No. 678,426. Patented July 16, 1901.

E. ROSI & G. VACOTTI.

ELECTRIC CLOCK.

(No Model.) (Application filed Dec. 19, 1898.) 2 Sheets—Sheet 1.

Fig 3.

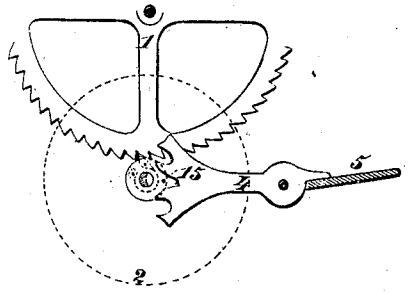


Fig 4.

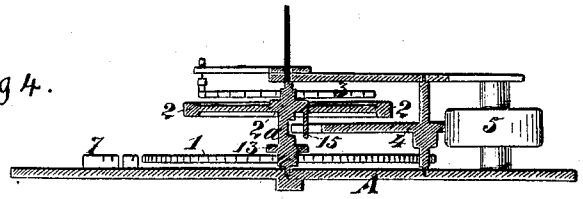


Fig 1.

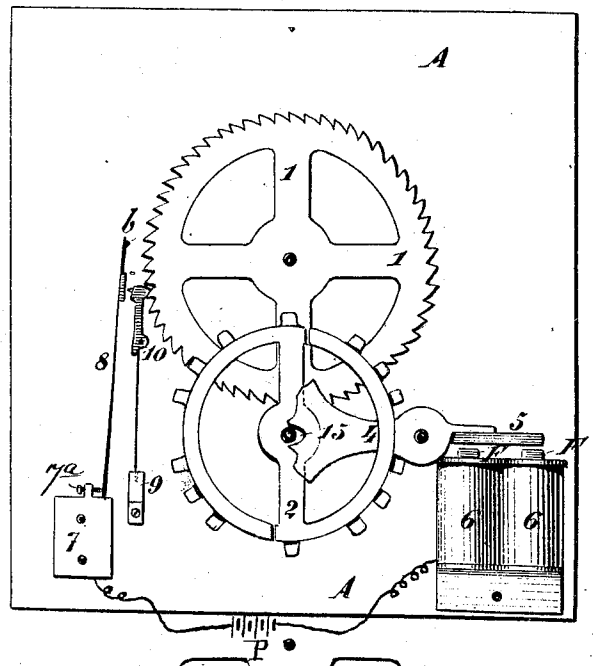
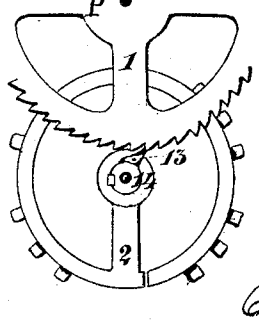


Fig 2.



Witnesses

H. C. Bowker

Inventors:

