

(No Model.)

D. F. SWEET.
PRIMARY ELECTRIC CLOCK.

No. 284,578.

Patented Sept. 4, 1883.

Fig. 1.

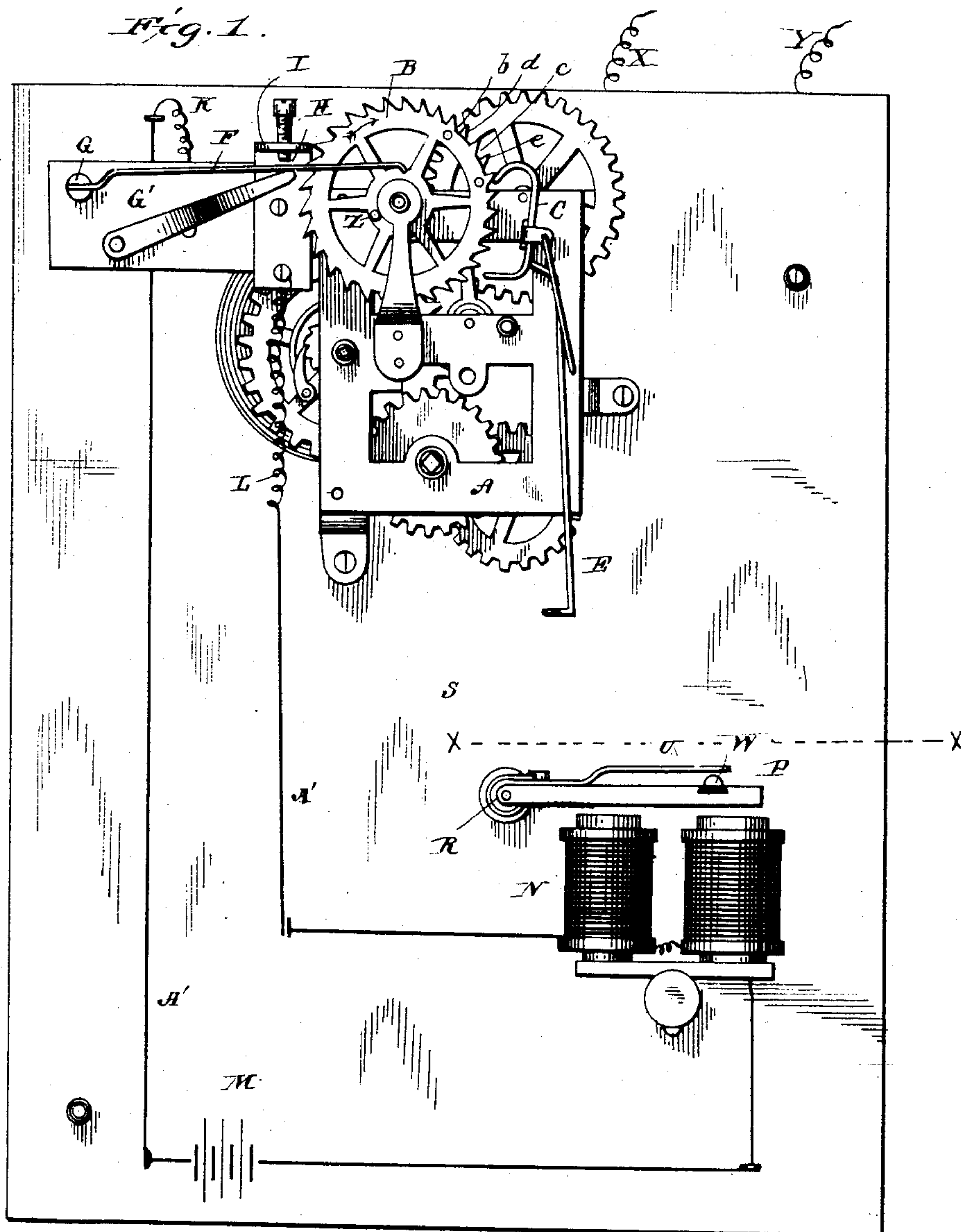


Fig. 3.

