

J. P. WILLIAMS & H. HUH.
 TIME CONTROLLER FOR ELECTRIC TIME LOCKS OR BURGLAR ALARM SYSTEMS.
 APPLICATION FILED SEPT. 4, 1909.

961,922.

Patented June 21, 1910.

2 SHEETS—SHEET 1.

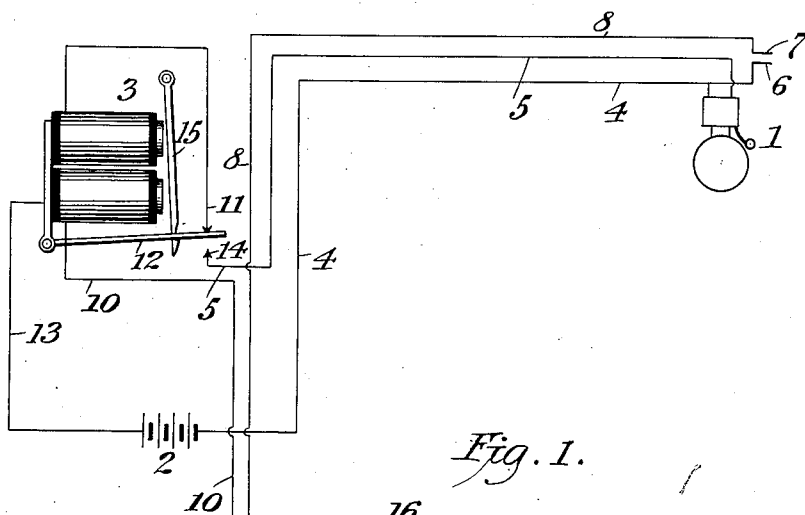


Fig. 1.

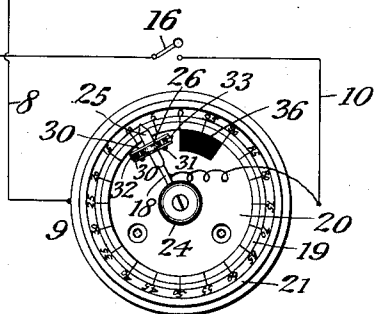


Fig. 5.

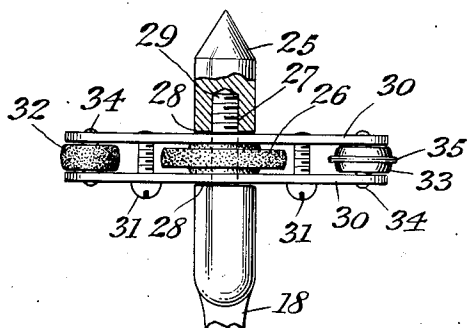
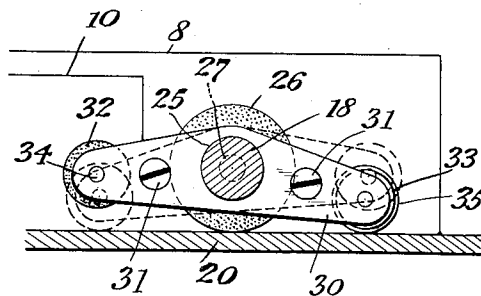


Fig. 4.



