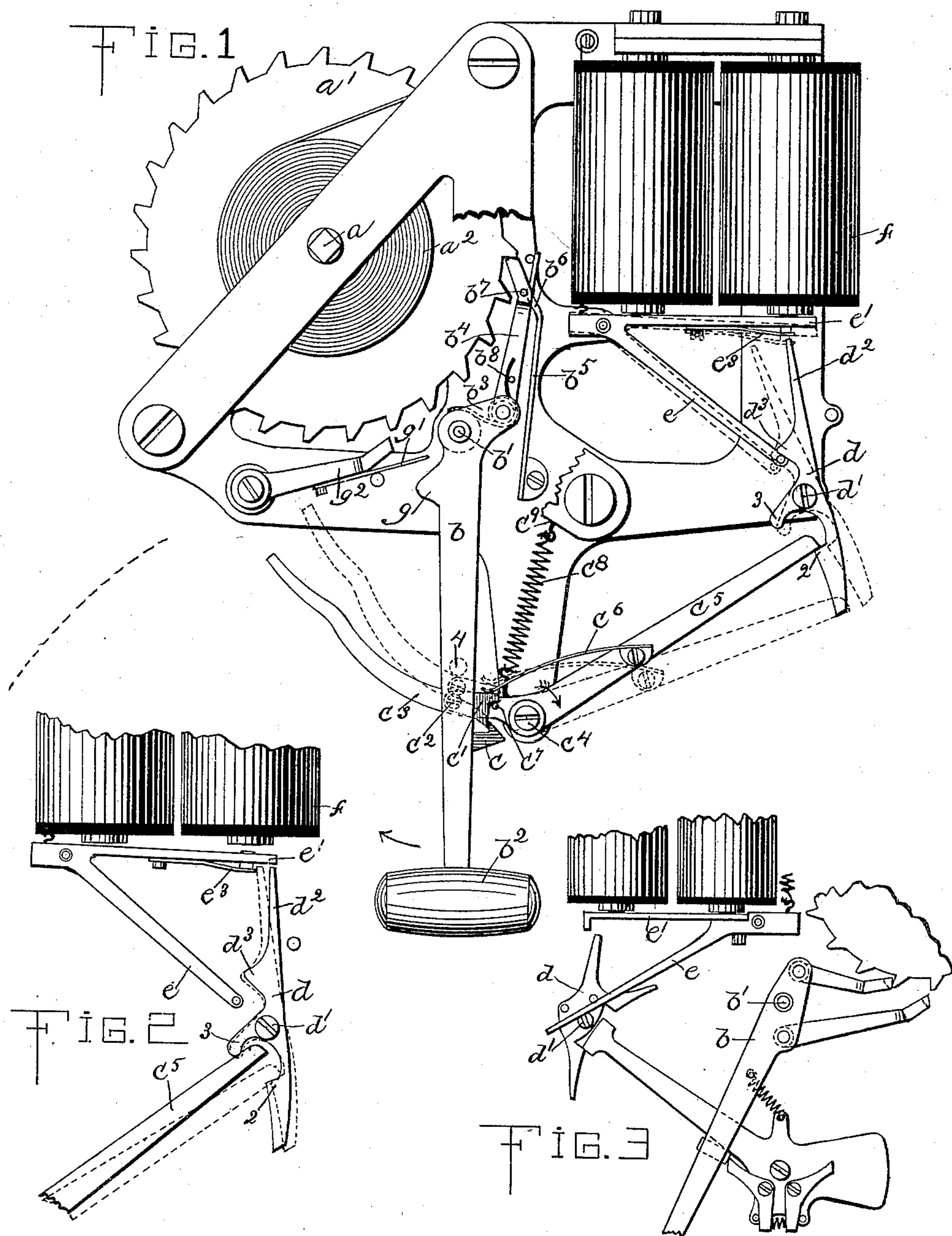


(No Model.)

F. W. COLE.
ELECTRO MECHANICAL GONG.

No. 452,932.

Patented May 26, 1891.



Witnesses.
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UNITED STATES PATENT OFFICE.

FREDERICK W. COLE, OF NEWTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO MOSES G. CRANE, OF SAME PLACE.

ELECTRO-MECHANICAL GONG.

SPECIFICATION forming part of Letters Patent No. 452,932, dated May 26, 1891.

Application filed December 9, 1890. Serial No. 374,040. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. COLE, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Electro-Mechanical 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 to improve the construction of electro-mechanical gongs.

