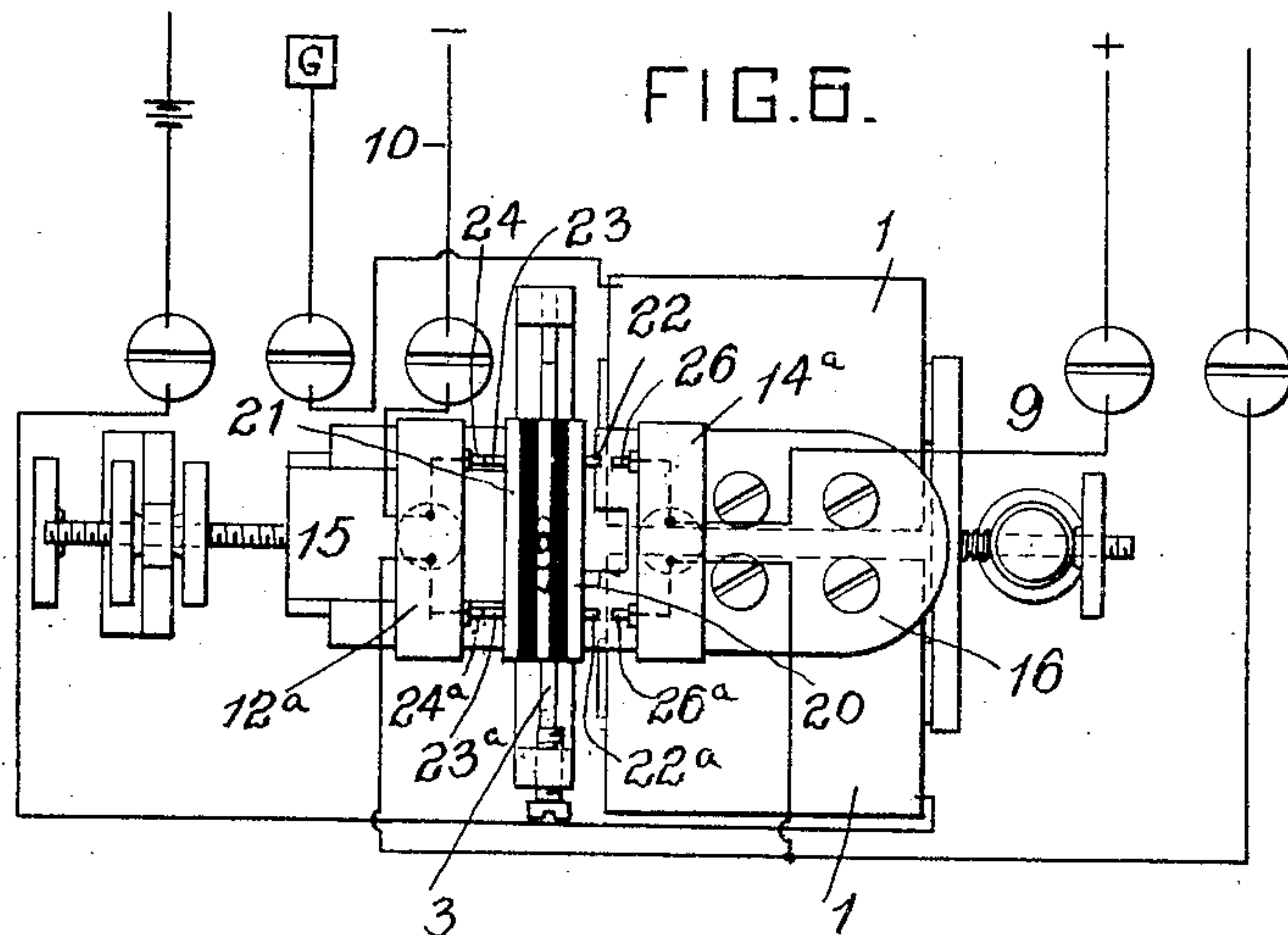
