

No. 771,749.

PATENTED OCT. 4, 1904.

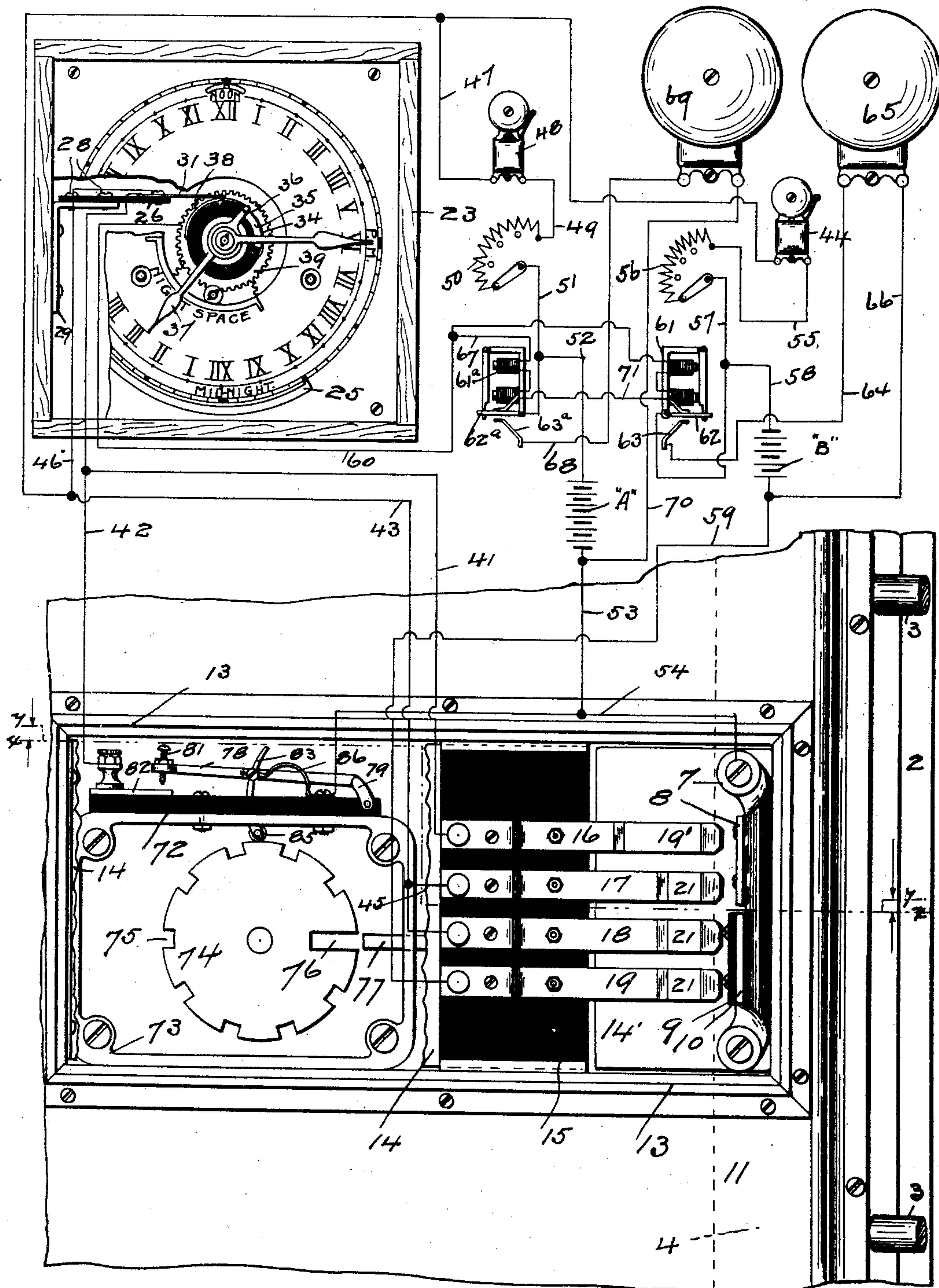
W. H. ROBINS & J. F. JACOBY.

BURGLAR ALARM.

APPLICATION FILED APR. 7, 1903. RENEWED JAN. 25, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

S. V. Griffin
E. H. H. H.

FIG. 1.

