

(No Model.)

W. F. WEISGERBER.

SYNCHRONIZING DEVICE FOR CLOCK PENDULUMS.

No. 309,269.

Patented Dec. 16, 1884.

Fig. 1

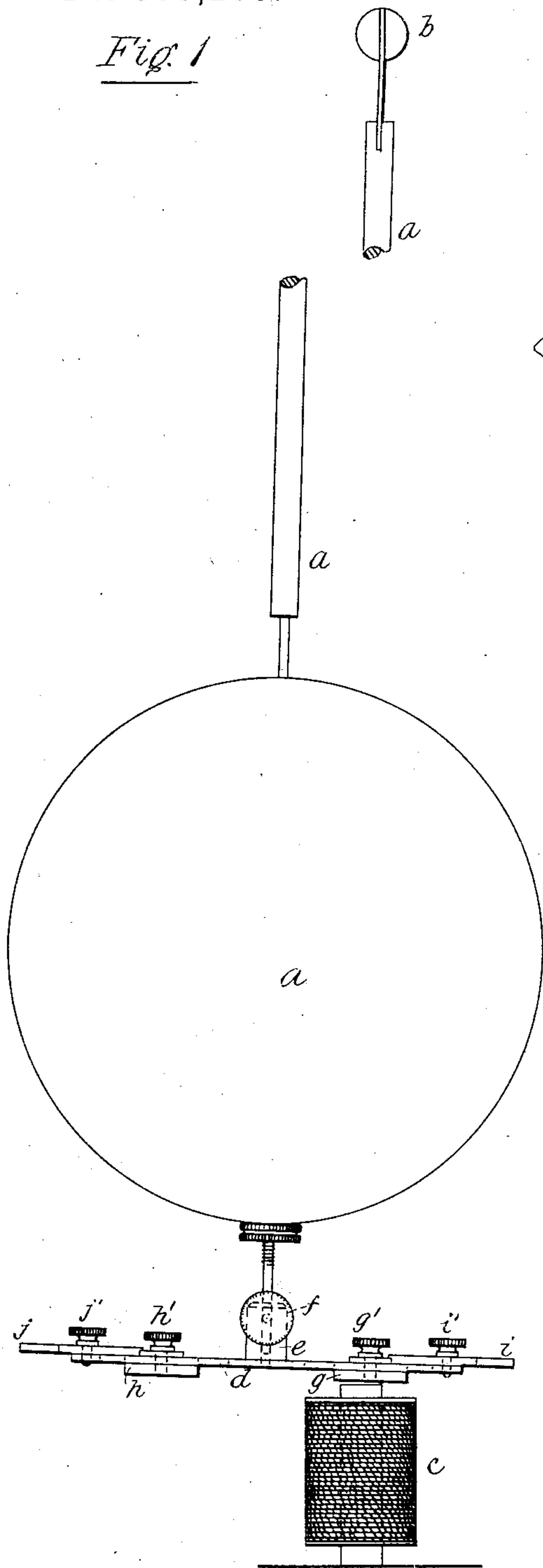


Fig. 3

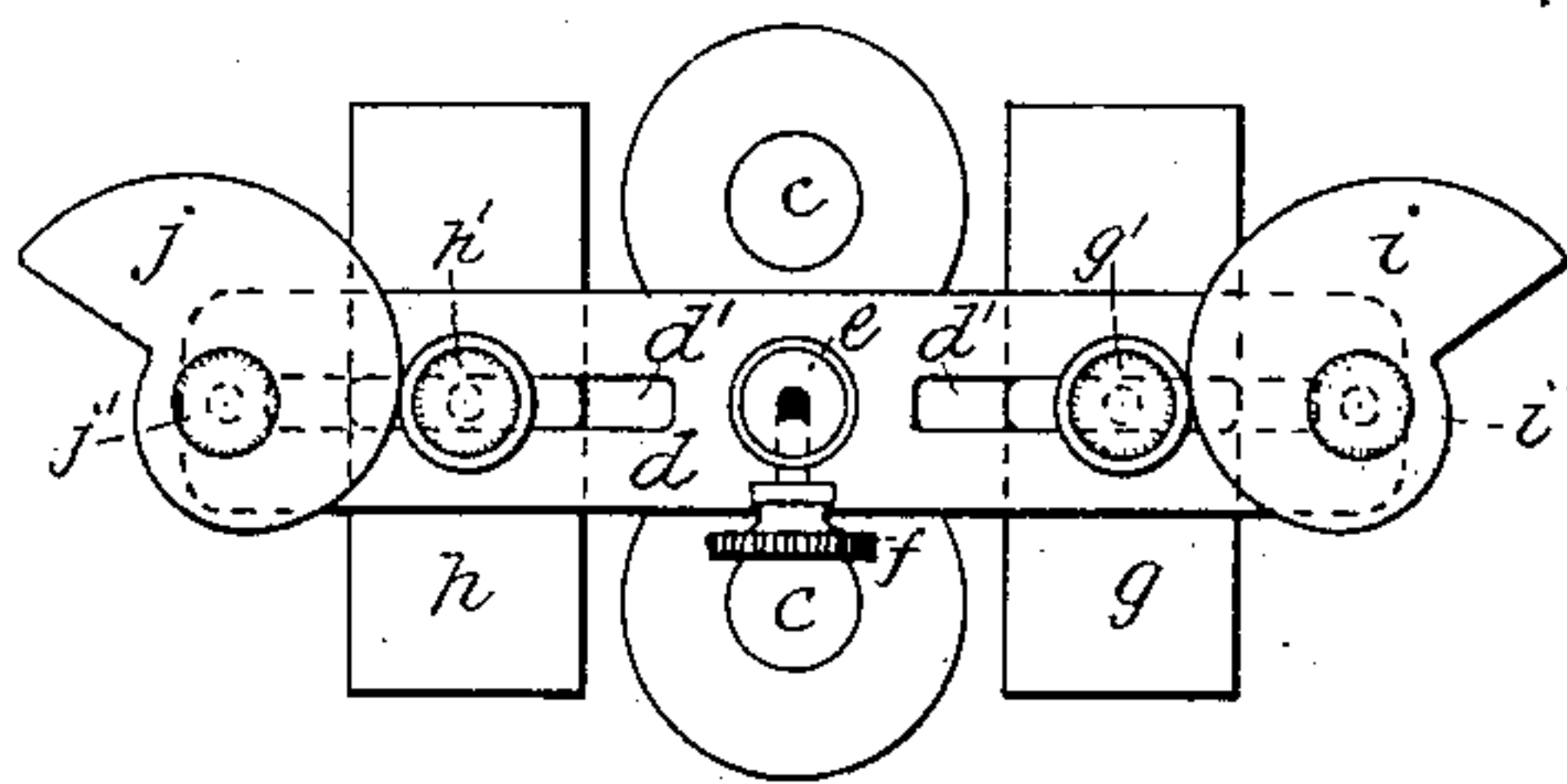


Fig. 4

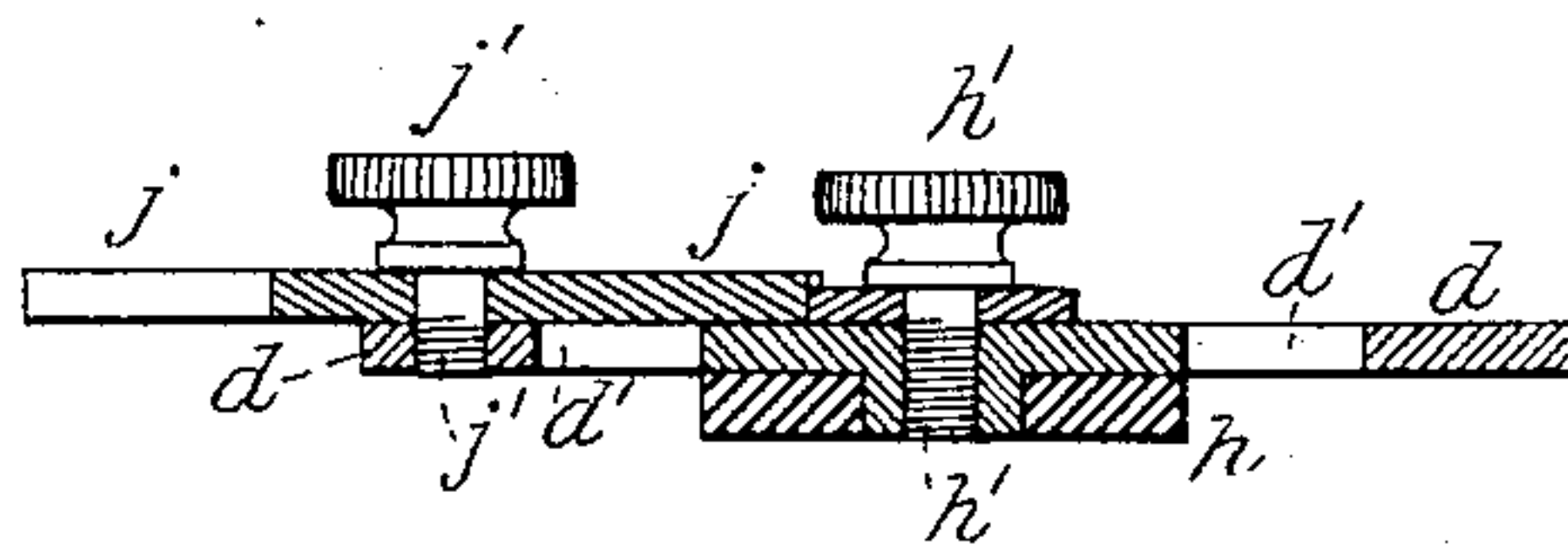
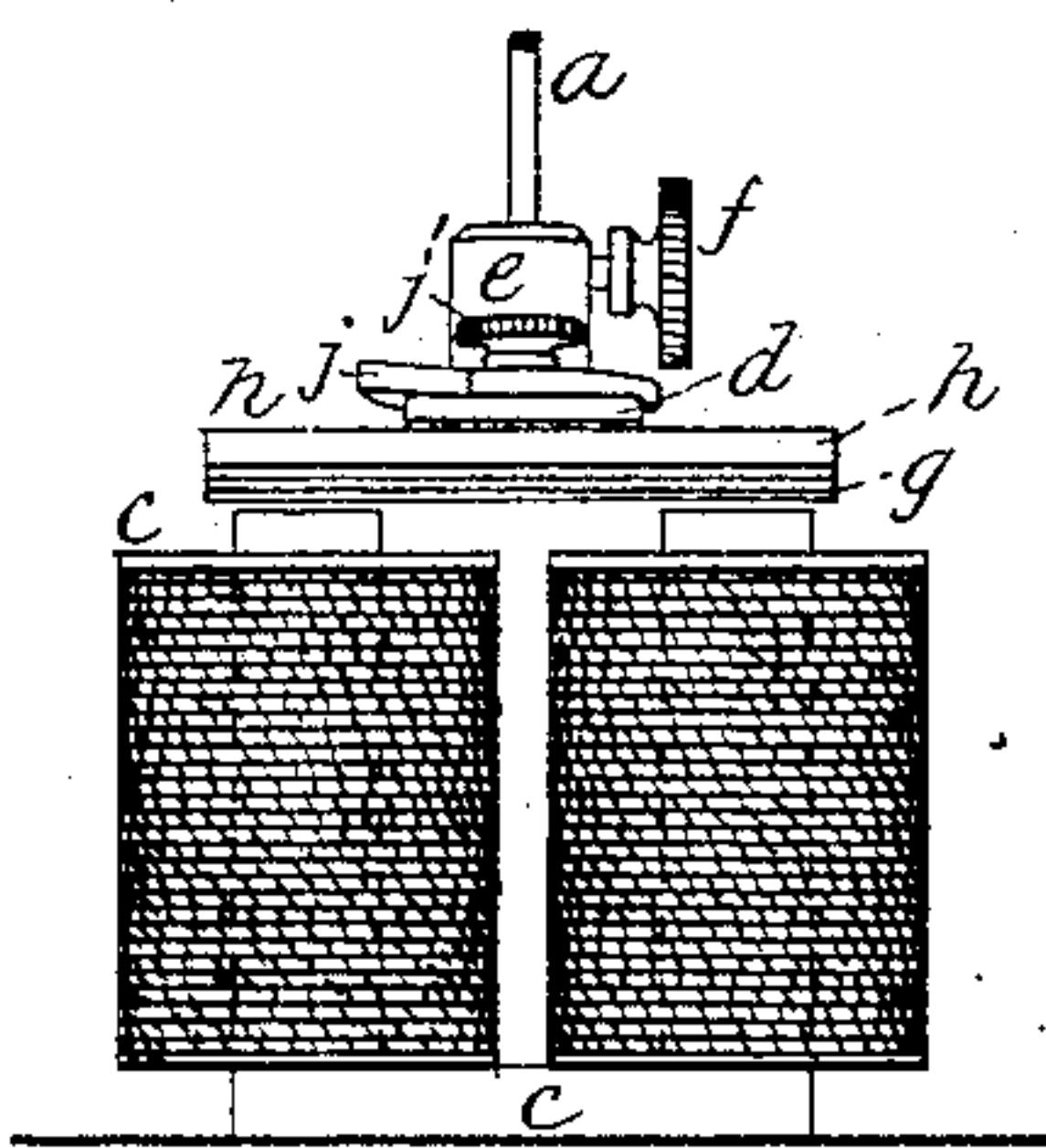


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

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SYNCHRONIZING DEVICE FOR CLOCK-PENDULUMS.

SPECIFICATION forming part of Letters Patent No. 309,269, dated December 16, 1884.

Application filed February 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. WEISGERBER, a citizen of the United States, and a resident of New York, county and State of New York, have invented certain new and useful Improvements in Synchronizing Devices for Pendulums of Clocks, of which the following is a specification.

This invention relates to that class of pendulum-clocks which are regulated by means of an electric current controlled by a station time-regulator acting through the medium of electro-magnetic devices to cause said pendulum to oscillate and synchronize with the pendulum of the station-clock.