In accordance with this invention the striker is designed to strike the gong on its advancing stroke, and is normally held by 15 suitable controlling mechanism at the beginning of its advancing stroke. The controlling mechanism for the striker is held by suitable releasing mechanism governed by the armature of an electro-magnet. As herein 20 provided, the releasing mechanism serves also as a retractor for the armature of the electro-magnet, but is movable, so that the armature when being attracted is not obliged to overcome the retractile force of said retractor. 25

Figure 1 shows in front elevation the striking mechanism of an electro-mechanical gong, the frame-work being broken away to better illustrate the parts; Fig. 2, a detail of the releasing mechanism and a portion of the controlling mechanism to be referred to, and Fig. 30 3 a modification to be referred to.

The main frame-work is of suitable shape and construction to support the operating 35 parts.

On a winding-shaft *a* is fixed a ratchet-wheel *a'*, and mounted on said shaft is a main spring *a''*, one end of which is attached to the shaft and the other end to a fixed point, as to 40 the frame-work.

The striking arm or lever *b* is pivoted at *b'*, and has at its lower end the hammer *b''*, and at one side of its pivot *b'* has a short projection *b'''*, to which is loosely connected a pawl 45 *b''''*, which engages the teeth of the ratchet-wheel *a'*. The pawl *b''''* bears against a yielding plate *b'''''*, having an inclined portion *b''''''*, and a pin *b'''''''* projects laterally from the pawl *b''''*, which bears upon the yielding plate *b'''''* at 50 the yielding portion *b''''''* thereon, and said pawl

b'''' is held in engagement with said yielding plate by a spring *b''''''*.

The striking arm or lever *b* has fixed to it a catch *c*, which engages a latch *c'*, pivoted at *c''* to an arm *c'''*, which is pivoted at *c''''*, and 55 is formed integral with or attached to an arm *c'''''*, projecting from the arm *c'''* at an obtuse angle. A spring *c''''''*, attached to the arm *c'''''*, bears upon the latch *c'* and holds it down against the fixed pin *c'''''''*. A spring *c''''''''* is at- 60 tached to a fixed point, as to the frame-work at *c'''''''''* and at the opposite end to the arm *c'''*, the tendency of which is to turn the arms *c'''* and *c'''''* on the pivot *c''''* in the direction of the arrow thereon. The arms *c'''* and *c'''''* and mech- 65 anism carried thereby, which engage and hold the striking arm or lever in the full-line position shown in Fig 1, which position it will be understood is the beginning of its advancing stroke, constitutes the controlling 70 mechanism for the striking arm or lever.

The arm *c'''''* is held in its elevated position against the tension of the spring *c''''''* by releasing mechanism consisting of a plate *d*, pivoted at *d'*, and having formed on it a shoulder 2 and also a shoulder or projection 3, and said plate *d* is extended vertically to engage 75 the spring-latch *e''* on the armature of the electro-magnet *f*. The arm *c'''''* of the controlling mechanism bears on the shoulder 2 when 80 the striking arm or lever is held at the beginning of its advancing stroke. The releasing-lever *d* has a projection *d''*, which, when the parts are in the full-line position, shown in Fig. 1, the armature being attracted, bears 85 upon an arm *e*, attached to the armature *e'*, and said releasing-lever *d* thus serves as a retractor for the armature *e'* when the magnet is de-energized. When the magnet is de-energized, the armature *e'* will be retracted 90 by its retractile spring, and by the pressure of the releasing plate or lever *d* upon it the arm *c'''''*, which bears heavily upon the shoulder 2, will turn the plate *d* on its pivot *d'*, thus removing the shoulder 2 from beneath the 95 outer end of the arm *c'''''*, that the latter may assume the dotted-line position shown in Fig. 1. As the controlling members *c'''* *c'''''* assume this dotted-line position the latch *c'* is disengaged from the catch *c* and the striking arm or 100

