF SAME PLACE.

CIRCUIT-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 653,132, dated July 3, 1900.

Application filed September 23, 1899. Serial No. 731,391. (No model.)

To all whom it may concern:

Be it known that I, HENRY GUY CARLETON, a citizen of the United States, residing at New York city, county of New York, and State of New York, have invented certain new and useful Improvements in Circuit-Controllers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to certain improvements in circuit-controllers which are primarily intended for controlling the circuits of electric locks, although they may, if desired, be used for other purposes.

15 One object of the invention is to produce a circuit-controller primarily intended for use with the circuits of electric locks which shall be simple, cheap, compact, and at the same time reliable, which shall be operated by a key in the same manner as an ordinary lock, and which shall in all external respects resemble an ordinary key-operated lock.

20 A further object of the invention is to produce a key-operated circuit-controller of the kind described with which it shall be impossible to make the lock-circuit operative except when the right key is used and in which should an attempt be made to operate it by an improper key or in any other manner notice will be immediately given—as, for instance, by sounding an alarm.

25 A further object of the invention is to produce a key-operated circuit-controller which may be variously "set up," so that a large number of controllers may be made with only slight differences in the controllers and keys, but in which such differences shall be sufficient to prevent the key of one controller from operating another.

30 A further object of the invention is to produce an improved form of protective plate which may be used with the circuit-controller and which shall in case any unauthorized attempt is made to remove the controller give immediate notice thereof—as, for instance, by sounding an alarm.

35 With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter described,

and fully set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same 55 parts, Figure 1 is a front elevation of a portion of a door, partly in section, an electric lock being shown in section therein and the circuit-controller therefor being shown in front elevation. Fig. 2 is a vertical central 60 section through the controller, the figure being on a somewhat larger scale than Fig. 1. Fig. 3 is a sectional view on the line 3 3 of Fig. 2 and looking to the right of the observer, the view being on the same scale as Fig. 2. 65 Fig. 4 is a diagrammatic view of the circuits employed.

Referring to the drawings, which illustrate the preferred form of the controller, 1 indicates a part which is to be controlled by the 70 electric lock—as, for instance, a door. The door has a suitable recess or mortise therein, in which is placed a casing 2. Mounted in this casing and so as to rotate therein is a cylinder 3, said cylinder operating as a circuit-controller in a manner to be hereinafter 75 described. Mounted in the cylinder 3 and so as to rotate therein is a second smaller cylinder 4, said cylinder being held in position in the first cylinder in any suitable manner, as 80 by a retaining-piece 5, which engages a groove 6 in said cylinder. The retaining-piece 5 and groove 6 are preferably so arranged as to permit the cylinder 4 to have a movement in one direction only with respect to the cylinder 85 3. To this end the said groove is provided with a square shoulder 61 at one of its ends, against which the retaining-piece 5 normally abuts. While this is a preferred feature of the construction, it may be omitted, if de- 90 sired, and the cylinders 3 and 4 may be held in position with respect to each other in any convenient or desired manner. The cylinder 4 also preferably extends out beyond the forward end of the casing 2 and has a shoulder 95 or flange 7 for a purpose to be hereinafter referred to. The cylinder 4 is also provided with a key-slot 8 of any desired form.

The cylinder 3 is preferably provided with a series of sockets 9, in which are contained 100

a series of spring-operated locking-pins 10. These locking-pins 10 when in their forward position extend into a series of perforations 11 in the cylinder 4 and lock the cylinders together. Mounted in the perforations 11 of the cylinder 4 are a series of lifting-pins 12, one or more of said pins being of different length from the other pins. The ends of these lifting-pins 12 extend down into the key-slot 8. The construction which has just been described is generally similar to that of the ordinary well-known Yale or pin lock, though in such locks the outer cylinder is not a rotating cylinder, the two cylinders being locked together by the pins 10. It is obvious that when a key having properly-arranged bits is introduced into the key-slot in the cylinder 4 the lifting-pins 12 will be raised to an amount to cause the locking-pins to just clear the perforations in the cylinder 4, so that the same may be rotated independently of the cylinder 3. If, however, any one of the lifting-pins is not lifted to the proper amount or if it is lifted too much, as will be the case if an improperly-bitted key is introduced into the lock, the cylinders will remain locked together, and an attempt to rotate the inner cylinder with the key will also rotate the outer cylinder.