Witnesses:
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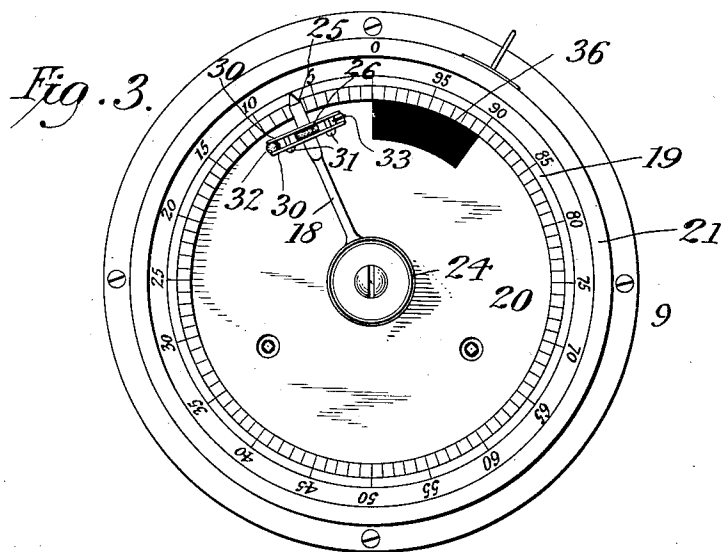
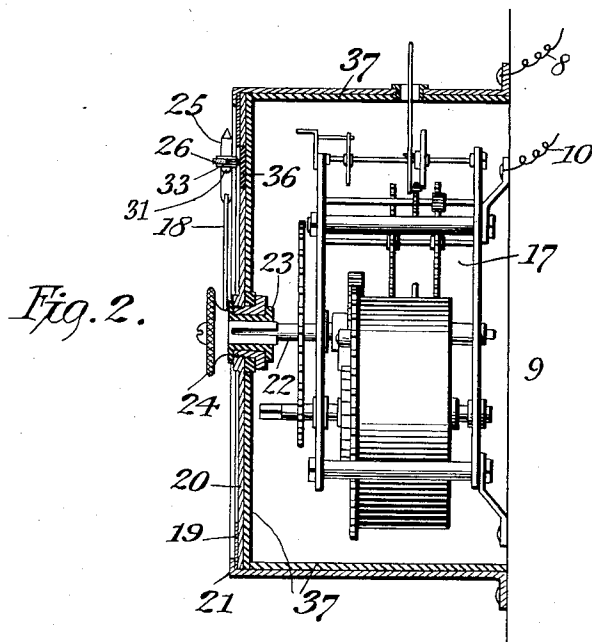
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 By their Attorney
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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN P. WILLIAMS AND HERMANN HUHN, OF NEW YORK, N. Y., ASSIGNORS TO
ELECTRIC BANK PROTECTION COMPANY, A CORPORATION OF DELAWARE.

TIME-CONTROLLER FOR ELECTRIC TIME-LOCKS OR BURGLAR-ALARM SYSTEMS.

961,922.

Specification of Letters Patent. Patented June 21, 1910.

Application filed September 4, 1909. Serial No. 516,233.

To all whom it may concern:

Be it known that we, JOHN P. WILLIAMS, a citizen of the United States, and resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, and HERMANN HUHN, a citizen of the United States, and resident of the city of New York, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Time-Controllers for Electric Time-Locks or Burglar-Alarm Systems, of which the following is a specification.

This invention relates to time-controllers for electric time-locks or burglar-alarm systems, and it has for its object to provide a simple and improved controlling mechanism of this character which will automatically operate to make and break the electric circuits, which can be conveniently manipulated for its operative action, which will be adapted for a wide range of adjustment and uses with relation to electric time-locks or the general features of a general alarm system, and which will furthermore possess advantages in positive operation and general efficiency.

We have herein shown our invention in its operative connection and relationship to some of the general features of a burglar-alarm system, but it will be understood that our improvements are adapted for a wide range of use and operation in other connections in which an automatic electric time-controller is desired to be employed.

In the drawings—Figure 1 is a diagrammatic view illustrating the circuit connections of our improved time-controller with some of the features of a general burglar-alarm system. Fig. 2 is a detail transverse sectional view, taken centrally through the improved time-controller mechanism. Fig. 3 is a detail face view of the improved time-controller device. Fig. 4 is a detail side view, on an enlarged scale, of the contact means carried by the hand, illustrating in dotted lines the operative action thereof, and showing the clockface in section. Fig. 5 is a detail plan view, on an enlarged scale, of the contact device carried by the hand.

Corresponding parts in all the figures are denoted by the same reference characters.