lever will then be under the entire control of the spring-actuated ratchet-wheel a' , and by it will be moved so that its hammer b^2 will strike the gong. (Represented by the dotted-line position shown.) As the striking arm or lever is moved into this position, a fixed pin 4 thereon follows along the upper side of the arm c^3 and depresses said arm, so that the arm c^5 will be raised into the full-line position shown in Fig. 2 and its outer end will strike the shoulder or projection 3 of the releasing-lever d and will turn said lever on its pivot d' into the full-line position shown in Fig. 2, removing the projection d^3 from the path of movement of the arm e , so that the armature e' may be attracted without the necessity of overcoming the tension or retractive force of the plate d . As the striking arm or lever b returns to its normal position, the pin 4 will follow along the upper side of the arm c^3 and allow said arm to rise, and at the same time the arm c^5 will fall onto the shoulder 2 of the releasing plate or lever d , and bearing heavily thereon will turn said plate or lever into the dotted-line position shown in Fig. 2, wherein the arm d^2 bears against the outer end of a yielding portion e^3 on the armature e' . The striking arm arriving at its normal position the pawl b^4 will engage the next tooth of the ratchet-wheel a' and the momentum of the hammer will cause the wheel to be turned backward slightly and release the holding-pawl g^2 , and thereby put the hammer again under the influence of the said wheel to hold the hammer on its forward movement. When the armature e' is attracted, the arm d^2 will be released, and the pressure of the arm c^5 upon the shoulder 2 causes the releasing plate or lever d to turn on its pivot in the full-line position represented in Fig. 1, wherein the projection d^3 again occupies a position to serve as a retractor for the armature. A projection g is formed on the striking arm or lever b , which, when said arm or lever moves forward to strike the gong, engages a yielding plate g' , secured to a pawl g^2 , and throws said pawl into engagement with a tooth of the ratchet-wheel a' to check the progressive movement of said ratchet-toothed wheel.

It will be seen that by providing the pawl b^4 with a yielding as well as inclined plate b^5 the ratchet-wheel a' can be readily wound without the use of the independent ratchet and pawl usually employed. It will also be seen that by means of the projection d^3 on the releasing-lever d serving as a retractor for the armature, and being restored to its normal position by the striking arm or lever, allows the magnet f freedom to attract its armature without the necessity of overcoming the retractive force of this retractor, but at the same time affords a strong retractor which will operate quickly when the magnet f is de-energized.

By referring to Fig. 3 the striking arm or lever b is pivoted at b' and has two pawls,

one at each side of said pivot, which co-operate with a spring-actuated ratchet-wheel, and controlling mechanism is provided for the said striking arm or lever, which is substantially the same as in another application filed by me concurrently with this, Serial No. 374,039. The outer end of the said controlling-lever engages a shoulder on a releasing-plate, as d , pivoted at d' , and two pins are provided, one or the other of which is engaged by the arm e of the armature e' and serves as a retractor for said armature, but is restored to its normal position by other means, so that the armature may move quickly and freely in each direction.

I claim—

1. In an electro-mechanical gong, a striking arm or lever and controlling mechanism therefor, combined with releasing mechanism for said controlling mechanism governed by the armature of an electro-magnet, a component part of said releasing mechanism serving as a retractor for the armature, substantially as described.
2. In an electro-mechanical gong, the striking arm or lever and controlling mechanism therefor, combined with releasing mechanism for said controlling mechanism, consisting of the plate d , having the shoulders 2 3, the arm d^2 , and the retractor d^3 for the armature of the electro-magnet, substantially as described.
3. In an electro-mechanical gong, the striking arm or lever b , having the fixed pin thereon, combined with controlling mechanism for said striking arm or lever, having a guide-faced restoring-arm, as c^3 , and moved in one direction by a spring and restored by said fixed pin, substantially as described.
4. In an electro-mechanical gong, a striking arm or lever and controlling mechanism therefor, comprising a catch on said arm or lever and an engaging latch therefor, means for moving said controlling mechanism, governed by an electro-magnet, and a guide-arm, as c^3 , for restoring said controlling mechanism actuated by the projection 4 on the striking arm or lever, substantially as described.
5. In an electro-mechanical gong, the striking arm or lever b and pawl for moving it, and a yielding guide or bearing for said pawl, combined with the spring-actuated ratchet-wheel a' , substantially as described.
6. In an electro-mechanical gong, the combination of the following instrumentalities: a striking arm or lever, an actuating-pawl therefor, the spring-actuated ratchet-wheel a' , into engagement with which said actuating-pawl normally lies, controlling mechanism which holds the striking arm or lever at the beginning of its advancing stroke in position to the spring of the ratchet-wheel, and a holding-pawl pivoted to the frame-work and normally disengaged from the ratchet-wheel and lying in the path of movement of said striking arm or lever to be moved by it into engagement with said ratchet-wheel when

the said striking arm or lever is released and moves in a direction to strike the gong, substantially as described.

7. In an electro-mechanical gong, the striking arm or lever, actuating-pawl and spring-guide plate therefor, and spring-actuated ratchet-wheel α' , combined with controlling mechanism for holding said striking arm or lever at the beginning of its advancing stroke
10 in a direction toward the gong, and the pawl

g^2 , moved into and out of engagement with the ratchet-wheel by the striking arm or lever, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

FREDERICK W. COLE.

Witnesses:

BERNICE J. NOYES,

FREDERICK L. EMERY.