INVENTORS

WILLIAM H. ROBINS

JOHN F. JACOBY

BY *JOHN F. JACOBY*
Paul & Paul
THEIR ATTORNEYS

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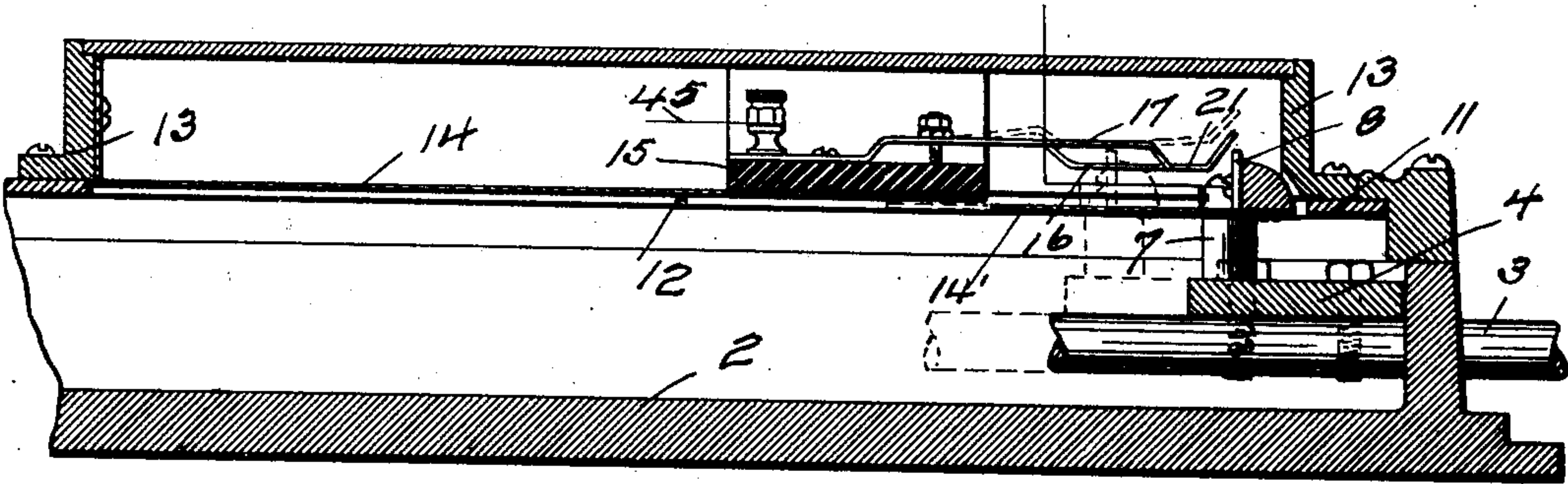


