

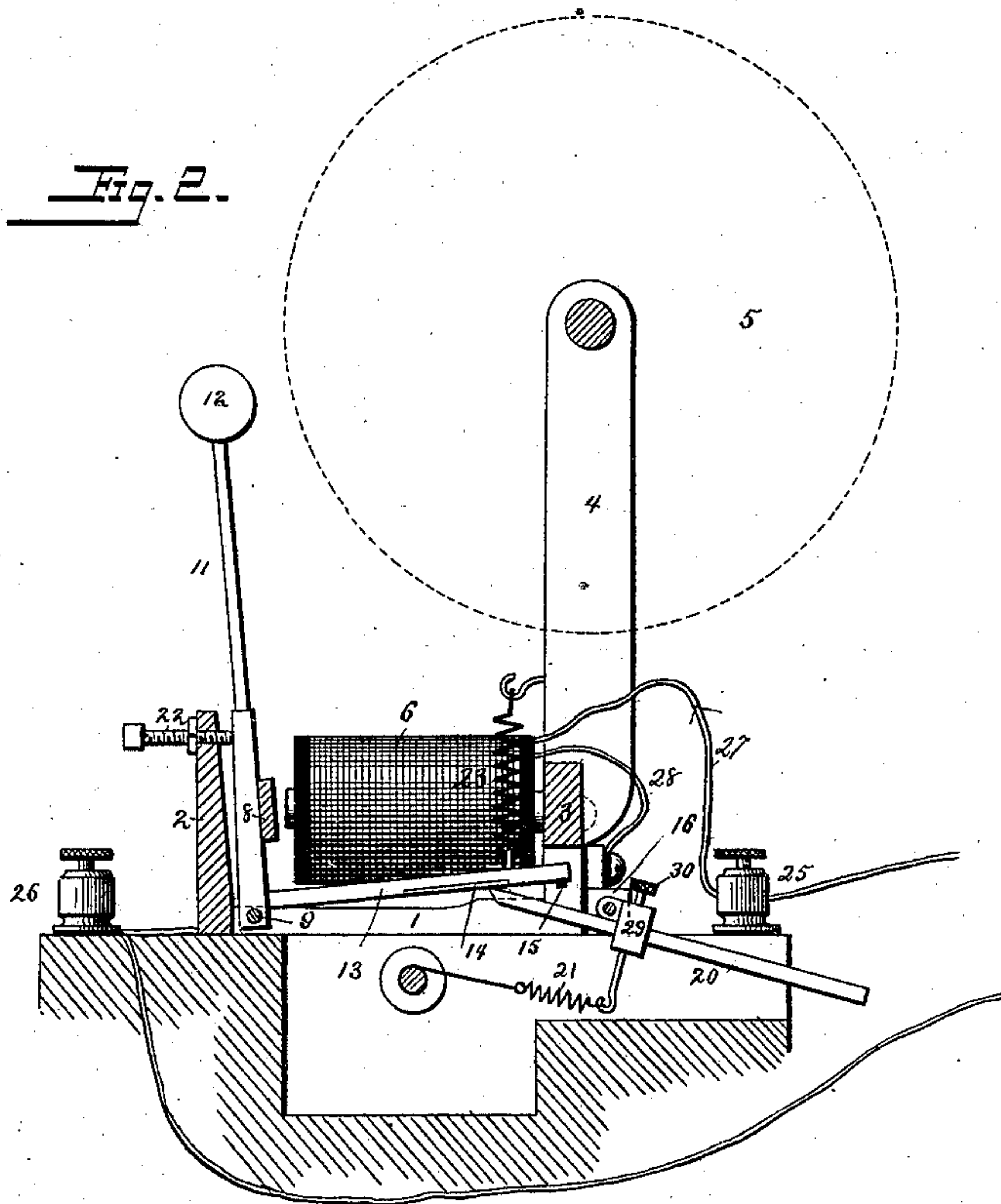
