No. 657,223. Patented Sept. 4, 1900.

I. KITSEE.

RECEIVING DEVICE FOR TELEGRAPHY.

(Application filed May 20, 1899.)

(No Model.)

Fig. 1.

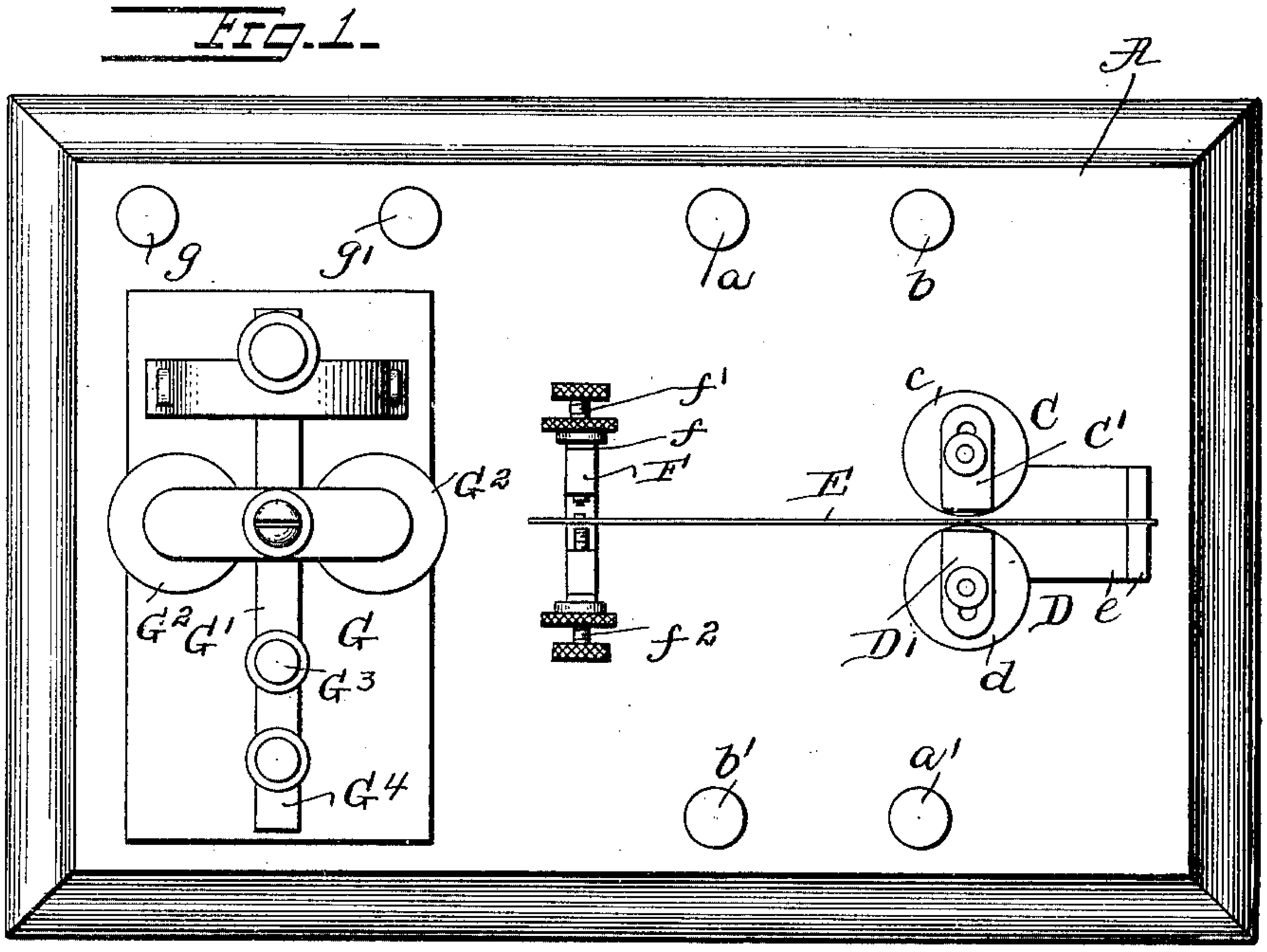


Fig. 2.

