

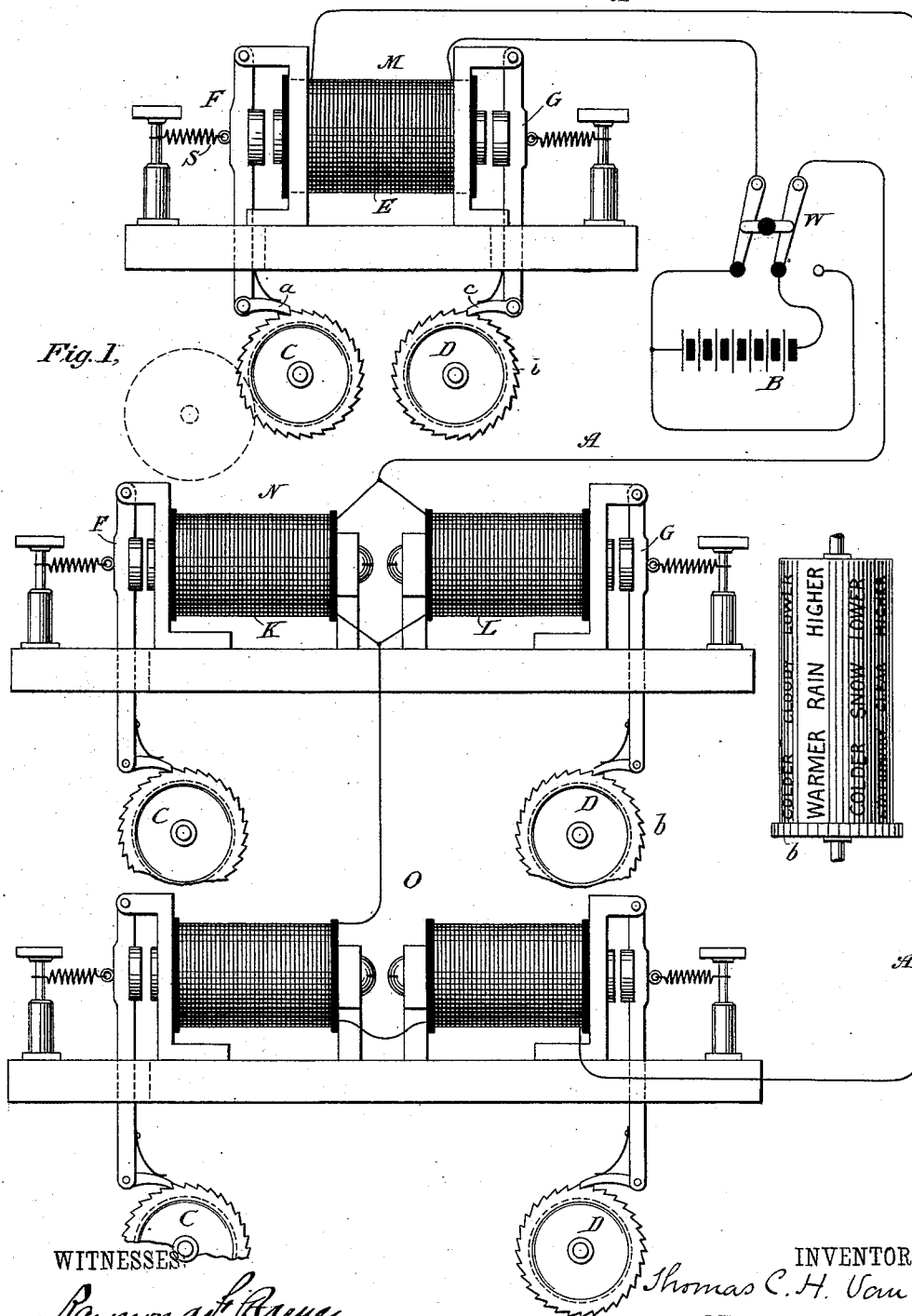
(No Model.)

2 Sheets—Sheet 1.

T. C. H. VANCE.  
ELECTRIC CLOCK AND INDICATOR SYSTEM.

No. 347,399.

Patented Aug. 17, 1886.



