

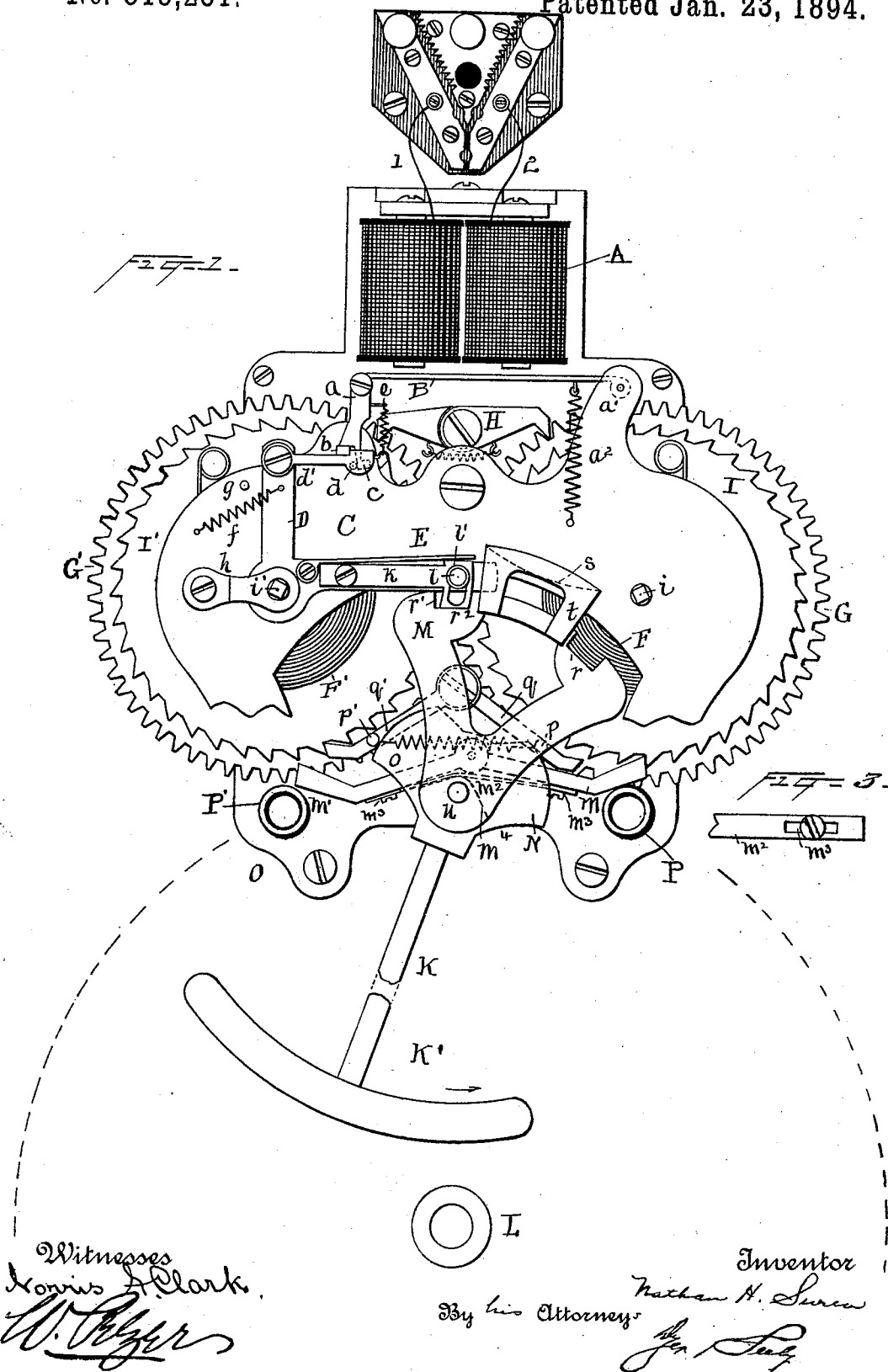
(No Model.)

2 Sheets—Sheet 1.

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ELECTRO MECHANICAL GONG.

No. 513,251.

Patented Jan. 23, 1894.



