No. 698,158. Patented Apr. 22, 1902.

A. TUERK.

ELECTRIC CLOCK WINDING MECHANISM.

(Application filed Jan. 31, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

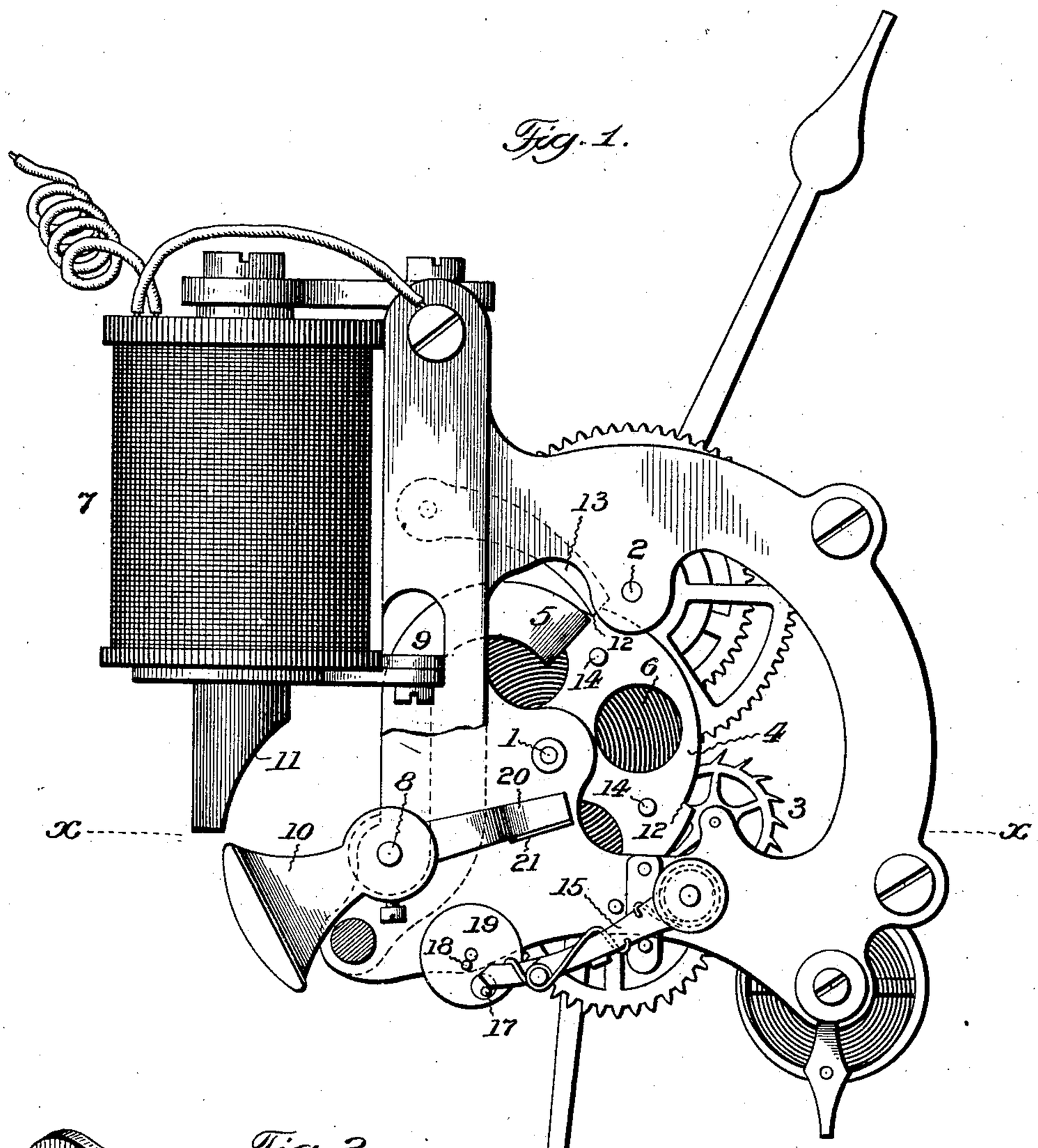


Fig. 2.

