

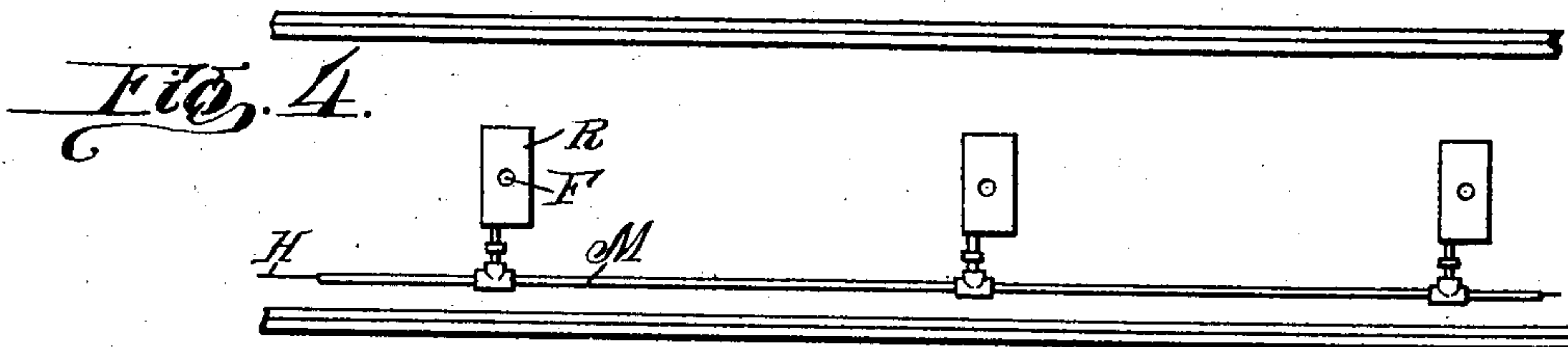
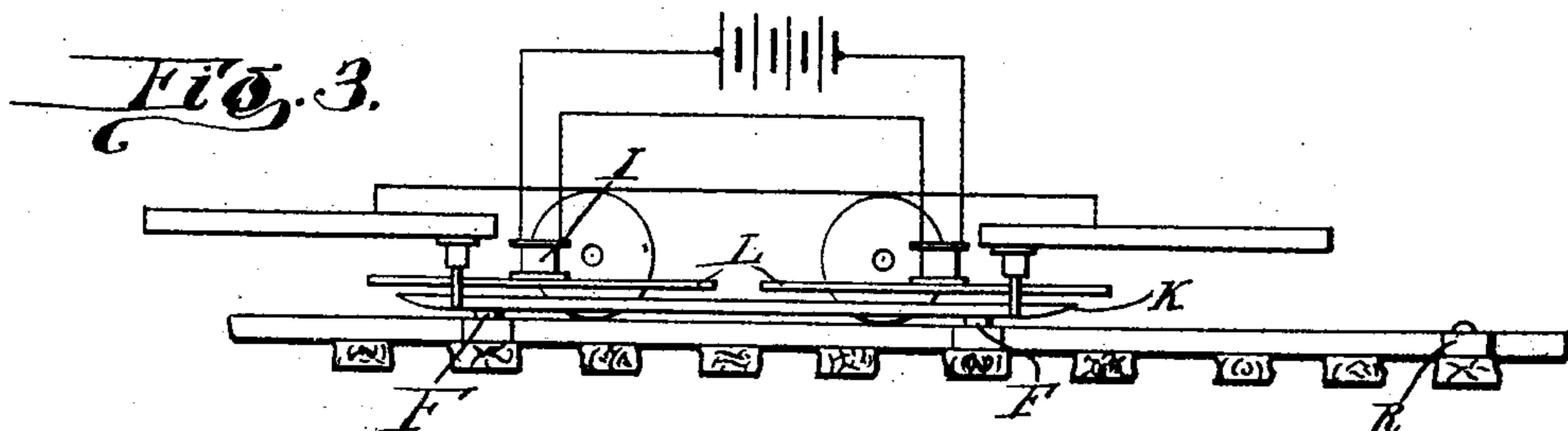
