

No. 771,748.

PATENTED OCT. 4, 1904.

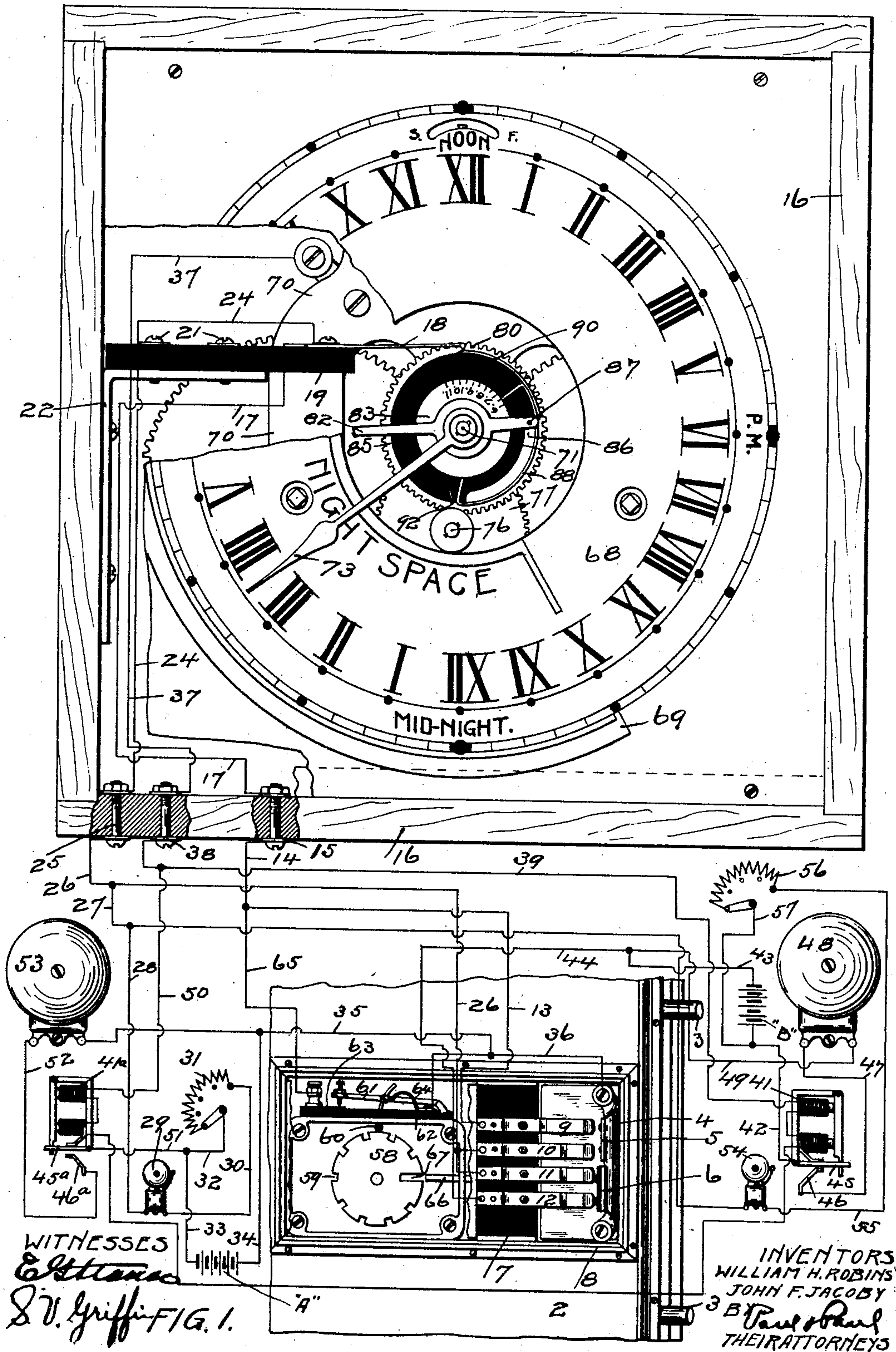
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ELECTRIC TIME ALARM.