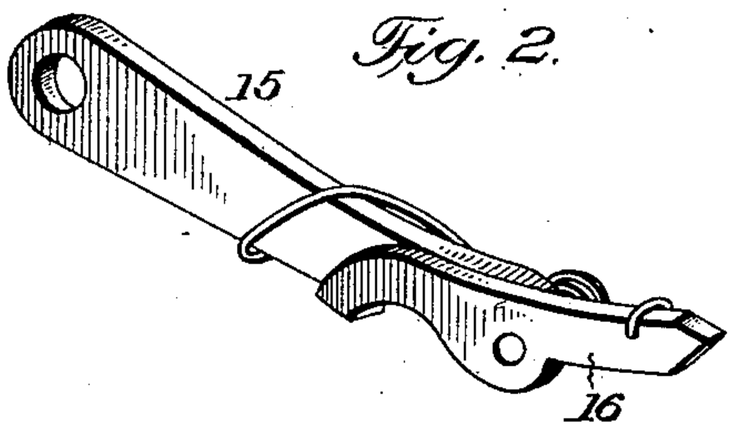
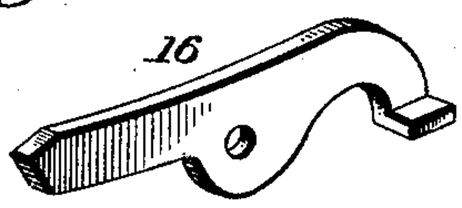


Fig. 3.



Attest:

John Enders Jr.

M. H. Holmes

Inventor:

Albert Tuerk,

by Robert Burns Attorney

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Fig. 4.

