

V. L. BEEMAN.
ELECTRIC SIGNAL SYSTEM.
APPLICATION FILED MAY 25, 1908.

912,786.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.

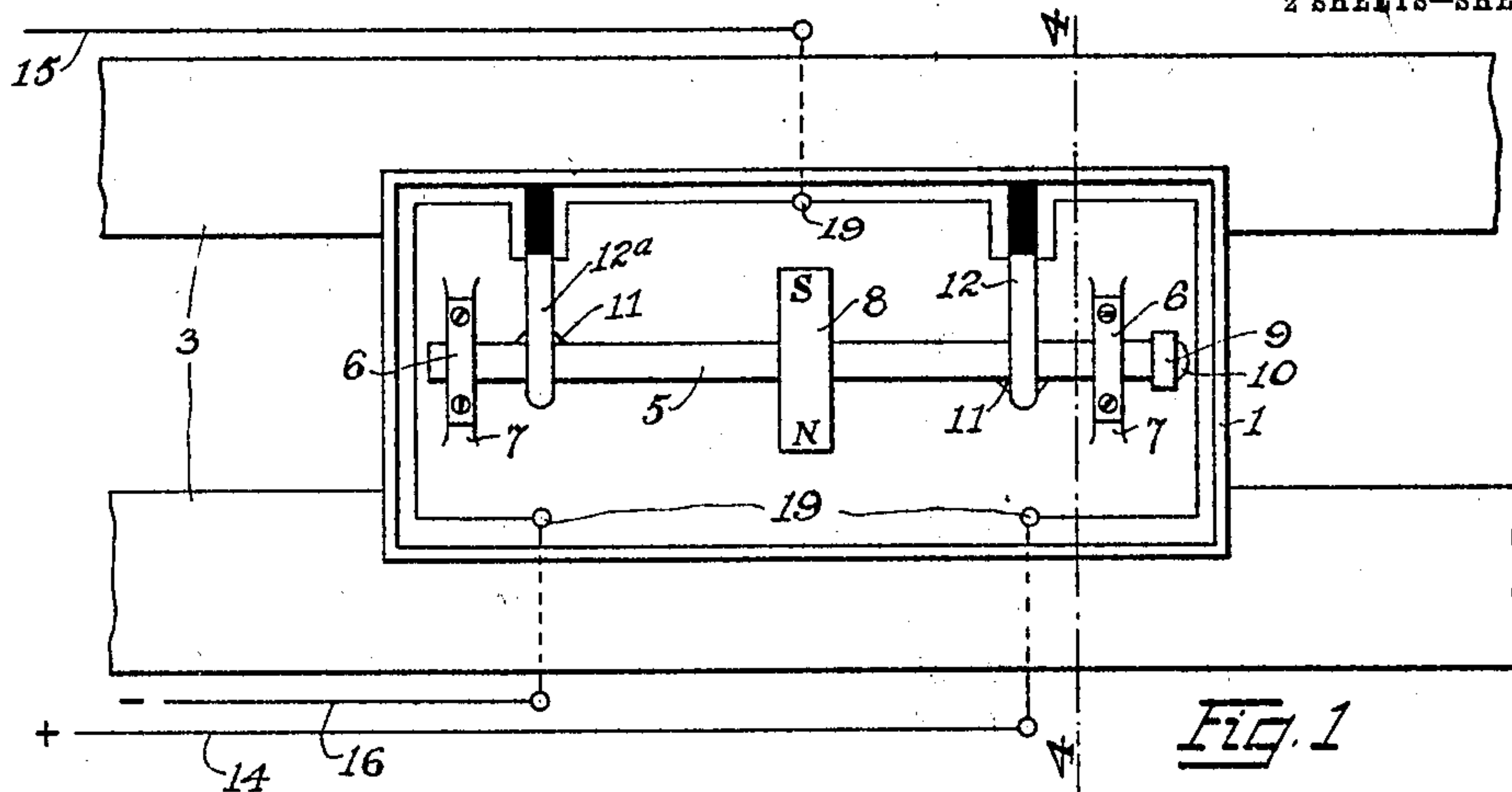


Fig. 1

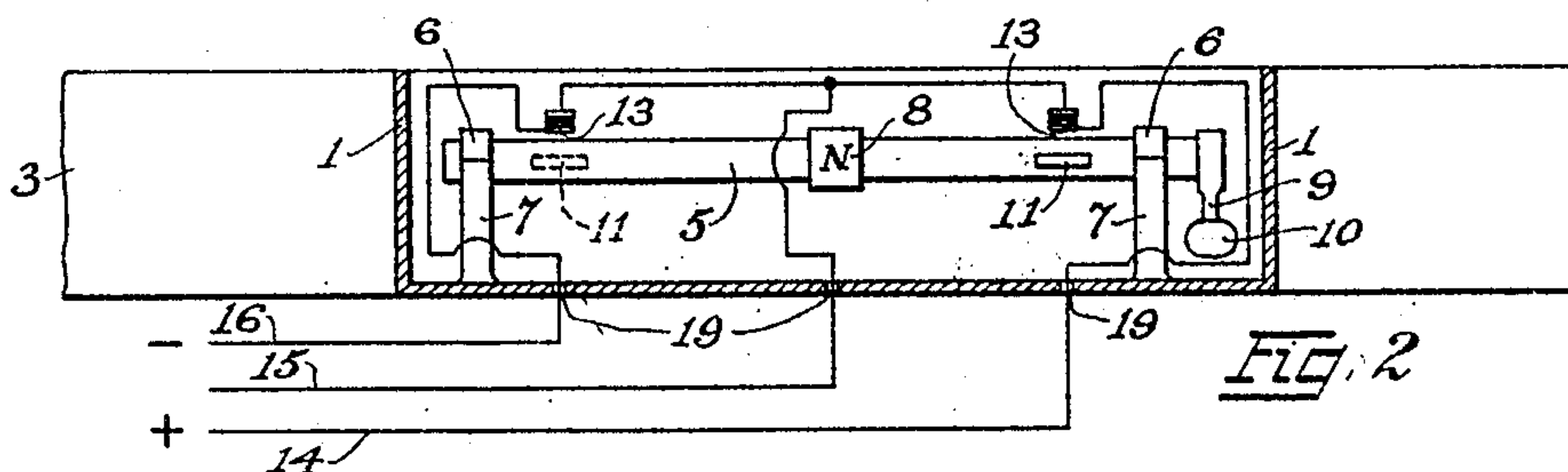


