

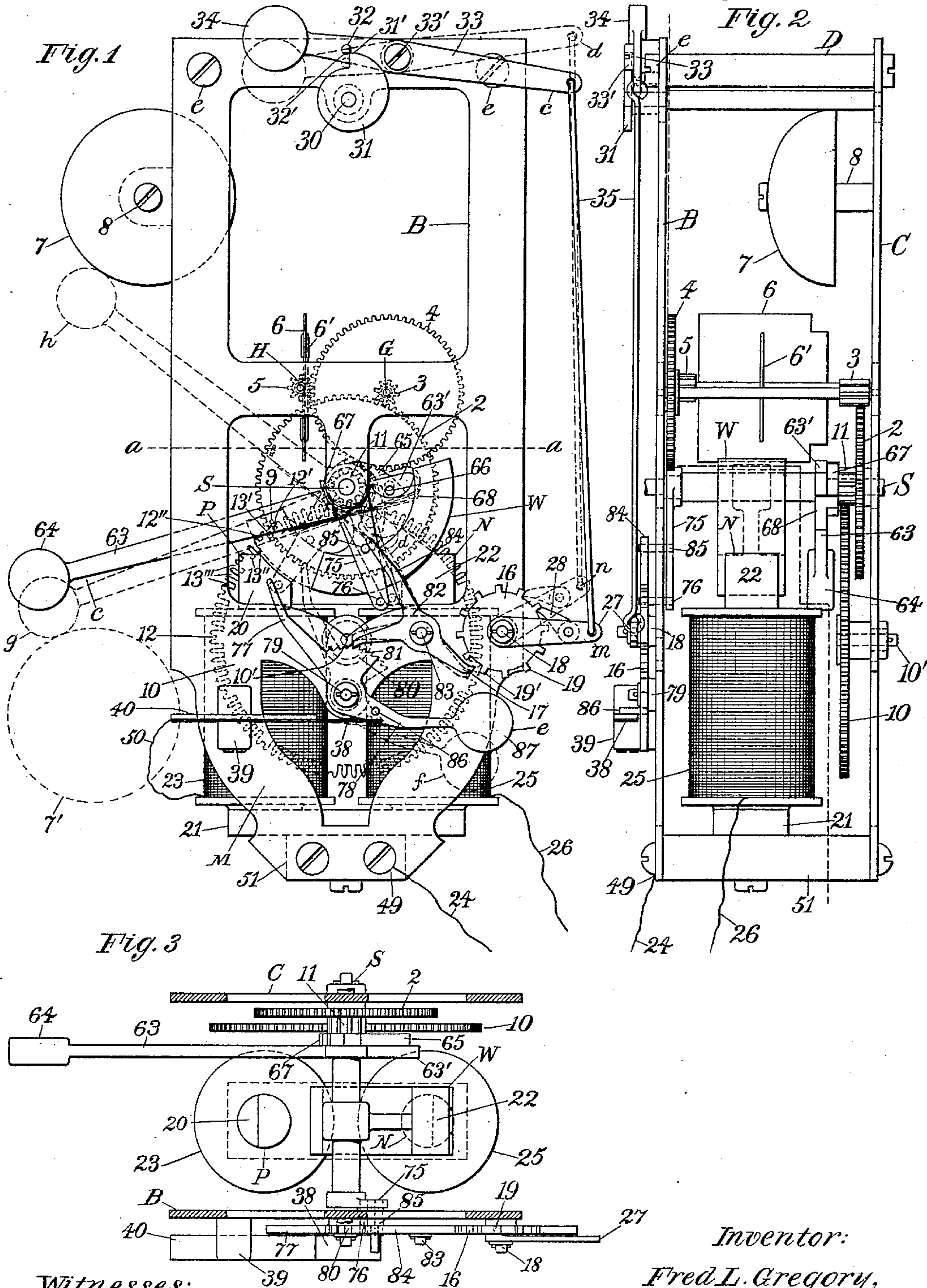
(No Model.)

2 Sheets—Sheet 1.

F. L. GREGORY.  
ELECTRIC CLOCK STRIKING MECHANISM.

No. 520,184.

Patented May 22, 1894.