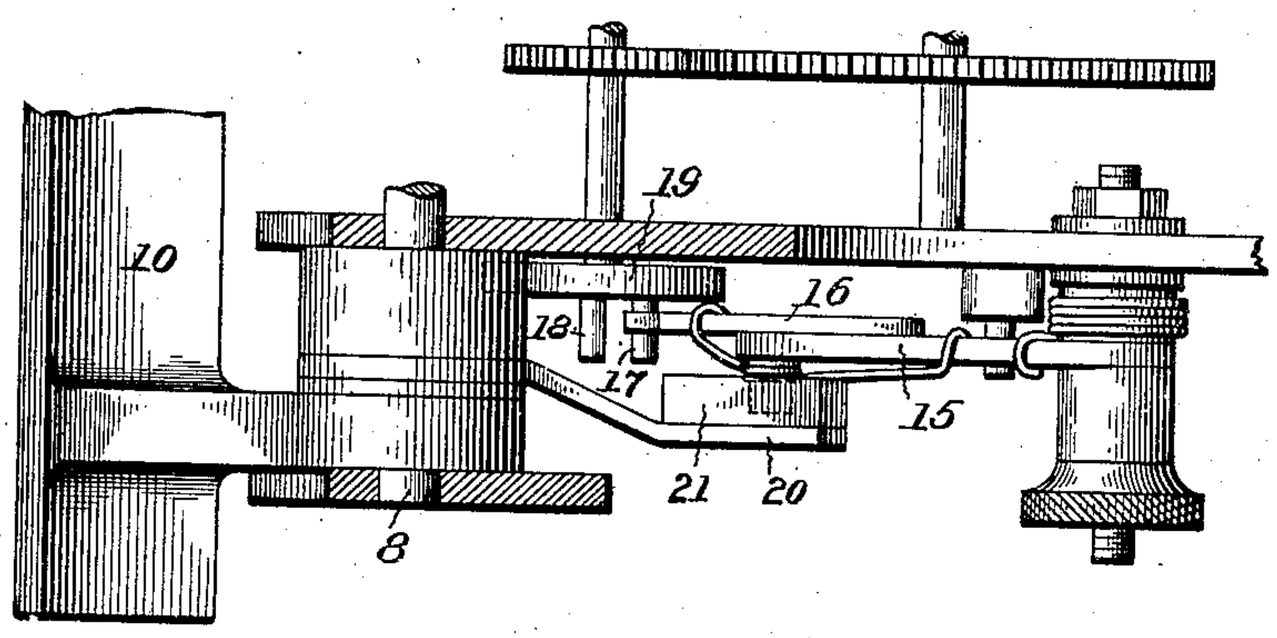


Fig. 5.

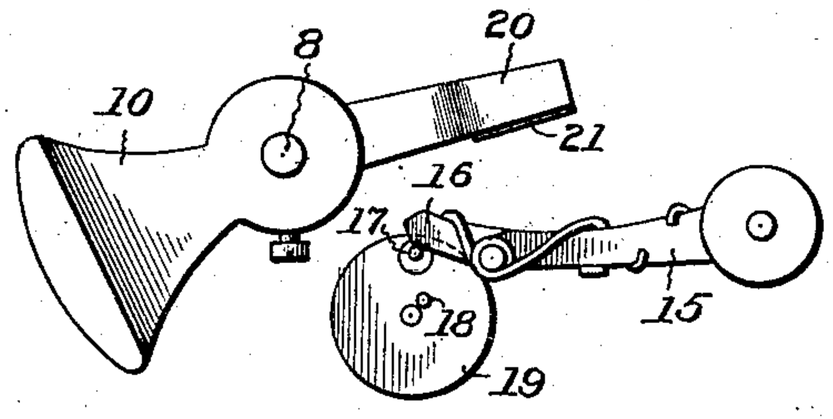


Fig. 6.

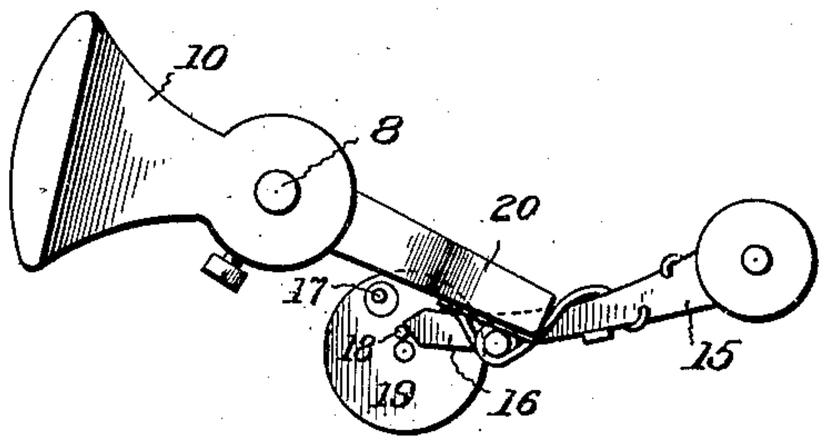


Fig. 8.

Fig. 7.

