

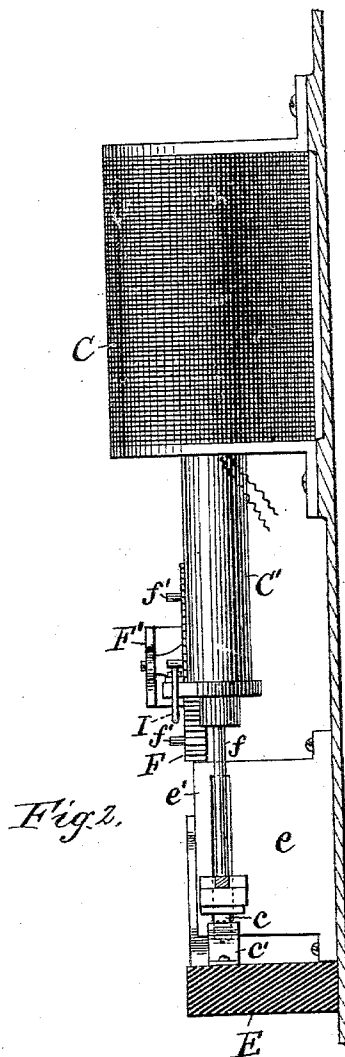
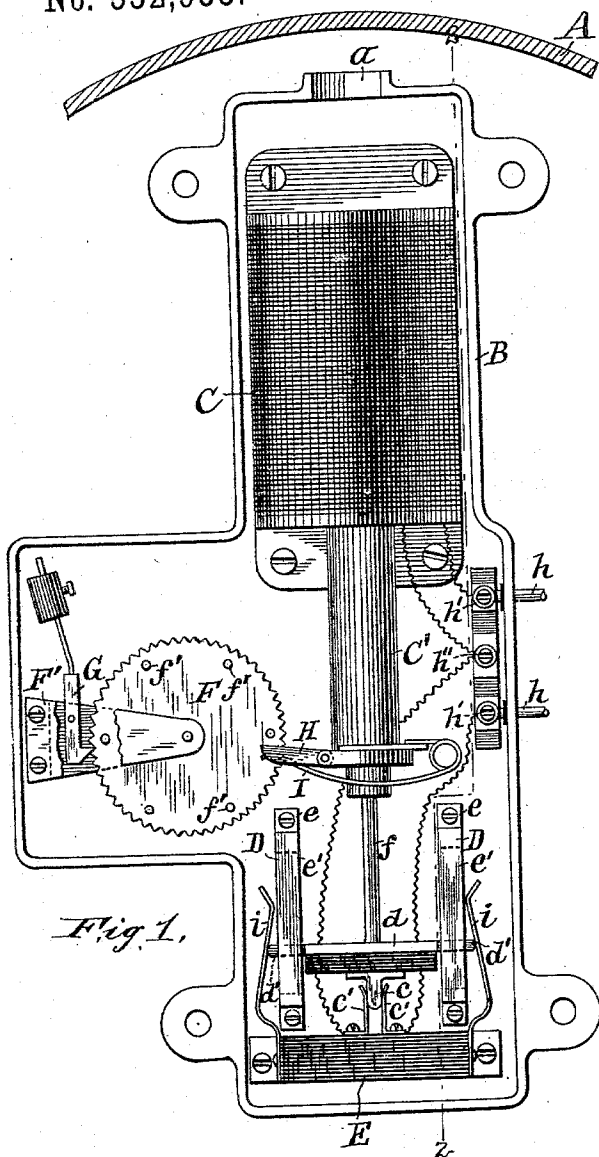
(No Model.)

2 Sheets—Sheet 1.

C. B. STERLING.
ELECTRIC BELL.

No. 552,933.

Patented Jan. 14, 1896.



WITNESSES:

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Mark W. Dewey

INVENTOR,

Charles B. Sterling

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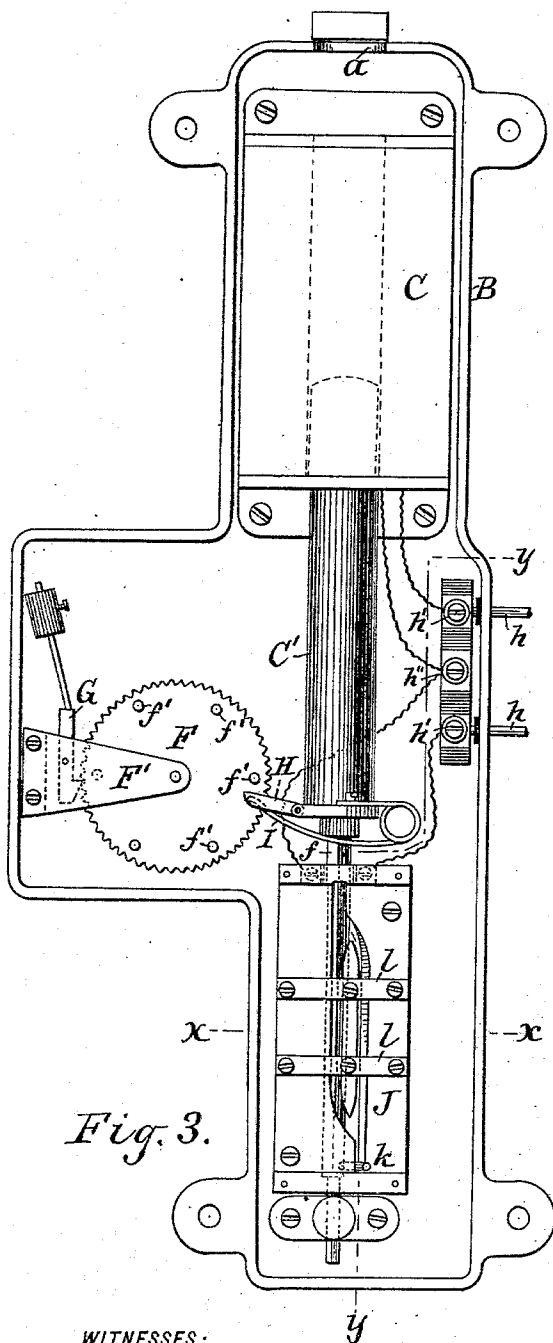


Fig. 3.

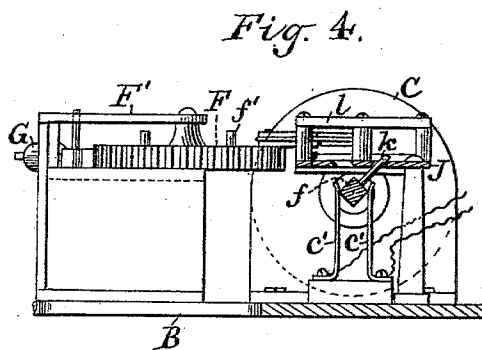


Fig. 4.

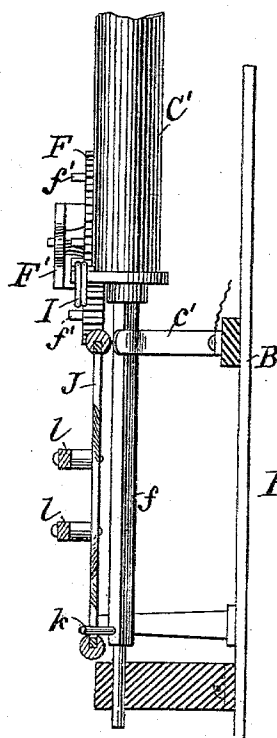


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES B. STERLING, OF NEW YORK, N. Y., ASSIGNOR TO THE DEWEY
ELECTRIC SIGNAL COMPANY, OF SAME PLACE.

ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 552,933, dated January 14, 1896.

Application filed September 3, 1895. Serial No. 561,278. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. STERLING, of New York, in the county of New York and State of New York, have invented new and useful Improvements in Electric Bells, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to electric bells or gongs for signaling and other purposes, and particularly for use on electric street-cars, and the object of my invention is to provide a device that will be simple and durable and that will operate effectively.

To this end my invention consists in the combination with a solenoid and the bell-hammer, of a core for the solenoid, a rotary brake engaging the core, a circuit maker and breaker connected to said core and movable vertically, stationary contacts insulated from each other to engage the circuit-maker, and guides for the circuit maker and breaker; and my invention consists also in the combination with a solenoid, the core and the gong, of a circuit maker and breaker connected to said core and movable therewith longitudinally, said circuit maker and breaker consisting of a square rod, or rod having different diameters or widths, stationary contacts insulated from each other to engage the circuit-maker, a pin projecting from one side of the said circuit maker and breaker, and irregular guides for the pin to work in, to rotate the said rod to cause it to make contact with the stationary contacts at the proper time; and my invention consists in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a front side elevation of the working parts of the bell together with a portion of the gong shown in section. Fig. 2 is an elevation of the same taken on line 22, looking from right to left. Fig. 3 is another front side elevation of the working parts of my improved signaling device similar to that shown in Fig. 1, but with my preferred form of circuit-controlling devices connected thereto. Fig. 4 is a sectional view taken on line *x x* of Fig. 3, and

Fig. 5 is a sectional view taken on line *y y* of Fig. 3.

