

(No Model.)

W. F. WEISGERBER.
SECONDARY ELECTRIC CLOCK.

No. 314,634.

Patented Mar. 31, 1885.

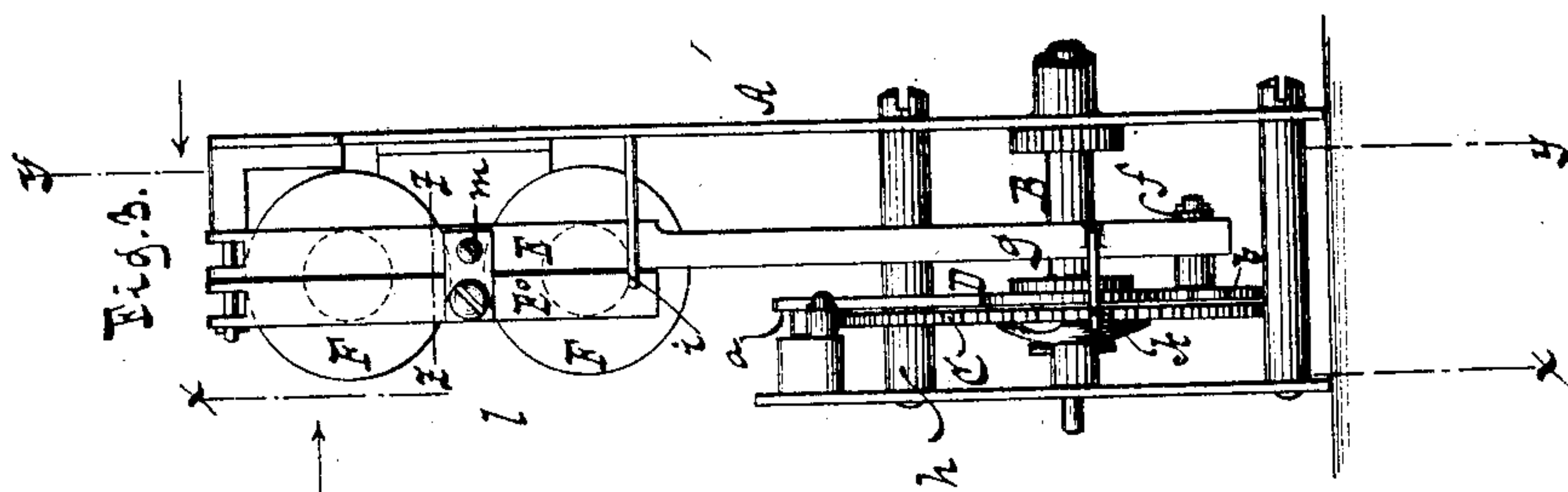


Fig. 2.

