

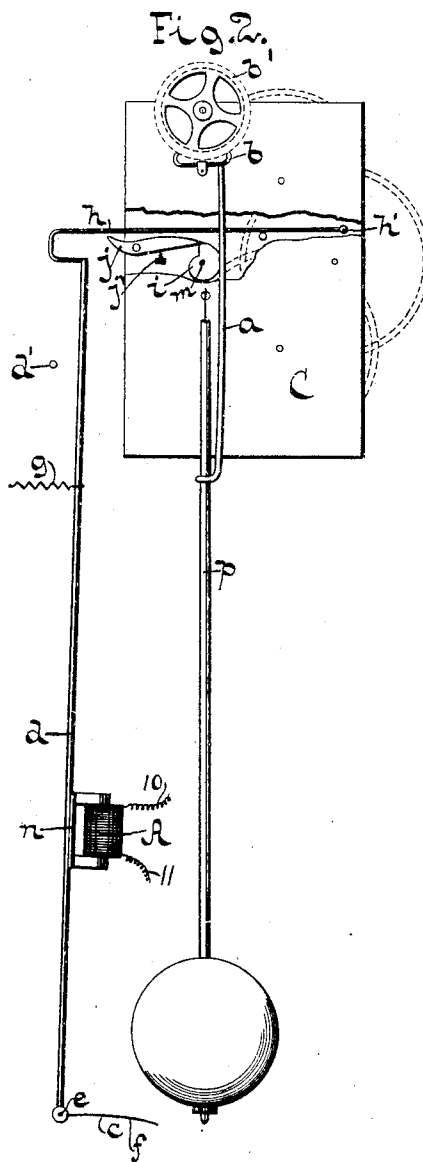
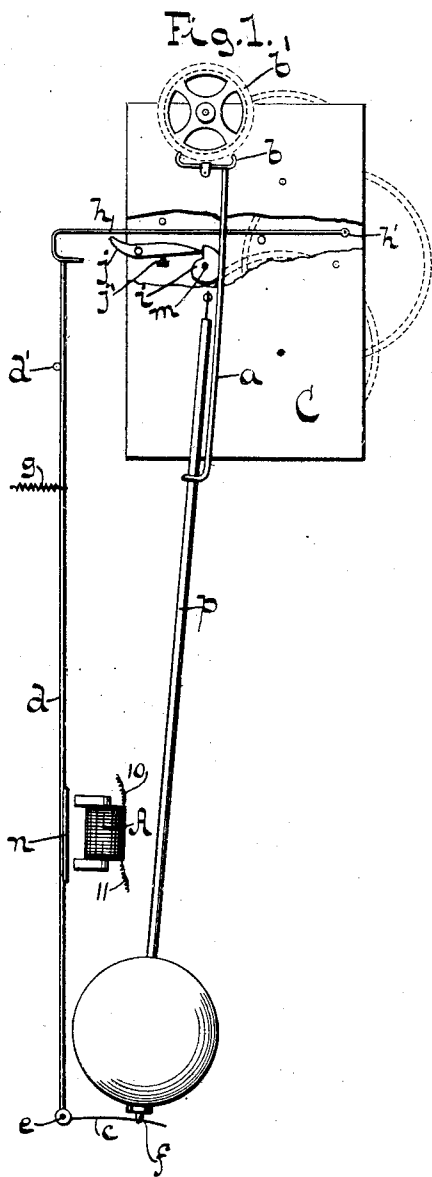
(No Model.)

2 Sheets—Sheet 1.

H. S. PRENTISS.
ELECTRIC SYNCHRONIZER FOR CLOCKS.

No. 502,381.

Patented Aug. 1, 1893.



WITNESSES:

Klas A. Trustad
J. J. Malle

INVENTOR

BY Henry S. Prentiss
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(No Model.)

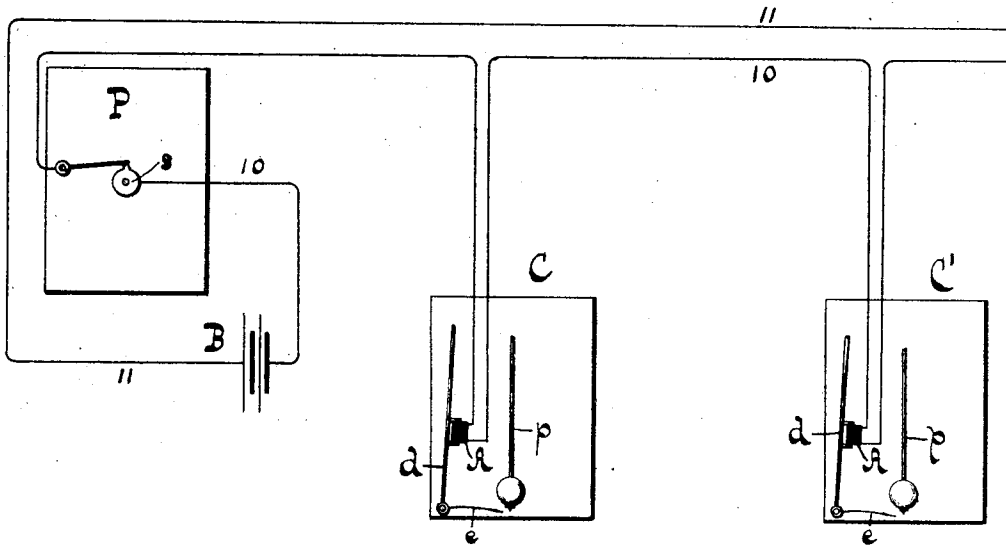
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Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY S. PRENTISS, OF ELIZABETH, NEW JERSEY.

