

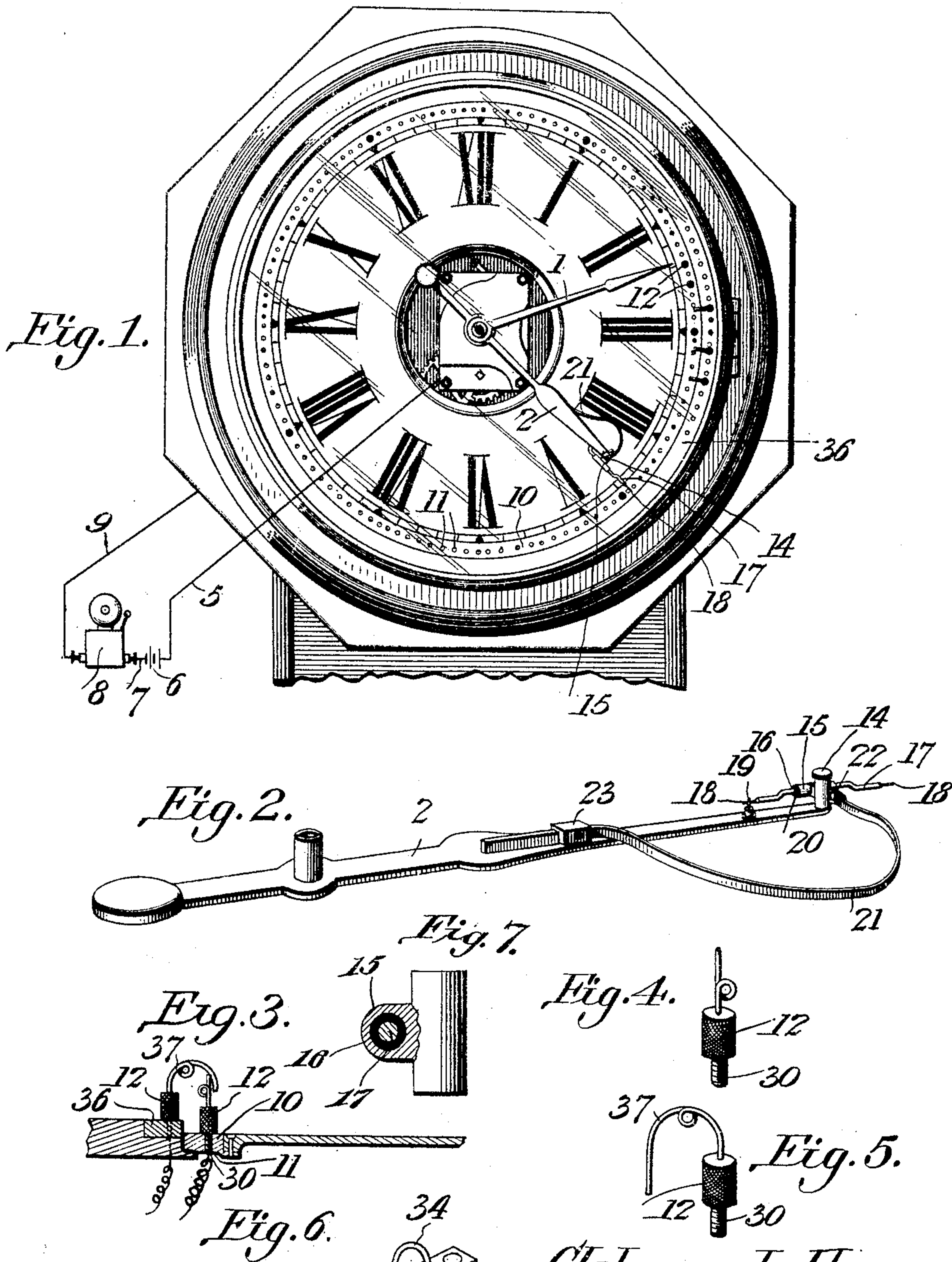
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PATENTED SEPT. 27, 1904.

C. L. HAYES.  
PROGRAM CLOCK.

APPLICATION FILED SEPT. 25, 1903.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## PROGRAM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 770,902, dated September 27, 1904.

Application filed September 25, 1903. Serial No. 174,614. (No model.)

