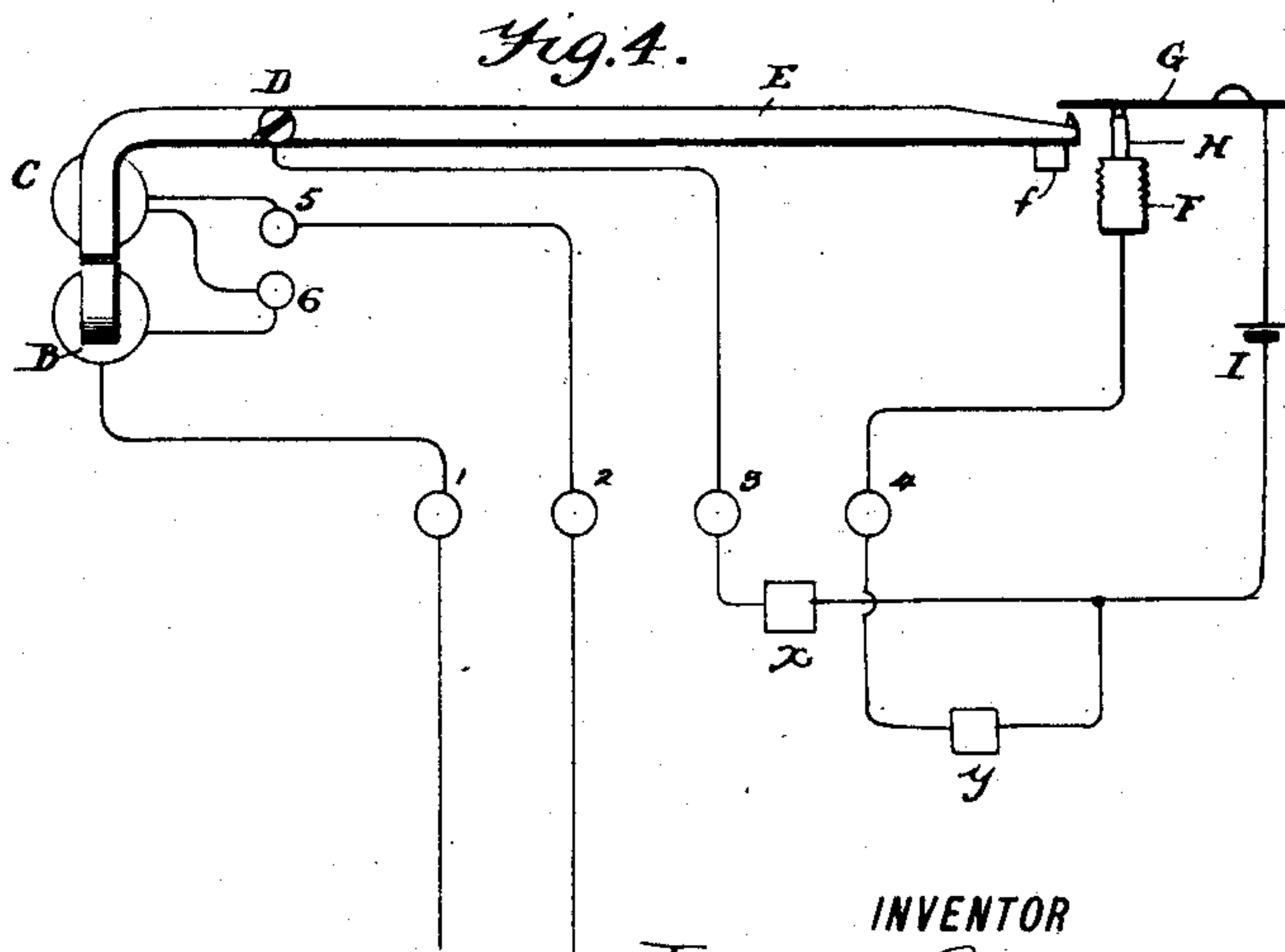


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TELEGRAPHIC RELAY.

SPECIFICATION forming part of Letters Patent No. 432,098, dated July 15, 1890.

Application filed April 7, 1890. Serial No. 346,882. (No model.)

To all whom it may concern:

Be it known that I, JOHN MARTIN TREBER, a citizen of the United States, residing in Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Telegraphic Relays, which the following is a specification.

My invention relates to improvements in telegraphic relays; and my object is to render the operation thereof extremely sensitive, while at the same time retaining a very simple construction.

