(No Model.) 3 Sheets—Sheet 1.

J. H. TYRRELL.

CONDUIT ELECTRIC RAILWAY.

No. 522,440. Patented July 3, 1894.

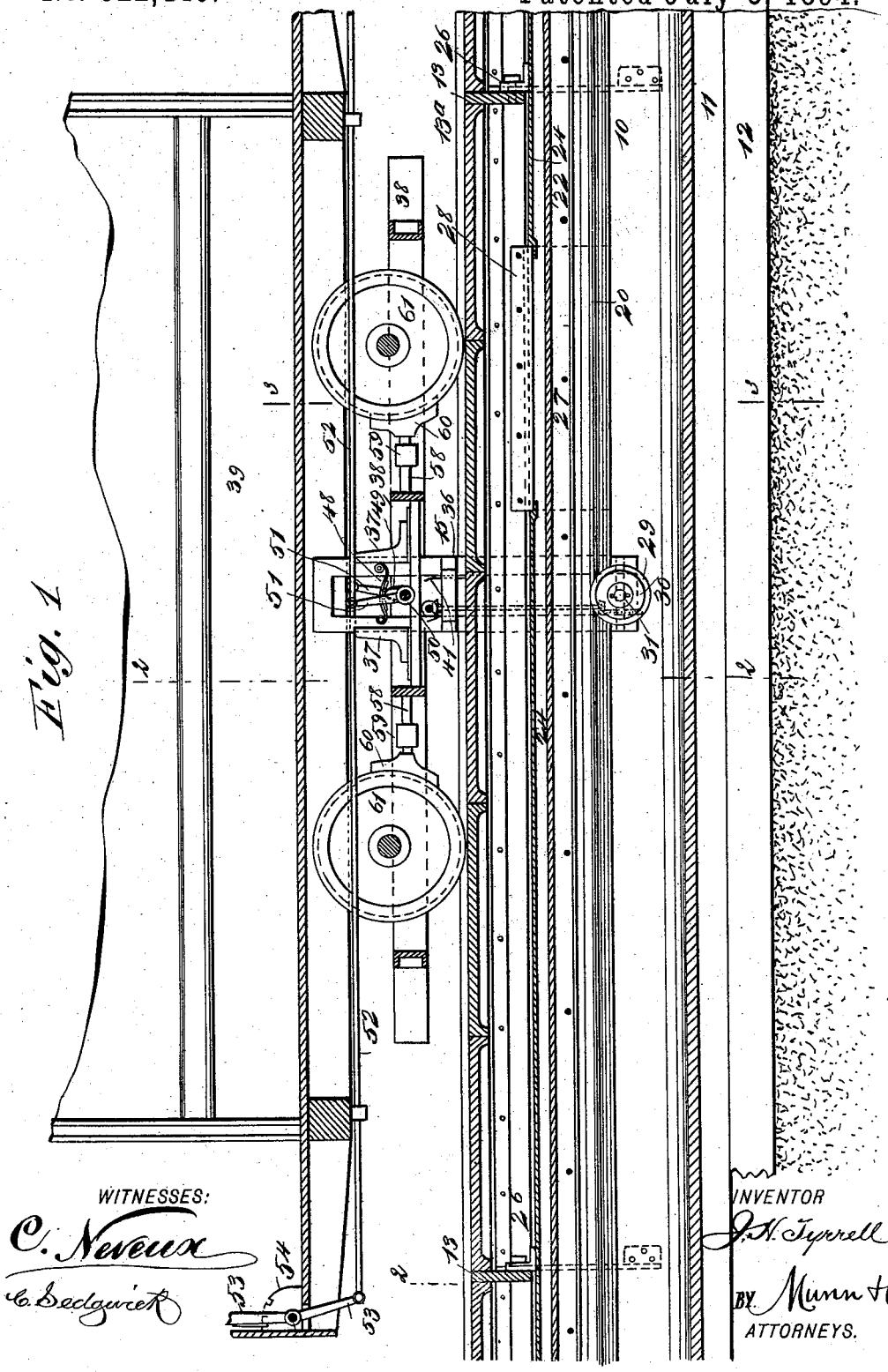

Fig. 1.

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR

J. H. Tyrrell

BY Munn & Co

ATTORNEYS.