Referring specifically to the drawings, A indicates the bell or gong, and B is the case or the base of the case, the cover thereof being removed. In the top of the case is an opening *a* for the purpose of allowing the bell hammer or core to work vertically therethrough to strike the gong. This opening is covered by the rim of the gong which is but a short distance therefrom. As will be seen in the drawings, all the inner parts are mounted within and upon the case B.

Referring more particularly to Figs. 1 and 2 of the drawings, below the solenoid C is a vertically-movable circuit maker and breaker. This circuit maker and breaker consists of a wedge-shaped piece *c* secured to but insulated from a horizontal plate *d* above it by a strip of fiber secured between the two parts *c* and *d*. The ends of the plate *d* are provided with narrow extensions *d' d'*, which are adapted to work in slots or guides D D. The guides are formed by two narrow parallel projections *ee*, extending from the inner side of the back of the case, and strips *e' e'* mounted thereon but separated therefrom at each end to form the slots in which the extensions *d' d'* work.

From the center and upper side of the plate *d* extends vertically a spindle *f*. This spindle is secured in the lower end of the core C' of the solenoid C.

Below the circuit-breaker, upon each side of the wedge or contact *c*, is a contact *c'*, mounted upon a block E, of insulating material, as fiber, and between which contacts the wedge *c* lies when in its lowest position to close the circuit through the coil or solenoid C. The contacts *c' c'* are angular shaped and somewhat flexible so that good contact will be made between them by the wedge *c*.

h h are the supply or leading-in wires, which are connected to screws *h' h'*, mounted on a block of insulating material within and on the right-hand side of the case. From the uppermost screw the circuit leads to and through the coil C, thence to one of the contacts *c'*, and from the other contact *c'* to the lowest screw *h*. For the sake of convenience in connecting the coil with the contact *c'* a

third binding-screw h'' , between the others, unites the connections from the said parts, as shown in Fig. 1.

Angular springs $i i$, formed of sheet metal, are secured to the ends of the block E, and bear with their free ends against the ends of the extensions $d' d'$ in such a manner that when the circuit-breaker is drawn upward by the core to break the circuit and above the springs $i i$ the breaker will be retarded somewhat in its downward movement; but the weight of the core forces the circuit-breaker below the ends of the said springs or the angles therein.

The operation is as follows: When the supply-circuit is closed by a key or push-button, (not shown in the drawings,) the electric current flows from the source to the upper one of the binding screws h' , thence through the coil C to the left-hand contact c' , thence through the wedge c of the circuit maker and breaker to the opposite contact c' , and from the latter contact to the lower binding-screw h' and supply-conductor h , thus completing the circuit. The flow of the current through this path causes the coil C to be energized and the core C' to be raised or drawn upward within the solenoid to force the hammer a' , the upper end of the core, upward against the gong A, thus sounding the bell. When the core is raised, the wedge c' is lifted above and separated from the contacts $c' c'$ and also above the angles or free ends of the springs $i i$, thus breaking the circuit through the coil and allowing the core and spindle to drop and again complete the circuit through the coil as before, when the operation is repeated, and continues to be repeated as long as the key or push-button in the circuit (not shown in the drawings) remains closed. In order to still more retard the movement of the core C' or to cause it to operate slowly, I may provide the core with a rotary brake. This brake consists of a wheel F, having a notched periphery resembling saw-teeth pivoted to a bracket F', mounted on the case, a weighted detent G pivoted intermediate its length engaging the periphery, and a pivoted tongue H, mounted on the lower end of the core and supported by a spring I, said tongue being adapted to engage with pins f'' , projecting from one side of the wheel. The teeth on the wheel and the end of the tongue H may be so shaped that the wheel will be turned in one direction only. The weight on the detent is made adjustable thereon to increase the friction. When the core is drawn upward, the tongue H slips by one of the pins, then returns to a horizontal position by means of the spring I, so that when it descends it strikes the pin and is retarded somewhat in its movement depending upon the pressure of the detent G upon the wheel. This device is illustrated in all of the figures.

