

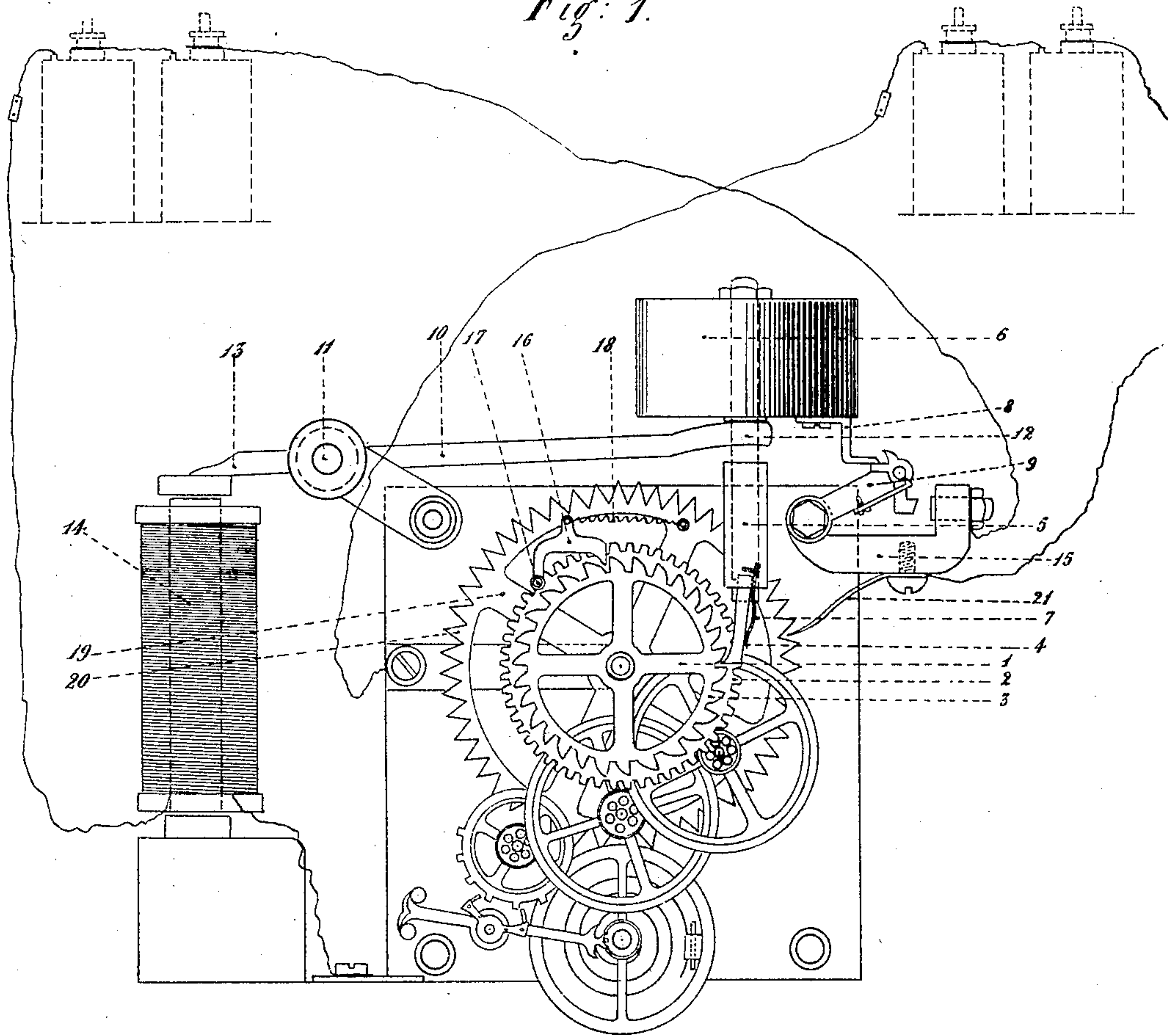
No. 804,082.

PATENTED NOV. 7, 1905.