In its adaptable use with relation to the

general features of a burglar-alarm system, our improved time-controller operates to enable the alarm system to be thrown into operative condition for any predetermined length of time, and to prevent the system from being short-circuited or disconnected during the daytime, on Sundays and holidays, when it is desired that the bank employing the system should remain closed. With this improved time-controller in connection with the alarm system, the bank may be kept closed and the burglar-alarm system in operation for any predetermined length of time, for instance up to one hundred hours, or longer if the clock and dial mechanism of the controller is so adjusted, thus extending over a period of two or more days, and the system will be automatically disconnected at the end of such predetermined length of time. The improved time-controller further provides means whereby the time-controlling mechanism may be started in operation without short-circuiting the alarm system, and also means whereby the time-controller does not put the alarm in operative condition until a given time after the mechanism is adjusted, whereby the banker may have sufficient time to close all doors and windows and leave the building before the alarm system is placed in circuit.

The present invention relates to that type of time-controller which is specifically described in the co-pending application for patent filed by M. F. Juruick, August 16, 1907, Serial No. 388,787, to which application reference may be had for a more detailed description of the general operative features and relationship of the time-controlling mechanism to the general features and conditions of a burglar-alarm system.

We will first describe the connections of our improved time-controller with the general features of one form of burglar-alarm system with which it is adapted to be used, as shown in Fig. 1. This system, as illustrated, comprises an alarm bell, 1, a suitable source of electrical energy, such as a battery, 2, an automatic drop or trip, 3, and the necessary connecting wires. The battery is connected directly to the bell by a wire, 4, and the return wire, 5, from the bell leads to the automatic drop, 3, where the circuit to the bell is normally open. The wire 4 is pro-

vided with a plurality of branches (only one of which is shown), each of which terminates in a contact, as illustrated at 6, suitably arranged at each of the windows, doors, locks, and at other desired points and parts of the bank building or of the structure to be protected by the system, and the contact 6 is in such position that it will close the circuit by contact or connection with any suitably-arranged contact, 7, connected by a wire, 8, to the casing of our improved time-controller, 9. A wire, 10, is connected with the clockwork or hand or indicator of our improved time-controller and extends to the coils of the automatic drop 3 and from thence to a terminal, 11, adjacent a pivoted lever, 12, which lever is connected to the frame of the automatic drop and to the battery 2 by a wire, 13. The wire 5 from the bell terminates in a contact, 14, adjacent the pivoted lever 12 and in a position to contact therewith when the lever is released by action of the armature, 15, of the automatic drop, which armature is adapted to normally held the lever 12 away from said contact 14 and release the lever and permit it to contact with the contact 14 when the automatic drop is energized by the passage of a current through its coils and the armature is attracted. Therefore, if at any time any of the contacts 6 and 7 before-mentioned are brought together, when our time-controller hereinafter fully described is in operative status, the circuit of the alarm system is immediately completed and a current will pass from the battery through the wires 4 and 8, through the time-controller and the wire 10 to the automatic drop 3, and from the lever through the wire 13 to the battery, and the operation of the automatic drop releases the pivoted lever 12 and closes the bell circuit at the contact 14 and the bell is started in operation and will continuously operate until its circuit is again opened by the breaking of the connection between the lever 12 and the contact 14.

One of the wires 8 or 10 extending from our improved time-controller 9 is preferably provided with a switch, as at 16, whereby the time-controller may be cut out of circuit when desired, it being understood that the general alarm system may be provided if desired with other means or connections whereby the alarm will be sounded, if any of the contacts 6 and 7 are brought together, when the time-controller 9 is not in use, as, for instance, an ordinary time-controller such as that mentioned in the previous application for patent hereinbefore referred to and which is adapted to break the circuit between the wires 8 and 10 during certain hours of the day and to close said circuit during the nighttime, whereby if the bank is entered during the daytime no alarm is sounded but an attempt to enter at night-

time would result in the operation of the alarm by action of such ordinary time-controller.

