

(No Model.)

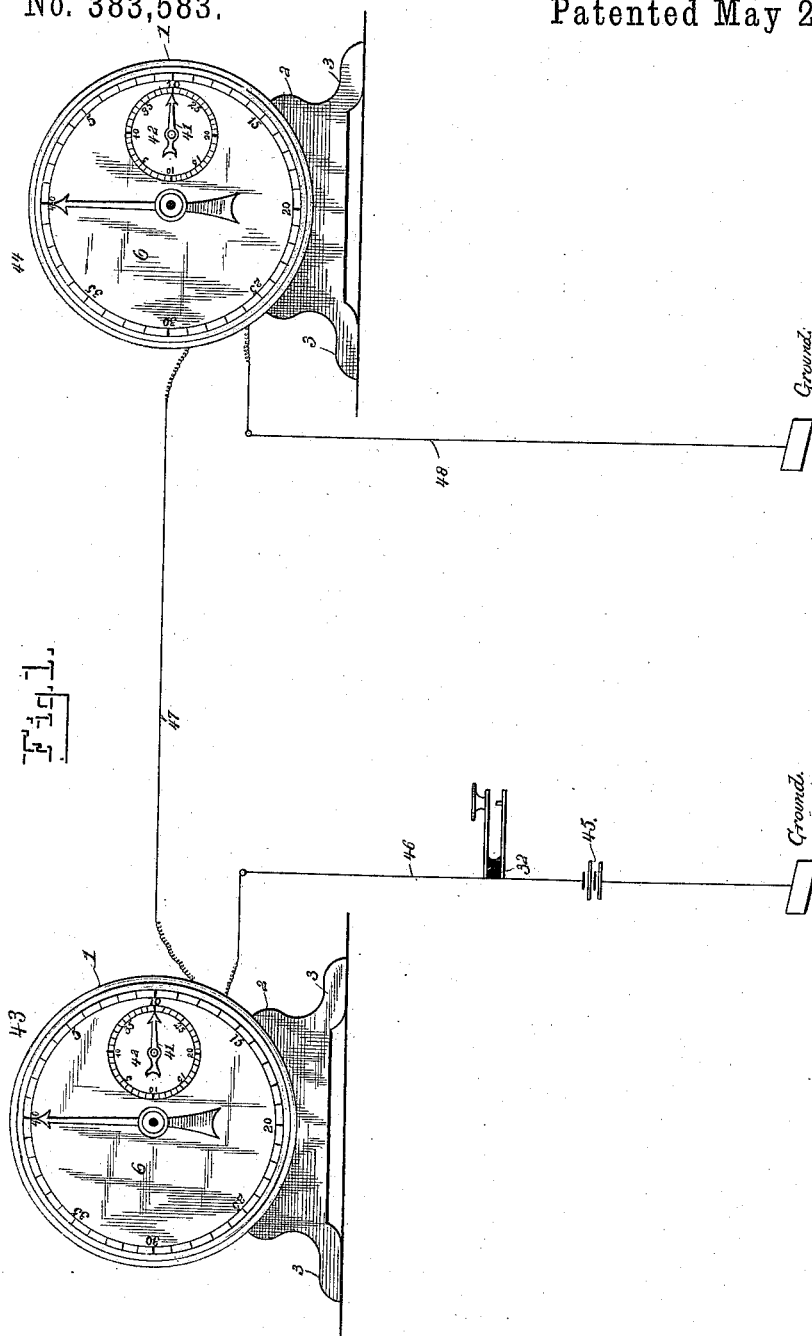
3 Sheets—Sheet 1.

J. F. McLAUGHLIN.

ELECTRO MAGNETIC REGISTER.

No. 383,583.

Patented May 29, 1888.



Witnesses,
Harry S. Rohrer,
John R. Stuart.

Inventor,
James F. McLaughlin.

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Fig. 2.