Fig. 2

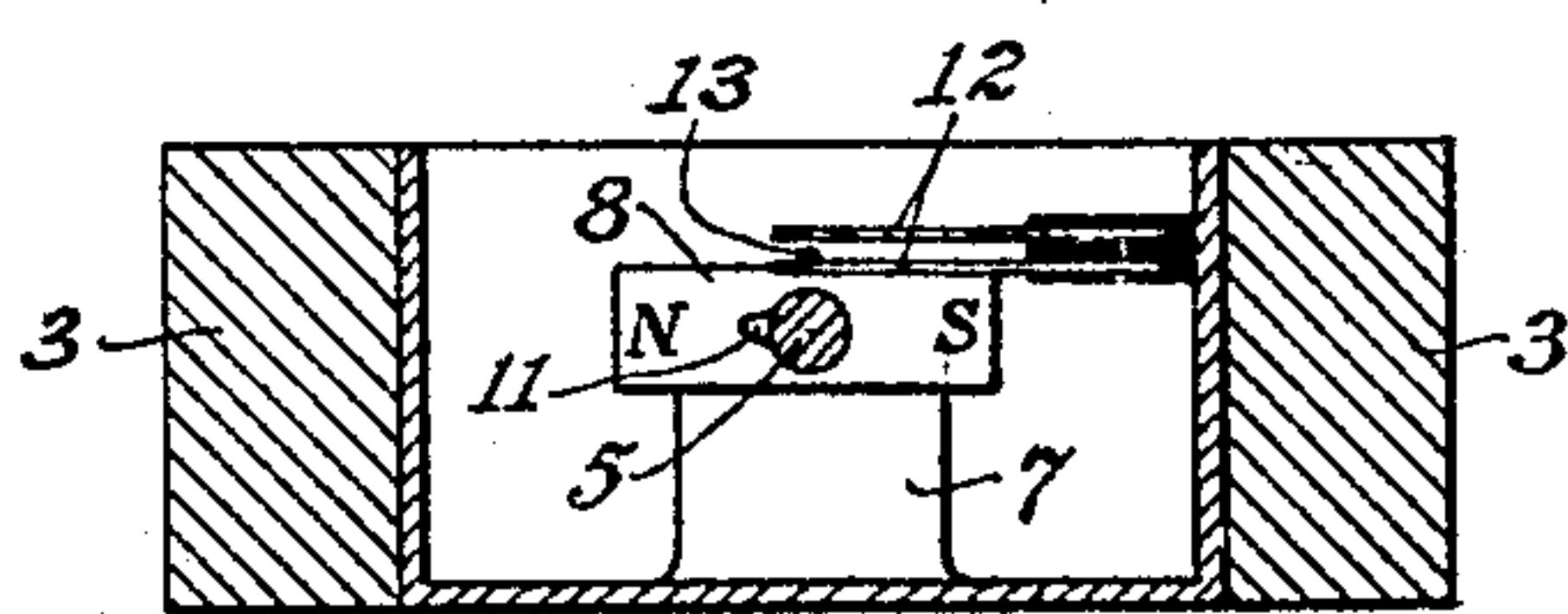


Fig. 4

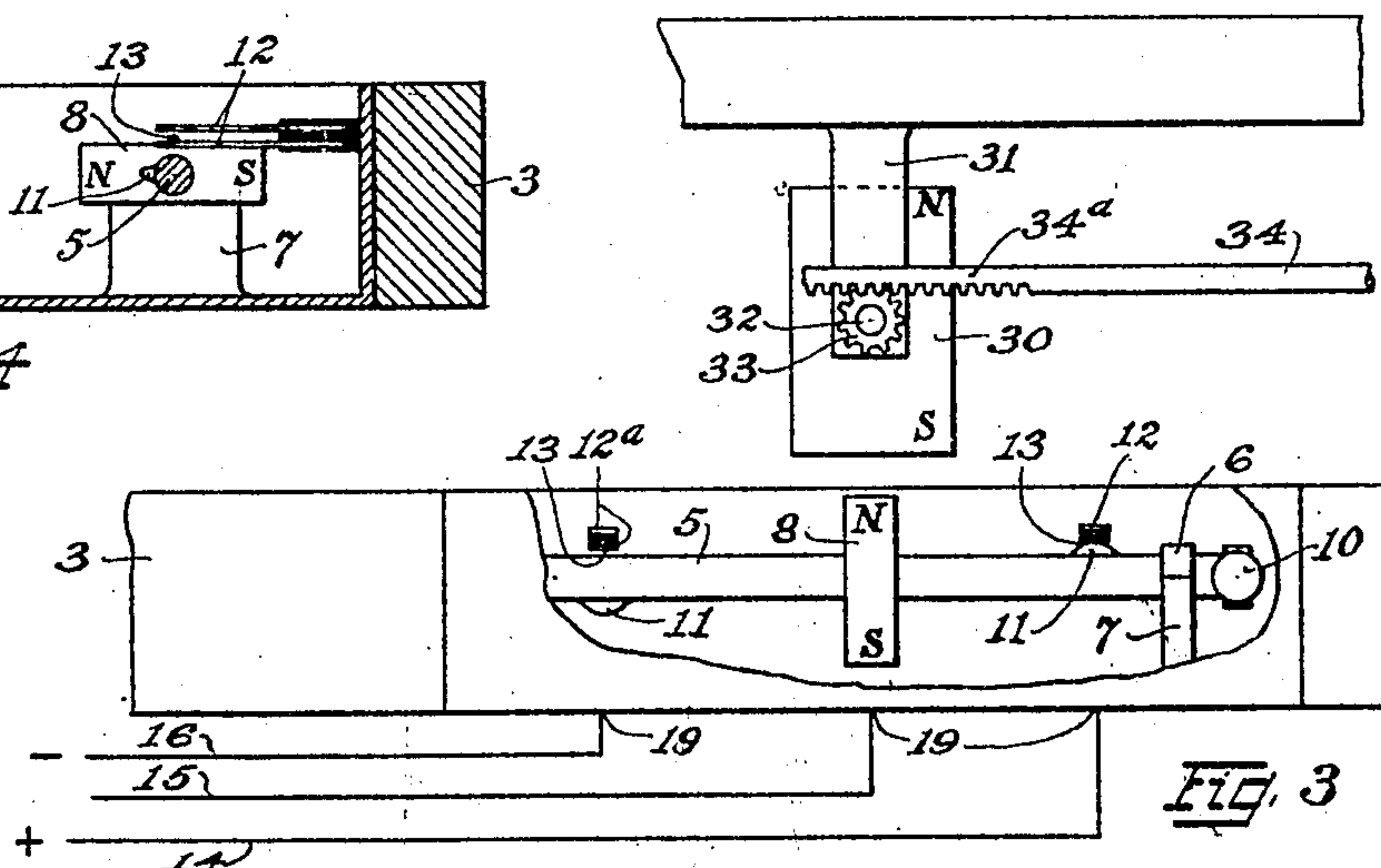