Emilio Rosi

Giuseppe Vacotti,

By Wm. E. Boulter attorney

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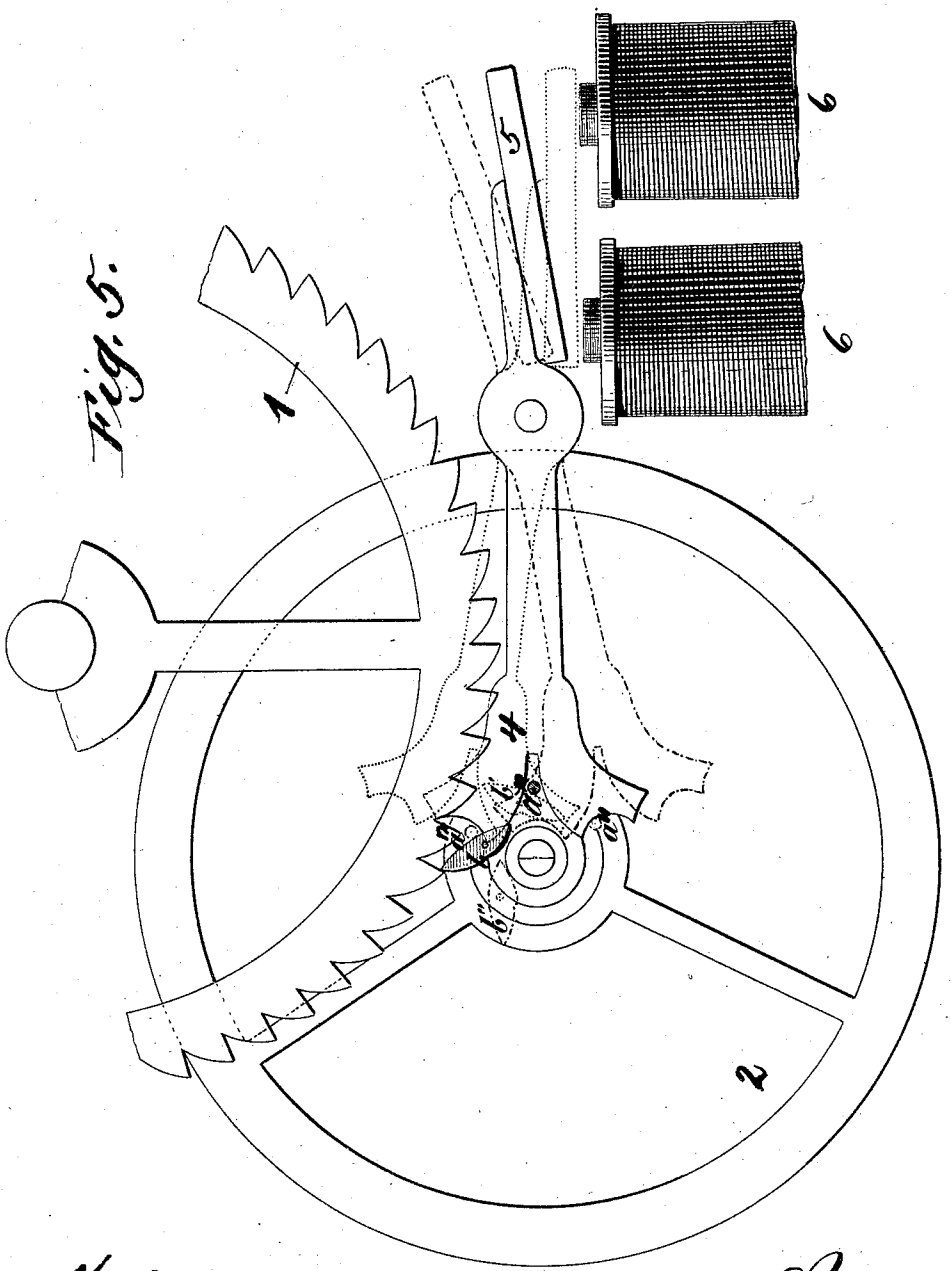
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ELECTRIC CLOCK.

(Application filed Dec. 19, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.



Witnesses:
W. K. Boulter
[illegible]

Inventors.
Emilio Rosi,
Giuseppe Vacotti.
By Wm. E. Boulter, attorney

UNITED STATES PATENT OFFICE.

EMILIO ROSI, OF ARQUATA-SCRIVIA, AND GIUSEPPE VACOTTI, OF SERRAVALLE-SCRIVIA, ITALY.

ELECTRIC CLOCK.

SPECIFICATION forming part of Letters Patent No. 678,426, dated July 16, 1901.

Application filed December 19, 1898. Serial No. 699,787. (No model.)

To all whom it may concern:

Be it known that we, EMILIO ROSI, residing at Arquata-Scrivia, and GIUSEPPE VACOTTI, residing at Serravalle-Scrivia, Italy, subjects of the King of Italy, have invented certain new and useful Improvements in or Relating to Electric Clocks or Watches, (for which we have made application for Letters Patent in Great Britain under No. 21,225, dated October 8, 1898, and in Italy, filed May 20, 1898,) of which the following is a specification.

This invention relates to an electric clock or watch, the construction of which is considerably simplified by the reduction of its parts, said mechanism marking seconds or multiples or fractions of seconds, according to the dimensions of the balance.

In the accompanying drawings, Figure 1 is a general view of the apparatus, Fig. 2 being a view of the lower part in which the balance is arranged. Fig. 3 is a detail view; Fig. 4, a vertical section; and Fig. 5 is a detail view, on an enlarged scale, with parts removed and parts broken away.

