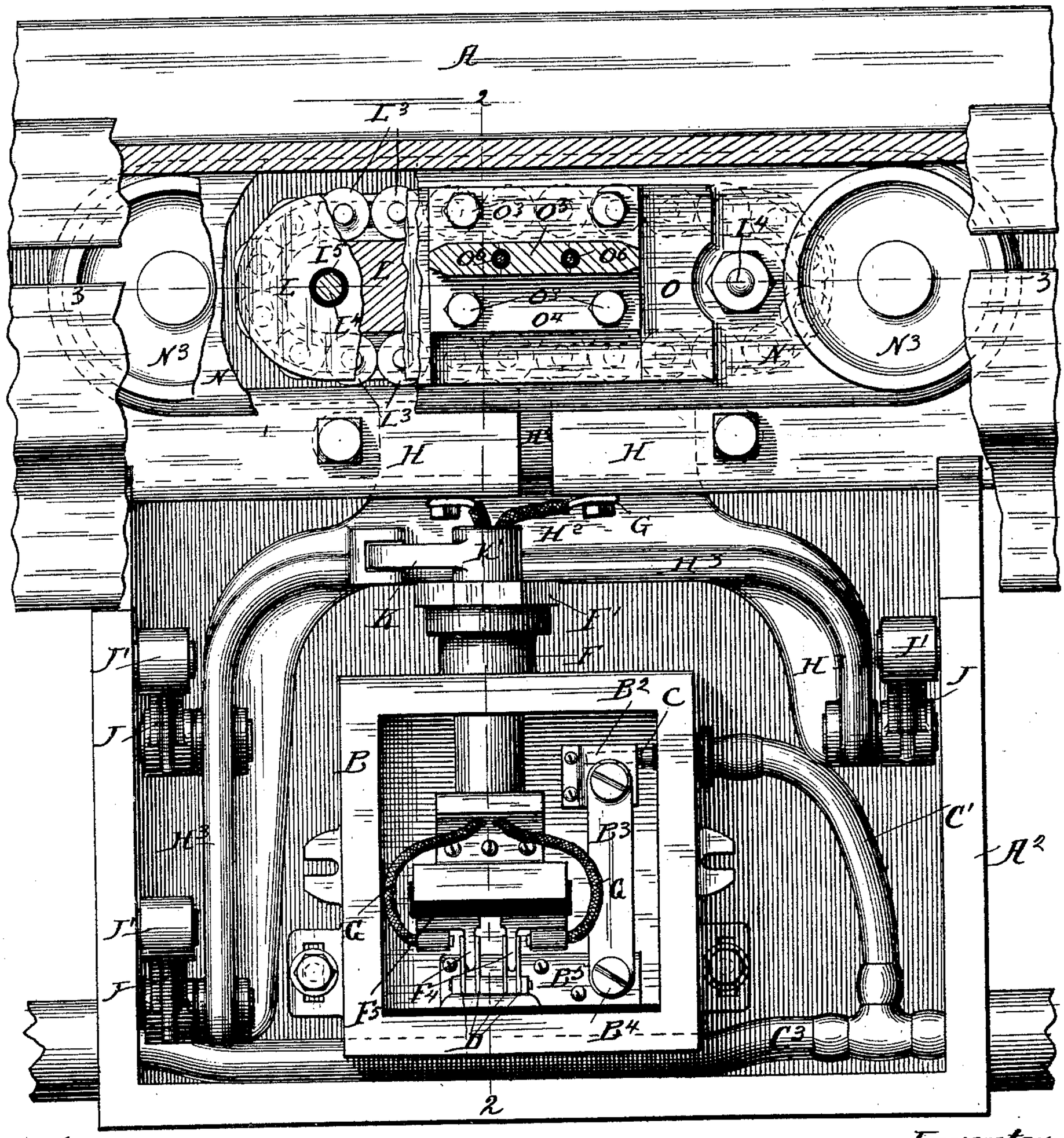
(No Model.) 2 Sheets—Sheet 1.

