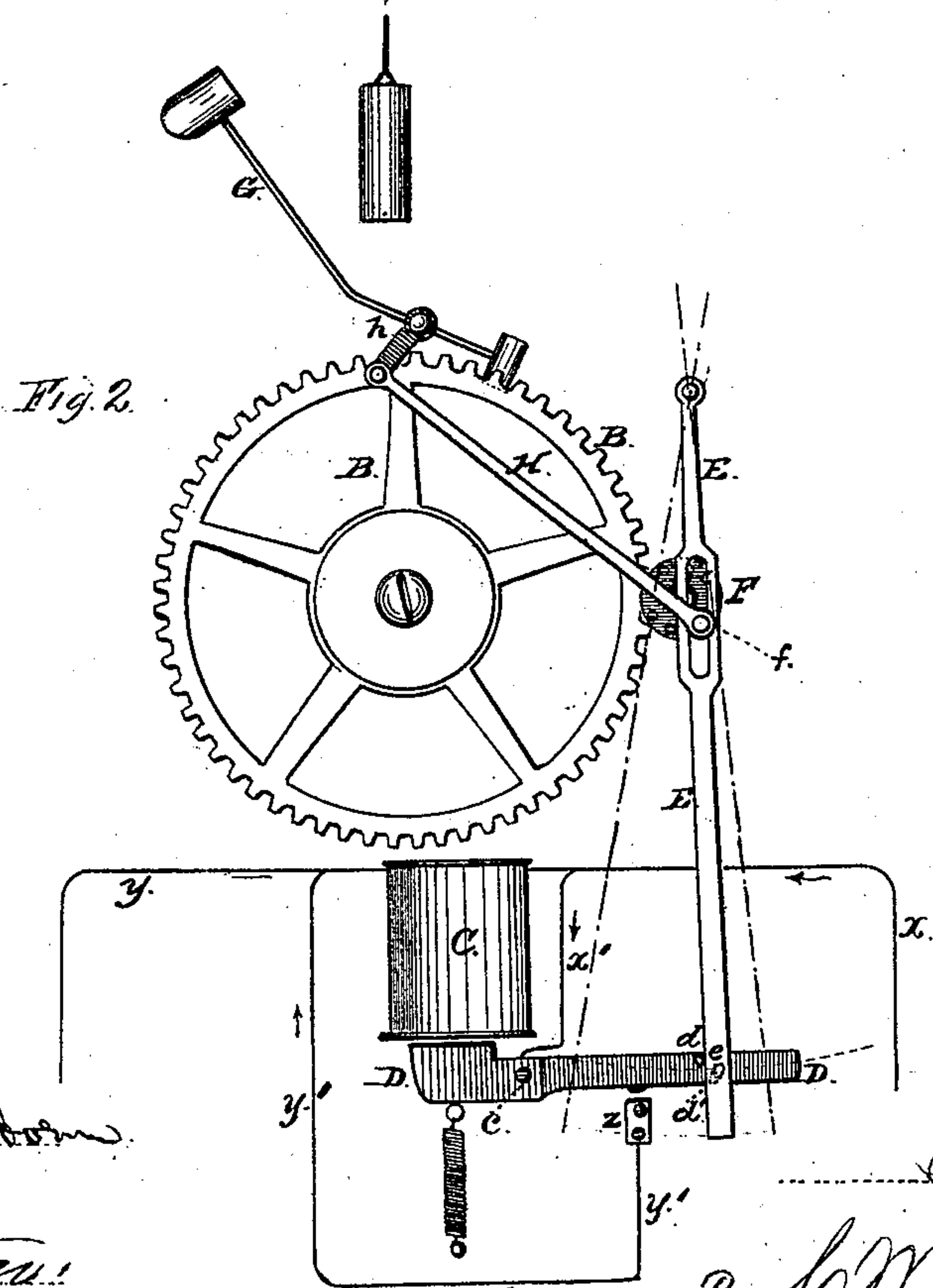