Witnesses:  
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*John L. Edwards Jr.*

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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

FRED L. GREGORY, OF CHICAGO, ILLINOIS.

## ELECTRIC CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 520,184, dated May 22, 1894.

Application filed April 27, 1893. Serial No. 472,052. (No model.)

*To all whom it may concern:*

Be it known that I, FRED L. GREGORY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Striking Apparatus, of which the following is a specification.

This invention relates to striking mechanism for electrically actuated clocks of the class described in my prior Letters Patent No. 455,532, dated July 7, 1891; the object being to furnish an improved striking-mechanism adapted for use in connection with a time-piece, or as a separate striking apparatus operable independently of a time-piece.

In the drawings accompanying and forming a part of this specification,—Figure 1 is a front elevation of a striking-mechanism embodying my present improvements and arranged for use in connection with a clock of the class described in my aforesaid Letters Patent. Fig. 2 is a side elevation of the mechanism, as seen from the right hand in Fig. 1. Fig. 3 is a sectional view in line *a a*, Fig. 1, showing the parts below said line as seen from a point above the same. Fig. 4 is a front view of the lower portion of the back-frame of the mechanism, together with the stop-wheel and its train of gearing. Fig. 5 is a front view similar to the lower portion of Fig. 1, and illustrates a modification of certain features of the apparatus. Fig. 6 is a view similar to a portion of Fig. 4, showing the stop-wheel in a modified form.

Similar characters designate like parts in all the figures.

For the purposes of my present improvements, I may employ in connection therewith, and as herein shown, a switch-mechanism, (together with a magnet and a rotary-reciprocating armature actuated thereby,) which constitutes in part the subject-matter of my prior application, Serial No. 429,745, filed April 19, 1892. But it will be understood that any other suitable and well-known form or arrangement of switch, magnet and armature, adapted for imparting an oscillating movement to a shaft, may be substituted for those herein shown, without departing from my present invention.

In the drawings, the operative parts of the

mechanism are shown carried by a framework having the usual front-frame B and back-frame C, these frames being connected together by pillars, D, and screws, *e*, after the usual manner of constructing clock-frames. The usual clock-train, this not being necessary to an understanding of my present improvements, is not shown herein; but in Figs. 1 and 2 I have shown the usual staff, or pointer-shaft 30, of a time-piece journaled in the frames B and C and carrying on its front end the striking-cam 31, for effecting the starting-up at the proper time of the striking-mechanism when this is used in connection with a time-piece. This operation is effected by means of a lever 33, which is shown pivotally supported at 33', on the frame B, and furnished with a weight 34, whereby its cam-pin 32 is normally held in contact with the cam 31. When this cam is revolved to raise the weight 34 as shown in Fig. 1, the cam-pin 32 passing off from the point 31' of said striker-cam, allows said weight to throw the lever 33 from its position shown in solid lines to its position shown in dotted lines in said Fig. 1. Said lever 33, being so actuated by the time-piece and weight, operates through the connecting-wire or rod 35, and by means of some intermediate mechanism substantially such as hereinafter described, to start the striking mechanism into operation.

The magnet employed for actuating the armature of the striking-apparatus consists, in the preferred form thereof herein shown, of the two cores 20 and 22 connected by the usual bar 21, and provided with the usual coils 23 and 25 on said cores respectively. Electricity is supplied to the coils 23 and 25 through wires, 50 and 26, respectively, in the usual manner. The magnet is supported by attaching the connecting-bar 21 thereof to the lower bar 51 connecting the two frame-plates B and C, as will be understood by comparison of the several figures of drawings. The winding of the magnet-coils, and the connection of the same with the source of electric supply, should, of course, be done in such a manner as to actuate the magnet armature in the direction required by the character of the operative parts hereinafter described.