The inner cylinder 4 operates a circuit-controlling means, which will be hereinafter fully described, by which it is caused to control, for instance, a circuit containing an electric lock. The outer cylinder operates circuit-controlling means by which it is caused to control any desired circuit—as, for instance, an alarm-circuit. In the present form of the invention the outer cylinder is also preferably provided with means which act upon the lock-circuit. It is obvious, therefore, that when the inner cylinder is revolved alone it may be caused to make a lock-circuit which it controls operative. When, however, the two cylinders revolve together, the outer cylinder may be caused by means of the devices it controls to make an alarm-circuit operative and also to so act upon the lock-circuit as to render it inoperative, thus preventing the lock-circuit from being rendered operative by a movement of the inner cylinder.

While the circuits employed may be variously arranged and either closed or open and the controlling devices carried by the cylinders may be of various kinds, the circuits will preferably be open circuits and the controlling devices will operate to close them.

The circuits will preferably be run as follows: A wire 13 is led from the battery B and connects with a wire 14, running to the magnets of an electric lock L. From the magnets of the electric lock a wire is run to a circuit-closing terminal 16. This circuit-closing terminal is in the path of a circuit-closing projection 17, carried on the inner cylinder 4.

The inner cylinder 4, which is preferably a metallic cylinder, is in electrical connection with the outer cylinder 3, also preferably a

metallic cylinder, and this cylinder carries a contact 18, which normally rests against a contact 19. This contact 19 is connected to the battery by a wire 20. Leading from the wire 13, before referred to, is a wire 21, which leads to any suitable alarm—as, for instance, a bell A. From the other side of the bell a wire 22 is led, said wire running to a spring-contact 23. Alongside said spring-contact 23 is another contact, preferably a spring-contact 24, from which is run a wire 26. This wire 26 is connected to the wire 20, leading to the battery B. With this system of circuits it is obvious that when the proper key is inserted in the circuit-controller and the locking-pins lifted thereby to the proper amount to unlock the inner cylinder from the outer cylinder a rotation of the key will cause the inner cylinder 4 to rotate and its contact 17 to strike the contact 16. A circuit will then be made from the battery through the wires 13 and 14 to the magnets of the lock through the wire 15 and contacts 16 and 17 to the cylinder 4 to the cylinder 3.

The cylinder 3 is normally in such position that its contact 18 is in electrical connection with the contact 19. If it remains unmoved and the cylinder 4 is rotated as described, so as to bring the contacts 16 17 together, the circuit will be made through the contacts 18 and 19 and the wire 20 back to the battery. The magnets of the lock are thus energized, and the lock is or may be operated according to the type of lock employed.

Should any attempt be made to open the lock by operating the circuit-controller in any other manner than by the proper key, it is obvious that the two cylinders 3 and 4 will turn together. In this case a projection 25, which is either of insulating material or insulated from the cylinder on the cylinder 3, will force together the two contact-springs 23 24. This makes a circuit from the battery through the wires 13 and 21 into the alarm A, from the alarm A by the wire 22 to the contact-springs 23 and 24, and from the contact-spring 24 by the wires 26 and 20 into the battery, thus sounding the alarm.

When the two cylinders 3 and 4 rotate together, as will be the case when an attempt is made to operate the controllers by any means other than by the proper key, it is obvious that the contact 17, carried by the inner cylinder 4, will be brought against the contact 16, thus making the lock-circuit at this point. The contact 18, carried by the cylinder 4, which is, as has been before described, in the lock-circuit, is accordingly arranged so that it will move away from the contact 19 before the contact 17 strikes the contact 16. The lock-circuit is therefore opened by the movement of the contact 18 with respect to the contact 19 before it is closed by the movement of the contact 17 against the contact 16.

In order to insure that the cylinder 3 is stopped in such a position that the contact

18 will be against the contact 19, a stop 50 is preferably provided on the casing, against which the projection 25 rests when the lock is in its normal position. The cylinder 3 may be held in the position in which the projection 25 rests against the stop 50 by any suitable form of spring. In the construction shown it is so held by a spring 51, which is connected at one end to a pin 52, carried by the cylinder 3, and at the other end to a pin 53, held on the casing. The projection 25 and stop 50 also insure that the cylinder 3 will rotate in that direction in which the projection 25 is brought against the contacts 23 24. In case any unauthorized attempt is made, therefore, to manipulate the lock the alarm will invariably be sounded.

When the proper key is inserted in the lock, the cylinder 4 will, as has been described, be turned with respect to the cylinder 3. The retaining-piece 5 and shoulder 61 on the groove 6, however, prevent any movement of this cylinder except in the direction in which the contact 17 is brought against the contact 16. In order to prevent the cylinder from being turned too far, so as to cause the contact 17 to pass the contact 16, thus breaking the circuit immediately after it is made, the cylinder 4 is preferably provided with a projection 54, which comes in contact with a stop-piece 55 on the lock-casing as soon as the contact 17 has made a good connection with the contact 16. With the arrangements of the parts described, therefore, it will be seen that any movement of the cylinder 3 will infallibly result in sounding an alarm, and any movement of the cylinder 4 independent of the cylinder 3 will close the lock-circuit.