Referring more particularly to Figs. 3, 4, and 5 of the drawings, it will be noticed that the circuit making and breaking device shown

differs somewhat from that above described. The spindle f , secured to the lower end of the core is square or irregularly shaped in cross-section and not round and is provided with an arm or pin k projecting from one side horizontally. In other words, the spindle has two widths or diameters s and s' . (See Fig. 4.) By means of this pin and an irregular slot or guide in a plate J, mounted on the base or case, the core and spindle is rotated slightly during both its ascent and descent. The spindle is oscillated first to one side and then to the other. The slot has two branches or paths, a right and left. In Fig. 3 the core, spindle and pin are shown in their lowest position. When the core is drawn upward the pin follows the right-hand path of the slot, which is straight and vertical for a distance and then turns to the left and enters the left-hand path, which is straight at its upper end and curved near its lower end turning to the right into the right-hand path. The shuttle-shaped piece of the plate J lying between the two paths is held supported in place rigidly by a pair of suitable yokes $l l'$.

$c' c'$ are the insulated stationary electric contacts arranged on opposite sides of the spindle f , so that the circuit through the coil will be completed between them when the spindle is turned so that it comes in contact with them, as clearly shown in Fig. 4. This is also the position of the spindle and pin k when they are in their lowest position, as shown in Fig. 3. The circuit being closed, the core, spindle and pin will ascend vertically without turning until it has nearly reached its highest point—that is, contact with the gong A. Just before this point is reached, the spindle is turned on its axis by the pin and curved slot, so that the circuit is broken between the contacts $c' c'$. The spindle being square, it will not bridge the distance between the contacts when the pin is moving in the left-hand branch of the slot. As soon as the gong is struck the core descends and the circuit remains broken until the pin is again forced to the right into the right-hand path, when the circuit is again closed as before, and the operation repeated.

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

1. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker connected to the lower end of said core, stationary contacts insulated from each other to engage the circuit maker and breaker, guides for the circuit maker and breaker, electrical connections between the supply conductors and the contacts, and a rotary break engaging the core, as set forth.

2. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker connected to the lower end of said core, stationary contacts insulated from each other to en-

gage the circuit maker and breaker, guides for the circuit maker and breaker, electrical connections between the supply conductors and the contacts, a wheel, a lever engaging the periphery and a tongue pivoted on the lower end of the core and provided with a spring, said tongue being adapted to engage the wheel, as and for the purpose described.

3. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker connected to the lower end of said core, stationary contacts insulated from each other to engage the circuit maker and breaker, guides for the circuit maker and breaker, electrical connections between the supply conductors and the contacts, a wheel having teeth in its periphery, a detent engaging the teeth and provided with an adjustable weight, a series of pins on one side of the wheel, a pivoted tongue on the lower end of the core to engage the pins, and a spring to support the tongue, as set forth.

4. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker secured to the lower end of said core and movable therewith, said circuit maker and breaker consisting of a straight rod having different widths, stationary contacts insulated from each other to engage the circuit maker, a pin projecting from one side of the said rod, and irregular guides for the pin to work in, to oscillate the said rod to cause it to open and close the circuit between the stationary contacts, as set forth.

5. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker secured to the lower end of said core and movable therewith said circuit maker and breaker consisting of a straight square rod in line with the core, stationary contacts insulated from each other and on opposite sides of the

rod to engage the rod, a pin projecting from one side of the said rod, and irregular guides for the pin to move in, to oscillate the said rod to cause it to alternately make and break contact with the stationary contacts, as set forth.

6. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker secured to the lower end of said core and movable therewith, said circuit maker and breaker consisting of a straight square rod, stationary contacts insulated from each other and on opposite sides of the rod to engage the sides of the rod, a pin on one side of the rod, and a plate mounted on the base parallel with the rod, and having an irregular slot therein with two branches for the pin to move in, substantially as described and shown.

7. The combination with the gong, the solenoid and the vertically movable core in the solenoid, of a circuit maker and breaker secured to the lower end of said core and movable therewith, said circuit maker and breaker consisting of a straight rod having different widths, stationary contacts insulated from each other to engage the circuit maker, a pin projecting from one side of the said rod, and irregular guides for the pin to work in, to oscillate the said rod to cause it to open and close the circuit between the stationary contacts, a wheel having teeth in its periphery, a detent engaging the teeth and provided with an adjustable weight, a series of pins on one side of the wheel, a pivoted tongue on the lower end of the core to engage the pins, and a spring to support the tongue substantially as described and shown.

In testimony whereof I have hereunto signed my name.

CHARLES B. STERLING. [L. s.]

Witnesses:

J. KENNEDY,

CHAS. D. DONOHUE.