(No Model.)

C. BOHMEYER.

SECONDARY ELECTRIC CLOCK MOVEMENT.

No. 386,103. Patented July 17, 1888.

Fig 1

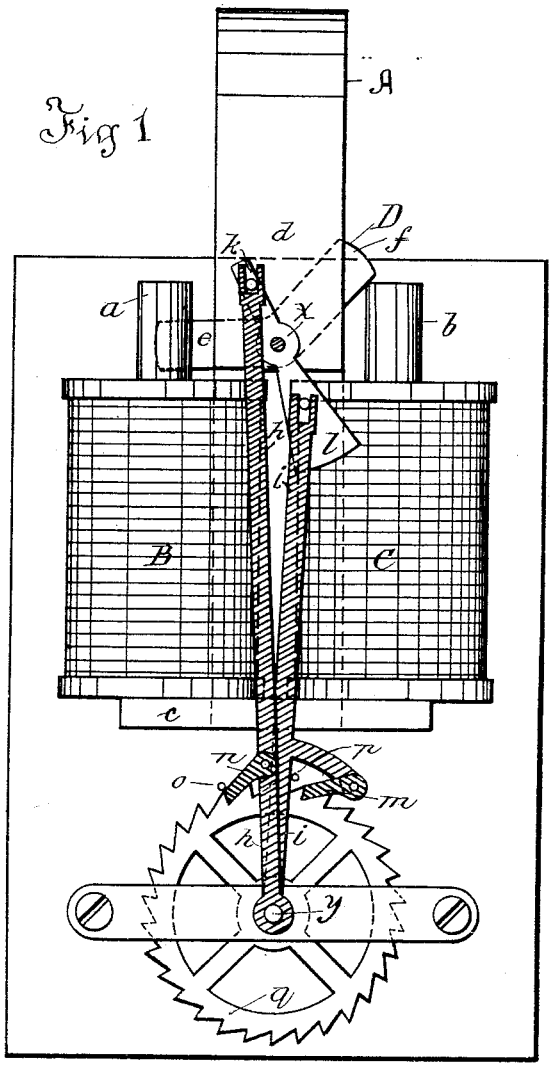
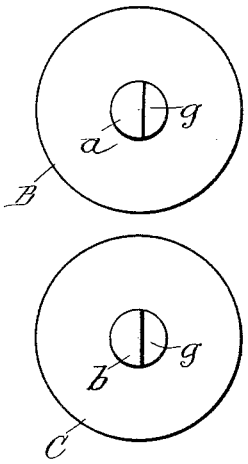


Fig 2



Witnesses.
W. Waddell
Z. A. Rae.

Inventor.
Carl Bohmeyer,
by W. Waddell
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UNITED STATES PATENT OFFICE.

CARL BOHMEYER, OF HALLE-ON-THE SAALE, PRUSSIA, GERMANY.

SECONDARY ELECTRIC-CLOCK MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 386,103, dated July 17, 1888.

Application filed February 20, 1888. Serial No. 264,690. (No model.) Patented in Germany July 12, 1887, No. 42,183.

To all whom it may concern:

Be it known that I, CARL BOHMEYER, a subject of the Emperor of Germany, and a resident of Halle-on-the Saale, Prussia, Germany, have invented a new and useful Improvement in Electric Clocks, (for which I have obtained patent in Germany, dated July 12, 1887, No. 42,183,) of which the following is a specification.

This invention relates to clocks in which the hand or hands are moved by mechanism set in action by periodical electric currents; and the object of the invention is an improved mechanism in which the shafts of the hands are moved by levers operated by an armature so placed as to exercise great leverage while requiring but a feeble current for actuating it.

Referring to the accompanying drawings, Figure 1 is an elevational view of the mechanism as seen from the rear. Fig. 2 is a plan view of the electro-magnetic poles, showing the construction or shaping of the ends of the cores.