WITNESSES

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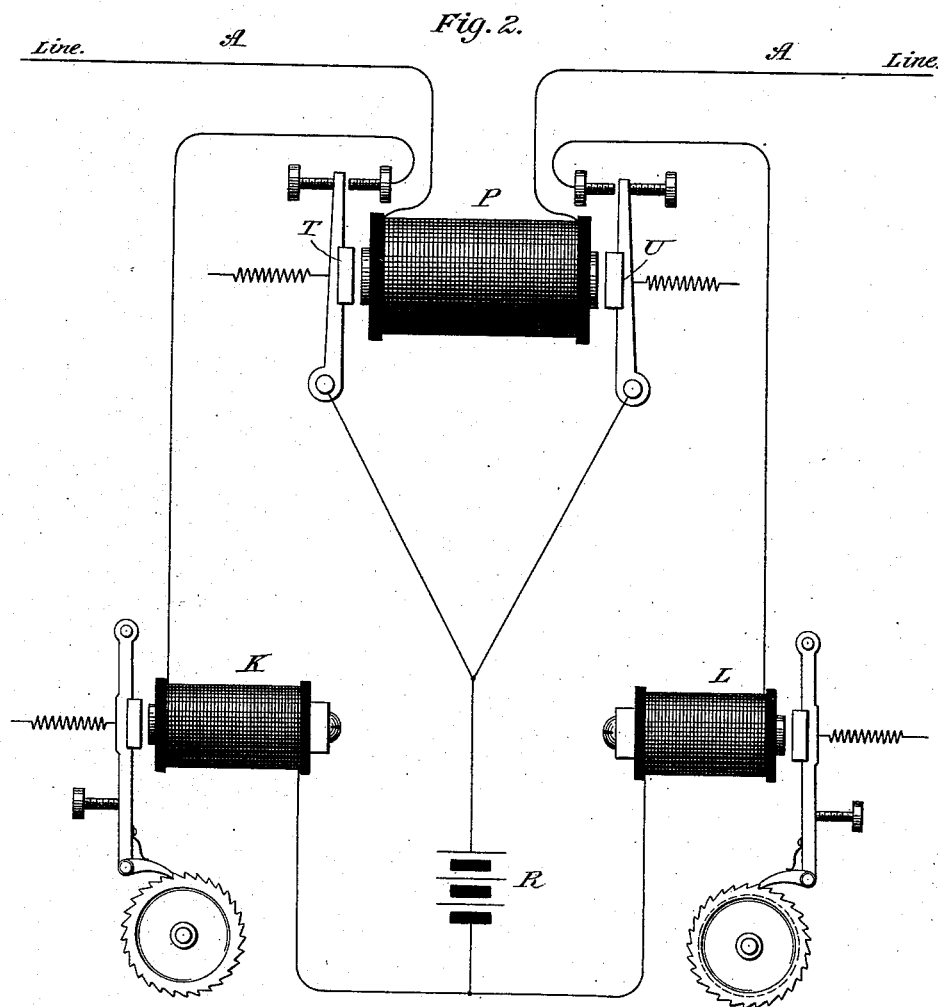
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2 Sheets—Sheet 2.

T. C. H. VANCE.  
ELECTRIC CLOCK AND INDICATOR SYSTEM.

No. 347,399.

Patented Aug. 17, 1886.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS C. H. VANCE, OF LOUISVILLE, KENTUCKY.

## ELECTRIC CLOCK AND INDICATOR SYSTEM.

SPECIFICATION forming part of Letters Patent No. 347,399, dated August 17, 1886.

Application filed May 5, 1886. Serial No. 201,139. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS C. H. VANCE, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Electric Clock and Indicator Systems, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The object of this invention is to combine time and weather indicating mechanisms, so as to be simultaneously or successively operated by the same electric circuit. For example: In the ordinary clock systems a given number of clock mechanisms are connected in series in an electric circuit, and operated by impulses of or changes in current on the circuit. My object is to combine with each of these clock mechanisms an indicator that is capable of being operated by the same current that operates the clock, but under abnormal conditions of the current, which, while they do not interfere with the operation of the clocks, will produce the desired changes or action of the indicators. This may be accomplished in various ways. A single magnet may be used for each combination, and two armatures of different adjustments provided for each magnet. One of the said armatures is connected with the clock mechanism, and at each impulse of current it is moved and its movement imparted to the clock. The other armature is adjusted so that it is moved toward the magnet only by a much stronger current than that required to move the first. The second armature is connected with the indicator mechanism. Under such conditions the normal current will operate all the clocks without disturbing the indicators; but once or twice each day a much stronger current will be sent over the line to operate both the clocks and the indicators. Another way of accomplishing the same result would be to have a single magnet for each combination provided with one soft-iron and one polarized armature. The soft-iron armature would be attracted by currents in either direction; but the polarized armature would be moved by a current in one direction only. The clock mechanisms in this case would be connected with the soft-iron armatures and the indicator mechanism with the others.

