No. 757,271. PATENTED APR. 12, 1904

F. W. COLE.

ELECTROMECHANICAL GONG.

APPLICATION FILED OCT. 4, 1902.

NO MODEL.

Fig. 1.

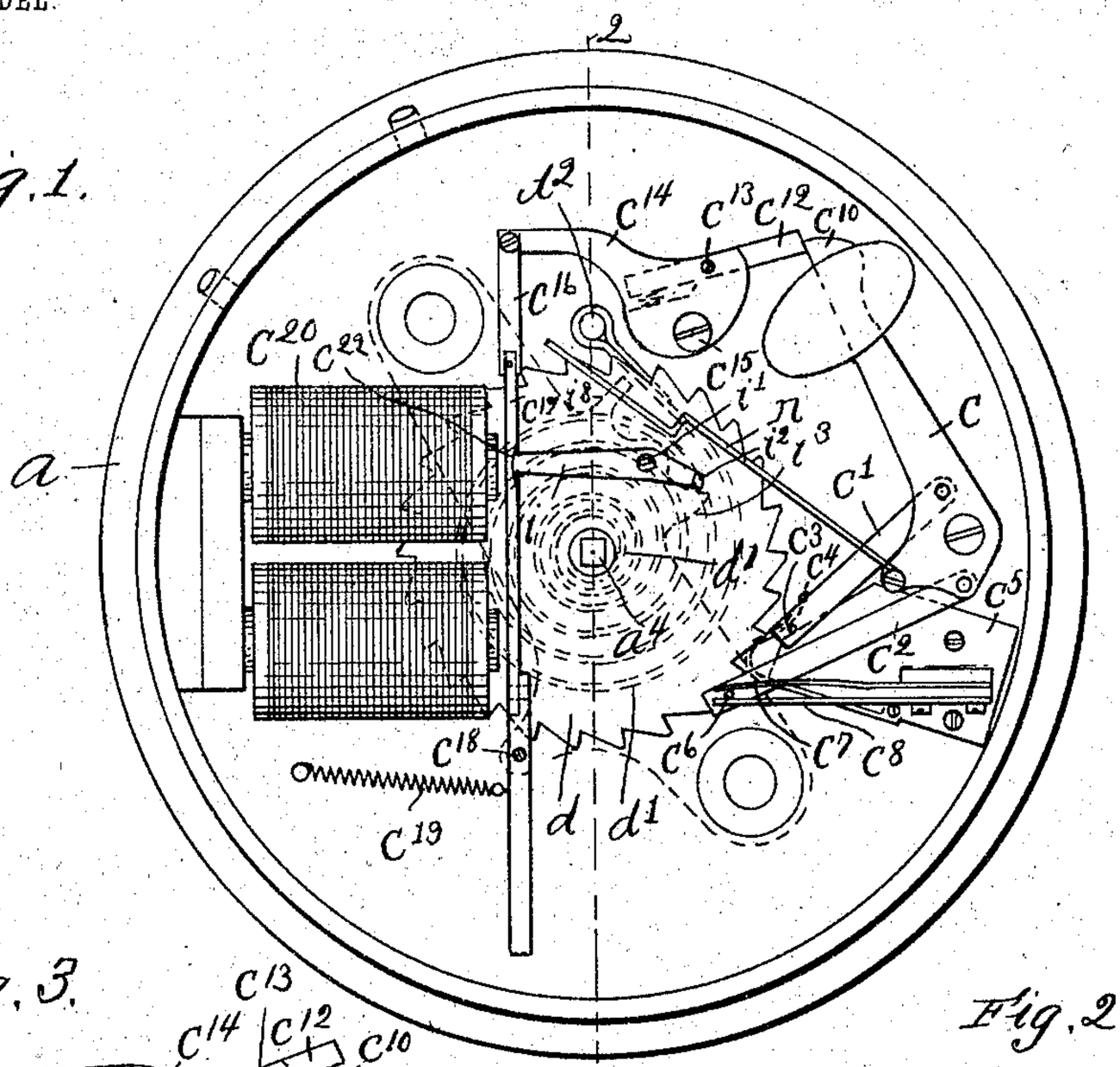


Fig. 3.