APPLICATION FILED APR. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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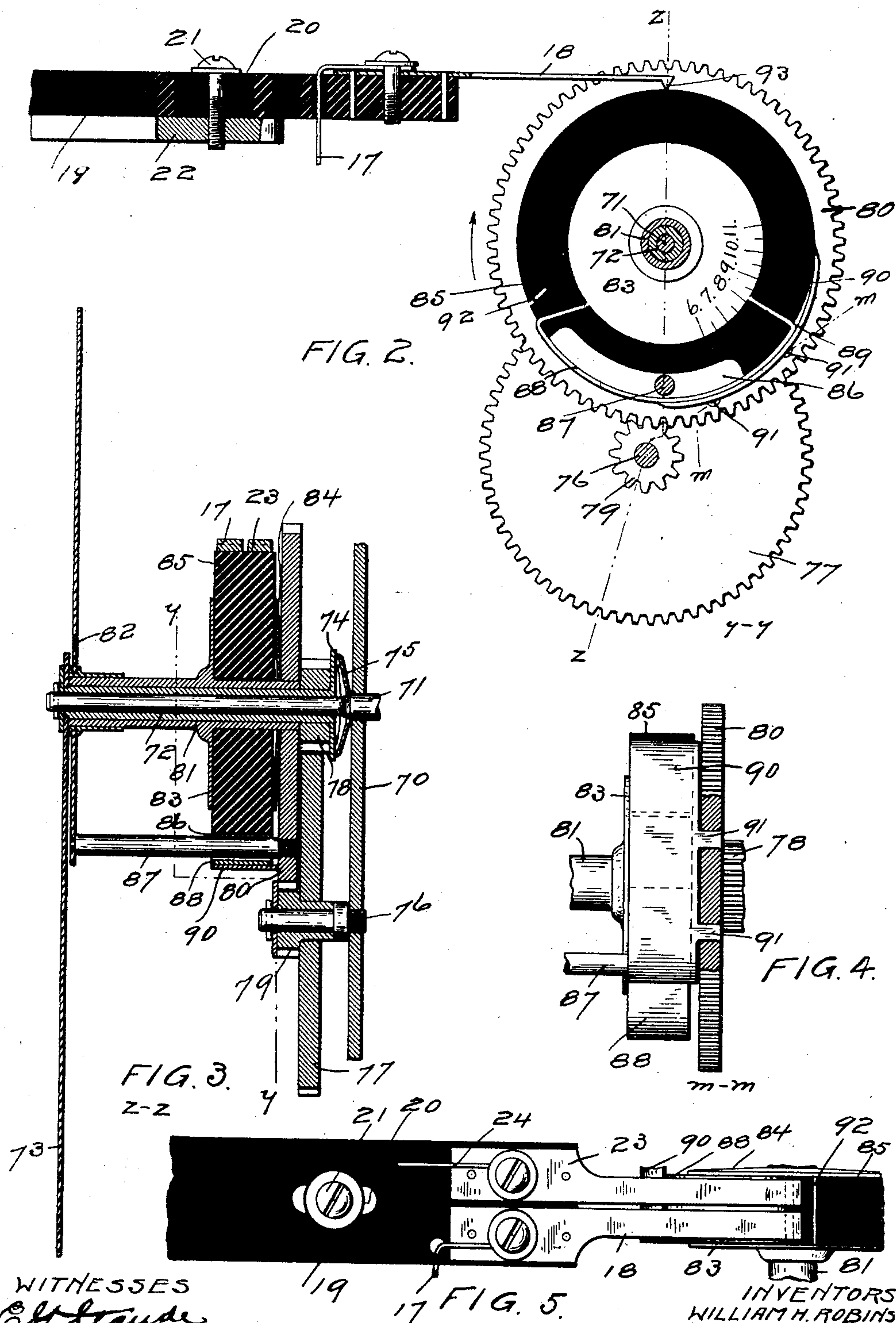
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2 SHEETS—SHEET 2:



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# UNITED STATES PATENT OFFICE.