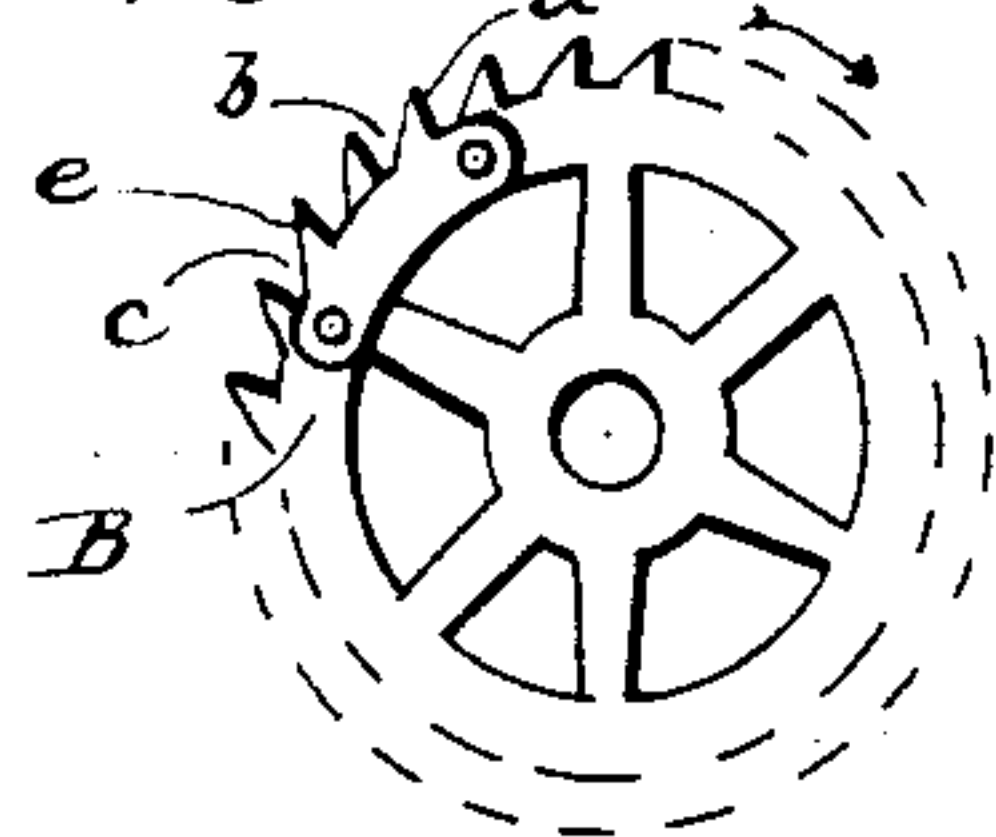


Fig. 4.

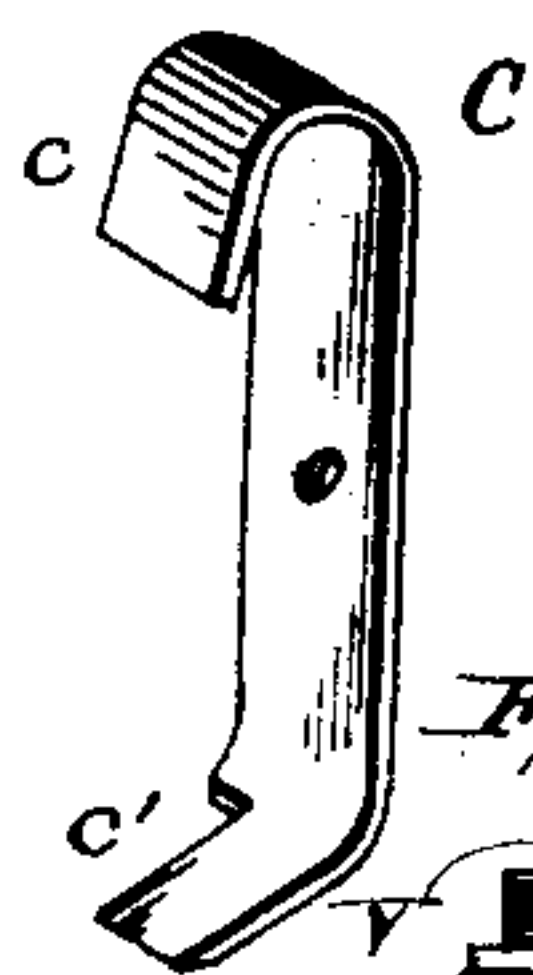


Fig. 2.

