

C. DURANT.
TELEGRAPH APPARATUS.

No. 96,090.

Patented Oct. 26, 1869.

Fig. 1.

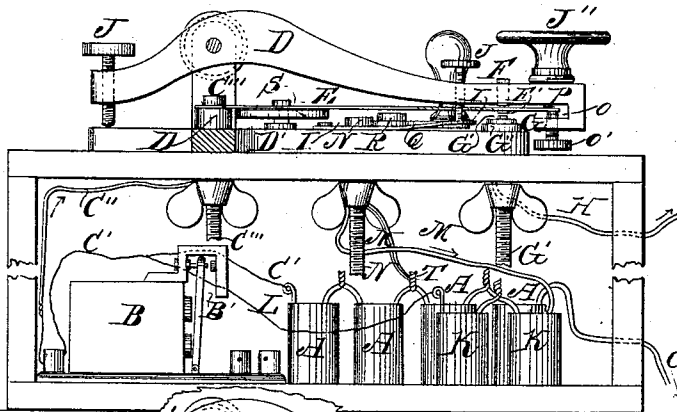


Fig. 2.

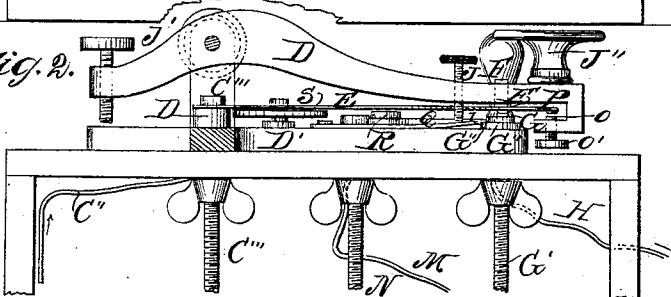
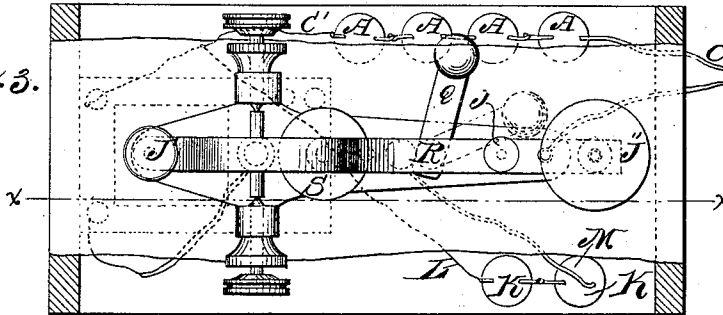


Fig. 3.



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Letters Patent No. 96,090, dated October 26, 1869.

IMPROVEMENT IN TELEGRAPH-APPARATUS.

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, CHARLES DURANT, of Jersey City, Hudson county, New Jersey, have invented a new and useful Improvement in Telegraph-Apparatus; 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 drawings, forming part of this specification.

In practical telegraphing, owing to "resistance" and "escape," there is sometimes a very wide difference in the attractive power developed in the main-line relay-magnet, so as to cause a corresponding violent recoil of the armature, or even to fail to operate it altogether.

The object of my invention is to modify the attractive power of the relay-magnet, to such a degree, and in such a manner as shall suffice to prevent, within certain limits, the violent recoil of the armature, and, also, by the same means, to better adapt the relay-machine to the perception of distant or weak signals.

It is not, however, proposed by my invention to equalize or to render the attractive power at several relays the same under any circumstances, it being designed and applicable to local use alone.

The invention consists in the construction and arrangement of the various parts, as will be hereinafter described.

Referring to the drawings, which form a part of this specification—

Figure 1 is a side elevation of my improvements, in part sectional, showing the main-line circuit open, and the extra circuit through the relay-machine closed.

Figure 2 is a similar elevation, showing the main-line circuit closed, and the extra circuit open.

Figure 3 is a plan view of my improvements.

Similar letters of reference indicate corresponding parts.

A is the main battery; B, the relay-machine; and B', the armature, all of the usual or any known construction.

C, the main-line battery ground-wire.

C', wire from the battery, communicating with the relay-machine.

C'', wire from relay-machine to screw C''', of the telegraph-instrument or key D'.

The screw C''' is insulated by the rubber block D'', from the telegraph-instrument.

E, conducting-spring, communicating with the screw C''.

F, insulating-pin, in the lever D, by which pin the spring E is insulated from the lever D.

F', platina point upon spring E, which point, when the main circuit closes, is brought in contact with the platina G, upon the conducting-screw G', which latter

is insulated from the base of the instrument D' by means of a rubber block, G''.

H, the main-line wire, attached to screw G'.

