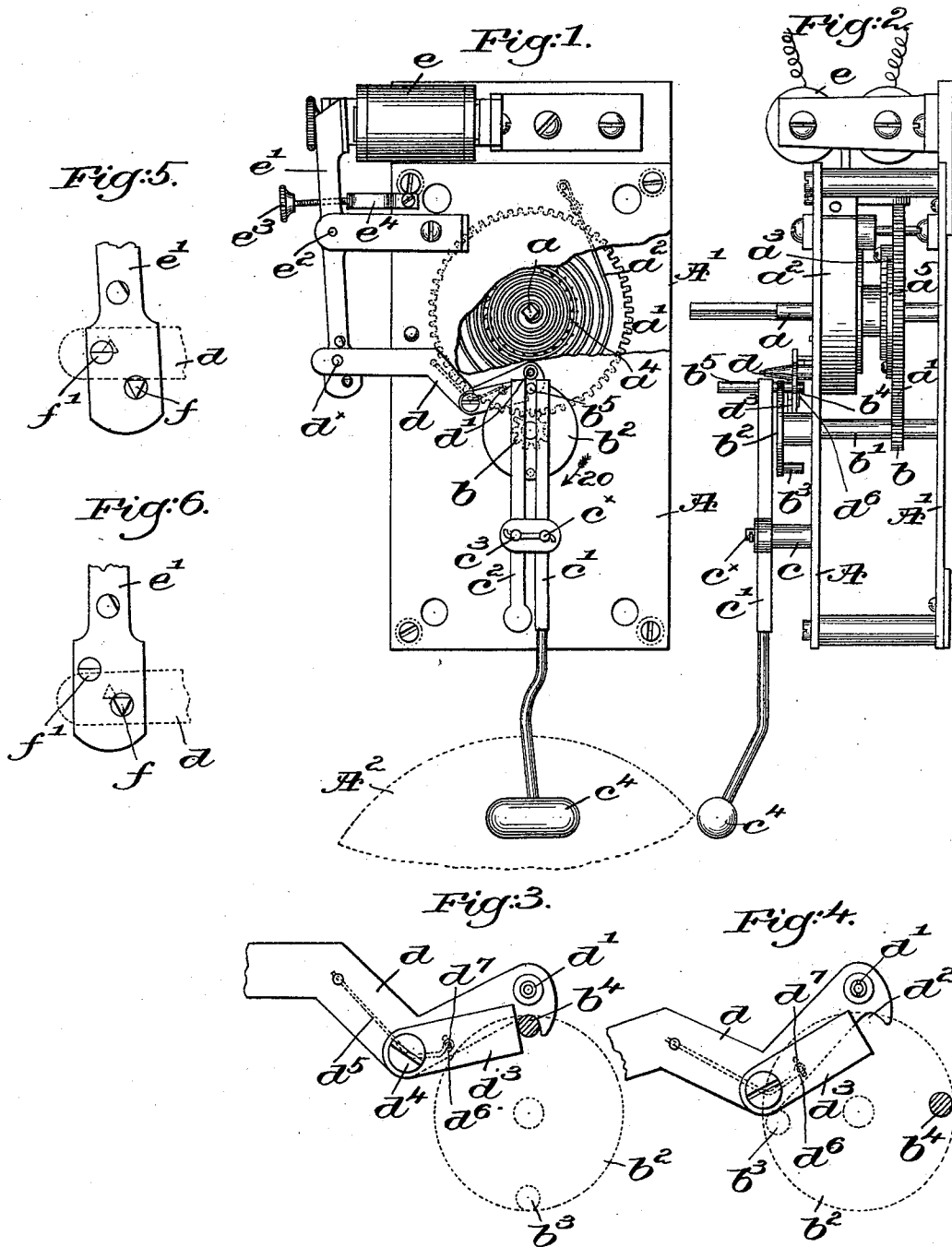


(No Model.)

M. MARTIN.
ELECTROMECHANICAL GONG.

No. 516,500.

Patented Mar. 13, 1894.



Witnesses.

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UNITED STATES PATENT OFFICE.

MORRIS MARTIN, OF MALDEN, ASSIGNOR OF ONE-HALF TO JOHN C. EDWARDS,
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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.

10 This invention has for its object the production of an electro-mechanical gong where-
in the hammer is arranged to strike the gong on each stroke in either direction, and with
equal force, the striking arm or lever vibrat-
ing positively on each side of the center al-
ternately. 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 mech-
anism is provided for the controlling mechan-
ism, as will be described.

15 In accordance therewith my invention con-
sists, in an electro-mechanical gong, of a strik-
ing arm or lever, actuating means to posi-
tively vibrate it on each side of the center
alternately, to strike a blow at each vibra-
tion, and controlling mechanism to engage
said actuating means and retain the said arm
or lever stationary in central position at the
20 end of each vibration, combined with electro-
magnetically governed releasing mechanism
for said controlling mechanism, substantially
as will be described.

25 Other features of my invention will be here-
inafter described and particularly pointed out
in the claims.

30 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.

35 The frame-work, including front and back
plates A, A', is of usual and suitable shape
to support the operative parts of the ap-
paratus. Loosely mounted on the winding
shaft *a* is a gear *a'*, the shaft being rotated
by the main spring *a²*, and rotating the gear
40 *a'* by means of the pawl *a³* on said gear, held
in engagement with the ratchet wheel *a⁴* fast

on the shaft *a*, by a spring *a⁵*, 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'*, ex- 55
tended through the front plate A and carry-
ing a disk *b²*, provided on its inner face with
two projections or pins *b³*, *b⁴*, diametrically
opposite each other, while a projection or pin
b⁵ extends from the outer side of the disk, and 60
as herein shown, forms a continuation of the
pin *b⁴*, the projection *b⁵* forming a crank pin,
for a purpose to be described. A suitable
stud or post *c* on the front plate forms a ful-
crum for the striking arm or lever *c'*, pivoted 65
thereto at *c^x*, said arm or lever having at its
outer end a hammer *c⁴* adapted to strike the
gong A², see dotted lines Fig. 1.

As clearly shown in Figs. 1 and 2, the in-
ner end of the striking arm is in the path of 70
movement of the crank pin *b⁵* when the lat-
ter 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 di-
ametrically opposite position the crank pin 75
will have positively moved the striking arm
from its central position, carrying the ham-
mer *c⁴* to the left, viewing Fig. 1, and the arm
returning to central position thereafter posi-
tively, as will be described. 80

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 sub-
stantially ninety degrees therefrom, thus giv- 85
ing 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 *c²* on the post 90
c at *c³*, 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 95
the path of movement of the crank pin *b⁵*
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 100
impinges against the striking arm *c'* and posi-
tively 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^x 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^x 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^5 on the guard extending through a slot d^7 in the lever and being acted on by a spring d^6 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^6 , 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:

FREDERICK L. EMERY,
JOHN C. EDWARDS.