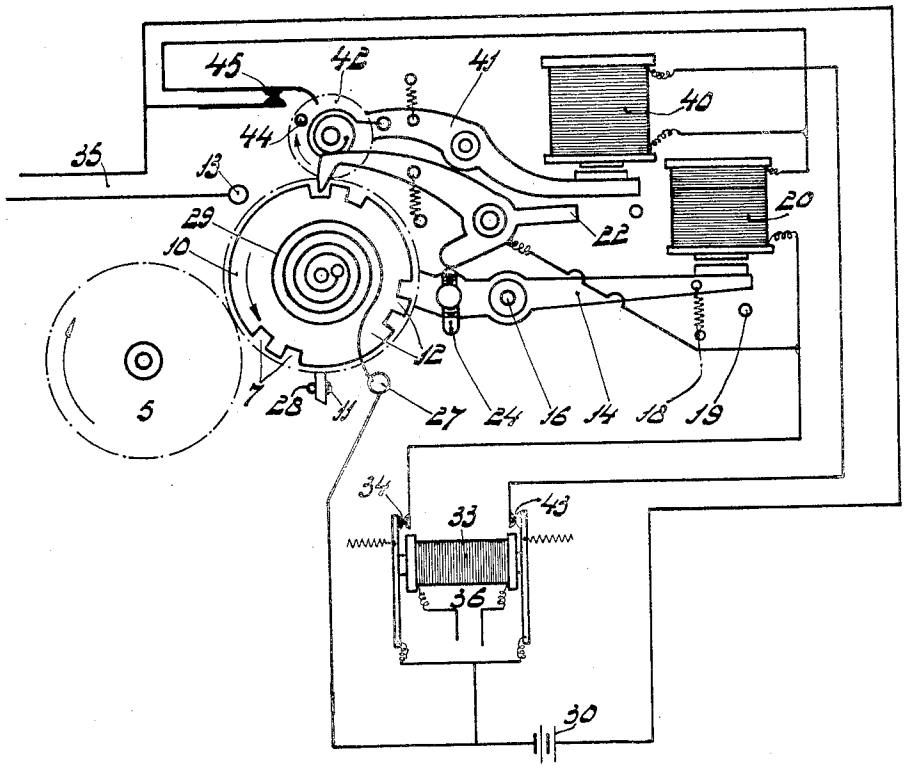
Aug. 29, 1933. C. LIPMANN ET AL 1,924,795

SELECTIVE RECEIVER

Filed Jan. 23, 1930



C. Lipmann
A. Strahm
A. Quinche
INVENTORS

By: Marks & Clerk
Attys.

Patented Aug. 29, 1933 1,924,795

UNITED STATES PATENT OFFICE

1,924,795

SELECTIVE RECEIVER

Camille Lipmann, Besancon, France, Andrè Strahm, Schramberg, Germany, and Albert Quinche, Besancon, France, assignors to N. V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands

Application January 23, 1930, Serial No. 422,920, and in Germany January 28, 1929

1 Claim. (Cl. 177—353)

Our invention has for its object an improvement in selective receiving systems for clocks or other mechanisms of the type which closes a circuit as soon as it receives a predetermined signal formed by a succession of current impulses and intervals therebetween through the agency of a so-called code wheel the periphery of which shows alternatively conducting and insulating or cut away parts corresponding to the impulses and intervals of the signal to be received.

Appended drawing shows a system of this type embodying our improvement the object of which is to prevent its undesired actuation through a single impulse of long duration.

This system comprises a toothed code wheel 10 the successive intervals 12 between the teeth of which correspond to the succession of impulses.

The spindle carrying the wheel 10 is secured to the end of a lever 14 pivotally secured at 16.

A toothed wheel 7 secured to the same spindle as the code wheel is adapted when the lever 14 rocks round its support 16, to mesh with the pinion 5 which is driven in a continuous manner at the required speed by the clockwork not shown. The code wheel is electrically insulated with reference to its spindle.

When the wheels 5 and 7 are in mesh, the code wheel is driven in the direction of the arrow and tensions the coiled spring 29 which urges the code wheel back into its inoperative position when the wheels 5 and 7 are disengaged.

The end of the lever 14 is submitted to the action of the electromagnet 20 which attracts it away from the adjustable screw stop 19. When the electromagnet is not excited the spring 18 returns the lever into its inoperative position for which the wheels 5 and 7 are disengaged.

In proximity to the code wheel is arranged a detent 22. It will be appreciated that when the lever 14 is not attracted by the electromagnet 20 and consequently the wheels 5 and 7 are disengaged, the detent 22 abuts against the screw 24 and does not touch the code wheel. On the contrary when the lever 14 is attracted as shown, the tooth-shaped end of the detent 22 is nearer the code wheel and comes into contact with the projections on the latter when they are in front of said tooth shaped end without any contact being provided with the recessed parts when these come in their turn in front of the said end.

The current controlling the device arrives through the wire 36 either directly from the transmitting station or from a wireless receiving station of any desired type. The apparatus to be controlled or the relay actuating it is fed through the wires 35.