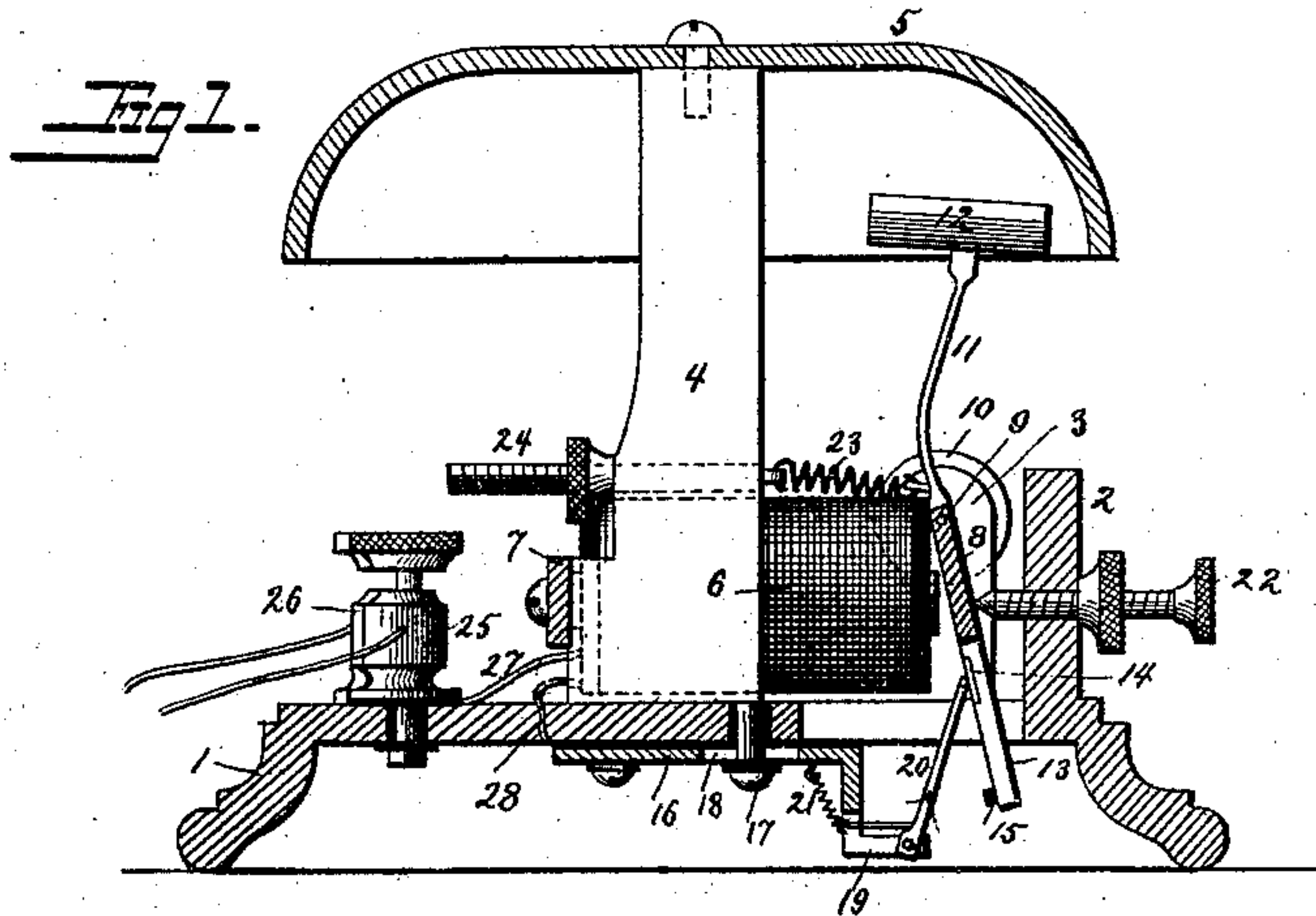
(No Model.)

