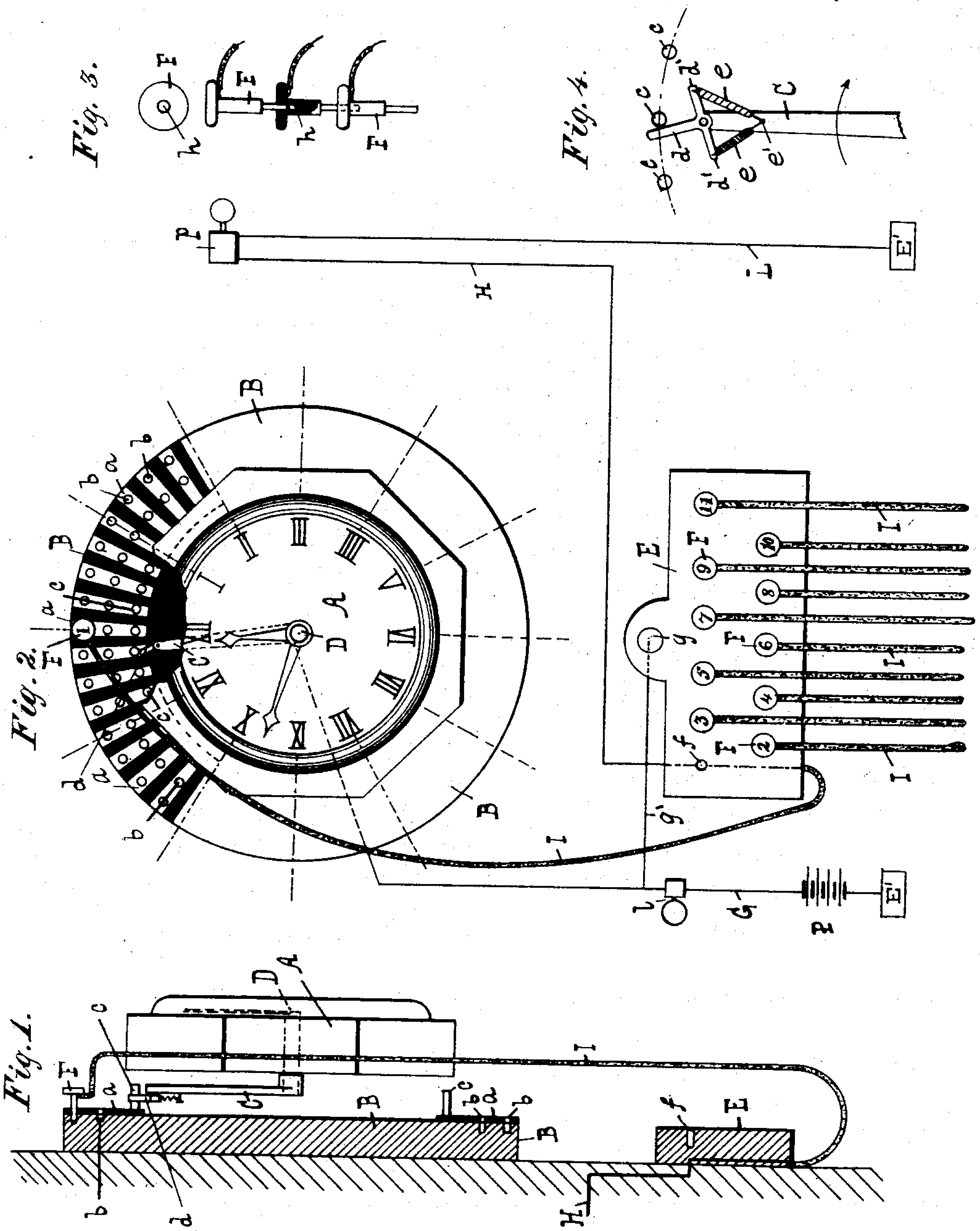
(No Model.) 2 Sheets—Sheet 1.

W. L. BAILIE & G. H. MILLS.

CHRONOMETER ELECTRIC CALL.

No. 344,072. Patented June 22, 1886.



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(No Model.) 2 Sheets—Sheet 2.