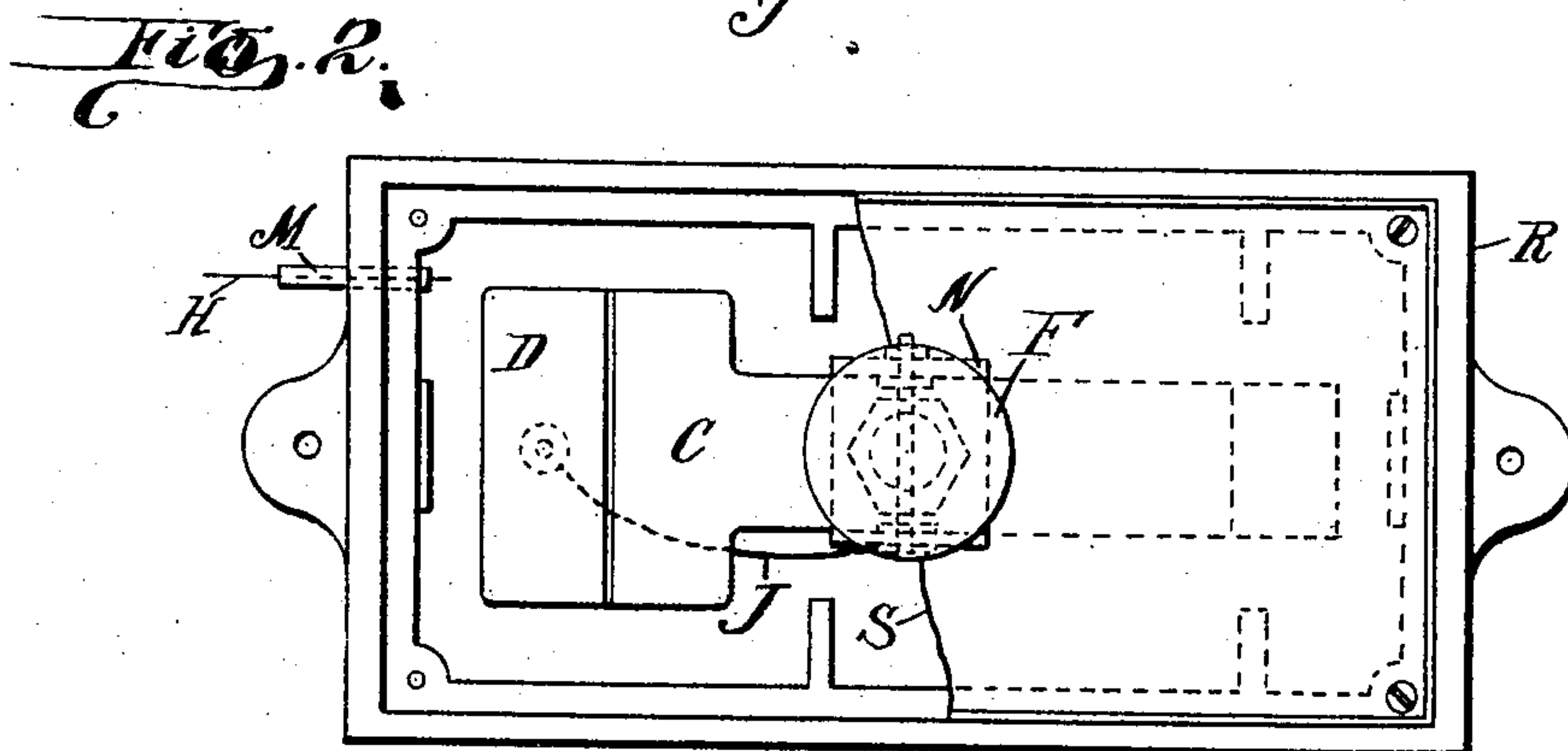
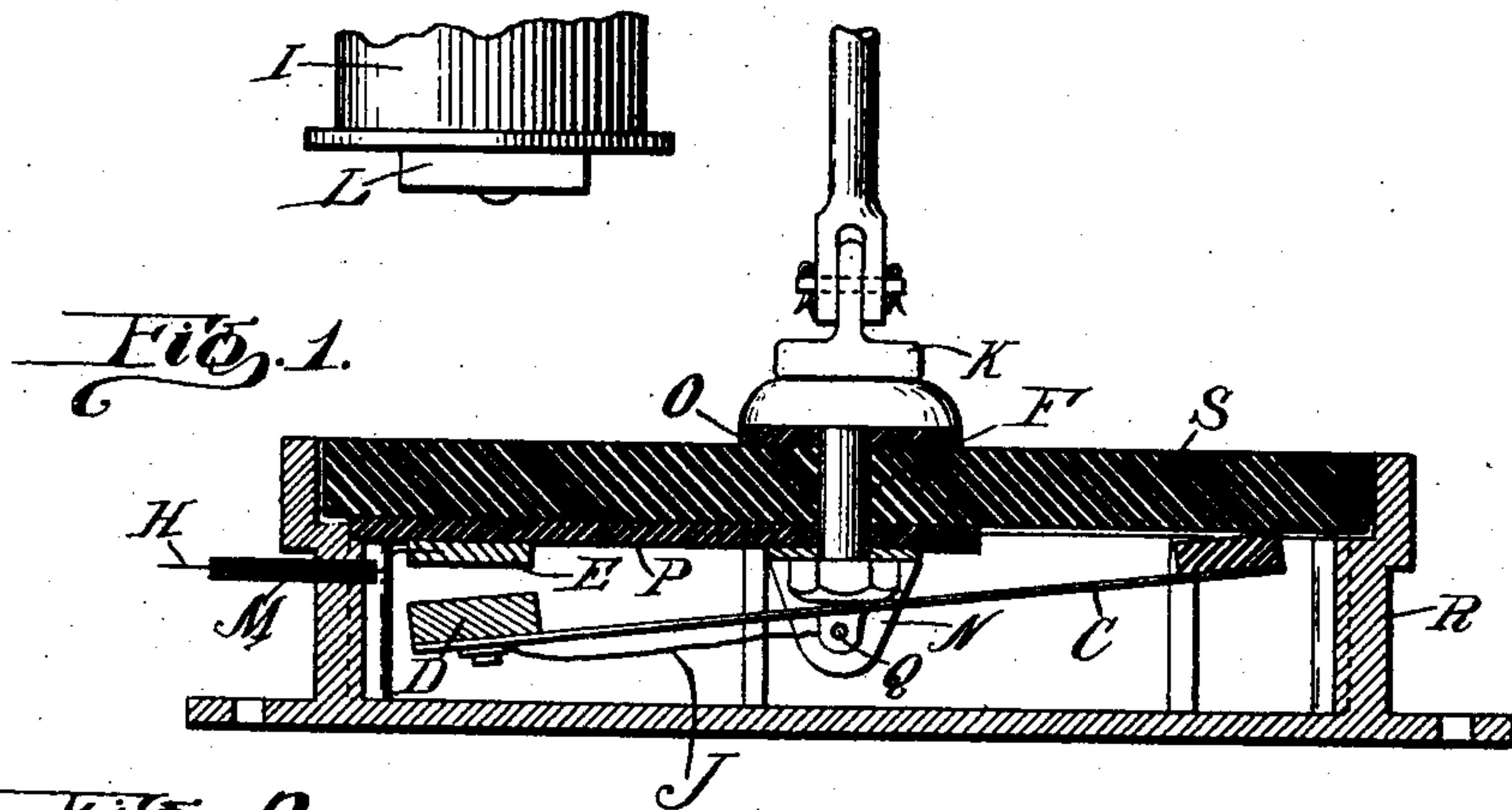
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PATENTED JULY 12, 1904.

