

(No Model.)

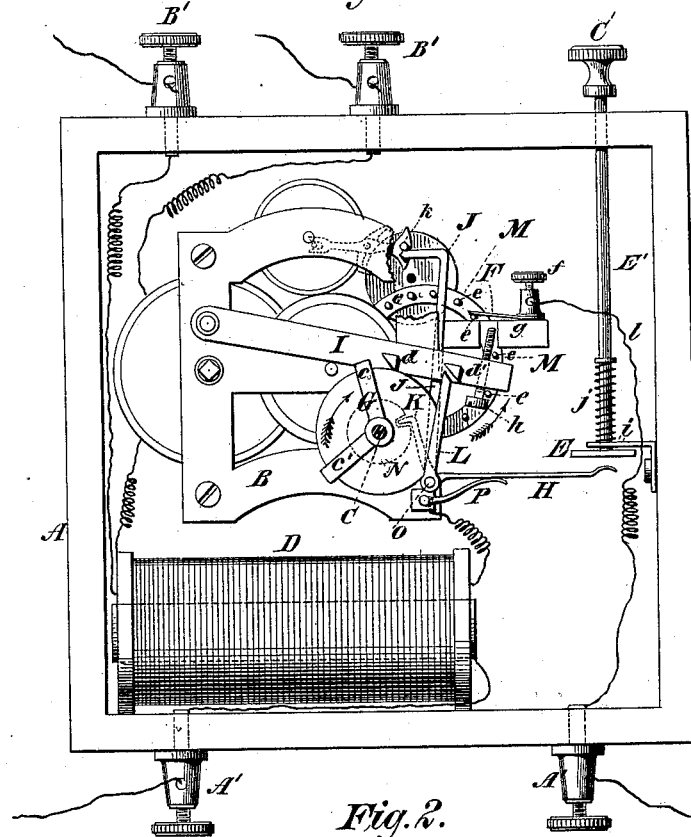
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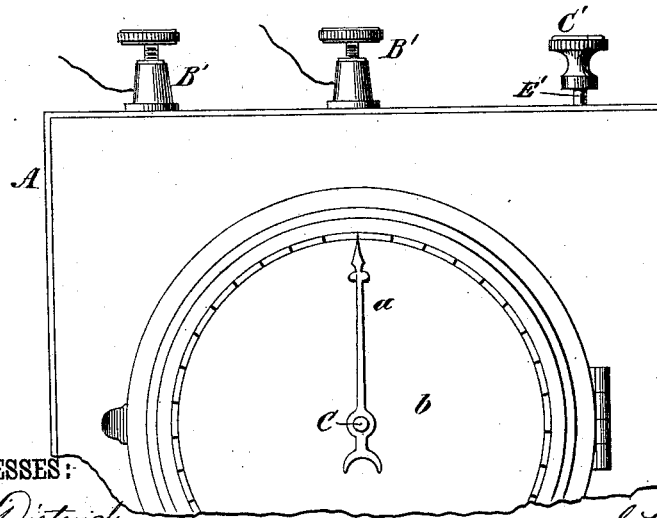
No. 303,052.

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*Fig. 1.*



*Fig. 2.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES W. RUEHLE, OF DETROIT, MICHIGAN.

## TRANSMITTER FOR TELEPHONE TIME SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 303,052, dated August 5, 1884.

Application filed February 28, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. RUEHLE, of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Time-Transmitter, of which the following is a full, clear, and exact description.

My invention relates to apparatus for transmitting time-signals over a telephone-circuit, or a number of circuits; and it consists in combining with a clock-movement a circuit-controlling apparatus capable of sending electric signals at intervals of one second, an intermitting device for discontinuing the signals at fixed periods, and stopping and starting mechanism for determining the time of sending signals and for limiting their duration.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a front elevation of my improved apparatus with the front of the case removed and parts broken away to show the internal construction. Fig. 2 is a partial front elevation, showing the dial and index.

The casing A contains an ordinary lever clock-movement, B, whose arbor C of the third wheel of the movement makes one revolution in two and a half minutes. The arbor C projects through the front of the casing, and is provided with an index, *a*, which turns in front of a dial, *b*, on the casing.

