(No Model.)

M. MARTIN.

ELECTROMECHANICAL GONG.

No. 516,500. Patented Mar. 13, 1894.

Fig:1.

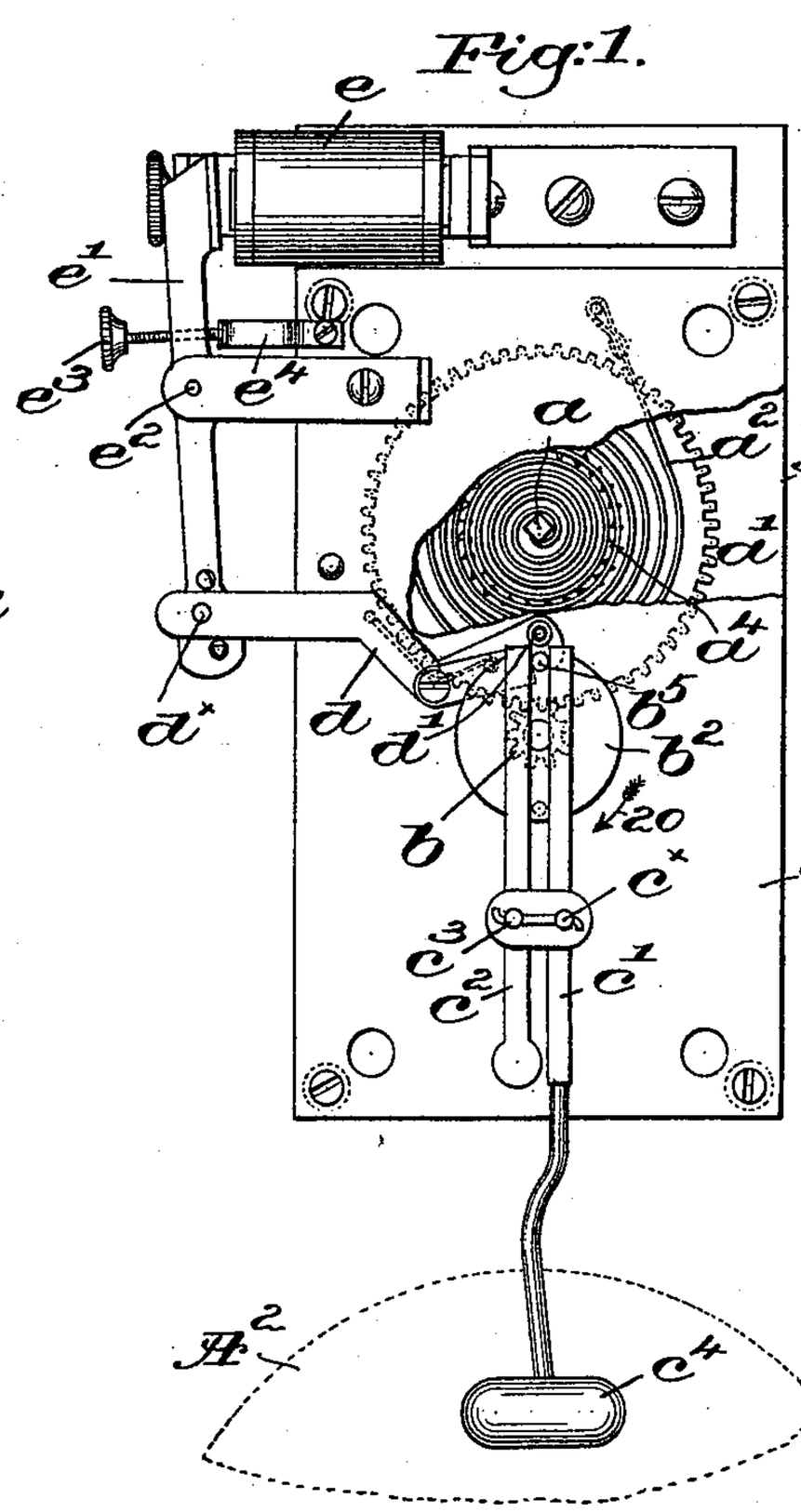


Fig:2.