Fig. 3

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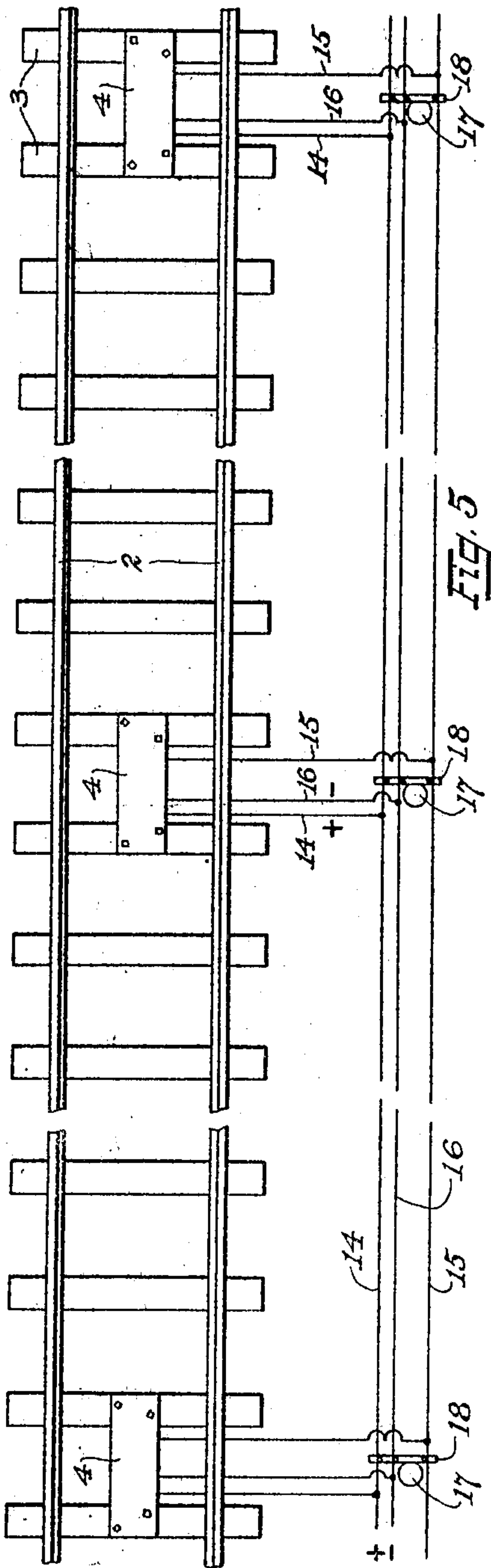