On the arbor C is mounted a notched stop-wheel, N, (shown in dotted lines in the drawings;) also, an intermitting wheel, G, carrying two arms, *c c'*, which project beyond its periphery far enough to engage a beveled pin, *d*, projecting into the path of the arms *c c'* from a lever I, pivoted to the frame of the clock-movement. The fourth wheel, M, of the clock-movement is provided with a series of pins, *e*, projecting laterally therefrom at equal distances from each other, and in position to strike a contact-spring, F, connected with a binding-post, *f*, supported by a bar, *g*, of insulating material. The pins *e* strike the spring F once each second while the clock is in motion, excepting when the spring is lifted by the screw *h* in the free end of the lever I. Four arms, H, J, K, and L, are fixed to a

rock-shaft, O, and pressed forward by a spring, P, attached to the clock-frame and bearing upward against the arm H. The arm H extends toward the side of the casing in position to be engaged by the foot E on the rod E'. This rod extends through a bracket, *i*, and through the top of the casing A, where it is provided with a button, C'. A spring, *j*, resting on the bracket *i* and pressing upward against a collar on the rod E', holds the foot E normally out of contact with the lever H. The arm J is capable of engaging a pin, *k*, projecting from the side of the escapement-lever of the clock. The arm K engages the notched wheel N, and the arm L, which is beveled on its free end, is capable of being engaged by the beveled pin *d'*, projecting from the side of the lever I. The local-battery wires are connected with the binding-posts A' A', and the circuit is through the primary wire of the induction-coil D, through the frame of the clock and wheel M, spring F, and wire *l*. The secondary wire of the induction-coil D communicates with the binding-posts B' B', one of which is connected with the line, the other with the ground.

When it is desired to send a time-signal over a telephone-circuit, the button C' is pressed at the beginning of some predetermined minute, bringing the foot E down upon the arm H, turning the rock-shaft O against the pressure of the spring P, simultaneously withdrawing the arm J from the pin *k* of the escapement-lever, withdrawing the arm K from the notch in the wheel N, and moving the beveled end of the arm L past the beveled pin *d'*, projecting from the lever I, raising the lever and allowing it to fall with the beveled pin *d'* in front of the arm L. The engagement of the beveled pin *d'* with the arm L holds the rock-shaft O and levers H J K L, connected therewith, in the position in which they were placed by pushing down the button C'. The operation just described releases the escapement-lever so that it is free to vibrate, and the clock-movement acts normally, carrying forward the wheels G M in the direction indicated by the arrows. The index *a* will also move at the same time over the dial *b*, to indicate the time. The pins *e* touch the spring F

and escape from it once each second, thereby making and breaking the primary circuit and producing impulses in the secondary wire of the induction-coil which yield audible signals in the telephones connected therewith. When the radial arm *c* reaches and engages the beveled pin *d* on the lever I, the said lever is raised, bringing the screw *h* into contact with the spring F and raising the spring out of the path of the pins *e* and holding it in that position for five seconds. At the same time the arm L is released from the pin *d'*, allowing the arm K to ride on the periphery of the wheel N, holding the arm J out of engagement with the pin *k* on the escapement-lever. At the end of five seconds the pin *d* drops onto the smooth periphery of the wheel G, allowing the spring F to be again engaged by the pins *e* for fifty-five seconds, when an interruption of five seconds is made by the engagement of the radial arm *c'* with the beveled pin *d*, and afterward the makes and breaks of the circuit occur as before until in the course of the revolution of the shaft C the bent end of the arm K drops into the notch in the wheel N, allowing the arm J to move forward and engage the pin *k* on the escapement-lever, thus stopping the clock.

There are four opportunities for taking the time while the wheel G is making its revolution—one at the beginning of the first, second, and third minutes, and when it stops at the end of two and one-half minutes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a clock-movement having a series of pins, *e*, on one of its wheels, of a contact-spring supported in the path of the said pins, and means, substantially as shown and described, for lifting the said spring out of the path of the pins, as and for the purpose set forth.

2. The combination, with a lever clock-movement provided with a pin, *k*, projecting from its escapement-lever, of the arms J K and notched stop-wheel N, as described.

3. The intermitting wheel G, provided with radial arms *c c'*, lever I, provided with the beveled pin *d*, and screw *h*, for lifting the contact-spring F out of the path of pins *e*, and thereby intermitting the series of signals, as described.

4. The combination, with the arms J K, of the arm L, lever I, and beveled pin *d'*, whereby the arm K is held out of engagement with the notched stop-wheel N until disengaged by the lifting of the lever I, as described.

5. The combination, with a lever clock-movement, of the pin *k*, projecting from the side of the escapement-lever, the arm J, capable of engaging the said pin, and mechanism for holding the said arm out of engagement with the said pin during a fixed interval, as specified.

6. The combination, with the rock-shaft O, provided with arms H J K L, and the spring P, of the push-rod E', provided with the plate E on its lower end, and the spring J, substantially as herein shown and described.

7. The combination, with a clock-movement and intermitting mechanism, of an induction-coil for transmitting signals over a telephone-line, as described.

8. The combination, with the clock-movement, of an auxiliary arbor, C, intermitting wheel G, stop-wheel N, lever I, provided with beveled pins *d d'* and screw *h*, and the arms J K L, as described.

CHARLES W. RUEHLE.

Witnesses:

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FREDERICK RUEHLE.