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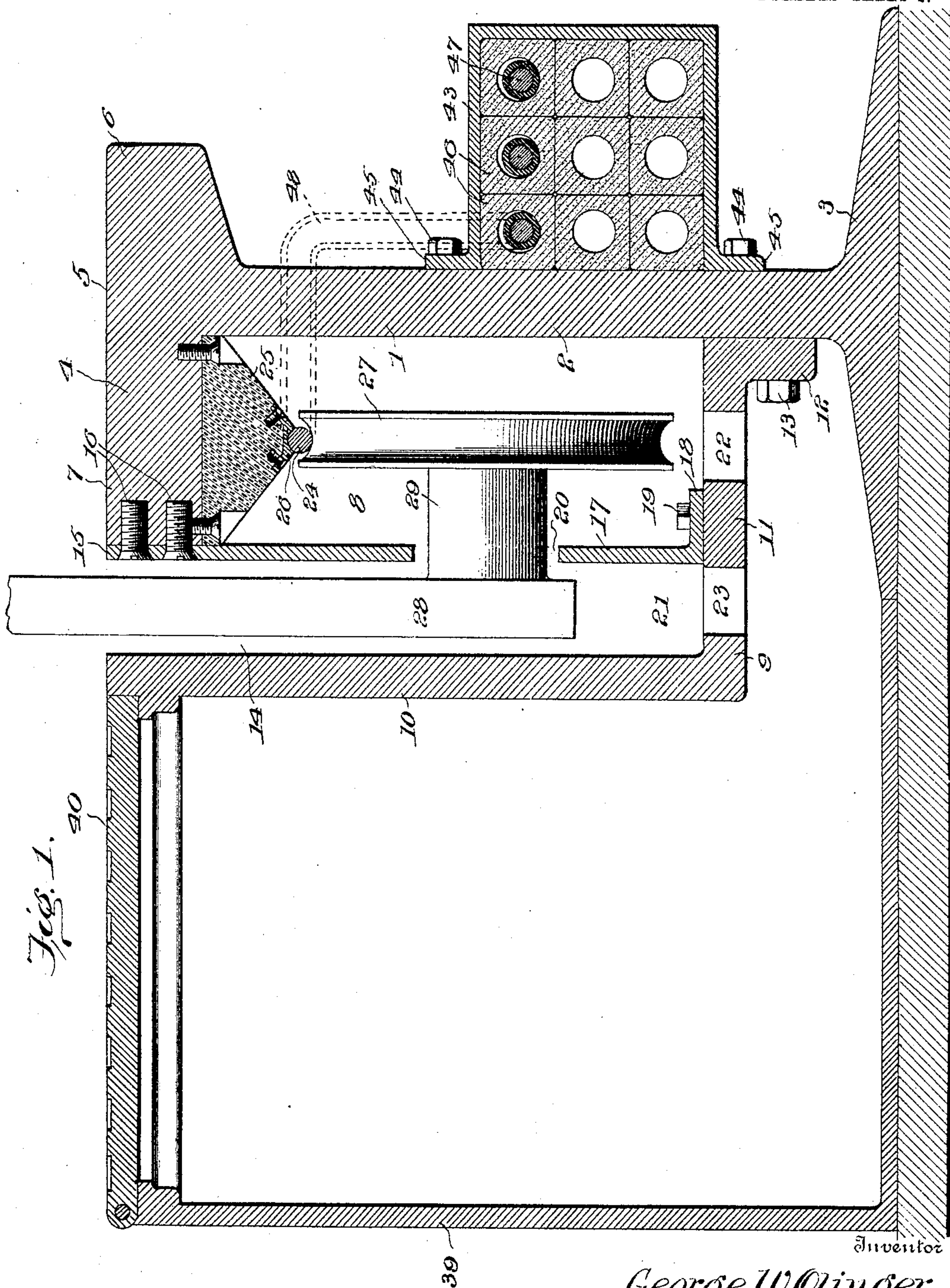
PATENTED MAR. 28, 1905..

G. W. OLINGER.

# ELECTRIC RAILWAY SYSTEM AND CONDUIT.

APPLICATION FILED JUNE 19, 1903.

