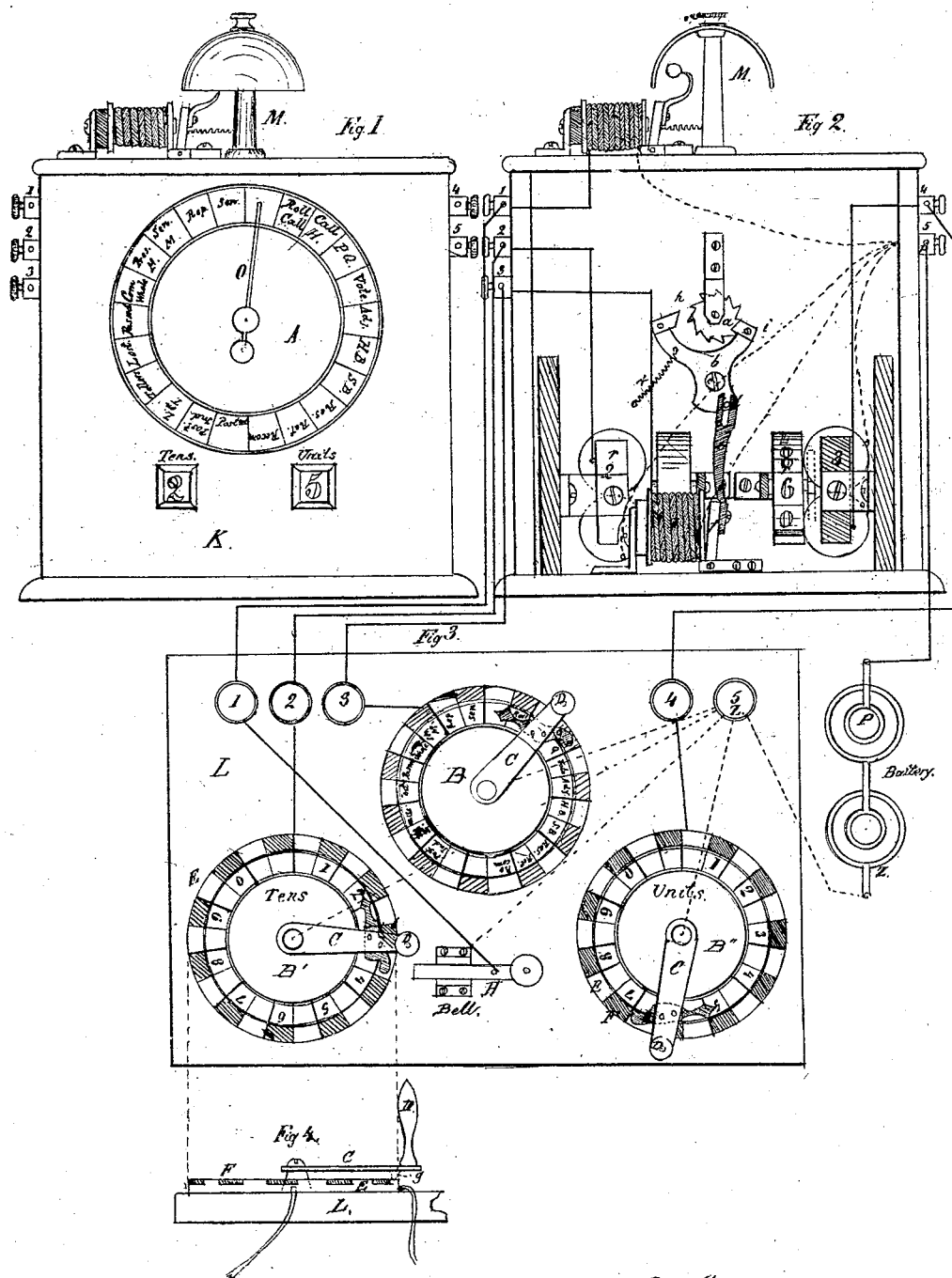


W. D. SMITH.
ELECTROMAGNETIC INDICATOR.

No. 111,394.

Patented Jan. 31, 1871.