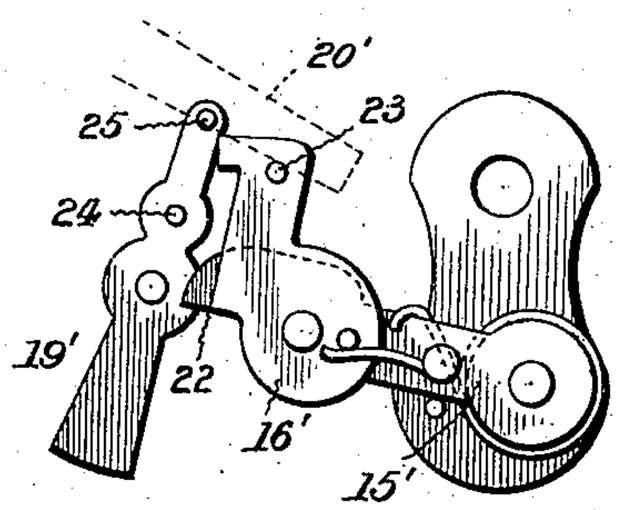
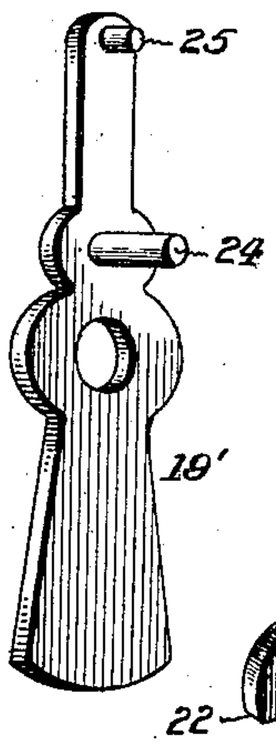


Fig. 9.



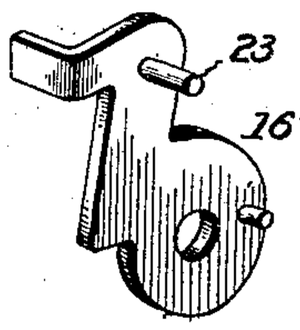
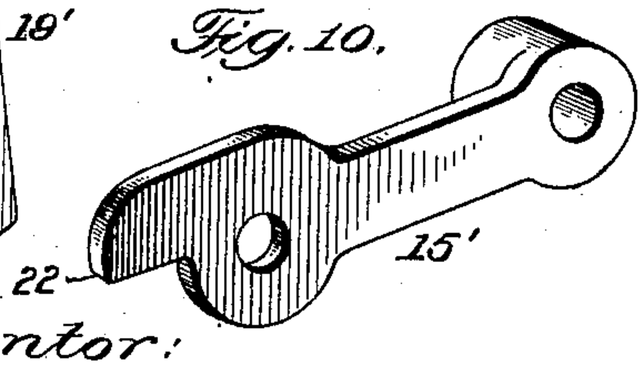


Fig. 10.



Attest:

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M. H. Holmes.

Inventor:

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UNITED STATES PATENT OFFICE.

ALBERT TUERK, OF CHICAGO, ILLINOIS.

ELECTRIC CLOCK-WINDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 698,158, dated April 22, 1902.

Application filed January 31, 1901. Serial No. 45,424. (No model.)

To all whom it may concern:

Be it known that I, ALBERT TUERK, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Clock-Winding Mechanisms, of which the following is a specification.

The present invention relates to that type of electrically-actuated clock-winding mechanisms in which the spring which actuates the clock mechanism is rewound at frequent intervals.

The object of the present improvement is to provide a simple and efficient electromagnetic rewinding mechanism in which the automatic circuit-closing mechanism acts with each active actuation of the electromagnetic winding mechanism in a rapid and positive manner to break the circuit, and thus avoid unnecessary waste of the electric current, and in consequence prolong the life or period of usefulness of the battery affording such electric current, all as will hereinafter more fully appear. I attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a clock-winding mechanism embodying the present invention, portions of the main frame being broken away to better illustrate the mechanism of the present improvement; Fig. 2, a detail perspective view of the vibratory contact-arm of the circuit-controlling mechanism; Fig. 3, a detail perspective view of the contact-finger of said vibratory contact-arm; Fig. 4, a fragmentary horizontal section of clock mechanism, taken on the irregular line *x x*, Fig. 1. Figs. 5 and 6 are detail elevations of the circuit-controlling mechanism in its intermediate position and nearing the final position, respectively. Fig. 7 is a detail elevation of a modified form of the circuit-controlling mechanism. Figs. 8, 9, and 10 are detached perspective views of the parts composing such modified form of the circuit-controlling mechanism.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the main shaft of an ordinary clock mechanism, having the usual pinion and gear-wheel connections with the hour-hand shaft 2 and with clock-escapement mechanism 3, respectively.