2 SHEETS—SHEET 1.



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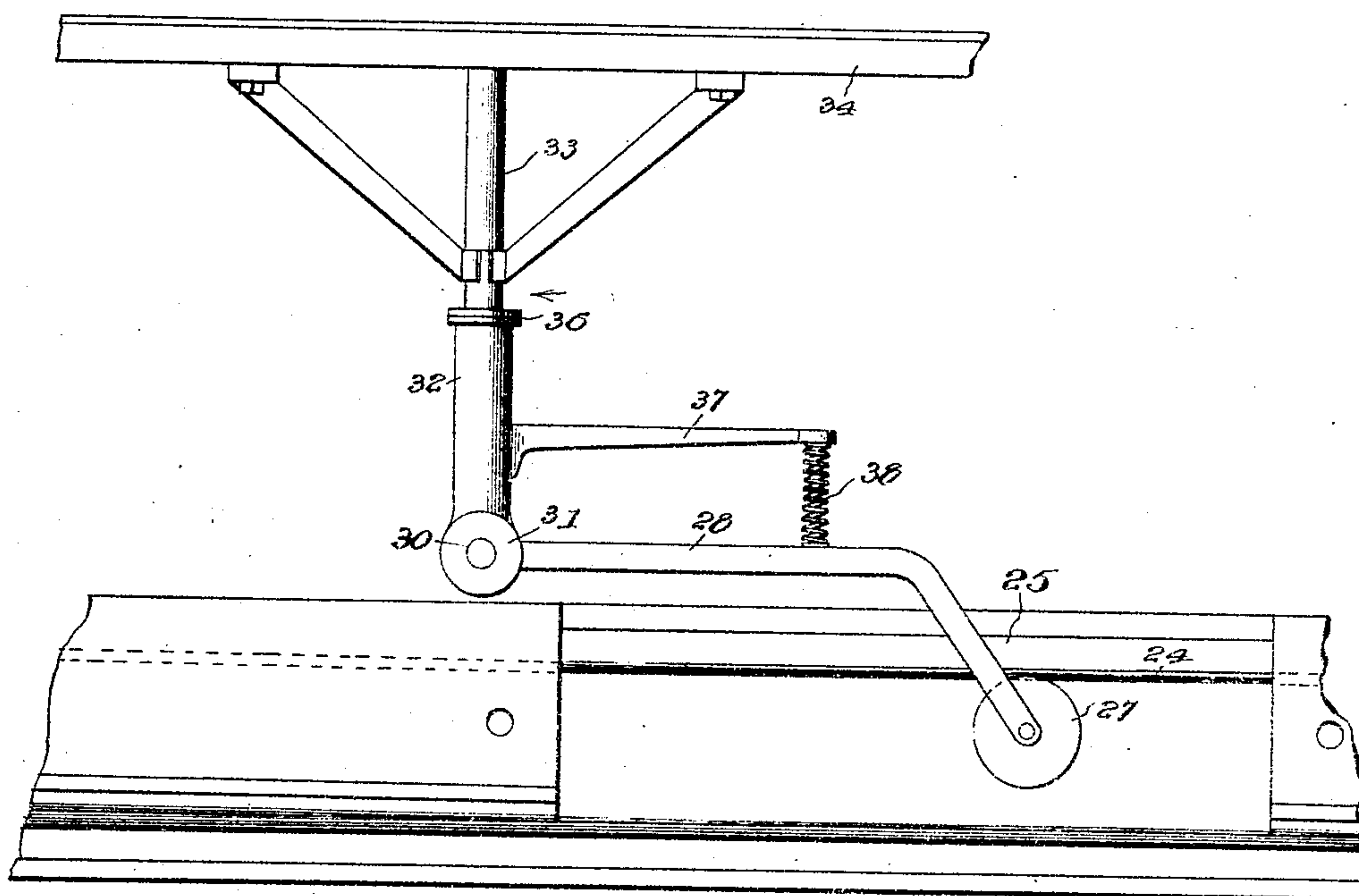
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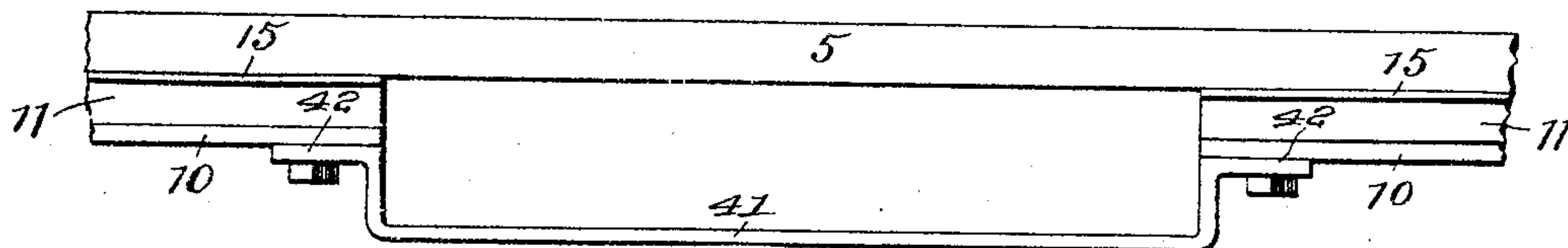
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2 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC-RAILWAY SYSTEM AND CONDUIT.