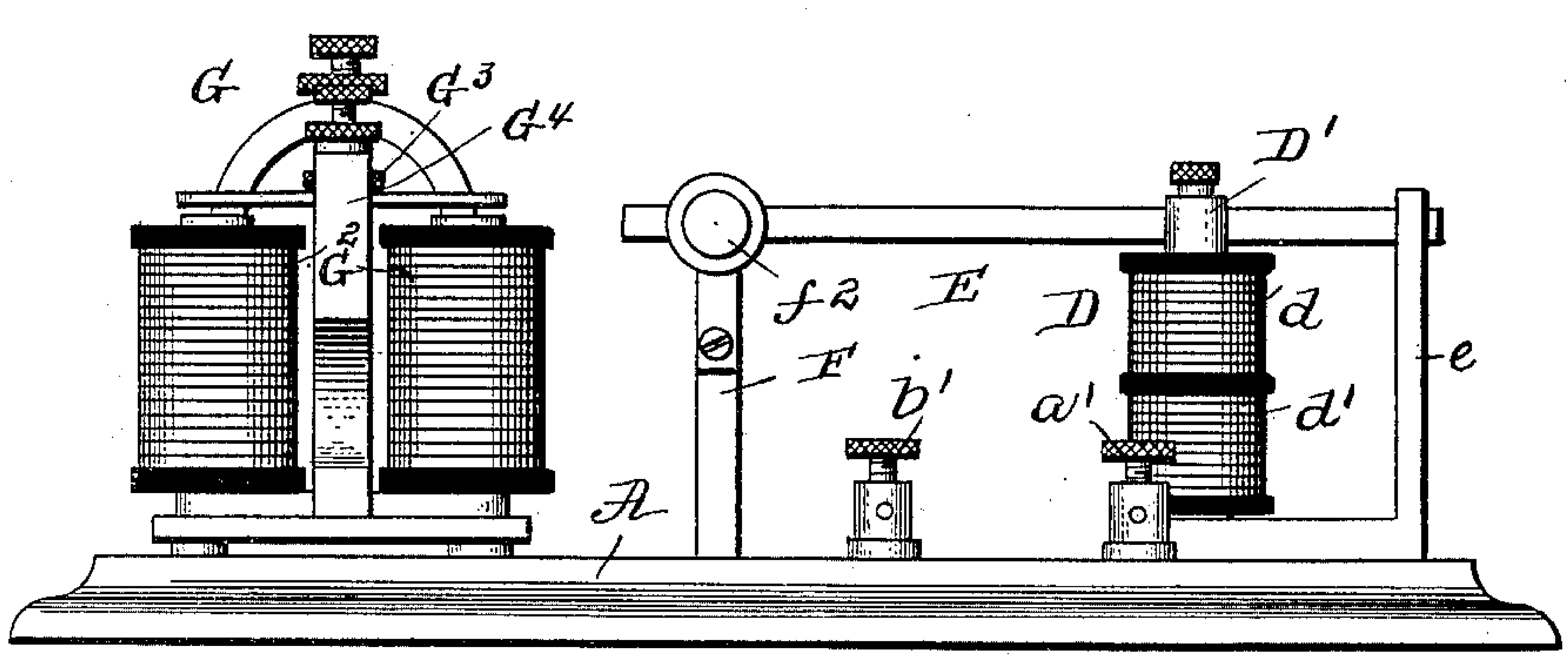