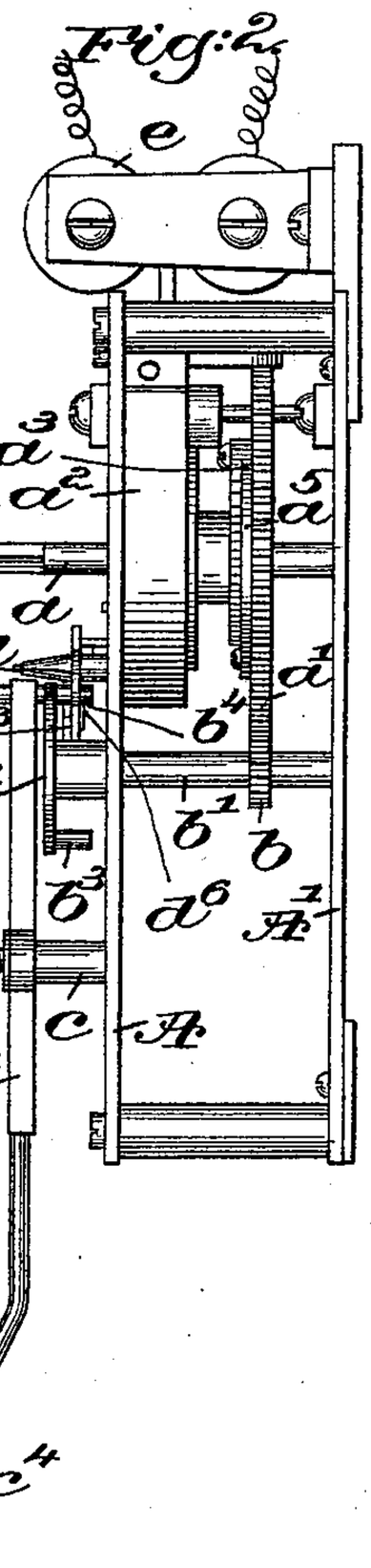


Fig:5.

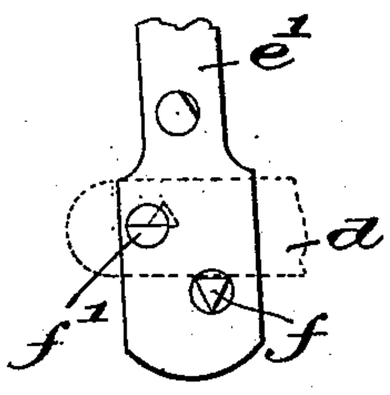


Fig:6.

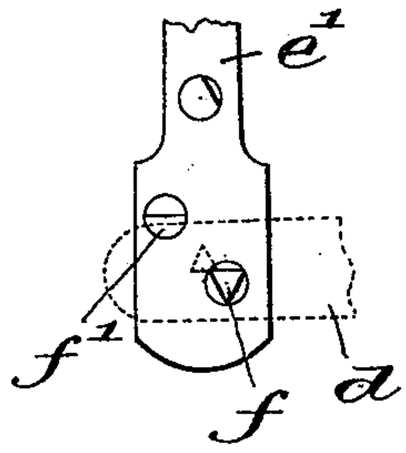


Fig:3.