The armature, designated in a general way by W, is shown carried by a rock-shaft S,



which is suitably journaled in the frame-plates B and C. The armature is on its outer side, substantially concentric with its supporting shaft, and is held in position to oscillate in close proximity to the poles P and N of the magnet, as will be understood from the drawings and my aforesaid Letters Patent. The rock-shaft S carries rigidly fixed thereon the striker-arm 63, usually provided at its outer end with a hammer, as 64, adapted for striking a bell, as 7, suitably held in proper position therefor. Said bell 7, may be supported on one of the frame-plates, as C, by means of the stud 8, or in some other convenient way. The bell is preferably located above the hammer, as indicated by solid lines in Figs. 1, 2 and 5, but in some cases it may be located below the same, as indicated by dotted lines at 7', Fig. 1. In the latter case, of course, the blow will be struck on the descent of the hammer; and as the downward stroke is made by gravity and is usually less rapid than the upward stroke (which is made directly by the force of the magnet), of course the tone of the bell will vary correspondingly.

The stop-wheel 10, is shown journaled on a stud 10', fixed in the frame-plate C, and is intermittently actuated from and by the movements of the shaft S, through an ordinary pawl-and-ratchet device, which, in the form thereof herein shown, consists of the ratchet-wheel 67, loosely mounted on said shaft S, and carrying the pinion 11, which meshes with the teeth of said stop-wheel; and the pawl 65, pivoted at 66 to the projecting end 63' of the hammer-arm 63, for engaging the teeth of said ratchet-wheel. On the reciprocating movement of the armature-shaft and hammer-arm, the pawl 65 engages the ratchet-wheel on the downward stroke of the hammer to turn forward the stop-wheel.

As a means for properly limiting the velocity of the hammer-arm during its downward stroke, so as to cause a sufficient time to elapse between the successive strokes of the hammer, an ordinary fan-train is provided and is arranged as follows: Fixed on one end of the loosely-mounted pinion 11, (carried on the aforesaid shaft S,) is a relatively large spur-wheel 2, which meshes with the pinion 3, of an intermediate shaft G, that is journaled in suitable bearings in the frames B and C, and carries another spur-wheel 4, meshing with the pinion 5, of the fan-shaft H; this shaft is provided with the usual fan 6, which may be held thereon by means of the ordinary clamp-wire 6', in a well-known manner understood by clock-makers. When the armature is swung forward (toward the left-hand) to the position shown by dotted lines in Fig. 1, the pawl 65 passes over one of the teeth of the ratchet-wheel 67, and on the descent of the hammer-arm 63 turns said wheel, and through it drives the fan-train, which in turn limits the velocity of the return-stroke of the hammer-arm and armature, for the

purpose hereinbefore mentioned. Said hammer-arm may also constitute the stop-arm for carrying the stop-pin 9, which pin is constructed and arranged for engaging on the downward movement of said stop-arm in the spaces between the teeth of the strike-wheel 10. This wheel is, in a general way, of the usual description, except that between each set of deep notches (except for the hour "I") there is a shallow notch, 12. The nature of the mechanism is such that, when once started, the striking operation is repeated each time said pin 9, descends into one of the deep notches, but is brought to a close whenever said pin rests in one of the shallow notches, as 12', or 12'', following the respective hour-sets. It will, of course be understood that the strike-wheel has, in the first set, one deep notch at 13', corresponding to the hour "I;" in the next set two notches, 13'' and 13''', one deep and the other shallow, and corresponding to the hour "II;" and so on, up to twelve. The shallow surface at 12, constitutes the "stop-surface" for limiting the switch-arm movement at the proper time and place to interrupt the operation of the switch and thus stop the entire mechanism. When the bell is placed in the position shown by solid lines so that it is struck by the hammer on the upward stroke of the hammer-arm, and the stop-pin 9, is raised from the notches 12' of the strike-wheel to strike the hour "I," the striking apparatus should, of course, at the next downward stroke of the hammer-arm, come to a stop; accordingly, the next notch after that for the hour "I" will be a shallow notch; similarly, the number of deep notches in each hour-set (when the mechanism is arranged as described) will in any case be equal to the number of strokes to be made, minus one.

The electrical circuit for energizing the magnet consists of the two terminals 24 and 26, one of which, 26, is shown leading directly to the spool 25, while the other one 24, is connected at 49 to the metallic frame. Connection is made with the other spool 23, through the wire 50, which leads to the contact-point, or spring 38. When the switch is thrown into engagement with said contact-point as shown by dotted lines in Figs. 1 and 5, the electrical circuit is thereby completed and the magnet-poles energized for raising the hammer-arm 63.