Heretofore a telegraphic relay has been constructed with a pair of fixed magnets and a pair of magnets over them carried by one arm of a weighted lever, said arm vibrating between a stop and a contact-piece; but in my invention I simplify this construction and avoid any unbalancing of the magnetic circuit.

My invention consists in the construction and combination of parts, as hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my complete relay, the contact-post being in section. Fig. 2 is a plan of the same. Fig. 3 is an end elevation from the left of Fig. 1, and Fig. 4 is a diagrammatic view showing the circuits and the relay in outline.

A indicates the base-board, having near one end two brackets *b*, which support the lower horizontal magnet B by means of its core, the brackets forming the poles of said magnet.

D indicates a T-shaped post carrying at its upper outer ends bearings *d* for the fulcrum-pins *e* of the armature-lever E. This lever has an adjustable weight *e'* on its long arm and a yoke *e²* at its outer end, carrying the pole-pieces *c*, which are secured to the core of the upper magnet C. Near the end of the long arm of the lever a contact-post F is secured to the base-board, and has a horizontal block *f*, of insulating material, at its upper end. This block is recessed to form a seat *f'* for the end of lever E and carries the contact-spring G. At the upper end of post F is a contact-pin H, said pin and post being insulated from an inclosing-tube.

Four binding-screws for the circuit-terminals are shown at 1, 2, 3, and 4, and near the

bracket *b* are shown two more binding-screws 5 and 6. Connections are made as follows: From screw 1 to lower magnet B, from B to screw 6, from screw 6 to upper magnet C, from C to screw 5, (the two latter connections being coiled around the pivot-pins *e* of the lever, as shown in Fig. 2, to avoid interference with the free movements of said lever,) and from screw 5 to screw 2, the terminals of the main or operating circuit being attached at 1 and 2. From screw 3 connection is led to the T-post D, which supports the lever, and from the contact-spring G to screw 3 through a local battery I and through a sounder or other local translating device *x*. The current in this circuit may pass from post D to lever E through the fulcrum-pins thereof or through a small flexible connection. (Shown at *e³*.)

It will now be seen that when the current in the operating-circuit is made and broken the armature-lever is vibrated to make and break the local circuit, as more fully hereinafter referred to. A second local circuit is formed by the connection from the contact-pin H to the screw 4, and from screw 4 through a second sounder or other translating device *y* to the wire leading to local battery I and spring G. Additional circuits might be controlled by placing springs or contact-points on both sides of the armature-lever at proper points to engage circuit-terminals.

The upper magnet C, besides being in itself an electro-magnet excited by the same main current which excites magnet B, is also the armature, the north pole of magnet C being opposite the south pole of magnet B and the south pole of the former being opposite the north pole of the latter. The two magnets, which are substantially equal in power, have an equal attraction for each other, and the device is therefore extremely sensitive.

The weight *e'* serves to adjust the tension of the armature by being set at different positions of the longer arm of the lever.

The vibrations of the lever by the main current exciting the two single magnets causes an alternate make and break of the two local circuits, one circuit being made through the armature-lever and contact-spring G and the other through spring G and contact-pin H, the two circuits including, respectively, the

translating devices x and y , and both circuits including the same local battery I.

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

5 is—

1. In a relay, the combination, with a horizontal single magnet having the upwardly-projecting poles, of a lever having its contact-point at one end and a yoke at the other end,
10 a horizontal single magnet carried by said yoke and having its poles adjacent to the poles of the first-mentioned magnet, a main circuit including the said magnets, and a plurality of local circuits operated by the contact end
15 of the lever, substantially as described.

2. In a relay, the combination, with a stationary magnet, of an armature-magnet carried at one end of a lever, a contact-spring above the other end of the lever, a contact-
20 pin beyond the end of the lever and under the spring, a main circuit including the said magnets, a connection from a battery to the

spring, and branch connections from the battery to the lever and to the contact-pin, said branches including translating devices, where- 25
by the vibrations of the armature-lever will alternately operate two local circuits, substantially as described.

3. In a relay, a single magnet having its pole-pieces in the form of two brackets, the 30
feet of the brackets being secured to the base out of the vertical plane of the magnet, whereby the magnet may be located close to the base, and the said pole-pieces serve the double
35 function of influencing the armature and securing the same in position.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN MARTIN TREBER.

Witnesses:

PHIL TOMPERT,
R. F. BAIRD.