

No. 781,418.

PATENTED JAN. 31, 1905.

W. D. GREGORY.  
ELECTRIC TELEGRAPH.  
APPLICATION FILED MAR. 30, 1904,

2 SHEETS—SHEET 1.

FIG. 1.

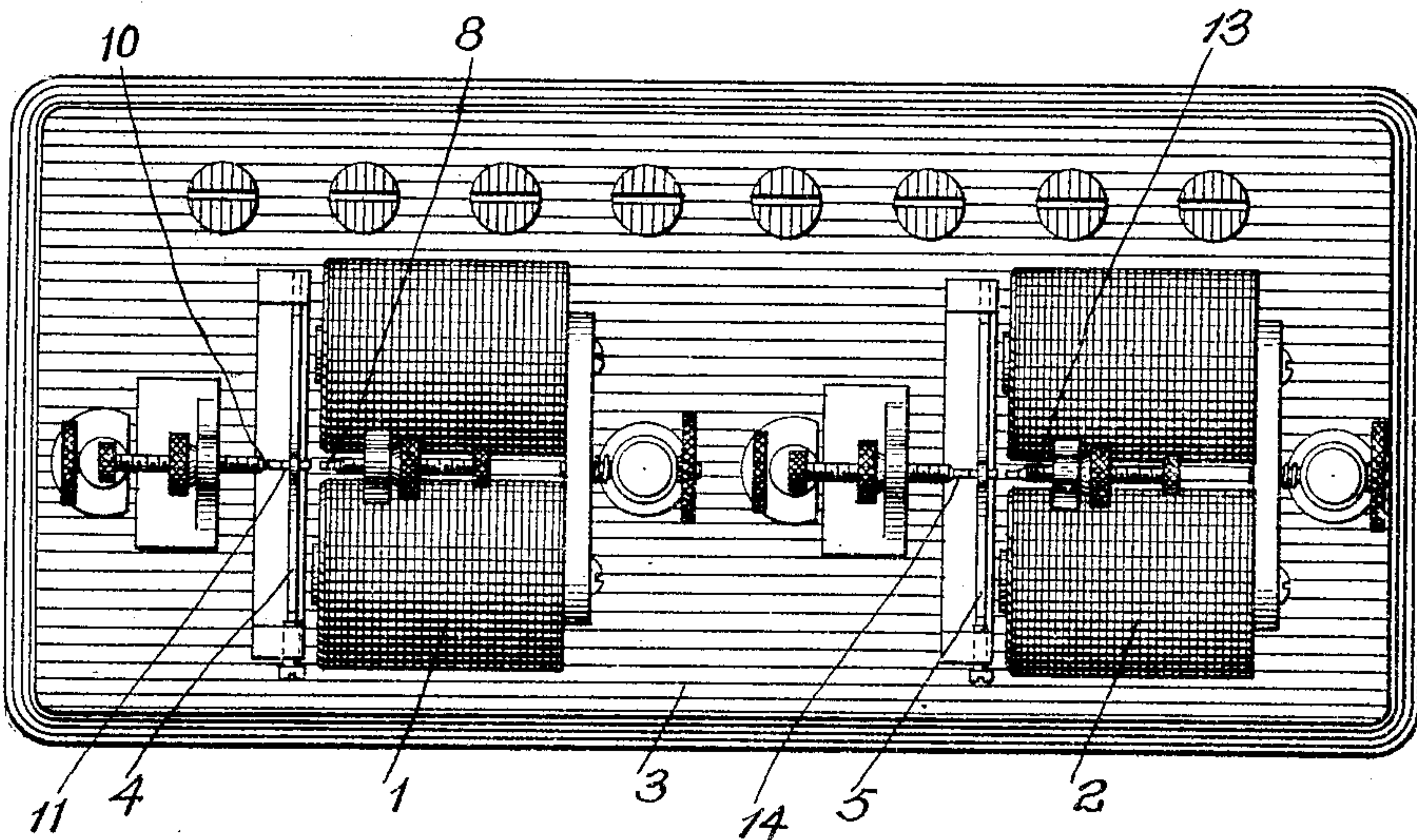
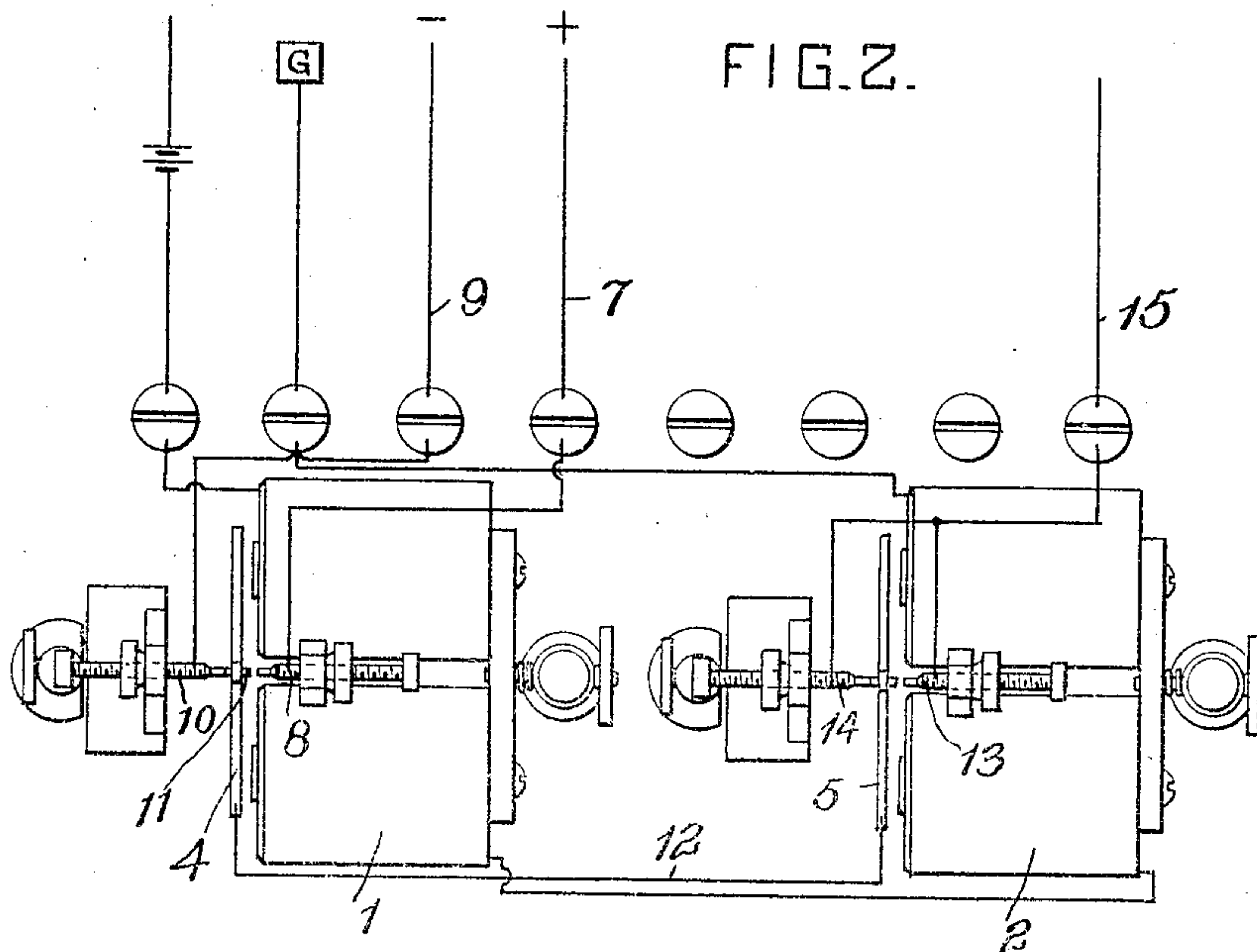


FIG. 2.