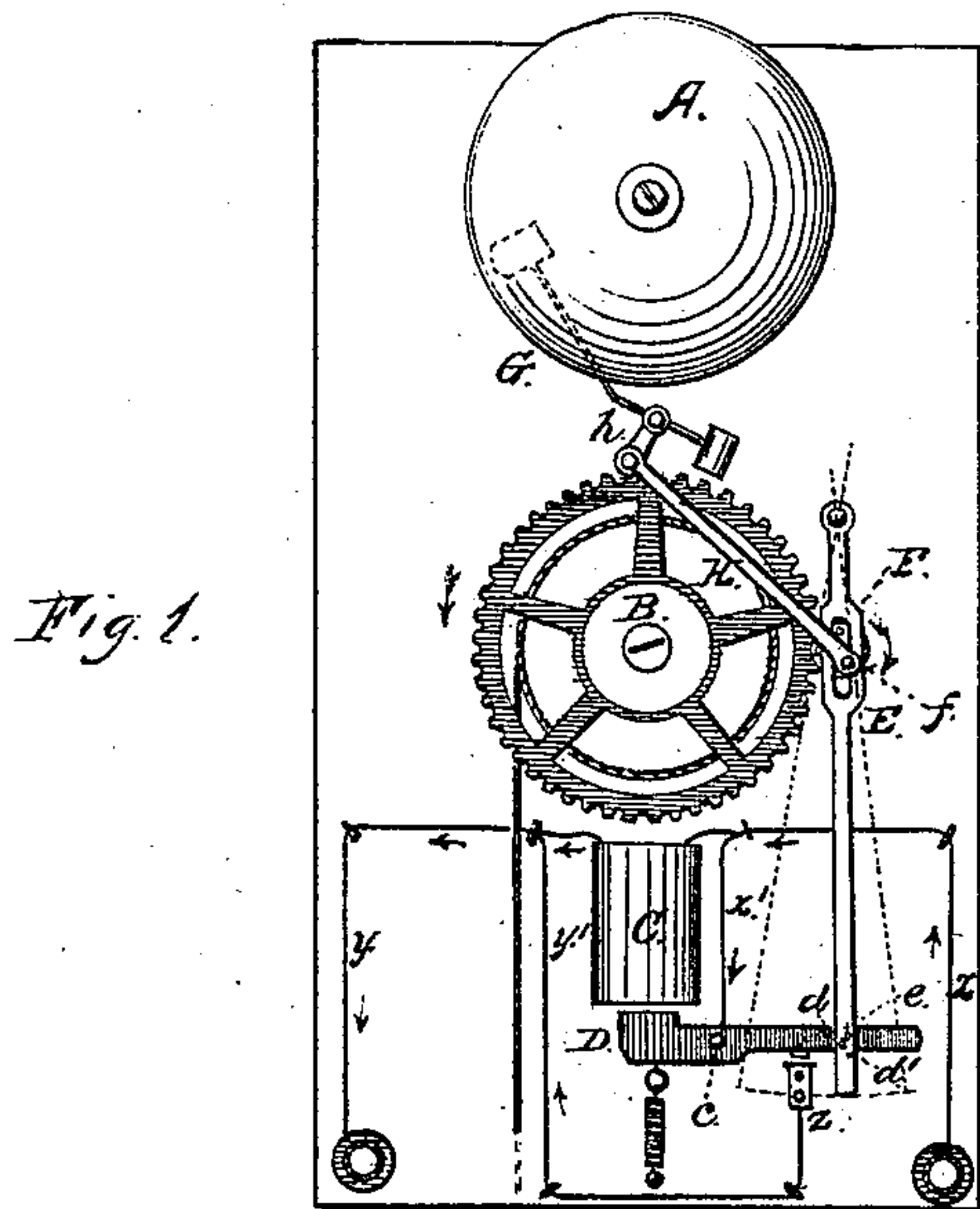