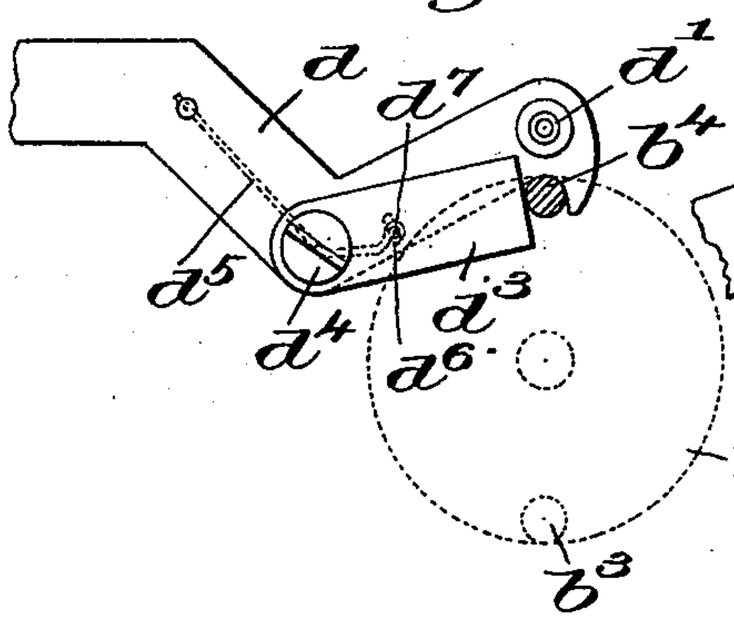
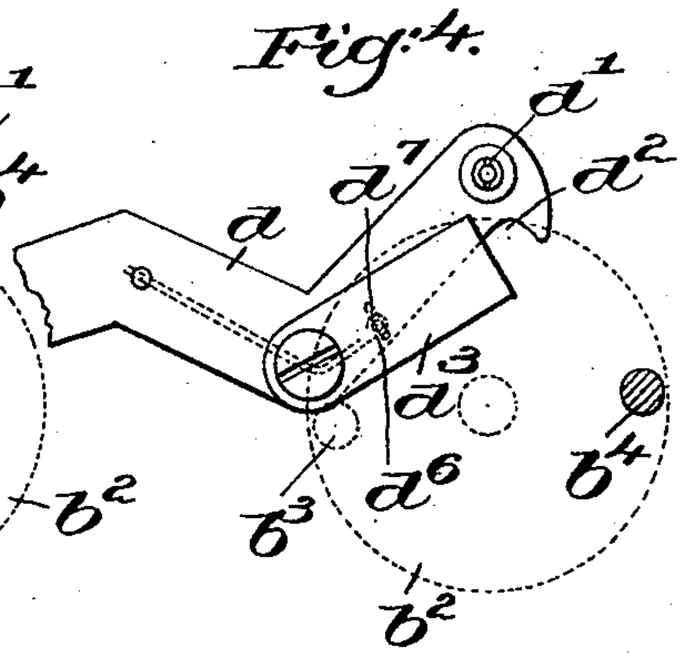


Fig:4.



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ELECTROMECHANICAL GONG.

SPECIFICATION forming part of Letters Patent No. 516,500, dated March 13, 1894.

Application filed August 8, 1893. Serial No. 482,670. (No model.)

To all whom it may concern:

Be it known that I, MORRIS MARTIN, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Electromechanical Gongs, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of an electro-mechanical gong wherein the hammer is arranged to strike the gong on each stroke in either direction, and with equal force, the striking arm or lever vibrating positively on each side of the center alternately. Controlling mechanism engages the actuating means and retains the striking arm or lever stationary in central position at the end of each vibration, and releasing mechanism is provided for the controlling mechanism, as will be described.

In accordance therewith my invention consists, in an electro-mechanical gong, of a striking arm or lever, actuating means to positively vibrate it on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism to engage said actuating means and retain the said arm or lever stationary in central position at the end of each vibration, combined with electromagnetically governed releasing mechanism for said controlling mechanism, substantially as will be described.

Other features of my invention will be hereinafter described and particularly pointed out in the claims.

Figure 1, in front elevation, and partially broken away, shows an electro-mechanical gong embodying my invention. Fig. 2 is a right-hand side view of the apparatus shown in Fig. 1. Figs. 3 and 4 are details of the controlling mechanism; and Figs. 5 and 6 are details to be referred to.

The frame-work, including front and back plates A, A′, is of usual and suitable shape to support the operative parts of the apparatus. Loosely mounted on the winding shaft a is a gear a', the shaft being rotated by the main spring a^2, and rotating the gear a' by means of the pawl a^3 on said gear, held in engagement with the ratchet wheel a^4 fast on the shaft a, by a spring a^5, see Fig. 2, whereby the gear remains stationary when the main-spring is wound. The gear a' is in mesh with a pinion b fast on a shaft b', extended through the front plate A and carrying a disk b^2, provided on its inner face with two projections or pins b^3, b^4, diametrically opposite each other, while a projection or pin b^5 extends from the outer side of the disk, and as herein shown, forms a continuation of the pin b^4, the projection b^5 forming a crank pin, for a purpose to be described. A suitable stud or post c on the front plate forms a fulcrum for the striking arm or lever c', pivoted thereto at $c^\times$, said arm or lever having at its outer end a hammer c^4 adapted to strike the gong A^2, see dotted lines Fig. 1.

As clearly shown in Figs. 1 and 2, the inner end of the striking arm is in the path of movement of the crank pin b^5 when the latter is rotated in the direction of the arrow 20, by the mechanism described, and in passing from the position shown in Fig. 1, to the diametrically opposite position the crank pin will have positively moved the striking arm from its central position, carrying the hammer c^4 to the left, viewing Fig. 1, and the arm returning to central position thereafter positively, as will be described.