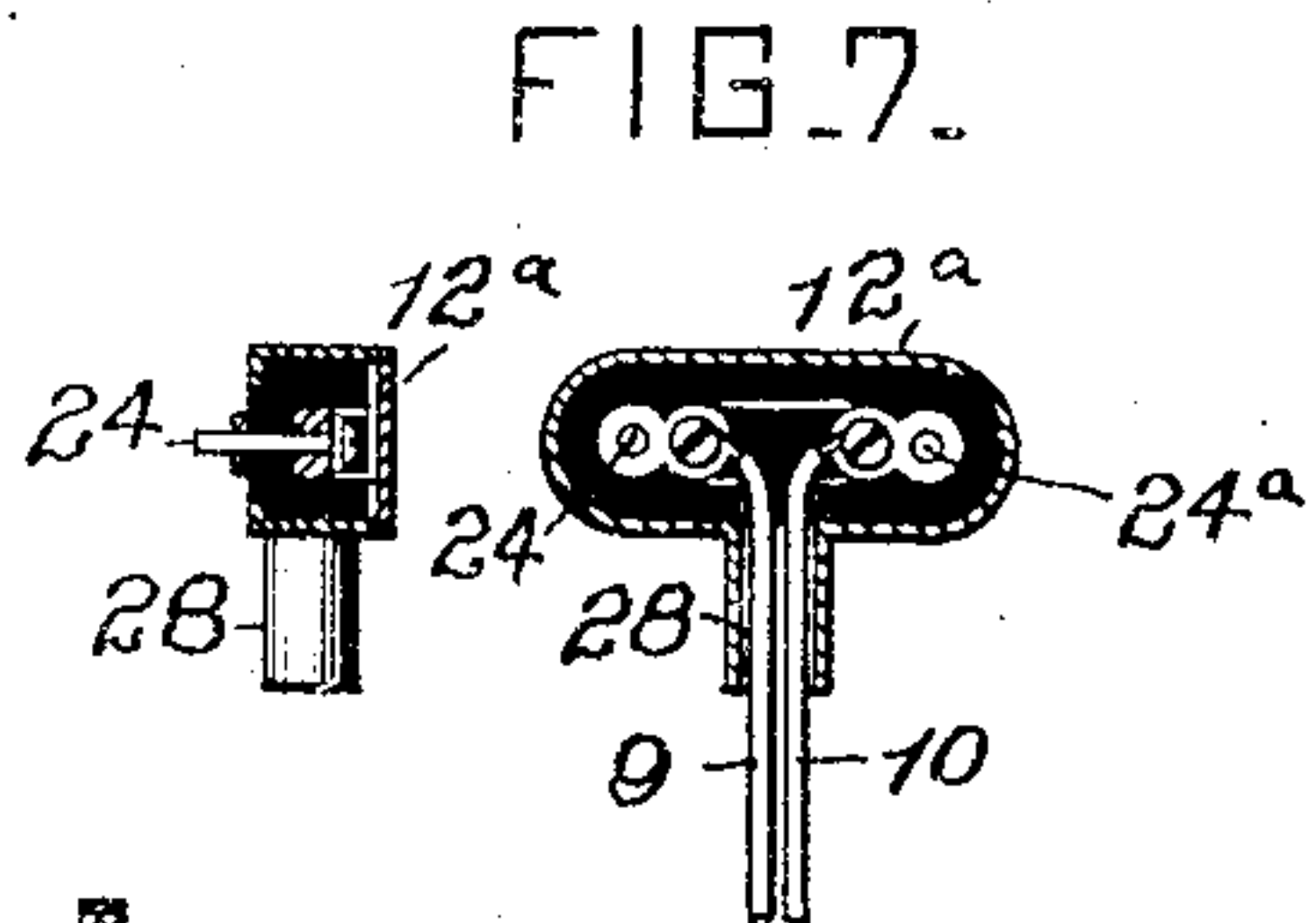
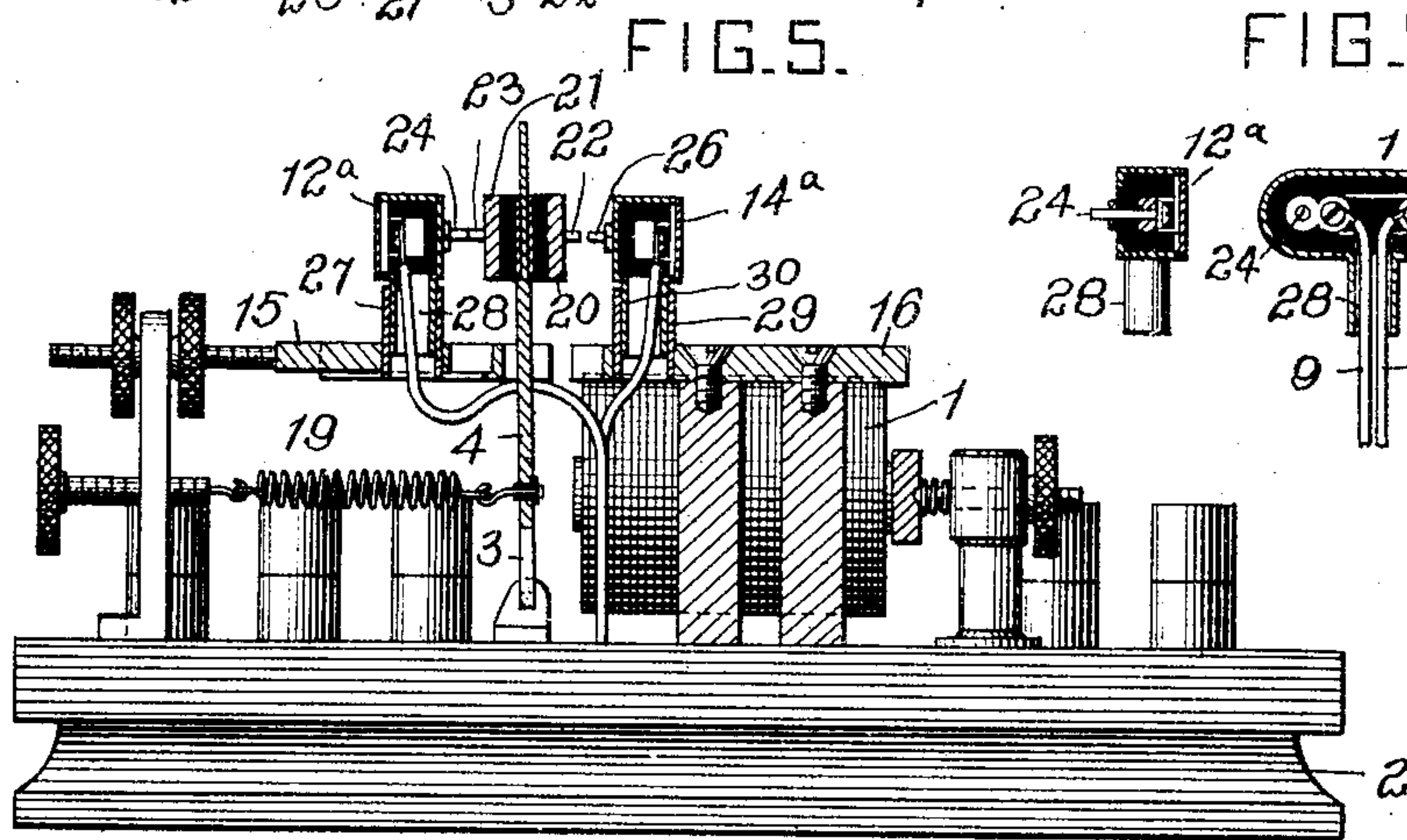