4 in the construction shown is the winding ratchet-disk, journaled so as to revolve loosely around the main shaft 1 and having operative connection with said shaft through the instrumentality of a coiled or motive spring 6, one end of which is secured to the said winding ratchet-disk 4 and the other end to a disk or arm fixed on the main shaft 1, as usual in the present type of electric clock mechanisms, such spring constituting the sole operative connection between the winding ratchet-disk and the main shaft aforesaid, the arrangement being such that during the periodic winding movement one end of said spring will be revolved around the main axis 1 to effect a winding up of said spring, and the tendency of the opposite end of such spring is to impart a uniform movement of rotation to the main shaft 1 and the clock mechanism connected thereto.

7 is the operating-electromagnet, arranged in separated relation to the main shaft 1 of the clock-movement.

8 is an intermediate shaft or axis, upon which is secured the carrying-lever 9 of the pawl 5, which is adapted to have operative engagement with the winding ratchet-disk 4, heretofore described. Said shaft or axis 8 also carries the oscillating armature 10 of the electromagnet 7, the adjacent faces of the pole-piece 11 of the magnet and of the oscillating armature being concentric with the pivot-axis 8 to afford an extended range of movement to the armature, as usual in this type of electromagnets.

In the construction shown in the drawings the winding-ratchet 4 is formed with a series of four peripheral notches 12 for engagement with the pawl 13 to prevent a retrograde movement of such disk and with a like number of studs 14, equally spaced on said disk and which are consecutively engaged by the spring-pawl 5 on the free end of the carrying-lever 9 of the electromagnetic actuating mechanism of the clock to effect an intermittent rotation of the disk 4 and a corresponding winding up of the motive spring 6.

The circuit-controlling mechanism of the present invention comprises, first, a pivoted

and insulated spring-arm 15, that is connected in any usual manner to one pole of the battery and is provided with a flexible contact-point, preferably formed by a spring-finger 16, pivoted to the free end of said arm 15, as illustrated in Figs. 1, 2, 4, 5, and 6 of the drawings, and by means of which the operating electric circuit is established, as hereinafter described, and, second, a single insulating-support 17 and a single contact-point 18, carried by a revoluble disk 19, that is geared to and receives motion from the main shaft 1, the number of revolutions of such disk being a multiple of the number of revolutions of the main shaft and corresponding in number to the number of ratchet-studs upon the winding-ratchet heretofore described. For example, with the construction shown in the drawings and in which a series of four studs are employed the disk 19 will have four revolutions to one of the main shaft. Normally the flexible contact-finger 16, heretofore described, will in the rotation of the disk 19 be engaged by and rest upon the insulating stud or support 17 and will drop into contact with the adjacent conducting-stud or contact-point 18 in the normal rotation of the disk 19 to complete the electric circuit and cause an operation of the electromagnetic winding mechanism heretofore described. With a completion of such actuation of the winding mechanism it is desirable to immediately disrupt the electric circuit with a view to economize the electromotive force of the operating galvanic battery, and to this end a breakage of such circuit is attained in a positive and rapid manner by an arm 20, having an insulated contact end 21 and carried by the armature-shaft 8, said arm in the final active movement of the armature being adapted to engage against the insulated spring-arm 15 to forcibly depress the same and draw the spring-finger 16 from off the conducting-stud or contact-point 18 to break the operating electric circuit. In the construction shown the flexible contact-finger 16 is pushed into the path of the insulated stud 17, ready for a periodic repetition of the actions just described in a continued normal movement of the clock mechanism.

