N° 21,224 A.D. 1898

Date of Application, 8th Oct., 1893—Accepted, 7th Oct., 1899

COMPLETE SPECIFICATION.

Improvements in or relating to Electric Clocks or Watches.

We, EMILIO ROSI, of Arquata-Scrivia, Manufacturer, and GIUSEPPE VACOTTI, of Serravalle-Scrivia, Italy, Watchmaker, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

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 multiple or fractions of seconds, according to the dimensions of the balance.

In the accompanying drawing

Figures 1 and 2 are views of the apparatus, Figure 1 shewing the position of the parts when the armature is not in contact with the electromagnet, and Figure 2 a similar view, shewing the position of the parts when the armature is in contact with the electromagnet.

Figure 3 is a detail view and

Figure 4 a vertical section.

Figure 5 is an underside view shewing the escapement 13 & cooperating parts, on a larger scale.

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 electro-magnet 6 and to an insulated plate 7 and spring 8.

The electric clock or watch comprises

1) 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 disc 14 carrying a small pivotted tooth 13, acted upon by a spring 12, which tooth communicates movement to the escapement wheel 1, and a small rod 15 fixed to one of the spokes of the balance wheel, which rod, when at rest engages in the fork or recess of the anchor 4.

2) 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.

3) A pair of electro-magnetic coils 6 of ordinary construction.

4) A toothed escapement wheel 1 which engages with the tooth 13 on the disc 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.

5) A small plate 7, insulated from the plate A by a vulcanite base, or otherwise, which plate carries the spring 8, and adjusting screw 9, which spring bears against a small rod or projection 11 of some insulating material.

6) 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.

7) 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, plate 7, to the other pole of the battery.

When there is no movement in the clock, the circuit is normallly broken, the balanced 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 electro magnets 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, 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 by it a tooth forward; the circuit is again closed and the same sequence of action is repeated.

The distance between the spring contact 8 and the pawl can be regulated by means of a screw 7^b, (the balance automatically varying its oscillations from $\frac{1}{2}$ to 2 revolutions, according to the power of the battery) whereby the contact between the spring 8 and the pawl 10 is closed for a more or less long time, and the armature 5 is maintained in contact with the electro-magnet for a more or less long time, so that the clock receives an electric current for longer and longer periods as the battery becomes weaker and thus goes uniformly until the battery is 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.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. An electric timepiece comprising an electro-magnet connected to one pole of a battery a balance provided at one end with an armature and at the other end with a cut away part co-operating with a pin on the balance wheel, intermediate gearing for driving the hands in combination with a spring pawl and an insulated spring contact plate connected to the other pole of the battery, substantially as described.

2. An electric timepiece comprising an electro-magnet connected to one pole of a battery, a balanced armature (4) with a recess (15), a balance wheel (2) provided with a pin (15), a wheel (1) pawl (10), spring contact (8) and insulated plate (7) connected to the other pole of the battery substantially as described.

3. An electric timepiece substantially as described or illustrated in the accompanying drawings.

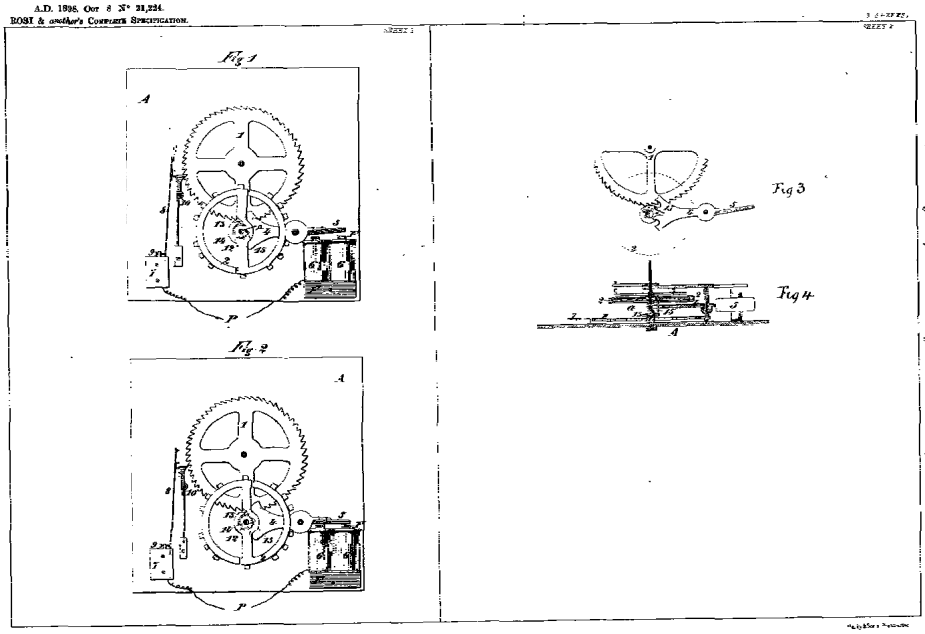
Dated this 8th day of October 1898.