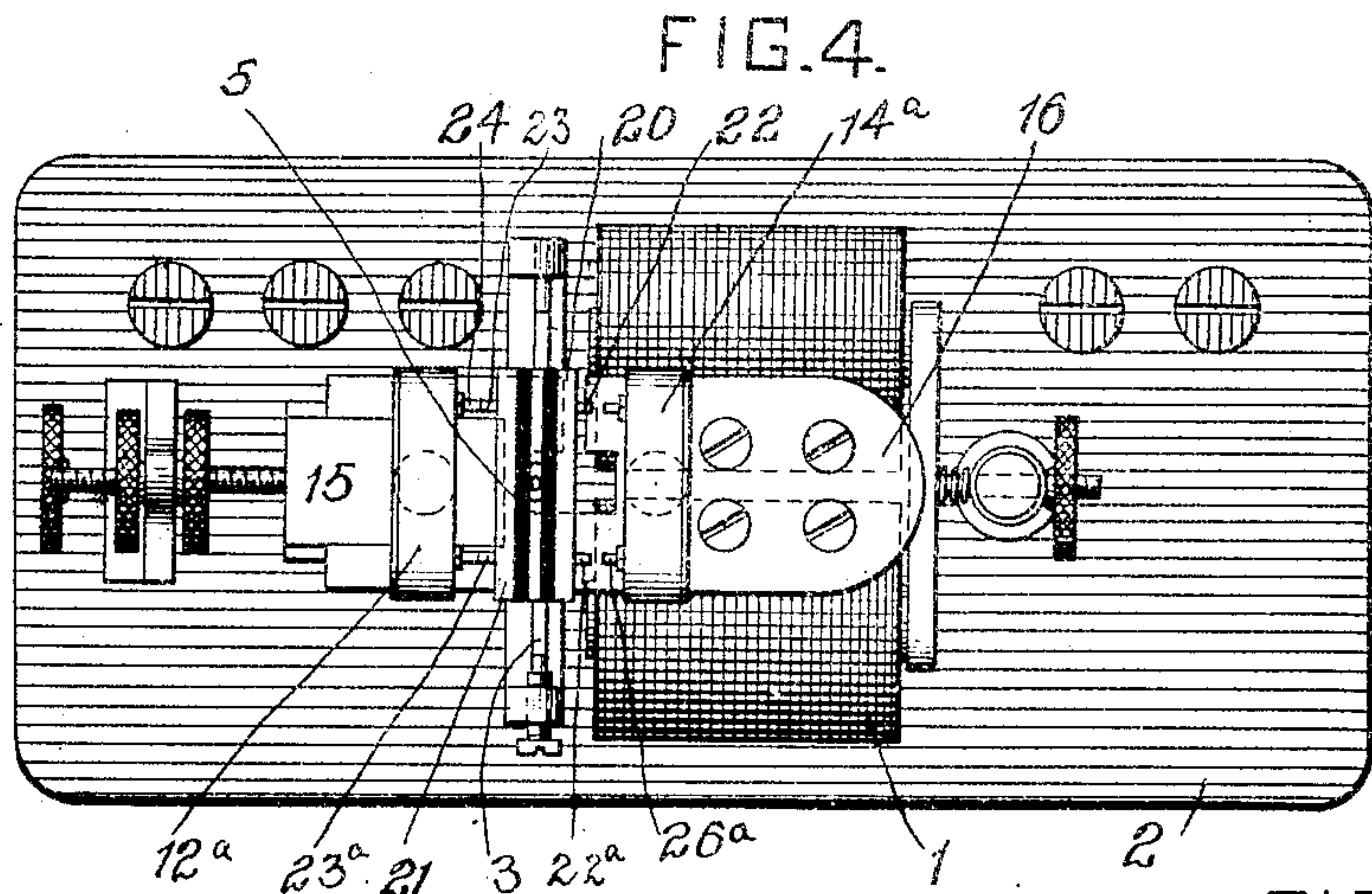