In the modified construction of the circuit-controlling mechanism (illustrated in Figs. 7, 8, 9, and 10 of the drawings) the spring-arm 15′ will have the same insulated arrangement and connection as heretofore described in connection with the spring-arm 15 and will be provided with a projecting toe 22 and a spring or flexible contact-finger of the following construction: 16′ is a spring contact-finger pivoted to the free end of the arm 15′ and provided with an angularly-arranged contact extension which is bent laterally, as shown in Fig. 9, and with a lateral stud 23 for engagement with an operating-arm 20′, similar to the operating-arm 20, heretofore described in connection with the main form of the circuit-controlling apparatus. 19′ is a revolving arm having rotation similar to the disk 19, heretofore described, and provided with an insulated lateral tappet-stud 24 and with a contact-stud 25, the former of which projects outside the plane of the latter and is adapted to engage beneath the projecting toe 22 of the spring-arm 15′ to lift the same, and on passing from beneath such toe enable the laterally-bent contact extension of the spring contact-finger 16′ to drop into contact with the contact-stud 25, from whence it is subsequently removed in a rapid and positive manner by the action of the operating-arm 20′ in manner similar to that described in connection with the main form of the circuit-controlling mechanism.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, a contact-stud carried by said counter-shaft, a flexible contact adapted to have electrical engagement with said contact-stud, and means moving in unison with the armature of the winding mechanism for pushing the flexible contact away from such electrical contact with the contact-stud, substantially as set forth.

2. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, a contact-stud carried by said counter-shaft, a flexible contact adapted to have electrical engagement with said contact-stud, and an arm moving with the armature of the winding mechanism and adapted to push the flexible contact away from its electrical contact with the contact-stud, substantially as set forth.

3. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, an insulating-stud and a contact-stud carried by said counter-shaft a flexible contact adapted to have engagement with said studs, and means moving in unison with the armature of the winding mechanism for pushing the flexible contact away from its electrical contact with the conducting-stud, substantially as set forth.

4. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, an insulating-stud and a contact-stud carried by said counter-shaft a flexible contact adapted to have engagement with said studs, and an arm mov-

ing with the armature of the winding mechanism and adapted to push the flexible contact away from its electrical contact with the conducting-stud, substantially as set forth.

5. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, a contact-stud carried by said counter-shaft, a flexible contact, the same comprising a vibratory spring-arm and a pivoted spring-finger on the free end of said arm, adapted to have electrical engagement with said contact-stud, and means moving in unison with the armature of the winding mechanism for pushing the flexible contact away from such electrical contact with the contact-stud, substantially as set forth.

6. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, a contact-stud carried by said counter-shaft, a flexible contact, the same comprising a vibratory spring-arm and a pivoted spring-finger on the free end of said arm, adapted to have electrical engagement with said contact-stud, and an arm moving with the armature of the winding mechanism and adapted to push the flexible contact away from its electrical contact with the contact-stud, substantially as set forth.

7. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, an insulating-stud and a contact-stud carried by said counter-shaft a flexible contact, the same comprising a vibratory spring-arm and a pivoted spring-finger on the free end of said arm, adapted to have engagement with said studs, and means moving in unison with the armature of the winding mechanism for pushing the flexible contact away from its electrical contact with the conducting-stud, substantially as set forth.

8. In an electromagnetic clock-winding mechanism of the character herein described, the combination with the intermittent winding mechanism, the main shaft, a counter-shaft geared with and receiving increased movement from the main shaft, an insulating-stud and a contact-stud carried by said counter-shaft a flexible contact, the same comprising a vibratory spring-arm and a pivoted spring-finger on the free end of said arm, adapted to have engagement with said studs, and an arm moving with the armature of the winding mechanism and adapted to push the flexible contact away from its electrical contact with the conducting-stud, substantially as set forth.

Signed at Chicago, Illinois, this 26th day of January, 1901.

ALBERT TUERK.

Witnesses:
ROBERT BURNS,
HENRY A. NOTT.