WILLIAM H. ROBINS AND JOHN F. JACOBY, OF MINNEAPOLIS, MINNESOTA,  
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MINNESOTA, A CORPORATION OF MINNESOTA.

## ELECTRIC TIME-ALARM.

SPECIFICATION forming part of Letters Patent No. 771,748, dated October 4, 1904.

Application filed April 7, 1903. Serial No. 151,448. (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 invented certain new and useful Improvements in Electric Time-Alarms, of which the following is a specification.

Our invention relates to burglar-alarm systems of the clock or automatic circuit-closer type; and the primary object of the invention is to provide an improvement in the clock or automatic circuit-closer mechanism with which the door-bolts of the vault or safe are connected.

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

The invention consists generally in providing means in connection with a clock mechanism for causing the clock to "go on" or enter into an alarm-circuit at a certain hour and to remain in such circuit for a certain predetermined length of time, usually from late in the evening until an early hour in the morning, during which time an alarm-gong will be sounded in case any one should attempt to throw the bolts of the door with which the clock mechanism is connected in either direction.

Further, the invention consists in an adjustable means whereby the time of entering the circuit can be changed at will and the period during which the time mechanism is in such circuit increased or diminished.

Further, the invention consists in providing means for sounding a "reminder" or warning-bell a few minutes prior to the time when the clock enters into the alarm-gong circuit for the night should the door be open or closed and the bolts in their unlocked position.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a front view of a clock mechanism, showing our improved adjustable time device applied thereto

and connected with a contact-spring mechanism on the vault-door. Fig. 2 is a section on the line *y y* of Fig. 3. Fig. 3 is a section on the line *z z* of Fig. 2. Fig. 4 is a section on the line *m m* of Fig. 2, and Fig. 5 is a plan view of Fig. 2.

In the drawings, 2 represents a vault-door having draw-bolts 3 and a block 4, mounted on the bar connecting said bolts and carrying the contact-plates 5 and 6, the latter plate being insulated from the bolts and the door.

7 is a block of insulating material arranged within the box 8.

9 is a reminder contact-spring, and 10, 11, and 12 are similar springs mounted on the block 7 and insulated thereby from the door and from each other. The reminder contact-spring 9 and the spring 10 are in the path of the plate 5, and the springs 11 and 12 are in the path of the plate 6, all as fully illustrated and described in a companion application of even date herewith. The spring 9 is connected by wires 13 and 14 with a contact-screw 15 in the casing 16 of the clock, from which a wire 17 runs to a brush 18, that is secured on an insulating-block 19, having slots 20, through which screws 21 pass to adjustably secure said block on a bracket 22. A second brush 23 is mounted on said block and insulated thereby from said first-named brush, and connected by a wire 24 with a binding-screw 25, from which wires 26, 27, and 28 lead to one side of a warning-bell 29, the other side of which is connected by a wire 30, a rheostat 31, and wires 32 and 33 with a battery A, from which wires 34, 35, and 36 lead to the contact-plate 5. The spring 10 is connected through the wires 26, 27, and 28 with the test-bell 29 of the reminder-circuit and through the wire 30, the rheostat 31, wires 32 and 33, battery A, and wires 34, 35, and 36 with the contact-plate 5. This spring 10 will close a circuit and sound a general alarm in case the bolts are moved when the clock is "on" or in circuit for the night, all as fully described in the companion application above referred to. The contact-spring 11 is in circuit with