W. D. GREGORY.
ELECTRIC TELEGRAPH.
APPLICATION FILED MAR. 30, 1904.

3 SHEETS—SHEET 2.



WITNESSES:

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No. 781,417.

PATENTED JAN. 31, 1905.

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3 SHEETS—SHEET 3.

FIG. 8.

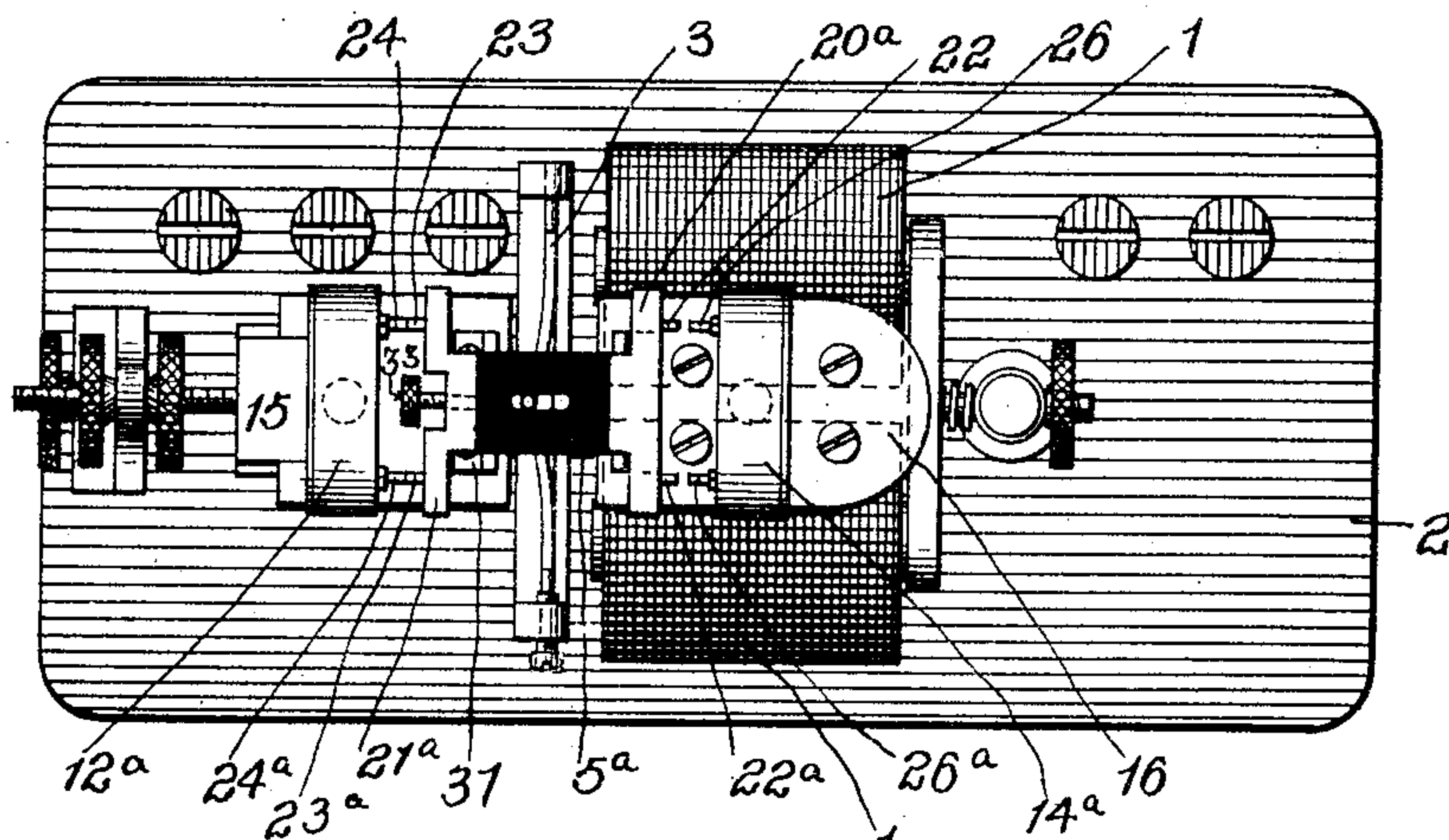
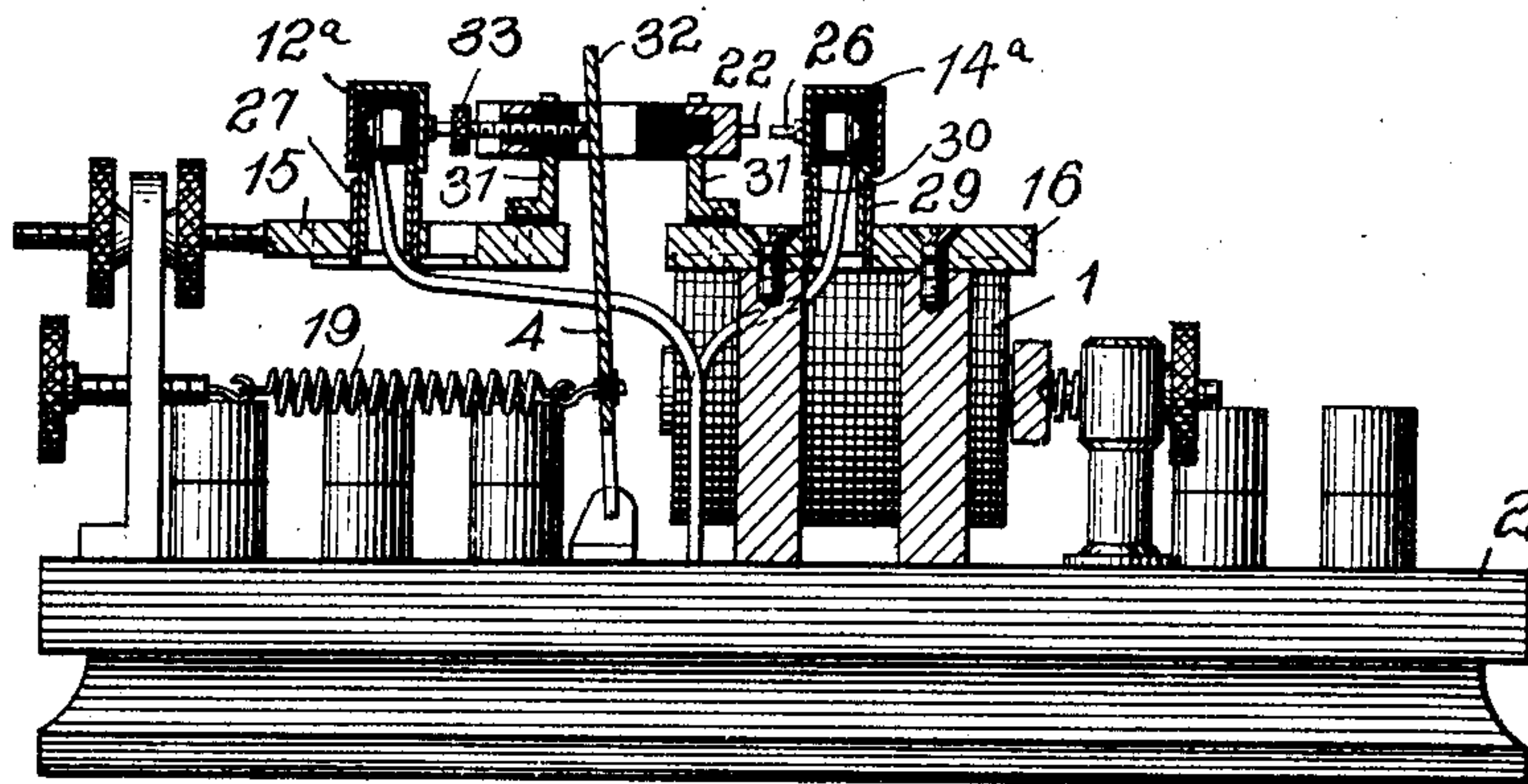


