

(No Model.)

2 Sheets—Sheet 1.

C. A. JACKSON.

MEANS FOR OPERATING SECONDARY CLOCKS.

No. 301,601.

Patented July 8, 1884.

Fig. 1

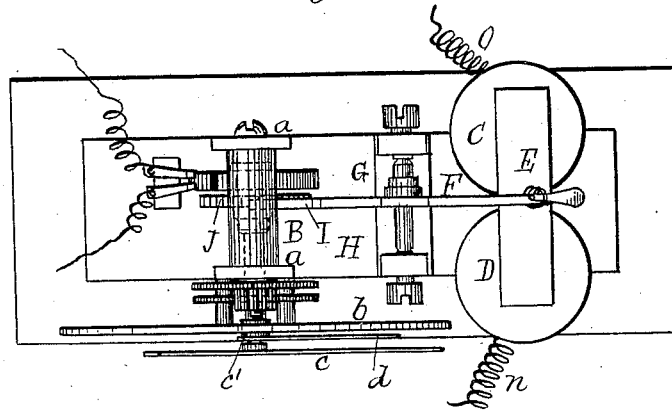
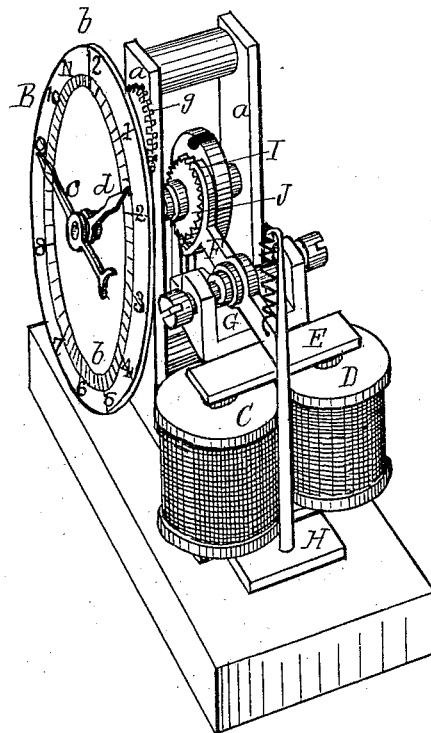


Fig. 4



Witnesses.
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Fig. 2

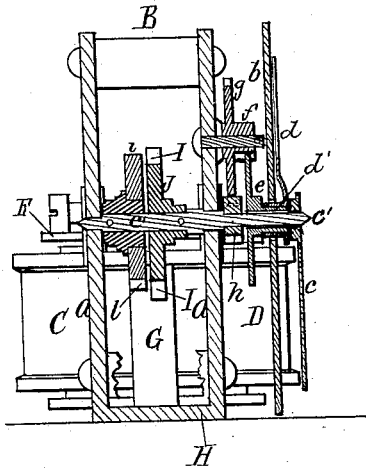


Fig. 3

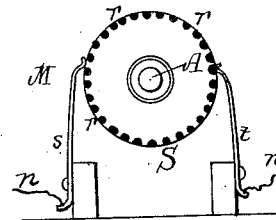
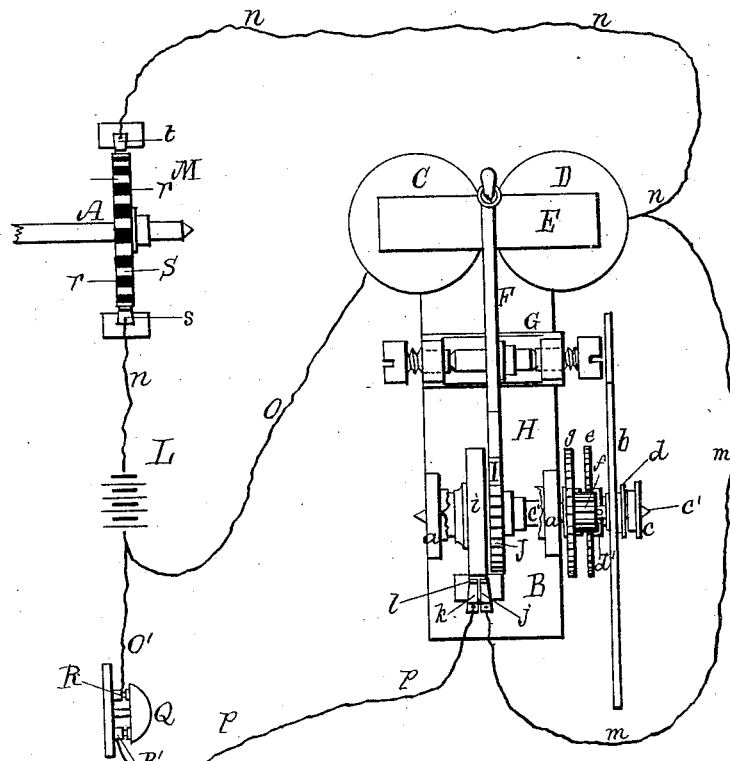