BOULT & WADE,
Agents for the Applicants.

Redhill: Printed for Her Majesty's Stationery Office, by Malcomson & Co., Ltd.—1899.

A.D. 1898. Oct 8 N° 21,224.

ROSI & another's Complete Specification.



[This drawing accompanies the original, but not reproduced here.]

A.D.
ROSI &

1888 Oct. 8. N° 21,224.
COMPLETE SPECIFICATION.

Fig. 1.

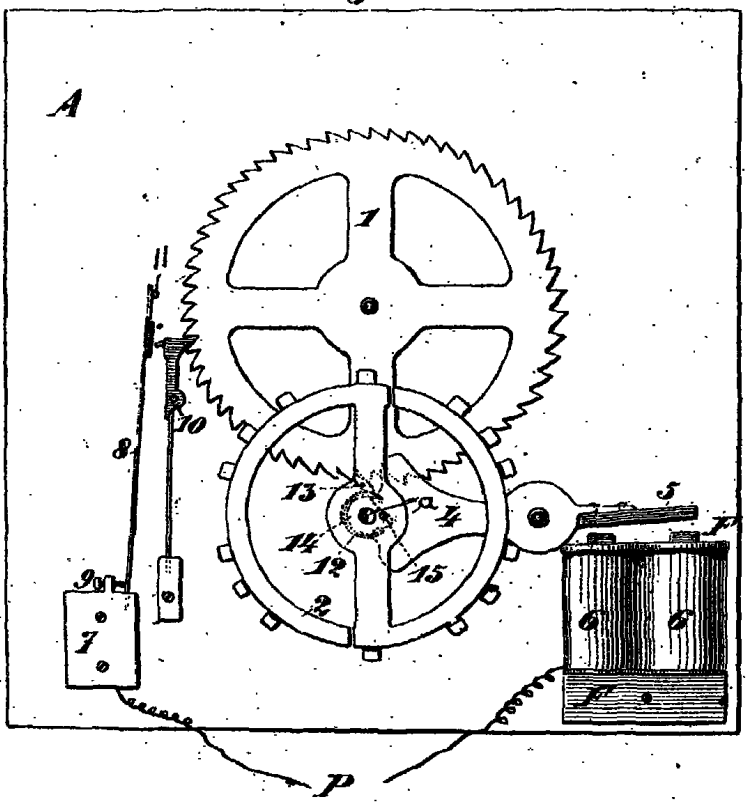
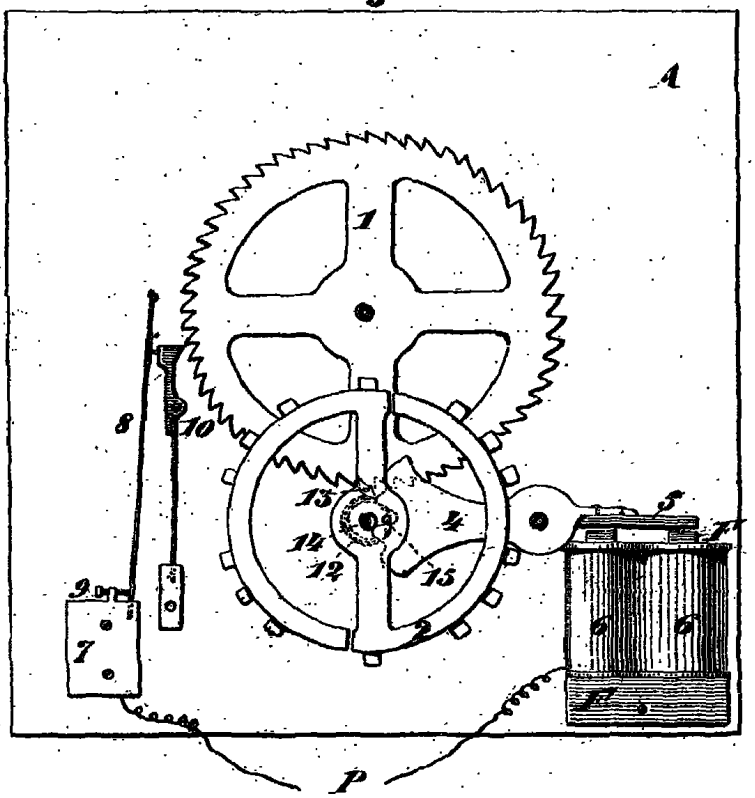


Fig. 2.



