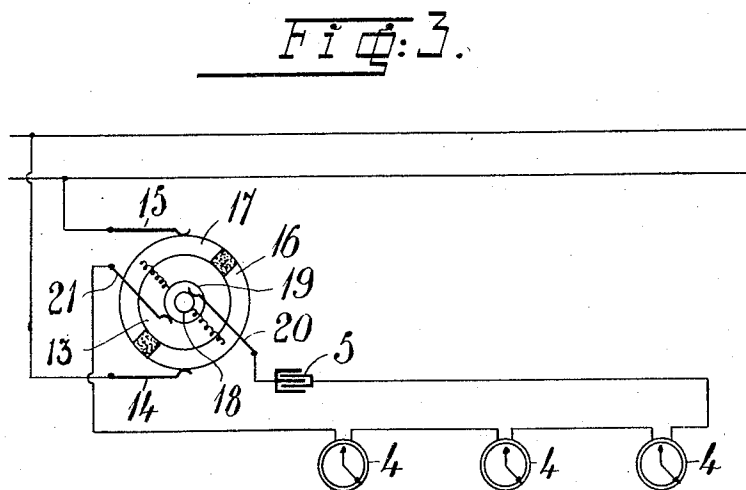
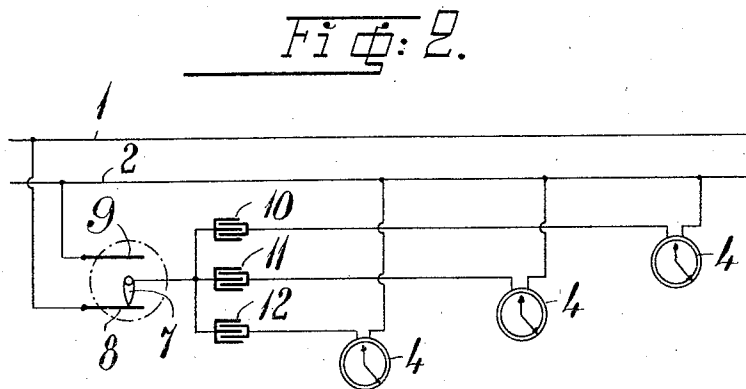
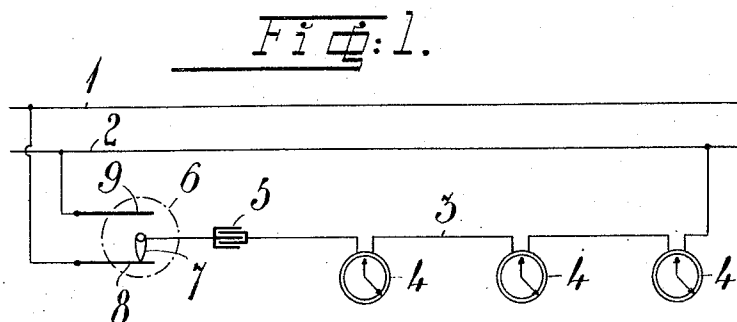


G. O. LARSSON.
 DEVICE FOR DRIVING ELECTRIC SECONDARY CLOCKS.
 APPLICATION FILED OCT. 26, 1908.

1,006,569.

Patented Oct. 24, 1911.



Witnesses.

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UNITED STATES PATENT OFFICE.

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DEVICE FOR DRIVING ELECTRIC SECONDARY CLOCKS.

1,006,569.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed October 26, 1908. Serial No. 459,597.

To all whom it may concern:

Be it known that I, GUSTAF OSCAR LARSSON, a citizen of the Kingdom of Sweden, residing at Stockholm, Sweden, have invented new and useful Improvements in Devices for Driving Electric Secondary Clocks, of which the following is a specification.

This invention relates to an improved device for driving electric secondary clocks.

In order to have a number of electric clocks go synchronously it is usual to drive them by means of current from a primary or central carefully regulated clock. The electrically driven clocks, the so called secondary or sub-clocks, may be of a very simple construction, a simple relay being usually used for driving them, said relay operating a step-by-step motion each time the circuit is closed and thereby turning their hands a distance corresponding to the intervals at which the circuit is closed in the primary or central clock. The said intervals may be comparatively long for instance 30 seconds or more, whereby the consumption of current for driving the secondary clocks will be comparatively small. However, when a plurality of secondary clocks are driven from a central clock and all of them receive impulses of current through a common switching device the contacts of the latter, especially by the breaking sparks will rapidly be worn out and must often be looked to in order to avoid interruptions of working.

The object of the present invention is to provide a device for driving electric secondary clocks by means of which the consumption of current will be essentially reduced and further the contacts of the primary clock will not be injured by sparks, the breakings of the circuit taking place at currentless contacts.

The invention consists, principally, in that the secondary clock or clocks is or are driven by means of impulses of current which are distributed from a source of electric current by means of a condenser or condensers under the control of a periodically operated switching device at the primary clock.

