

G. LUND.
Electric Clock-Regulator.

No. 210,133.

Patented Nov. 19, 1878.

Fig. 1.

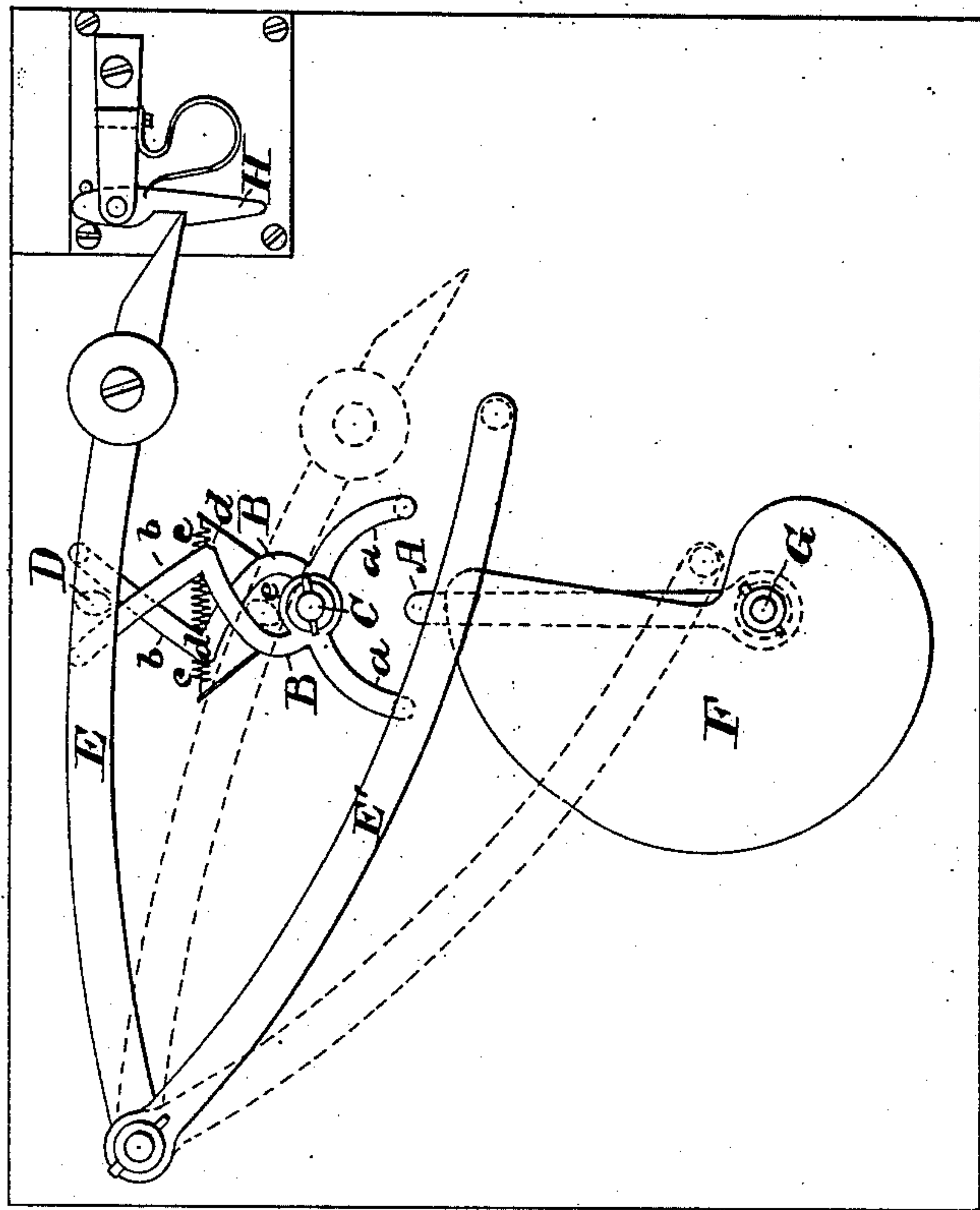
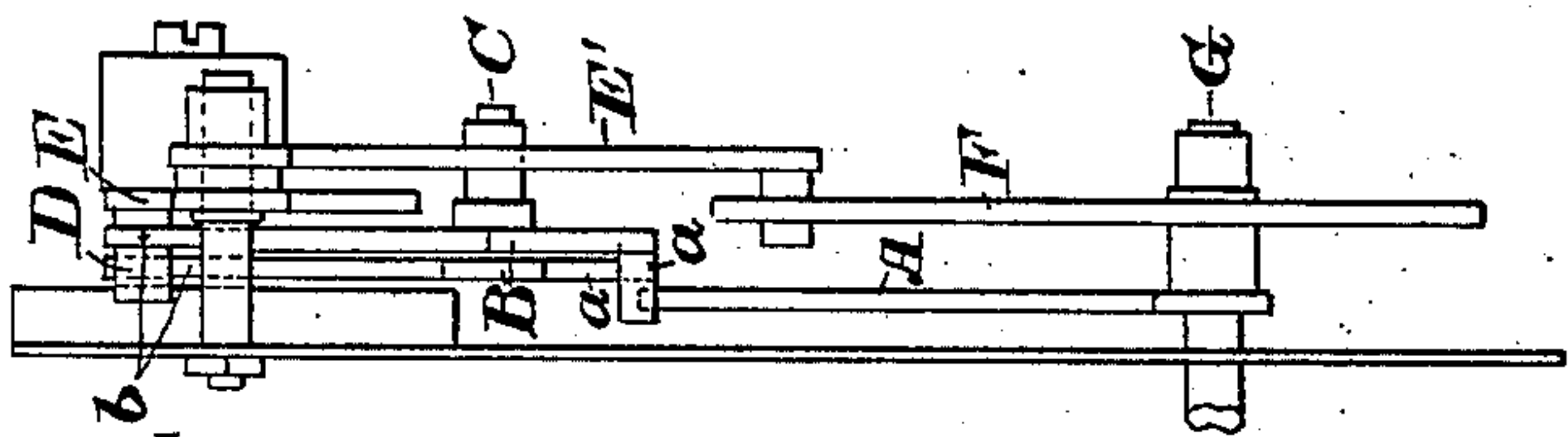