W. L. BAILIE & G. H. MILLS.

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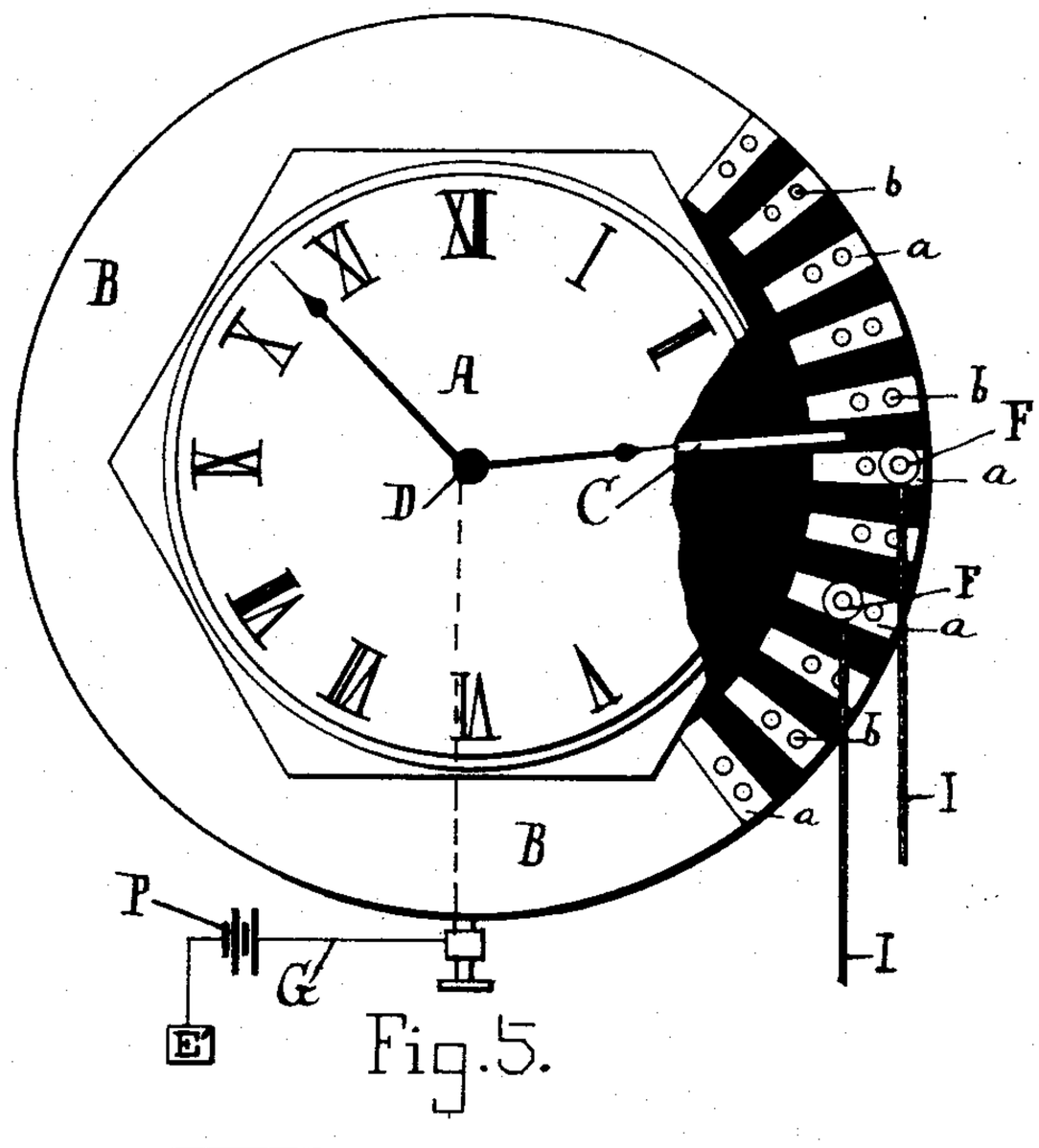

Fig. 5.

