(No Model.)

C. E. BARSCHIG.

SECONDARY ELECTRIC CLOCK.

No. 304,595. Patented Sept. 2, 1884.

Fig. 1.

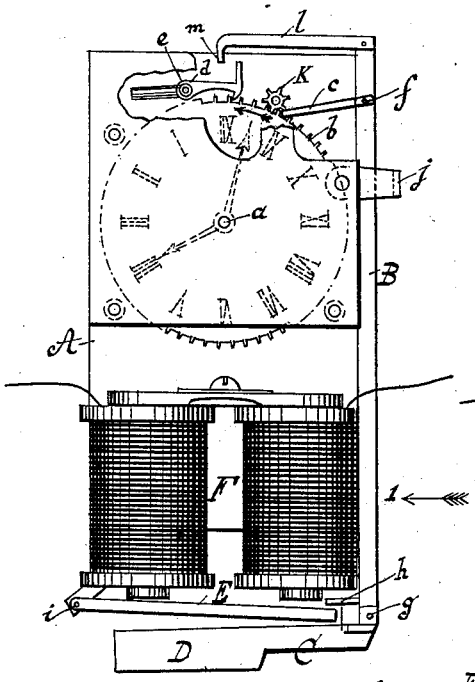


Fig. 2.

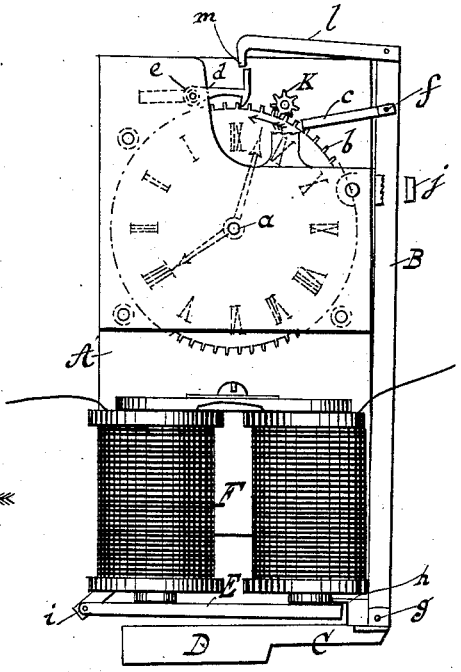
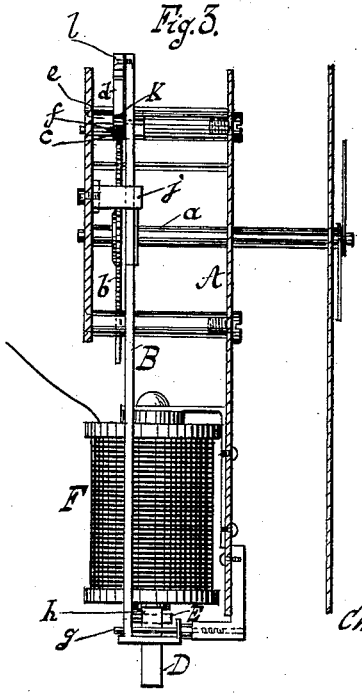


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES E. BARSCHIG, OF ST. LOUIS, MISSOURI.

SECONDARY ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 304,595, dated September 2, 1884.

Application filed March 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BARSCHIG, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented new and useful Improvements in Electric Clocks, of which the following is a specification.

This invention relates to certain improvements in mechanism for imparting motion to secondary electric clocks, said improvements being pointed out in the following specification, and illustrated in the accompanying drawings, in which—