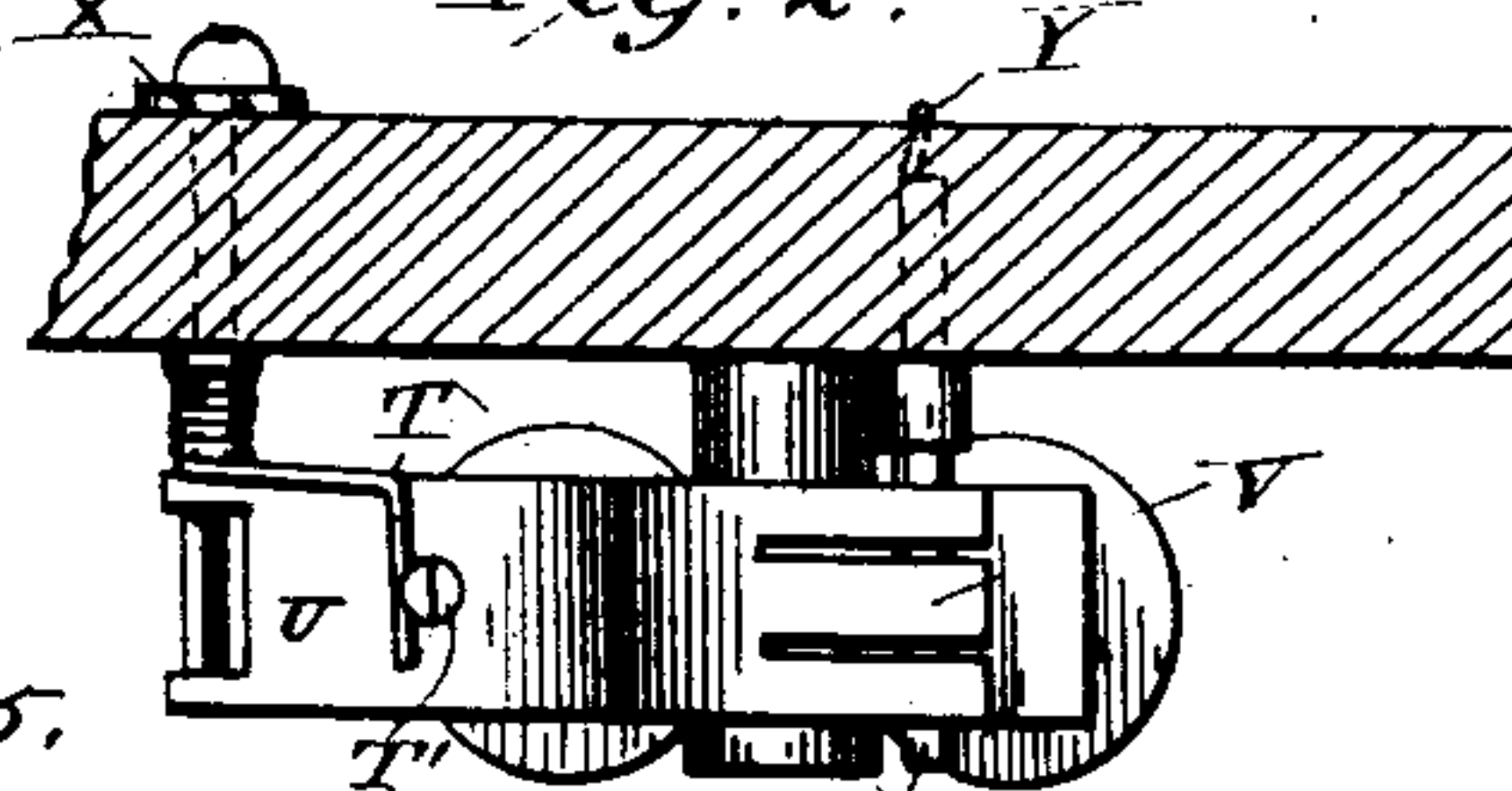
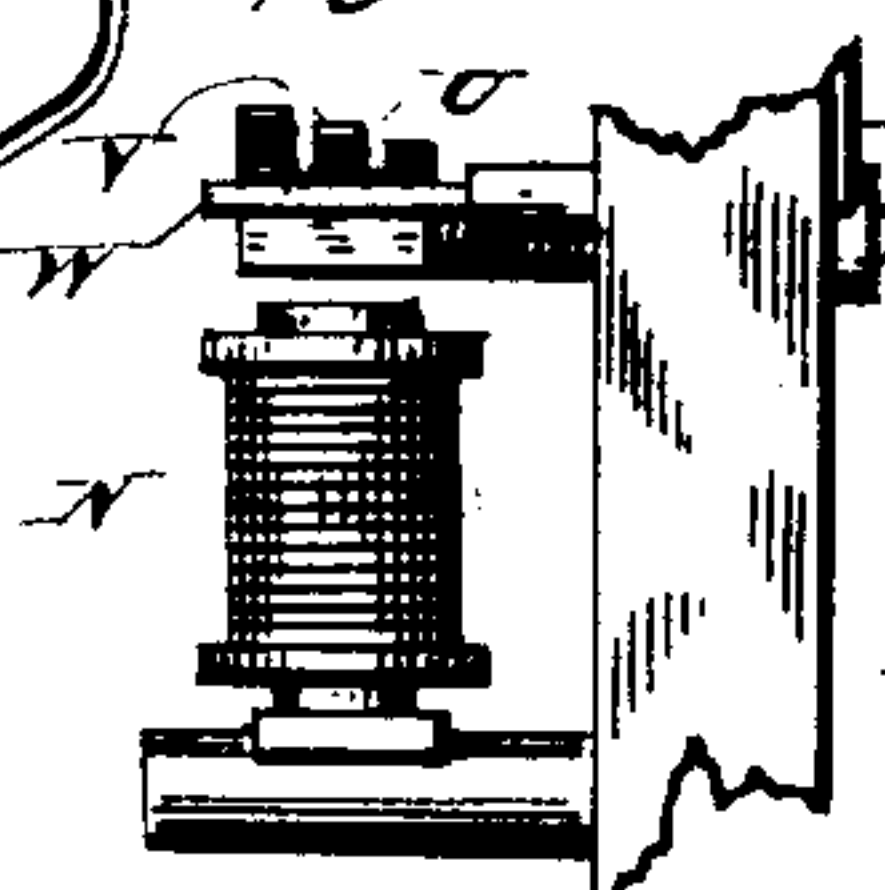