Fig. 5

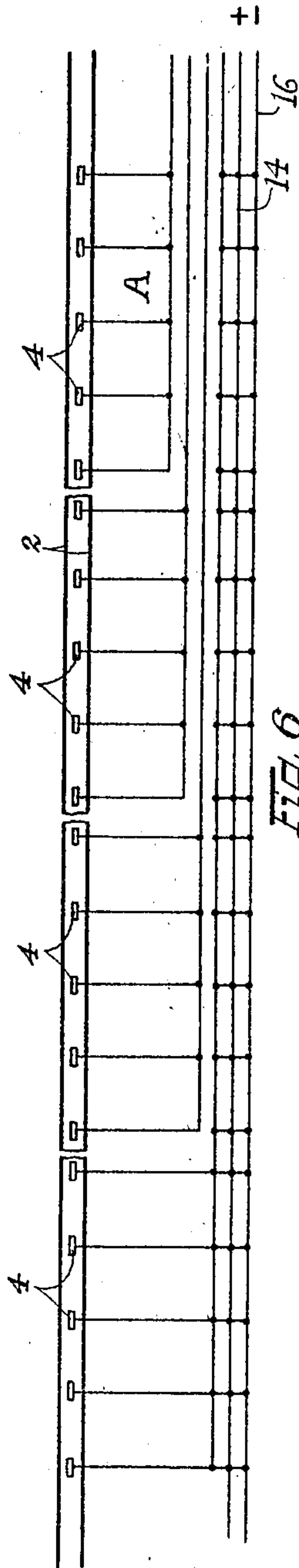


Fig. 6

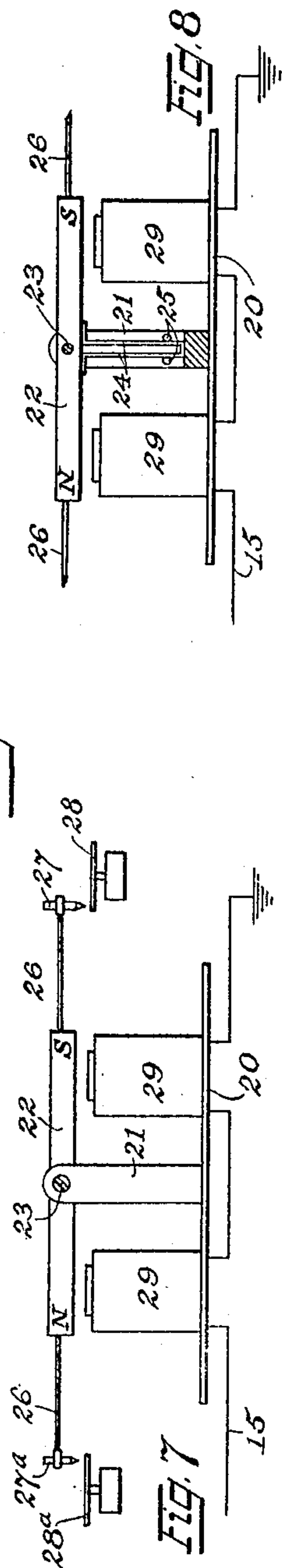


Fig. 7

Fig. 8

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UNITED STATES PATENT OFFICE.

VALENTINE L. BEEMAN, OF WELLINGTON, OHIO.

ELECTRIC SIGNAL SYSTEM.

No. 912,786.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed May 25, 1908. Serial No. 434,804.

To all whom it may concern:

Be it known that I, VALENTINE L. BEEMAN, a citizen of the United States, residing at Wellington, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Electric Signal Systems, of which the following is a specification.

My invention relates to improvements in railway signal systems, and more particularly to visual signals for railway service in which electrical and mechanical devices jointly coöperate for the purpose of indicating the position of a train on the road at the despatcher's office, or in the locomotive-cab of another train, or at both of said places whereby said rolling stock will be protected from collision.

Briefly, the invention consists in dividing the track or tracks into blocks or sections of predetermined lengths, each provided with electrical devices capable of being operated by a locomotive or car passing there-through in either direction, the construction and arrangement being such that the position of a train will be automatically indicated in the signal tower, or in both the signal tower, and the locomotive-cab of an approaching train, as may be desired.

Provision is made in my improved system whereby the train-despatcher at his headquarters may by reference to visual signals or indicating mechanism displayed therein follow the train throughout its entire course or determine its location.

With these ends in view, my invention consists in the novel construction, arrangement, and combination of parts, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings, forming a part of this specification, Figure 1, is a top plan view of a track relay, and its connections, used in the present embodiment of the improved signal system. Fig. 2, a longitudinal sectional view of the relay-box or casing, the relay mechanism being shown in side elevation. Fig. 3, a side elevation of the same, the relay being shown in an energized position in connection with a pendent reversible magnet adapted to be carried by a locomotive or car. Fig. 4, a cross-sectional view of the track relay taken through line 4-4, of Fig. 1. Fig. 5, a plan view of a portion of a railway equipped with the im-

proved signal system. Fig. 6, a diagrammatic view of the same, the track being divided into four sections or blocks. Fig. 7, a side elevation of the improved indicating or recording device to be mounted in the train-despatcher's office, or in a tower. Fig. 8, a similar view of the same, partly in section, illustrating spring and pivot connections of the oscillating armature bar.

