C. M. BREEDLOVE.

TELEGRAPHY.

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1,049,044.

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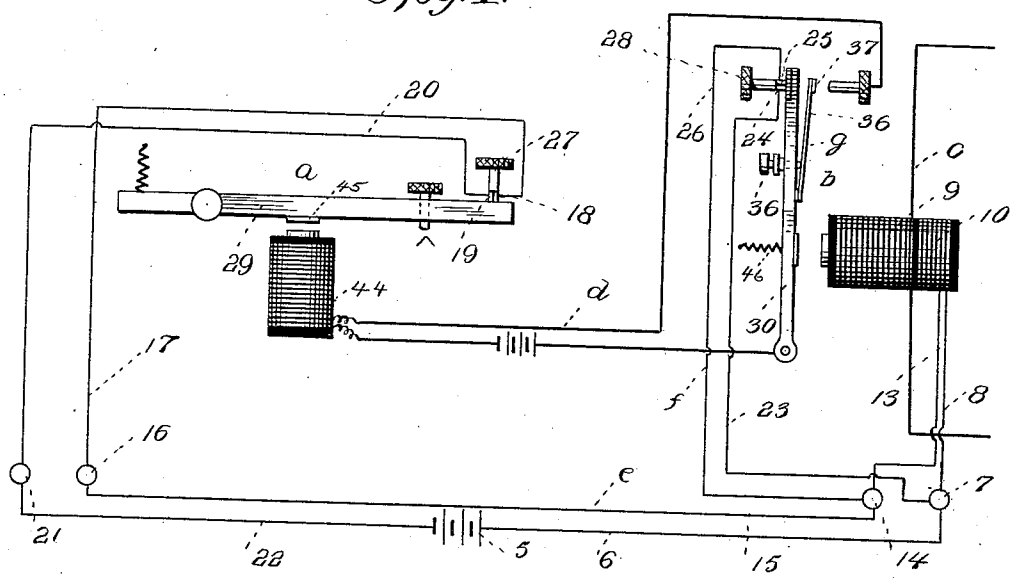
Fig. 1.



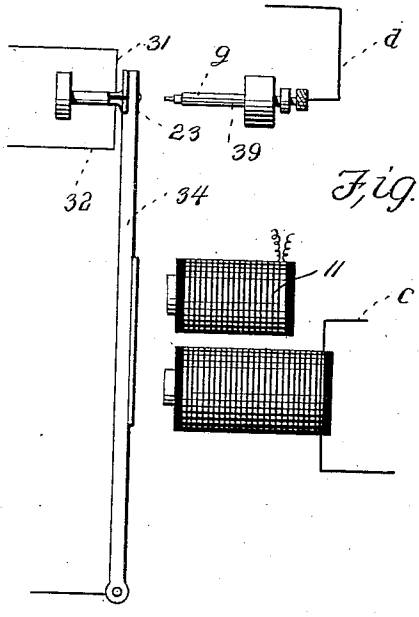


Fig. 3.

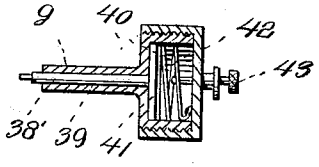


Fig. 2.

Witnesses

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CLARENCE M. BREEDLOVE, OF BIRMINGHAM, ALABAMA.

TELEGRAPHY.

1,049,044. Specification of Letters Patent. Patented Dec. 31, 1912.

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To all whom it may concern:

Be it known that I, CLARENCE M. BREEDLOVE, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Telegraphy, of which the following is a specification.

The general object of the invention is to increase the magnetic flux for attracting the relay armature of an electric telegraph instrument.

Other objects will appear and be better understood from the following description taken in connection with the accompanying drawings, in which,

Figure 1 is a view partly in elevation and partly in diagram of one embodiment of the invention. Fig. 2 is a modified form of the duration point. Fig. 3 is a view partly in diagram and elevation of a sufficient portion of a relay to illustrate the application of a modified form of the device.

a indicates in general, an ordinary form of sounder and *b* an ordinary form of relay.

c indicates the main circuit, *d* the local circuit in which the sounder and relay are connected, the opening and closing of this circuit being controlled as usual, by the armature of the relay.

Since the parts just described and their connections are well known, a detail description of the same need not be given. It may be stated, however, that what is shown and as previously stated are merely to illustrate one application of the invention and I do not intend to limit myself to the employment of these parts for the reason that the invention hereinafter described may be employed with various systems of telegraphy and in fact with any electromagnet operating at a relatively great distance from its source of energy.

e indicates an auxiliary circuit which comprises a suitable source of electric energy such as a battery of cells 5, a wire 6 connecting one pole of the battery with a binding post 7 on the relay *b*, a wire 8 connecting the binding post 7 with an electromagnet 9. The electromagnet 9 may, as shown in Fig. 1, be the regular relay magnet with a few additional coils such as indicated at 10 wound thereon, or as shown in Fig. 3, an additional magnet 11 may be employed. In either event the auxiliary circuit which passes through the coils 10 or magnet 11 will be separate and distinct from the main and local circuits *c* and *d* respectively.

13 indicates a wire connecting the additional coil 10 or coil of the magnet 11, as the case may be, with a binding post 14 on the relay.

15 indicates a wire connecting the binding post 14 with a binding post 16 on the sounder and 17 indicates a wire connecting the binding post 16 with a contact 18.