the wires 26 and 24, the brush 23, the frame of the clock, the wire 37, the contact-screw 38, the wire 39, the magnets of the automatic circuit-closer 41, wire 42, battery B, wires 43 and 44, to the contact-spring 12. This circuit will be closed when the clock is on, and the contact-plate 6 is moved into engagement with the springs 11 and 12 by the projection or withdrawal of the bolts. The passage of the current through the circuit-closer 41 will release the drop 45 and close a circuit through the contact-spring 46 and wire 47 to the alarm-gong 48, and from the gong through the wires 49 and 43 to the battery B, and from thence through the wire 42 to the drop. If the contact-plate 5 be moved into engagement with the spring 10 when the clock is in circuit, an electric circuit will be established through the wires 26 and 24, the brush 23, the clock-frame, the wire 37, wires 39 and 50 to the magnets of the drop 41<sup>a</sup>, from thence through the wires 51 and 33, the battery A, and the wires 34, 35, and 36 back to the contact-plate 5. The closing of this circuit will release the drop 45<sup>a</sup> and close an alarm-gong circuit through the spring 46<sup>a</sup>, wire 52, through the gong 53, wires 35 and 34 to the battery A, and wires 33 and 51 back to the drop. A similar circuit will also be established through the reminder-spring 9 to sound a general alarm when the clock is in circuit for the night in case the door is left open or closed and unlocked. The test-circuit for the general-alarm contact-springs 11 and 12 is made through the wires 26 27, the test-bell 54, wire 55, rheostat 56, wire 57 to battery B, and wires 43 and 44 to the spring 12. Whenever the contact-plate 6 comes in engagement with the springs 11 and 12, this circuit will be closed; but when the clock is in circuit the current will pass through it instead of through the rheostat.

We have shown the mechanism connected with the tumbler of a combination-lock, but do not claim the same herein, as it forms the subject-matter of the companion application herein referred to, and it is sufficient to state that the tumbler 58 has a series of notches 59 to receive an arm 60, carried by an oscillating member 61, that is mounted on a block 62, of insulating material. The circuit is normally opened by the member 61 being raised out of contact with a plate 63. A spring 64 tends to hold said member in engagement with said plate. The contact-plate 63 is connected to the arm 61 through the spring 64. A pin 66, connected with the draw-bolts of the door, is arranged to enter a slot 67 in the tumbler and lock it against revolution when the bolts are withdrawn. If the tumbler is revolved when the bolts are thrown to lock the door, the arm 60 will drop into one of the notches and allow the member 61 to contact with the plate 63 and close an alarm-circuit.

We will now proceed to describe the mechan-

ism of the clock which forms the subject-matter of our present invention. As shown in Fig. 1, the clock is provided with a twenty-four-hour dial-plate 68, having a night-space 69 outlined thereon and extending, preferably, from ten o'clock in the evening to six in the morning, though this space may be increased or diminished, if preferred. We have shown the night-space at the bottom of the dial, with the noon hour, or twelve o'clock, at the top; but their positions may be reversed, if preferred. 70 represents a portion of the frame of the clock, whereon a post or stud 71 is mounted. 72 is a sleeve fitting over said post and carrying the minute-hand 73. The inner end of said sleeve is provided with a flange 74, 74, between which and the frame 70 is a spring-washer 75. In using a twenty-four-hour dial it is necessary that the hour-hand should make a complete revolution once in twenty-four hours instead of once in twelve, as usual, and we therefore provide a stud 76 on the frame 70 and mount thereon a gear 77, engaging a pinion 78 on the sleeve 72. A pinion 79 on said stud engages a gear 80 on a sleeve 81, whereon the hour-hand 82 is mounted, and causes the said sleeve and the hour-hand thereon to make one revolution to twenty-four revolutions of the minute-hand and its sleeve. A disk 83 is provided on the sleeve 81, between which and a friction-washer 84 a disk 85, of insulating material, preferably fiber or hard rubber, is mounted and held by said spring-washer against accidental movement, though easily adjustable when it is desired to set the clock to close the circuit there-through at any desired hour. The disk 85 is provided with a curved peripheral slot or recess 86, through which a pin 87 extends, connecting the gear 80 with the hour-hand and forming a stop to limit the adjustment of said disk. This slot may of course be made longer or shorter, as preferred. A peripheral contact-plate 88 is provided on said disk over the slot 86, and the ends of said plate are turned in and fitted snugly within slits in said disk in contact with the disk 83 to insure a circuit through the clock in case contact between plates 88 and 90 should be broken. One of these ends, which we designate by reference-numeral 89, is opposite a series of marks or graduations on the face of the disk 83 and serves as a pointer thereto, the marks or graduations representing hours, which we have shown extending over a period of five hours, (indicated by the numerals 6, 7, 8, 9, 10, and 11.) 90 represents a fixed contact-plate having lugs 91, which secure it to the gear 80, and arranged to bear upon the contact-plate 88. In adjusting the disk 85 the contact-plate 88 slides under the plate 90 and has a rubbing contact therewith, and it is evident that by revolving the disk 85 so that the plate carried thereby will be moved away from the fixed plate or toward the same the contact-surface can be length-