*To all whom it may concern:*

Be it known that I, CLEBURNE LEE HAYES, a citizen of the United States, residing at Lebanon, in the county of Wilson and State of Tennessee, have invented a new and useful Program-Clock, of which the following is a specification.

This invention relates to certain improvements in program-clocks or clocks of that general character employed for the closing of electrical alarm-circuits for the ringing of one or more alarms at any distance from the clock. These devices are employed for the sounding of alarms at desired intervals in schools or other places where certain duties or lessons are scheduled for predetermined periods or for use in hotels and the like where a clock in the clerk's office will sound an alarm at a predetermined time in one or more of the rooms.

The principal object of the invention is to improve, simplify, and cheapen the construction of such clocks, to render the circuit-closing operation more certain, and to provide for the closing of the circuit for any desired length of time in order that either a momentary or prolonged signal may be sounded.

A further object of the invention is to provide a device of this character with mechanism so arranged as to permit a single hand to accomplish the closing of more than one circuit, so that alarms of different character and situated at different points may be under the control of a single timing mechanism.

With these and other objects in view, as will hereinafter more fully appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a face view of a clock constructed in accordance with the invention. Fig. 2 is a detail perspective view looking from the under or inner face of the hour-hand. Fig. 3 is a sec-

tional plan view of the face of the clock, illustrating the construction of the rings for carrying the adjustable circuit-closers. Figs. 4 and 5 are detail perspective views of different forms of circuit-closing pins which may be employed. Fig. 6 is a detail view of a slightly-modified form of contact. Fig. 7 is a detail sectional view showing the connection between the hour-hand and the circuit-closing lever.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The clock mechanism proper is of the usual type and includes a minute-hand 1 and an hour-hand 2, the latter being specially constructed and formed of some good conducting material. The hands are mounted, as usual, on the central arbors of the clock-frame, the hour-hand being electrically connected thereto and serving as a conductor, the frame of the clockwork being connected to a conductor 5, that is connected to one pole of a battery 6, the opposite pole of the battery being connected by a wire 7 to an alarm or relay 8 and said alarm or relay being connected by a wire 9 to a metallic ring 10, arranged outside the dial and concentric therewith. The ring 10 may be formed of brass or other suitable metal and is preferably arranged with its outer face flush with that of the dial. In this ring are formed a large number of threaded openings 11, adapted for the reception of circuit-closing pins 12, which may vary in construction in accordance with the character of the signal to be sent; but each of the pins is provided with a yieldable point or end to be engaged by a circuit-closing member carried by the hour-hand. Secured to the outer end of the hour-hand is a stud 14, forming a pivot for a small metallic block 15, having a tubular socket 16 for the passage of a contact-lever 17, at the opposite ends of which are yieldable pins 18 for engagement with the similar pins of the contact devices carried by the ring 10, the outer pin only engaging these contact devices, while the inner pin is maintained in engagement with a depending pin 19, carried by the hour-hand and electrically connected thereto. The



tubular socket 16 is provided with a sleeve 20, forming an insulating-lining between the contact-lever and the block 15, and said block is normally held in the position shown in Fig. 1 by means of a spring 21, of which the outer end is connected to a loop or eye 22, carried by the block, and the inner end is clamped in a slotted block 23, arranged on the under side of the hour-hand. This spring normally tends to hold the inner pin of the contact-lever in engagement with the pin 19 and maintain the outer pin in such position as to engage the contacts of the ring 10, but being sufficiently light to yield freely immediately after the closing of the alarm-circuit and permit the passage of the contact-arm past the pin or other contact device which it engages.

Owing to the slow travel of the hour-hand, it is not desirable to employ a circuit-closing device which would remain in contact with a stationary circuit-closer and be moved out of engagement therewith by continued travel of the hour-hand. This movement will result in the sounding of a prolonged signal and will be unnecessary to accomplish the purpose for which the program-clock is intended. In the present case it will be observed that the circuit is maintained closed for a very short period of time and can only be maintained closed during the time the contact-lever is in engagement with the pin 19 and one of the contact devices carried by the ring 10. As soon as continued movement of the hour-hand results in a partial rotative movement of the block 15 the circuit is broken and the alarm ceases.