G. M. STERNBERG.

ELECTRIC BELL.

No. 373,102.

Patented Nov. 15, 1887.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE M. STERNBERG, OF THE UNITED STATES ARMY.

ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 373,102, dated November 15, 1887.

Application filed March 2, 1887. Serial No. 229,427. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. STERNBERG, of the United States Army, and temporarily residing at Baltimore, Maryland, have invented certain new and useful Improvements in Electric Bells, of which the following is a specification.

My invention relates to improvements in that class of electric bells which is known under the name of "trembler bells," in which the circuit closed at the push-button or other switch is automatically interrupted by the action of the bell-hammer and then automatically closed again, whereby a number of electrical impulses act in rapid succession in the magnet of the bell and produce as many strokes of the bell-hammer as there are distinct electrical impulses. In bells of this character as heretofore constructed the circuit is interrupted by the bell-hammer lever at the initial movement of the same and before it has completed its stroke, so that the hammer receives only a momentary impulse from the electro-magnet and has to complete its stroke by its own momentum, unaided by the magnet. In consequence of this, the stroke of the hammer is comparatively weak and uncertain, and the bell must be adjusted quite close to the hammer. In single-stroke bells the circuit remains closed so long as the push-button or other switch is depressed, and the hammer or the armature with which it is connected is in that case attracted throughout the whole length of its stroke, giving a powerful blow to the bell. There is, however, a serious defect even in this class of bells, arising from the fact that the hammer is held by the magnet in its attracted position after the blow has been struck, whereby the hammer, often remaining in contact with the bell, acts as a dampener upon the same.

My invention has for its object the construction of a trembler-bell in which the separate electric impulses are continued to nearly the end of the stroke of the hammer, when the circuit is automatically interrupted, whereby my trembler attains the force of a single-stroke bell without the defect of the latter, arising from the continuation of the electric impulse beyond the time when the stroke is completed.

In my improved electric bell the duration of the separate electric impulses is adjustable, and if adjusted to last beyond the completion

of the stroke the bell becomes at once a single-stroke bell. Thus, while my improved bell is primarily intended to be operated as a trembler-bell, it may be adjusted to operate as a single-stroke bell.

All this will more fully appear by reference to the annexed drawings, in which I have illustrated, in Figure 1, a sectional elevation of one form of my improved convertible trembler and single-stroke bell, and in Fig. 2 a similar view of another form of the same.

In Fig. 1 the base of the bell is shown as an inverted flat cup, 1, of metal, with standards 2 3, for the support of an adjustable stop and pivots for the armature, and a post, 4, for the support of the bell 5. An electro-magnet, 6, of ordinary construction, is mounted upon the base. Only one coil of this magnet is shown in the drawings, the other being cut away through the yoke-piece 7, for clearness of illustration.

It will be understood that in the construction shown the two legs of the magnet are arranged one on each side of post 4, although any other arrangement may be adopted, and, if so desired, only a single coil and core may be used. On each side of the magnet there is a standard, 3, (only one of which is shown,) and the armature 8 is pivoted between adjustable journal-bearings 9, mounted in said standards. From the upper edge of the armature extends an elastic arm, 11, carrying the hammer 12, and from the lower edge of the armature extends a stiff arm, 13, provided near its upper end with platinum contact-plate 14, and near its lower free end with a piece of insulating material, 15. To the under side of the base is secured, but insulated therefrom, an adjustable bracket, 16. This bracket is bent twice at right angles, and is secured by a screw, 17, passing through a slot, 18, in the bracket into the base. When this screw is loosened, the bracket may be adjusted lengthwise to be nearer to or farther from the depending arm 15.

The lower end, 19, of the bracket is slotted, and in said slot is pivoted a lever, 20, which has attached to a point below its fulcrum a spring, 21, which tends to turn the lever, so as to hold its upper platinum-tipped end in contact with the contact-plate 14 on the arm 13. An ordinary adjustable stop, 22, is mounted in standard 2, for limiting the movement of the

armature, and a retractile spring, 23, adjustable by a screw, 24, passing through post 4, is used as in other bells of this character. Of the two binding-posts 25 26, the one, 25, is insulated from the base, and the other, 26, is in metallic contact with the same.

The operation of the bell will now be easily understood. If at the distant push-button the circuit is closed, the current enters by binding-post 25, and passes by a connection, 27, to the coils of magnet 6, which it leaves by a wire, 28, connecting with the bracket 16. From the bracket the current proceeds by lever 20, and by the platinum contacts at 14 to arm 13, the armature, and through the journal-bearings of the same to the base and out by the binding-post 26. The magnet, being thus energized, will attract its armature, whereby arm 13 is moved toward lever 20, maintaining rubbing contact with the same at 14 until by the continued movement of arm 13 the piece of insulating material, 15, attached to its free end comes in contact with the lever 20 at a point near but above the fulcrum of the latter. The least movement beyond this position causes the arm 13, with the piece of insulating material, to impinge upon lever 20, and to move the platinum tip of the same out of contact with the platinum-plate 14, whereby the circuit is broken. By properly adjusting bracket 16, as above described, the moment when the break of circuit takes place can be fixed, as described; and in order to obtain the most powerful stroke of the hammer the adjustment should be such that the break occurs when the hammer is very nearly, but not quite, in contact with the bell. It will be readily understood that by reason of the fact that the piece of insulating material, 15, acts upon lever 20 near the fulcrum of the same, the free end of the latter moves a considerable distance out of contact with rod 13. The break is therefore a comparatively wide one. After completion of the stroke, the bell-hammer rebounds by the elasticity of the spring 11, and by the action of retractile spring 23. This carries the hammer and rod 13 back to the position shown in the drawings, and spring 21, acting upon lever 20, causes the latter to follow up the movement of rod 13 and to re-establish contact with the same at 14. This contact, however, is not established before the hammer has fairly returned to its original position, for while spring 21 tends to establish the contact spring 23 tends to maintain the break, and only after the armature has arrived at its back-stop 22 can lever 20 overtake rod 13. As soon as the contact is re-established, the operation just described is repeated until the circuit is broken at the distant push-button. It will now be understood that by proper adjustment of bracket 16 the duration of each electrical impulse, and thereby the force of stroke of the bell-hammer, can be adjusted at will. If the adjustment is such that the piece of insulating material, 15, remains out of contact with lever 20,