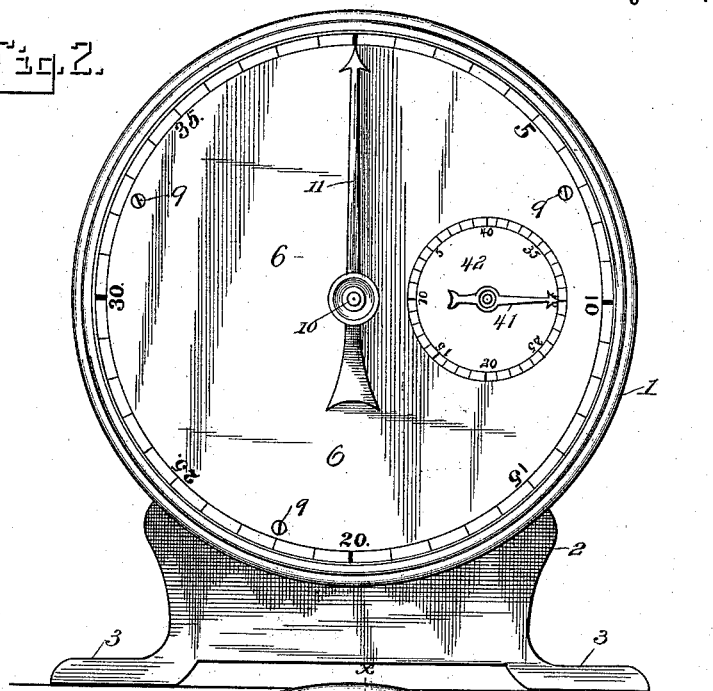
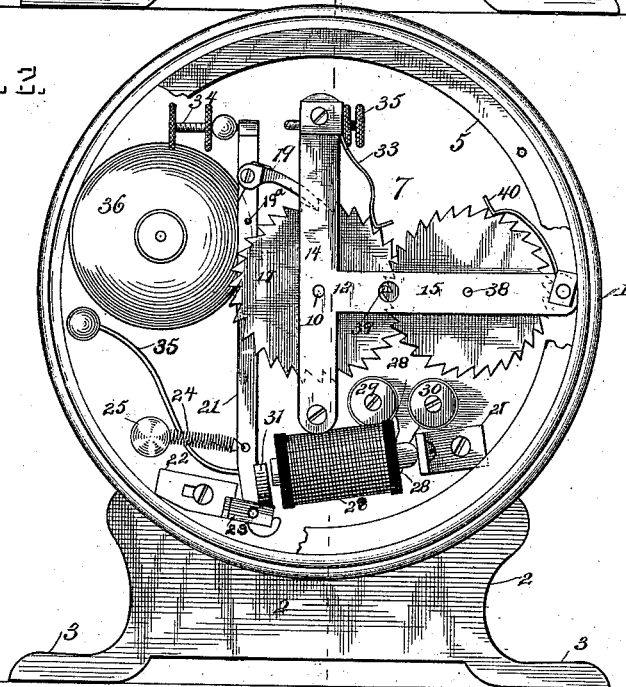


Fig. 3.



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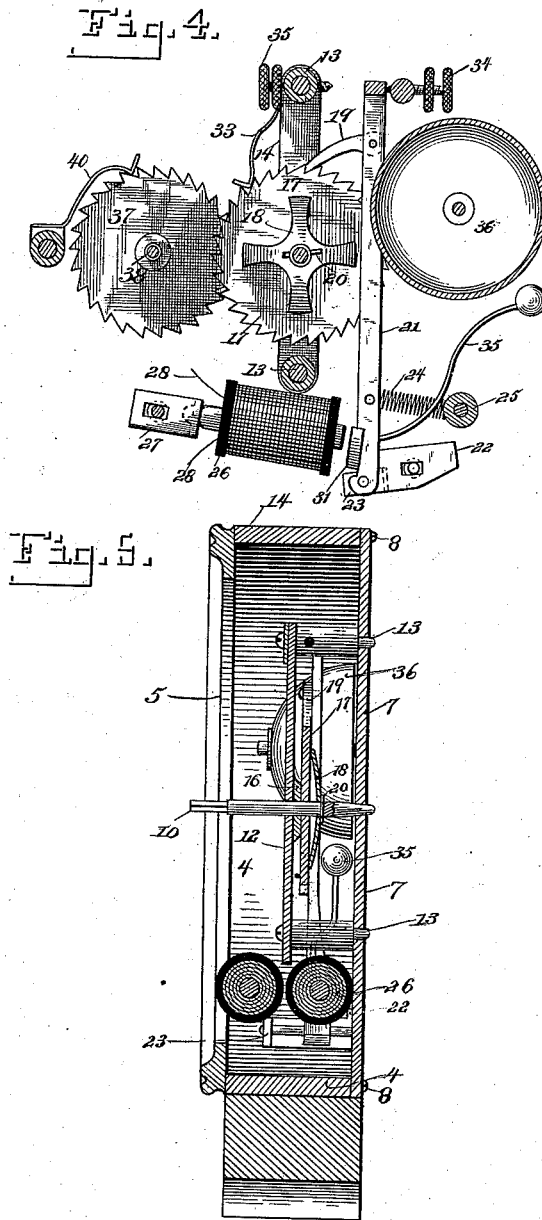
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRO-MAGNETIC REGISTER.

