

F. MARTI

ELECTROMAGNETIC IMPULSE TIMEPIECE

Fig: 1

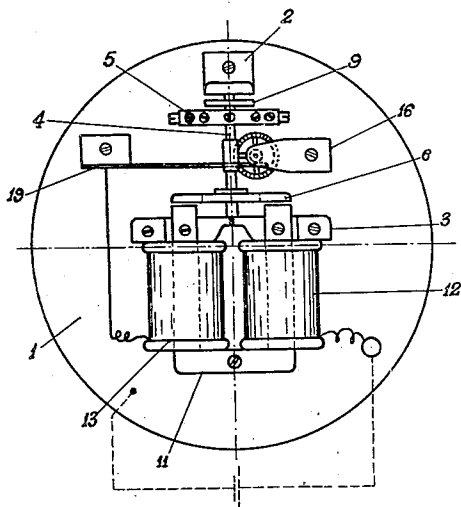


Fig: 2

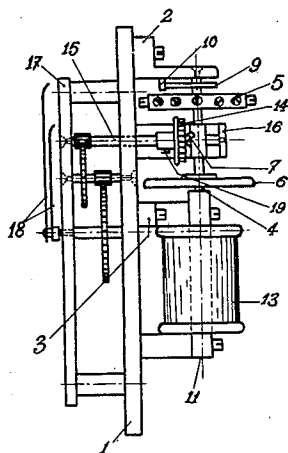
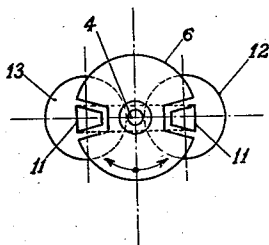
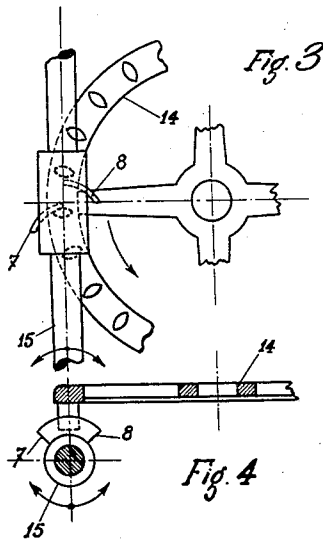


Fig. 5



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ELECTROMAGNETIC IMPULSE TIMEPIECE

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Up to the present, the manufacture of small electric time-pieces has always met with some technical difficulties. If the direct giving of impulse to a relatively heavy pendulum was easy, the face of things changed when the matter was for setting in motion the balance of either a small clock or a watch.

The solutions either suggested or brought into practice evaded the obstacle by simply substituting for the winding up, by hand, of both travelling clocks and usual watches their winding up by an electro-magnet. A system of contacts, more or less intricate, closed periodically the circuit of the electro-magnet, which, in attracting its armature, wound up again the main spring of the time-piece.

House and travelling clocks, motor car watches, etc., built in such a manner, are liable to the inconvenience of being too complicated as well as of showing a poor electric efficiency, so that large cells or even a connection to a distribution network are necessary for keeping them going.

My invention relates to an electro-magnetic impulse time-piece wherein the magnetic energy acts directly on the regulating part without travelling through the whole train of wheels, which spends needlessly the greatest part of the energy.

A small cell, located e. g. within the very case of the time-piece, is able to supply the required energy to keep the latter going for a very long period.

On the accompanying drawing sheet, Fig. 1 is a front view of one constructional embodiment of my invention and Fig. 2 a side view of the same, whilst Figs. 3 and 4 show each enlarged views of the impulse pallets and the escapement wheel, and Fig. 5 represents a front view of the parts constituting the impulse electro-magnet.

Construction: To the backing plate 1 (see Fig. 1) are fastened the two sockets 2 and 3, in which runs freely the arbor 4 carrying the balance 5, the electro-magnetic impulse flange 6 and the impulse pallets 7 and 8 (see Figs. 2 and 3).

The regulating spring 9, attached to the

pin 10, prompts the vibrating motion of the arbor 4. The pin is fixed to the socket 2.

To the socket 3 are also secured the two branches of the U-shaped core 11, carrying the coils 12 and 13.

The parts 11, 12 and 13, as well as the flange 6 form the electro-magnetic impulse system, designed for keeping the balance vibrating and, accordingly, the time-piece going. The flange 6 is provided with two recesses disposed diametrically opposite each other and, when the electromagnet is not excited, has the position shown in Fig. 5, the two recesses lying above the cores 11.

A specially shaped escapement wheel 14 (see Figs. 3 and 4) is riveted to an arbor 15, pivoting on the socket 16 and the bridge 17 for the train of wheels. This wheel, being in the field of action of the impulse pallets 7 and 8 (see Figs. 3 and 4), is allowed to escape half a tooth, in direction of the arrow, for every half vibration (see Fig. 3).

By the interposition of the arbor 15, this rotation is communicated to the train of wheels carrying the hands 18.

The escapement wheel 14 is electrically insulated from the arbor 15 and is in rubbing contact with the also insulated snap 19.

Operation: In the position of rest, the balance arbor 4, together with the flange 6, occupies the place shown in Fig. 5.

As soon as the arbor 4 moves clockwise to the right, the pallet 8 (see Fig. 3) gets in contact with a tooth of the escapement wheel 14 and closes the circuit of the cell viz, coils 12 and 13, snap 19, escapement wheel 14, pallet 8, arbor 4, spring 9, pin 10, and, therefrom, back to the cell through the body of the time-piece. The current flowing in that way energizes the electro-magnet, which tends to move the flange 6 in the direction referred to and gives thus an electro-magnetic impulse to the balance, till the pallet 8 leaves the tooth of the escapement wheel 14 and opens the circuit, the balance going on vibrating freely. When the latter moves back, the pallet 7 will in turn get in contact with the following tooth of the escapement wheel 14, the consequence being a new impulse from the electro-magnet, still in direc-

tion of the instantaneous motion of the balance. Each vibration is followed by the same play.

Accordingly the pallets 7 and 8 perform the double duty of electric contact parts, for feeding the electro-magnet, and, of mechanical impulse parts, for setting in motion the escapement-wheel.

I claim:

10 1. An electro-magnetic impulse time-piece comprising an escapement wheel actuating the movement, and a rotative arbor on which are mounted a balance, an electro-magnetic impulse flange acted upon by an electro-
15 magnet and impulse pallets to actuate said escapement wheel, the escapement wheel and the impulse pallets being connected in circuit with the electro-magnet so that the circuit is made and broken between the impulse
20 pallets and the escapement-wheel.

2. In combination with electrically driven clockwork, an electromagnet, an oscillating arbor, an armature mounted thereon and actuated by said electromagnet to give an
25 impulse to said arbor, a balance wheel on said arbor, impulse pallets also carried by said arbor and being included in the circuit of the electromagnet, and an escapement wheel operatively connected with said clockwork
30 and having its teeth arranged in the path of said oscillating impulse pallets to therefrom receive a rotary motion, said escapement wheel being also included in the electric circuit so that the impulse pallets and the teeth
35 of the escapement wheel form the make and break device of said circuit.

In testimony whereof I affix my signature.

FRITZ MARTI.

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