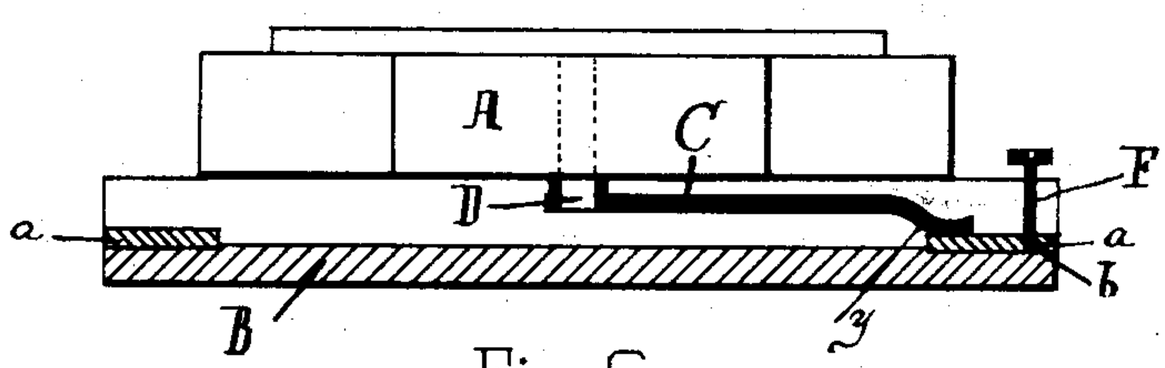

Fig. 6.

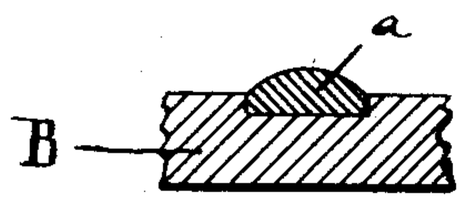

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM L. BAILIE AND GEORGE H. MILLS, OF BALTIMORE, MARYLAND.

CHRONOMETER ELECTRIC CALL.

SPECIFICATION forming part of Letters Patent No. 344,072, dated June 22, 1886.

Application filed March 12, 1886. Serial No. 195,032. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. BAILIE and GEORGE H. MILLS, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Chronometer Electric Calls, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to improvements in electro-calls governed by a chronometer, in which the electrodes of the circuit are connected at a prearranged time automatically, thereby closing the circuit and ringing the electro-bell in the same, as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of the plug and switch boards with the chronometer shown in full side elevation; Fig. 2, a front view of the chronometer, switch-board, plug-retaining board, and the general arrangement of the bells, wire, &c.; Fig. 3, detail views of the switch-plugs; Fig. 4, a detail view of the universal pawl-pins and the arm which communicates with the arbor. Fig. 5 is a front view of the chronometer and switch-board, with a portion of the chronometer removed, showing the arm constructed without the pawl. Fig. 6 is a sectional view through the switch-board, showing the bent form of the arm when no pawl is provided, with the chronometer shown in full plan. Fig. 7 is a section through a portion of the switch-board and one switch-plate, showing the curved form of the surface of the switch-plate.

Similar letters refer to similar parts through the several views.

The letter A designates the chronometer, which may be constructed on any of the well-known principles, with its casing formed circular or octagon, as shown, by which the connecting-plates *a* can be placed entirely around the same.

Concentric to and in the rear of the chronometer A is arranged the switch-board B, whose diameter is greater than the frame of the chronometer, thereby projecting beyond the same, and around the said projection the plates *a* are radially arranged.

The plates *a*, forming stationary electrodes, consist of any suitable electro-conducting material—such as brass, copper, &c.—with twelve of them placed on a line radially with each character of the chronometer, with three others intervening between each two of the twelve, thereby dividing the board B into twelve equal parts, which are subdivided into four, each representing the one-fourth of an hour. These plates are provided with one, two, or more holes, *b*, in which are inserted the switch-plugs F, and a pin, *c*, that projects sufficiently far to come in contact with the pawl *d* on the arm C, attached to the arbor D.

The arm C, forming a traveling electrode, is arranged between the face of the switch-board B and the rear of the chronometer, and attached to the arbor D in such a manner that it is always in line to coincide with the hour-hand, thereby rotating in unison with the same. To the end of the arm C is pivoted a universal pawl, *d*, provided with two right-angle arms, *d'*, which are attached to one end of the spring *e*, the other end of the said spring *e* being attached to the arm C at *e'*, thus permitting the arm C to bring the pawl *d* in contact with the pin *c* as it rotates, and to pass thereby in either direction, and also to hold the pawl and pin in contact several moments, which closes the circuit during that period and continuously rings the bell in the circuit likewise.

The retaining-plug board E is located in close proximity to the chronometer, preferably below the same, and is provided with the holes *f*, in which the switch-plugs F are placed when not in communication with the plates *a*. To the upper part of the board E is arranged the general-call plate *g*, which is connected to the main circuit by the wire *g'*, the function of the said plate and connection being to communicate with the guest's chamber independent of the chronometer by placing one of the plugs F in contact therewith, which completes the circuit by way of the ground E' and wires G, I, H, and L, which are used in case the guest does not promptly respond to the automatic call by signaling through the ordinary annunciator.