In order to prevent unauthorized removal of the controller, it will preferably be secured in the door by means of a protective plate 30, somewhat similar to that described in my former patent, No. 608,320, granted August 2, 1898. In the present form of this protective plate, however, the recesses 31, which receive the screws 32, are countersunk, so as to render it impossible to bite off the heads of the screws and so remove the plate. The operation of this protective plate will be readily understood from the description contained in the Letters Patent No. 608,320. It may be briefly remarked, however, that the inner plate 2 of the lock is connected with one pole of the battery through a wire 70, which connects with the circuit-wire 22, (indicated in Fig. 4,) and the outer plate 30 is in electrical connection with the other pole of the battery through a wire 71, which connects with the wire 26. The screws 32 have their threaded portions 33 enlarged, a cut-away space being formed between the threaded portions of the screws and the heads thereof. The plates 2 and 30 are insulated from each other by means of insulating-blocks 34, and each screw 32 is insulated from the plate 30 by means of an insulating-washer 35. It is obvious that when the screws 32 are driven

home—as indicated in Fig. 2, for instance—the plates 30 and 2 will not be electrically connected. When, however, any attempt is made to move the plate 30 by unscrewing the screws 32, the enlarged portions 33 of the screws will establish a contact between the two plates and thus ring the alarm which is located in the circuit.

The cylinder 4 preferably extends through the protective plate 30 and must, therefore, be insulated from the said plate. This insulation may be accomplished in various ways. Preferably, however, a flanged collar 60, made of any suitable insulating material, will be arranged to surround the cylinder 4, the flange of the collar being located behind the flange or shoulder 7 of the cylinder 4 and being interposed between it and a recessed shoulder 72 of the protective plate. The flange of the collar is preferably of such a width that it is entirely concealed by the shoulder 7, and the edge of the plate 30, surrounding the recess, extends down behind the flange 7. Any attempt, therefore, to drill through the flange will result in closing the alarm-circuit referred to.

Any suitable form of electric lock may be used with the circuit-controller which is described in this application. Preferably, however, the controller will be used with the lock or opening devices described in my Patent No. 608,321, granted August 2, 1898, and such a lock or opener is illustrated in Fig. 1. Reference is made to said patent for a full description of this lock and the various forms thereof. For the purpose of this application it is sufficient to say that the lock in general consists of a pair of magnets 40 41, which are carried on a movable frame 42, said frame being operated by a cam 43, which is in turn operated from the handle of the lock. The plate 34 has a shoulder 35 thereon, against which bears the armature 36 of the magnet. When the circuit is turned through the magnets, the armature will be held to the poles of the magnets. If, therefore, the cam 43 be operated, the magnets, armature, and lock-bolt will move back together. If, however, the magnets be deenergized, any movement of the cam 43 will simply cause the magnet-carrying frame and magnets to move back alone without disturbing the position of the locking-bolt.

Suitable switches for controlling the various circuits may of course be inserted in the circuits at any suitable points, and such a switch is indicated in dotted lines at 65, (see Fig. 4,) the purpose of the switch being to control a branch circuit (indicated in dotted lines) which throws the current from the battery through the magnets of the lock.

While the parts of the circuit-controller described are preferably rotating cylinders connected by pins which are operated by differently-bitted keys, it is to be understood that the invention is not by any means limited to such a construction. The parts of the con-

troller need not be rotating parts, nor need they be connected by pins in the manner described. The invention therefore is to be understood as generic in its nature and as embracing all forms of controllers in which key-operated devices are caused to control a lock-circuit and an alarm-circuit.

What I claim is—

1. In a circuit-controller for electric locks, the combination with a normally-inoperative lock-circuit and a normally-inoperative alarm-circuit, of key-operated devices for independently controlling said circuits, substantially as described.

2. In a circuit-controller for electric locks, the combination with a normally-inoperative lock-circuit, and a normally-inoperative alarm-circuit, of key-operated devices for controlling said circuits, and means whereby said devices are caused on the insertion of the proper key to render the lock-circuit operative and the alarm-circuit inoperative and on the insertion of an improper key to render only the alarm-circuit operative, substantially as described.

3. In a circuit-controller for electric locks, the combination with a normally-inoperative lock-circuit, and a normally-inoperative alarm-circuit, of key-operated devices for controlling said circuits, and means whereby said devices are caused on the insertion of the proper key to render the lock-circuit operative and the alarm-circuit inoperative, and on the insertion of an improper key to cause the alarm-circuit to become operative and render the lock-circuit inoperative at a second point, substantially as described.