ened or shortened, as desired, and the period during which the clock will be on or in circuit correspondingly increased or diminished. The contact-plate 88 may be moved  
 5 under the fixed plate 90 and be almost entirely covered by the same, or the said plate 88 can be adjusted by revolving the disk 85, so that one of its ends will barely underlap the end of the fixed plate, and in this position  
 10 the circuit through the clock will be closed for a considerable period of time, which period may be regulated in length, as desired, by the adjustment of the disk 85, the slot 86 permitting the free adjustment, within certain limits, of said disk without moving the  
 15 hour-hand. The scale on the disk 83 is so arranged with respect to the contact-plates and the clock-dial that by adjusting the disk 85 so that a figure on said scale will be opposite the end 89 of the movable contact the circuit  
 20 will be closed through the clock when the hour-hand reaches the point on the dial corresponding to the hour of the graduation opposite the pointer 89. If it is desired that the clock should enter the circuit early in the evening, the disk 85 will be revolved to move the  
 25 contact-plate 88 from under the fixed contact, increase the length of the contact-surface, and the length of time during which the clock is in circuit, it being preferred to have the clock  
 30 mechanism pass out of the circuit at six o'clock in the morning, though an earlier or later hour may be provided for, if desired. It is evident that if the clock be set to enter the circuit, say, at ten o'clock in the evening and a bank  
 35 clerk or official should be at work and have the vault-door open or closed but not locked and fail to lock up before the time arrived for the clock to go on for the night that a general alarm would be sounded. To avoid  
 40 this disturbance and annoyance, we insert a thin metallic plate 92 in the periphery of the disk 85 near one end of the contact-plate 88, the space between them representing, preferably, an interval of about fifteen minutes  
 45 of the movement of the minute-hand. This interval can be changed by increasing or diminishing the distance between the contact-plates 88 and 92. The brushes 18 and 23 are provided with knife-edges 93, that slide over  
 50 the periphery of the disk 85 as the clock mechanism is operated, and as soon as these knife-edges come in contact with the plate 92 a reminder-circuit will be closed, assuming  
 55 that the door-bolts are in their unlocked position, through the plate 92 from one brush to the other and from one brush through its connecting-wires to the contact-plate 5 and the contact-spring 9 and its connecting-wires  
 60 to the other brush. As soon as this circuit is closed the test-bell 29, located in the reminder-circuit, will be rung to warn the person in charge of the vault that the door must be closed and the bolts thrown or the general  
 65 alarm will be sounded in a few moments. The

person in charge can, after the reminder-alarm sounds, either close and lock the vault-door or, if he desires to keep the vault open, adjust the time circuit-closer so that the clock  
 70 will enter the circuit at a later hour. The reminder-circuit will also be closed and the bell rung if the combination-lock has not been set on the proper or "safe" number for the night.