Fig. 5.



Witnesses.

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PRIMARY ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 284,578, dated September 4, 1883.

Application filed April 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, D. FRED SWEET, a citizen of the United States, residing at Hastings, in the county of Barry and State of Michigan, have invented certain new and useful Improvements in Primary Electric Clocks, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain improvements in primary electric clocks and transmitters; and it has for its objects, first, to so construct the escapement-wheel that it will skip a tooth during its rotation, leaving the
15 clock-movement free to overcome the resistance of the circuit making and breaking spring; second, to give distance of motion sufficient to insure perfect contact and prevent a double make and break by the escapement-wheel being moved back by the motion of the pendulum; third, to provide for a second skip of the escapement-wheel, so as to give a good and quick clearance when the circuit is opened; and, fourth, to provide for the employment of
25 a light battery in connection with the primary clock, in a local circuit, to operate an electro-magnet, and a secondary circuit maker and breaker to send the necessary impulses through the line-circuit, thereby reducing the spark at
30 the contact maker and breaker of the primary clock, and the consequent injury at such points. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of my
35 improved primary clock and transmitter; Fig. 2, a horizontal sectional view on the line xx of Fig. 1; Fig. 3, a back view of the escapement-wheel detached; Fig. 4, a perspective view of the escapement-pallets. Fig. 5 represents an
40 edge view of a portion of the apparatus, showing the three-fingered contact maker and breaker.

The letter A indicates the frame of the clock, and B the escapement-wheel, which has
45 two notches or teeth removed, as indicated by the letters $b\ c$, and at one side of said removed teeth, the wheel has secured to it two teeth, $d\ e$. The main movements of the clock are of the ordinary or any approved description, and drive the pallet-lever C, which is mounted
50 in the usual manner, and has secured to it the pendulum-actuating rod E, as shown in Fig.

1. The upper pallet, c , is double the width of the lower pallet, c' , for the purpose more fully hereinafter described. The escapement-wheel, 55 on its outer face, near the center, is provided with a projection, the object of which is to lift and drop the contact-making spring F, which is secured to a post, G, attached to an extension, G' , fastened to the frame of the clock- 60 work. Below said spring sits one end of a metallic arm, also secured to said extension, which serves as a stop to limit the downward movement of the spring.