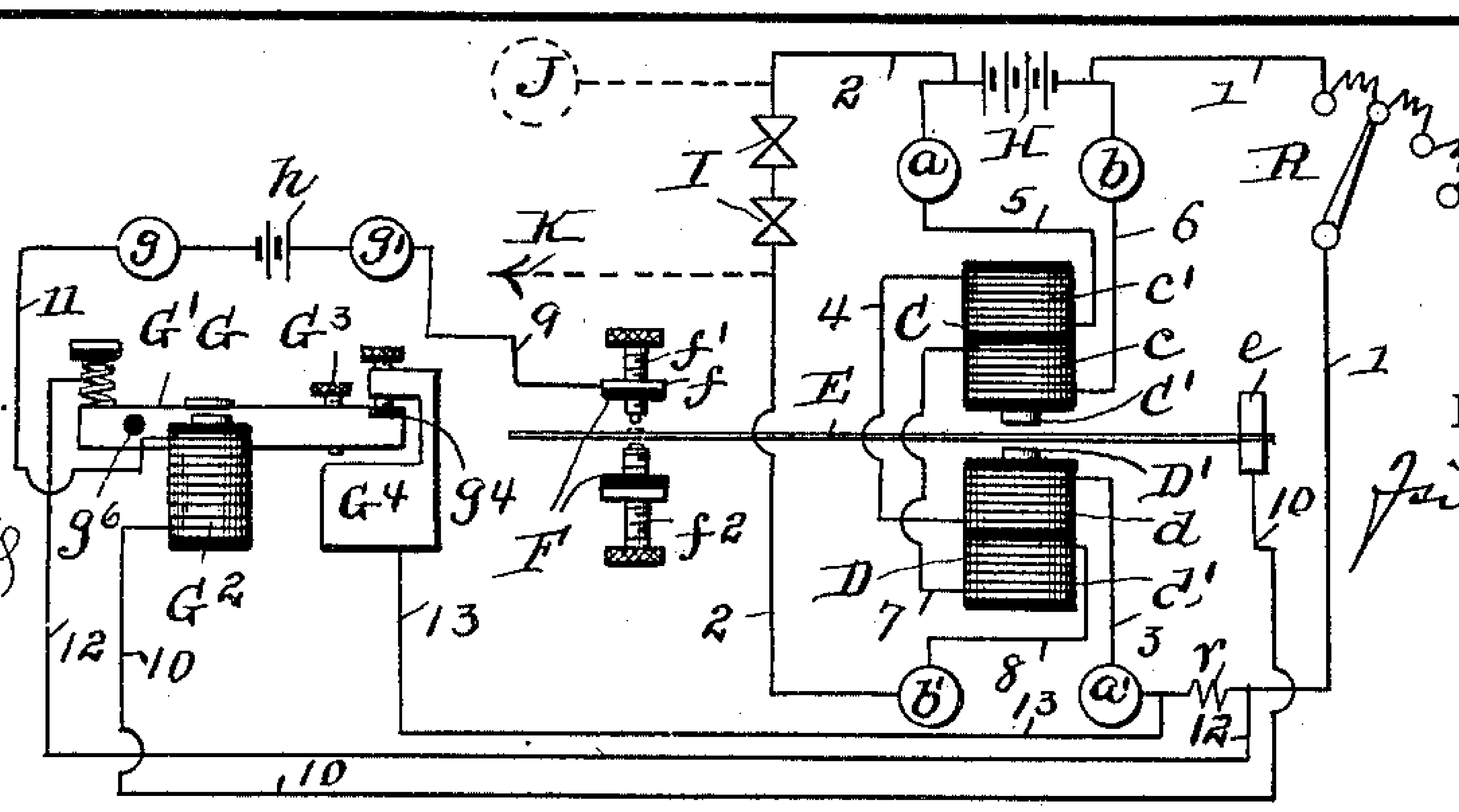