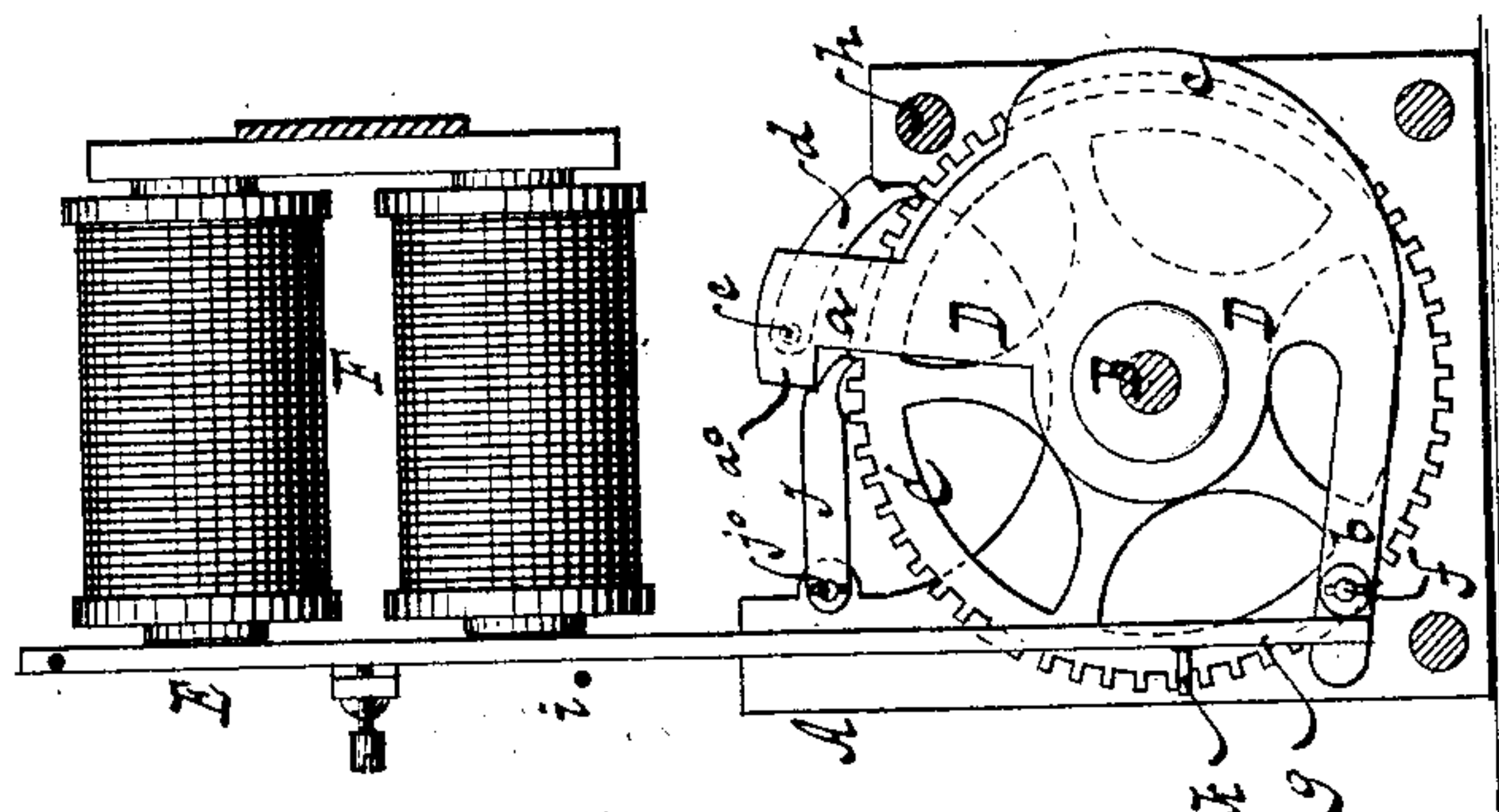
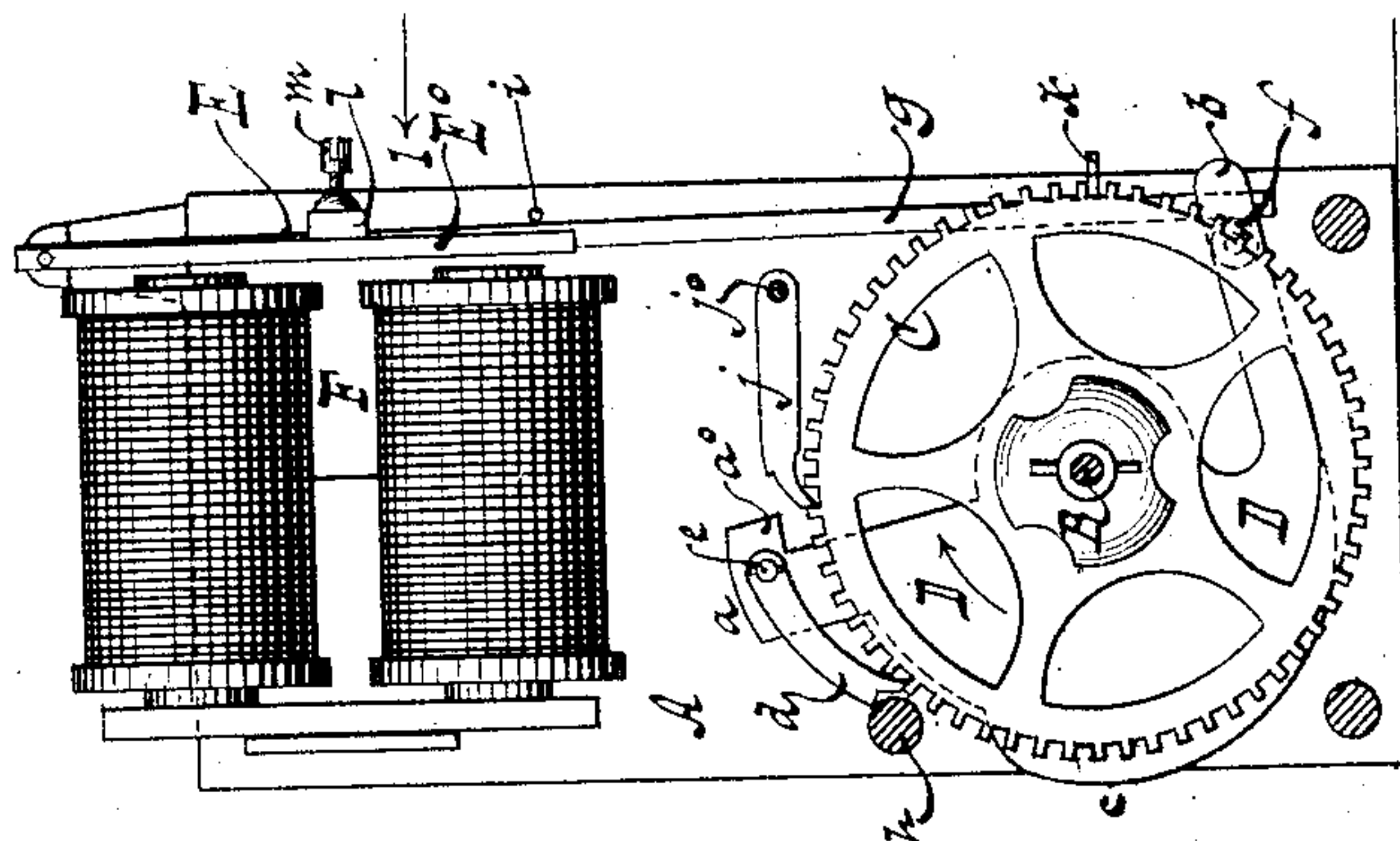