E. E. KELLER.

UNDERGROUND RAILWAY CONDUIT.

No. 460,780. Patented Oct. 6, 1891.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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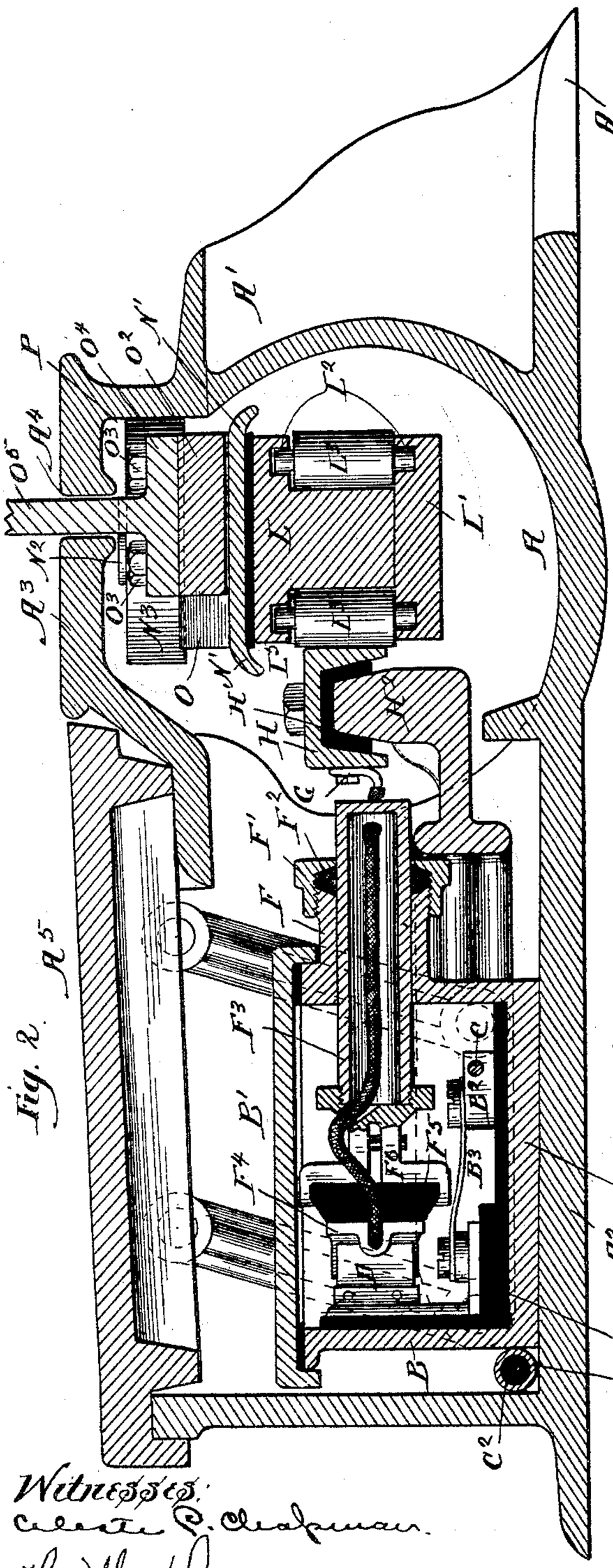

Fig. 2.