We claim as our invention—

1. The combination, with a timepiece, of a revolving disk having insulating and conducting surfaces, a conducting-surface outside the circumference of said disk and contacting with  
 80 said first-named conducting-surface, a brush arranged to bear upon said surfaces, and an alarm-circuit connected with said last-named conducting-surface and with said brush.

2. The combination, with an alarm-circuit, of a time mechanism connected therewith, and  
 85 a circuit-closer connected with said time mechanism and arranged to close the circuit through said mechanism during a certain predetermined period, said closer comprising an insulating-surface and a conducting-surface there-  
 90 on, a second conducting-surface bearing upon said first-named conducting-surface, and a brush arranged to bear upon said insulating and conducting surfaces.

3. The combination, with a time mechanism, of an electric alarm-circuit, a circuit-  
 95 closer arranged to close the circuit through said mechanism during a certain predetermined period, and said closer comprising an insulating-surface and a conducting-surface  
 100 thereon, a second conducting-surface bearing upon said first-named surface, a brush, and said insulating-surface being adjustable with respect to said second conducting-surface to allow said period to be lengthened or short-  
 105 ened at will.

4. The combination, with a time mechanism, of an electric alarm-circuit, a circuit-  
 110 closer arranged to close the circuit through said mechanism during a certain predetermined period, and said closer comprising movable insulating and conducting surfaces, a fixed conducting-surface, arranged to contact with said movable conducting-surface, and a brush bearing upon said surfaces.  
 115

5. The combination, with a time mechanism, of an electric alarm-circuit, a circuit-  
 120 closer arranged to close the circuit through said mechanism during a certain predetermined period, and said closer comprising a revolving disk having insulating and conducting peripheral surfaces, a fixed conducting-surface contacting with said movable conducting-surface and a brush arranged to bear upon  
 125 said surfaces.

6. In a time circuit-closer, the combination, with an electric alarm-circuit normally open, of a time mechanism connected with said circuit, an insulating-disk arranged to be moved  
 130 by the gears of said mechanism, or independ-



ently thereof, a contact-plate provided on the periphery of said disk and extending partially thereover, a second contact-plate carried by said time mechanism and having a rubbing contact with said first-named plate, and a brush arranged in said alarm-circuit and adapted to bear upon the periphery of said disk and upon said plates as said disk is revolved.

7. In a time circuit-closer, the combination, with an electric alarm-circuit normally open, of a clock connected with said circuit, an insulating-disk mounted on the hand-post of said clock and movable therewith, or independently thereof, a contact-plate secured to the periphery of said disk and extending partially thereover and having a rubbing metallic connection with said clock, and a brush arranged in said alarm-circuit and adapted to bear upon the periphery of said disk and upon said plate.

8. In a time circuit-closer, the combination, with an electric alarm-circuit normally open, of a clock connected with said alarm-circuit, an insulating-disk mounted on the hand-post of said clock and movable therewith, or independently thereof, means for limiting the independent movement of said disk, a contact-plate secured to the periphery of said disk and extending partially thereover and having a rubbing metallic connection with said clock mechanism, and an insulating-brush provided in said alarm-circuit and arranged to bear upon the periphery of said disk and upon said plate.

9. The combination, with a clock, of an insulating-disk loosely mounted on the hand-post, a disk secured on said hand-post and provided with a scale representing hours, a friction device provided on said post, between which and said scale-disk, said insulating-disk is held, a metallic plate provided on the periphery of said insulating-disk and extending partially thereover, a second metallic plate connected with said clock mechanism and having a rubbing contact with said first-named plate, an electric alarm-circuit connected on one side with the mechanism of said clock and an insulated brush connected with the other side of said alarm-circuit and arranged to bear upon the periphery of said disk and upon said plates.