FIG. 9.



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UNITED STATES PATENT OFFICE.

WILLIS D. GREGORY, OF PITTSBURG, PENNSYLVANIA.

ELECTRIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 781,417, dated January 31, 1905.

Application filed March 30, 1904. Serial No. 200,755.

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 described herein relates to certain improvements in instruments for multiplex telegraphy, the invention being especially adapted for use in connection with high-voltage currents liable to produce an arc between terminals of the circuit breaker or charger. In order to prevent the formation of arcs and the consequent continuity of currents, I provide for a multiple of breaks in the circuits, and in order to insure simultaneous opening of bolt-breaks automatic adjustment of one or more of the members of the circuit charging or breaking mechanism is provided for.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of a relay for multiplex telegraphy having my improvement applied thereto. Fig. 2 is a sectional elevation of the same. Fig. 3 is a diagrammatic view illustrating the circuits for the relay. Figs. 4 and 5 are views similar to 1 and 2, illustrating a modification of the improvement. Fig. 6 is a diagrammatic view showing the circuits for the construction shown in Figs. 4 and 5. Fig. 7 is a sectional detail view. Figs. 8 and 9 are views similar to Figs. 4 and 5, illustrating further modifications in the construction of the relay.

In the practice of my invention the electromagnets 1 are secured to a base 2 in the usual or any suitable manner, and the armature 3 is secured to a pivotally-mounted lever 4, arranged in suitable relation to the electromagnets 1. Upon an upward extension or stem 45 of the lever 4 is secured a block 5 of insulating material, which is held from rotation upon the stem or upward extension of the lever by any suitable means—as, for example, by a set-screw passing through the block and bearing 50 against the stem. Pins 7 7^a and 8 8^a, formed