It will be understood that such an ordinary time-controller as that just mentioned will operate to control the system during the ordinary conditions of the banking business during the week, but that such a time-controller would disconnect the alarm system upon Sunday morning and upon the mornings of holidays, the same as upon the mornings of weekdays, and thus leave the system disconnected and out of operation during the daytime of Sundays and holidays, whereas our improved time-controller of the type herein set forth is adapted to operate to retain the alarm system in connected and operative condition over Sundays and holidays and for any predetermined length of time up to one hundred hours or longer if desired. Thus, the switch 16 is useful in cutting out our improved time-controller 9 during the week or when its operation may not be required, and for placing said time-controller in circuit on the day previous to each Sunday, holiday or other day or period during which it is desired that the bank, or other building or protected structure upon which the alarm system is employed, be closed and protected. It will, however, of course be understood that the improved time-controller embodying our present invention and improvements may be used in connection with the alarm system, whether any other supplementary time-controller is or is not employed, for the purpose of controlling the system during the ordinary conditions of the banking business during the week or during a short period, as for instance the working hours of a single day or during the nighttime between the working hours of two days.

The general features of the improved time-controller embodied in our present invention and improvements are illustrated more in detail in Figs. 2 to 5, and comprise any ordinary or adapted arrangement of clockwork, 17, having a train of gears so proportioned and arranged that a single hand, 18, moves around the dial. The dial, 19, has its scale preferably running in hours from one to one hundred, though the scale may be for a greater or less number of hours, as desired or according to the specific purpose for which the time-controller is to be used. The dial is carried, in relation to the clockface, 20, by a suitable casing, 21, which latter is completely insulated from the moving parts of the clockwork and connected to the wire 8. The hand or indicator 18 is in operative connection with the clockwork 17 and is moved thereby, and it is adapted to normally travel in contact with the clockface 20, whereby the current may pass from the wire 10 (which is connected to the clock-

work) through the clockwork and to the hand in connection therewith, and through the hand, the clockface, and the casing 21 to the wire 8, thus completing the circuit. As before explained, the clockwork is completely insulated from the casing 21 and the clockface 20, so that the only contact for completing the circuit is through the hand or indicator 18, extending from the clockwork, and the clockface 20 carried by the casing 21; and the shaft, 22, carrying the hand 18, is suitably insulated from the clockface 20, at its point of projection there-through, as shown at 23. Said hand-shaft 22 is provided at its front projecting end with a suitable thumb-piece, 24, whereby it may be manually turned in either direction to move the hand or indicator 18 in either direction for its initial adjustment with relation to the dial. The hand or indicator 18 projects and moves above or in front of the clockface 20 and its contact therewith is by means of contact mechanism, connected with and carried by the hand, which we will now proceed to describe. At a point adjacent the outer indicating end, 25, of the hand 18, the latter is provided with a wheel or roller, 26, of insulating material, which travels in contact with the clockface 20 during the movement of the hand, and for this purpose the hand is preferably provided with a reduced portion, as at 27, forming a bearing for the wheel or roller 26 and constituting two shoulders, as at 28—28, at the sides of said roller.

In practical construction, to produce the conditions just stated, the main portion of the hand 18 is preferably provided with a reduced extension, 29, forming the inner shoulder 28, upon which extension is secured, by screw-threads or otherwise, the pointer or indicator end 25, which latter forms the outer shoulder 28. At each side the wheel or roller 26, a plate, 30, is mounted and extends transversely with relation to the hand, so that the plates project a suitable distance at each side the hand, and these plates constitute a framework which is carried by the hand in its movement and which in turn carries the contact devices whereby connection is made between the hand and the clockface 20. Said plates are pivotally mounted upon the reduced portion 27 of the hand, so that they have a rocking bearing thereon, and are respectively at each side the wheel or roller 26 and retained in position by the shoulders 28—28. Said plates are in frictional contact with the respective sides of the insulating roller 26, so that the movement of the latter in either direction will be communicated to said plates and tend to cause the same to turn upon their pivotal mounting in the direction of such movement and be maintained in this downwardly-turned position continuously during the

movement of the hand in either direction and the corresponding movement of the wheel or roller 26 which frictionally bears upon said plates. To provide for the adjustment of the frictional contact between the plates 30 and the roller 26, whereby the actuation of the frame constituted by said plates in its rocking movement is accomplished by the travel of the hand and roller, we provide a clamping means preferably consisting of two set screws, 31—31, respectively arranged at diametrically opposite sides of the roller 26 and transversely extending between the plates 30, whereby the adjustment of said screws will bring the plates closer together and thus cause them to bind more tightly in their frictional contact against respective sides of the roller 26, or will enable a sufficient separation of the plates to reduce said frictional contact, as desired.

