(No Model.)

J. HAMBLET.

ELECTRIC SYNCHRONIZING DEVICE FOR CLOCK PENDULUMS.

No. 418,125. Patented Dec. 24, 1889.

Fig. 1.

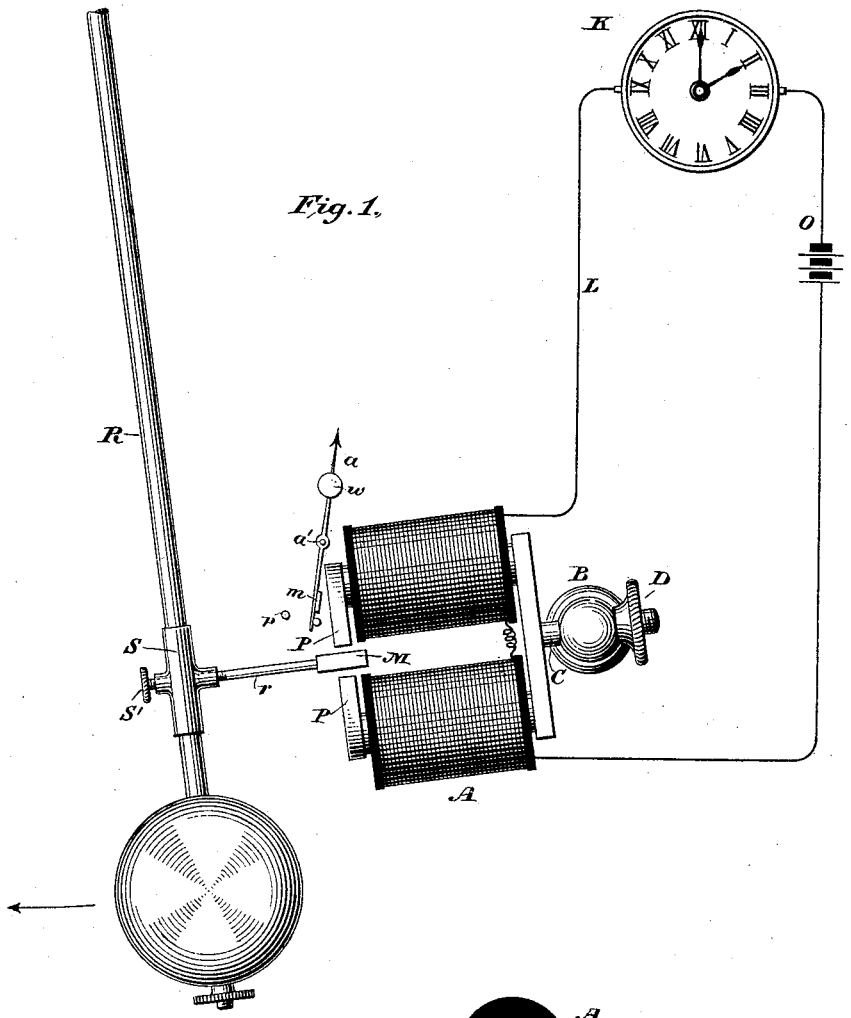
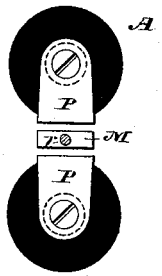


Fig. 2.



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JAMES HAMBLET, OF BROOKLYN, NEW YORK.

ELECTRIC SYNCHRONIZING DEVICE FOR CLOCK-PENDULUMS.

SPECIFICATION forming part of Letters Patent No. 418,125, dated December 24, 1889.

Application filed March 7, 1889. Serial No. 302,295. (No model.)

To all whom it may concern:

Be it known that I, JAMES HAMBLET, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Synchronizing Devices for Clock-Pendulums, of which the following is a specification.

The invention relates to the class of apparatus employed for maintaining the pendulums of clocks in unison with each other.

The invention will be readily understood by those skilled in the art by inspection of the accompanying drawings, in which—

Figure 1 shows the device applied to the pendulum of a clock to be synchronized, and Fig. 2 is an end view of the electro-magnet which forms a part of the device.

The pendulum to which the device is applied, as shown, may be that of an ordinary weight or spring clock, and the object is to keep such pendulum in beat with the master or controlling clock.

The electro-magnet A is attached to the clock-case by means of the standard B, through which passes the rod C, which is attached to the yoke or back plate of the magnet and is held firmly by the set-nut D. The pole-pieces P of the magnet are turned inward toward each other, as shown, and the magnet is set in such a position that the faces of the pole-pieces are approximately parallel to the pendulum-rod R when it is at the end of its swing. The pendulum-rod carries the sleeve S, which can be fixed upon the rod at any point by means of the thumb-screw S′. The sleeve carries the small rod *r* of non-magnetic material, and this rod sustains the armature M. The magnet is set in proper position to receive the armature M between its pole-pieces at the extremity of each swing of the pendulum.

The master clock K is arranged to send impulses over the wire L, which connects in circuit the battery O at suitable intervals, which may be every second or every two, three, or four seconds, and these impulses are sent by the master clock at the time when the armature M is closely approaching the space between the pole-pieces P. If the clock is slow, it is suitably hastened; if fast, it is suitably retarded. It will be seen that when the armature M is midway between the pole-pieces P—that is, in the position shown in the drawings—it is attracted equally by each pole-piece, and there is therefore no strain upon it; and, also, it will be seen that the effect of the magnetic attraction upon the armature M is always directly in the path of the pendulum, thus agreeing with its own impulses as given it by the clock-train. Hence it is not subject to strain. It will also be seen that, no matter whether the current applied to the magnet is weak or strong, it can have no injurious effect upon the clock, but can have only the desired effect to synchronize it with the pendulum-beats of the master clock.

It is desirable that an indicator of some kind be provided with the synchronized clock, so that it can be learned at a glance whether it is receiving the synchronizing impulses. A convenient one is shown in the weighted arrow *a*, pivoted at *a′*, and carrying the small armature *m* in a position to be attracted by the magnet whenever the latter is vitalized. The indicator plays between the stops *p*, and the weight *w* carries the armature *m* away from the magnet when the latter is not vitalized. The arrow, therefore, will be seen to swing to and fro if the proper impulses for synchronizing the clock are passing over the line L.

I claim as my invention—

1. A synchronizing device for clock-pendulums, consisting of an electro-magnet having inwardly-projecting pole-pieces, and an armature attached to the pendulum arranged to pass between said pole-pieces at each beat.

2. The combination of a pendulum, an electro-magnet having pole-pieces projecting toward each other, an armature attached to the pendulum and arranged to be carried between said pole-pieces at each beat, and means, as a master clock and an electric circuit, for vitalizing said electro-magnet at regular intervals.

3. The combination of a pendulum, an electro-magnet having pole-pieces projecting toward each other, an armature attached to

the pendulum and arranged to be carried between said pole-pieces at each beat, means, as a master clock and an electric circuit, for vitalizing said electro-magnet at regular intervals, and an indicator to show that the device is in operation.

In testimony whereof I have hereunto subscribed my name this 6th day of March, A. D. 1889.

JAMES HAMBLET.

Witnesses:
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