For making and breaking the circuit for the purpose of operating the pressure-device, a circuit-breaker, or switch, of the locking variety, is provided, which, in the preferred form thereof, described in my aforesaid application, is constructed and organized as follows: The switch-lever 78, carrying the contact-point 86 for making the electric circuit through the terminal 38, is pivotally supported at 79 on the frame M. Said switch has means, as for instance, the weight 87, fixed thereto, for moving it to close the circuit, as shown, for instance, in Fig. 5, when the switch is released from its locking device;



and is provided with a suitable detent-rim, as the segment 80, for engaging with a detent-pawl, or switch lock 82, (that is pivoted on a stud, 83, fixed in the frame M,) and has an arm, 84, whereby it may be unlocked from the switch, as shown in Fig. 5. The switch also has suitable means, as for instance, the projecting arm 77, for operating the same on the retractive movement of the pressure-device. As a means for effecting this operation, the arm 63 (or the shaft S thereof) carries a switch actuating arm, 75, which is provided with a pin or projection, 76, for engaging said switch-arm 77 on the retractive stroke of the pressure-device, and with another pin or projection, 85, for opening the switch-lock by striking said lock-arm 84 at the end of the working stroke of the pressure-device. In some cases, if it be so preferred, one other projection (not herein shown) on the arm 75, and located between the present positions of the pins 76 and 85, (the arms 77 and 84 being suitably shaped therefor,) may be substituted for said separate pins or projections 76 and 85. The detent-segment, or locking-rim, 80, is shown consisting of a series of ratchet-teeth, 81, (see Figs. 1, 2 and 3,) arranged in the form of a segment concentric with the pin 79; but in lieu of this device I may, in some instances, use the well-known detent-device consisting of a friction-rim operating in connection with a frictional detent-pawl, or detent-cam.

The electrical terminal 38 is shown consisting of a spring 38', which is carried by the magnet-frame M, and suitably insulated therefrom, being supported on an intermediate block, 39, of insulating material. A suitable guard, as 40, is usually provided to prevent accidental bending of said spring.

The operation of the mechanism is as follows: The weighted lever 63, having been raised, as for instance to the position shown by dotted lines in Fig. 1, and the magnet de-energized, said lever begins to descend, and thus operates, through the pawl 65, the ratchet-wheel 67, and the connections above described, to turn the gear 2, on its shaft to drive forward the fan-train. The clock-work and stop-wheel now continue in operation, and the lever 63 gradually descends from its uppermost position to the position *c* shown by solid lines in Figs. 1 and 5; at this time the switch-actuating arm 75 (or the projection 85 thereof) engages the switch-lock 82 (or the arm 84 thereof) to detach this lock from the switch, as shown by dotted lines in Figs. 1 and 5, this operation being completed when the arm 84 has reached position *d*, as also shown in Fig. 5. The switch, having been unlocked as described, is now thrown forward by the weight 87, as shown in Fig. 1, to bring the contact-point 86 against the terminal 38 and thus complete the circuit for re-energizing the magnet; this having been done, the magnet again acts through the armature W to retract the arm 63 for again continuing the operation as before. On the

raising of the lever 63 as described, the arm 75, which is carried therewith in its movement, strikes the switch arm 77, and, owing to the momentum of the weight 87, throws the switch forward more or less toward the position thereof shown in Fig. 1, thereby suddenly separating the contact-point 86 from the terminal 38 and thus breaking the electric circuit; the detent 82, in the mean time, drops upon the detent-notches 81, and locks the switch in the extreme position to which it may be carried by the blow of its said actuating arm 75. The effect of this construction and combination of the several parts is to insure the proper operation of the circuit-breaking switch when the battery becomes weak and the current therefore only able to retract the pressure-device or weight-arm, as 63, through a portion of its maximum stroke; and by thus preventing short-circuiting and the consequent running down of the battery toward the latter part of its term of life, said term of life is very greatly extended; so that an electric clock embodying my said improvements may be operated in a reliable manner by a relatively small battery for an unusually long period of time.