Fig. 5



Witnesses.

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UNITED STATES PATENT OFFICE.

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MEANS FOR OPERATING SECONDARY CLOCKS.

SPECIFICATION forming part of Letters Patent No. 301,601, dated July 8, 1884.

Application filed September 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ALMON JACKSON, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Electric Clocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to means for operating one or more clocks through the interposition of an electro-magnet and armature operating a propelling-escapement of the secondary clock through the influence of a circuit-breaker which governs said armature, and is itself driven by the pulsations of the standard clock by the same battery-power which operates the said escapement.

The drawings accompanying this specification represent, in Figure 1, a plan, and in Fig. 2, a cross-section, of a device embodying my invention. Fig. 3 is a view of the circuit-breaker or commutator. Fig. 4 is an isometric elevation of the device. Fig. 5 is a plan showing the connections with the bell and battery.

In the above-named drawings, A represents the minute-hand arbor of a standard or main clock from which motion is to be communicated to a series of clocks in different localities, the aim of my invention being to maintain uniform time throughout a town, city, or other locality by operating all its clocks from such standard.

B in the drawings represents a clock of any desired character, which is one of a series to be operated from the standard, the frame of this clock B being shown at *a a*, its dial at *b*, its minute-hand at *c*, its minute-hand arbor at *c'*, its hour-hand at *d*, and its arbor at *d'*, while the usual train of wheels is shown at *e f g h*.

To carry out the principle of my invention in one form of application I proceed as follows: In close proximity to the clock B, I locate a pair of electro-magnets, C D, over which

is placed a horizontal armature, E, secured to the rear end of a horizontal oscillating armature-lever, F, and lifted by a spring suitably located, the lever F being pivoted practically at its center to an upright post, G, erected upon the tablet or base-plate H of the clock. The front end of the lever F is formed into an anchor, I, with pallets, which take into a scape-wheel, J, fixed to the minute-hand arbor *c'*. Vibrations of the armature E impart intermittent rotations of the minute-hand and its arbor, as well as of the hour-hand and its arbor, the usual dial-train of gearing being used to transmit motion from the arbor of the minute-hand to the hour-hand arbor sleeved thereon.

To the minute-hand arbor *c'*, I secure a circular disk or commutator, *i*, and in front of this commutator I erect upon the base-plate of the clock two plate-springs, *j k*, the free ends of which bear upon the periphery of the said commutator *i*. The commutator is composed of hard rubber or other effective insulating material, and has let into its periphery a block or tooth, *l*, of suitable conducting material.

To the spring *j* is connected one end of a wire, *m*, whose opposite end connects with the wire *n* from the positive pole of an electric battery, L, such wire *n*, after leaving the battery, being intercepted by a circuit-breaker, which is shown at M, and thence passing to the magnet D.

O in the drawings represents a wire from the negative pole of the battery L as connecting with the magnet C, and having a branch wire, O', connecting to one of the binding-posts, P, of an electric bell, which is shown at Q. To the other binding-post, R, of the bell one end of a wire, *p*, is connected, the opposite end of such wire connecting with the spring *k*, before named.