SPECIFICATION forming part of Letters Patent No. 785,758, dated March 28, 1905.

Application filed June 19, 1903. Serial No. 162,191.

*To all whom it may concern:*

Be it known that I, GEORGE W. OLINGER, a citizen of the United States, residing at Orchard, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Electric-Railway Systems and Conduits, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to electric-railway systems and conduits, and has for its object to provide an underrunning-trolley system comprising a conduit wherein the conductor may be effectively supported and protected. In its  
15 preferred form said conduit is adapted for use as an underground conduit, although not limited to such use; and the invention also comprises specific features of improvement relating to a conduit of this type.

20 The invention consists in certain novel features which I will now proceed to describe and then will particularly point out in the claims.

Figure 1 is a vertical sectional view of a structure embodying my invention in one  
25 form. Fig. 2 is a side elevation, showing the construction at one of the openings or boxes which permit the introduction of the trolley into the conduit and its removal therefrom, the guard-plate being removed and a trolley  
30 being shown in the conduit; and Fig. 3 is a plan view of that portion of the conduit having the opening shown in Fig. 2, the combined guard and tie plate being shown in position in said figure.

35 In the said drawings the main structural member of the conduit is shown as consisting of a beam 1, comprising a vertical web or body 2, a flanged base or foot 3, and an enlarged head 4, said beam being, therefore, in a gen-  
40 eral way similar in form to an I-beam or girder-rail. The head 4 preferably extends laterally outward on both sides of the web or body 2, its upper surface 5 being preferably formed into a tread-surface on which the  
45 wheels of the car may travel. When this is the case, the lateral projection 6 of the head, which is nearest the center line of the track and which constitutes the inner side of the rail, is formed like the corresponding part of an  
50 ordinary rail. The projection 7 on the other

side of the head is preferably extended a considerable distance to form a cover or roof for the top of the conduit which contains the conductor, which conduit is indicated by the reference-numeral 8. Supported from the beam 55 1 is an L-shaped beam 9, having a vertical member 10, extending upward to a level with the top of the beam 1, and a horizontal member 11, provided with a flange 12, by means of which it is secured to the outer face of the 60 web 2 by bolts 13. The member 10 of the beam 9 is of less height than the beam 1, so that a space is formed below the member 11 of the beam 9 between it and the base 3 of the beam 1. The member 11 is of greater length 65 than the projection 7 of the beam 1, so that a space 14 is formed between the outer face of said projection and the adjacent inner face of the member 10. A plate 15, secured to the outer face of the projection 7 by screws 16 or 70 otherwise, extends downward therefrom, and a similar plate 17, provided with a flange 18, secured by bolts 19 to the top of the member 11, extends upward toward the plate 15 and lies in the same plane therewith, a slot or 75 opening 20 being formed between the two. It will be observed that the member 11 forms the bottom of the conduit 8 and the plates 15 and 17 form the outer vertical wall of the conduit 8, said wall being provided with a longi- 80 tudinal slot 20. The member 10 and the plates 15 and 17 also form the vertical or lateral walls of a second conduit 21, the bottom of which is formed by the member 11, while its mouth is formed by a slot or opening 14. 85

The two conduits 8 and 21 may be considered as a single conduit, divided into two parts or compartments by the vertical plates 15 and 17, and if the said plates are omitted—a construction which is within the scope of my in- 90 vention in its broadest form—they will form a single conduit without any subdivision.