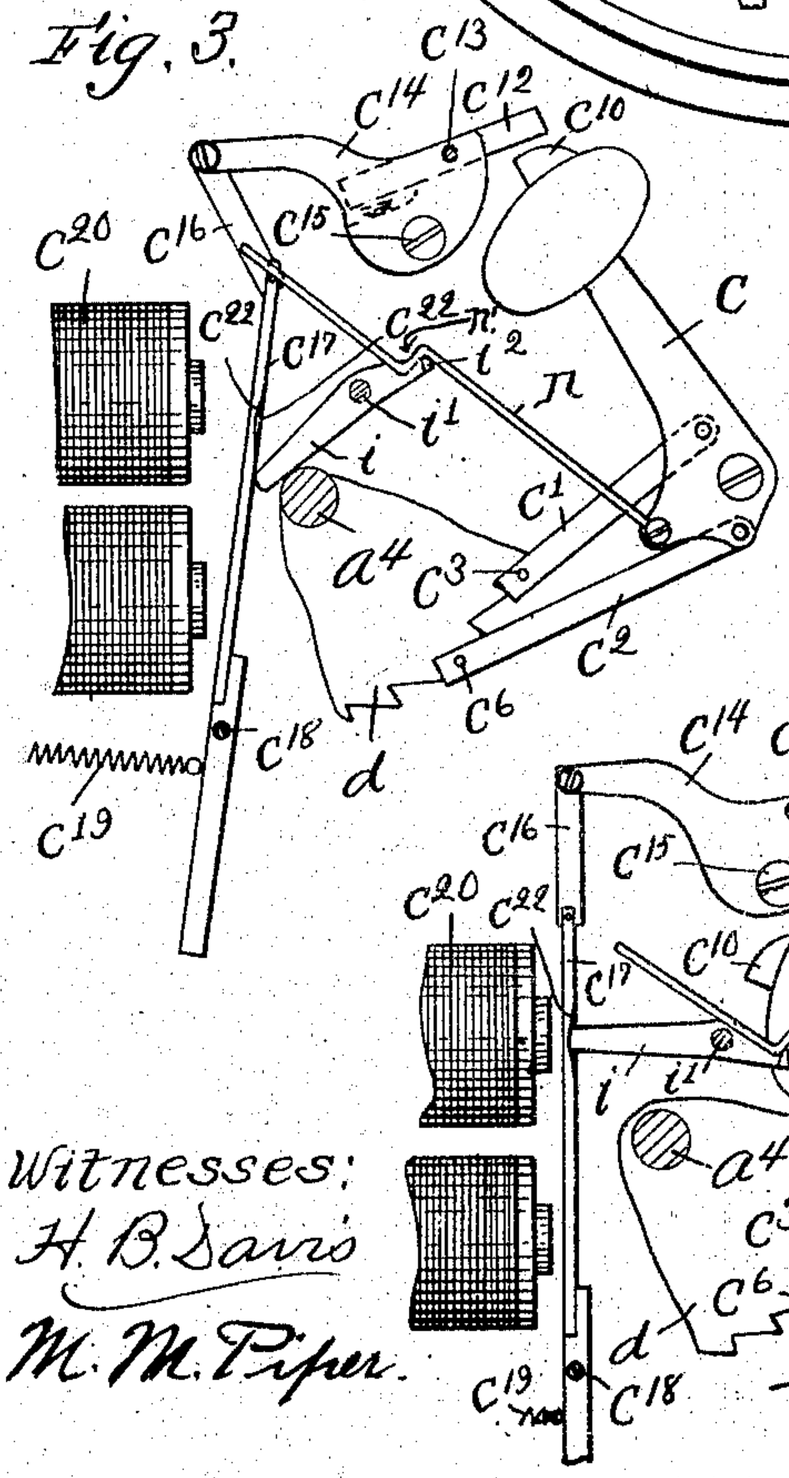


Fig. 2.