The clock B, as herein arranged, indicates time by impulses of a minute each by the minute-hand, as such hand is operated by power transmitted from the minute-hand of the standard clock.

If it is desired to mark seconds of time, the circuit-breaker will be connected with the pendulum of the standard clock. I employ in the present instance a circuit-breaker secured to

and rotating with the minute-hand arbor A of the standard clock, composed of a circular disk, S, of conducting material, into the periphery of which are inserted a series of non-conducting blocks, *r r*, &c., while upon opposite sides of the said disk S, I erect springs *s t*, the free ends of which bear upon the periphery of the disk. The springs *s t* are so arranged that they both bear on the conducting part of the periphery, thus closing the circuit during a part of the time, while the disk S is rotating a distance equal to the interval between each proximate two blocks, *r*, but one of them passes to or is made to be in contact with one of said blocks, thus breaking the circuit before the other spring is out of contact with the conducting part of the periphery. Thus the circuit is alternately made and broken. Both springs might be made to pass at once to and from the blocks *r*; but in that case the periods during which the circuit would be open could not be so long, relatively, as in the arrangement first described. The wire *n* from the positive pole, after leaving the battery, connects, first, with the spring *s*, then is intercepted by the commutator M, and connects the spring *t* with the magnet D. The non-conducting blocks *r* of the circuit-breaker S are equidistant, and sixty in number, to correspond to the number of minutes in an hour.

The operation of the above-described construction of parts is as follows: Each beat of the minute-hand of the standard clock, or the passage of such hand past a given point at each minute of time, imparts a like movement to the minute-hand arbor of the clock B by means of the armature E, escapement I, and scape-wheel J, the armature being attracted at each closure of the circuit through the disk S and the wires *n O*. These movements of the minute-hand of the clock B continue synchronously with those of the standard clock until the hour-hand of such clock B arrives at the next succeeding hour-division of its dial, when the conducting tooth or space *l* of the commutator *i* wipes against the springs *j k* and closes the circuit of the battery through the wires *n, m, p*, and *Q* and negative pole *O*, thereby ringing the bell. As the non-conducting division *l* of the commutator *i* passes by the springs *j k*, the circuit through the bell is broken, not to be again closed until at the lapse of an hour, the minute-hand continuing its movements at all times.

I do not confine myself to the form of commutator shown in Figs. 1 and 3 of the draw-

ings, as this may be varied from to a considerable extent without departing from the scope of my invention in this particular—as, for instance, the non-conducting block or division *l*, in lieu of being let into the periphery of the disk, may be inserted in each side of such disk and the springs arranged to bear respectively upon these blocks. Nor do I restrict myself to the precise form of circuit-breaker herein shown, as it is obvious that various forms may be employed without losing sight of the gist of my invention in this regard, which I consider to consist in the combination, with a primary or standard clock and an auxiliary or secondary clock, and an escapement and wheel device, such clock operated by the armature of an electro-magnet, of a suitable circuit-breaker, by means of which the impulses of the primary clock are transmitted to the armature and escapement of the secondary clock.

I claim—

1. A rotating circuit closer and breaker carried by a hand-arbor of a standard clock, in combination with an electro-magnet in the same circuit, devices operated by said electro-magnet to give a corresponding motion to the corresponding arbor of a secondary clock, a circuit breaking and closing disk carried by the latter arbor and operating to shunt the circuit at regular intervals, and an alarm actuated by the said shunt-circuit, substantially as set forth.

2. The rotary circular circuit closer and breaker S, provided with non-conducting blocks *r* in its periphery, in combination with the springs *s t*, wiping against said periphery, said springs being arranged to bear simultaneously for a moment against the conducting parts of the disk, though one spring is in contact with block *r* before the other leaves said conducting part, an electro-magnet included in the same electric circuit with said device S, a hand-arbor of a standard or main clock, to which arbor said device S is attached and with which it turns, and devices which are operated by said electro-magnet at intervals depending on the breaking and closing of said circuit, to cause a similar motion of the corresponding arbor of a secondary clock, substantially as set forth.

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

CHARLES ALMON JACKSON.

Witnesses:

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A. F. HAYDEN.