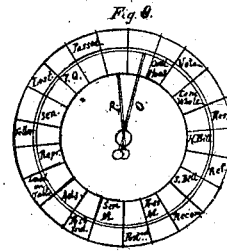
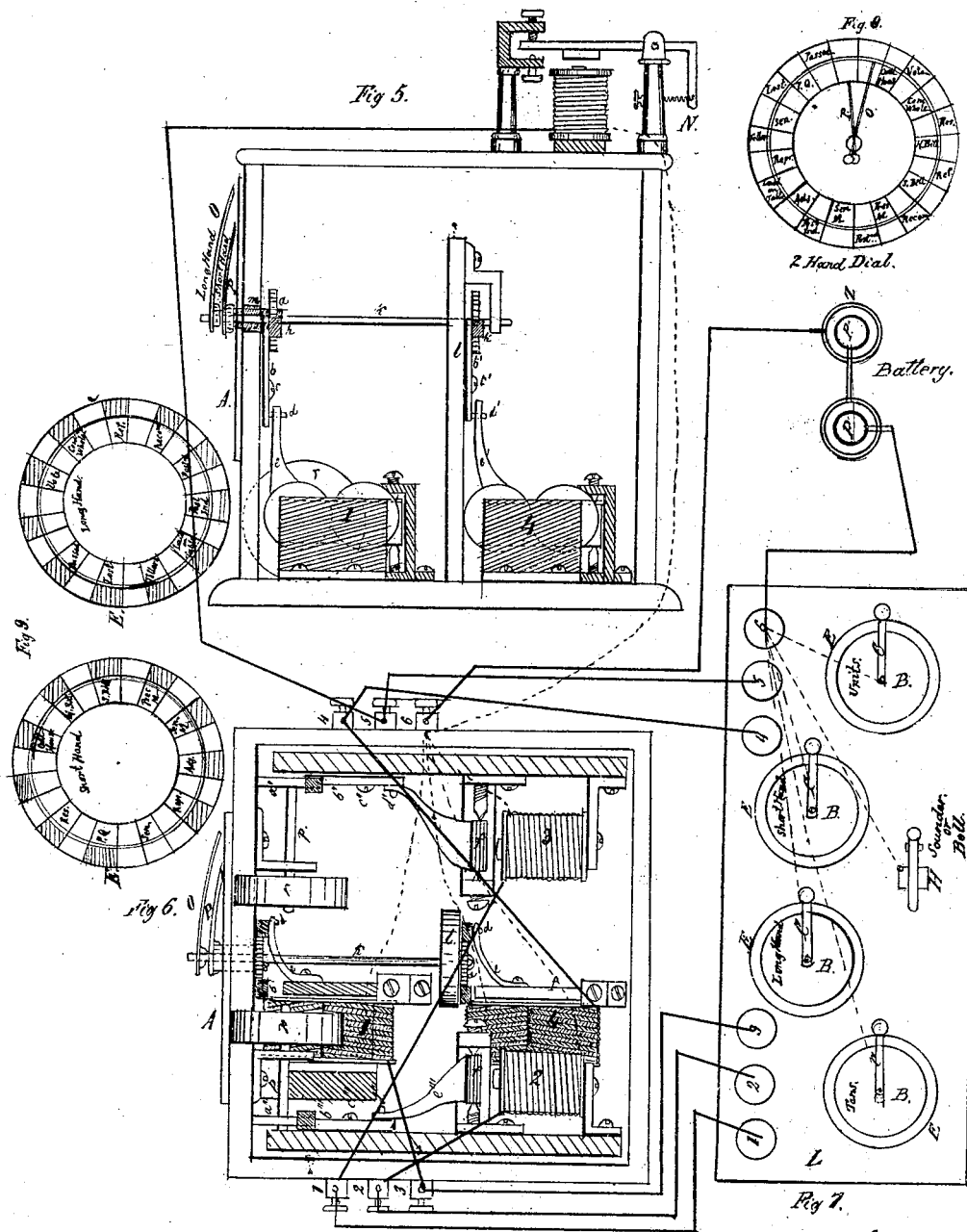