10. The combination, with a clock, of an insulating-disk loosely mounted on the hand-post and movable with the clock-gears, or independently thereof, and having a peripheral slot, a pin connected with the hour-hand and with said clock-gearing and projecting through said slot, a contact-plate provided on the periphery of said disk over said slot, a second plate having a metallic connection with said clock-gearing and having a rubbing contact with said first-named plate, an electric alarm-circuit connected with said clock-gearing on one side and an insulated brush con-

nected with the other side of said circuit and arranged to bear upon the periphery of said disk and said contact-plates.

11. The combination, with a clock, of an insulating-disk mounted on the hand-post, a contact-plate provided on the periphery of said disk and extending partially thereover, a second plate also provided in the periphery of said disk and spaced from said first-named plate, brushes arranged to bear upon the periphery of said disk and said plates and insulated from said clock and from each other, an alarm-circuit connected with one of said brushes and said first-named contact-plate, and a reminder alarm-circuit connected with said brushes, substantially as described.

12. The combination, with an electric alarm-circuit, a clock mechanism connected with said circuit, an insulating-disk, a contact-plate arranged on the periphery thereof, and in circuit with said mechanism, brushes insulated from said mechanism and from each other and in said alarm-circuit to close the same upon coming in contact with said plate, a reminder-circuit connected with said brushes, a second plate provided in the periphery of said disk and spaced from said first-named plate to momentarily close said reminder-circuit and sound an alarm shortly before said brushes come in contact with said first-named plate, substantially as described.

13. The combination, with an electric alarm-circuit, of a timepiece connected with said circuit, an insulating-disk and a conducting-surface thereon in circuit with said timepiece, brushes insulated from said timepiece and from each other and in said alarm-circuit to close the same upon coming in contact with said conducting-surface, a reminder-circuit connected with said brushes and a second conducting-surface provided on said disk and in advance of said first-named conducting-surface and spaced therefrom and in the path of said brushes, whereby the reminder-circuit will be momentarily closed to sound an alarm shortly before said brushes come in contact with said first-named conducting-surface.

14. The combination, with a time mechanism, of an electric alarm-circuit connected therewith, a circuit-closer arranged to close the circuit through said mechanism during a certain predetermined period, and said circuit-closer comprising a revolving disk having an insulating and a conducting peripheral surface, a second conducting-surface arranged to bear upon said first-named conducting-surface, a brush device, and said disk being adjustable independently of said second conducting-surface to permit the time of its closing said alarm-circuit through said time mechanism to be changed.

15. The combination, with a timepiece, of an electric alarm-circuit, a disk having a revolving movement with said timepiece and an independent rotary movement and provided



with insulating and conducting surfaces that are fixed with respect to said disk and also having a suitable indicating device, said conducting-surface being in circuit with said timepiece, a fixed scale having marks representing hours past which said indicating device is moved by the rotation of said disk, and a brush arranged to bear upon said surfaces.

16. In a timepiece, the combination, with a post, of an insulating friction-held disk mounted thereon, a conducting-plate provided in the periphery of said disk, a fixed conducting-surface wherewith said plate has a rubbing contact, a scale representing hours past which said disk is movable, and a brush arranged to bear upon said insulating and conducting surfaces.

17. In a timepiece, the combination, with the hand-post, of an hour-hand sleeve mounted thereon, a gear secured on said sleeve, an hour-hand, an insulating-disk loosely mounted on said sleeve and having a peripheral slot or recess, a pin connecting said gear and said

hour-hand through said slot, a conducting-plate secured to the periphery of said disk and bridging said slot, a fixed conducting-plate contacting with said movable plate, and a brush arranged to bear upon the periphery of said disk.

18. The combination, with a timepiece, of a revolving disk having an insulating-surface, a fixed conducting-surface in circuit with said timepiece, an insulated conducting-surface provided on said disk and having a rubbing contact with said fixed surface, brushes arranged to bear upon said surfaces, and alarm-circuits connected with said timepiece and said brushes.

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.