The switch-plugs F are constructed to fit one in the other by having the end of their shank of a size to coincide with the hole *h*, formed in the top of each slug, the same being devised to permit several calls to be made at the same time, which may be multiplied as

desired, and in case an exceptionally large number of calls are to be made the second row of holes, *b*, in the plates *a* can be utilized. To the said pins are secured one end of the insulated flexible conductors I, with their other end attached to the wires H at the retaining-plug board E, which permits the pins F to be moved to and from the plates *a* on the board B.

As shown in Fig. 2, the plan is complete with one room, and as all the other room-connections are the same a duplication is unnecessary. In the said view the letter P designates the battery located in the line-wire G, which runs and is connected with the metallic works of the chronometer, thereby conveying the current to the arm C through the same, from which it passes to the plates *a*, when they are connected to the conductor I, which leads through the retaining-plug board E to the room-wire H, that connects with the bell *p*, and runs to the ground E′ by way of the wire L, and as one side of the battery-wire is also connected to the ground the circuit is complete when the arm C places the pawl *d* in contact with the pin *c* on the plate *a*, which is connected with room 1 by the flexible conductor, thus ringing the bell *p* in room 1 as long as the pawl *d* and pin *c* are in contact.

To the wire G is connected the bell *l*, which when the circuit is made rings, thereby notifying the attendant in the office that a guest is being called, so that he may look for the return-signal through the ordinary annunciator.

The operation is as follows: Supposing the guest of room No. 1 wishes to be called at twelve o'clock, the plug of that number is removed from the board E and placed in one of the holes *b* in the plate *a*, as shown in Fig. 2, that is in line with 12 on the face of the chronometer. Then when the arm C, moving in unison with the hour-hand, places the pawl *d* in contact with the pin *c*, the electro-circuit is made through the wires G, I, H, and L, which operates the bell *p* in the room and wakens the guest, who signals through the annunciator that he has received the call. In case the guest does not respond the attendant removes the plug and calls again by placing it against the plate *g*, which also rings the bell *p*, which if not answered indicates that the guest requires personal attention. In case the call is to be made at one-quarter, one half, or three-quarters of the hour, the plugs are placed in the hole *b* of the intervening plates.

As here shown, the switch-board is arranged to call the hours and quarters thereof; but by placing a larger number of the intervening plates *a* the call can be made at any fraction of the hour.

It is obvious that the pawl *d* and pins *c* may be dispensed with, and the ordinary sliding contact used instead thereof, as illustrated in Figs. 5, 6, and 7, wherein the arm C terminates in the bent form *y*, Fig. 6, and in its movement makes contact by friction with the plates *a*, the exposed surface of the switch-plate *a* being curved, as represented in Fig. 7, to permit the passage of the arm C; but we prefer the pawl, as the friction is less.

Having described our invention, what we claim, and wish to secure by United States Letters Patent, is—

1. In an electro-circuit, the combination of a chronometer, A, with its center arbor extended rearward, the arm C, provided with the pawl *d*, the switch-plates *a*, provided with the contact-pins *c*, and mounted upon some insulating material, B, the switch-plugs F, and the bell *p*, for the purpose set forth.

2. In an electro-circuit, the combination of a chronometer, A, with its center arbor extended rearward, the arm C, the switch-plates *a*, mounted upon some insulating material, B, the switch-plugs F, and the bell *p*, for the purpose set forth.

3. In an electro-circuit, the combination of a chronometer, A, with its center arbor extended, the arm C, the switch-plates *a*, provided with the contact-pins *c*, and mounted upon some insulating material, B, the switch-plugs F, and the bell *p*, for the purpose set forth.

4. In an electro-circuit, the combination of a chronometer, A, provided with a traveling electrode, the plates *a*, mounted upon some insulating material, the switch-plugs F, provided with a pocket or opening, *h*, for the purpose of piling the said plugs and dividing the electric current, and the bell *p*, for the purpose set forth.

5. In an electro circuit, the combination of a chronometer, A, with its center arbor extended rearward, the arm C, arranged to engage with the plates *a*, the plates *a* radially arranged around the chronometer A and provided with the plug-holes *b* for the plugs F, and the call-bell *p*, for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM L. BAILIE.
GEORGE H. MILLS.

Witnesses:
G. A. BOYDEN,
JNO. T. MADDOX.