It will be obvious that the leverage exerted by the crank pin upon the striking arm will be greatest during the movement from the position shown in Fig. 1, to a position substantially ninety degrees therefrom, thus giving a powerful blow of the hammer upon the gong. In order to obviate the loss of power due to decreased leverage if the crank pin should play in a slot of the striking arm I have pivoted an auxiliary lever c^2 on the post c at c^3, said lever being substantially parallel to the striking arm or lever c' and having its outer end extended beyond the fulcrum of the striking arm, as clearly shown in Fig. 1.

The inner end of the auxiliary lever is in the path of movement of the crank pin b^5 through a portion of its rotation, and while moving through its second quarter revolution will bear against the auxiliary lever and move its outer end to the right Fig. 1, until it impinges against the striking arm c' and positively moves the latter to the center.

During the movement of the crank pin through its third quarter revolution it exerts its greatest power upon the auxiliary lever, which still impinges upon the striking arm beyond its fulcrum, and will carry the hammer from the center to the right, Fig. 1, to strike the second blow upon the gong, the blow being delivered with as much power as the first blow, owing to the above described arrangement of the striking arm and auxiliary lever.

In its fourth quarter revolution the crank pin acts upon the striking arm and returns it to central position, so that it will be readily understood from the foregoing that the striking arm or lever is positively vibrated on each side of the center alternately, to strike a blow at each vibration, the actuating means therefor comprising a crank pin and mechanism to rotate it, and forming a common actuator for both the striking arm and the auxiliary lever.

In order to provide controlling mechanism for the actuating means, whereby the striking arm or lever is retained stationary in central position at the end of each vibration, I have herein shown an irregularly shaped lever d loosely pivoted at d' to a stud or post on the front plate, said lever having a hook-like end to form a recess d^2, the lever being so pivoted that its hooked end is in the path of movement of the projections or pins b^3, b^4, on the inner side of the disk b^2.

Referring to Figs. 1, 2 and 3, the projection b^4 is shown as resting in the recess d^2 of the lever d, the actuating means being held stationary thereby; the outer end of the lever is provided with a pin $d^\times$ projecting from its inner side and having a shoulder 10, shown in dotted lines Figs. 5 and 6, adapted to rest on a projection f', see Fig. 5, the end of the lever d being therein shown in dotted lines.

With the parts in the position in Figs. 1, 2, 3 and 5, the projection b^4 presses strongly against the hooked end of lever d and tends to raise said end, which tendency, however, is counteracted by the projection $d^\times$ resting on the projection f'. The armature e' is pivoted at e^2 adjacent to an electro-magnet e, a spring e^4 acting on a screw stop e^3 on the armature retracting the same. When the armature e' is attracted, its lower end is moved to the left, Fig. 1, into the position shown in Fig. 6, and by such movement the projection f' is disengaged from the shoulder 10, which drops onto the projection f on the armature thus moved into its path. Now when the armature is retracted the projection f will be moved to the right, Fig. 6, releasing the shoulder 10 and thereby the lever d, which will be turned on its pivot by the projection b^4 until the latter is freed from the recess d^2, the actuating means then being free to rotate and vibrate the striking arm to strike a blow at the left of the center, viewing Fig. 1. When the disk b^2 has made substantially one-quarter of a revolution, the projection b^3 will engage the lever d, as shown in dotted lines Fig. 4, and as the said projection moves it will turn the lever d until the projection enters the recess d^2, the disk having then made a semi-revolution, and the controlling mechanism will again lock the actuating means with the striking arm in central position. When the lever d is being moved back to the position shown in Figs. 1, 3 and 5, the shoulder 10 will pass by the projection f', pushing it aside momentarily, the spring e^4 returning it in place to hold the shoulder as has been described.

The releasing means for the controlling mechanism thus, as herein shown, comprises the projections f, f' on the armature lever e', and the shoulder 10 of the lever d, which they engage alternately, and the releasing means are governed by the movements of the armature of the electro-magnet e. The projections b^3 and b^4 are engaged successively by the lever d, and the actuating means are positively stopped at every semi-revolution of the crank pin, retaining the striking arm stationary in central position between each and every blow, the blows of the hammer being delivered alternately on opposite sides of the center. In order that the disk will not be turned backward a short distance each time the shaft a is turned when wound, I have pivoted a guard d^3, shown as a flat plate, to the lever d at d^4, a pin d^6 on the guard extending through a slot d^7 in the lever and being acted on by a spring d^5 on the inner side of the lever. As the projections b^3, b^4, in turn engage the lever d they raise the guard d^3 against the action of the spring d^5, the guard springing into the position shown in Figs. 1 and 3 when the projection passes into the recess d^2, but any retrograde movement of said projection is resisted by the end of the guard.