ELECTRIC SYNCHRONIZER FOR CLOCKS.

SPECIFICATION forming part of Letters Patent No. 502,381, dated August 1, 1893.

Application filed May 19, 1892. Serial No. 433,505. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. PRENTISS, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Synchronizers for Clocks, of which the following is a specification.

My invention has reference to improvements in apparatus for synchronizing time-pieces and it consists essentially in regulating these several secondary clocks to run slightly fast, and providing each of the same with a detent automatically thrown into engagement with the pendulum or other governing member, at the hour as indicated by the respective clock, combined with means operated from the primary clock to release the train at the exact hour; all of which are more fully pointed out in the following specification and claims and illustrated in the accompanying drawings in which—

Figure 1 represents a face view of a secondary clock, showing the clock at the hour, and the governing member detained. Fig. 2 is a similar view showing the governing member free. Fig. 3 is a diagram illustrating the arrangement of the clocks in a system.

Similar letters and numerals indicate corresponding parts throughout the several views.

In the drawings, referring at present to Figs. 1 and 2, the letter C designates one of the secondary clocks, which may embody any suitable well known movement, such for instance as a pendulum or lever movement.

In the example illustrated in Figs. 1 and 2, I make use of a pendulum movement of which *m* is the arbor of the minute hand, *p* the pendulum, *a* the verge rod, *b* the pallet lever and *b'* the scape wheel, all constructed as usual.

c d is a detent lever pivoted at *e*, the horizontal arm *c* of which is made of resilient material, such for instance as thin spring steel, and is provided with suitable means for engaging with the end of the pendulum *p*, such as a notch, or a hole *f* adapted to receive the pointed end of the pendulum rod. The vertical arm *d* of the lever is acted on by a spring *g* and is adapted to be engaged by a locking arm *h* pivoted at *h'* to the frame of the clock. The outer part of this arm is bent downward and then inward to form a U shaped end.

On the arbor *m* is secured a cam *i* which is engaged by one arm of a drop *j*, the opposite arm of which extends below the locking arm *h*. *j'* is a small spring against which the drop falls.

A is an electro-magnet connected with the branch wires 10 and 11 leading from the main line. The armature *n* is carried by the arm *d* of lever *c d*.

During the hour the parts are in the position shown in Fig. 2 and the pendulum is free to oscillate, the detent lever being held clear of the pendulum by the end of the locking arm *h*. At the hour as indicated by the clock, (Fig. 1) one end of the drop *j* falls into the cavity of the cam *i* and the opposite end lifts the locking arm *h*. The spring *g* now draws the arm *d* of the detent lever against a stop *d'* and the arm *c* thereof is brought into the path of the pendulum, which it grasps and retains.

At the exact hour as indicated by the master clock the circuit is closed by said master clock through the electro magnet A, and detent lever *c d* is turned about its pivot to release the pendulum, and the locking arm falls and holds the lever in this position (Fig. 2).

In Fig. 3 I have shown the secondary clocks arranged in a system. P is the master clock, its circuit closer, of any suitable construction and operated to close the circuit at the exact hour as indicated by the master clock, and to break the circuit immediately thereafter. B is the battery, and 10 and 11 the wires including the several electro-magnets A of the secondary clocks C C', &c.

It will be noticed that the detent herein described is arranged to stop the pendulum when at or near the end of its vibrations, whereby the same will resume its oscillations without the aid of a starting device, when released.

It is evident that according to the system herein described, slow running secondary clocks would not be synchronized. Consequently in an extensive system of clocks where it may be difficult to keep all the clocks running fast at all times, the clocks may be regulated as usual. In this case the devices described would act to set fast running clocks to the correct time, and other devices could be used to synchronize slow running clocks.

Therefore I do not wish to restrict myself to purposely running the clocks fast.

I do not wish to restrict myself to the specific means herein shown for arresting the motion of the governing member, or to the particular manner in which the same are applied, since it is evident that changes can be made in these respects without departing from the spirit of my invention.

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

1. A time piece provided with a mechanical detent adapted to engage with the governing member to arrest its motion and stop the train, a cam on one of the arbors of the train, an operative connection between said cam and the detent for actuating the latter to lock the governing member and arrest the motion of the train at the hour as indicated by the time piece, and an electro-magnet for effecting the release of the governing member from the detent, substantially as described.

2. In a clock system, a master clock provided with a circuit closer adapted to close and break the circuit at the hour as indicated by said clock, and secondary clocks, each provided with a detent adapted to engage with and hold the pendulum, a cam on one of the arbors of the train, an operative connection between said cam and the detent for actuating the latter, as described, to lock the pendulum, at the hour as indicated by the clock, and an electro-magnet vitalized by the closing of the circuit at the master clock to withdraw the detent from the pendulum, substantially as described.

3. In a time piece, the combination of a pendulum, a detent provided with a notch or hole adapted to engage with the pendulum, a locking lever arranged to engage with said detent as described, an operative connection between the train of the time piece and the locking lever, and an electro-magnet arranged to act upon the detent, substantially as described.

4. In a time piece, a pivoted detent adapted to engage with the pendulum, a locking lever adapted to engage with the detent, a cam, an operative connection between the cam and the locking lever, and an electro-magnet arranged to act upon the detent, substantially as described.

5. A time piece provided with a detent adapted to positively engage the governing member to arrest the motion of the train, an operative mechanical connection between said detent and the train of the time piece for actuating the detent to engage with and lock the governing member to arrest the normal motion of the train at the hour as indicated by the time piece, and an electro-magnet vitalized for effecting the release of the governing member from the detent, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 18th day of May, 1892.

HENRY S. PRENTISS.

Witnesses:

KLAS H. TERNSTADT,
A. FABER DU FAUR, Jr.