W. E. GUTHRIE.
ELECTRIC RAILWAY SYSTEM.

APPLICATION FILED FEB. 5, 1904.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

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ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 764,942, dated July 12, 1904.

Application filed February 5, 1904. Serial No. 192,212. (No model.)

To all whom it may concern:

Be it known that I, WILBER EUGENE GUTHRIE, a citizen of the United States of America, and a resident of Chambersburg, county of Franklin, State of Pennsylvania, have invented certain new and useful Improvements in Electric-Railway Systems, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical sectional view of one of the contact-boxes, showing in end elevation the adjacent parts of the contact-shoe and the magnetized bar; Fig. 2, a plan view thereof with a part of the cover broken away to show the interior of the box; Fig. 3, a diagrammatic view of a car and the adjacent part of the road-bed, and Fig. 4 a plan view of a portion of a road-bed provided with my improvements.

This invention has reference to that system in which a continuous live trolley-wire is done away with (thereby dispensing also with the expensive conduits used in the underground systems and the line of supporting-poles employed in overhead systems) and in lieu thereof is employed a feed-wire buried in the road-bed and connecting at intervals along the road-bed with a series of upward-projecting contacts adapted to make contact with a long shoe carried underneath the car and made greater in length than the distance between any two contacts, so that it will make contact with the next preceding contact before it passes off the succeeding contact, suitable automatic devices being employed to put the contacts in circuit with the feed-wire when the shoe engages them in succession and to cut them out as the shoe leaves them.

The present invention is designed mainly to greatly simplify and render more positive and certain in operation the devices for automatically making and breaking the supplemental contacts as the shoe engages and leaves the main or surface contacts, as more fully hereinafter set forth.

The invention is susceptible of embodiment in a variety of specific structures, and it will be therefore understood that I do not intend

confining my claim to the particular embodiment herein shown and described.

In its preferred construction my invention embodies a series of cast-iron boxes set in the road-bed at the proper intervals and provided each with a cover of slate or other non-conducting non-magnetic material through which the stem of the surface contact depends, a pivoted gravitating armature-bar carrying the movable one of a pair of supplemental contacts, which is in constant electrical connection with the inner end of the stem of the surface or main contact, and a fixed supplemental contact insulatively supported above the movable contact, so as to make contact with the same when the armature carrying said movable contact is raised. To automatically elevate the armatures in succession as the car advances, I employ a magnetized bar, which is suspended from the truck-frame in any suitable manner, so that it shall lie to one side of and approximately parallel with the shoe and in a plane above the same, this bar being magnetized by being connected to the core or cores of one or more, preferably two, electric magnets, which are by preference arranged in a circuit independent of the motors and controllers, so that they shall be constantly magnetized. This magnetized bar is in reality but extensions of the cores of the coils, as is obvious, and it is preferably divided midway its length, as shown, each part being connected to one of the coils. This magnetized bar is so positioned that it passes over the contact-carrying end of the pivoted armature in the box, and it is sufficiently energized to lift said end and make the contact as soon as its forward end is directly over it, and in order that the contact shall be made before the shoe reaches the surface contact and be maintained until after the shoe has passed, and thereby avoid destructive arcing at these contacts, the magnetized bar projects a short distance ahead of the forward end of the shoe and a short distance to the rear of its rear end, as shown.

Referring to the drawings by letters, R designates the cast-iron box with a cover S, of slate or other non-conducting material, this

cover being removably clamped in place by means of four screw-bolts at the corners of the cover and being made water-tight by any suitable rubber gasket and cement.

5 F is the surface contact, the stem of which depends through a central hole in the cover and is clamped in place by a nut on the lower or inner end of the stem. Between the head of the contact-piece and the surface of the
10 cover is interposed a rubber gasket O and suitable cement in order to make this joint water-tight.

Clamped securely on the under side of the cover by the nut on the stem of the contact-
15 piece is a plate of non-conducting material P, and between this plate and the nut is clamped a brass bracket N, between whose depending ears is pivotally mounted a soft-iron armature C. On one end of this armature-bar is fas-
20 tened the movable member D of a pair of supplemental contacts, and this end of the armature-bar normally tends to swing downward because of its preponderance of weight. The other end of this armature carries a block
25 which normally but lightly bears against the under side of the cover, and thereby limits the downward movement of the contact-carrying end. The contact D is in constant electrical connection with the brass bracket N by means
30 of a short flexible conductor j.