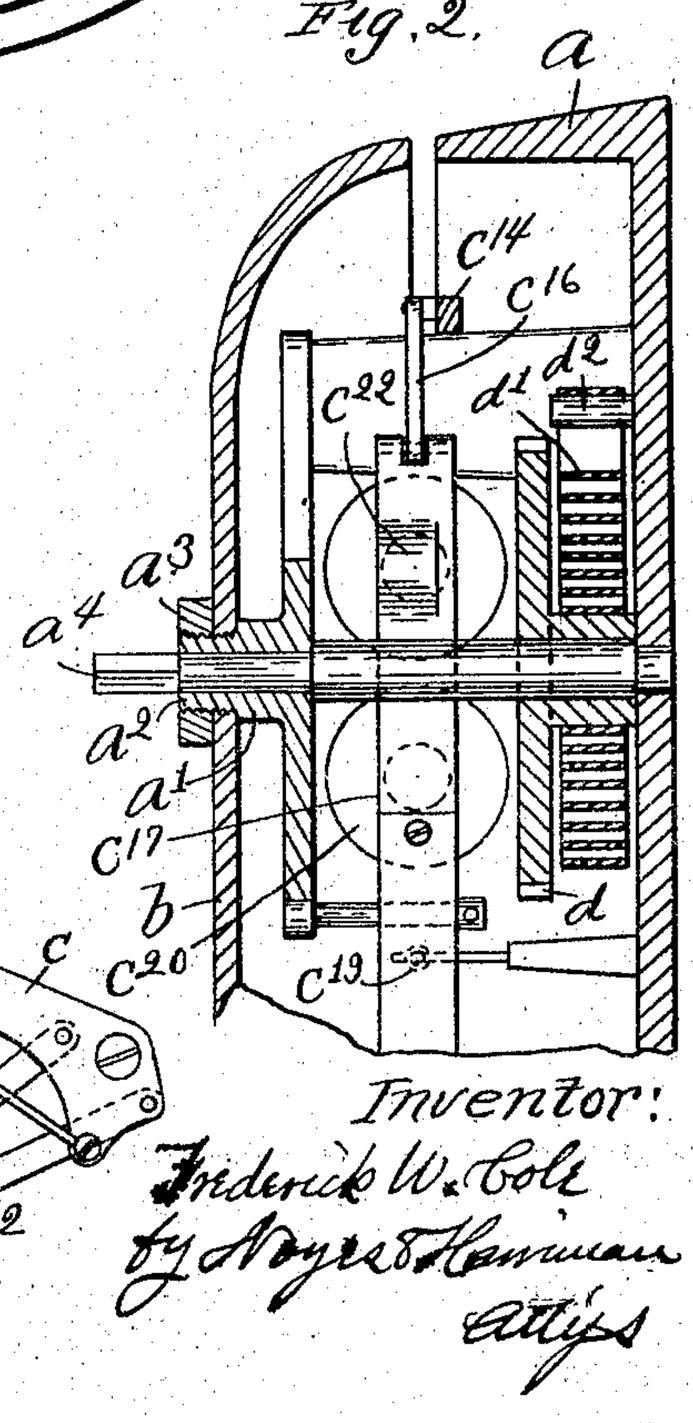
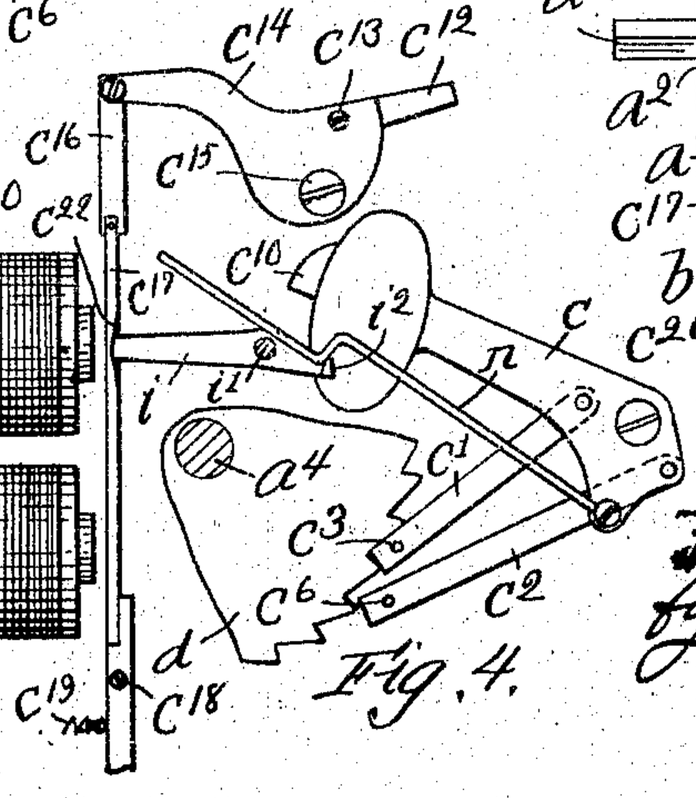