The working is as follows:

We will suppose by way of example the signal is constituted by two impulses of one second each separated by an interval of one second and succeeded by a silence of three seconds and by two further similar sets of two impulses of one second each separated by intervals of one second; in this case the code wheel will have the shape shown on the figure, the speed of the clockwork being adjusted in a manner such that the time required for the passing of a recessed part corresponding to an impulse in front of the end of the detent 22 is slightly below one second. At the moment of the beginning of the signal, the current arriving through 36 actuates the relay 33 which closes the contact 34 in the circuit of the electromagnet 20. Consequently the electromagnet 20 is excited through the current from the battery 30 and attracts the lever 14. Thus the wheel 7 comes into engagement with the wheel 5 and drives the code wheel.

A little before the end of the first impulse the first projection comes in front of the end of the detent 22 which rides over it and closes thus the following electric circuit:

Negative pole of the battery 30, terminal 27, spring 29, code wheel, detent 22 electromagnet 20 and positive pole of the battery 30.

The electromagnet 20 remains thus excited as long as the detent remains in contact with a projection, this contact lasting due to the size given to the projection, a little over one second. Therefore when the detent falls into the second recess, the second impulse will have begun acting on the relay 33 and the electromagnet 20 remains actuated through the first described circuit comprising the contact 34.

The lever 14 continues being attracted by the electromagnet 20 and therefore the code wheel continues rotating as long as the signal corresponding to the code wheel is produced. When the total desired angular movement of the code wheel is at an end, the arm 11 borne by the said wheel comes against a stationary contact 13 and closes the circuit of the battery 30 over the wires 35 feeding the apparatus to be closed, the contact 13, the arm 11, the code wheel, the spring 29 and the terminal 27.

The apparatus to be controlled or the relay actuating it will thus be operative only when the wheel has ended its movement i. e. when the signal has been given out completely.

At the end of the signal when the end of the detent is in front of the last recess and the relay 33 allows the contact 34 to open, the electromagnet will cease attracting the lever 14 which returns to its original inoperative position under the action of the spring 13. The code wheel is thus disconnected and returns to its inoperative position under the action of the spring 29, 11 abutting against the stop 28.

When a signal other than the predetermined signal is received, it cannot actuate the apparatus to be controlled unless it causes the code wheel to rotate through its complete predetermined angular movement, there being no interruption of the circuit however short it may be while the end of the detent is in front of a recess.

The device so far disclosed is of a known type. But it shows a serious drawback inasmuch as it may become operative at the reception of a long uninterrupted signal during the time in which the receiving appartus is adjusted for reception.

The object of the present invention is to provide a system for selective reception which is so arranged that the apparatus returns to its inoperative position when it is excited by wireless signals at a moment at which an interruption should occur in the time signal for which the apparatus is adjusted.

To this end there is pivoted above the lever 22 another double-armed lever 41, one end of which carries the armature of the relay 40 connected in parallel with the electromagnet 20. The other end has secured to it a rotary disc 42 showing a toothed periphery, this disc returning to its inoperative position under the action of a spring. This disc is provided with a pin 44 engaging the path of switch 45 inserted in the electric circuit of the relays 20 and 40. The disc 42 meshes with the toothed wheel 7 mounted on the shaft of the code wheel when 41 is attracted by 40.

The working is as follows:

At the reception of a time signal the relay 33 is excited which attracts its armatures so that not only the contact 34 but also the contact 43 in the circuit of relay 40 is closed. This results in that not only the toothed wheel 7 is brought into engagement with the toothed wheel 5 as explained hereinabove, but also with the toothed wheel 42. If the duration of the excitation exceeds the length of the impulse corresponding to the time signal, the pin 44 will continue rotating until it touches the switch 45 thus switching-off both relays, whereupon the whole system returns to its inoperative position. The path of the pin 44 may be so chosen that both recesses in the code wheel corresponding to the first set of two impulses of the time signal have been passed over already by the detent before the switch can become operative.

At the reception of an uninterrupted signal, the duration of which exceeds that of the signals constituting the time signal, for example, a dash of three seconds, then the apparatus returns to its inoperative position through the opening of the switch 45, without closing the circuit 35.

What we claim is:

A selector responsive to a code consisting of electric impulses and intervals of predetermined duration comprising a driving mechanism, a code wheel adapted to be driven by said mechanism provided with a series of raised conducting portions the width of which is such that the duration of their passing a given point under the action of the driving mechanism is slightly above the corresponding interval between two impulses and the intervals between the raised portions have each a width such that the duration of their passing a given point is slightly below the corresponding predetermined impulses, an electromagnetic clutch controlled by the impulses adapted to connect the code wheel to the driving mechanism, means to return the code wheel to original position when the clutch is disengaged, circuit connections whereby the electromagnetic clutch is controlled by the raised conducting portions of the code wheel during the intervals of the code and means for insuring that a single long impulse will not advance the code wheel to final position, comprising an electromagnet energized by the impulses, an auxiliary wheel means controlled by the electromagnet when energized to couple the auxiliary wheel to the driving means and means controlled by the auxiliary wheel after being driven a predetermined distance due to a long impulse to open the circuit of the electromagnetic clutch and thereby return the code wheel to original position.

CAMILLE LIPMANN.
ANDRÈ STRAHM.
ALBERT QUINCHE.