At the respective outer ends of the pivoted frame constituted by the plates 30, are provided rollers, 32 and 33, respectively, which rollers in the preferred construction are mounted between the plates 30 and have bearings upon cross-shafts, 34, extending between the plates. One of these rollers, 32, is of insulating material, and the other of said rollers, 33, is of metal or a conducting material, and said rollers 32 and 33 are adapted to respectively contact with the clockface 20 when the frame constituted by the plates 30 is at the respective limits of its downward position in its rocking movement upon its pivotal mounting upon the hand 18. Said rollers 32 and 33 are of sufficient diameter to project beyond the inner or under edge of the frame-plates 30, so that at the limit of the movement of the respective ends of the frame constituted by the plates 30 toward the clockface 20 said frame or plates cannot contact with the clockface but are retained therefrom by the respective rollers 32 or 33 which contact with the clockface, and the metal roller or conductor 33 is preferably provided with a circumferential rib or projection, as at 35, which constitutes a contact edge bearing upon the clockface. The relative arrangement of the respective rollers 32 and 33 is preferably such that the insulating roller 32 is at the side of the hand 18 in the direction of its movement from numbers of lower to higher character on the dial 19, while the metal or conductor roller 33 is at the side of the hand in the direction of its movement from numbers of higher to lower character on the dial. Under this relative arrangement, the operative status is such that the clockwork will move the hand or indicator in the direction which will cause and maintain the contact of the metal or conductor roller 33 with the clockface 20, to complete the circuit through the hand and clockface, this direction being

from numbers of higher to lower character on the dial, while the manual movement of the hand 18 in the reverse direction will cause and maintain the contact of the insulating roller 32 with the clockface 20, to maintain the circuit open, this manual movement being from numbers of lower to higher character on the dial. Thus, when the hand or indicator 18 is manually moved in such reverse direction, the insulating roller 32 will be brought in contact with the clockface and by the same action the metal or conductor roller 33 is withdrawn from the clockface, by the rocking movement of the frame constituted by the plates 30, and then the movement of the hand in normal direction by action of the clockwork will automatically, through the frictional contact of the insulated master roller 26 against the plates 30, cause the rocking movement of said plates, during a certain interval of time, whereby the insulating roller 32 is withdrawn from contact with the clockface 20 and the metal or conducting roller 33 is brought into contact with the clockface.

The clockface 20 is provided with an insulated section or segment, as at 36, which is in the path of travel of the metal or conducting roller 33 carried by the hand 18, which insulated section is preferably formed by cutting away the clockface and inserting a strip or block of insulating material on a plane flush with the outer surface of the clockface. This insulated section 36 may be provided at any adapted or desired point with relation to the dial scale, but is preferably arranged at the zero mark on the dial and extending over an area corresponding to ten points on the dial, representing ten hours, in a direction from the zero point to numbers of higher to lower character on the dial, for instance from the zero point to the dial point ninety, as herein illustrated.

The clock casing 21, as well as the clockface 20, is preferably lined throughout with insulating material, as at 37, to effect the complete insulation of the casing and clockface from the clockwork and perfectly obviate the accidental passage of the electric current between the clockwork and the casing and clockface except through the hand or indicator 18. Preferably, the dial scale is arranged in points indicating hours and running from one to one hundred hours and extending counter-clockwise, that is with the numbers of lower to higher character extending from left to right, and preferably the normal movement of the hand or indicator 18 by action of the clockwork is in the direction from right to left, so that the hand normally moves from numbers of higher to lower character on the dial. It will be understood, however, that the relative arrangement of the dial and hand movement may be adapted to the various conditions of use or

connection in which our improved time-controller is to be employed, and that the dial scale may be arranged in a greater or less number of points than one hundred hours, according to conditions.