Fig. 4.



Fig. 1.



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SECONDARY ELECTRIC CLOCK

SPECIFICATION forming part of Letters Patent No. 314,634, dated March 31, 1885.

Application filed June 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. WEISGERBER, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Secondary Electric Clocks, of which the following is a specification.

The object of this invention is to simplify and cheapen the mechanism of a secondary electric clock and at the same time to insure a correct action with a comparatively weak current of electricity.

The peculiar and novel construction of my electric clock is pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section in the plane *xx*, Fig. 3, when the electro-magnet is not vitalized. Fig. 2 is a similar section in the plane *yy*, Fig. 3, when the electro-magnet is vitalized. Fig. 3 is a side view looking in the direction of arrow 1, Fig. 1. Fig. 4 is a transverse section of the divided armature in the plane *zz*, Fig. 3.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a frame which forms the bearings for the arbor B, which carries the second or minute hand of a secondary electric clock. On this arbor is mounted a wheel, C, which has sixty teeth, so that whenever this wheel is turned one tooth, the hand is turned forward for one minute or for one second.

On the arbor B swings loosely a lever, D, which is provided with two arms, *a* *b*, and with a weight, *c*, which has a tendency to throw the lever into the position shown in Fig. 1. In the example shown in the drawings, the weight *c* is formed out of one piece with the remaining portions of the lever, the whole being cut out of sheet metal, and I prefer this form of the lever because it can be produced in the cheapest possible manner; but, if desired, the weight *c* may be made out of a separate piece of metal and attached to the lever by any suitable means. The arm *a* of the lever D carries a pawl, *d*, which swings loosely on a pivot, *e*, so that it drops in gear with the cog-wheel C by its inherent gravity, and the arm *b* of the lever D carries a stud, *f*, (by preference made in the form of a roller, as shown in the drawings,) which bears on an

arm, *g*, extending from the armature E of the electro-magnet F. By the action of the weight *c* the lever D is thrown in such a position that the point of the pawl *d* is thrown beneath a stud, *h*, secured in the frame A, and that the stud *f* acts upon the arm *g*, so as to throw the armature against its back stop, *i*. By referring to Fig. 1, it will be seen that, when the point of the pawl *d* is thrown beneath the stud *h*, said pawl is locked in gear with the wheel C, so that this wheel cannot be turned in either direction. In the example shown in the drawings the locking-stud *h* forms part of the frame A, and by these means the labor of applying a separate locking-stud is saved; but said locking-stud can be made in any other form suitable for the purpose.

