PATENT SPECIFICATION

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463,201
No. 30134/35.

COMPLETE SPECIFICATION

Improvements in Electric Time Pieces

I, HENRI BUECHE, of Court, Berne, Switzerland, of Swiss Nationality, 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:—

The subject of the present invention is an electric time piece characterised on the one hand by an electrical contacting device of which the movable part fixed to the staff of the balance wheel is constituted by the end of a finger in the form of a pallet, the inclined faces of which displace parallel to the said staff the other contacting part which is constituted by a blade spring and held in such manner that it comes in contact with one or other of the inclined faces of the said pallet according to the direction of oscillation of the balance wheel, and on the other hand by a pin fixed on the armature of an electro magnet, which armature is in one with the balance wheel, this pin in one direction of oscillation of the balance wheel driving the first wheel of the train geared to the hands and not driving it in the other direction of oscillation by virtue of the fact that it presents, against the back of the tooth engaged, an inclined part which displaces the said wheel bodily parallel to the staff of the balance wheel, a jumper spring preventing the wheel from turning during this operation and then returning it to position.

The annexed drawing shows partly and by way of example one embodiment of the invention.

Fig. 1 shows the whole of the mechanism.

Fig. 2 is a section of the bearings of the first wheel of the mechanism driving the hands.

Figs. 3 and 4 show the above-mentioned wheel in operation with the entraining driving pin fixed to the movable armature.

Fig. 5 shows the form of iron core of the electro-magnet.

Fig. 6 shows the operation of the contacting parts.

Referring to the drawings a bridge 1 mounted on the plate 1^1 and held by two screws 2 and 3 is provided with two parallel brackets 7 and 8 bent at 90° forming two bearings for the pivots of the staff 6 of the balance wheel 9. The lug 10 to which the hair spring is anchored is fixed to the bracket 7. The staff 6 carries a finger 11 the end of which, on rotary displacement of the balance wheel 9, contacts with the end of a blade spring 5 which is in its path and is electrically insulated from the bridge 1. The iron core 15 of the electro-magnet 4 also fixed to the bridge 1 is formed by assembled plates, the ends 13 of which are slightly spaced from one another to form a gap (Fig. 5) into which freely extends the armature 12 mounted on the staff of the balance wheel.

The end of the finger 11 is reduced in thickness and forms an inclined pallet (Fig. 6). The end of the blade 5 opposite the pallet of the finger 11 is caused, on the passage of the latter, to be displaced parallel to the staff 6, sliding on one or the other of the inclined sides of the finger 11 according to the direction of oscillation of the balance wheel.

One of the poles of the source 14 of electricity is connected to the plate 1^1 and from thereby the mass to the finger 11; the other pole is connected to the commencement of the winding of the coil 4, the other end of which is connected to the blade 5 electrically insulated from the bridge 1. On each oscillation of the balance wheel, the contacting members 11 and 5 contact and produce closure of the circuit from the source 14 of electricity as a result of which an impulse is imparted to the armature 12 and consequently to the balance wheel.

Fig. 6. In order to avoid electrically insulating one side of the contacting finger 11, a costly and very delicate operation, provision is made whereby in one direction of oscillation of the balance wheel the duration of contact will be longer. This is obtained by reason that in the position of rest of the blade 5 co-operating with the inclined faces of the finger 11 the end of the blade is placed just below the centre of the finger. On the oscillation of the balance wheel in the direction of the arrow H (Fig. 6) the

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upper inclined face of the finger will come under the blade 5, causing it to be displaced from its position R to the position indicated in dotted lines G, then the blade, when the finger 11 wipes past it, will return to its position of rest R. On return of the balance wheel in the direction of the arrow F the finger will present its lower inclined face above the plate, which will yield downwards into position D, but with a path and during a time much less than the preceding operation. It is easy to understand that the balance wheel, in oscillating, will close the electric circuit by the contacting members 5 and 11, producing attraction of the armature between the poles 13 of the electro-magnet. In the direction of oscillation of the balance wheel indicated by the arrow H, the armature is forcibly attracted between the pole masses. On the other hand, on the return in the direction of the arrow F, the duration of contact being very short, the magnetic action has no effect on the armature.

The pinion 17 connected to the train (not shown) of the watch pivots between the plate 1^1 and a smooth pipe 18 fixed to the bridge 19. The elongated opening in the pipe (Fig. 2) permits displacement of the pivot 21 parallel to the staff of the balance wheel. On the pivot 21 is mounted a wheel 16 which is connected through a train of gearing to the clock hands and is displaced, in the direction of the arrow, by the armature 12 which, when it is displaced from right to left, Fig. 3, carries its pin 20 against the radial face of a pinion tooth, and the jumper spring 22 yields for the passage of the tooth. On return of the armature the pin 20 again comes in contact with the tooth but should not drive the wheel 16. For this purpose the inclined face of the pin 20 comes against the back of the tooth (Fig. 4) which causes the wheel to move bodily parallel to the staff of the balance wheel and the spring returns it to position when the pin is disengaged from the tooth.