The time divided by the balance is converted into minutes and hours by the escapement-wheel 1 and suitable toothed wheels of ordinary construction.

The clock is driven from one or more cells connected to the coils of an electromagnet 6 and to an insulated plate 7 and spring 8.

The electric clock or watch comprises a balance-wheel 2, which may be compensated or otherwise provided with a spiral spring 3, Fig. 4, connected to its shaft in the usual manner, and a shaft cut away at *a* and provided at its lower end with a disk 14, carrying a small spring-tooth 13, which communicates movement to the escapement-wheel 1, and a small rod 15, fixed to one of the spokes of the balance-wheel, which when at rest engages in the fork or recess of the anchor 4; an anchor 4, provided with a small soft-iron armature 5 at its outer end and a fork, the shape of which is represented in Figs. 1 and 3, at its inner end; a pair of electromagnetic coils 6 of ordinary construction; a toothed escapement-wheel 1, which engages with the tooth 13 on the balance-wheel spindle, (on the spindle of this wheel 1 is arranged a small pinion for the transmission of movement to a series of toothed wheels forming the ordinary movement of a clock or watch for driving the hands;) a small plate 7, insulated from the armature A by a vulcanite base or otherwise, which plate carries the spring 8, which bears against a small rod or projection *b* of some insulating material; a small spring-pawl 10 engaging with the teeth of the wheel 1, (this pawl closes the circuit by coming in contact with the spring 8 whenever the wheel 1 is moved in consequence of the impulse it received from the balance, the pawl being then pressed back by the edge of the tooth into contact with the spring 8, thus completing the electric circuit;) a battery P or batteries having its poles connected with the coils 6 and with the small plate 7, respectively. The circuit being closed by the pawl 10 coming in contact with the spring 8, the current travels from one of the poles of the battery through the coils 6, plate A to the pawl 10, spring 8, and plate 7 to the other pole of the battery.

When there is no movement in the clock, the circuit is normally broken, the armature being out of contact with the coil; but a slight impulse given by hand to the balance is sufficient to lift the pawl 10 and bring it in contact with the spring 8, thereby closing the circuit, whereupon the electromagnets 6 attract the armature 5, imparting an energetic impulse to the balance by means of the anchor 4 working against the pin 15. The balance is thus caused to oscillate and the small spring-tooth 13 passes lightly on its movement in one direction over the escapement-wheel 1, but at the return movement, produced by the force of inertia, the wheel 1 is moved a tooth forward, the circuit is again closed, and the same sequence of action is repeated.

When the distance between the spring-contact 8 and the pawl has been regulated by means of screw 7^a, the balance will automatically increase the extent of its oscillations according to the strength of the current and cause the contact between the spring 8 and the pawl 10 to be closed for a more or less long time and maintain the armature 5 in contact with the electromagnet for a more or less long time, so that the clock receives an electric current for longer periods as the bat-

tery becomes weaker, and this causes uniformity until the battery becomes nearly completely exhausted.

The special arrangement of the apparatus renders it insensible to outside currents. By suitably arranging the parts by which this apparatus is constituted and by increasing or reducing their dimensions very large electric clocks or electric watches can be constructed according to this invention, which can go for at least a year with a very small driving power as compared to their dimensions.

What we claim is—

An electric timepiece comprising an electromagnet adapted to be connected to one pole of a battery, of an escapement-wheel, a balance-wheel, a spring-tooth carried by the balance-wheel spindle and communicating movement to the escapement-wheel, a pin on the balance-wheel, a pivoted lever having a soft-iron armature at one end adapted to be attracted by the electromagnet, and having a cut-away part at the opposite end adapted to be engaged by the pin on the balance-wheel, a plate A, an insulated plate thereon, a spring 8 adapted to be connected to the other pole of the battery, carried by the latter plate, and a spring-pawl engaging the teeth of the escapement-wheel and adapted to make contact with the spring 8 when said spring is pressed outwardly by the escapement-wheel each time the latter receives an impulse, and means for varying the distance between the spring-pawl and the spring 8.

In testimony whereof we have hereto set our hands in the presence of the two subscribing witnesses.

EMILIO ROSI.
GIUSEPPE VACOTTI.

Witnesses:
OSVALDO MARCENARO,
ANTONIO DOLIO.