FIG. 2. 4-4

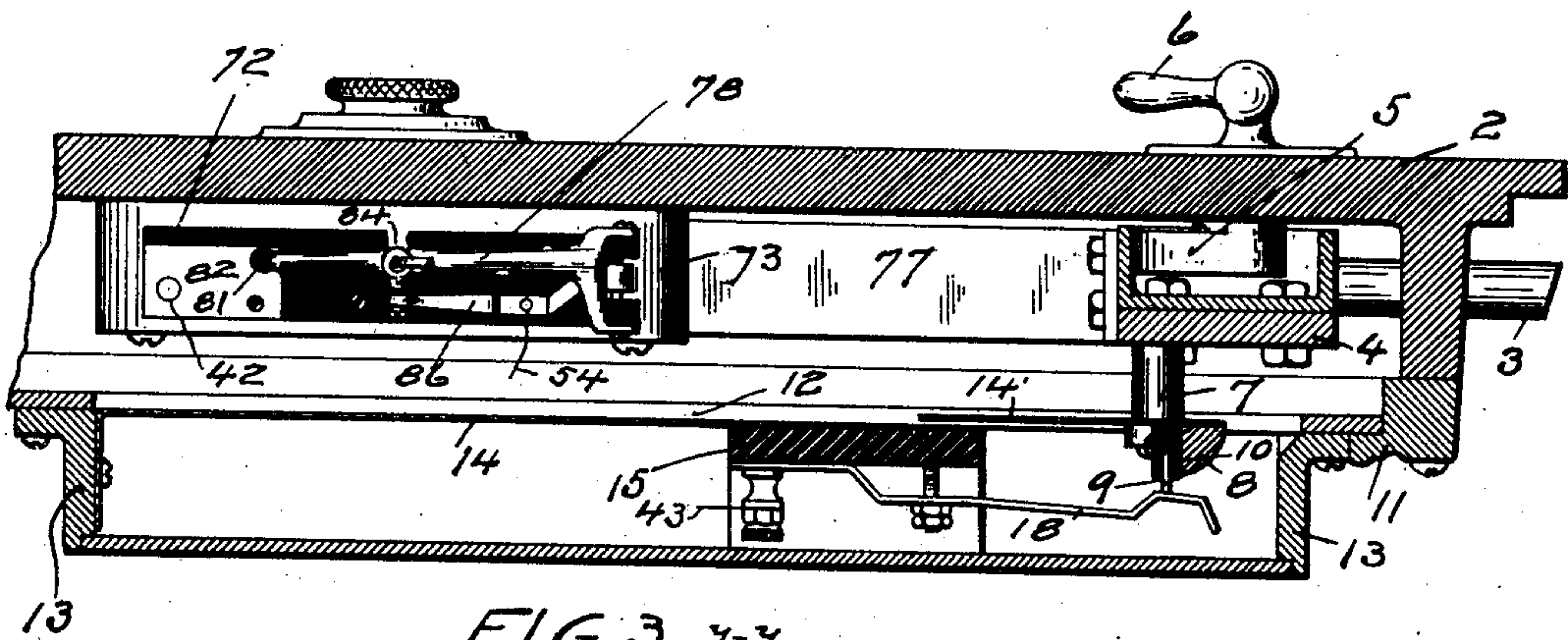


FIG. 3. 4-4

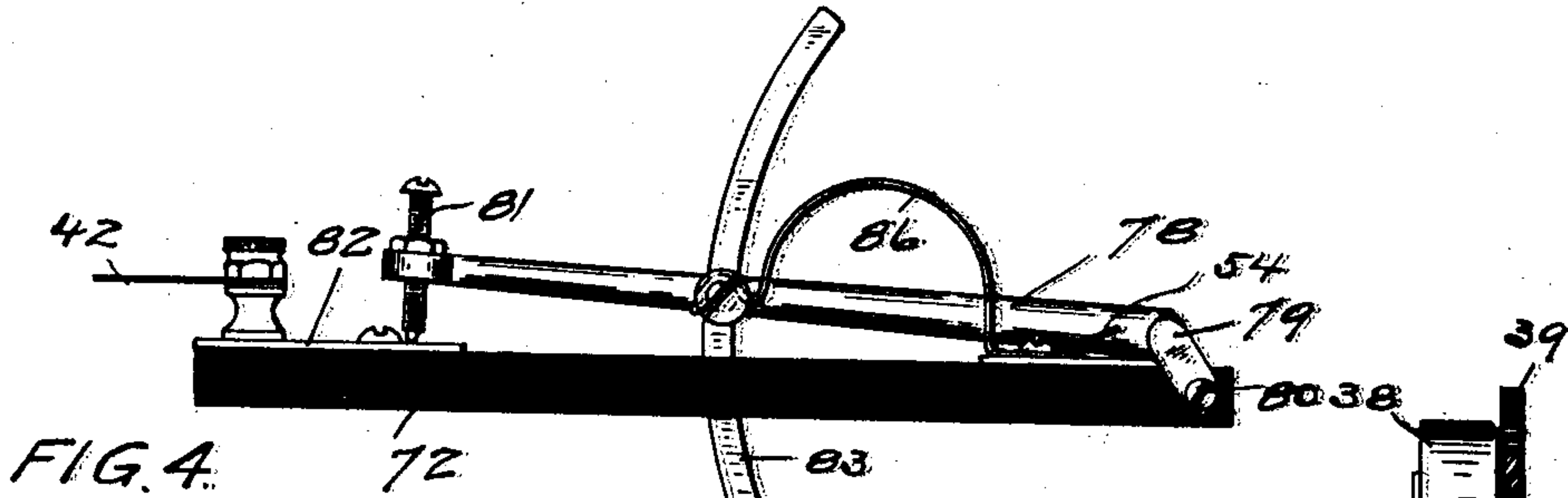


FIG. 4.



FIG. 5.

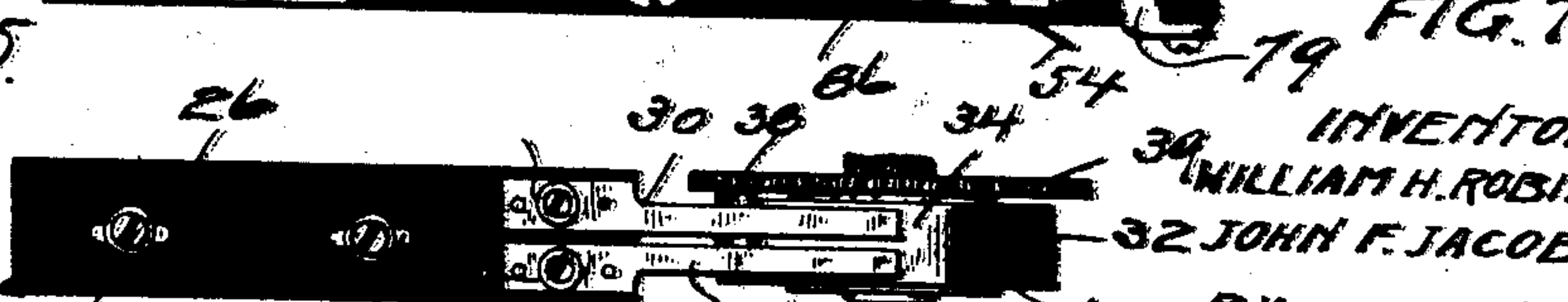


FIG. 6.

FIG. 7.

WITNESSES

E. J. [Signature]
S. V. [Signature]

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FIG. 6.