WITNESSES:

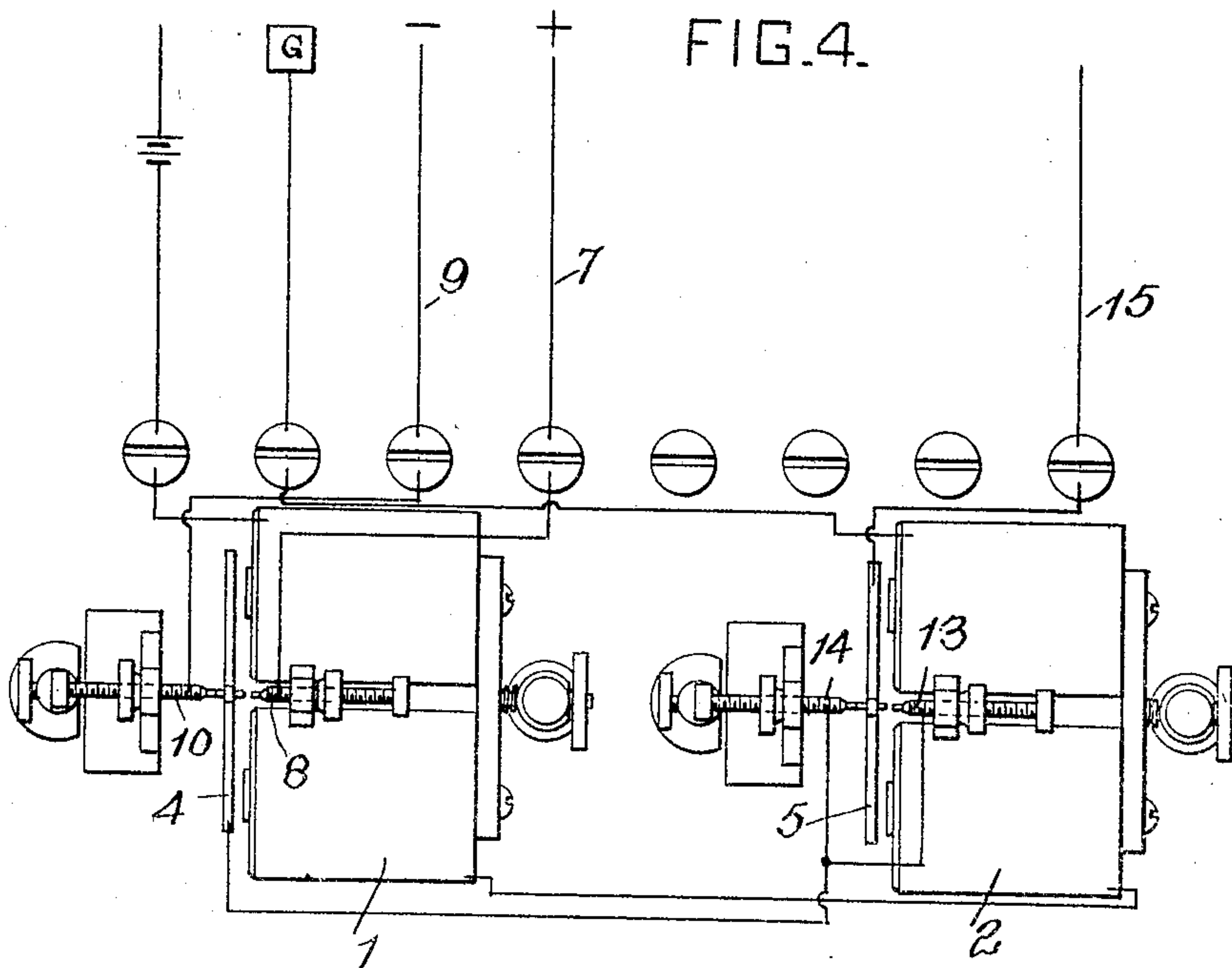
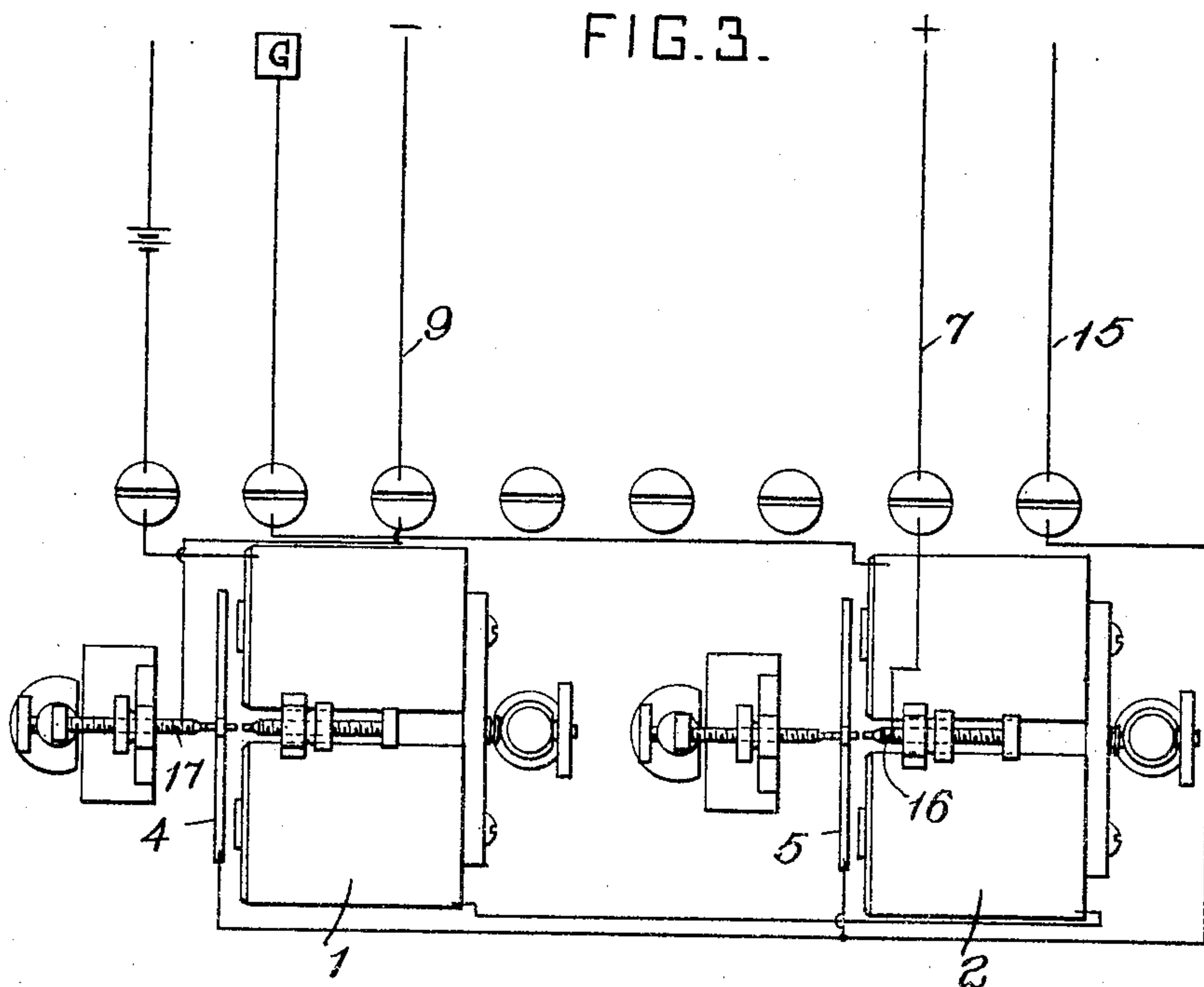
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