The letter H indicates a contact-point secured to the lower end of a set-screw passing 65 through a bracket, I, which is secured by an insulating-connection to the extension G' , before mentioned. The said spring and contact-point serve to make and break an electric circuit through the wires K and L, secured at 70 their ends, respectively, to the extension and bracket before mentioned, the battery M having its poles connected with said wire and the helices of an electro-magnet, N, as shown 75 in Fig. 1 of the drawings.

The letter P indicates the armature of the said magnet, which is pivoted at one end to a post, R, secured to the supporting-wall S of the clock in such position that said armature 80 may vibrate freely over the poles of said magnet. The said armature is held normally away from the magnet by means of a coiled spring setting around the post and secured to it at one end, the other end of said spring being 85 formed with a right-angled bend, T, which is clamped to a transmitting contact maker and breaker and the armature by means of a screw, T' , so as to form a perfect electrical connection. The said contact maker and 90 breaker consists of a bent metallic plate, U, which is formed with a series of spring-fingers, V. Between said contact maker and breaker and the armature extends a metallic post, W, which is secured to the supporting- 95 wall of the clock. The distance between the said contact maker and breaker and the armature at their separated ends is such as to permit the armature to vibrate and alternately bring the contact maker and breaker into and 100 out of contact with the post W, before mentioned. The armature directly under the said post is provided with a strip of insulating material to prevent the current from circuiting

at such point when the armature is in a normal position. The post to which the armature is pivoted is connected with one end of a wire, X, forming part of a secondary or line circuit, and the post W with a wire, Y, forming part of the same circuit, in which is included any desired number of secondary clocks and a battery powerful enough to give the impulses to the same.

It will appear that by the above-mentioned construction, the escapement-wheel having two teeth taken out and set off at one side and the pallets formed of unequal widths, the wheel will be permitted to skip a tooth at one point in its revolution—that is, as the pin Z is passing the contact making and breaking spring F—leaving the clock-movement free to overcome the resistance of the circuit make and break spring, and also to get sufficient distance of motion to insure perfect contact and prevent a double make and break by the backward movement of the escapement, which is caused by the excess of motion of the pendulum. It will also be perceived that directly after the first skip a second skip of the wheel is permitted, which gives a free and rapid clearance when the circuit is to be opened.

The primary circuit maker and breaker is to be used in a local circuit of its own, as indicated, the object being to enable the use of a very light battery, thereby obviating the heavy spark attendant upon the employment of a heavy battery, which would soon injure the contacts.

The three fingers of the secondary circuit maker and breaker insure the proper contact in the main or line circuit, in which a large battery has necessarily to be employed, according to the number of secondary clocks in the line. With such battery in the circuit a very large spark would be produced with a single contact make and break, which would soon oxidize the contacts, so that the circuit would soon be interrupted. As constructed, however, the fingers of the secondary contact maker and breaker, when brought into contact with the post, are pressed against it with a rubbing motion, the fingers varying slightly in their horizontal planes. As the current is broken by the last portion of the contacts, the

circuit will be broken by the finger that last leaves the post, so that when one contact becomes oxidized the other two are unaffected, and the contact will be made by the next in turn, and when that becomes oxidized the contact will be made by the third, thus permitting the first finger, by the rubbing action, to clear off the oxidation and make the circuit anew when the other contacts become oxidized, thus enabling the contact maker and breaker to automatically regulate itself, so as to insure a perfect make and break for an indefinite time.

The operation of my invention is as follows: The primary clock being put in motion, at each revolution of the escapement-wheel the spring will be lifted by the pin Z touching the contact-maker F and establishing a current through the wires A', battery M, and the helices of the magnet N. This attracts the armature, so that the spring U comes in contact with the post W, establishing a current through the line-wires X Y and the secondary clocks and a battery of suitable power.

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

1. The combination, in a primary electric clock, of the escapement-wheel having two of the teeth cut away and offset teeth at one side, and the pallet-lever having pallets of unequal width, whereby the escapement-wheel is permitted to skip during its revolution, substantially as and for the purposes specified.

2. The combination, with the escapement-wheel having two of the teeth cut away and the pallet-lever having pallets of unequal width, of the projection on the escapement-wheel, the spring contact maker and breaker, the contact-point, and the circuit-wires connected with a suitable battery, and an electromagnet adapted to operate a secondary circuit maker and breaker, substantially as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

D. FRED SWEET.

Witnesses:

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