Fig. 3.



Witnesses.

Inventor.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CHARLES E. WILSON, OF SAME PLACE.

RECEIVING DEVICE FOR TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 657,223, dated September 4, 1900.

Application filed May 20, 1899. Serial No. 717,616. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Receiving Devices for Telegraphy, of which the following is a specification.

My invention relates to an improvement in a receiving device for telegraphy, and has more special reference to wireless or space telegraphy.

One object of my invention is to produce a receiving device actuated by the incoming electric waves in a manner so as to destroy the balance of a normally-balanced electromagnetic device.

The second object of my invention is to actuate through this device a second or localized device.

In the drawings forming part of this specification, Figure 1 is a plan view. Fig. 2 is a side elevation. Fig. 3 is an electric diagram of the relay embodying my invention.

A is the non-conducting base of the instrument.

e is a permanent magnet, on one arm of which are placed the electromagnetic coils C and D, the lower ends of the cores of which are in contact with the permanent magnet *e* and the upper ends of the cores of which are provided with the adjustable pole-pieces of soft iron C′ and D′. The upper end of the permanent magnet is in contact with the tongue or lever E. At the extreme end of said lever or tongue is the non-conducting upright F, provided on one side with the contact-piece *f* and the adjustable screw *f′* and on the other side with the adjustable screw f^2. Each of the cores of the electromagnet C and D are provided with two independent coils designated, respectively, by the letters *c* and *c′* on one core and *d* and *d′* on the other core. The resistance and turns of wires in every one of these coils should be alike. The lower terminal of the upper coil *c* of the electromagnet C is connected with the lower terminal of the lower coil or coils *d′* of the electromagnet D, and the lower terminal of the upper coil *d* of the electromagnet D is connected with the lower terminal of the lower coil *c′* of the electromagnet C. It is therefore obvious that these four coils in their electrical connection so far form two coil pairs, each pair capable of balancing or counteracting the influence of the other pair if both pairs were oppositely connected to one and the same source of current, and this connection is clearly illustrated in Fig. 3, as follows: The upper part of coil *c* is connected, through wire 6 and binding-post *b*, with the negative pole of the battery H, and the upper terminal of the coil *d′* is connected, through wire 8, binding-post *b′*, and wire 2, with the interposition of microphonic material I, later on to be described, with the positive pole of this battery. As said above, the coils *c* and *d′* represent one coil pair, and the current flowing from the battery H tends to energize both core-pieces, so as to give them a certain polarity; but the second coil pair, consisting of coils *d* and *c′*, are connected to the same battery in opposition to the first coil pair in the following manner: The upper part of the coil *d* is connected, through wire 3 and binding-post *a′*, with the interposition of resistance *r*, through wire 1, with the interposition of the resistance R, to the negative pole of the battery H, and the upper terminal of the coil *c′* is connected, through wire 5 and binding-post *a*, to the positive pole of said battery. Supposing, now, that the battery H is entirely disconnected from the coil-circuits, the upper ends of both cores would be of one and the same polarity, for the reason that they are resting on one and the same terminal of the magnet. If, now, the battery H is connected to both of the coil-circuits and these circuits are of equal resistance, then one coil pair will tend to increase the strength of one core polarity and decrease the strength of the other core polarity. At the same time the action of the second coil pair will be the reverse of the action of the first coil pair, and the action of the battery will therefore be nullified; but as soon as the resistance of one of the circuits will vary from the resistance of the second circuit the equilibrium will be destroyed, and the polarity of one of the core-pieces will be increased and of the other decreased. As long as the equilibrium is established the lever or tongue E will be equally affected by each of the core-pieces if the same are at equal distances from

the lever or tongue; but as soon as the equilibrium is destroyed the lever will be carried to one side or the other, as the case may be.