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELECTROMECHANICAL GONG.

SPECIFICATION forming part of Letters Patent No. 757,271, dated April 12, 1904.

Application filed October 4, 1902. Serial No. 125,859. (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 Electromechanical Gongs, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to electromechanical gongs, and has for its object to construct a controlling device for the actuating mechanism which is positively connected with and operated by the armature of the electromagnet; also to construct a governing device for the armature of the electromagnet, which operates to govern the position of the controlling device—as, for instance, when in one position it holds the armature with the controlling device in engagement with the parts to hold the actuating mechanism at rest and when in another position it permits the armature to move the controlling device to set free the actuating mechanism; also to provide means for restoring said governing device and armature and parts connected with said armature adapted to be operated by one of the power-driven parts—as, for instance, the strike-arm; also to project the winding-shaft through the gong, beneath which all the operating parts are placed.

Figure 1 shows in front elevation an electromechanical gong embodying this invention, the gong, which is struck by the hammer, being removed to disclose the operating mechanism. Fig. 2 is a vertical section of the gong shown in Fig. 1, taken on the dotted line 2 2, Fig. 1. Fig. 5 is a detail showing both governing device and controlling device in their abnormal positions and the striking-arm, which has been disengaged, traveling on its backward stroke. Fig. 4 is a detail of the parts shown in Fig. 3, the controlling device and governing device both being restored to their normal positions and the striking-arm being in its most remote position away from the gong.

The special type of gong herein shown, to which my improvements are applied, is ordinarily termed a "turtle" gong and comprises a shell or case *a*, suitable supports therein for the operating parts, and a gong *b*, yet my improvements are applicable to other types of gongs. In the gong shown a boss *a'* is formed on the frame, from which projects an externally-screw-threaded teat a^2, adapted to receive a nut a^3, and the gong *b* has a hole through it, through which said teat passes, so that said gong rests upon the boss *a'*. A hole is provided through the boss and teat for the winding-shaft a^4 of the actuating mechanism, said shaft being provided with a square end, adapting it to receive a suitable key. In other types of gongs to which my improvements are applicable of course this particular construction of support for the gong and provision for winding the actuating mechanism will not necessarily be employed.

The actuating mechanism for the pivoted striking arm or lever *c*, bearing the bell-hammer, consists, essentially, of a ratchet toothed wheel *d*, secured directly to the winding-shaft a^4, and a spring *d'*, one end of which is connected with said winding-shaft and the other end with a post d^2. Two pawls c' c^2 are pivotally connected to the striking-arm, one at each side of the pivot of said arm, which engage said ratchet toothed wheel *d* and which are operated by said wheel to in turn operate the striking-arm. The pawl c' has a pin c^3 projecting laterally from it, upon which the free end of a spring c^4 bears, the action of said spring being to throw the pawl down, so that the pin c^3 will strike a fixed point—as, for instance, one side of a block c^5—and thereby disengage the pawl from the ratchet-wheel and limit its movement away from the ratchet-wheel.