In the drawings there is shown a single alarm, which may be located at any desired distance from the clock, or a series of alarms may be distributed throughout a building and all connected with the same timing device, or a relay may take the place of the alarm and the several bells, buzzers, or other alarms arranged in the relay-circuit. The ring-contacts 12 are in the form of pins, preferably of yieldable material and having their lower ends secured to the heads of screws 30, which may be fitted in any one of the threaded openings formed in the ring 10. The heads of the screws are milled or serrated, as shown in Fig. 4, in order to permit their ready introduction into the openings. In some cases it may be desirable to prolong the contact, and in such cases the contact-pin is preferably provided with a coiled or volute portion intermediate of its length and formed of yieldable material that will offer less resistance than the spring 21, so that the circuit may be maintained closed for any desired length of time. This construction is illustrated in Fig. 4.

Where the clock is employed in connection with a school, academy, factory, or other place, it may be desired to energize different circuits for the sounding of different alarms during the day—as, for instance, the sound-

ing of the gong at the commencement of work—and in such cases I preferably employ an additional contact, such as indicated in Fig. 6, wherein 33 designates a base-plate that may be secured to the woodwork surrounding the ring 10 and form one of the terminals of the gong-circuit. This plate is insulated from the ring 10 and carries a finger 34, that is bent outward and downward into alignment with the circular row of contacts carried by the ring, so that when the hour-hand of the clock travels past the finger 34 the gong-circuit will be energized without energizing any of the remaining alarms in the building. This feature of the invention may be carried out to a further extent by the employment of one or more additional rings or segments, as indicated in Fig. 3, wherein 36 designates an outer ring or segment preferably disposed in a different plane from that in which the ring 10 and the clock-dial are disposed. This auxiliary ring is provided with one or more openings for the reception of threaded pins carrying inverted-U-shaped contact-fingers 37, that are bent into the path of movement of the hour-hand contact. In this manner auxiliary circuits may be closed to sound alarms at any desired point without the sounding of the alarms in circuit with the ring 10. The contacts carried by the ring 36 may vary in character, and the flexible contacts shown in Fig. 5 will sometimes be used to advantage where it may be necessary to sound an alarm or alarms for a comparatively long period of time.

Having thus described the invention, what is claimed is—

1. In combination, a timing mechanism including an hour-hand formed of conducting material and included in an alarm-circuit, a contact formed rigid with the hand and revolving therewith, a block pivotally mounted near the outer end of the hand, a circuit-closing lever carried by but insulated from the block, said lever having one of its ends normally engaging the rigid contact, a spring of which one end is secured to the hand and the opposite end to the block, said spring serving to maintain the lever in contact-engaging position, a ring or support forming the second terminal of the circuit and disposed concentric with the axis of movement of the hand, said ring being provided with a plurality of openings, and a contact-pin adjustable to any one of the openings and serving when engaged with a circuit-closing lever to move the latter from engagement with the stationary contact.

2. In combination, a timing mechanism including an hour-hand, a pivoted block carried by the hour-hand, a spring secured at one end to the hand and at its opposite end in engagement with the block, a tubular socket forming a part of the block, a circuit-closing lever extending through the socket, an insulating-sleeve between the lever and the wall of the



socket, a contact carried by the hand and normally engaged by one end of the lever, said contact forming one terminal of an electric circuit, and an adjustable contact disposed 5 within the path of movement of the opposite end of the lever, substantially as specified.

3. In a device of the class specified, a movable circuit-closer, a plurality of concentrically-disposed conductors, and contacts carried 10 by said conductors, all of the contacts being disposed in a single annular row in the path of movement of the movable circuit-closer.

4. In a program-clock, a circuit-closer carried by one of the hands of the clock, a plurality of concentrically-disposed insulated 15 supports forming the terminals of different circuits, and adjustable contacts carried thereby, all of the contacts being disposed in a sin-

gle annular row in the path of movement of the circuit-closer. 20

5. In a program-clock, a plurality of supports formed of conducting material and arranged concentrically, contacts carried by the inner support, contacts carried by the outer support and bent to place their terminals in 25 alinement with those of the inner support, and a revoluble circuit-closer for engaging said contacts.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 30 the presence of two witnesses.

CLEBURNE LEE HAYES.

Witnesses:

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