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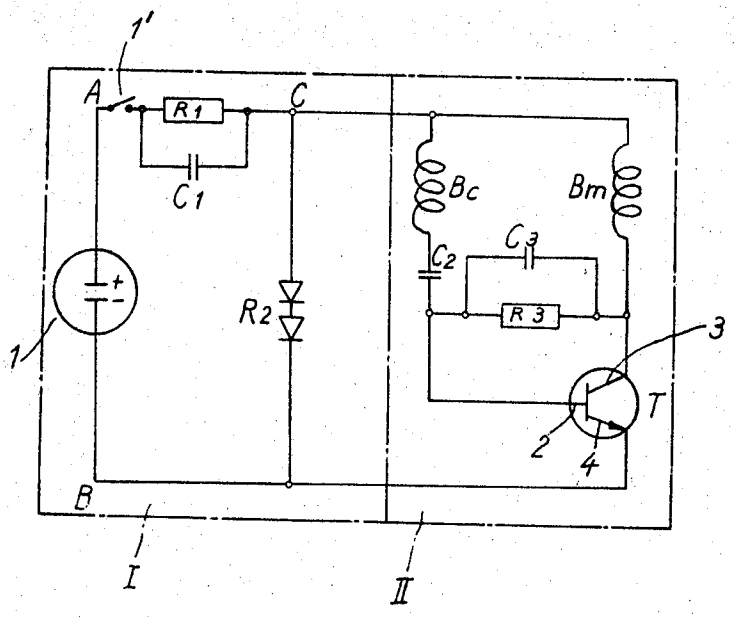

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FEEDING DEVICE OF AN ELECTRIC CLOCKWORK

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ABSTRACT OF THE DISCLOSURE

A feeding device producing a stabilized feeding current to an electric clockwork and comprising, a pair of resistances, a condenser connected in parallel with one of the resistances to permit the alternate pulses coming from the clockwork to close themselves on a low impedance circuit constituted by the condenser and by a source of direct feeding current while producing the self-starting of the clockwork at the time of switching on the clockwork as the condenser operates substantially as a short circuit with respect to the resistance with which it is connected in parallel.

The present invention relates to a feeding device of an electric clockwork for providing a stabilized feeding current.

The feeding devices of an electric clockwork must present the following properties so that the clockwork will operate satisfactorily.

It must:

(1) Supply direct current that is well stabilized.
(2) Present a very weak internal resistance to the alternate short pulses emanating from the clockwork.
(3) Permit the self-starting of the electric clockwork by means of the sudden appearing of the feeding current to the input of the clockwork when put under tension.

The purpose of the present invention is to provide a feeding device of an electric clockwork which provides these three properties.

This feeding device is characterized by the fact that it comprises a condenser connected in parallel with one of a pair of resistances, this condenser allowing the alternate pulses coming from the clockwork to be detected in the low impedance circuit constituted by the condenser and by a source of direct feeding current, while providing self-starting of the clockwork when it is put under tension owing to the fact that the condenser operates substanially as a short circuit with respect to the resistance with which it is connected in parallel.

The drawing is an electrical diagram showing by way of example, one embodiment of the invention.

Portion I represents the feeding device and portion II represents the circuit of an electric clockwork, all for facilitating an understanding of the operation of the feeding device.

The feeding device comprises a source of feeding current **1**, having two terminals designated by A and B, the internal resistance of which is relatively weak with respect to the resistance of the electric clockwork. In case the source of current has too high an internal resistance, same can be remedied by the addition of a condenser connected in parallel therewith.

The stabilization of the current is produced by a linear resistance R_1 and by a non-linear resistance R_2 constituted by two diodes directly connected. Non-linear resistance

R_2 could also be constituted by a resistance VDR, by a Zener diode or by any non-linear means. The suitable choice of the resistances R_1 and R_2 allows maintenance to between points C and B of the circuit of a stable current of a desired value. Thus the tension between the terminals A and B of the source of current can vary to a large extent without the tension between points C and B being submitted to any substantial change, all so that the condition of a well stabilized supply current is met.

A switch **1'**, connected between terminals A and resistance R_1 allows the on and off switching of the feeding device.

A condenser C_1 is connected in parallel with resistance R_1.

The electric clockwork comprises a driving coil B_m, a pickup coil B_c of a conventional horological vibratory or oscillator element carry permanent magnet means which interact with coils B_m and B_c, a transistor T, a capacity C_2 connected in series with pickup coil B_c and a base **2** of transistor T, and a constant time, constituted by a capacity C_3 and by a resistance R_3 mounted in parallel, connected between base **2** and a collector **3** of transistor T.

Condenser C_1 of the feeding device serves three functions:

(1) It bypasses resistance R_1 permit the signal induced in pickup coil B_c to circulate in the circuit constituted by condenser C_2, base **2** and an emitter **4** of transistor T, the feeding source U, the switch **1'**, and condenser C_1 with backway to B_c, all without any substantial weakening, so as to produce a feeding of the transistor.

That is to say, the signal induced in pickup coil B_c must be able to pass in a circuit of low impedance, a condition necessary for successful operation of the clockwork and a provision of the second of the above-mentioned properties.

(2) It levels the tension at the outputs of resistance R_1 in the manner of a filter. Its effect is especially useful when current shocks are produced, due to the opening of the transistor, and circulate in the circuit constituted by driving coil B_m, collector **3** and emitter **4** of transsistor T, feeding source U, switch **1'** and condenser C_1.

This also serves to provide the second of the above-mentioned properties.

(3) As the clockwork is placed under tension, by means of switch **1'**, condenser C_1 is unloaded so as to provide a short circuit, at switching on, and thus a sufficient pulse of current to the clockwork to produce the self-starting of the latter and thus to provide the third of the above-mentioned properties.

It is to be noted that, when the force of current U is not connected, that is to say when switch **1'** is open, condenser C_1 unloads itself into resistance R_1, so that it is unloaded at the next switching on.

In the embodiment shown, the several elements of the circuit can have, for instance, the following values:

Source of current U—6 to 18 v.
Resistance R_1—1 to 2KΩ
Resistance R_2—150KΩ
Capacity C_1—10 μf.
Capacity C_2—20 μf.
Capacity C_3—0.1 μf.

It is also to be noted that, in the usual stabilisers of current, condenser C_1 is in parallel with non-linear resistance R_2 This arrangement has the drawback of not permitting self-starting, due to the fact that condenser C_1 would then short-circuit resistance R_2. The tension to the inputs of the clockwork could thus, at the time of switching on increase only slowly, as condenser C_1 is loaded through resistance R_2, with the result that it would

not produce the current shocks necessary for the self-starting of the clockwork.

What I claim is:

1. In combination with an electric clockwork including a driving coil, a pickup coil, a transistor, a capacity in series with the pickup coil and a base of the transistor, a capacity and resistance in parallel and connected between the base and a collector of the transistor and a feeding device for providing a stabilized feeding current to the clockwork whenein said comprises:

a source of direct feeding current,

a switch for the feeding of the feeding current,

a linear resistance and a non-linear resistance for stabilizing the feeding current,

a condenser connected in parallel with the linear resistance for bypassing the linear resistance upon a switch on of the feeding current and providing a pulse to the clockwork adequate for the self-starting of

the clockwork wherein said non-linear resistance is connected between said terminals of said source, said condenser is located between one of said terminals of said source and said non-linear resistance and said feeding device is connected across both the input and the output of said transistor.

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U. S. Cl. X.R.

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