The operation and advantages of our invention will be readily understood by those skilled in the art to which it appertains.

A description of the operative action of the improved time-controller with relation to the alarm system herein illustrated, under circumstances of use where it is desired to close a bank building or other protected structure for the period of a day or longer, will enable a full understanding of the operation of the time-controller with relation to conditions requiring the operative control of the system for a shorter period of time and with relation to other circumstances and uses for which the invention is adapted, and will also enable a full understanding of the operation whereby the alarm system or other connection with which the improved time-controller is in operative association is prevented from being short-circuited or disconnected during a given length of time, is automatically disconnected at the end of this predetermined length of time, is not short-circuited by the starting in operation of the time-controlling mechanism, and is not in operative condition until a given time after the time-controlling mechanism is adjusted, which latter provision is to enable sufficient time to close all doors and windows and other protected parts of the bank or protected structure after the time-controlling mechanism is adjusted and before the alarm system is placed in circuit. For instance, in the use of the improved time-controller, when it is desired to close the bank building or protected structure for a determined length of time, say for a day, such as Sunday or a holiday, the banker computes the time during which it is desired that the bank shall remain closed and the alarm system be maintained in operative condition, and sets the hand or indicator 18 of the controller accordingly. For example, if Monday is a legal holiday and the bank is to remain closed from twelve o'clock noon on Saturday until eight o'clock Tuesday morning, the banker or operator moves the hand or indicator 18 until it reaches the point "68" on the dial. This adjustment of the hand 18 may be accomplished in either direction, manually by grasping the thumb-piece 24 and, in securing the final desired adjustment, moving the hand in the direction of the insulating roller 32, so that in its final adjusted position said roller 32 will contact with the clockface 20 and the metal or conductor roller 33 will be out of contact with the clockface. The clockwork, if not in operation, is now started, but the alarm circuit is open through the time-controller by reason

of the fact that the circuit connection through the hand or indicator 18 and the clockface 20 is broken at the insulating roller 32. As the hand 18 is moved, by action of the running clockwork, from the dial point "68" toward the dial point "67", the insulated master wheel or roller 26, which is at all times in contact with the clockface, turns in its revoluble movement and by its frictional contact with the pivoted frame constituted by the plates 30 moves said frame in its rocking movement, so that the insulating roller 32 is lifted from contact with the clockface and the metal or conductor roller 33 is brought down into contact with the clockface. The period required for the movement just stated is preferably about one-half hour, the relative construction and arrangement of the hand and contact mechanism thereon being adjusted to the conditions of this period, but the period may be longer or shorter, as desired. During the period just stated, the banker or attendant is afforded time to close the vault and doors and windows and protected points of the bank building or protected structure, and afterward the alarm system is of course automatically thrown into its operative condition as soon as the metal or conductor roller 33 comes in contact with the clockface 20. As it is sixty-eight hours from noon Saturday until eight o'clock Tuesday morning, the hand or indicator 18 will reach the zero point on the dial at the time it is desired to reopen the bank, and at this time the conductor roller 33 passes onto the insulated section 37 of the clockface, whereby the alarm circuit is again broken and the banker or attendant may enter the building or protected structure and open the vaults without setting off the alarm.

The time-controller is preferably arranged within the vault, and after the banker or attendant opens the vault the switch 16 can be thrown, if it is desired to disconnect the time-controller from the alarm system until its use is again required, or if the time-controller is left in connection with the system the extent of the insulated section 36 of the clockface 20 is such that the alarm circuit will be broken at said insulated section for a considerable period, in the present instance as herein illustrated such period being ten hours. Therefore, if the opening of the bank or vault or the throwing of the switch 16 should for any reason be delayed, the alarm would not be thrown into operation until the conductor roller 33 can contact with the clockface 20 at the opposite side of the insulated section 36. With the construction and arrangement of the insulated section 36, as herein shown and described, the period of ten hours from the opening time at the bank, during which the alarm circuit is broken even though the time-controller is in con-

tion with the system, would more than cover the whole period during which the bank is to remain open, and the general construction and arrangement of our improved time-controller is such that each evening the time-controller could be readily set to cover the night period during which the bank is to be closed and to automatically open the alarm circuit the succeeding morning at the time the bank is to be opened and maintain this condition during the whole period during the day when the bank is open.