The member 11 of the beam 9 is provided with openings 22 underneath the conduit 8 and with openings 23 underneath the conduit 95 21, so as to permit any water or dirt which may accumulate in said conduit, to pass downward and be discharged from said conduits into the space below the same.

As hereinbefore stated, the lateral projec- 100



tion 7 forms the top or cover of the conduit 8, in which conduit the conductor 24 is located immediately under said top or cover and at a point considerably above the lateral slot or opening 20, which gives access to said conduit. I prefer to support the conductor directly from said top or cover by means of suitable insulating-supports 25, secured to the under side of said top or cover in any suitable manner and having the conductor connected therewith in any suitable manner. In the present instance I have shown for this latter purpose metallic saddle-blocks 26 screwed to the insulating-supports 25 and having the conductor brazed to them or otherwise connected therewith.

It will be observed that the conductor is located practically at the top of its conduit, where it is protected in the most efficient manner from water or dirt either falling into or accumulating in the conduit. Such obstructive material entering the structure from above can only pass into the conductor-conduit through the lateral slot 20, and since the conductor lies above said slot it will not be exposed to any such material thus entering, since such material will pass downward after it enters the conductor-conduit in a direction away from the conductor. Moreover, the conductor thus located has its under side utilized as a contact-surface for the trolley-wheel, which is advantageous for the reason that the contact-surface thus presents no place of lodgment for obstructive material, as in the case where the upper surface of the conductor is the contact-surface.

The trolley-wheel is indicated at 27 and travels in the conduit 8, being pressed upward against the conductor by any suitable mechanism, preferably that shown. The trolley-arm (indicated at 28) travels in the conduit 21 and carries a bearing 29, extending horizontally through the slot 20 to the trolley-wheel 27, which is supported by said bearing. My preferred construction of the trolley-arm and its supporting mechanism is that shown in Fig. 2, in which the trolley-arm extends diagonally upward through the slot 14 to a point above the conduit and then horizontally forward, its forward end being pivoted at 30 between lugs 31 on the lower end of a sleeve 32, carried by a vertical spindle 33, supported from the car-truck or car-body 34. The sleeve 32 is free to turn around the spindle 33 and may be held in position thereon in any suitable manner—as, for instance, by a fixed collar on the spindle, embraced by a two-part bearing 36 on the upper end of the sleeve. The sleeve 32 has secured to it a rearwardly-extending arm 37, the rear end of which has connected to it the upper end of a spring 38, the lower end of said spring being connected to the trolley-arm 28. In this way the trolley-arm is free to swing both laterally and vertically,

and is at the same time held by spring-pressure against the under side of the conductor.

In order to provide for the removal of the accumulation of obstructive material which passes down through the openings 22 and 23, I provide at suitable intervals boxes 39, located adjacent to the outer side of the conduit and having hinged or removable covers 40. By this means access may be had at intervals to the space below the conduits, so as to remove from said space the accumulated material. Provision is also made at suitable intervals for the removal of the trolley-wheel from the conductor-conduit or its insertion therein. To this end at suitable intervals the plates 15 and 17 and the vertical member 10 are omitted or cut away, as shown in Figs. 2 and 3, so as to permit the trolley arm and wheel to swing laterally outward. When the conduit is an underground conduit, in order to provide a space or chamber into which the arm and wheel may thus swing I employ a combined guard and tie plate 41, having the shape of a comparatively shallow channel-bar in horizontal cross-section and provided with terminal flanges 42, by means of which it may be bolted to the ends of the upright members 10 at each side of the space. Since the various parts of the structure will be made in longitudinal sections, the ends of the beams 9 may be occasionally separated by a suitable distance and connected by the tie-plates 41, which thus serve to unite said sections, while at the same time a space is formed between the sections, which permits the swinging out of the trolley wheel and arm.