WILLIS D. GREGORY, OF PITTSBURG, PENNSYLVANIA.

## ELECTRIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 781,418, dated January 31, 1905.

Application filed March 30, 1904. Serial No. 200,757.

*To all whom it may concern:*

Be it known that I, WILLIS D. GREGORY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Electric Telegraphs, of which improvements the following is a specification.

The invention herein described relates to certain improvements in telegraphy, the improvements being especially applicable to multiplex telegraph, wherein it is necessary for fast sending that the current be reversed as rapidly as possible. Such rapidity of sending can be attained only by a short traverse or oscillation of the armature and its lever; but when employing high-tension currents, as is now customary, a short movement of the armature and its lever will permit the formation of an arc between contact-points, and hence the current which should be interrupted will continue to flow, forming a short circuit with the source of opposite polarity, and the proper signals will not be given.

The invention described herein has for its object the formation of such a break as will prevent the formation of an arc and that without increasing the extent of oscillation or movement of the armature.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan of a double relay arranged in accordance with my improvement. Fig. 2 is a diagrammatic view illustrative of arranging the circuits in the relay. Figs. 3 and 4 are similar views illustrating modifications in the arrangement of the circuits.

In the practice of my invention I employ two electromagnets 1 and 2, which are secured upon a base 3 in any suitable relation to each other. The armature-levers 4 and 5 are pivotally mounted on the base in suitable relation to the electromagnets, which are so connected in the circuit of a battery that both will be energized or deenergized simultaneously. In the arrangement shown in Fig. 2

the positive pole of a generator is connected by wire 7 to the front contact pin or screw 8 and the negative pole of the generator is connected by wire 9 to the contact stop or screw 10. The contact-points 11, carried by the armature of relay 1, are connected by wire 12 to the contact-points of the armature 5 of relay 2, and the front and back stops 13 and 14 are connected by branches to the line-wire 15. By this construction it results that both armatures will move simultaneously, or practically so, so that two breaks will be formed at the same time between the generators and the line-wire, and the two gaps thus formed, although each is too short to prevent the formation of an arc between contact-points, will by their combined length prevent the formation of arcs.

In Fig. 4 the manner of connecting the generators and the line-wire to the relay is somewhat changed and modified—as, for example, the front and back contact-points 8 and 10 of relay 1 are connected, as before, to opposite poles of generators, but the contact-points carried by the armature of relay 1 are connected to the front and back stops or contacts 13 of relay 2 and the line-wire 15 is connected to the contact-point carried by the armature-lever 5. In this construction, as in that hereinbefore described, the double break or gap is formed in the circuit.

In the construction shown in Fig. 3 provision is made for the breaking of the circuit from the positive pole of a generator to a line-wire by one of the relays, as 1, and from the other pole of the generator to the line-wire by the other relay, 2. As therein shown, one of the poles of the generators, as the positive pole, is connected to the front contact screw or pin 16 of relay 2, while the negative pole of the other generator is connected to the back-stop or screw 17 of the other relay, 1. The armatures 4 and 5 of both relays are connected to the line-wire. In this construction when the armatures are drawn forward to the electromagnets the circuit from the negative pole of the generator is broken and when the armatures are drawn back from their magnets

by the retracting-spring the circuit from the positive pole or terminal of the generator is broken.

I claim herein as my invention—

- 5 1. In a telegraph system the combination of a circuit two make-and-break mechanisms arranged in said circuit and means for simultaneously operating said make - and - break mechanism to make or break said circuit, substantially as set forth.
- 10 2. In a telegraph system the combination of a line-wire two branches extending from the line-wire to opposite poles of generators, a make-and-break mechanism in each branch
- 15 and two electromagnets arranged to be simultaneously energized or deenergized for simultaneously operating the make-and-break mechanisms to make or break the circuit, substantially as set forth.
- 20 3. In a telegraph system the combination of two electromagnets arranged to be simultaneously energized and deenergized; armatures,

front and back contact-points for each armature, the front and back contacts for one armature being connected to opposite poles of 25 generators and the armature connected to the front and back points of the other magnet, and the armature of the second magnet connected to the line-wire, substantially as set forth.

4. In a telegraph system the combination of 30 a line-wire, two branches connecting the line-wire with opposite poles of generators, two make-and-break mechanisms in each branch and two electromagnets arranged to be simultaneously energized and deenergized for simultaneously operating said make - and - break 35 mechanisms to make or break said circuit, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIS D. GREGORY.

Witnesses:

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F. E. GAITHER.