N° 16,814 A.D. 1904

(*Under International Convention.*)

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COMPLETE SPECIFICATION.

Electric Installation for Transmitting the Time.

I, Colonel David Perret, Manufacturer, of Neuchatel, Switzerland, 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:—

This invention relates to an electric installation for transmitting the time by means of a clock with an electric winding apparatus furnished with circuit breakers actuated by a moveable part of the movement.

In this installation the circuit breakers of the clock are connected with the circuit of a source of electricity in which relays are introduced for opening and closing local working circuits containing controlled clocks, the electric winding apparatus of the controlling clock being itself placed in a local circuit controlled by one of the relays.

In the accompanying drawing an example of the invention is diagrammatically illustrated.

In this example the controlling clock comprises a ratchet wheel *a* on which a pawl *b* acts which is flexibly connected with a lever *c* fulcrummed at *d* and under the action of a spring *e* which has a tendency through the medium of the pawl *b* to rotate the ratchet wheel *a* in the direction indicated by the arrow. The pawl *b* is under the action of a blade spring *f* which keeps this pawl in engagement with the teeth of the ratchet wheel *a*, but on the movement of the pawl *b* is capable of being pushed towards a contact screw *g* with which one of the poles of the battery *h* is connected. A second pawl *i* is held in engagement with the teeth of the ratchet wheel *a* by a small spring *k* and the tail *l* of this pawl embraces a blade spring *m* which has the tendency to move away from a contact screw *n* with earth connection. When the end of one of the teeth on the wheel *a* comes under the pawl *i* the blade spring *m* moves away from the contact screw *n* under the influence of the piece *l* belonging to the pawl *i* causing an interruption of the circuit between *m* and *n*. The second pole of the battery *h* is connected with a wire *o* which runs to earth and in which relays *p* under tension are introduced. Each of these consists of a coil of an electromagnet the two ends of which are connected with the wire *o* and of an electric stirrup *q* one arm of which that is firmly connected with the core of the magnet is fixed to the base of the relay whilst the other arm that is under the influence of the magnetic field created by the magnet

[*Price* 8*d*.]

can come into contact with an insulated terminal *r*. To this latter one of the ends of a local circuit *s* is connected in which a certain number of controlled clocks *t* are introduced as also a source of electricity *u*. The second end of each local circuit *s* is connected with the moveable arm of the flexible stirrup of the corresponding relay. In one of the local circuits *s* the electro-magnet *v* is inserted which effects the winding up of the controlling clock.

The electric circuit acts as follows:—

Under the action of the spring *e* the pawl *b* rotates the wheel *a* in the direction indicated by the arrow. In consequence of this the pawl *i* is gradually raised by the end of a tooth on the wheel and the blade spring *m* moved away from the contact screw *n*, causing an interruption of the current between *m* and *n*. At the same time the downward movement of the pawl *b* forces the spring *f* against the end of the contact screw *g*. The transmission is effected as follows:—The contact between *f* and *g* is made slightly before the pawl *i* engages again into an indentation in the wheel *a*. At the moment when the pawl *i* engages the circuit of the battery *h* is closed as the two circuit breakers are so and the current enters the winding of the electromagnets of all the relays *p* so that the moveable arms of the flexible stirrups *d* are attracted to them and come into contact with the terminals *r*. The local circuits *s* are then closed so that the current of each of the sources of electricity *u* can actuate the corresponding controlled clocks *t*. At the same time the electromagnet *v* which winds up the controlling clock is energised, so that the armature on the lever *c* is attracted and the spring *e* caused to bend that is to say the controlling clock is wound up.

As soon as the spring *e* has been bent by the action of the electro-magnet *v* on the armature of the lever *c* the pawl *b* the end of which has come into engagement with a succeeding tooth on the wheel *a* no longer holds the spring *f* in contact with the screw *g* so that the circuit of the battery *h* being opened, the spring *e* can again act on the wheel *a* through the medium of the pawl *b*.

Every clock with electric winding device may without being subjected to any alteration, be employed as a controlling clock in an installation of the kind that forms the subject of the present invention. All that is necessary is to connect the two circuit breakers of the controlling clock with a circuit employed for actuating relays each of which is intended to open and close a circuit in which controlled clocks are inserted and to introduce the electromagnet employed for winding and the controlled clock in one of these local circuits.

As the electromagnet *v* for the controlling clock is introduced into one of these local circuits *s* which actuate controlled clocks, the controlling clock cannot be wound up unless this circuit has been previously closed by the corresponding relay, that is to say, unless the controlled clocks of the same circuit be simultaneously actuated. In order that some of the controlled clocks may not be slower than the controlling clock, it is thus only necessary that some controlled clocks which are slower than those of the other local circuits should be inserted in the same local circuit as the winding device for the controlling clock and in series therewith so that as long as these slow clocks have not been effectually actuated the controlling clock cannot be wound up and break the circuit of the relays. It is thus certain that this circuit will remain closed during a period sufficiently long to allow of all the controlled clocks being duly actuated.