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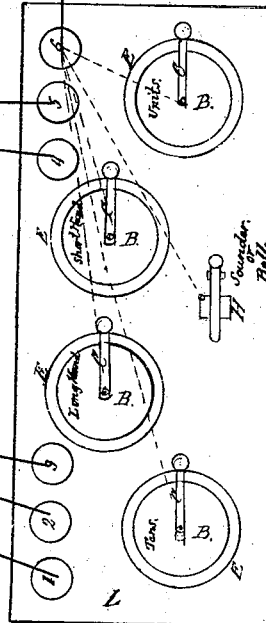
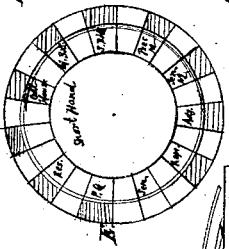
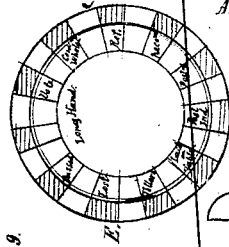
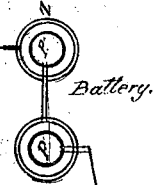
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2 Hand Dial.



James H. Mandeville
George E. Wiley

Wesley L. Smith

United States Patent Office.

WESLEY D. SMITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 111,394, dated January 31, 1871.

IMPROVEMENT IN ELECTRO-MAGNETIC INDICATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WESLEY D. SMITH, of the city of Washington and District of Columbia, have invented certain Improvements in Electrical Indicators, of which the following is a specification.

The object of this invention is to furnish a ready and accurate means for transmitting intelligence from one place to another, *e. g.*, transmitting in a capitol from one point therein (as a senate chamber) information of the business being transacted by a legislative body to any other place in the building, (as an assembly chamber, or various committee rooms,) so that a legislator while absent from his seat, but within the building, may have notice when his presence is necessary to vote upon any particular bill, or to engage in any other public business.

Thus, by placing two indicators in each committee room, and one indicator in an assembly, and another indicator in a senate chamber, the proceedings of the respective bodies can be made known to each other, and also to all of the committees, or in any other part of the building where two indicators may be placed.

Or, with slight modification, this instrument can be equally adapted for use in hotels, factories, stock-boards, government departments, or any other place where it is desirable to indicate intelligence in any one place, or in several places simultaneously.

Figure I, plate 1, is a front elevation of an electrical indicator.

Figure II, plate 1, is a rear elevation thereof, showing the working of the escapement which operates the indicating hands.

Figure III, plate 1, shows the key of the bell-alarm and the arms for controlling the electric current; it also shows upon dials the intelligence to be transmitted by the operator to corresponding dials arranged for observation.

Figure IV, plate 1, shows a sectional elevation of a metallic ring with non-conducting surfaces arranged, preferably, upon the circumference of the dial, which, in connection with an arm revolving thereon whenever intelligence is indicated, closes and opens the electric current.

Figure V, plate 2, is a side sectional elevation of the electrical indicator surmounted by a common telegraph sounder, and showing in detail the arrangement of the escapements and shafts for revolving the indicating hands or surfaces.

Figure VI, plate 2, is a plan view of the indicator for showing the relative position of the magnets and escapements.

Figure VII, plate 2, shows which arm is used to operate any particular hand or indicating surface, and also the key to operate the alarm or sounder.

Figure VIII, plate 2, is a modification of the dial shown in fig. 1, where two hands are employed.

Figure IX, plate 2, is a modification of fig. III.

The intelligence to be indicated is represented, fig. I, upon a dial, A, or it may be placed upon a revolving wheel or cylinder, *r*, located within the box K, which contains all the operating mechanism of the indicator.

Pointers, O and P, designate the particular information communicated, or it is shown through apertures in the box.

Electro-magnets, I, are placed within the box, fig. II, so as to move the escapement which communicates motion either to a pointer upon the dial or a revolving surface behind the aperture in the box.

There are as many magnets and escapements employed as there are separate revolving surfaces and pointers.

The escapement, with its attachments, an armature-lever and retracting spring, is an important feature in this invention, for by a successive closing and opening of the electric current a continuous motion is imparted to the escapement without the aid of any other mechanism.

As soon as the armature *f* is attracted by the passage of the current around the electro-magnet I, the lever *e*, attached to it by means of a slot and pin *d*, so moves the escapement that one of its pallets, *h*, enters the escape-wheel *a*, thus propelling this wheel one tooth. Upon breaking the current a retracting spring, *x*, causes the other pallet *i* to enter the escape-wheel and propel it another tooth in the same direction. The revolution of the escape-wheel carries with it a shaft upon which is secured an indicating pointer.

But it is designed to use two or more hands whenever the instrument is brought into practical use.