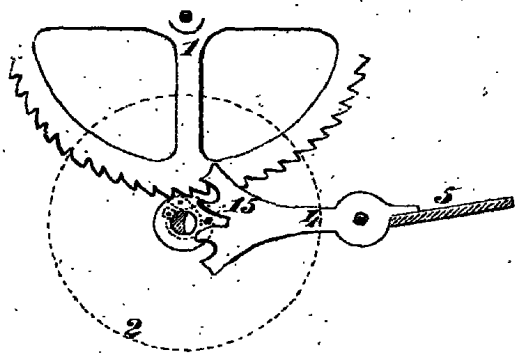


Fig 3

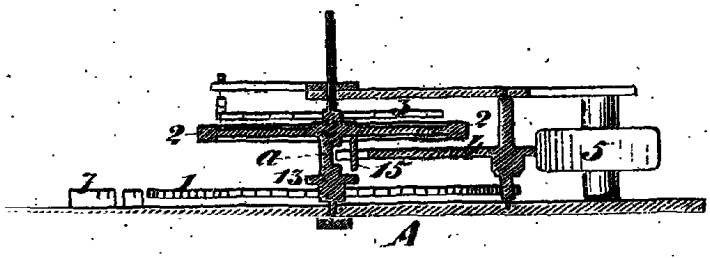
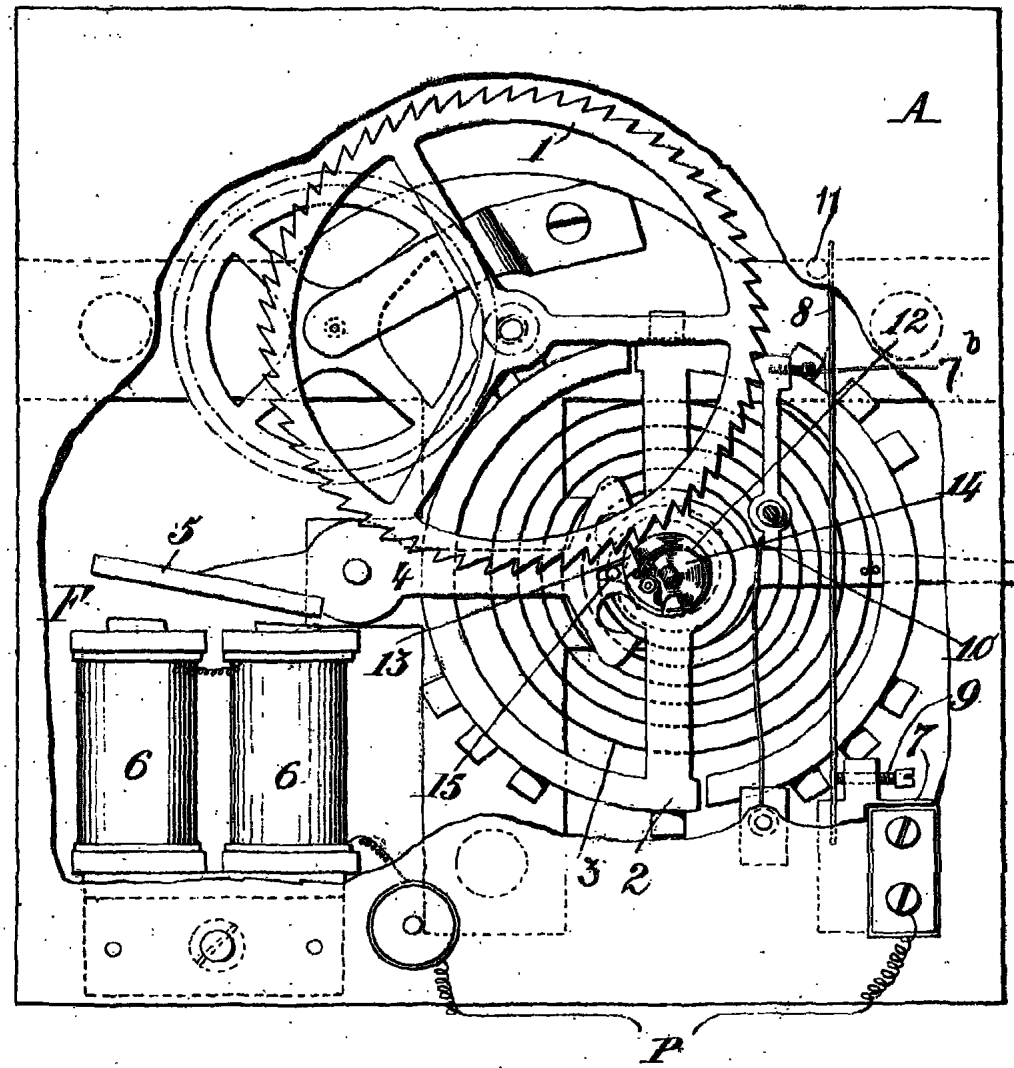


Fig 4.

[This Drawing is a reproduction of the Original on a reduced scale.]

Malby & Sons, Photo-Litho.

Fig. 5.



[This Drawing is a reproduction of the Original on a reduced scale.]

Malby&Sons, Photo-Litho.