SPECIFICATION forming part of Letters Patent No. 383,583, dated May 29, 1888.

Application filed March 19, 1887. Serial No. 231,554. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electro-Magnetic Registers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an electro-mechanical indicating or registering instrument capable of being successively operated over a line-wire by the alternate make and break of an electrical circuit from a suitable source of electricity.

For the attainment of these objects my invention comprises certain combinations of apparatus having details of construction and a mode of operation particularly applicable to the different uses to which it may be adapted.

The accompanying drawings illustrate an organization of devices and parts which will be better understood from the detailed description given hereinafter.

Figure 1 is a diagrammatical view showing two instruments in circuit and so arranged as to be operated in unison. Fig. 2 is a view in front elevation showing the dial-face, the respective index-hands, the system of numbers circularly arranged thereupon, and the inclosing-casing for the interior mechanism. Fig. 3 is a similar view with the front plate or face and index-hands removed, showing the interior construction. Fig. 4 is a view in rear elevation with the back plate and the casing removed. Fig. 5 is a vertical transverse section on line *x x*, Fig. 3.

Like numbers of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings by numbers, 1 indicates the circular casing, having a suitable base, 2, provided with feet 3 3, formed integral therewith, as shown in Figs. 1, 2, and 3. This casing may be formed of any suitable material, as desirable, but is preferably made of some ornamental and durable wood. The front edge of the side or waist 4 of the casing 1 is provided with a molding or flange, 5, which serves as a guard or support for the

face or dial plate 6, which is attached thereto by screws 9 9. (See Figs. 3 and 5.)

7 designates the back plate, secured to the side 4 of casing by screws 8 8, and to which the interior mechanism is fastened in a manner to be hereinafter described.

The shaft 10, upon the forward end of which is mounted the index-hand or pointer 11, projects into a suitable bearing socket in the back plate, 7, as shown in Fig. 5, and is further supported and held in a horizontal position by the T-shaped brace plate or frame 12, which in turn is secured upon the supporting-posts 13 13, fastened suitably to the circular back plate, 7, said frame 12 being provided with a perforation of sufficient size to admit of the entrance of the shaft 10.

The brace-plate 12 is composed of the vertical and horizontal arms 14 and 15, both being formed in one piece, (see Fig. 3,) and the arm 14 having a circular boss or bushing, 16, made integral with its under surface, as shown in section in Fig. 5.

17 designates a ratchet-wheel mounted loosely on the shaft 10 in contact with the bushing 16.

18 is a spider-shaped spring or friction-clutch, also mounted by pin 20 on the shaft 10, and having its tension equally distributed upon the rear plane or face of the ratchet-wheel 17, the object of which construction will be more fully set forth.

The pawl 19, adapted to engage the teeth of ratchet-wheel 17, is fastened near the free upper extremity of the reciprocatory pawl-lever 21, which in turn is pivotally secured at its lower extremity to the compound arm or extension 23 of the plate 22, which is provided with a rectangular slot, as shown, and adjustably fastened to the back plate, 7, by a screw passing through said slot.

19^a designates a small laterally-projecting pin located on the side of the pawl-lever 21 at a relative distance from the pawl 19, so that when said pawl 19 engages in and actuates the ratchet-wheel 17 the pin 19^a will engage the wheel 17 and will act in the capacity of a check-pawl, for preventing the wheel 17 from being advanced more than the distance intervening between any two teeth thereof.

The retracting-spring 24 is attached at one end to the lever 21, and is suitably secured at

the other to the adjusting-screw 25, which enters the back plate, 7, the object of said spring being to withdraw the pawl-lever, and consequently the pawl, after each engagement of said pawl 19 with the ratchet-wheel 17.

26 designates an electro-magnet mounted in the manner shown upon the non-magnetic plate 27, which is fastened to the back plate, 7; and 28 28 are the wires electrically and respectively connecting the terminals of the helix of the said magnet with the binding-posts 29 and 30, arranged on the back plate. (See Fig. 3.)

31 is the armature of the magnet 26, secured near the lower pivoted end of the lever 21 and opposite to the poles of the magnet, as shown. Thus when the magnet is energized by the depression of the circuit-closer 32 (shown in diagram, Fig. 1) the armature 31 is attracted, and consequently the lever 21, carrying the pawl 19, is actuated, so as to cause the ratchet-wheel to be rotated one step forward, the spring-dog 33, which is fastened to arm 14, by virtue of its tension, preventing the wheel 17 from being further rotated when it is relieved from the engagement of the pawl 19 after a forward stroke of the lever 21. This movement of the ratchet-wheel will cause the pointer or index-hand 11 to advance a corresponding distance around the dial-plate 6.