Fig. 2.



ATTEST.

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GEORGE LUND, OF LONDON, ENGLAND, ASSIGNOR TO JOHN ALEXANDER LUND, OF SAME PLACE.

IMPROVEMENT IN ELECTRIC-CLOCK REGULATORS.

Specification forming part of Letters Patent No. **210,133**, dated November 19, 1878; application filed July 22, 1878; patented in England, July 15, 1877.

To all whom it may concern:

Be it known that I, GEORGE LUND, of London, England, have invented certain Improvements in Apparatus for Synchronizing Clocks and other Time-Pieces, of which the following is a specification:

My invention relates to apparatus for synchronizing clocks or other time-pieces or frequently setting them to equal or standard time, in which one of the hands or other moving part, when it reaches a certain point in its travel, say every hour, is acted upon by a pair of setting-levers, which approach each other and move the hand (if it is either fast or slow) to the position of correct time, the levers being operated electrically from a primary or standard time-keeper.

My present invention consists of an improved apparatus for this purpose, in which the said setting-levers are, in addition to the arms which clasp the clock-hand, provided with cam-arms, which present their opposed faces to the action of a pin or projection moving between them, all parts being so arranged that as the said pin or projection approaches the fulcrum of the levers the cam-arms are parted, and the clasping-arms are consequently caused to embrace the clock-hand; also, in a weighted lever bearing said pin, raised by the action of the clock-work, sustained when raised by a suitable catch, and dropped to actuate the setting-levers by electrically withdrawing the catch; also, in certain details of construction, all as will be more fully hereinafter set forth.

In the drawings my apparatus is shown in rear elevation in Figure 1 and in side elevation in Fig. 2.