The pawl c^2 has a pin c^6 projecting laterally from it, which occupies a position between the ends of two flat springs c^7 c^8, attached to said block c^5, the tendency of the uppermost spring c^7 being to lower the pawl, and thereby disengage it from the ratchet-wheel, and the tendency of the lowermost spring being to lift the

pawl, and thereby thrust it into engagement with the ratchet-wheel. The action of the ratchet-wheel in operating the striking-arm is substantially the same as usual—as, for instance, normally the lowermost pawl c^2 is in engagement with the ratchet-wheel and the uppermost pawl c' is out of engagement therewith, and as the actuating mechanism is set free the ratchet-wheel will thrust the pawl c^2 in a direction to move the striking-arm c away from the gong, and such movement of the arm causes the pawl c' to approach the ratchet-wheel at the same time one of the teeth of the ratchet-wheel approaches the pawl, and when the ratchet-wheel has moved the pawl c^2 a short distance—far enough for the pawl c' to be brought into engagement with the ratchet-wheel—the spring c^7 will act to disengage the pawl c^2 from the ratchet-wheel, and then as the ratchet-wheel continues its revolution the pawl c' will be moved in a direction to move the striking-arm toward the gong, and such movement will continue until the spring c^4 disengages said pawl c' from the ratchet-wheel, at which time the pawl c^2 is again brought into engagement with the ratchet-wheel. Thus the striking-arm will be moved first away from and then toward the gong, making one complete excursion each time the actuating mechanism is let off.

The outer end of the striking-arm c is formed or provided with a detent c^{10}, which is engaged by a controlling device which, as herein shown, consists of a let-off comprising, essentially, a a pawl c^{12}, pivoted at c^{13} to an arm c^{14}, pivoted at c^{15}, the extremity of which arm is loosely connected by a link c^{16} with the upper end of the armature c^{17}. The armature c^{17} is pivoted at c^{18} and has attached to it a retractile spring c^{19}, the tendency of which is to move said armature away from the poles of the electromagnet c^{20}. Whenever the armature is retracted at a time when not restrained from operation by a governing device to be described, the arm c^{14} will be turned on its pivot and the let-off will be moved out of engagement with the detent c^{10}, (see Fig. 3,) to thereby release the striking-arm and set free the actuating mechanism for said striking-arm. It is designed and intended that the armature shall normally hold the controlling device in its normal position *i. e.*, with the let-off in engagement with the detent on the striking-arm, to thereby hold the actuating mechanism at rest—and that said armature shall at such time be held by its retractile spring in a semiretracted position against or in engagement with the governing device to be described and that whenever said armature is attracted the governing device shall move out of the way, so that when said armature is retracted with the governing device out of the way it will retract its full stroke and when so doing will move the controlling device out of engagement with the striking-arm, and that thereafter said armature shall be restored by the governing device to its semiretracted position preparatory to being again attracted.

The governing device consists of a dog i, pivoted at i' to the frame at a point near the armature, having at one end a short bent arm i^2, which normally bears upon a projection i^3 on the frame, (see dotted lines, Fig. 1,) which projection serves as a stop for limiting the movement of the governing device in one direction, and when the dog is in this position its opposite end engages the armature. The armature is pressed against the end of the dog by the retractile spring c^{19} with sufficient force to normally hold the dog in its elevated position, being the position shown in Fig. 1, yet whenever said armature is attracted the dog is immediately set free and falls by gravity to the position shown in Fig. 3. To assist in holding the dog in its elevated position, as shown in Fig. 1, the armature is provided or formed with a shallow recess c^{22}, which receives the end of the dog. The armature is free to be attracted by reason of the loose connection with the arm c^{14}. After the armature has been attracted and the dog i has dropped out of engagement with it into the position shown in Fig. 3 then as the armature retracts, there being no obstruction to oppose such movement, the armature will retract its full stroke, drawing upon the link c^{16}, and thereby drawing down the arm c^{14} and disengaging the controlling device from the striking-arm, as shown in Fig. 3, and the parts will remain in this position until mechanically restored, which of course takes place immediately preparatory to the gong responding to another electrical impulse. Thus it will be seen that the dog drops out of engagement with the armature whenever the latter is attracted, and thereby permits the actuating mechanism to operate. Whenever the actuating mechanism is released, it will operate the striking-arm and all the parts are then immediately restored, the controlling device being brought into position to again engage the striking-arm. The dog i is employed to restore the parts.