For operating the switch-arm 84 to inaugurate the striking operation, I prefer to employ a ratchet-wheel or like device, as 16, set to operate upon a projecting arm of said switch-element 82, after the manner illustrated in Figs. 1, 2 and 3. The wheel, or ratchet, 16, is pivotally supported on a pin 18, and the teeth 19, of said wheel are constructed to permit the normal movement of the arm 17, without interruption. On the gradual turning of the clock-shaft 30, Fig. 1, to bring the let-off notch 32', under the pin 32 of the lever 33, this lever, being weighted, operates, through the rod 35, lever 27, and pawl 28, to suddenly turn the said ratchet 16, from the position *m* to that of *n* shown in Fig. 1, and thus carry the point 19', of said ratchet against and over the switch-arm 17. This throws the switch from the position *e* to that of *f* shown in Fig. 1, and by releasing the switch-lever allows this to drop and make the connection for raising the weighted main lever 63 from its lower position *g* to the upper position *h* in Fig. 1, where the hammer thereon is in contact with the gong, or bell, 7. When the time has come to start the striking-mechanism, the clock brings the cam 31 to the position shown in Fig. 1, when the weighted lever 33, having been elevated as shown, drops off from the cam to the position shown by dotted lines in said figure, thereby raising the lever 27 and pawl 28, and turning the aforesaid switch-actuating wheel 19 forward one tooth, carrying the tooth 19' thereof against and past the arm 17 of the switch-lever 82. The switch being thus once actuated, starts the striking-mechanism as hereinbefore described, which continues in action (including the switch-mechanism), until the stop-pin 9, strikes one of the stop-faces or notches 12' of the striking-wheel; this



brings the striking-mechanism to rest, in the manner hereinbefore described. On the descent of the stop-pin 9 into one of the deep notches of the strike-wheel 10, the rock-shaft S, is so far turned over toward the left-hand in Fig. 1, as to bring the switch-pin 85 against the switch-arm 84 and thereby cause the electric circuit to be completed and energize the magnet for reversing the movement of the weighted arm and raise this to the position shown in Fig. 1, for striking the bell one stroke and engaging the pawl 65 with the next notch of the ratchet 67.

As a means for starting the striking-mechanism into action without the use of a time-piece, any convenient appliance may be used for once actuating the switch-lever 82, to close the electric circuit. This may be done by an operator striking a lever-arm or other part of the switch-mechanism itself. Or, the switch-mechanism may be actuated for the purpose set forth by means of an electric device, such, for instance, as shown in Fig. 5. This apparatus consists of the weighted armature-lever 90 pivotally supported at 91, to a fixed portion of the framework of the mechanism, and having at its working end the click, or gravity-pawl 92, pivotally supported thereon, and whose projecting end engages (on the downward stroke of said armature-lever) with the arm 17, of the switch 82. Said armature-lever may be elevated by any suitable means, as, for instance, by the spring 93, connected to said lever at 94, and to a pin 95, on the framework. The armature-lever 90 is shown carrying the armature 96 located immediately over the core 97, of a magnet 98, whose coil is connected at one end with the wire 99, and at the other end with the wire 100. The latter wire 100, is shown connected with the contact-piece 101, and adjacent to this is located a push-button, 102, carried by a contact point, or spring 103, that is connected by another wire, 104, with a source of electric supply, (which may be any suitable battery) this being also connected by said wire 99 with the coil of the magnet. When it is required to throw the switch into action for starting the striking-mechanism, the operator has only to close the circuit of the auxiliary magnet 98, by pressing on the push-button 102, and contacting the spring 103, with the aforesaid contact-piece 101, thus completing the circuit through the coil 100, of the magnet; which magnet, being thus energized, draws down the armature and its lever 90, to engage the click 92, with the arm 17 of the switch-lever and thus throw the switch into action. During this operation said click passes by the arm 17 to the position shown by dotted lines in Fig. 5, and on the return-movement of the armature-lever the click passes freely by the switch-arm into position for repeating the operation. Thus, but one action of the switch can be produced by a single closing of the circuit by the push-button 102.