From the foregoing explanation of the construction it will be readily understood that the object of locating the armature 31 near the lower end of the lever and the magnet in corresponding relation thereto is to allow said pawl-lever a greater curvilinear reciprocation at the point upon which the pawl is fixed, said movement being restricted or limited by the adjusting-screws 34 and 35, as clearly shown in Figs. 3 and 4.

Simultaneously with each forward movement of the pawl-lever an annunciating apparatus is operated by means of a bell-rod, 35, fixed at one end to said lever, the other free end being provided with a tap or ball which is normally in proximity to the gong 36. The ratchet-wheel 37, which is similar in size and construction to the wheel 17, except that its teeth are inclined in opposite directions, is rigidly keyed to a short shaft, 38, which has its bearings in the arm 15 of the plate 12, and in the back plate, 7. This wheel, as shown in Figs. 3 and 4, is so arranged as to slightly overlap the wheel 17 without meshing therewith, the front plane of the wheel 17 being nearly parallel with the rear plane of wheel 37.

39 is a small pin or stud on the ratchet-wheel 17, which engages one of the teeth of wheel 37 at each revolution of the wheel 17, the spring-dog 40 operating in a similar capacity as the dog 19—namely, to prevent the pin 39 from rotating the wheel 37 more than the distance intervening between any two adjacent teeth thereof when the said wheel has been relieved from the actuating agency of the said pin 39. The small index-hand 41, which moves over the face of the dial 42, is adjustably mounted

on the forward end of a horizontal shaft, so that it can be removed at will. Thus it will be obvious that each complete revolution of the index-hand 11 will advance the smaller pointer or hand, 41, one space in an opposite direction to that of hand 11, and, furthermore, inasmuch as the teeth upon the respective wheels 17 and 37 correspond in number, it necessarily follows that it will necessitate as many revolutions of the hand 11 to rotate the hand 41 completely around the dial-face 42 as there are separate movements of the lever 21 required to advance the hand 11 around its respective face. However, it will be apparent that such relative construction of wheels may be varied to meet the various requirements of the instrument.

Should it be desirable to change the position of the hand 11 from any designated point on the dial-face to another, this can be accomplished readily, without rotating the ratchet-wheels 17 and 37, by slightly pressing upon and turning the shaft 10 in a reverse direction, the slightest pressure of said shaft and any impediment to the reverse motion of wheel 17 by the spring holding-pawl 33 being sufficient to release the friction-clutch, previously described.

The diagram in Fig. 1 illustrates two of my instruments, 43 and 44, both placed upon the same line-circuit and operated simultaneously by the depression and release of the key of the circuit-closer 32. When this key is depressed, the current passes up from its battery 45 over its path 46 47 48 to ground at the other end of the line, thereby instantaneously energizing the respective magnets of both instruments 43 and 44 and simultaneously causing the attraction of their armatures and the operation of the pawl-and-ratchet mechanism and the annunciating device, and when the circuit-closing key is released the magnets are de-energized.

Manifestly the circuit-closer 32 might be located at any suitable or desirable point in the line, and the instruments might be operated locally in an electro-mechanical manner by the make and break of the circuit. It will also be apparent that two or more pins might be fixed on the plane of the wheel 17, so as to cause the rotation of the wheel 37 to make any desirable number of steps less than its number of teeth during a revolution of the ratchet-wheel 17.

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

The combination, with an electric circuit and a circuit-controller therefor, of an electro-magnet included in said circuit, an adjustably-pivoted armature pawl-lever controlled by said electro magnet, limiting and retracting agencies for said pawl-lever, actuating and check pawls carried by said pawl-lever, a ratchet-wheel controlled by said pawls, an index-hand operated by said ratchet-wheel, a second ratchet-wheel rotated at every com-

plete revolution made by the first-mentioned
ratchet-wheel, a second index-hand controlled
by said second ratchet-wheel, spring-dogs for
severally retarding the rotation of the two
5 ratchet-wheels, a bell-rod rigidly attached to
said armature pawl-lever, a sounding-gong op-
erated by said bell-rod, whereby each move-
ment of an index-hand is announced, and the
friction-clutch mounted on the central shaft,
10 whereby the index-hands may be set at any

desired point on the dial-face without disturb-
ing the interior mechanism of the register,
substantially as described.

In testimony whereof I affix my signature in
presence of two witnesses.

J. F. McLAUGHLIN.

Witnesses:

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GEO. H. TICHENOR.