the bell is at once converted into a single-stroke bell.

The modification shown in Fig. 2 differs mainly in form from the construction shown in Fig. 1. The incoming current passes from the insulated binding-post 25 by wire 27 to magnet 6, and from the latter by wire 28 to insulated bracket 16. In this form of my apparatus bracket 16 is not adjustable, but simply serves as a support for lever 20. Preferably two such brackets are used one on each side of the magnet; but in the sectional elevation shown only one can be seen. A boss, 29, is pivoted between the two brackets, and it is preferably, but not necessarily, constructed with its preponderating weight on one side of the pivot, as shown. Through this boss, and adjustable therein, passes the rod 20, which thus becomes a lever. It may be fixed in any desired position by clamp-screw 30. This adjustment serves the same purpose as the adjustment of the bracket 16 in the construction shown in Fig. 1. In the one the lever is adjusted with the supporting-bracket, and in the other the bracket is fixed and the lever adjustable upon the same. The platinum tip of lever 20 makes contact with platinum plate 14 on rod 13, which extends from the armature 8 or from the armature-lever. Said rod is also provided with a piece of insulating material, 15, as in the form shown in Fig. 1. From bracket 16 the current proceeds by lever 20 to platinum contacts at 14, and by rod 13 and the frame δ to and out by binding-post 26. The operation of this modified form of my bell is identical with that of the form first described.

When the armature is attracted, the piece of insulating material, 15, will cause a break of circuit at 14, and the moment when this break occurs is dependent upon the adjustment of lever 20.

Numerous other modifications may be desired without departing from the fundamental idea of my invention, and I desire it to be understood that I do not limit myself to the exact construction shown or described.

I claim as my invention—

1. In an electric bell, the combination, with an electro-magnet and striking mechanism actuated thereby, of a circuit making and breaking lever actuated by the striking mechanism and adjustable as to the duration of contact, substantially as described.

2. In an electric bell, the combination of an electro-magnet and striking mechanism with an automatic circuit-breaker composed of an extension from the striking mechanism and a contact-lever adjustable in relation to the extension for timing the duration of the contact, substantially as described.

3. In an electric bell, the combination, with an electro-magnet and striking mechanism actuated thereby included in the circuit, of a lever in adjustable contact with the striking mechanism and an insulated piece upon the latter, actuating the lever to break the circuit

in accordance with the adjustment of the same, substantially as described.

4. In an electric bell, the combination, with an electro-magnet and striking mechanism, of an adjustable contact making and prolonging lever, and an insulated piece upon the striking mechanism for breaking and prolonging the break of the circuit, substantially as described.
5. In an electric bell, the combination, with an electro-magnet and striking mechanism actuated thereby, of an automatic circuit-breaker composed of a lever in contact with an extension from the striker, an insulated piece upon the extension for actuating the lever to break contact, and means for adjusting the lever in relation to the insulated piece, whereby the durations of contact and break can be varied at will, substantially as described.

6. In an electric bell, the combination, with an electro-magnet and striking mechanism actuated thereby, of an automatic circuit-breaker consisting of a rod extending from the striker, a spring-actuated lever adjustably overlapping and making contact with the same, and an insulating-piece upon the rod, in position to act upon the lever at a point between its contact and fulcrum, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE M. STERNBERG.

Witnesses:

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WILLIAM H. BERRY.