4. The combination with a normally-open lock-circuit and a normally-open alarm-circuit, of key-operated devices operating on the insertion of the proper key to close the lock-circuit and on the insertion of an improper key to close the alarm-circuit, substantially as described.

5. The combination with a normally-open lock-circuit and a normally-open alarm-circuit, of key-operated devices operating on the insertion of the proper key to close the lock-circuit and on the insertion of an improper key to close the alarm-circuit and open the lock-circuit at a second point, substantially as described.

6. The combination with a normally-inoperative lock-circuit and a normally-inoperative alarm-circuit, of a movable controller for each circuit, means whereby upon the insertion of a proper key the controller for the lock-circuit is made operative and upon the insertion of an improper key the controller for the alarm-circuit is made operative, substantially as described.

7. The combination with a normally-open lock-circuit and a normally-open alarm-circuit, of a movable controller for the lock-circuit, a movable controller for the alarm-circuit which also operates to open the lock-circuit, and means whereby upon the insertion

of a proper key the lock-circuit shall be closed and upon the insertion of an improper key the alarm-circuit shall be closed and the lock-circuit opened, substantially as described.

8. The combination with a normally-inoperative lock-circuit and a normally-inoperative alarm-circuit, of a rotating key-operated controller for each circuit, means carried by the controller for the alarm-circuit for operating on the lock-circuit to render it still further inoperative, and means whereby upon the insertion of a proper key the controller for the lock-circuit shall be rotated alone, but upon the insertion of an improper key both controllers shall be rotated, substantially as described.

9. The combination with a normally-inoperative lock-circuit, of a rotating controller therefor, a normally-inoperative alarm-circuit, a rotating controller for said circuit, means operated by the alarm-circuit controller for acting upon the lock-circuit, means whereby upon the insertion of a proper key the controller for the lock-circuit is rotated and the circuit made operative, and means whereby upon the insertion of an improper key both controllers rotate, and the alarm-circuit controller renders its circuit operative and acts upon the lock-circuit to render it still further inoperative, substantially as described.

10. The combination with a normally-open lock-circuit, of a rotating controller for closing the same, a normally-open alarm-circuit, a rotating controller for closing the same, means operated by the controller for the alarm-circuit for acting upon the lock-circuit to open it, means whereby upon the insertion of a proper key the controller for the lock-circuit will be rotated to close the same, and means whereby upon the insertion of an improper key both controllers will be rotated and the alarm-circuit controller will operate to close the alarm-circuit and open the lock-circuit, substantially as described.

11. The combination with a movable part carrying circuit-controlling devices, of a second movable part also carrying circuit-controlling devices, and key-operated devices acting to normally lock the two parts together, the first movable part being adapted to be independently operated by a key which releases the locking devices, and both parts being adapted to be operated simultaneously by a key which does not release the locking devices, substantially as described.

12. The combination with a cylinder carrying circuit-controlling devices, of a movable support in which it is mounted, said support also carrying circuit-controlling devices, key-operated devices serving to normally lock the two parts together, the cylinder being adapted to be rotated by a key which releases the locking devices, and both the cylinder and support being adapted to be operated by a key which does not release the locking devices, substantially as described.

13. The combination with a pair of rotating cylinders, each cylinder carrying circuit-controlling devices, of means whereby the two cylinders are locked together, and key-operated means by which said locking means may be released so that the cylinders may operate independently of each other, substantially as described.

14. The combination with a normally-inoperative lock-circuit and a normally-inoperative alarm-circuit, of a pair of cylinders, each cylinder carrying a controller for one of the circuits, locking devices whereby the cylinders may be caused to rotate together, and key-operated means whereby the locking devices are released and the cylinders allowed to rotate independently of each other, substantially as described.

15. The combination with an alarm-circuit and a lock-circuit, of a pair of cylinders, means whereby one cylinder acts as a controller for the lock-circuit, means whereby the other cylinder acts as a controller for both circuits, locking devices whereby the two cylinders may be caused to rotate together, and key-operated means for releasing the locking devices so that the cylinders may rotate independently of each other, substantially as described.

16. The combination with a normally-open lock-circuit and a normally-open alarm-circuit, of two rotating cylinders, means carried by one of the cylinders for closing the lock-circuit, means carried by the other cylinder for closing the alarm-circuit and opening the lock-circuit, locking devices whereby the two cylinders may be caused to rotate together, and key-operated means for releasing the locking devices so that the cylinders may rotate independently of each other, substantially as described.