The electromagnet for winding the controlling clock may also be introduced quite alone in a local circuit *s* the relay in which would be less active than any of the others so that this relay would not close the circuit of the electromagnet and cut the relay circuit unless the less inactive relays of the other local circuits *s* had already acted.

Controlling clocks may be introduced into each of the local circuits either in series or in shunt or partly in series and partly in shunt and the relays

may also be connected in shunt with the circuit *o*. The relay circuit *o* is shown in the drawing as having its two extremities connected with earth, but it is evident that this circuit might also be provided with a return conductor other than the earth.

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:—

Electric installation for transmitting the time by means of an electrically wound up clock provided with circuit breakers actuated by a moveable part of the movement, these circuit interrupters being connected with the circuit of a source of electricity in which relays are introduced for closing and opening local working circuits containing controlled clocks, the electric winding device of the controlling clock being itself inserted in a local working circuit controlled by one of the relays.

Dated this 30th day of July, 1904.

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PERRET'S COMPLETE SPECIFICATION.

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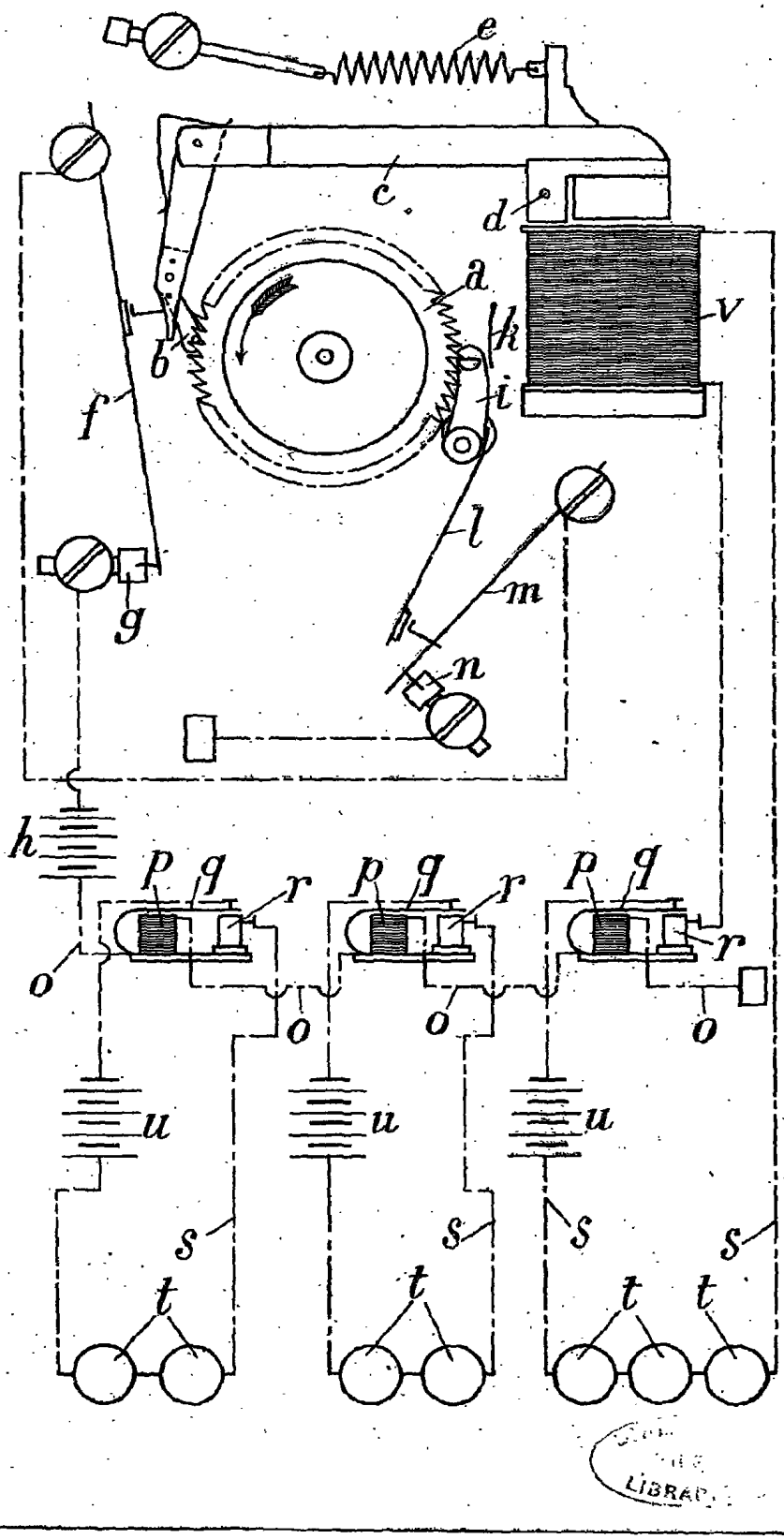

[This Drawing is a reproduction of the Original on a reduced scale.]

Malby&Sons, Photo-Litho.