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INVENTORS

WILLIAM H. ROBINS

JOHN F. JACOBY

BY *Paul [Signature]*

THEIR ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM H. ROBINS AND JOHN F. JACOBY, OF MINNEAPOLIS, MINNESOTA,
ASSIGNORS TO AMERICAN BANK PROTECTION CO., OF MINNEAPOLIS,
MINNESOTA, A CORPORATION OF MINNESOTA.

BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 771,749, dated October 4, 1904.

Application filed April 7, 1903. Renewed January 25, 1904. Serial No. 190,571. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. ROBINS and JOHN F. JACOBY, both of Minneapolis, county of Hennepin, State of Minnesota, have
5 invented certain new and useful Improvements in Burglar-Alarms, of which the following is a specification.

The invention relates to burglar-alarm systems using an automatic circuit-closer, such
10 as a clock, and designed for use particularly in connection with bank-vaults, safes, or other storage-apartments where money, jewels, or other valuables are kept; and the object of the invention is to provide a simple, positively-
15 acting, easily-applied apparatus for sounding a general alarm in case any one should tamper with or attempt to throw back the bolts of a safe or vault door after they have been closed and the clock or other automatic circuit-closer connected therewith has reached
20 the point where it enters the circuit or is "on" for the night.

A further object is to provide means for causing the general alarm to be sounded when
25 the clock "goes on" for the night in case the vault-door has been left open or closed without being locked.

A further object is to provide means for indicating by a test-bell to the person who
30 throws the bolts in opening or closing the door when the clock is out of circuit or "off" or when the door is standing open, as during the day, that the system is in working order.

A further object is to provide means for
35 sounding an alarm in case any one should tamper with the combination-lock after the bolts have been thrown to lock the door.

Other objects of the invention will appear from the following detailed description.

40 The invention consists generally in various constructions and combinations, all as herein-after described, and particularly pointed out in the claims.

In the accompanying drawings, forming
45 part of this specification, Figure 1 is a view of a portion of the inside of a vault-door, showing our invention applied thereto and connected with an automatic circuit-closer and

with suitable alarm bells or gongs. Fig. 2 is a section on the line *x x* of Fig. 1 looking up- 50 ward in the direction of the arrows. Fig. 3 is a similar view on the line *y y* of Fig. 1 looking downward in the direction of the arrows. Fig. 4 is a side view of the device used in connection with the tumblers of the 55 combination-lock. Fig. 5 is a plan view of the same. Fig. 6 is a plan view of a portion of the mechanism of the automatic circuit-closer. Fig. 7 is a detail showing the manner of connecting the circuit-closing mechan- 60 ism and the clock-gearing.

In the drawings, 2 represents a vault or safe door of the ordinary construction, provided with draw-bolts 3, connected by a bar 4, that is moved back and forth to project or with- 65 draw the bolts by means of a cam device 5, having an operating-handle 6.

7 represents a block secured on the bar 4 and provided with a contact-plate 8, that is in circuit with the door-casing when the elec- 70 trical connections are made.

9 represents a second contact-plate mounted in a block of suitable insulating material 10, that is secured to the block 7.

11 represents the door-lining, having an 75 opening 12, that is covered by a box or casing 13. Within this box we provide a plate 14, whereon a block 15 of insulating material is mounted, and upon said block we provide a series of contact-springs 16, 17, 18, and 19, 80 the first two being in the path of the contact-plate 8 and the last two in the path of the contact-plate 9. A plate 14' is preferably provided on the bar 7 and arranged to coöperate with the plate 14 to close an opening in the 85 lining of the door when the bolts are projected. When the bolts are retracted, the plate 14' will lap by the plate 14, as shown in Fig. 3. The contact-spring 16 is provided with an offset or bent section 19' near its free end, 90 which when the bolts and bar are withdrawn will come in contact with the plate 8 during its backward movement and will remain in contact therewith at all times, except when the bolts are thrown to lock the door. The 95 contact-springs 17, 18, and 19 are provided

with offsets 21, that are shorter than the offset 19' and are engaged by the plates 8 and 9, but only for a brief interval, intermediate to the limits of the movement of the bolts during their projection and retraction. When this engagement between the contact-springs 17, 18, and 19 and the plates 8 and 9 takes place, if the plates are in electric-alarm circuits such circuits will be closed and alarms sounded each time the door-bolts are operated to lock or unlock the door.

As will hereinafter appear, we utilize the closing of circuits by the movement of the bolts to ring test-bells during the day and sound a general alarm at night. When the bolts are fully withdrawn to unlock the door, the contact-plates will be out of engagement with the springs 17, 18, and 19 and in contact still with the spring 16; but when the bolts are projected to lock the door the contact-plates 8 and 9 will be out of engagement entirely with all the springs. It follows, therefore, that when the vault-door is locked all circuits through the contact-springs will be open and all but one, through the spring 16, when the bolts are withdrawn.