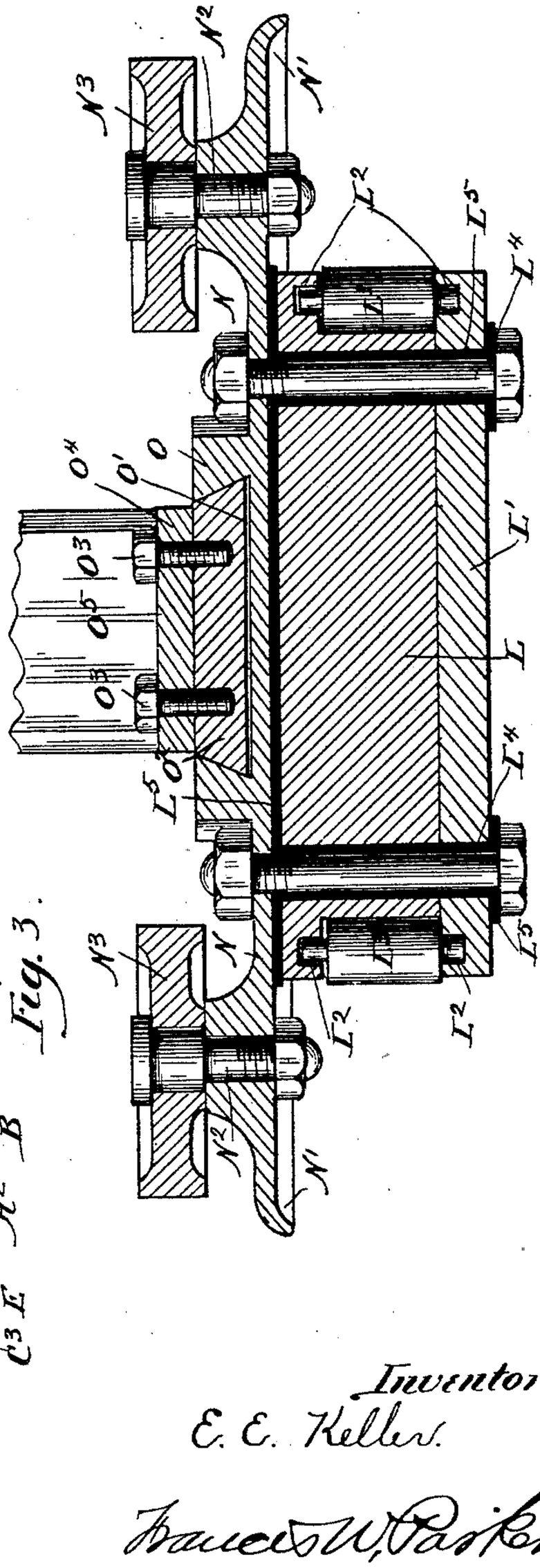

Fig. 3.

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UNITED STATES PATENT OFFICE.

EMIL E. KELLER, OF CHICAGO, ILLINOIS.

UNDERGROUND RAILWAY-CONDUIT.

SPECIFICATION forming part of Letters Patent No. 460,780, dated October 6, 1891.

Application filed April 13, 1891. Serial No. 388,626. (No model.)

To all whom it may concern:

Be it known that I, EMIL E. KELLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Underground Railway-Conduits, of which the following is a full, clear, and exact specification.

My invention relates to underground conduits for electric railways, and has for its object to provide convenient means whereby electricity may be conducted from a concealed and insulated underground conduit to a moving car. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan, part sectional and part broken view. Fig. 2 is a cross-section on the line 2 2. Fig. 3 is a longitudinal section through the trolley on the line 3 3.

Like parts are indicated by the same letters in all figures.

A is a conduit-body, preferably having the lateral flanges A′ A′, and provided with the lateral boxes A^2 at suitable intervals. The conduit proper is provided with the cover A^3, through which is formed the slot A^4, and the boxes are provided with the removable covers A^5. In each box is placed a circuit-closing chamber B, provided with a sealed covering-lid B′ and containing a binding-post B^2, a fusible strip B^3, a binding-post B^4, and an insulated strip B^5, secured to such binding-post. From the binding-post B^2 leads the conductor C, which is inclosed in the insulation C′ and leads to the conductor C^2, insulated in the pipes C^3. On the strip B^5 are secured the spring contact-plates D D. The strips and binding-posts are insulated at E, so that the terminal contact-strips D D are normally insulated from everything except the conductor C.