19 indicates a contact insulated from the contact 18 and 20 a wire connecting the contact 19 with a binding post 21 on the sounder, while 22 indicates a wire connecting the binding post 21 with the other pole of the battery 5.

f indicates a shunt or short circuit which comprises a wire 23 connecting one side of the auxiliary circuit such as the wire 7, 8, with a contact 24.

25 indicates a contact insulated from the contact 24 and 26 a wire connecting the contact 25 with the other side of the auxiliary circuit such as the wires 13, 15.

The contacts 18 19, 24 25 are shown as connected respectively with the adjusting screws 27 and 28 of the sounder and relay, respectively. This view is simply to illustrate a convenient connection and arrangement for the contacts and it will be seen that the same result would be obtained if these contacts were arranged on the lever 29 of the sounder or armature 30 of the relay, the latter construction being shown in Fig. 3 wherein the wires 31 and 32 are connected to the insulated contacts 23 carried by the armature 34.

Referring to the drawings *g* indicates a duration point adapted to follow the relay armature for a short distance when the main circuit is opened in the usual manner, by the operator's key, whereby, to prevent the sudden breaking of the main and local circuits upon sudden fall and rise of current in the main line and obviate the sticking and sparking at the relay *b*. In order to accomplish this result each point is adapted to yield and may as shown in Fig. 1, comprise a resilient body 36 connected to the armature 30 and provided with a platinum tip or point 37 and adjusted by means of an adjusting screw 36, or as shown in Fig. 2, the tip *g* may comprise a plunger rod 38′ arranged to slide in the sleeve 39

having a chamber 40 to receive the head or plunger 41 of the rod and a compression spring 42 for forcing the rod 38′ outwardly in the sleeve, an adjusting screw 43 being provided to limit the inward movement of the plunger 41. In this connection the sleeve 39 and its chamber may be adapted to fill the office of the post or contact shown in Fig. 3, and designated by 35, wherein it will be seen that the parts are arranged so as to permit of the armature moving the duration point inwardly against the action of the spring when the main circuit is closed.

In operation and when the main and local circuits are closed, the auxiliary circuit will be open. Figs. 1 and 3 show the position of the parts when the main and local circuits are open. In this connection it will be seen that the auxiliary circuit extends by the wire 6 and binding post 7 where it branches, owing to the relatively high resistance of the magnet coils and passes by the wire 23, contact 24, armature 30, contact 25, wire 26, of the shunt or short circuit to the wire 15 on the other side of the line. The circuit then extends through the binding post 16, wire 17, contact 18, lever 29, contact 19, wire 20, binding post 21, and wire 22 to the battery 5. Now, when the key in a distant station is depressed and the relay magnets energized by the main circuit *c*, the armature 30 will be attracted by the magnets of the relay. When the connection between the armature 30 and contacts 24 and 25 is broken and before the said armature closes the main circuit or, in other words, while it is approaching the adjacent post or abutment, the short circuit will be broken, whereby, the auxiliary circuit will extend by the wire 6, binding post 7, wire 8, coil 10, wire 13, binding post 14, and thence as before described, through the sounder and to the battery 5. In this connection it will be observed that the current of the auxiliary circuit will increase the attracting tendency of the electromagnet 9, thus insuring a strong pull on the armature 30 until the latter contacts with the adjacent post or abutment, whereupon the local circuit will be closed and the auxiliary circuit broken by virtue of the magnet 44 of the sounder attracting the armature 45 connected to the lever 29. This action will take place at each opening and closing of the main and local circuits. Due to leaks and other losses of excessive resistance in a long line, frequent trouble is caused by the inability of the magnets of a relay to attract the armature when a number of dots in quick succession are made such as when writing rapidly. Heretofore it has been necessary to nicely adjust the armature in order to insure the attraction of the same by the magnets. With this construction, however, it will be observed that this is obviated since it will be seen that as soon as the armature moves from contact with the contacts 24 and 25 and against the action of its spring 46, the magnets will be additionally energized and if the current ceases to flow through the main line during the closing movement of the armature the additional energy imparted to the magnet will be sufficient to enable them to attract the armature to complete its closing movement, thus insuring the click of the sounder *a*. In this instance it will be observed, however, that when the sounder closes, the auxiliary circuit will be broken whereupon the armature will return to its former position as shown in Fig. 1.

Although I have shown and described one embodiment of my invention it is to be understood that I am not to be limited to the specific arrangement and construction of parts since various changes will be made, within the scope of the appended claims without departing from the spirit or sacrificing any advantages of the invention.

What I claim as new is:

1. In telegraphy, in combination with a sounder, a local circuit for operating the same, a relay including electromagnets for controlling the local circuit, and a main circuit for operating the relay; of an auxiliary circuit controlled by the sounder and arranged to energize one of said electromagnets of the relay, and means arranged to short-circuit the auxiliary circuit when the other electromagnet of the relay is deën-ergized.

2. In telegraphy, in combination with a sounder, a local circuit for operating the same, a relay including electromagnets for controlling the local circuit, and a main circuit for operating the relay; of an auxiliary circuit controlled by the sounder and arranged to energize one of said electromagnets of the relay, and a short circuit controlled by the armature of the relay and arranged to shunt the current from one of the relay magnets when the same is deënergized.

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

CLARENCE M. BREEDLOVE.

Witnesses:

J. F. WEISS,

C. E. MORGAN.