When the armature E is attracted by the electro-magnet F, the lever D is turned in the direction of the arrow marked on it in Fig. 1, and it is thrown into the position shown in Fig. 2. In this position the lip *a'* of the arm *a* catches over the point of the independent stop-pawl *j*, so as to lock the same in gear with the wheel C, and retain said wheel for the time being firmly in position, and at the same time a dog, *k*, secured to the arm *g* of the armature, is thrown in gear with the wheel C, so as to insure still further the correct position of said wheel. By the movement of the lever D above described the propelling-pawl *d* is drawn back one tooth, and when the circuit through the electro-magnet is broken the wheel C is propelled one tooth by the action of the weight *c*, and the armature E is thrown against its back stop, *i*; in other words, all the parts reassume the position shown in Fig. 1, with the exception of the wheel C, which is moved one tooth. The independent stop-pawl *j* swings on a stud, *j'*, secured in the frame A, and, since the same drops in gear with the cog-wheel C by its own gravity, it prevents this wheel from turning back while the lever D is being moved by the attraction of the armature, and when this lever has completed its backward movement the stop-pawl is locked, and at the same time it forms a stop which prevents the lever from swinging back beyond the desired distance, so that the propelling-pawl cannot possibly take more than one tooth at each stroke of the lever D.

In the example shown in the drawings the

arm *g* of the armature is made out of one and the same piece of iron with the same, so as to save labor; but, if desired, the arm can be made of a separate piece and secured to the armature in any desirable manner.

The armature is made in two sections—viz., the main section *E* and the secondary section *E'*—the latter being so adjusted in relation to the former that it is somewhat closer to the core of the electro-magnet.

On the secondary section *E'* is secured a lug, *l*, which carries a set-screw, *m*, that bears upon the main section *E*. (See Figs. 3 and 4.) By this set-screw the position of the main section in relation to the secondary section and to the core of the electro-magnet can be adjusted to a certain extent. When the electro-magnet is vitalized, the secondary section *E'*, being somewhat closer to the core, is attracted first, and by its action upon the main section *E*, the latter is moved toward the core, so that it is finally attracted by the action of a comparatively weak current of electricity, the lever *D*, which carries the propelling-pawl *d*, being moved a short distance by the action of the secondary section of the armature upon the main section, so that it requires comparatively little power to complete its motion.

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

1. The combination, substantially as hereinbefore described, of the electro-magnet, the armature, the cog-wheel mounted on or geared together with the center arbor of a clock, the gravitating or weighted lever mounted loosely upon the center arbor and exposed to the action of the armature, the propelling-pawl mounted on the gravitating lever and gearing into the cog-wheel, and the independent stop-pawl.

2. The combination, substantially as hereinbefore described, of the electro-magnet, the armature, the cog-wheel mounted on or geared together with the center arbor of a clock, the gravitating or weighted lever which is exposed to the action of the armature, the propelling-pawl mounted on the gravitating lever, the locking-stud *h*, and the independent stop-pawl.

3. The combination, substantially as hereinbefore described, of the electro-magnet, the armature, the cog-wheel mounted on or geared together with the center arbor of a clock, the gravitating or weighted lever, which is exposed to the action of the armature, the propelling-pawl mounted on the gravitating lever, the locking-stud *h*, the independent stop-pawl, and the lip *a'*, for locking this stop-pawl during the time the propelling-pawl is released by its locking-stud.

4. The combination, substantially as hereinbefore described, of the electro-magnet, the armature, the arm *g*, extending from this armature, the cog-wheel *C*, mounted on or geared together with the center arbor of a clock, the gravitating or weighted lever *D*, mounted loosely upon the center arbor, the stud *f*, secured on this lever and bearing against the arm *g* of the armature, the propelling-pawl *d*, pivoted to the lever *D* and gearing into the cog-wheel *C*, the independent stop-pawl *j*, the stud *h*, for locking the propelling-pawl, and the lip *a'*, formed on the lever *D*, for locking the stop-pawl.

5. The combination, substantially as hereinbefore described, of the electro-magnet, the armature, the arm *g*, extending from said armature, the cog-wheel *C*, mounted on or geared together with the center arbor of a clock, the gravitating or weighted lever which is exposed to the action of the arm *g*, the stop-pawl *k*, secured to this arm, the propelling-pawl mounted on the gravitating lever, and the locking-stud *h*.

6. The combination, with the cog-wheel mounted on or geared together with the center arbor of a clock and with the propelling-pawl which is in gear with the cog-wheel, of an electro-magnet and an armature divided in two sections, *E'* *E*, one of which acts upon the propelling-pawl, substantially as and for the purpose shown and described.

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

WILLIAM F. WEISGERBER. [L. s.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.