A is a permanent magnet broadened at one end to form a plate, *c*. On said plate are fastened by one end the cores *a b*, carrying the coils B C. Said cores extend upward toward the opposite pole, *d*, of the permanent magnet A, and to this pole is pivoted a two-armed armature, D. The cores *a b*, being in connection with one end of the permanent magnet, become themselves magnetic, their upper poles being alike and contrary to the polarity of the armature *e f*, by reason of the connection of the latter with the opposite pole, *d*, of the permanent magnet.

The upper extremities of the cores *a b* project a convenient distance above their coils, and are cut away or recessed on one side, as *g*, for a convenient depth, as shown in Fig. 2, so that the respective wings *e f* of the armature D may pass before the standing parts of the cores *a b*, and thus the attraction of the respective core upon the armature be exercised through a longer distance, this being necessary or advantageous by reason of the distance of the armature from the shaft of the hand, and the longer travel therefore necessary to be given to the armature. On the shaft *x* of the armature D are two levers, *k l*, so placed that when the armature is in an intermediate position before the poles of the cores *a b* said levers may stand aligned with the line connecting the centers of the shafts *x* and *y*, the one lever, *k*, being directed away from shaft *y*, the second lever, *l*, directed toward said shaft. The shaft *x* may be weighted to normally stand in this position. In the drawings the lever *l* carries a slight preponderance of weight for this purpose. This is not, however, essential to the mechanism. On the levers *k* and *l* are pins engaging in the slots at the respective ends of the forked levers *h i*, pivoted loosely on the shaft *y* of the minute-hand. On the said shaft is a ratchet-wheel, *q*, and on the said levers *h i* are pawls *n m*, respectively, engaging one behind the other in the teeth of the said ratchet. A train of wheels (not shown) of the usual nature drive the hour-hand, if there be one, from the minute-shaft *y*. Above the pawls *n m* are pins *o p*, whereby the engagement of the pawls with the teeth is assured. The coils B C are so wound that a current passing through them in the one or other direction forms of the cores *a* and *b* and base-plate *c* a horseshoe electro-magnet, the coils *a b* being of opposite polarity.

This clock is designed to be placed in electric connection with a central-station clock, in which an automatic pole-changer is arranged for changing the direction of the current at definite intervals corresponding to the number of teeth on the ratchet-wheel *q*, so that the latter is caused to complete one revolution in each hour.

The operation of the mechanism is as follows: When a current passes through the coils B C, the armature is attracted to the pole of one core and repelled from the other. In the drawings the core *a* has attracted the arm *e* of the armature and the core *b* repelled the arm *f* thereof. By this movement the upper lever, *k*, has moved the lever *h* and the latter revolved the ratchet-wheel *q* by the pawl *n* for a certain distance. The lever *l* has moved back the lever *i*, so that the pawl *m* arrives behind the next tooth of the ratchet-wheel. When now a current passes in the opposite direction through the coils B C, the armature D is revolved, the pawl *m* propels the wheel *q*, and the pawl *n* is drawn back behind the next tooth.

The pins *o p* are so placed as to prevent the ratchet-wheel from lifting the respective pawls *n m*, by its momentum or otherwise, until withdrawal of the pawl from under the respective pins by backward movement of the lever.

I claim—

1. In an electric clock, the combination, with magnet A, of cores *a b*, in connection with one pole of said magnet, a two armed armature, D, in connection with the opposite pole of said magnet, coils B and C on said cores, levers *k l h i*, adapted to be operated by movement of said armature, as set forth, and pawls *n m* on said levers *h i*, respectively, together with ratchet-wheel *q*, adapted to be revolved by said pawls, for the purpose set forth.

2. The combination of magnet A, cores *a b*, having recesses *g*, coils B C thereon, armature D, having arms *e f*, levers *k l h i*, pawls *n m*, pins *o p*, and ratchet-wheel *q*, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL BOHMEYER.

Witnesses:

EDMUND ZOCH,

MAX MATTHÄI.