In practice, of course, the push-button and

the contact-maker operated by the same may be placed at any convenient point, however distant from the striking-mechanism. My improved striking-mechanism is, therefore, adapted for use as a fire-alarm, the auxiliary magnet being operable from a distant station, as, for instance, from the signal-box of a fire-alarm system. By locating the bell in the position indicated by dotted lines in Fig. 1, of course the bell-stroke will be made by the downward movement of the hammer, which movement also operates the fan-train; but, owing to the latter circumstance and the requirement that the fan shall hold back the descent of the hammer-arm to properly time the bell-strokes, I deem it impracticable to use the down-stroke for the purpose of striking the bell. Besides, the up-stroke being made directly and without any resistance from the train of gearing, the blow is made quickly and is more effective for ringing the bell in a proper manner. It will, of course, be understood that by the term "up-stroke" is meant the stroke of the bell made by the attraction of the magnet, and by "down-stroke" is meant the return-stroke due to the weight, or to a spring in case this should be substituted for a weight. How the spring may be applied is indicated by dotted lines in Fig. 4, the usual pull-spring 52, being connected at one end to the hammer arm at 53, and at the other end to some suitable fixed point, as the pin 54.

One advantage of my improved electrically-actuated striking-mechanism is that only a given amount of electrical energy is used at each stroke of the bell, independently of the duration between the strokes; this duration being governed by the fan and the train of gearing, may be varied to give either a slow-striking or a fast-striking clock.

In some cases, the stop-wheel may consist, as shown in Fig. 6, of a plain spur-wheel having stop-faces consisting of pins projecting from the side of the wheel. In this view the pins are designated by 12<sup>a</sup>, 12<sup>a'</sup>, 12<sup>a''</sup>, &c., and correspond to the equivalent stop-faces 12, 12', 12'', &c., Fig. 4. The operation of this modified form of the stop-wheel in the several combinations specified is substantially the same as the operation of the stop-wheel described in connection with Figs. 1 to 5, inclusive. In either case, the stop-faces are to be located on the wheel at successive points corresponding to the required stopping-times of the mechanism.

The oscillating member, comprising a hammer-arm and means for mounting the same to have a reciprocatory movement substantially as described together with its stop and an arm or pin adapted for operating the switch, is herein sometimes designated as the reciprocatory striker, it constituting substantially a single member of certain of the combinations.

The apparatus intermediate to and connecting the shaft 30 and the switch for oper-



ating the latter device, is sometimes herein designated as a switch-actuator. It will, however, be understood that any suitable and well-known device adapted for so connecting those parts may be substituted for the particular arrangement of mechanical elements herein shown and described for said purpose, without departing from my present invention.

The features herein shown and described, but not claimed herein, which features comprise, in combination, "a power-shaft, an electrically-propelled power-shaft-actuator, means for imparting an intermittent movement to said actuator, and a resistant-speed regulator in operative connection with the power-shaft," constitute, in part, the subject-matter of a separate application filed by me January 30, 1894, Serial No. 498,522, wherein said subject-matter is further described and broadly claimed.

Having thus described my invention, I claim—

1. In a striking-mechanism, the combination with the magnet, and with the reciprocatory striker carrying a stop, of the stop-wheel, and a switch in circuit with the magnet and in position to be operated by the striker, substantially as described.

2. In a striking-mechanism, the combination with the magnet and its armature, of the reciprocatory striker and its stop, a stop-wheel, substantially as described, having stop-faces at points corresponding to the stopping-times of the mechanism, means for advancing the stop-wheel, and a switch in circuit with the magnet and in position for operation by the striker.

3. In a striking-mechanism, the combination with the magnet, of the oscillating armature carrying a striker-arm and a stop, a stop-wheel, substantially as described, having stop-faces at points corresponding to the required stopping-times of the mechanism, means for advancing the stop-wheel on the successive movement of the armature, a switch in circuit with the magnet and in position for operation by the striker, and means for setting the switch in its operative position independently of the striker.

4. In a striking-mechanism, the combination with the magnet, of the oscillating armature carrying a striker-arm and its stop, a stop-wheel, substantially as described, having stop-faces at points corresponding to the stopping-times of the mechanism, means for advancing the stop-wheel on the successive movements of the armature, a switch-lever in circuit with the magnet and in position for operation by the striker on its forward stroke, and a switch-lock in position for operation by the striker on its full return stroke, said stop-faces being located on the stop-wheel in position for so limiting said return-stroke as to prevent operating said switch-lock.