From the foregoing description and explanation, it will be noted that our improved time-controller operates to automatically close the circuit at a given time after being started in operation, whereby the operator has ample time to close the vaults and the doors and windows or other protected parts of the bank or protected structure, and also operates to automatically break the circuit at the end of a predetermined time, to permit the reopening of the bank or protected structure without starting the alarm in operation. The contact means carried by the hand or indicator permits the hand to be set either forward or backward and operates automatically to insulate the hand from circuit contact with the clockface until the clockwork which carries the hand operates to cause the automatic break of such insulated condition and the contact of the metal or conductor roller with the clockface to complete the circuit. The entire operation is automatic, it being simply necessary to adjust the hand or indicator to the desired starting point, and no supplementary means separate from the moving hand are required to make or break the circuit. Our improved time-controller is furthermore adapted for effective use in connection with time-locks on vault or safe doors, and all electrical systems or arrangements the operation of which is controlled by the opening and closing of the electrical circuit.

We do not desire to be understood as limiting ourselves to the detail construction and arrangement of parts as herein shown and described, as it is manifest that variations and modifications therein may be resorted to, in the adaptation of our invention to varying conditions of use, without departing from the spirit and scope of our invention and improvements. We therefore reserve the right to all such variations and modifications as properly fall within the scope of our invention and the terms of the following claims.

Having thus described our invention, we claim and desire to secure by Letters Patent:

1. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, contact means carried by

the hand for establishing electrical connection between the hand and the clockface, and means actuated by the movement of the hand to cause the making and breaking of the contact between said contact means and the clockface.

2. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a conductor contact carried by the hand and adapted to bear against the clockface, an insulating contact carried by the hand and adapted to bear against the clockface, and a rocking connection between said conductor contact and insulating contact, whereby one of said contacts is lifted as the other is depressed.

3. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a frame pivoted transversely upon the hand, a conductor contact carried at one end of said frame, an insulating contact carried at the other end of said frame, and means actuated by the movement of the hand for pivotally moving said frame.

4. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a frame pivoted transversely upon the hand, a conductor contact carried at one end of said frame, an insulating contact carried at the other end of said frame, and a roller mounted upon the hand and bearing upon the clockface and insulated therefrom and having an operative connection with said frame to pivotally actuate the same.

5. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a frame pivoted transversely upon the hand, a conductor contact carried at one end of said frame, an insulating contact carried at the other end of said frame, and a roller mounted upon the hand and bearing upon the clockface and insulated therefrom and having a frictional bearing upon said frame to pivotally actuate the same.

6. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, plates transversely pivoted upon the hand, a conductor contact mounted at one end of said plates, an insulating contact mounted at the other end of said plates, and a roller mounted upon the hand between said plates and bearing upon the clockface and insulated therefrom and having a frictional contact with said plates to pivotally actuate the same.

7. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried

by said clockwork, plates transversely pivoted upon the hand, a conductor contact mounted between said plates at one side of the hand, an insulating contact mounted between said plates at the other side of the hand, and a roller mounted upon the hand between said plates and bearing upon the clockface and insulated therefrom and having a frictional contact with said plates to pivotally actuate the same.

8. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, plates transversely pivoted upon the hand, a conductor contact at one end of said plates, an insulating contact at the other end of said plates, a roller mounted upon the hand between said plates and bearing upon the clockface and insulated therefrom and having a frictional contact with the plates to pivotally actuate the same, and clamping means for controlling the frictional contact between said plates and roller.

9. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a frame transversely pivoted upon the hand, a conductor contact at one end of said frame, an insulating contact at the other end of said frame, and a roller mounted upon the hand and bearing against the clockface and insulated therefrom and having a frictional contact with said frame to pivotally actuate the same.

10. A time-controller of the class described, comprising a clockwork, a clockface insulated therefrom, a hand or indicator carried by said clockwork, a frame pivoted transversely upon the hand, a conductor contact at one end of said frame, an insulating contact at the other end of said frame, a roller mounted upon the hand and bearing upon the clockface and insulated therefrom and having a frictional contact with said frame to pivotally actuate the same, and means for adjusting said frictional contact.

11. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, a conductor contact pivotally carried by the hand and adapted to contact with said clockface, and means actuated by the movement of the hand for bringing said conductor contact into and out of connection with the clockface.

12. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts

being suitably insulated, a member pivotally mounted upon said hand and projecting laterally therefrom, a conductor contact carried by said member, and means upon the hand for pivotally actuating said member during the movement of the hand to bring said conductor contact into and out of contact with the clockface.

13. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, a roller carried by the hand and actuated by contact with the clockface and insulated therefrom, and a conductor contact carried by the hand and actuated by said roller during the movement of the hand to contact with the clockface and be withdrawn therefrom.

14. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, a roller carried by the hand and actuated by contact with the clockface and insulated therefrom, a conductor contact mounted at one side of the hand, and an insulating contact mounted at the other side of the hand, said contacts being actuated by said roller during the movement of the hand to bring the insulating contact in connection with the clockface by movement in one direction and to bring the conductor contact in connection with the clockface by movement in the opposite direction.

15. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, and means carried by the hand whereby upon its movement in one direction it has an insulated connection with the clockface and upon its movement in the opposite direction it has an electrical connection with the clockface.

16. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, and means whereby the movement of the hand in normal direction by action of the clockwork establishes electrical connection between the hand and clockface and movement of the hand in the opposite direction breaks such electrical connection.

17. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, and means whereby the movement of the hand in normal direction by action of the clockwork automatically establishes electrical connection between the hand and clockface and movement of the hand in the opposite direction automatically breaks such electrical connection.

18. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, and means carried by the hand whereby it is maintained from electrical connection with the clockface for an initial period of time during its movement in normal direction by action of the clockwork and is afterward automatically brought into electrical connection with the clockface.

19. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, insulation means carried by the hand and operatively actuated by contact with the clockface during the movement of the hand, and means for establishing electrical connection between the hand and the clockface, said last-mentioned means being actuated by said first-mentioned means.

20. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockface and in connection with the other side of said electric circuit, said parts being suitably insulated, a conductor contact carried by the hand and adapted to contact with the clockface, and means for automatically throwing said conductor contact into and from connection with the clockface by movement of the hand.

21. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, a hand carried by said clockwork and in connection with the other side of said electric circuit, said parts being suitably insulated, a conductor contact carried by the hand and normally in electrical connection with the clockface during movement of the hand by actuation of the clockwork, and means for automat-

ically withdrawing said conductor contact from electrical connection with the clockface by movement of the hand in the opposite direction.

- 5 22. A time-controller of the class described, comprising a clockwork, an electric circuit, a clockface in connection with one side of said electric circuit, and a hand carried by said clockwork and in connection
10 with the other side of said electric circuit, said parts being suitably insulated, said hand being movable in one direction to establish electrical connection between the hand and the clockface and movable in the
15 opposite direction to break said electrical connection.

23. A time-controller of the class described, comprising an electric circuit, a dial-member in connection with one side of said

electric circuit, a hand or indicator member 20 in connection with the other side of said electric circuit, said members being suitably insulated and adapted to travel one in contact with the other, and means actuated by the movement of one of said members for .25 automatically making and breaking electrical contact between said members for a period of time during the movement of one of said members with relation to the other.

In testimony whereof we have signed our 30 names in the presence of the subscribing witnesses.

JOHN P. WILLIAMS.
HERMANN HUHNS.

Witnesses:

A. C. LYNETT,
FREDK. A. SMITH.