The apparatus herein shown and described may be used in a normally closed or normally open circuit, as may be most convenient, is very rapid in its operation, and has a small number of simple parts.

I do not restrict myself to the specific construction shown, as it is obvious that the same may be changed without departing from my invention, the gist of which consists in vibrating a striking arm alternately at opposite sides of the center, to strike a blow at each vibration, and retaining the striking arm stationary in central position at the end of each vibration.

I claim—

1. In an electro-mechanical gong, a striking arm or lever, actuating means to positively vibrate it on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism to engage said actuating means and retain the said arm or lever stationary in central position at the end of each vibration, combined with electro-magnetically governed releasing mechanism for said controlling mechanism, substantially as described.

2. In an electro-mechanical gong, a striking

arm or lever, actuating means to positively vibrate it on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism to engage said actuating means and retain the said arm or lever in central position at the end of each vibration, combined with releasing mechanism for the controlling mechanism governed by each movement of the armature of an electro-magnet, substantially as described.

3. In an electro-mechanical gong, a striking arm or lever, actuating means, comprising an intermittingly rotating crank pin, to vibrate it on each side of the center alternately, and controlling mechanism to positively stop said crank pin at each semi-rotation thereof, to retain said arm or lever in central position at the end of each vibration, combined with releasing mechanism for said controlling mechanism governed by the armature of an electro-magnet, substantially as described.

4. The striking arm or lever, actuating means to positively vibrate it on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism for said actuating means, comprising a recessed lever to positively engage the actuating means and retain the striking arm or lever in central position at the end of each vibration, combined with releasing mechanism for said controlling mechanism governed by the armature of an electro-magnet, substantially as described.

5. The striking arm or lever movable positively from and to the center, on opposite sides alternately, to strike a blow at each outward movement, actuating means to move said arm or lever, comprising a rotating disk, a crank pin, and stops, and controlling mechanism to engage the stops successively and thereby retain the disk stationary at times, combined with releasing mechanism for said controlling mechanism governed by the armature of an electro-magnet, substantially as described.

6. The striking arm or lever, actuating means, including a rotatable disk having stops, to positively vibrate said arm or lever on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism for said actuating means, consisting of a recessed lever to engage said stops in succession and adapted to be moved into and out of operative position by said stops, combined with releasing mechanism for said notched lever to retain it in operative position, and an electro-magnet and its armature to govern said releasing mechanism, substantially as described.

7. The striking arm or lever, actuating means to positively vibrate it on each side of the center alternately, to strike a blow at each vibration, and controlling mechanism for said actuating means, comprising a recessed lever to positively engage the actuating means and retain the striking arm or lever in central position at the end of each vibration, and a guard carried by said lever to prevent retrograde movement of the actuating means, combined with releasing mechanism for said controlling mechanism governed by the armature of an electro-magnet, substantially as described.

8. A pivoted striking arm or lever having an attached hammer, and an auxiliary pivoted lever substantially parallel to it and adapted to act upon said striking lever between its fulcrum and the hammer, combined with a common actuator for both of said levers, the same consisting of a rotating crank pin, which is made to actuate the striking lever positively in one direction during its movement over a portion of its path, and thereafter through the auxiliary lever effect the movement of the striking lever positively in the opposite direction during another portion of the path of the crank-pin, substantially as described.

9. A pivoted hammer carrying striking arm or lever, and an auxiliary lever pivoted adjacent thereto and substantially parallel therewith, and extended beyond the fulcrum of and to engage said striking arm or lever, a common actuator for said levers to act upon one and then the other, and thereby vibrate the striking arm or lever at alternate sides of the center, whereby the hammer strikes each blow with the same force, and controlling mechanism to engage said actuator when the striking arm or lever is in central position, combined with releasing mechanism for the controlling mechanism governed by the armature of an electro-magnet, substantially as described.

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

MORRIS MARTIN.

Witnesses:

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JOHN C. EDWARDS.