Figure 1 represents a rear view showing the parts in position when the electro-magnet is not vitalized. Fig. 2 is a similar view showing the parts in position when the electro-magnet is vitalized. Fig. 3 is a side view looking in the direction of arrow 1, Fig. 1.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates the frame, which forms the bearings for the center arbor, *a*, of a secondary electric clock. This arbor carries the minute-hand, or it is geared together with the minute-hand arbor, and on it is mounted a cog-wheel, *b*, which is exposed to the action of the propelling-pawl *c* and of the stop-pawl *d*. The stop-pawl swings loosely upon a pin, *e*, and it drops in gear with cog-wheel *b* by its own gravity, but its point is beveled off on its face looking toward the propelling-pawl *c*, so that when the cog-wheel *b* is turned in the direction of the arrow marked on it in Fig. 1 the stop-pawl is raised, but said stop-pawl prevents the cog-wheel from being turned in the direction opposite to said arrow. The propelling-pawl *c* swings on a pivot, *f*, which is secured in a lever B, and said pawl engages with the teeth of the cog-wheel *b* by its own gravity. The lever B has its fulcrum on a pivot, *g*, secured in the frame A, and to its bottom end is firmly secured an arm, C, which carries a weight, D. From the inner edge of the lever B projects a lip, *h*, over the end of the armature E of an electro-magnet, F. The armature swings on a pivot, *i*, secured in the frame A, and the electro-magnet F is firmly fastened to the frame A by any suitable means. By the action of the weight D the lever B is thrown into the position shown in Fig. 1; but when the electro-magnet is vitalized, the armature E is attracted so that it acts on the lip *h*, and thereby the lever B is thrown back to the position shown in Fig. 2. This backward motion of the lever is limited by stop *j*, which is adjusted to correspond to the distance between the successive teeth of the cog-wheel *b*, so that whenever the lever B swings back the propelling-pawl moves back very little more than sufficient to engage with a fresh tooth of the cog-wheel, and when the lever B is thrown forward by the weight D, the cog-wheel *b* is propelled exactly one tooth, said cog-wheel being locked for a short period by the stop-pawl *d*, as will be presently explained. When the propelling-pawl is in its forward position, Fig. 1, its tip catches beneath a locking device, *k*, secured in the frame A, so that said pawl is held in gear with the cog-wheel *b* and retains the same firmly in position, preventing it from being turned in either direction. The pawl *c* therefore has the double function of propelling the cog-wheel *b* and of locking the same in position after it has been propelled.

On the upper end of the lever B is secured an arm, *l*, which carries a nose, *m*, and when the lever, together with the propelling-pawl *c*, has been thrown back to the position shown in Fig. 2, whereby the cog-wheel *b* would become free to be turned in the direction of the arrow marked on it, the nose *m* has been brought in a position over the stop-pawl *d* so that this pawl cannot be raised, and that it acts as a locking-pawl, preventing the cog-wheel *b* from being turned in either direction until the lever B begins to move forward. The nose *m* is so adjusted that it relieves the pawl *d* immediately when the lever B begins to move forward, so that it does not interfere with the action of the propelling-pawl *c*, which action does not begin before the stop-pawl has been released.

In place of the nose *m*, any other suitable locking device may be substituted.

In the example shown in the drawings, the locking device *k* is made in the form of a pinion which is in gear with the cog-wheel *b*, and which, whenever the cog-wheel is propelled one tooth, turns on its arbor and closes down upon

the propelling-pawl. This device is absolutely sure in its action; but, if desired, a simple pin may be substituted for it.

From this description it will be seen that the cog-wheel *b* is always kept under the control of the two pawls *c* and *d*, and that the same cannot be moved except by the action of the propelling-pawl.

The electro-magnet F is in an electric circuit controlled by the primary clock in a manner well known to those skilled in the art, so that the propelling-pawl *c* imparts to the minute-hand of the secondary clock the required step-by-step movement.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore described, with the cog-wheel *b*, of the lever B, the propelling-pawl *c*, pivoted to this lever, the weighted arm C and lip *h*, the armature E, the electro-magnet F, and a locking device for locking the propelling-pawl and the cog-wheel in their position of rest.

2. The combination, substantially as hereinbefore described, with the cog-wheel *b*, of the stop-pawl *d*, the lever B, the propelling-pawl *c*, pivoted to this lever, the weighted arm C and lip *h*, the armature E, the electro-magnet F, and a locking device for locking the propelling-pawl and the cog-wheel in their position of rest.

3. The combination, substantially as hereinbefore described, with the cog-wheel *b*, of the stop-pawl *d*, the lever B, the locking device *m*, carried by said lever, the propelling-pawl *c*, pivoted to this lever, the weighted arm C and lip *h*, the armature E, the electro-magnet F, and a locking device for locking the propelling-pawl and the cog-wheel in their position of rest.

4. The combination, substantially as hereinbefore described, with the cog-wheel *b*, of the stop-pawl *d*, the lever B, the locking device *m*, carried by said lever, the stop *j*, the propelling-pawl *c*, pivoted to the lever, the weighted arm C and lip *h*, the armature E, the electro-magnet F, and a locking device for locking the propelling-pawl and the cog-wheel in their position of rest.

5. The combination, substantially as hereinbefore described, with the cog-wheel *b* and the pawl which serves to propel this cog-wheel, of a pinion which gears into the cog-wheel and closes down upon the propelling-pawl after each movement of the cog-wheel.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

CHAS. E. BARSCHIG. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.