On the outer side of the circuit-closing chamber is a sleeve F, having the screw-cap F′ and stuffing-box F^2, through which moves the cylinder F^3, which carries at its inner end within a chamber the insulated circuit-closing strips F^4 F^4, which are adapted to engage the contact-strips D. These circuit-closing strips are insulated from each other by the insulation F^5, and are supported on the block F^6 on the end of the cylinder F^3, and each is electrically connected with a conductor G, which conductors pass through the cylinder F^3 and emerge at opposite directions at its outer end, where they are secured each to one end of a rail H, there being two of such rails whose ends are in close proximity at the point where the conductors emerge in the cylinder. These rails are made of heavy channel-iron and are supported by the insulation H′ on the block H^2, which rises from the inner extremity of the yoke H^3. This yoke is supported on three hangers J J J, which hangers are pivoted on the inside to the box A^2 at J′ J′. They are positioned so that the weight of the rail tending to keep the hangers in a vertical position normally causes the rail and hangers to move outwardly toward the center of the conduit A. Pivoted loosely to the yoke is the arm K, which is secured at its upper end to the projection K′ from the cylinder F^3, so that as the rail thus swings toward the center of the conduit it draws the cylinder with it, and thus breaks the contact between the circuit-closers F F and the contact-plates D D. When the rail is pushed toward the left, as indicated in Fig. 2, by the action of the trolley, the cylinder is pushed inwardly and the parts brought to the position shown in Fig. 1, whereby both rails H H are brought into electrical connection with the conductor C^2.

The trolley consists of an upper plate N, with overhanging edges N′, and at its extremities are pivoted on the vertical bolts N^2 N^2 the guide-wheels N^3 N^3. Midway of the plate N, and secured together by bolts, are the two blocks L L′, elliptical in shape, and provided each with a groove L^2, in which are journaled the contact-rollers L^3 L^3. These two blocks L L′ are secured to the plate N and in proper position with reference to each other by the bolts L^4 L^4, and they are suitably insulated from the plate N and the bolts by the insulation L^5. On the upper central portion of the plate N is the raised portion O, through the center of which and through the width of the trolley is formed a wide groove O′, with undercut edges. Loosely fitted in this transverse groove is the block O^2, with protecting edges, as shown in Fig. 3, and secured by the bolts O^3 to the plate O^4, which projects laterally from the trolley-shank O^5, through which pass the conductors O^6 O^6 to

the moving car. A straight continuous guide-edge P, on the inner upper side of the conduit A, is provided, against which the guide-rollers N^3 may bear. The conductors O^6 pass down into and make contact with the trolley-blocks L L′, so as to be in electrical connection with the rollers L^3 L^3.

It is apparent that many changes could be made in the construction and arrangement of these several parts without departing from the spirit of my invention, and also that various omissions of some particulars could be made without materially affecting the operation of the remaining parts. I do not wish to be limited to the specific form and arrangement shown.

The use and operation of my invention are as follows: The main conductor C^2, suitably insulated in the pipes C^3, is laid in the ground near the conduit and passes through the several boxes A^2. Within the box a short branch C′ is carried off and connected by means of a binding-post and fusible strip G with the contact-strips D D, the several parts being securely insulated within the circuit-closing chamber B, which may be filled with insulating-oil. When no car and no trolley is in proximity to the rail, its weight is sufficient to draw it toward the right from the position shown in Fig. 2 and carry it out into the conduit, but not beneath the slot. The weight of the rail carries with it the cylinder F^3, which is drawn through its sleeve F, so as to break connection between the circuit-closers F and the contact D, and this is the normal condition of the several parts. The car to which the trolley is connected now approaches, receiving its current from a rail. The rollers L^3 engage the side of the rail, several of them being in contact at the same time, so that electrical connection is made from the motor to the car through the conductors O^6 O^6 down to such rollers, through the rail to the conductors G, and thence from the contacts F and D to the line-wire. The adjacent ends of the two rails are connected to the same yokes and box, so that both are carried in to complete contact through either of them. The rollers are in contact with both rails simultaneously, so that there is no break in the current. After the car and its trolley has sufficiently passed any given box, the rails at that point will swing outwardly and break the circuit at that point, so that there will not be more than two rails in circuit at the same time, and hence no great leakage. The trolley is supported against the weight of the rail by means of the engagement of the wheels N^3 on the guide portion P. The connection between the trolley and the shank is such as to permit lateral play, for the slot being placed in the side of the top of the conduit the trolley must be placed at one side of the shank, and as the trolley is likely to travel in either direction in the operation of the conduit it is necessary that it should be adapted to project upon either side of the shank. Hence the sliding connection between the trolley and the shank.

