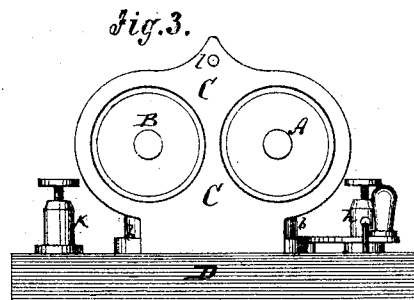
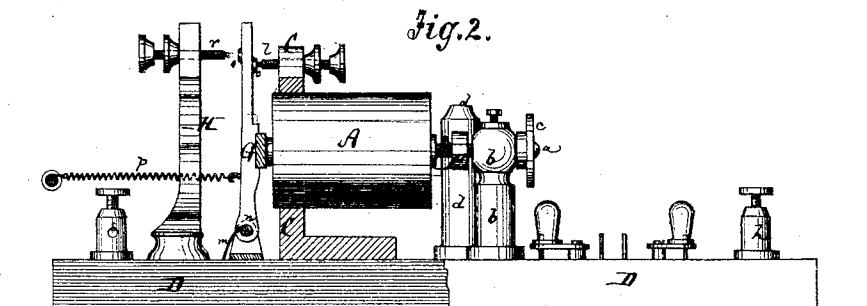
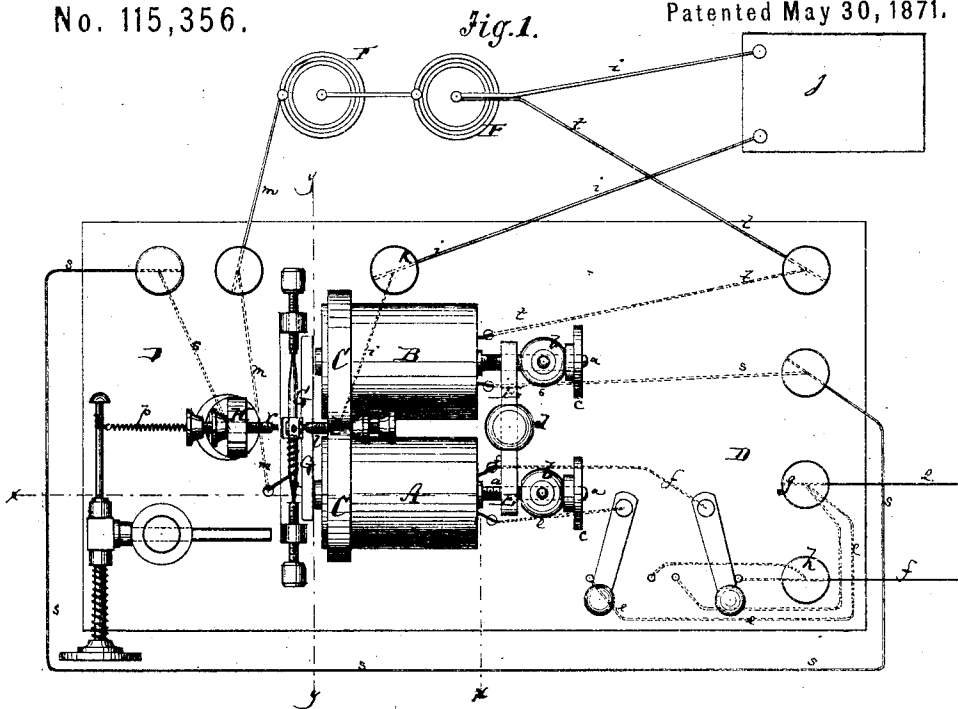


C. RATHBONE.

Improvement in Telegraph Relay Instruments.

No. 115,356.

Patented May 30, 1871.



Witnesses:

A. Bernchenhof.
Hm H. C. Smith.

Inventor:

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UNITED STATES PATENT OFFICE.

CLARENCE RATHBONE, OF ALBANY, NEW YORK.

IMPROVEMENT IN TELEGRAPH-RELAY INSTRUMENTS.

Specification forming part of Letters Patent No. 115,356, dated May 30, 1871.

To all whom it may concern:

Be it known that I, CLARENCE RATHBONE, of Albany, in the county of Albany and State of New York, have invented a new and Improved Relay Instrument; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a plan or top view of my improved telegraphic apparatus. Fig. 2 is a vertical longitudinal section of the same on the line *x x*, Fig. 1. Fig. 3 is a transverse section of the same on the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements in telegraph instruments, whereby the currents can be regulated at will as to intensity and quantity, and relay instruments made practically self-adjusting, so that even in bad weather the action will be firm and even in the main and all intermediate stations. The invention consists, first, in making the two cores of the magnet separately adjustable in a longitudinal direction, so that thereby each one can be moved independent of the other. The invention also consists in certain other arrangements of parts, as hereinafter more fully described.

A and B in the drawing are the two cores of the magnet of a telegraphic apparatus. Their front ends fit through apertures of a plate or supporting-frame, C, which is rigidly affixed to the bed D of the instrument. From the back of each core projects a screw-shank, *a*, through the connecting-bar E, which is held stationary by a standard, *d*, and through supporting-posts *d d*, respectively. A nut, *e*, is applied to the end of each shank *a*, and by its means each core can be separately adjusted parallel to its axis. Thus, instead of the two cores being rigidly connected, as is ordinarily the case in relays, the bar connecting the cores is stationary, and each core passing through it has, by the nut or equivalent

means, an adjustment of its own without moving the other core, though still forming the same magnet. This is advantageous whenever it is desired to use an intensity and a quantity current on the same magnet. The wires *ef* of the main circuit enter the terminal posts *g h* of the instrument and traverse the fine wire, which is wound around one core, A, only. The local circuit sends one wire, *i*, from the local battery F through the local sounder *j* and binding-cups *k* to the magnet point *l* of the front support C, while the other wire, *m*, passes from the battery to the pivot *n* of the vibrating armature G.

When the armature is attracted by the magnetism induced by the passage of the current through the fine wire it moves toward the magnet, and the points *l* and *o*, the latter being on an arm of the armature, touch, and close thereby the local circuit through the local battery and sounder. When the main circuit is broken the armature is pulled back by the spiral spring *p* until the point *o* touches a pin, *r*, in a support or post, H. This closes an extra circuit by the same local battery F through the points *o r*, such circuit being conducted over the wire *m* to the pivot *n* of the armature G; thence from the point *o* to *r*; thence by a wire, *s*, around the spool or side B of the magnet, which is wound with coarse wire; and, finally, over a wire, *t*, to the battery. The wires *m s t* convey thus the extra circuit. When the extra circuit is closed the armature is attracted toward B, but as soon as it starts it breaks the circuit at *o r*, when the springs pull it back again, closing the extra circuit. In this manner the armature is kept continually vibrating until the main circuit closes and attracts the armature to the point *l*. The relay is thereby rendered self-adjusting and the action of the main circuit very distinct, as the armature only stops when said main circuit is closed, and not otherwise.

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

1. The magnets A B, made separately adjustable in the direction of their respective

axis, substantially as and for the purposes herein shown and described.

2. The connecting-bar E of a pair of magnets, made stationary, and perforated to admit the movable cores, as specified.

3. The relay-magnet having one core with fine wire connected with the main circuit, and

the other core with coarse wire connected with the local battery and vibrating armature, as specified.

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Witnesses:

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