My invention consists of an electro-magnet fixed centrally under the pendulum of a secondary clock, and two armatures so connected to the pendulum that they alternately come under the influence of the magnet, causing the pendulum to oscillate over the same synchronously with the pendulum of the central-station clock. The pendulum of the station-clock, by means of a suitable circuit-breaker controlled by it, causes the electric current to energize the electro-magnet for a short time when in the extreme positions of its oscillations, so causing the magnet to alternately attract and release the armatures, and compelling the pendulum to which they are attached to move and synchronize with that of the station-clock. The two armatures are so constructed that they may be readily adjusted in their positions on the pendulum to perfectly balance the same and to regulate the amplitude of its vibrations; but to describe my invention more particularly, I will now refer to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a plan view showing the armature centrally over the magnet, and Fig. 4 is an enlarged part longitudinal vertical section of the armature-carrying plate.

a represents an ordinary pendulum, and *b* its point of suspension. The electro-magnet *c* is fixed in location directly under the point of suspension *b*. To the lower end of the pendulum-rod is attached the plate *d*, of brass or other diamagnetic material, provided at its

center with the boss *e* and thumb-screw *f*, by means of which it is secured to the pendulum-rod. The two iron armatures *g* and *h* are secured to the plate *d* by means of the thumb-screws *g'* and *h'*, and they are held in transverse position on the plate *d* by means of ribs on their upper sides, which fit into the slots *d'* *d'*, formed through the plate. Said slots permit of the movement of the armatures to and from the center of the plate; and to adjust them in position relatively to the electro-magnet *c* two flat scroll-cams, *i* and *j*, are pivoted on the top of the plate *d* at its extreme ends, the edges of the cams bearing against the thumb-screws *g'* and *h'* of the armatures.

To make the necessary adjustment after the device is set up the armatures *g* and *h* are moved into their extreme outward positions, with their set-screws sufficiently loose to allow them to slide in the slots *d'* *d'* of the plate *d*. The cams *i* and *j* are then rotated, thereby forcing the armatures toward the center of the plate *d* until the pendulum is properly balanced and the armatures so located as to be acted upon by the magnet *c* to give the desired amplitude to the oscillations of the pendulum. The thumb-screws *g'* and *h'* are then tightened.

The pendulum in Figs. 1 and 2 of the drawings is shown in position at the end of a stroke, with the armature *g* attracted over the poles of the magnet *c*, and the electric current is cut off from the magnet *c* by the station-clock as its pendulum commences its backward stroke, thereby releasing the pendulum *a*, and allowing it to move synchronously with the station-clock pendulum. The current is again caused to energize the magnet *c* when the pendulum of the station-clock is at the other end of its stroke, thus causing the magnet *c* to attract the armature *h*, and retard or accelerate the movement of the pendulum *a*, according to its being fast or slow in its beats. By this arrangement it will be seen that by means of one magnet and two simply constructed and applied armatures a uniform movement is given to the pendulum to cause it to oscillate equally on both sides of the center line and in accordance and synchronously with the pendulum of the station-clock. Of course it will be understood that other means than a pri-

mary pendulum-regulator may be used to send the electric current through the magnet *c* at the proper intervals.

The pendulum *a* forms part of an ordinary clock-movement, such device not being shown in the drawings, as it forms no part of my invention.

The armatures *g* and *h* may be adjusted by means of screws having bearings in the plate *d*, instead of by means of cam-plates *i* and *j*.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with an electro-magnet, of a pendulum provided with two armatures at its lower end, so arranged as to be alternately attracted by the electro-magnet, which is fixed in position on the vertical line passing through the point of suspension of the pendulum, substantially as and for the purpose set forth.

2. In combination, an electro-magnet, a swinging plate located over the poles of the same, a pendulum to the lower end of which the swinging plate is secured, and two armatures adjustably connected to the swinging

plate on opposite sides of its center, substantially as and for the purpose set forth.

3. As a means of adjusting an armature relatively to the poles of an electro-magnet, in combination, an electro-magnet, an armature, a slotted carrying-plate on which the armature is clamped and free to slide, and a scroll-cam pivoted on the plate and adapted to move the armature thereon when rotated, substantially as set forth.

4. In combination, the pendulum *a*, plate *d*, armatures *g* and *h*, and electro-magnet *c*, substantially as set forth.

5. In combination, the pendulum *a*, plate *d*, provided with slots *d'* *d'*, the armatures *g* and *h*, the adjusting scroll-cams *i* and *j*, and the electro-magnet *c*, substantially as set forth.

In testimony whereof I have hereunto set my hand, at New York, county and State of New York, this 11th day of February, A. D. 1884.

WILLIAM F. WEISCHERBER.

Witnesses:

ALFRED SHEDLOCK,
H. D. WILLIAMS.