P. SEILER.  
ELECTRO-MAGNETIC ALARM-BELLS.

No. 194,933.

Patented Sept. 4, 1877.



Witnesses:

*Edward C. Osborn*

*E. Pattern*

Inventor:

*Paul Seiler*

*By C. W. Smith*



# UNITED STATES PATENT OFFICE.

PAUL SEILER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF  
HIS RIGHT TO JOSEPH HERZ, OF SAME PLACE.

## IMPROVEMENT IN ELECTRO-MAGNETIC ALARM-BELLS.

Specification forming part of Letters Patent No. **194,933**, dated September 4, 1877; application filed  
March 17, 1877.

*To all whom it may concern:*

Be it known that I, PAUL SEILER, of the city and county of San Francisco, and State of California, have invented a new and useful Improvement in the Striking Apparatus of Electro-Magnetic Alarm-Bells, which improvement is fully set forth in the following specification and accompanying drawing.

In the said drawing, Figure 1 is a front view of an electro-magnetic alarm apparatus with my invention applied thereto. Fig. 2 is an enlarged detail view of the mechanism operating the hammer.

My invention relates to that class of electro-magnetic alarm apparatus in which the signals are given by the strokes of a hammer upon a bell or gong, the strokes being produced and controlled by the action of the armature-lever upon the mechanism which vibrates the hammer.

It consists in the construction, arrangement, and combination of an oscillating lever with the vibrating hammer and its actuating mechanism of the alarm-bell or apparatus, in such manner that but one stroke shall be given for each oscillation of the lever, the movement of the lever being controlled by pins or stops upon the armature-lever, so that the lever shall make but one movement back and forth to each movement of the armature.

It further consists in the combination and arrangement, with the electro-magnet and armature-lever, of an electro-alarm bell or apparatus of a "cut-out" or shorter circuit-wires for the currents from the battery, whereby several bells or apparatus having magnets of different degrees of resistance may be connected with and operated by the same signaling apparatus, so that the same signal shall be repeated through all the magnets, and the magnets in the line shall not be influenced or prevented from operating by any of the other magnets of different resistance in connection with the battery.

The object of my invention is to furnish an alarm apparatus for transmitting signals by strokes upon a bell or gong, which shall be sure and accurate in giving the correct number of signals, and which shall not allow the striking apparatus actuating the hammer to operate more than once to each movement of the armature-lever.

The gong A is arranged upon a supporting board or tablet, together with the usual means for giving motion to the striking apparatus, consisting of a drum rotated by a cord and weight, and a gear-wheel, B, secured upon the axis of the drum. Beneath these are situated the electro-magnet C, connected in the ordinary manner with the wires from the battery.

The armature beneath this magnet is placed upon the shorter end of the armature-lever D, which is pivoted to the supporting-tablet at *c*, and is provided with the pins *d d'*, which control the oscillations of the lever E that actuates the hammer.

The lever E is pivoted at its upper end to the tablet, and it extends downward to the end of the armature-lever D, so as to bring its pin or stop *e* in proper working position with respect to the pins *d d'* of the lever D. Its oscillations are produced by means of the pinion F in gear with the wheel B, this pinion having an eccentric pin, *f*, upon its side, which works in a slot in the lever E. Thus the action of these parts, as the drum rotates, is to cause the lever E to oscillate rapidly forth and back upon its pivot, whenever the end, carrying the stop *e*, is released from the pins upon the end of the armature-lever D; but these pins *d d'* hold the lever back as long as the shorter end of the lever D is not attracted by the magnet; therefore the lever E can only oscillate, and allow the mechanism with which the hammer G is connected to operate it, when the end of the armature-lever is attracted and released by the magnet.

The stop *e*, upon the end of the lever E, when the instrument is at rest, is in contact with and bearing against the lower pin *d'* upon the armature-lever D, and no oscillation of the lever E can take place while the armature is in this position; but when the current transmitted through the magnet causes the armature to be attracted the longer end of the lever D is depressed, and the upper pin *d*, which is set forward of the lower pin *d'*, is thrown in line with the stop *e*, so that as the oscillating lever E is released from the lower pin it is caught and held by the upper pin, and when the current is interrupted, and the armature released, the end of the armature-lever, having the pins upon it, is raised and



the stop *e* slips out between the pins, and allows the lever *E* to make one oscillation forward and back.

The pinion *F*, which is revolved by the gear and drum, is caused to actuate the hammer by means of the link *H*, connecting the eccentric pin *f* with the lever *h* of the hammer, and as the pinion revolves the hammer is caused to vibrate forth and back, one revolution of the pinion producing one vibration of the hammer and one stroke upon the gong.