5. In a striking-mechanism, the combination with the magnet and with the bell, of the reciprocatory striker and its stop, a switch in

circuit with the magnet and in position for operation by the striker, a stop-wheel operatively connected with the striker and having stop-faces for limiting the return-stroke thereof at points corresponding to the required stopping-times of the mechanism, and a fan-train connected with the striker for limiting the velocity of its return-stroke.

6. In a striking-mechanism, the combination with a stop-wheel having successive stop-faces, a reciprocatory striker carrying a stop adapted to engage said faces and thereby limit the return-movement of the striker so as not to actuate the switch, a time-piece shaft, and a switch actuator connecting said shaft and the switch-mechanism, whereby the switch is actuated by said shaft for starting the striking mechanism, substantially as described.

7. In a striking-mechanism, the combination with a strike-wheel having peripheral teeth and having the spaces between said teeth of different depths and the bottom surface of the shallower spaces constituting stop-faces as set forth, of a shaft having a pinion meshing with the said teeth for driving the strike-wheel, a reciprocatory striker carrying a stop in position for entering the said striker-wheel spaces, and means operatively connecting said striker and pinion for turning the strike-wheel on one movement of the striker, substantially as described.

8. In a striking-mechanism, the combination with a stop-wheel having successive sets of deep notches with intermediate shallow notches, of a reciprocatory striker having a stop adapted to engage in said notches on the movement of the striker in one direction, and a ratchet-device and pinion intermediate to the striker and stop-wheel for advancing the wheel on the movement of the striker in the opposite direction, substantially as described.

9. The combined gear and stop-wheel herein described, for striking mechanisms, consisting in a wheel having successive sets of notches, peripherically, of relative uniform depths corresponding to the successive numbers to be struck by the mechanism, and having between each two successive sets of said notches a stop-notch of lesser depth than the depth of the adjacent notches, substantially as described and for the purpose set forth.

10. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker and switch-actuator, an electrical striker-actuator, and a locking switch in circuit with the striker-actuator substantially as set forth.

11. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker and switch-actuator, an electrical striker-actuator, a locking switch in circuit with the striker-actuator, and a stop-wheel substantially as described.

12. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker and switch-actuator, an electrical striker-



actuator, a stop-wheel, a locking switch in circuit with the striker-actuator and a fan-train in connection with the stop-wheel substantially as described.

5 13. In a striking-mechanism, in combination, a reciprocatory striker, switch-actuator and stop-wheel actuator, a stop-wheel, an electrical striker-actuator, a switch in circuit with  
10 said actuator, a fan-train in operative connection with the stop-wheel, and means for actuating the fan-train from the striker on the return-stroke of the striker, substantially as described.

14. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker, a  
15 stop-wheel, a fan-train in operative connection with the stop-wheel, and means for connecting the striker with the fan-train on the return-stroke of the striker, whereby the velocity of said return-stroke is regulated, sub-  
20 stantially as described.

15. In a striking-mechanism of the class specified, in combination, a reciprocatory striker, means for actuating the striker, a fan-  
25 train normally at rest on the forward stroke of the striker, and means for actuating the fan-train from the striker on the return-stroke thereof, whereby the forward or working stroke of the striker is free of the fan-train  
30 and the return-stroke thereof is controlled by the fan-train, substantially as described.

16. In a striking mechanism, in combination, a bell or gong, a reciprocatory striker, an electrical striker-actuator, a locking switch in circuit with said striker-actuator, a stop-  
35 wheel, a switch-actuator and stop-wheel-actuator, and means for limiting the velocity of the striker during its return stroke, substantially as described.

17. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker, an electrical striker-actuator, a reciprocatory locking-switch in circuit with said striker-actuator, a stop-wheel, a stop-wheel-actuator, and means, substantially as described, for  
40 actuating and for locking and releasing the switch in and from its circuit-breaking position, substantially as set forth.

18. In a striking-mechanism, in combination, a bell or gong, a reciprocatory striker, an  
50 electrical striker-actuator, a reciprocatory locking-switch in circuit with said striker-actuator, a switch-locking-actuator intermediate to said switch and striker, a stop-wheel and stop-wheel-actuator, and a fan-train in  
55 operative connection with the stop-wheel and striker, substantially as and for the purpose set forth.

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