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

1. An electric time piece characterised on the one hand by an electrical contacting device of which the movable part fixed to the staff of the balance wheel is constituted by the end of a finger in the form of a pallet, the inclined faces of which displace parallel to the said staff the other contacting part which is constituted by a blade spring and held in such manner that it comes in contact with one or other of the inclined faces of the said pallet according to the direction of oscillation of the balance wheel, and on the other hand by a pin fixed on the armature of an electro-magnet, which armature is in one with the balance wheel, this pin in one direction of oscillation of the balance wheel driving the first wheel of the train geared to the hands and not driving it in the other direction of oscillation by virtue of the fact that it presents, against the back of the tooth engaged, an inclined part which displaces the said wheel bodily parallel to the staff of the balance wheel, a jumper spring preventing the wheel from turning during this operation and then returning it to position.

2. An electric time piece incorporating a mechanism constructed and arranged to operate as described with reference to the accompanying drawing.

Dated this 31st day of October, 1935.

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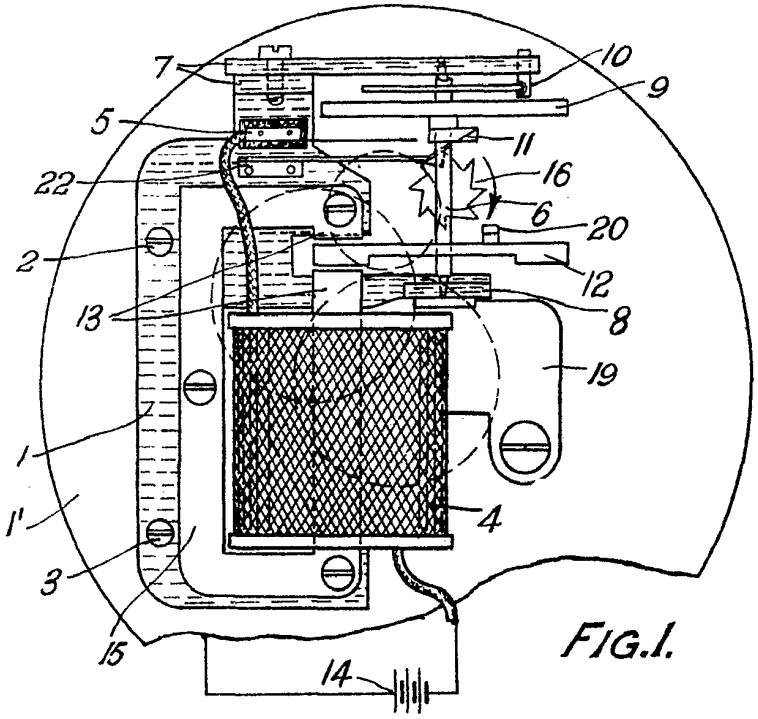

FIG. 1.

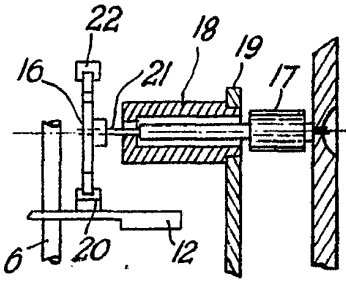

FIG. 2.

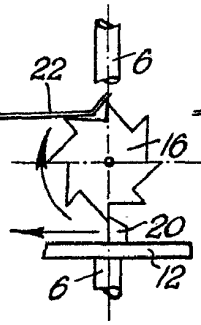

FIG. 3.

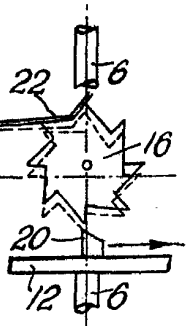

FIG. 4.

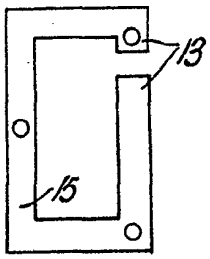

FIG. 5.

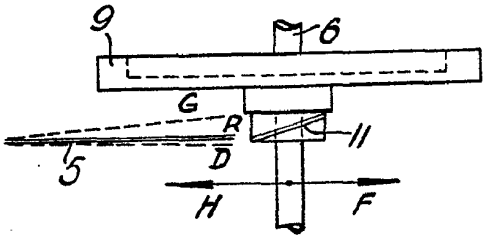

FIG. 6.

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