The movement of the oscillating lever after it has completed its backward motion and is about to return is arrested by the stop or pin *d'*, which, when the lever *D* is at rest and free from the magnet, is in line with the path of motion of the stop *e* on the lever *E*. Thus, for each attraction of the armature, the stop *e* of the lever *E* is thrown from the pin *d'* against the forward pin *d*, and for each release of the armature the stop *e* is allowed to slip from the pin *d*, and the lever makes one complete oscillation forward and back, and vibrates the hammer, one stroke of the gong being thus given for each movement of the armature.

The release of the lever *E* from the pins of the armature-lever, and its arrest by them at the end of each oscillation, is made certain and positive by the manner of arranging and operating the lever *E*, which allows a lever of greater length to be used, whereby the arc described by the end of the lever approaches a straight line, or one of slight curvature, and the stop *e* is caused to travel in nearly a straight path, thus insuring the perfect entrance of the stop *e* between the pins *d d'*, and the certain arrest of the movement of the lever *E* whenever these stops of the armature-lever *D* are thrown into the line of motion of the stop *e*.

The use of a vibrating or oscillating lever of greater length than those now or heretofore used in instruments of this character insures a correct number of strokes to be given by the gong, for the movement of the stop *e* in a much larger arc causes its movements to be made more slowly, and the perfect action of the pins or stops on the armature-lever is obtained. The liability of these pins and stops being bent or injured by the too rapid motion of the oscillating-lever is also entirely removed, and the instrument is rendered accurate and reliable in giving the correct number of strokes.

In connection with the magnet and the armature-lever is arranged a short circuit or cut-out, as shown in Fig. 2 of the drawing. This consists of the wire *x'*, connected with the wire *x* of the battery, and with the armature-lever *D* and the wire *y'* leading from the main wire *y* around the magnet to a block, *z*, placed below the longer end of the lever *D*. This allows part of the current from the main wires to take a shorter circuit through the wires *x'*, lever *D*, block *z*, and wire *y'* to the wire *y*, and thus pass to the other magnets in the circuit, instead of being entirely attracted

or led through the coils of the magnet. This cutting out of the magnet takes place whenever the armature is attracted by the magnet, and the armature-lever *D* strikes against the block *z* and completes the circuit between the wires *x' y'*.

The manner of controlling the revolutions of the pinion *F* by means of the long oscillating lever *E*, as herein described, insures the perfect arrest or interruption of the movement of the pinion and of the hammer vibrated thereby, for the greater leverage thus given to the stop *e* at the end of the lever causes a slight or delicate resistance given by the pins or stops on the armature-lever to act with increased power upon the eccentric pin *f* of the pinion, and check its motion effectually, as the stop *e* is arrested by the pins *d d'*.

This construction and arrangement has likewise the advantage of preventing the blows of the hammer from reacting upon the lever *E* and throwing the stop *e* too violently against the pins which arrest its motion, for at that part of the revolution of the pinion which brings the hammer against the bell, the eccentric pin *f* is in such position with respect to the slot in the lever that but little motion is given to the lever, and all the force of the weight or motor driving the pinion is thrown upon the hammer, and the bell is struck before the stop *e* strikes the pin *d*.

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

1. In an electro-magnetic striking apparatus, the arrangement and combination together of the long oscillating lever *E*, operated by the pinion *F*, and its eccentric pin or equivalent mechanism driven by the weight and drum or other motor, the vibrating hammer *G*, connected with and actuated by the pinion *F*, and the electro-magnet armature lever and pins, studs, or stops thereon, which control the movements of the oscillating lever, substantially as herein described, for the purpose set forth.

2. In an electro-magnetic alarm apparatus, the combination, with the armature-lever *D*, having pins or stops *d d'* situated in different planes, of the long slotted lever *E*, provided with a pin or stop, *e*, whereby the lower end of such slotted lever moves in substantially a straight line, as described and shown.

3. In an electro-magnetic alarm apparatus, substantially as described, the combination, with the magnet *C* and armature *D*, of the short circuit-wires *x' y'*, constructed and arranged substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 3d day of March, 1877.

PAUL SEILER. [L. S.]

Witnesses:

C. W. M. SMITH,  
PHILIP MAHLER.