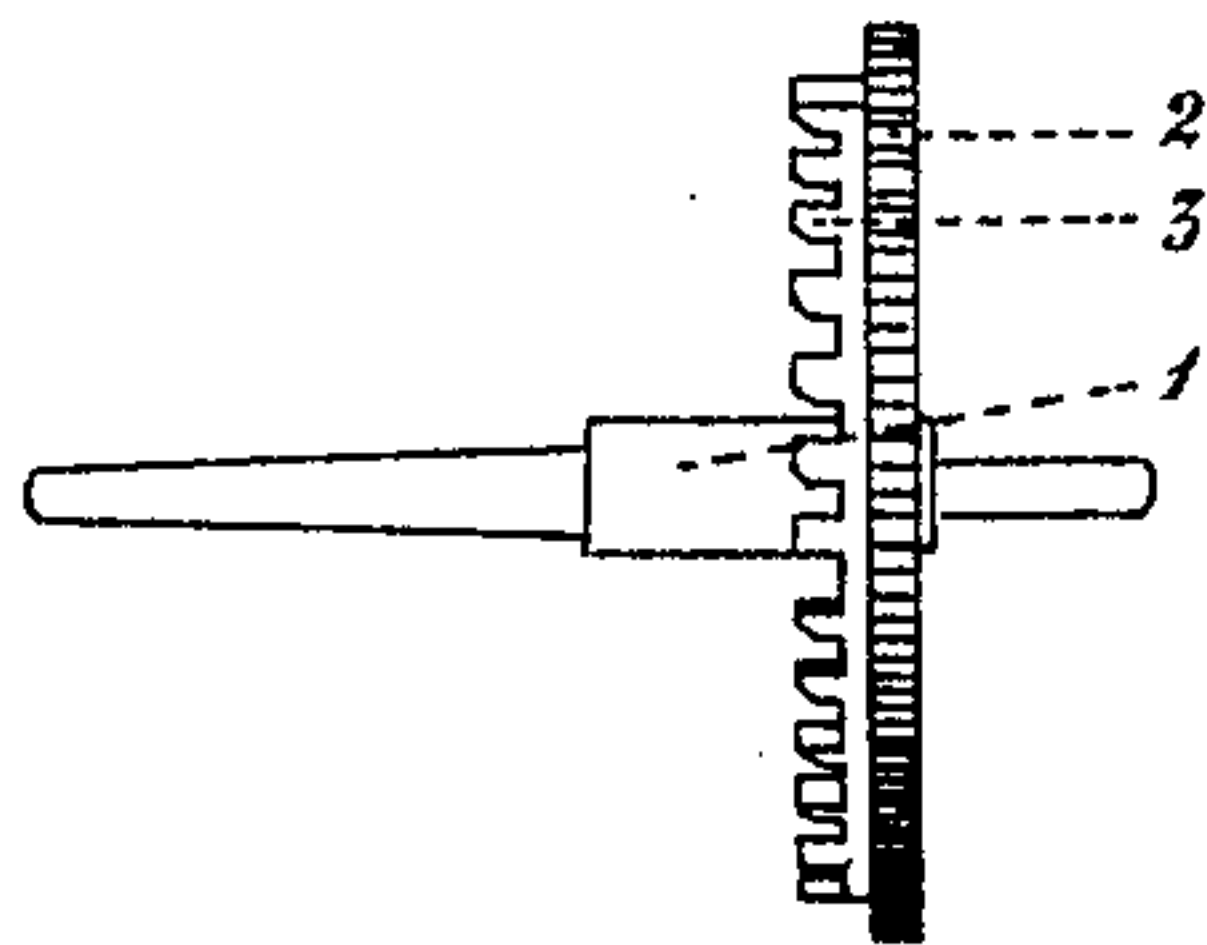
L. AGOSTINELLI.  
ELECTRIC CLOCK.

APPLICATION FILED JULY 31, 1903.