of conducting material, are secured in the block 5, and on opposite sides thereof and to the pins 7 and 8 are connected wires 9 and 10, extending, respectively, from opposite poles of a generator. The pins 7^a and 8^a are connected to branches 9 and 10 of the line-wire. In order to connect electrically the pins 7 7^a and 8 8^a, contact-pins 11 and 11^a are secured in the plate or head 12, and pins 13 13^a are similarly secured in the plate or head 14. These heads 12 and 14 are pivotally mounted on a slide 15 and a frame or plate 16, respectively, said plate or frame being formed with suitable guides for the slide. As the plates or heads 12 and 14 are formed of conducting material and are insulated from the slide and frames, as shown, they will electrically connect the pins 7 7^a or 8 8^a, dependent upon the position of the armature-lever. The adjustment of the slide 15 is effected by means of a nut 17 and threaded stem 18 from the slide. As these heads 12 and 14 are loosely mounted upon their respective supports, it will be understood that as the armature is shifted, say, toward the electromagnets 1 the contact of the one of the pins, as 7, with the pin 11 on the head 12 will insure such movement on the head or plate 12 as to throw the other pin, 11^a, into contact with the pin 7^a, thereby completing the circuit of which the head 12 will form a part. As the armature moves away from the electromagnets under the action of the tension-spring 19 a double break will be formed in the circuit, thereby preventing any formation of the arc between the contact-pins on the block 5 and head 12.

In the construction shown in Figs. 4, 5, and 6 the armature-stem carries plates 20 and 21 on opposite sides of the stem, but insulated from the stem and from each other, as shown. These plates are provided, respectively, with pins 22 and 22^a and 23 and 23^a, each adapted to contact with pins 24 and 24^a on a movable head 12^a and pins 26 and 26^a on a movable head 14^a, said heads being arranged on opposite sides of the armature-lever. The pins 24 and 24^a are connected to wires passing up through a tubular support 27 and a tubular stem 28 on the head 12^a, the stem 28 fitting loosely in the tubular standard or support 27,

so that the head is free to turn, the tubular support being secured to slide 15. The pins 26 and 26^a are similarly connected to wires extending up through the hollow standard 29, secured on plate 16, and a hollow stem 30, formed of the head 14^a. This construction would prevent bending or shifting back and forth of the connecting-wires with the armature as it is shifted in the operation of the apparatus. As shown in Fig. 7, the pins in the pivotal heads 12^a and 14^a are insulated from the heads, so that said pins can be electrically connected only by the plates 20 and 21 and the pins carried thereby.

As shown in Figs. 8 and 9, the block operated by the armature may be slidably mounted in guides 31, which are supported by the plate or frame 16, but insulated therefrom. The ends 20^a and 21^a of this sliding block 5^a are formed of metal and have the contact-pins 22 22^a and 23 23^a set therein. The body or central portion of the block is formed of non-conducting material, so that the end plates 20^a and 21^a are insulated from each other. This block is shifted back and forth by the armature-lever 4. A suitable connection between the block and armature consists of a stem 32 from the armature-lever projecting into a slot in the body of the block, so that the armature-lever will have some movement independent of the block and will therefore shift the block by a blow which will be followed up by the stem, preventing any rebound of the block. The extent of independent movement of the armature-stem in the slot is controlled by a screw 33, projecting into the slot.

The simultaneous formation of two breaks or gaps is electrically equal to a single gap of double the length of one of the short nibs, so that the required gap can be produced by a very short movement or swing of the armature. As it is practically impossible to adjust by screws two contact-pins so that they will contact simultaneously with two other pins, the pivotally-mounted heads are em-

ployed, so as to insure the contact of the pins, said pins being shifted automatically.

I claim herein as my invention—

1. In a telegraph instrument the combination of electromagnets, an armature-lever, a pair of contact-pins carried by the lever, and a second pair of contact-pins, one pair of contact-pins being adjustable by the other pair, substantially as set forth.

2. In a telegraph instrument the combination of electromagnets, an armature-lever, a block or head carried by the lever and provided with two pairs of contact-pins, heads arranged on opposite sides of the armature-lever and each provided with a pair of contact-pins, said heads being automatically adjustable by the block or head carried by the armature-lever, substantially as set forth.

3. In a telegraph instrument the combination of electromagnets, an armature-lever, two pairs of contact-pins carried by the lever, a pair of contact-pins arranged on one side of the armature-lever, a second pair of contact-pins arranged on the opposite side of the lever, one member of two pairs of pins being connected to source of opposite polarity, and the other member of the said pairs being connected to a line-wire, the two remaining pairs having their pins electrically connected, substantially as set forth.

4. In a telegraph instrument the combination of electromagnets, an armature-lever; two pairs of pins carried by said lever, the pins of each pair being electrically connected, a pair of pins insulated from each other arranged on one side of the armature-lever and a pair of insulated contact-pins arranged on the opposite side of the lever, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIS D. GREGORY.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.