I, spring, for throwing up the key-lever D.

J, an adjusting-screw, set in the key-lever D, and passing through an opening in the spring E, for regulating the throw of the front end of the key-lever, its rear end being regulated by the adjusting-screw J'.

The usual finger-button is shown at J''.

The operation of the instrument is substantially the same as all analogous telegraph-keys.

When the key D is in the position shown in fig. 2, the main-line circuit is closed, and the electric current passes from the battery A, through the relay-machine B, thence, through wire C' and spring E, to the main line H. When the key-lever is in the position shown in fig. 1, the points F' G are separated, and the main-line circuit is broken.

I will now proceed to describe the means which I employ to regulate the attractive power developed in the magnet of the relay-machine:

I provide a small independent or extra battery, K, one pole of which communicates, by wire L, joined to wire C', with the relay-machine, and thence by wire C'' with the telegraph instrument D D'. The other battery-pole communicates, through wire M and screw N, with the telegraph instrument D D'. At the front end of the lever-key D is an adjusting-screw, O', by which the contact of the key with the platina P, upon the extremity of the spring E, is regulated.

It will thus be seen that when the lever D stands in the position shown in fig. 1, the circuit is open, in respect to the main-line wire, and no signals will pass on the wire H; but in respect to the relay-machine B, the circuit is closed, and a weak current from the independent battery K passes through the relay-machine, causing its magnet to attract the armature, thus reducing the force of its recoil.

When the key occupies the position shown in fig. 2, the platinas F' G of the main-line circuit are brought into contact, and the platinas O P are carried out of contact; consequently, the circuit between the independent battery K and the relay-machine is opened, while the main-line circuit is closed.

By means of my improvement, the recoil of the relay-armature, which begins at the instant the main circuit opens, is, at the same instant, modified by the closing of the circuit between the extra battery and the relay-machine.

From the foregoing, it will be evident that the effect of the extra battery is not only to modify the action of the armature, relative to the relay-magnet, during the time when the main-line circuit is closed, but also to change its relative position to said magnet when the circuit is broken, inasmuch as the armature

will be attracted toward the magnet, against the tension of its spring, in proportion to the number of cups employed to form the extra battery. The armature thus becomes operatively susceptible to the influence of a weaker attractive power than it would be in its usual and more inclined position away from the magnet. When thus adjusted, a very "weak signal" will be almost certainly perceptible.

It will be observed that the lines connecting this extra battery to the magnet, being protected from exposure to the various influences, accidents, &c., to which the main line is necessarily and constantly exposed, a comparatively equable action of the same is thereby secured.

The extra circuit used and operating the relay-machine, is intended to be generally weaker than the main-line circuit.

For convenience in using the telegraph-instrument, I provide a lever-button, Q, pivoted to the base D', at R, and arranged above the spring I. When this button is open, as shown in black, fig. 3, the spring I acts to throw up the key-lever D, and break the circuit; but when the button is closed, as shown in red, the spring I is depressed by the button, and the spring cannot act upon the key, which falls and closes the main-line circuit, and so remains until lifted by the hand of the operator, or until the button Q is thrown open.

When thus closed, the operator adjusts the armature, in the usual manner, to the reception of distant weak signals.

Upon the base D', I arrange an insulated adjusting-screw, S, for the adjustment of the spring E.

I do not limit or confine myself to the particular arrangement of mechanical parts herein shown, nor to any special arrangement thereof, as these may be varied in many ways, without departing from my invention.

One modification of my improvement would be to

dispense with the independent battery, and its pole-wire L, and in lieu thereof, to take a current from the main battery, by connecting the wire M with the main battery, at T, for example, the wire M, when thus connected, being indicated by the combined blue and red lines, fig. 1.

In such case, when the main telegraph-circuit is closed, a current derived from the main battery will then pass through the relay-machine, and control the armature, in the manner heretofore described.

When the extra battery is stronger than necessary, I reduce it, either by throwing out some of the battery-cups, or by introducing one or more resistance-coils, or other suitable resisting-device into the extra circuit.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. So combining a relay-machine, and one or more batteries, or other electrical supply with a telegraph-instrument, that when, by the operation of the instrument, the main telegraph-circuit is opened and closed, another circuit, communicating with the same relay-machine, will be correspondently closed and opened, and the attractive power developed in the relay-magnet will be thereby modified, substantially as described.
2. The conducting-spring E, or its equivalent, in combination with a telegraph-instrument, for the purpose described.
3. The lever-button Q, operating as described.
4. The combination of the screw J with the lever-key D and spring I, substantially as described.
5. The employment of the insulated adjusting-screw S', in combination with the spring E, substantially as described.

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Witnesses:

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