In the accompanying drawing I have shown diagrammatically three systems embodying my invention.

Referring to Figure 1, 1 and 2 indicates two main conductors, for instance two wires of a lighting net, while 3 indicates a third

conductor in which is inserted a number of secondary clocks 4. The construction of the latter is not illustrated, as the same can be of any well known or suitable kind. The driving magnet thereof may however suitably be provided with a wound armature. In the conductor or wire 3 is further inserted a condenser 5 serving to take up the currents used for driving the secondary clocks.

6 is a wheel in the primary clock from which the secondary clocks are driven. On the shaft of said wheel 6 is provided a contact 7 which during each revolution of the shaft engages two contact springs 8 and 9 arranged diametrically opposite each other. The said contact springs 8 and 9 are connected to the wires 1 and 2 respectively, and the contact 7 is connected to the one end of wire 3 the other end of which is connected to wire 2. The construction of the primary clock may in other respects be arbitrary and the said clock may be driven mechanically or electrically and can eventually only consist of a carefully regulated electric pendulum or any equivalent device serving to drive the wheel 6. In the position of the contact 7 shown in the drawing the condenser is charged and the secondary clocks thereby receive an impulse of current feeding the same one step. When the contact 7 has been turned 180°, it engages the spring 9 whereby the condenser will be discharged. The secondary clocks thereby again receive an impulse of current and are again fed one step. If the wheel 6 makes one revolution a minute the secondary clocks thus receive impulses of current at intervals of 30 seconds, and their step-by-step motion thus should be such that the minute hand is turned a distance corresponding to half a minute for each impulse of current.

In the system shown in Fig. 2 the secondary clocks 4 are connected in parallel and each provided with a condenser 10, 11, 12, the charging and discharging of all condensers being accomplished by means of a common switching device 7, 8 and 9 in the primary clock. Obviously a separate contact device may be used for each secondary clock if desired, and a single condenser may be used for all the secondary clocks.

In the system shown in Fig. 3 the secondary clocks are connected in series with each other and with a condenser as in Fig. 1. However, the contact device differs from

that shown in Fig. 1 by that the condenser after having been charged is not only discharged but is also re-charged to the opposite polarity in the next closing of its circuit. For this purpose a commutator 13 is provided in the primary clock, which at predetermined intervals reverses the connection between the poles of the source of electric current and the ends of the circuit of the secondary clocks, whereby the charging of the condenser will periodically be reversed. By this means the capacity of the condenser will be better utilized than if it after each charging only is discharged to null potential. The commutator, which for instance can be turned one revolution a minute, is in the drawing shown as consisting of two contact springs 14 and 15 bearing against a ring which is composed of two halves 16 and 17 insulated from each other and engaged by sliding contacts 20 and 21 connected to the ends of the circuit of the secondary clocks.

The construction of the contact device of the primary clock may, obviously, be varied in any well known or suitable manner and the secondary clocks may be grouped at will without deviating from the principle of the invention.

Having now described my invention what I claim is:

1. In combination, an electric circuit, a primary clock, a secondary clock circuit, an electric condenser in the latter circuit to discharge through said latter circuit, and a time contact device operated by the said primary clock for charging and discharging the condenser at distinct intervals and simultaneously controlling the discharge of the condenser through the secondary clock circuit, substantially as and for the purpose set forth.

2. In combination, an electric circuit, a primary clock, a time contact device operated by said clock, a number of secondary clocks and an electric condenser connected in series with said secondary clocks and the time contact device, said contact device simultaneously controlling the charging of the condenser and its discharge through the

secondary clocks, substantially as and for the purpose set forth.

3. In combination, an electric circuit, a primary clock connected to said circuit, a number of secondary clocks connected to the said primary clock, an electric condenser for taking up and delivering the energy to be supplied to the secondary clocks, and a time contact device operated by the said primary clock for periodically reversing the charge of the said condenser and controlling the discharge through the secondary clocks, substantially as and for the purpose set forth.

4. In combination, an electric circuit, a primary clock, a secondary clock circuit, a condenser in the secondary clock circuit and a contact operated by the primary clock to charge the condenser alternately positively and negatively, and simultaneously discharge the condenser through the secondary clock circuit.

5. In combination, an electric circuit, a secondary circuit, a condenser and a secondary clock in the secondary circuit, said clock included in the secondary circuit between the condenser and primary circuit, and means to alternately positively and negatively charge the condenser and simultaneously discharge it through the secondary circuit and clocks.

6. In combination, an electric supply circuit, a secondary circuit, a condenser therein to produce discontinuity of said circuit, a secondary clock in said secondary circuit, a primary clock, a contact device driven by the primary clock to alternately connect the condenser to the positive and negative sides of the supply circuit and thereby simultaneously discharge positive and negative current impulses through the secondary circuit and clocks therein.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GUSTAF OSCAR LARSSON.

Witnesses:

CONRAD DELMAR,
JOHN DELMAR.