The sounding device G is provided with the electromagnetic coils G^2 and the lever-armature G'. This armature is provided with the usual adjustable screw G^3 and is also provided with the insulating-piece g^4. One end of the lever is pivoted at g^6 and the other end of the lever rests normally, if the circuit is open, against the lower point of the adjustable screw connected to the metallic upright G^4. The coil of the electromagnet G^2 is connected, through wire 11, binding-post g, battery H, binding-post g', and wire 9, to the contact-point f in proximity to the tongue or lever of the device before described. The other terminal of the electromagnet G^2 is connected, through wire 10, with the permanent magnet e and through same with the tongue or lever E. As long as this lever rests against screw f^2 or is otherwise out of contact with screw f' with its contact-point f the circuit including the electromagnet of the sounder G is open; but as soon as the tongue or lever E is brought in contact with f the circuit including the sounder is closed and the sounder will be actuated. The downstroke of the sounding-lever G' will electrically connect, through the adjustable screw G^3, this lever with the conducting-upright G^4. This action will short-circuit the resistance r of the device before described, for the reason that one terminal of this resistance is connected, through wire 12, with G', and the other terminal is connected, through wire 13, with the metallic upright G^4.

In one of the circuits of the first-described device is placed the microphonic material I, and in the other circuit of this first-described device is placed the variable resistance R and the normal resistance r. The microphonic resistance I is also connected, as indicated in the drawings by dotted lines, with the aerial conductor J and the ground K, respectively, and consists, preferably, of two carbon buttons, which, as experiments have proven, do not cohere when electric impulses of high intensity are sent through them. The carbon buttons are preferably secured in a manner so that the same may be in slight contact with each other, but should offer a comparatively-high resistance. This resistance is reduced as soon as the current impulses pass; but as soon as the flow of these impulses ceases the former resistance is practically restored.

I will now describe the working of this instrument if connected to a receiving-circuit in wireless or space telegraphy.

The operator in charge of the receiving instrument will connect, first, the different coil-circuits to the battery H. He will then, with the aid of the switch of the variable resistance R, balance both opposing coils, so that the influence of the pole-piece C' will equal the influence of the pole-piece D' on the tongue or lever E. He will then connect the terminals of the microphonic material to the aerial conductor and ground, respectively. Normally the lever E may rest against the screw f^2. As soon now as electric waves arrive through the aerial conductor J at the station they will pass through the microphonic material I to the ground K. The resistance therefore of these microphones will be greatly reduced, and the balance of the two circuits will be destroyed. The influence of the core C' will be increased and the influence of the core D' decreased. The lever therefore will be repelled by D' and be attracted by the core C'. This will bring the lever in electrical connection with the contact-piece f, closing the circuit containing the sounder. The lever once brought to this position would rest at the contact-point f and remain inoperative for the following impulses; but the downstroke of the sounder will at the same time short-circuit resistance r of the second circuit and therefore lower its whole resistance. This action will force the lever again to its former resting-place against the screw f^2, which action will open the sounding-circuit, and thereby the short circuit around the resistance r, leaving the lever free to respond to the next following impulse.

The lever or tongue may be pivoted to the stationary magnet and may consist of a rigid bar of soft iron, or the lever may consist of a vibrating reed clamped to the magnet e.

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

1. In wireless telegraphy, a receiving instrument consisting of a polarized and differential relay, one of the circuits of which is provided with microphonic material, the other circuit of which is provided with an adjustable resistance, a local circuit, an electromagnetic device placed therein, and a resistance in the latter relay-circuit adapted to be shunted through the action of the electromagnetic device, said local circuit being adapted to be closed through the action of said polarizing differential relay.

2. In space telegraphy, a receiving instrument consisting of a polarized and differential relay containing in one of its balances a device the resistance of which is decreased through the action of the incoming high-tension impulses of electricity, in combination with a local sounding device adapted to be actuated by the armature of said relay, said sounding device being adapted to open and close a shunt-circuit containing a resistance, and thereby restore the balance of said relay, the aerial conductor as well as the ground-wire being connected to said relay.

In testimony whereof I sign my name, in the presence of two subscribing witnesses, this 19th day of May, A. D. 1899.

ISIDOR KITSEE.

Witnesses:
WALLACE B. ELDRIDGE,
E. R. STILLEY.