Similar numerals of reference designate like parts throughout all the figures of the drawings.

The improved track-relay is mounted in a relay-box or casing 1, preferably, midway between the rails 2, of the track, and at suitable intervals or distances apart (for example, one mile), and the track is divided into a plurality of sections or blocks, each block or section being provided at suitable intervals with track-relays, for example, five in each section, as shown in Fig. 6, of the drawings. The relay-box or casing 1, is preferably mounted between the ties 3, and is provided with a cover 4.

The relay mechanism comprises a horizontal rotatably-mounted bar or shaft 5, supported at its ends in bearings 6, of vertical pillow-blocks or bearing-brackets 7, supported on the base or bottom of the relay-box or casing near each end thereof. The bar or shaft 5, is provided, intermediate or midway of its ends, with armature-bar 8, normally held in a horizontal position by means of a lever-bar 9, said lever-bar being connected to one end of the bar or shaft 5, and provided at its free end with a weight or head 10. The bar or shaft 5, is provided on opposite sides, and, preferably, near each end thereof, with contact-projections or cams 11, said contact-projections being, preferably, in alinement with the armature-bar 8, and carried by the oscillating shaft 5, when actuated by the energized magnet bar 8, to make contact with the contact-points of the switches which will now be described. The switches comprise two horizontally-extending spring-bars 12, and 12^a, secured to one side of the relay-box or casing 1, and having their free ends disposed above the bar or shaft 5, and in alinement with the contact-projections or cams 11. In the present instance, the lower spring-bars 12, and 12^a, are provided near their free ends with contact-studs 13, adapted to make contact with the free ends of the upper or opposing spring-bars 12, and 12^a, when the lower

spring-bars are engaged by the adjacent contact-projections 11, on the oscillating bar or shaft 5, when the armature-bar 8, is energized. In the present instance, the lower spring-bar 12, is electrically-connected to a positive (+) feed wire 14, the upper spring bar 12, being connected to a return-wire 15, leading to the indicator, hereinafter described. The lower spring bar 12^a, is similarly connected to a negative (—) feed-wire 16, the upper spring bar 12^a, being similarly connected to the return-wire 15. The positive and negative feed-wires 14, and 16, and return-wire 15, are, preferably, carried and supported along the right of way by means of poles 17, and cross-arms 18, as shown in Fig. 5, of the drawings. The said feed and return wires are provided at suitable intervals with lead wires leading to the several track relays and entering the bottom, of the relay-box or casing, through suitable openings 19.

The indicator designed to be located in the train-despatcher's office, or in a tower, comprises a base-plate 20, suitably mounted, and to which is secured a pair of bearing-arms or standards 21. An armature-bar 22, is pivotally-mounted and interposed between the ends of the standards 21, and is normally held in a position parallel to the base-plate 20, and its motion on the pivot 23, resisted, by means of a pair of spring-arms 24, interposed between the standards 21, and secured in position by means of pins 25. The armature-bar 25 is provided at its ends with oppositely-disposed spring-arms 26, carrying in their ends marking-pencils or points 27, and 27^a, adapted to impinge upon impression-plates 28, and 28^a, when the armature bar 22, is energized and moved through the medium of the electromagnets 29, connected to the return-wire 15. The impression-plates or recording devices, indicated at 28 and 28^a, may be of any suitable and convenient form for performing this function and for the purpose of this application need not be further described.

For the purpose of energizing the armature-bar 8, of the track magnet, a reversible pendent magnet 30, is secured to the locomotive or car by means of depending bearing-arms 31, and a cross-shaft 32. The cross shaft 32, is provided with a pinion 33, and a reversing lever 34, is provided with a rack 34^a, engaging with the pinion 33, whereby the poles of the magnet 30, may be reversed to attract the poles of the armature-bar 8, according to the direction in which the locomotive or car is traveling.