17. The combination with a pair of rotating cylinders, of a series of pins for locking the cylinders together, a series of pins, one or more of which differs in length from the other pins, for operating the locking-pins, a key-slot into which said pins project, and circuit-controlling devices carried by the cylinders, substantially as described.

18. The combination with a rotating outer cylinder, of a rotating inner cylinder mounted therein, a series of locking-pins operating to lock the two cylinders together, a series of lifting-pins, one or more of which differs in length from the others, said pins projecting into a key-slot in the inner cylinder, a lock-circuit, controlling means therefor carried by one cylinder, an alarm-circuit, and controlling means therefor carried by the other cylinder, substantially as described.

19. The combination with a rotating outer cylinder, of an inner cylinder mounted therein, a series of locking-pins carried by the outer cylinder and serving to lock the two cylinders together, a series of lifting-pins, one or more of which differs in length from the others, said pins projecting into a key-

slot in the inner cylinder, a lock-circuit, controlling means therefor carried by the inner cylinder, an alarm-circuit, controlling means therefor carried by the outer cylinder, said outer cylinder also carrying a second controlling means for the lock-circuit, substantially as described.

20. The combination with a rotating outer cylinder, of an inner cylinder mounted therein, a series of locking-pins carried by the outer cylinder and serving to lock the two cylinders together, a series of lifting-pins, one or more of which differs in length from the others, said pins projecting into a key-slot in the inner cylinder, a normally-open lock-circuit, a closing device therefor carried by the inner cylinder, a normally-open alarm-circuit, and a closing device therefor carried by the outer cylinder, said outer cylinder also carrying means by which the lock-circuit is opened when the alarm-circuit is closed, substantially as described.

21. In a circuit-controller, the combination with an outer cylinder, of means for preventing its rotation except in one direction, an inner cylinder, means for preventing its rotation except in one direction, means for limiting the amount of rotation of said inner cylinder, and circuit-controlling devices carried by each of the cylinders, substantially as described.

22. In a circuit-controller, the combination with an outer cylinder carrying a contact-point and a circuit-closing projection, of a circuit-terminal lying in the path of the contact-point, circuit-closing devices adapted to be operated by the projection and lying in the path thereof, an inner cylinder, means for locking the two cylinders together, means for releasing said locking means, a contact-point carried by the inner cylinder, a circuit-closing terminal lying in the path of the contact-point, means for preventing the rotation of the inner cylinder except in one direction, and means for limiting its rotation in that direction, substantially as described.

23. The combination with a casing, of a protective plate therefor, the plate being insulated from the casing, a headed holding device for securing the plate to the casing, said holding device passing through the plate and casing and having a reduced portion, said reduced portion lying in a perforation in one of the members and the other portion being long enough to span the distance between the casing and plate, insulation between the headed holding device and that member which surrounds its reduced portion, the head of the holding device lying in a countersunk recess in said member, a suitable source of electrical energy to which the plate and casing are connected, and an alarm in the connections, substantially as described.

24. The combination with a casing, of a protective plate therefor, said plate having a countersunk recess, insulation between the plate and the casing, a screw having a reduced

portion passing through perforations in the plate and the casing and the head of the screw lying in the recess in the plate, the reduced portion of the screw lying in the perforation of said plate and its other portion being long enough to span the distance between the plate and the casing, a suitable source of electrical energy to which the plate and the casing are connected, and an alarm in said connections, substantially as described.

25. The combination with a casing, of a protective plate therefor, of an outer cylinder contained in the casing, an inner cylinder extending through the front of the casing and the protective plate, an insulated washer interposed between the cylinder and the plate, insulation between the casing and the plate, securing devices for holding the plate to the casing, insulation between the securing devices and the plate, a source of electrical energy to which the plate and the casing are connected, and an alarm in the connections, the securing devices being adapted to establish an electrical connection between the plate and the casing when they are withdrawn, substantially as described.

26. The combination with a casing, of a protective perforated plate therefor, an outer rotating cylinder secured in the casing, an inner cylinder mounted in the outer cylinder, said inner cylinder extending through the casing and the plate and having a shoulder overlapping the edges of the perforation in the plate, a recess surrounding the perforation, an insulating-collar in the recess, insulation between the plate and the casing, securing devices for connecting the plate and the casing, insulation between said securing devices and the plate, a source of electrical energy to which the casing and plate are connected, and an alarm in the connections, the securing devices being adapted to establish an electrical connection between the plate and the casing when they are withdrawn, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY GUY CARLETON.

Witnesses:

JAMES Q. RICE,
T. F. KEHOE.