In connection with a device of this kind it is desirable to provide an automatic circuit-closer, preferably a clock, so arranged that during a certain period of the night or at any other time, if preferred, a circuit will be closed through the clock in case any one should tamper with the vault-door and attempt to throw back the bolts and sound an alarm bell or gong or a series of them. The particular mechanism employed in this system in connection with a clock to close a circuit there-through for a certain predetermined period will form the subject-matter of a companion application of even date herewith, and hence we make no claim to the same broadly herein and will not enter into any detailed description except what is necessary to show the manner of closing the circuits when the draw-bolts are operated. We have shown a suitable clock-casing 23 in the drawings, provided with a twenty-four-hour dial on which a "night" space 25 is outlined to indicate the period during which the clock is shown on.

26 is a block of insulating material having slots 27 to receive screws 28, that adjustably support said block upon a bracket 29. Brushes 30 and 31 are secured on said block and have their free ends arranged to bear upon a disk 32, of insulating material, loosely mounted on the hand-post 33. A metallic plate 34 is provided in the periphery of said disk, and beneath said plate is a slot 35, wherein a pin 36 on the hour-hand 37 is adapted to travel. A curved plate 38 is mounted on a gear 39 of the clock and is arranged to bear on the plate 34. The ends of the brushes 30 and 31 rest upon the plates 34 and 38 with a yielding pressure. A comparatively thin plate 40 is inserted in the periphery of the disks 32 near

one end of the plate 34. The plates 34 and 38, having metallic connections with the clock gearing and frame, will be in circuit therewith, and such circuit will be interrupted or broken except during such time as the brushes are bearing on said plates during the period that the clock is on. The plate 40 will close a circuit between the brushes 30 and 31 for a brief period shortly before the brushes engage the plates 34 and 38. The contact-spring 16, which we will designate as the "reminder-circuit" spring, is connected with the brush 31 by wires 41 and 42, and through plate 40, brush 30, and wires 46, 43, and 47 with one side of a bell 48, which we prefer to designate as the "test-bell" for the reminder-circuit. The other side of said bell 48 is connected, through the wire 49, with a rheostat 50, from which connections 51 and 52 lead to one side of a battery A, and from thence through connections 53 and 54 to the bar 7. The springs 17 and 18 are connected, through the wires 43, 46, and 47, with the brush 30, and the wire 43 leads to one side of a bell 44, which we prefer to designate as the "test-bell" for the general-alarm circuit. The other side of the bell 44 has an electrical connection 55 with a second rheostat 56, from whence wires 57 and 58 lead to a second battery B, one side of which is connected, through a wire 59, with the general-alarm contact-spring 19. The clock-frame is connected by a wire 60 with a circuit-closer 61, having a drop 62, to which the electrical connection 57 is attached. A contact-spring 63 is connected, through a wire 64, with one side of a gong 65, whose other side is connected by wires 66 and 59, battery B, and wires 58 and 57 with the drop 62. A wire 67 leads from the wire 60 to a second circuit-closer 61^a, having a drop 62^a, to which the wire 51 is connected, and a contact-spring 63^a is connected, through the wire 68, gong 69, wire 70, battery A, and wires 52 and 51, with the drop 62^a.

From the foregoing description it will be noted that several independent circuits are provided in this system and that provision is made for testing each circuit each time the bolts are thrown to lock or unlock the vault-door. The circuit through the clock is shown interrupted or broken at an early hour in the morning—say about six o'clock—and the general-alarm circuit will consequently be open at the time the vault is usually opened for the day's business. When, however, the cashier or other person in charge of the vault throws back the bolts to open the door, the plate 9, engaging the downwardly-bent ends of the contact-springs 18 and 19, will connect the same and will momentarily close a circuit through the wire 43, the test-bell 44, the wire 55, the rheostat 56, the wire 57 to the battery B, and from thence through the wire 59 to the contact-spring 19. The test-bell 44 will then be rung and serve as an indication to the person opening the door that the battery B

for the general-alarm circuit is in working order. At the same time that the plate 9 engages the springs 18 and 19 the plate 8 will also contact with the spring 17 and close a circuit through the wires 43 and 47 to the bell 48, the wire 49 to the rheostat 50, and through wires 51 and 52 to battery A, and wires 53 and 54 to the bar 7, on which the plate 8 is mounted. The test-bell 48 will consequently be rung to indicate that the battery A of the reminder-circuit is in condition to perform its functions.

When the door is closed at the end of the day's business and the bolts projected to lock it, the test-bells will again be rung and the person in charge of the vault will know that the system is in working order for the night. As indicated by the drawings, the circuit through the clock will be on or closed at ten o'clock, though the mechanism may be adjusted for any other hour, as will appear in the companion application heretofore referred to. During the day when the bolts are drawn back the plate 8 will be in contact with the spring 16, as heretofore described, and if an officer or employee of the bank should fail to lock the vault-door after closing it at night or should be working in the bank and have the door open the general alarm will be sounded the moment the clock reaches the point where the circuit is closed therethrough, as will hereinafter appear.