For this purpose other magnets, fig. V, and escapements, with their attachments, are employed, while over the main shaft *k*, which turns one hand, O, only, are arranged hollow sleeves *m* upon which to secure additional pointers, P.

It is evident that as many hands can be employed upon the dial as there can be placed complete sets of magnets and escapements between the front of the instrument and the upright bar *l* which supports the arm-lever, pallets, escape-wheel, *e' h' a'*, and shaft *k*, that turns the long hand.

Whenever an indicating surface or pointer is revolved, a separate magnet and escapement, with its attachments, must be used, all of which is done by merely duplicating this simple mechanism, thereby dispensing with most of the train-work common to indicators.

Clock-work cannot be used in this instrument, for

all the indicators must be so constructed that they can be operated separately and kept independent of each other. In clock-work this cannot be done, for the different parts are inseparably joined together, making one portion of its mechanism dependent upon another.

In this instrument it is indispensable that the indicators be so constructed that any one of them can be operated alone, at will, without any other one being controlled in the least or operated at the same time.

This is accomplished by my method of operating with an open circuit, the current being closed when an indication is to be made through that circuit alone which corresponds to the indicator which it is intended to operate.

Communication is established in the usual manner with an electric battery and the several electro-magnets controlling the indicators of the instrument K and a board, L, fig. III, whereon are placed as many revolving arms or common telegraph keys O as there are separate portions of the instrument to be controlled by the operator.

In the drawing revolving arms are represented as the means for closing and opening the electric current; they revolve over and rest upon a metallic surface, in which is set a non-conducting substance, so that the surface of the ring is divided into alternate conducting and non-conducting spaces.

The manner of establishing the connections is illustrated in fig. III of the accompanying drawing, and is as follows:

From the zinc pole of the battery a wire passes to the binding-screw, fig. III, from thence independent wires pass to each circuit-closer, thence to its respective electro-magnet, thence to screw 5, fig. II, and thence to the other pole of the battery. It is obvious that when the circuit is closed on any one of these branch circuits the other circuits will not be affected.

Whenever the arm is at rest it is intended for the said arm to be in contact with a non-conducting surface, and whenever one indicator is set the electric current is open, thus leaving the current free to act upon any other part of the instrument which it may be desired to operate.

Either hand can be made to point to any space upon the dial, but, as has been heretofore remarked, it is intended to use two or more indicating hands, which may be of different colors or forms, so as to make two or more indications at the same time.

For example, a legislative body is considering a certain bill, the number of which may be shown through apertures in the box. One hand may show whether it is an assembly or senate bill, while the other hand

may indicate what disposition is being made of it; as referred, recommitted, passed, lost, &c.

While the bill is pending if a member should move a suspension of the rules so that its consideration might be continued out of its regular order, other hands may show intervening legislation, while the two hands (first described) may remain to indicate the last action upon the bill.

In order to do this, and, at the same time, to have the indications made and the current always open, it is necessary to set one hand at least one space in rear of the other, for when any one hand points to all the indications which can be made upon the dial-plate, the current must be closed and opened upon the alternate indications.

If both hands should be made to start from the same point, and it were desirable to make all the indications that could be made with each indicator at the same instant, the current would be so divided with a single battery that some of the indications would be imperfect; therefore, it is essential whenever an indication is made that the current should be open so that the current is free to work accurately any other portion of the instrument and only require one battery.

Whenever the instrument is set to communicate intelligence an alarm-bell, M, is sounded to give notice of that fact.

A common sounder, N, is employed so that a telegram may be sent if desired.

In building this instrument for use it should be constructed with double walls filled with any well known material which is a non-conductor of sound, in order that its workings may be silent.

Claims.

1. An electrical indicator, composed of the following elements in combination: A dial marked with signs or signals, two or more hands rotated independently over the same and mounted upon shafts which are concentric to each other, and mechanism for rotating each hand, consisting of a toothed wheel upon its respective shaft, pallets, and a vibrating lever, actuated directly by an electro-magnet, the whole operating substantially as described.

2. In combination with the elements of the foregoing claim two or more revolving surfaces with letters, words, figures, or other characters arranged thereon, and rotated directly by electro-magnetism, substantially as described.

Witnesses:

WESLEY D. SMITH.

JAMES H. MANDEVILLE,
GEORGE E. WISE.