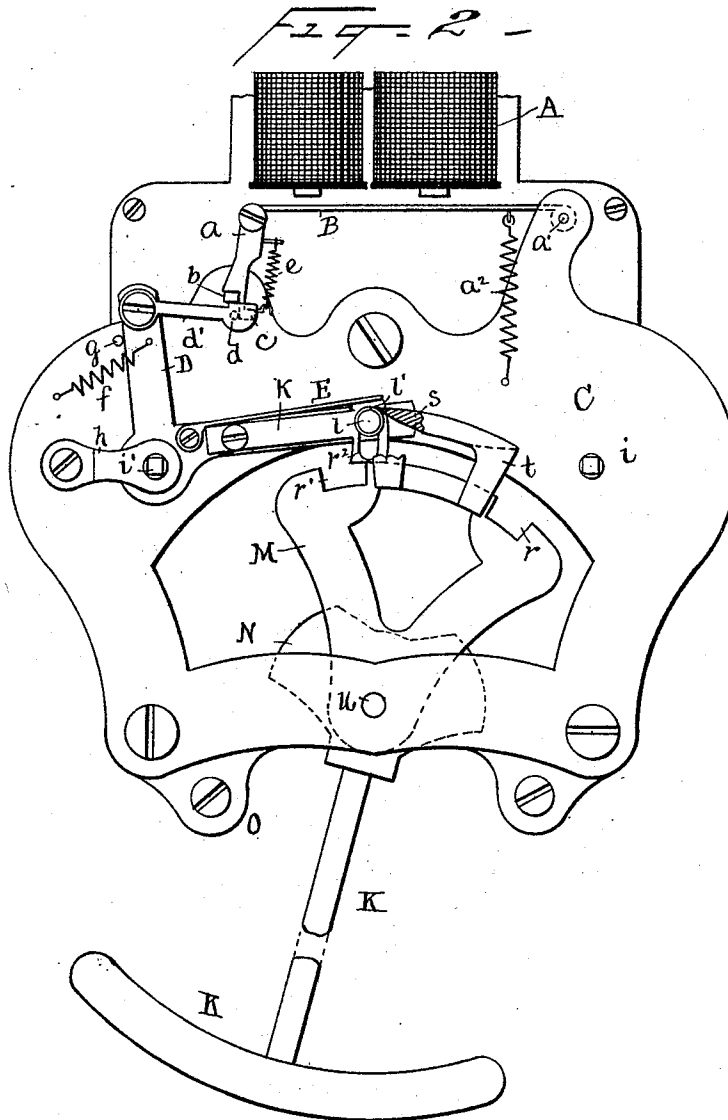
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Witnesses
James A. Clark,
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Inventor
Nathan H. Suren
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UNITED STATES PATENT OFFICE.

NATHAN H. SUREN, OF NEW YORK, N. Y., ASSIGNOR TO THE GAMEWELL
FIRE ALARM TELEGRAPH COMPANY, OF SAME PLACE.

ELECTRO-MECHANICAL GONG.

SPECIFICATION forming part of Letters Patent No. 513,251, dated January 23, 1894.

Application filed October 11, 1893. Serial No. 487,865. (No model.)

To all whom it may concern:

Be it known that I, NATHAN H. SUREN, a citizen of the United States, residing in the city of New York, county and State of New York, have invented certain new and useful Improvements in Electro-Mechanical Gongs, of which the following is a specification.

My invention relates to bells or gongs of that character in which the movement of the striker arm is effected mechanically, the mechanism which moves the arm being controlled electrically.

The main object of my invention is to produce a simple, effective and durable apparatus of this character in which a sufficient amount of power can be stored up to operate the bell many more times than has heretofore been possible and in which a rapid and even motion of the striker arm is secured with a minimum amount of wear on the working parts; and my invention consists in various novel devices and combinations of devices employed by me in accomplishing the above named objects, as hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a face view of the bell mechanism, with part of the covering plate broken away; Fig. 2, a face view with the covering plate complete, certain parts being omitted in order to illustrate those shown more clearly; and Fig. 3, an enlarged bottom portion of the spring for the operating pawl.

A is an electro magnet in the circuit 1, 2, which is controlled by any suitable transmitter so as to produce current impulses in the said magnet. The magnet A is provided with an armature B pivoted at a' and retracted by the spring a^2 . At its free end the armature B is pivoted to the downwardly extending arm a which normally rests upon the pin b secured stationarily to the covering plate C, which pin also serves as a stop against the upward movement of the pivoted arm d' . The arm a has a projecting foot c which normally extends down beside pin d attached to the under side of arm d' . The arm d' is secured by a pivot to the double-armed lever D which is retracted by the spring f against the stop g . The spring e connects the free end of arm

d' with the arm a . The lever D is preferably pivoted as shown upon the winding shaft i of the coiled spring F, the stationary plate h forming an additional bearing for the said shaft. The horizontal portion of the lever D is provided with a laterally extending pin l which at its outer end has upon it a small roller l' . The pin l itself passes through the slotted head r^2 of an arm k pivoted on the side of lever D and provided with the flat spring E which bears upon the head r^2 to force it downward.

As before stated the apparatus is provided with two coiled springs, F and F'. I provide each of these springs with the winding shaft i or i' , but they are arranged to be wound simultaneously from either shaft by means of the wheels G and G' which turn with the respective winding shafts and which engage with each other, so that the turning of either winding shaft effects the turning of the other. The springs themselves are each secured at one end to the winding shaft and at the other end to a ratchet wheel I or I' loose upon the said shaft, whereby when the springs are released the wheels I and I' are turned.