The letter E designates the stationary member of the pair of supplemental contacts. This contact is secured to the insulating-plate P just above the movable contact D and is con-
35 nected to a branch of the feed-wire H, which extends into the box through an armored conduit M. The main part of the feed-wire H extends along the road-bed and is inclosed in a suitable protecting-pipe or armored con-
40 duit M.

The contacts D and E are of brass, copper, carbon, or other conducting material. The outer end of the insulating-plate P is held in position by a lip formed on the interior of the
45 box, as shown in Fig. 1.

The letter K designates the contact-shoe, which depends from the car-truck and is adapted to bear upon the exposed portions of the surface contacts F as the car moves along
50 the road-bed.

The letter L designates the magnetized bar, which is suitably suspended and is energized by a pair of electromagnets I, connected up in a circuit independent of the motors and
55 controllers. Said magnetized bar is preferably divided into two sections midway its length and is arranged in a plane just above the contact-shoe and supported in approximately parallel relation thereto. Its forward
60 end projects beyond the forward end of the shoe, and its rear end extends out beyond the rear end of the shoe, as shown in Fig. 3.

The operation of the system will be obvious from the foregoing, and a detail description

thereof is considered superfluous. The cur- 65 rent is supplied through conductor H to contact E. The contacts F remain dead until armature C is lifted by magnet-bars L, where- upon D and E make contact, and thereby per-
70 mit the current from the feed-wire to flow up through conductor j, brass N, surface contact F, and thence through the shoe and its supports to the motors and controllers on the car, and thence back to the generator through the return rail or wire. 75

It will be observed that by reason of the fact that the magnet-bar is longer than the contact-shoe the armature is lifted before the shoe comes in contact with the surface con-
80 tact, so that this contact is alive, ready to transmit the current to the motor the instant the contact-shoe reaches it. The armature is held up until the contact-shoe has left the sur- face contact by reason of the extension of the
85 magnet-bar beyond the rear end of the contact-shoe. This prevents arcing at the contacts D and E. It will be observed that the armature normally gravitates to the position shown in Fig. 1, so that the surface contacts F are dead at all times except when the car
90 is directly over them.

It will be obvious that the gap between the sections of the bar L is not sufficient to per-
95 mit the armature C to return to its normal position when the break between said sections is over said armature, and it will also be observed that the contact D is heavy enough to overbalance the block at the opposite end of the armature, so that the end of the armature
100 carrying said block D normally tends to swing downward without the use of springs.

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

1. A contact-box for electric-railway sys- 105 tems consisting of a box provided with a cover of non-conducting material, a surface contact having a stem extending down through said cover, a clip attached to the lower end of said stem below the cover and having depending
110 ears, an armature-bar pivotally supported between said depending ears and carrying at one end a supplemental contact, this end carrying a supplemental contact normally tending to swing down, another supplemental contact
115 supported immediately above the aforesaid contact, one of the supplemental contacts being connected to the feed-wire and the other to the surface contact, and suitable insulating means for the various parts. 120

2. A contact-box for electric-railway sys- tems consisting of a box provided with a cover, a surface contact having a stem extending
125 down through said cover, an armature-bar carrying at one end a supplemental contact, a device for pivotally connecting this armature-bar at a point between its ends to the lower end of the stem of the surface contact, the end

of the armature-bar carrying the supplemental contact normally tending to swing down, another supplemental contact supported above the aforesaid supplemental contact, one of the
5 supplemental contacts being connected with the feed-wire and the other to the surface contact, and suitable insulating means for the various parts.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, 10
this 4th day of February, 1904.

WILBER EUGENE GUTHRIE.

Witnesses:

EDWARD F. TRACY,
WILLIAM H. BROWN.