I claim—

1. In an underground electric-railway conduit, the combination of an insulated conductor with a series of circuit-closing devices connected therewith at intervals therealong, a series of movable conductors in the conduit, composed each of a heavy rail or the like substantially parallel with the conduit and suspended so as to move across such conduit, and connections between such movable conductors and the circuit-closers, the heavy rails so constructed and disposed as normally to be in a position out of engagement with the insulated conductor and adapted when moved against its gravity across the conduit to bring its connection and the circuit-closers together, so that each of such rails is successively pushed aside and placed in circuit by the trolley and is then permitted by gravity to be restored to its normal position out of circuit.

2. The combination of an insulated main conductor with contact-plates connected therewith at intervals therealong and contained in chambers, a movable part projecting through the walls of such chamber and adapted to engage such contact-plates, conductors leading therefrom, a series of separate insulated-conductor rails loosely suspended so as normally, by the action of gravity, to hang out of connection with the conductor-main, each of said rails connected with one of the movable parts in such manner that when the rail is moved aside by the trolley against the action of gravity the movable part is forced in and contact is made within the chamber between the rail and the insulated main conductor.

3. The combination of an insulated main conductor with contact-plates connected therewith and placed therealong at suitable intervals, with a series of long heavy conductor-rails substantially parallel with and loosely suspended in the conduit so as to swing laterally, the points of suspension of such rails being placed so that the rails normally hang by gravity out of contact or connection with the conductor and contact-plates on the rails or connected with them and adapted when the rails are moved laterally against gravity to engage the contact-plates connected with the insulated conductor, and thus to successively place each rail in circuit with the insulated conductor during the passage of the trolley.

4. The combination of an underground conduit with a slot at one side thereof, a series of laterally-movable conductors within such conduit and supported so as normally to hang at one side of the slot and to be moved laterally by a trolley to contact the insulated main conductor, and a trolley provided with a shank and a loose connection between the two, whereby the trolley may move laterally upon the shank, thus permitting the same trolley to be used to travel in either direction in the slot.

5. The combination of an underground conduit with a series of boxes projecting laterally from the same, an underground insulated main conductor passing through such boxes, a series of circuit-closing chambers, one in each box, contact-plates within such chamber insulated and connected with the main conductor, a movable part projecting from the side of such chamber and carrying insulated conductors therein, a circuit-closing plate on such movable part and connected with such conductor and within the chamber, and a series of movable separate conductors in the conduit, each connected with one of such insulated conductors in the movable parts, so that by the motion of such movable conductors the part may be moved in the side of the chamber and contact made from the main conductor to such movable conductor.

6. The combination of an underground conduit with a series of boxes projecting laterally from the same, an underground insulated main conductor passing along such boxes, with series of circuit-closing chambers, one in each box, contact-plates within such chambers insulated and connected with the main conductor, a movable part projecting from the side of each of such chambers and carrying insulated conductors therein, a circuit-closing plate on such movable part and connected with such conductor and within the chamber, and a series of movable separate conductors in the conduit, each connected with one of such insulated conductors in the movable parts, so that by the motion of such movable conductors such part may be moved in the side of its chamber and contact be made from the main conductor to such movable conductor, said movable conductors consisting each of a heavy piece of metal suspended upon hairs, so as normally to swing away from the chamber and break contact within the same.

7. The combination of an underground conduit with a bearing or guide surface on one side, a series of heavy laterally-moving conductors on the opposite side, and a trolley adapted to engage such movable conductors and provided with guide-rollers to engage such guide-surface.

Signed at Chicago, Illinois, this 10th day of April, 1891.

EMIL E. KELLER.

Witnesses:
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HARRIET M. DAY.