The position of the gong is indicated by the dotted line at the lower part of Fig. 1, at its center being the stud L upon which it is held in place by a screw in the usual way. The striker arm K terminating in the hammer K' is beneath the gong and strikes upon the inside of it, first on one side and then on the other. The striking arm K carries at its upper end the rigidly secured segment M, having two notches r and r' with which the slotted head r^2 of arm k engages alternately. Upon the head of the segment M between the two notches is the projecting extension t whose upper end has the overhanging curved guiding edge s adapted to ride over the roller l' , as more clearly shown in Fig. 2. Also carried by the striking arm K, and jointed together as shown, are the operating pawls m and m' engaging respectively with the toothed wheels I and I'. The bent flat spring m^2 slotted at m^3 , m^3 , bears against the circular joint of the two operating pawls, and the striking arm carries on its under side the pointed cam m^4 which bears against the spring m^2 . The striking arm is pivoted at u between the base

plate O and the covering plate C. These plates are joined by posts P P' in the path of movement of the operating pawl. The toothed wheels I and I' are also provided respectively with the retaining pawls *q* and *q'* pivoted on the base plate O and connected together by spring *o*. Each of the retaining pawls has upon it a pin *p* or *p'*, and at the middle part of the striking arm is the cam N having curved sides which bear against the said pins as the arm moves to move the pawls into, and to permit them to escape from, engagement with the toothed wheels.

The operation of the apparatus is as follows: By the use of a key in connection with either winding shaft *i* or *i'* both springs are wound to the desired tension, the double pawl H preventing the wheels G and G' from turning backward during this operation. Upon the magnet being energized it lifts the armature B and raises the foot *c* of arm *a* from the side of pin *d* to the top thereof. The circuit to the magnet being again broken and the armature retracted by its spring *a*², the arm *d'* is thus pushed downward and disengaged from post *b*, and spring *f* then moves lever D which raises the head *r*² of the arm *k* out of the notch *r'* and unlocks the striking arm so as to leave it free to move.

The apparatus being in the position shown in Fig. 1, that is with the operating pawl *m* in engagement with the toothed wheel I, and the retaining pawl *q* out of engagement therewith, the revolution of the wheel I being communicated to the striking arm K above its pivot, moves said arm in the direction of the arrow until the gong is struck. During this movement the curved side of the cam N bearing against the pin *p* of the retaining pawl *q* moves said pawl gradually into a notch of the toothed wheel I, the said pawl reaching a position to hold the wheel from further movement at or about the time the gong is struck, while the pawl *q'* drops out of its notch in wheel I', the curved surface on that side of cam N having moved away from it. At the same time the operating pawl *m'* is moved also and is guided by contact with post P' into engagement with a notch of the wheel I', and further at the end of the stroke the operating pawl *m* is thrown by the momentum of the stroke out of engagement with the wheel I, this movement being assisted by the spring *m*². In addition to these movements the curved guiding edge *s* at the head *t* of the striking arm has passed over the roller *l'* on pin *l* as more clearly shown in Fig. 2, and has thus moved the horizontal portion of the lever D downward without moving the arm *k*. This movement of the lever D is communicated to the arm *d'* and pin *d* moves arm *a* back to its original position as in Fig. 1. When the notch *r* passes under the slotted head of the arm *k* the latter drops into the notch by the pressure of the spring E and the parts are then all in readiness for the next stroke, the

position of the operating pawls and retaining pawls being the reverse of that shown in Fig. 1, so that upon the next movement caused by the magnet the wheel I' turns while the wheel I remains stationary and the striker is moved in the opposite direction from before, and this operation is repeated so often as the magnet is affected by the making and breaking of the circuit at the transmitter.

By using two springs, one for each stroke, instead of using a single spring for giving both strokes, as has heretofore been done, I am enabled to store up and maintain power to operate the bell a much greater number of times than before, and by arranging the springs so that they are wound simultaneously no additional manipulation is involved in the use of the two springs. The use of two driving wheels, for the alternate strokes, the same being operated by the source of power formed by the two springs, diminishes the degree of wear on the wheels and pawls and provides a rapid and even movement of the striking arm. The retaining pawls moved into position by the striking arm form stops which prevent the release of both wheels when the striker arm is electrically released from the lock which normally holds it at *r* or *r'*, and allow only the spring and wheel to respond which move the striker arm in the required direction.

What I claim is—

1. In an electro-mechanical gong, the combination with the striking arm, of two springs connected with said arm so as to alternately move the same in opposite directions, a lock for said striking arm, and an electro-magnet for releasing said lock, substantially as set forth.