It is frequently necessary for some officer or employee of the bank to work at night and keep the vault open, and to avoid the annoyance and disturbance of having a general alarm sounded the reminder-circuit is provided which will sound a warning a few minutes, usually fifteen, prior to the time when the circuit is closed through the clock. The reminder-circuit spring 16 is always in contact with the plate 8 when the bolts are withdrawn, and when the brushes 30 and 31 come in contact with the plate 40 a circuit will be established through the wires 41 and 42 to one brush, through the plate 40 to the other brush, through the wires 46, 43, and 47 to the test-bell 48, from the bell to the rheostat 50 through the wire 49, from the rheostat 50 through the wires 51 and 52 to the battery A, and from the battery A through the wires 53 and 54 to the plate 8. Should the person in the bank fail to notice the reminder warning and close the vault-door and throw the bolts, a general alarm will be sounded when the clock goes on through springs 16, wires 41 and 42 to one brush, and through the clock, wires 60 and 67, circuit-closer 61^a, wires 51 and 52, battery A, and wires 53 and 54 to the contact-plate 8, which is always in engagement with the spring 16 when the bolts are in their unlocked position. If the person in charge of the vault closes and locks the door when the reminder-bell rings, the plate 8 will be moved out of contact with the

spring 16 and the general-alarm circuit there-through opened. We prefer to provide the general-alarm circuit through the spring 16 as an additional safeguard in case the other springs be broken or displaced and should the vault-door not be locked before the clock goes on for the night; but primarily the spring 16 is intended for use only as a contact for the reminder-circuit.

Should a burglar or other person attempt to withdraw the bolts and open the door after the clock or general-alarm circuit is on for the night, the plate 9 upon being moved into engagement with the springs 18 and 19 would close a circuit through the wires 60 to the circuit-closer 61, release the drop 62, from the drop through the wires 57 and 58 to the battery B, and from the battery B through the wire 59 to the brush 19. The falling of the drop 62 would close a circuit through the springs 63, the wires 64, the gong 65, the wires 66, the battery B, and the wires 57 and 58 to the drop 62. At the same time an alarm-circuit would be closed through the contact-plate 8, the spring-plate 17, wires 45, 43, and 46 to one of the brushes, from the brush through the plate 38 and the clock-frame to the wire 60, through the wire 67 to the circuit-closer 61^a, through the wires 51 and 52 to the battery A, and the wires 53 and 54 to the plate 8. As the drop 62^a falls the circuit would be established through the spring 63^a and wire 68 and the gong 69, the wire 70 to the battery A, and the wires 51 and 52 to the drop 62^a. It will be evident that with the considerable amount of resistance in the test-circuits resulting from the use of the rheostats the energy from the batteries will pass through the clock-frame and the drop-circuits when the circuit is closed by the clock mechanism to permit the passage of the current therethrough instead of passing through the test-circuits and test-bells. It will thus happen when the system is complete and the clock on or in circuit for the night that if the bolts are thrown in either direction a general-alarm circuit will be closed when the contact-plate 8 touches either of the springs 16 or 17 and the plate 9 comes in contact with the springs 18 and 19. The additional circuits provided render operation of the alarm practically certain under all conditions and at the same time afford a convenient means for testing the alarm-circuits when the clock is out of circuit or off for the night.

We prefer to connect the circuit-closers by a wire 71, which will permit one battery to release both drops and close both alarm-circuits in case one battery should be exhausted or there should be a break in some of the connections. The gongs 65 and 69 may of course be arranged in any suitable place in the bank or other building where the system is installed, and we may also cut in a circuit that will be connected with a street-gong.

In connection with the mechanism heretofore described we prefer to provide a device for use in connection with the tumblers of the combination-lock of the vault or safe door whereon the system is applied. This device consists in mounting a block 72, of insulating material, upon the casing 73, that incloses the tumbler 74 of the combination-lock. This tumbler has, as usual, a series of notches 75 and a notch 76, that is considerably deeper than the others, to receive a sliding pin 77, secured on the bar 4 and arranged to enter said notch or slot 76 when the bolts are withdrawn to open the vault-door. As soon as the pin 77 has entered the slot in the tumbler it will obviously be impossible to move the tumbler in either direction. Upon the insulating-block 72 we arrange an arm 78, having a forked end 79 mounted on a pivot-pin 80, and the opposite end of said arm is provided with an adjustable contact-screw 81, that is adapted when the arm 8 is in its depressed position to rest upon a plate 82, mounted on the block 72. A curved arm 83 is adjustably mounted on the arm 78 at a point near the middle thereof and extends down through the slot 84 in the block 72 and is provided with an antifriction bearing-wheel 85 at its lower end that is adapted to rest upon the periphery of the tumbler 74 and to drop into the notches therein as the tumbler is revolved. A flat spring 86 is mounted on the block 72 and connected with the arm 78 to hold the contact-screw 81 in engagement with the plate 82. The arm 63 is so adjusted that as its roller rides on the periphery of the tumbler the arm 78 will be raised sufficiently to lift the screw 81 out of contact with the plate 82 and put the spring 86 in tension to depress said arm 78 when the roller 85 drops into one of the notches in the tumbler. The plate 82 is connected with the wire 42, and the spring 86 is connected with the wire 54. It therefore happens that should the burglar or any other person tamper with the lock when the door is closed and the bolts thrown and turn the tumbler 74 sufficiently to allow the roller 85 to drop into one of the notches the arm 72 will be depressed, allowing the screw 81 to come in contact with the plate 82 and close the circuit through the wire 42, one of the brushes, the clock-frame when the clock is on for the night, the wires 60 and 67 to the circuit-closer, the wires 51 and 52 to the battery A, and the wires 53 and 54, and the spring 86 to the arm 78 and the screw 81. The falling of the drop 62^a will close the gong-circuit 69 in the manner heretofore described.