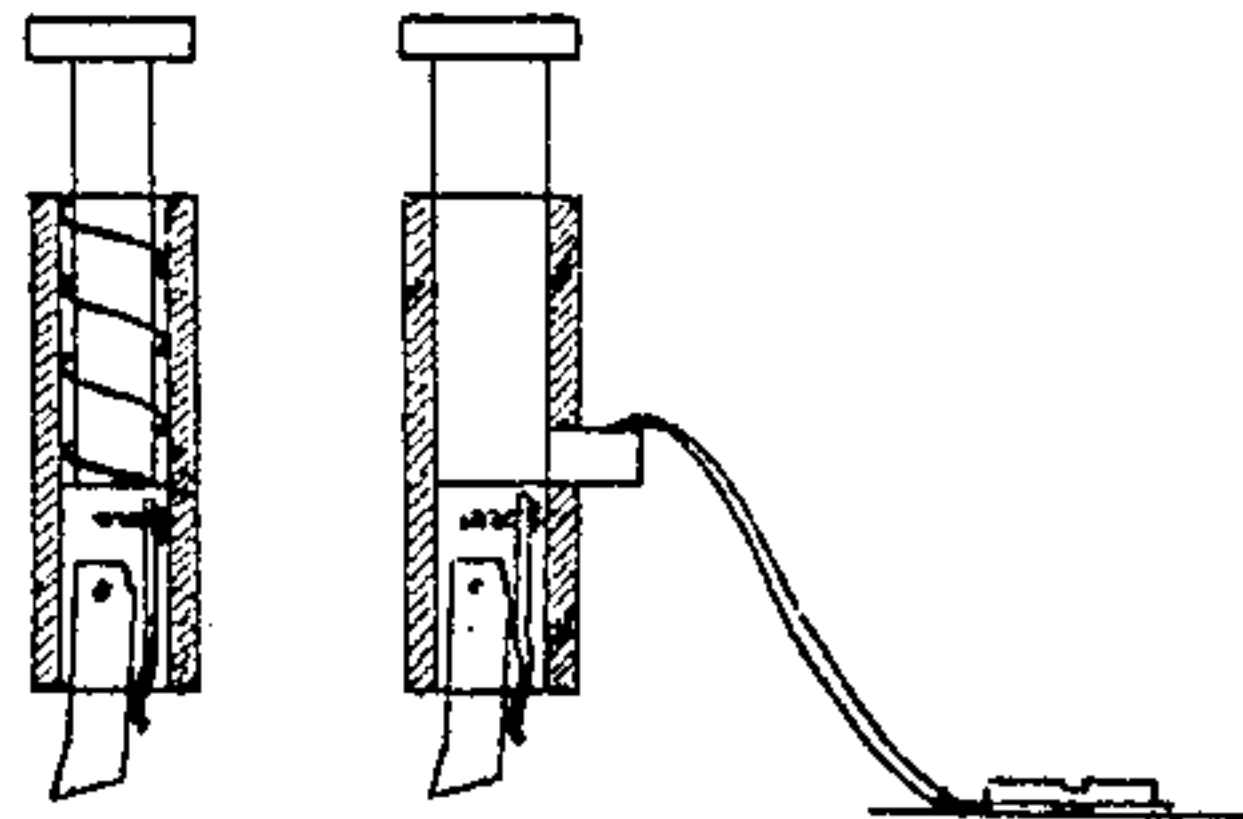
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*



*Witnesses:*

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*Leopoldo Agostinelli*  
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# UNITED STATES PATENT OFFICE.

LEOPOLDO AGOSTINELLI, OF TERNI, ITALY.

## ELECTRIC CLOCK.

No. 804,082.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed July 31, 1903. Serial No. 167,803.

*To all whom it may concern:*

Be it known that I, LEOPOLDO AGOSTINELLI, a subject of the King of Italy, residing at Terni, Italy, have invented certain new and useful Improvements in or Relating to Clocks and Regulators, of which the following is a specification.

This invention relates to an electric clock which may be used to regulate as well as to drive other clocks. The chief advantage of construction according to this invention consists in the diminution of friction—that is to say, of a defect which hitherto has been evident in the construction and use of electric clocks. Besides this advantage there is also the advantage of great simplicity of construction, and it is well known that the simpler the mechanism the less liable it is to get out of order.

In the accompanying drawings, Figure 1 shows a diagrammatic view of the clock mechanism constructed according to this invention. Fig. 2 is a detail view of the driving-wheel, and Fig. 3 detail views of modified forms of the pawl-operating device.