Let A represent either the minute-hand of the clock, or a false minute-hand, or the counterpoise of the minute-hand, or other moving part which may be operated upon to set the clock. BB are the setting-levers, pivoted upon a stud, C, placed opposite the position of the hand A when it is at the end of each hour or other interval of time at which it is desired to correct the clock.

The arms *a a* of the levers B B are provided at their ends with pins or projections, between which to embrace the hand A in setting it, and their other arms, *b b*, are bent or shaped

in zigzag form, or so as to present their approaching faces, in the manner of cams, to the action of a pin or projection, D. A spring, *e*, is arranged to keep the levers B B normally open or their arms *a a* separated.

The pin D may be operated directly by, or be attached to, the armature of an electro-magnet, if desired; but I prefer to mount it, as shown, on a weighted lever, E, arranged to be lifted by the action of the clock-work and dropped to operate the levers B B by the action of an electro-magnet.

To raise the lever E, I provide a cam or snail, F, mounted on and operated by some revolving shaft or spindle, G, and acting on the arm or tail E' of the lever, or on some intermediate part. When sufficiently raised the lever E is caught and retained by a spring-catch, H, which may be retracted to release the lever by the action of an electro-magnet.

The operation is as follows: Assuming that the clock is to be set or synchronized at the end of each hour, and that, as shown, a dummy or set-hand is operated upon, connected with the minute-hand. About five minutes before the end of the hour the lever E is raised to its full height by the cam F, and is there held by the catch H. At the exact completion of the hour, when the hand A stands nearly midway between the levers B B, a current of electricity is sent from the regulator or standard clock, which, acting through an electro-magnet, draws back the catch H and releases the lever E, which falls into the position shown by the dotted lines in Fig. 1. As the lever falls the pin D acts upon the zigzag arms *b b* of the levers B B, first separating them, thereby bringing together the arms *a a*, and then, having passed the points *d d*, drops into the open space *e*, thus permitting the arms *a a* to spring apart. As the arms *a a* come together they move the hand A, if it has deviated any from the correct time, exactly to the hour-point, and then separating, as described, leave it free to continue its motion.

In returning, the pin D must again close the arms *a a*; but by arranging that the cam shall not commence to act until about five minutes after the hour, the hand will have moved sufficiently to clear them.

If desired that the arms *a a* shall dwell or rest for a short time while embracing the hand A, the points *d d* may be formed with straight faces for a short distance.

The lever E may work from below, and be operated by a spring in lieu of a weight, if desired.

In small clocks, or those in which the pin D is operated directly by the armature of the magnet, the zigzag of the arms *b b*, forming the points *d d* and space *e*, is omitted, and the pin effects its return motion at once, thus leaving the levers free to open.

In lieu of providing the ends of the arms *a a* with pins or projections for embracing the hand A, these arms may embrace a pin on the hand.

I claim as my invention—

1. A device for synchronizing clocks, consisting of the levers B B, fulcrumed at C, having arms *a a*, for setting the hand, and cam-arms *b b*, which present their opposed faces to the action of a pin or projection, D, moving between them, all so arranged that as said pin or projection approaches the fulcrum C the arms *b b* are parted and the arms *a a* caused to embrace the hand A, substantially as set forth.

2. The levers B B, having arms *a a*, adapted

to embrace the hand A, and arms *b b*, so shaped that as the pin D is moved between them toward their fulcrum it first causes the arms *a a* to approach each other, and then permits them to spring apart, substantially as and for the purposes set forth.

3. The weighted lever E, bearing the pin D, sustained when raised by a suitable catch, and when released adapted to actuate in its fall the levers B B through the medium of its pin D, substantially as set forth.

4. The combination of the hand A, levers B B, constructed substantially as set forth, their operating-pin D, weighted lever E, cam F, and catch H, arranged and operating together to form a synchronizing attachment for clocks, substantially as shown and described.

In witness whereof I, the said GEORGE LUND, have hereunto set my hand this 13th day of March, 1878.

GEORGE LUND.

Witnesses:

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