Electric traction systems as now constructed generally comprise feed-wires and high-tension transmitting-wires, and I provide means for doing away with the overhead location of such wires by means of an auxiliary conduit 43, closed at top and bottom and on one side, the other side being closed by the web 2 of the beam 1, to which the auxiliary conduit 43 is secured by bolts 44, passing through lugs 45. This auxiliary conduit may contain any desired number of subconduits 46, containing feed or high-tension wires 47, as shown in Fig. 1. Said figure also illustrates in dotted lines at 48 a connection between a feed-wire and the conductor 24 by means of an insulated feed-wire passing through a suitable opening in the web 2 of the beam 1.

I do not wish to be understood as limiting myself strictly to the precise details of construction hereinbefore described and shown in the accompanying drawings, as it is obvious that these details may be modified without departing from the principle of my invention.

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

1. In an electric-railway system, a conduit comprising a main longitudinal member or



beam consisting of a vertical web with lateral extensions at its bottom to form a base, and a lateral extension at its top to form the top of the conduit, a second longitudinal member or beam composed of a horizontal portion secured to the main member and forming the bottom of the conduit, and a vertical portion extending upward to a level with the top of the main member, and separated from the lateral extension thereof to form a slot or opening, and a partition dividing the conduit thus formed and consisting of a plate extending downward from the lateral extension at the top of the main member, and a plate extending upward from the horizontal portion of the second member, the adjacent edges of said plates being separated to form a slot, substantially as described.

2. In an electric-railway system, a conduit comprising a main longitudinal member or beam consisting of a vertical web with lateral extensions at its bottom to form a base, and a lateral extension at its top to form the top of the conduit, a second longitudinal member or beam composed of a horizontal portion secured to the main member and forming the bottom of the conduit, and a vertical portion extending upward to a level with the top of the main member, and separated from the lateral extension thereof to form a slot or opening, and a partition dividing the conduit thus formed and consisting of a plate extending downward from the lateral extension at the top of the main member, and a plate extending upward from the horizontal portion of the second member, the adjacent edges of said plates being separated to form a slot, the horizontal portion of the second member being provided with outlet-openings on each side of the plate arising therefrom, substantially as described.

3. In an electric-railway system, a conduit comprising a main longitudinal member or beam consisting of a girder-rail having a tread-surface at the top, one side of its overhanging head forming the top of the conduit, the vertical web of said rail forming one side of the conduit, and a second longitudinal member or beam secured to said rail and comprising a horizontal portion forming the bottom of the conduit, and a vertical portion forming the other side wall of the conduit, said vertical portion extending upward to a level with the top of the rail and being separated

therefrom to form a slot or opening, substantially as described.

4. In an electric-railway system, a conduit for the trolley-wire comprising a main longitudinal member or beam consisting of a vertical web with lateral extensions at its bottom to form a base, and a lateral extension at its top to form the top of the conduit, a second longitudinal member or beam, L-shaped in cross-section, secured to one side of the main member to form the base and outer side of the conduit, and separated therefrom at the top to form a slot or opening, and a third member of trough-like form secured to the other side of the main member and forming an auxiliary conduit for the feed and other wires, substantially as described.

5. In an electric-railway system, a conduit comprising main girder members, secondary members L-shaped in cross-section and secured to the side of the main members to form the bottom and outer side of the conduit, and a combined guard and tie plate, channel-shaped in horizontal section, and connecting the ends of the secondary members to form a lateral space for the insertion and removal of the trolley arm and wheel, substantially as described.

6. In an electric-railway system, a conduit comprising a main longitudinal member, a beam consisting of a vertical web with lateral extensions at its bottom to form a base, and a lateral extension at its top to form the top of the conduit and a second longitudinal member or beam composed of a horizontal portion secured to the vertical web of the main member of the base and forming the bottom of the conduit, and a vertical portion extending upward to a level with the top of the main member, and separated from the lateral extension thereof to form a slot, a partition extending from the lateral extension of the main member to the horizontal portion of the second member, said partition being provided with a longitudinally-disposed slot therein, and outlet-apertures in the horizontal portion of the second member on both sides of the partition.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. OLINGER.

Witnesses:

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