In lieu of a single magnet two may be used, one or both having a polarized armature, or a polarized relay may be employed for operating the indicator; or the invention may be carried out in a number of other ways, as will more fully appear from the following detailed description, in which reference is made to the drawings, which illustrate the principle of the invention and the best manner of which I am at present aware in which the same is or may be carried out.

Figure 1 is a diagram of a system in which my invention is used. Fig. 2 is a modification of the same.

The letter A designates an electric circuit leading from a given point or station, as B, and including a number of combined clock and indicator mechanisms, which are located at stores, offices, or wherever desired.

The problem is to combine with each clock a device which may be set or changed at given intervals to exhibit the weather report for the succeeding day by the same circuit as that with which the clocks are connected. I accomplish this in the following manner: In close proximity to each other, preferably in the same box or case, I place an electric-clock mechanism, C, and an indicator, D. The particular construction of either or both of these instruments may be indefinitely varied. I have therefore represented both by simple and well-understood forms of mechanism—the clocks by a train of gears impelled step by step by a pawl, *a*, and the indicator by a cylinder carrying a ratchet-wheel, *b*, that is turned step by step by a pawl, *c*. On the surface of the cylinder are printed the various symbols or words used in indicating weather probabilities, so that by turning the cylinder to a certain point the desired combination of words will be displayed. The clocks and indicators obviously move in unison, so that if one be at the central station it will show the condition of all the others.

The first combination of clock and indicator shown in the circuit A is designated M, the second N, and the third O. That lettered M consists of a single magnet, E, with two poles. In face of each pole is a pivoted armature, F and G. The former carries the spring-pawl *a* and actuates the clock; the other carries the pawl *c*, that operates the indicator. If both

armatures are of soft iron the armature F is adjusted by its spring s, to respond to a much weaker current than the other. To operate a system provided with these devices, impulses of current are sent over the line every minute or half-minute, the strength of the current being sufficient to move the clock-armatures, but not the indicator-armature. By this means the clocks are moved the proper amounts. Once or twice during the day it may be necessary to shift the indicators. To do this, much stronger impulses of current are sent over the line, and these move both armatures. When by this means the indicators are brought to the position necessary for displaying the proper combination of symbols or words, the weaker currents are used again and the indicators permitted to remain at rest. The device at M may be adapted for a similar use by making armature F of soft iron and armature G of hard steel, magnetized. The current will attract the armature G when it flows in one direction, and repel it when flowing in an opposite direction. To operate both clocks and indicators, it is only necessary to send a certain number of the current impulses over the line in the direction which actuates the armatures G. Any ordinary form of reversing-switch—such as that indicated at W—may be used for this purpose.

At N a modified form of device is shown, which may be adapted to either of the plans above described. In lieu of one magnet, two independent magnets, K L, and armatures F G are used, and the circuit divides between them. Instead of dividing between the two magnets, the current may pass through both in series, as shown in the device or combination O. A large number of these instruments may be connected up in a circuit and operated from the same station; but where the number

is considerable, and the resistance of the circuit is much increased, the certainty and delicacy of action may be increased by the use of relays under well-understood conditions. 45

In Fig. 2 the most ordinary way of using a relay is shown. The circuit A includes a number of relay-magnets, P, one for each combination of clock and indicator. With the relay is used a local battery, R, the circuit of which is divided through the clock-magnet K and the indicator-magnet L. The branch including the clock-magnet is closed by the attraction of the armature T, which is of soft iron, while the other branch is closed by the attraction of armature U, which is permanently magnetized. When it is desired to operate the indicators, the current impulses on A are reversed, so that both armatures, T U, are drawn up and the local battery-current sent through both magnets K L. There are many other ways of accomplishing the same results; but I have shown the principal and the simplest of which I am now aware. By this system, with little or no expense, a new and very useful result is attained. The indicators may be combined with many forms of clock now in use, and form a very useful and desirable adjunct to an electric-clock system. 60 65

What I claim is— 70

The combination, with an electric circuit and means for varying the strength of the current impulses therein, or their equivalents, of time and indicator mechanisms and electro-magnets included in the circuit, and differently-adjusted armatures, or their equivalents, for operating the time and indicator mechanisms, respectively, as set forth. 75

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Witnesses:

A. E. MUELLER,  
JOHN S. PARK.