A bent arm n is loosely attached to a projection on the striking-arm near the pivot thereof, which passes up by and beyond the short arm i^2 of the dog and through a hole in a projection i^8 on the frame, the outer or free end of said arm being thus guided by said projection, and an offset or bend is formed or provided in said arm at n', which normally occupies a position above the short arm i^2 of the dog, but which when the dog i falls serves as a stop against which said short arm i^2 strikes, so that the dog will be engaged by said bent arm n whenever it falls into its abnormal position; but as soon as the said dog falls and the actuating mechanism released the striking-arm will be moved away from the gong, and during this movement of the striking-arm it operates to draw down the arm n in

the direction of its length and to return the dog to its normal position, as shown in Fig. 4. The dog, which has been restored to its normal position by the drawing down of the arm n, will remain in such position by the pressure of the armature upon it. Thus the governing device is restored by the striking-arm during the movement of said arm away from the gong. As the dog is restored to its normal position by the arm n it engages the armature, which at such time occupies its full retracted position, as shown in Fig. 3, and positively moves said armature back to its normal position, as shown in Fig. 1, near to but not in engagement with the poles of the electromagnet c^{20}, thereby returning said armature to its semiretracted position, and such movement of the armature causes the arm c^{14} to also resume its normal position, so that the controlling device will be restored or moved into a position to be engaged by the detent c^{10} on the striking-arm when said striking-arm again arrives at the end of its excursion and has struck a blow. Thus the governing device serves as a restoring device for the armature and for the controlling device as well as determines or governs the position of said controlling device relative to the striking-arm.

I do not desire to limit my invention to many of the details of construction herein described, as it is obvious that many changes may be made which come within the scope of my invention.

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

1. In an electromechanical gong, the combination of a striking-arm, actuating mechanism therefor, a let-off engaging said arm, an electromagnet, an armature therefor which is connected with said let-off and which operates said let-off to release the striking-arm when moved into its full retracted position, a dog engaging said armature for holding it in its semiretracted position, which is released by said armature when the latter is moved into its attracted position, and when released, permits said armature to move into its full retracted position, and means, operated by the striking-arm for restoring said dog, substantially as described.

2. In an electromechanical gong, the combination of a striking-arm, actuating mechanism therefor, a pivoted let-off engaging said arm, an electromagnet, an armature therefor, an unyielding link connecting said armature with said let-off, said armature operating to move said let-off when moved into its full retracted position, a dog engaging said armature for holding it in its semiretracted position, which is released by said armature when the latter is moved into its attracted position, and when released disengages said armature permitting it to move into its full retracted position, and means for operating said dog to restore the armature and parts connected therewith, substantially as described.

3. In an electromechanical gong, the combination of a striking-arm, actuating mechanism therefor, a pivoted let-off engaging said arm, an electromagnet, an armature therefor, an unyielding link connecting said armature with said let-off, said armature operating to move said let-off when moved into its full retracted position, a dog engaging said armature for holding it in its semiretracted position, which is released by said armature when the latter is moved into its attracted position, and when released disengages said armature permitting it to move into its full retracted position, and means, operated by the striking-arm, for operating said dog to restore the armature and parts connected therewith, substantially as described.

4. In an electromechanical gong, the combination of a striking-arm, actuating mechanism therefor, a let-off engaging said arm, an electromagnet, its armature, and an unyielding link connecting said let-off with said armature, whereby the let-off is positively moved in both directions, and also held by the armature, substantially as described.

5. In an electromechanical gong, the combination of a striking-arm, actuating mechanism therefor, a pivoted let-off engaging said arm, consisting of a pivoted dog c^{12}, and a pivoted arm bearing it, an electromagnet, its armature, and an unyielding link connecting the arm bearing the let-off with said armature, whereby the let-off is positively moved in both directions and also held by the armature, substantially as described.

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

FREDERICK W. COLE.

Witnesses:
B. J. NOYES,
H. B. DAVIS.