In Fig. 1 the tumbler is shown set with the arm bearing on the periphery thereof between the notches, and in applying the apparatus to a vault-door a certain number of the combination is selected as a safety-number and the banker instructed that when the lock is set on that number the arm 83 will bear on the tum-

bler between two notches and that if the tumbler be moved in either direction a sufficient distance to allow the arm to drop into one of said notches a circuit will be closed and the alarm sounded.

We have shown and described the alarm mechanism applied to one style of lock using a notched rotating tumbler, but do not wish to confine ourselves to the use of the device with this style of lock alone, as it is capable of application to any make of combination-lock employing a rotating spindle.

We claim as our invention—

1. The combination, with a door and the draw-bolts thereon, of insulated contact-springs, a contact-plate insulated from the door and arranged to engage said contact-springs for a brief interval during the operation of projecting and retracting the bolts, a test-bell, and an electric circuit connected with said springs through said bell.

2. The combination, with a door and the draw-bolts thereon, of insulated contact-springs having offset or bent portions near their free ends, an insulated contact-surface arranged to engage the offset portions of said springs and momentarily connect the same, a test-bell, and an electric circuit connecting said springs through said bell.

3. The combination, with a door and its bolts, of contact-springs mounted thereon and insulated from each other and the door, a contact-plate actuated by the movement of the door-bolts to engage said springs, a time circuit-closer arranged to close a circuit there-through during a certain predetermined period, an electric circuit connecting said springs through said time circuit-closer, a gong-circuit, and an automatic circuit closer or drop provided in said gong-circuit and cut into said electric circuit, substantially as described.

4. The combination, with a vault or safe door and the bolts thereof, of a contact-spring mounted on said door and insulated therefrom, a contact-plate arranged to be actuated by the movement of the bolts in each direction to successively make and break contact with said spring with each movement, a test-bell, and an electric circuit connecting said contact-spring, said bell and said plate.

5. The combination, with a vault-door and its draw-bolts, of a contact-spring secured at one end on said door and insulated therefrom and provided at its free end with an offset or bent portion, a contact-plate movable with said bolts and arranged to momentarily engage the offset portion of said spring as the bolts are projected or withdrawn, a test-bell, and an electric circuit connecting said contact-spring and said bell with said plate.

6. The combination, with a vault-door and draw-bolts, of a contact-spring, a contact-surface arranged to engage said spring for a brief interval only during the projection or retraction of said bolts and to be out of contact with

said spring when said bolts are fully projected or withdrawn, a time circuit-closer, and electric circuit connecting said contact-spring and said time-closer with said contact-plate, an alarm-gong, and an automatic circuit-closer in circuit with said alarm-gong and cut into said first-named electric circuit, for the purpose specified.

7. The combination, with a vault-door and the draw-bolts thereon, of a contact-spring, a contact-surface out of engagement with said spring when said bolts are projected, but arranged to engage said spring when said bolts are withdrawn and remain in contact therewith while said bolts are in their withdrawn position, a time circuit-closer, an alarm-bell, and an electric circuit connecting said spring, said time-closer and said bell with said contact-surface.

8. The combination, with a vault-door and the draw-bolts, of a bar connecting said bolts, a block mounted on said bar, a contact-plate carried by said block, a spring mounted on said door and insulated therefrom and provided with an offset portion, said spring being normally in contact with said offset when said bolts are withdrawn, but out of contact therewith when said bolts are projected to the limit of their movement, a time circuit-closer, an alarm-bell, and an electric circuit connecting said spring and said time circuit-closer, and said bell with said contact-plate.