Upon referring to Fig. 3, it will be seen that the negative or south pole of the pendent magnet 30, has attracted the positive or north pole of the armature-bar 8, swinging the shaft 5, and bringing one of the contact-projections 11, in engagement with a lower

spring-member 12, whereby contact-stud 13, makes connection with the upper spring-bar 12, electrically-connected to the return-wire 15, leading to the indicator, the current passing through the positive feed-wire 14, of the lower spring-bar 12, to which the positive feed-wire 14, is connected. The wire 15, leading to the indicator in the train-despatcher's office, or in a tower, will thus indicate the position of the locomotive or car when the current connection is established. As soon as the magnet 30, has passed over the track-magnet the armature-bar 8, of the latter will be restored to its normal or horizontal position by the weight or head 10.

Upon referring to Fig. 6, of the drawings, it will be understood that, presuming a train to be starting in on section or block A, in passing over the first relay a current will be established from the feed wire 14, through the conducting-wire 15, leading to indicator, by the action of the relay, as hereinbefore described. The current flowing through the indicator shown in Fig. 7, will energize the magnet and attract the south pole of the armature-bar 22, causing the marking pencil 27, to mark upon the impression-plates or recording mechanism 28, thus indicating the position of the train and direction in which it is traveling.

From the foregoing description, taken in connection with the accompanying drawings, the operation and advantages of my invention will be readily understood.

What I claim and desire to secure by Letters Patent is,—

1. An electric signal system for railways, comprising a track divided into a plurality of blocks, a plurality of track-relays in said blocks, circuit wires extending along said track and connected to said track-relays, a reversible train-magnet adapted to have its poles reversed to attract the poles of the armature bar according to the direction being traveled and to energize said track-relays and close the circuit, means for de-energizing said track-relays and opening the circuit when passed by said train-magnet, an indicator, and a return-wire connecting said track-relays with said indicator.

2. In a railway signal system, a train-actuated track-relay comprising a relay-box or casing, a shaft rotatably-mounted therein and carrying a transverse armature-bar and oppositely-disposed contact-cams, switches each comprising a pair of spring-bars having their free ends adapted to be engaged by said contact-cams, one of said spring-bars being connected to the circuit-wire and provided with a contact-stud at its free end and the other connected to a return-wire, and a weighted lever secured to said shaft and normally holding said contact-cams out of engagement with said spring-bars.

3. In a railway signal system, a train-actuated track-relay comprising an oscillating shaft carrying a transverse armature-bar and contact-cams, spring-bars having their lower members connected to the circuit-wire and the free ends thereof adapted to be engaged by said contact-cams and provided with contact-studs adapted to engage with the free ends of the upper or opposing members, said opposing members being connected to a return-wire adapted to make current with said circuit-wire when said armature-bar is energized, and means for returning said armature-bar to its normal position.

4. In a railway signal system, a train-magnet actuated track-relay comprising a relay-casing, an oscillating shaft mounted therein and carrying an armature-bar having a positive and negative pole and corresponding contact-cams, positive and negative circuit closing switch spring-bars having their free ends adapted to make contact with each other when engaged by said contact-cams, positive and negative feed-wires connected to said switch spring-bars, a return wire connected to the opposing switch spring-bars normally separated from said spring-bars connected to said feed-wires, a reversible train-magnet adapted to energize one or the other of the poles of said armature-bar, means for restoring said armature-bar to its normal position, and indicating devices connected to said return wire for indicating the position of said armature-bar when energized.

5. In a railway signal system, a train-magnet actuated track-relay carrying an oscillating shaft having contact-projections and carrying an armature magnet-bar having a positive and a negative pole, a positive and a negative circuit-closing switch adapted to make contact with said contact-projections, a positive and a negative feed-wire connected to said circuit-closing switches, respectively, a return-wire connected to said switches and normally out of circuit with said feed-wires, a reversible train-magnet adapted to energize one or the other of the poles of said armature magnet-bar, means for deenergizing said track-relay, and means for indicating said train-magnet when energized.

6. In a railway signal system, a track-relay comprising a relay-casing, a shaft armed with contacts and carrying an armature magnet-bar having a positive and a negative pole, a positive and a negative circuit-closing switch adapted to make contact with said contacts, a positive and a negative feed-wire connected to said switches, respectively, a return-wire connected to said switches and normally out of circuit with said feed-wires, means for energizing said track-relay, and means for deenergizing said track-relay.

In testimony whereof I have affixed my signature, in presence of two witnesses.

VALENTINE L. BEEMAN.

Witnesses:

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O. C. BILLMAN.