2. In an electro-mechanical gong, the combination with the striking arm, of the two springs connected therewith for alternately moving the same in opposite directions, a lock for said striking arm, an electro-magnet for releasing said lock, and stops alternately preventing the operation of the springs, substantially as set forth.

3. In an electro-mechanical gong, the combination with the striking arm, of the two springs connected therewith for alternately moving it in opposite directions, said springs being mechanically joined so as to be wound simultaneously, substantially as set forth.

4. In an electro-mechanical gong, the combination with the striking arm, of the two coiled springs connected therewith for alternately moving it in opposite directions, and the toothed wheels engaging each other and situated on the winding shafts of the respective springs, substantially as set forth.

5. In an electro-mechanical gong, the combination with the striking arm, of two driving wheels, a source of power for said driving wheels, connections between each of said driving wheels and the striking arm for moving it alternately in opposite directions, a lock

for said striking arm, and an electro-magnet for releasing said lock, substantially as set forth.

6. In an electro-mechanical gong, the combination with the striking arm, of the two driving wheels, each mechanically connected with said striking arm for moving the same alternately in opposite directions, a source of power for said driving wheels, a lock for said striking arm, an electro-magnet for releasing said lock, and stops engaging said driving wheels alternately, controlled by the movement of the striking arm, substantially as set forth.

7. In an electro-mechanical gong, the combination of the striking arm, the two driving wheels, a source of power therefor, a lock for the striking arm, an electro-magnet for releasing said lock, and two operating pawls, each adapted to engage one of said driving wheels and mechanically connected with the striking arm, and means operated by the striking arm for moving said pawls into and out of engagement with said driving wheels, substantially as set forth.

8. In an electro-mechanical gong, the combination with the striking arm, of the two driving wheels, a source of power therefor, a lock for the striking arm, an electro-magnet for releasing said lock, the operating pawls carried by the striking arm and moved thereby alternately into engagement with the driving wheels, and the retaining pawls alternately engaging said wheels and controlled by the movement of the striking arm, substantially as set forth.

9. In an electro-mechanical gong, the combination of the striking arm, the two driving wheels, a source of power for said driving wheels, a lock for said striking arm, and a magnet for releasing said lock, operating connections between each of said driving wheels and the striking arm, the pivoted retaining pawls, and the cam N carried by the striking arm and engaging said retaining pawls to move the same into and out of engagement with said driving wheels, substantially as set forth.

10. In an electro-mechanical gong, the combination of the striking arm, the two driving wheels, a source of power for said wheels, a lock for said striking arm, a magnet for releasing said lock, the operating pawls pivoted upon said striking arm, the guides guiding said operating pawls into engagement, the retaining pawls pivoted on a stationary part, and the cam on said striking arm controlling the engagement of said retaining pawls, substantially as set forth.

11. In an electro-mechanical gong, the combination of the striking arm, the two driving

wheels, a source of power for said wheels, a lock for said striking arm, a magnet for releasing said lock, the operating pawls pivoted together upon said striking arm, the slotted spring bearing against said operating pawls and the pointed cam on the striking arm engaging said spring, substantially as set forth.

12. In an electro-mechanical gong, the combination with the striking arm, of two driving wheels each connected with said striking arm for moving it alternately in opposite directions, two springs, one connected with each of said wheels for moving the same, a lock for said striking arm, and an electro-magnet for releasing said lock, substantially as set forth.

13. In an electro-mechanical gong, the combination of the striking arm having the notched segment a source of power for moving it alternately in opposite directions, the electro-magnet, its armature and a lever moved by said armature and provided with a locking catch engaging one of said notches at each end of the stroke of said striking arm, substantially as set forth.

14. In an electro-mechanical gong, the combination with the striking arm, of a source of power for moving it, an electro-magnet, its armature, a locking catch for the striking arm, mechanism intermediate between said armature and said catch for moving said catch and means actuated by the striking arm independent of said catch for restoring said intermediate mechanism to operative position, substantially as set forth.

15. The combination of the striking arm having the notched segment, of the lever D connected with the magnet armature, the arm pivoted on said lever and having the head for engagement with said notches, and means actuated by the striking arm for moving said lever independent of said pivoted arm, substantially as set forth.

16. The combination of the striking arm having the notched segment, of the lever D connected with the magnet armature, the pin *l* on said lever, the arm *k* pivoted on said lever and having a slotted head, and the guide on the striking arm engaging said pin as said arm moves, substantially as set forth.

17. The combination of the electro magnet, its armature, the lever D carrying the locking catch, the arm *a* carried by the armature, and the intermediate arm *d* engaged by arm *a* to move the lever D, substantially as set forth.

This specification signed and witnessed this 7th day of October, 1893.

NATHAN H. SUREN.

Witnesses:

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W. PELZER.