9. The combination, with a vault-door and the draw-bolts thereon, of a contact-spring, a contact-surface out of engagement with said spring when said bolts are projected, but in contact with said spring when the bolts are withdrawn, a general-alarm circuit connected with said bolts and spring, a time circuit-closer arranged to enter said alarm-circuit at a certain predetermined hour and remain therein for a predetermined period, and a reminder-circuit also connected with said spring and bolts and arranged to be momentarily closed by said time circuit-closer shortly before the closing of the general-alarm circuit therethrough.

10. The combination, with a lock-tumbler provided with a series of notches in its periphery, of the draw-bolts, a pin movable with said bolts and arranged to enter one of said notches and lock said tumbler when said bolts are withdrawn and be out of engagement with said tumbler when said bolts are projected, an oscillating member, a contact-plate insulated therefrom, a spring for normally holding said member in engagement with said plate, an arm adjustably mounted on said member and arranged to rest on the periphery of said tumbler between said notches and normally hold said member away from said plate against the tension of said spring, and an alarm-circuit connected with said plate and member.

11. The combination, with a lock-tumbler

provided with a series of notches in its periphery, of a circuit-closer arranged to drop into said notches as said tumbler is revolved, and an alarm-circuit connected with said tumbler.

12. The combination, with a vault-door and the draw-bolts thereon, of a lock-tumbler provided with a series of notches in its periphery, means actuated by the movement of said bolts for locking said tumbler against rotation when said bolts are in their retracted position, a circuit-closing device normally resting upon the periphery of said tumbler and arranged to drop into said notches as said tumbler is revolved, and an alarm-circuit connected with said circuit-closing device, for the purpose specified.

13. The combination, with a lock-tumbler provided with a series of notches in its periphery, of an oscillating insulated member, an insulated contact-plate, a spring arranged to move said member into engagement with said plate, an arm carried by said member and arranged to rest on the periphery of said tumbler between said notches and normally hold said member away from said plate, and an alarm-circuit connected with said plate and said member.

14. The combination, with a combination-lock tumbler, of an oscillating insulated member, an insulated contact-surface, a spring tending to hold said member in engagement with said surface, means provided in connection with said tumbler and cooperating with said member to hold said member out of contact with said surface, and an alarm-circuit connected with said surface and said member.

15. The combination, with the draw-bolts, of insulated contact-springs, an insulated contact-surface arranged to engage said springs for a brief interval during the operation of projecting and retracting said bolts, a test-bell, an electric circuit connected with said springs through said bell.

16. The combination, with an electric alarm-circuit, of a time mechanism connected therewith, a circuit-closer arranged to close the circuit through said mechanism during a certain predetermined period, and a reminder-circuit arranged to sound an alarm shortly before the circuit is closed through said time mechanism.

17. The combination, with an electric alarm-circuit that is normally open, of a timepiece connected with said alarm-circuit, an adjustable circuit-closer arranged to close the circuit through said time mechanism during a certain predetermined period, and a reminder-circuit arranged to sound an alarm shortly before the circuit is closed through said timepiece.

18. The combination, with a door-bolt, of an electric general-alarm circuit that is normally open when the bolt is fully withdrawn or projected and closed when intermediate thereto, a time mechanism connected with said alarm-circuit, a circuit-closer arranged to close the

circuit through said time mechanism during a certain predetermined period, and a reminder-circuit arranged to sound an alarm shortly before the circuit is closed through
5 said time mechanism.

19. In a burglar-alarm system, the combination, with a door-bolt, of an electric alarm-circuit closed through said bolt when the door is unlocked, a time mechanism in said alarm-
10 circuit and normally open, a circuit-closer arranged to close the circuit through said time mechanism during a certain predetermined period, and means for sounding a reminder-
15 alar m shortly before the time when the circuit is closed through said time mechanism should said bolt still be in its unlocked position, substantially as described.

20. The combination, with the draw-bolts, of an insulated contact-spring, a contact-surface out of engagement with said spring when
20 said bolts are projected, but in contact therewith when said bolts are withdrawn, a general-alarm circuit connected with said bolts and spring, a time circuit-closer arranged to enter
25 said alarm-circuit at a certain predetermined hour and remain therein for a predetermined period, and a reminder-circuit also

connected with said spring and bolts, substantially as described.

21. The combination, with the draw-bolts, 30 of an insulated spring, a contact-surface out of engagement with said spring when said bolts are projected, but arranged to engage said spring when said bolts are withdrawn and remain in contact therewith when said bolts 35 are in their withdrawn position, a time circuit-closer, an alarm-bell, and an electric circuit connecting said spring, said time-closer and said bell with said contact-surface.

22. The combination, with a lock-tumbler, 40 of an insulated member, an insulated contact-surface, means provided in connection with said tumbler and cooperating with said member to normally hold it out of contact with said surface, and an alarm-circuit connected 45 with said surface and said member.

In witness whereof we have hereunto set our hands this 31st day of March, 1903.

WILLIAM H. ROBINS.
JOHN F. JACOBY.

In presence of—

RICHARD PAUL,
S. V. GRIFFIN.