The main feature of the invention is the employment of a wheel 1 with two sets of teeth 2 3, one of which, 2, drives other wheels as in ordinary clocks for the purpose of transmitting the movement, while the other teeth 3, of special shape and at right angles to the first set of teeth, do not engage with any wheels, but only with a pawl 4, connected to a bar 5, on the top of which is a weight 6. There are thirty of these lateral teeth 3 on the wheel 1 and the distance between them represents two minutes. This does not, however, mean that a smaller or larger number of teeth could not be used. The movable pawl 4 is provided with a light spring 7, which tends to keep it in engagement between the teeth 3.

The weight 6, of sufficient size for producing movement of the clock, is simply an invariable constant. It is not carried either by cords or springs, and also forms an important feature of the invention. It can be increased or reduced in accordance with the electric current and with the construction of the clock, and in this way it will cause the clock to go with most absolute precision.

To the bottom surface of the weight 6 is secured a small gun-metal bracket 8, and under said bracket 8 is a small copper spring pawl or lever 9, which on descending closes an electric circuit.

A lever 10, pivoted at 11, supports by one

of its arms 12 the weight 6, the other shorter arm 13, made of soft iron, projecting at a suitable distance above an electric magnet 14, which attracts it when a current is passed through it.

The movement takes place in the following manner: The weight 6 presses down the bar 5, the movable pawl 4 of which, under the action of the spring 7, presses against one of the teeth 3 of the wheel 1. At a certain point—in this case after an interval of exactly two minutes—the bracket 8, which rests on the lever 9, causes the latter to touch a contact 15 and closes an electric circuit. The magnet 14 then becomes magnetized, attracts the arm 13 of the lever 10, and raises the weight 6 into its original position. The circuit is thus instantaneously opened, and the weight 6, with its bar 5 and the movable pawl 4, descends by gravity to the next tooth of the wheel 1.

The movement produced by electricity—that is to say, the raising of the weight 6—might prevent the clock from going during a short interval or might even reverse its movement. In order to obviate that, a small escapement or maintaining power 16, pivoted at 17 to one of the frames supporting the wheels and provided with a weak spring 18, presses, shortly before the electromagnet becomes operative, against one of the teeth of the wheel 1 and prevents movement in the opposite direction, while the pendulum continues to move.

Owing to a very small force being required for raising the weight 6 every two minutes, it is sufficient to have two or three good primary cells or an equivalent number of storage batteries.

Instead of a weight a helical or other spring may be used to press the end of the lever downward, Fig. 3, but as the tension of the spring may vary the use of a weight is preferable.

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

1. An electric clock comprising a wheel provided with two sets of teeth 2 and 3, the teeth 3 being at right angles to the teeth 2, a pawl engaging the teeth 3, a bar carrying the pawl, a power 6 on the top of the bar, a spring-pawl adapted to be actuated by the said power 6, a pivoted lever carrying an armature at one end and supporting the power 6 at the other end, an electromagnet adapted when energized to attract the said armature and an electric circuit in which the electromagnet is

included, the said spring-pawl being adapted to close the said circuit and thus energize the magnet when the power 6 has operated to cause the spring-pawl to descend as and for the purpose specified.

2. An electric clock comprising a wheel provided with two sets of teeth 2 and 3, the teeth 3 being at right angles to the teeth 2, a pawl engaging the teeth 3, a bar carrying the pawl, a power 6 on the top of the bar, a spring-pawl adapted to be actuated by the said power 6, a pivoted lever carrying an armature at one end and supporting the power 6 at the other end, an electromagnet adapted when energized to attract the said armature, an electric

circuit in which the electromagnet is included, the said spring-pawl being adapted to close the said circuit and thus energize the magnet when the power 6 has operated to cause the spring-pawl to descend, and a pivoted main- 20 taining power having a spring adapted to engage against one of the teeth of the wheel in the manner and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of 25 two subscribing witnesses.

LEOPOLDO AGOSTINELLI.

Witnesses:

ENUTS IGURZZUT,  
ADOLFO TOFIENI.