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Fig. 2

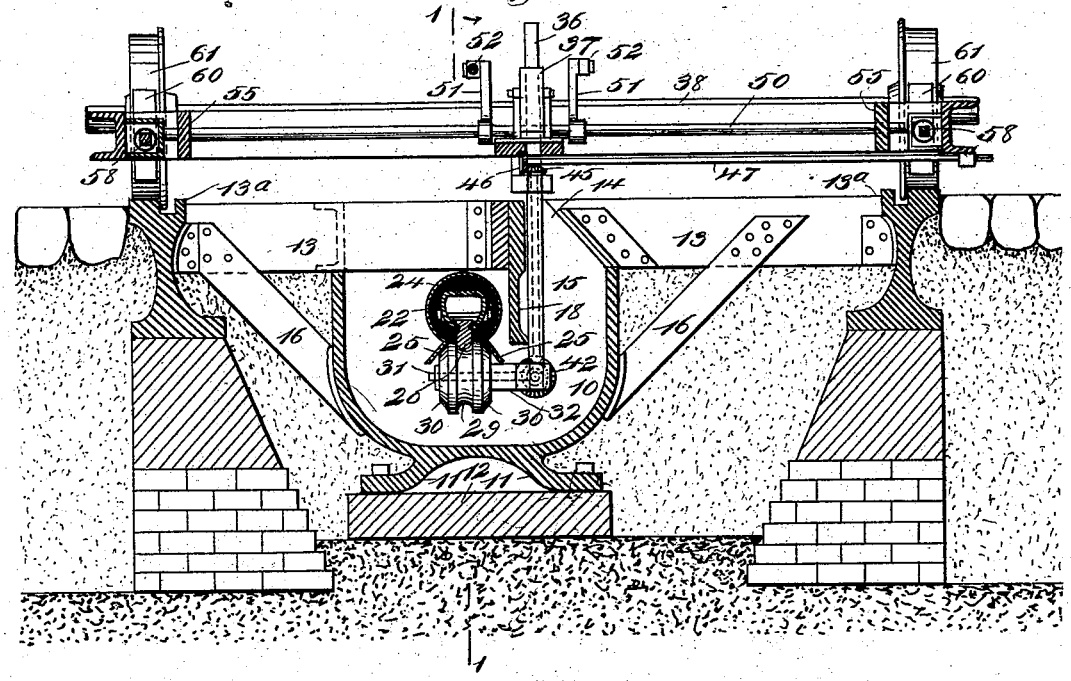
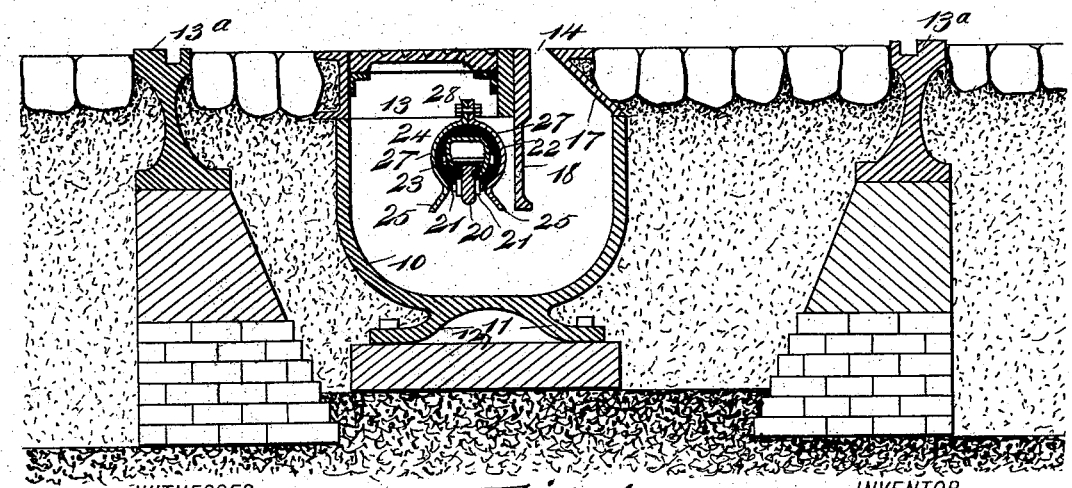


Fig. 3

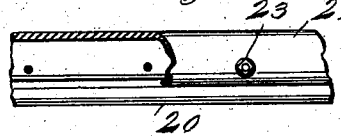


WITNESSES:

C. Neveux

E. Sedgwick

Fig. 4



INVENTOR

J. H. Tyrrell

BY Munn & Co

ATTORNEYS.

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Fig. 5

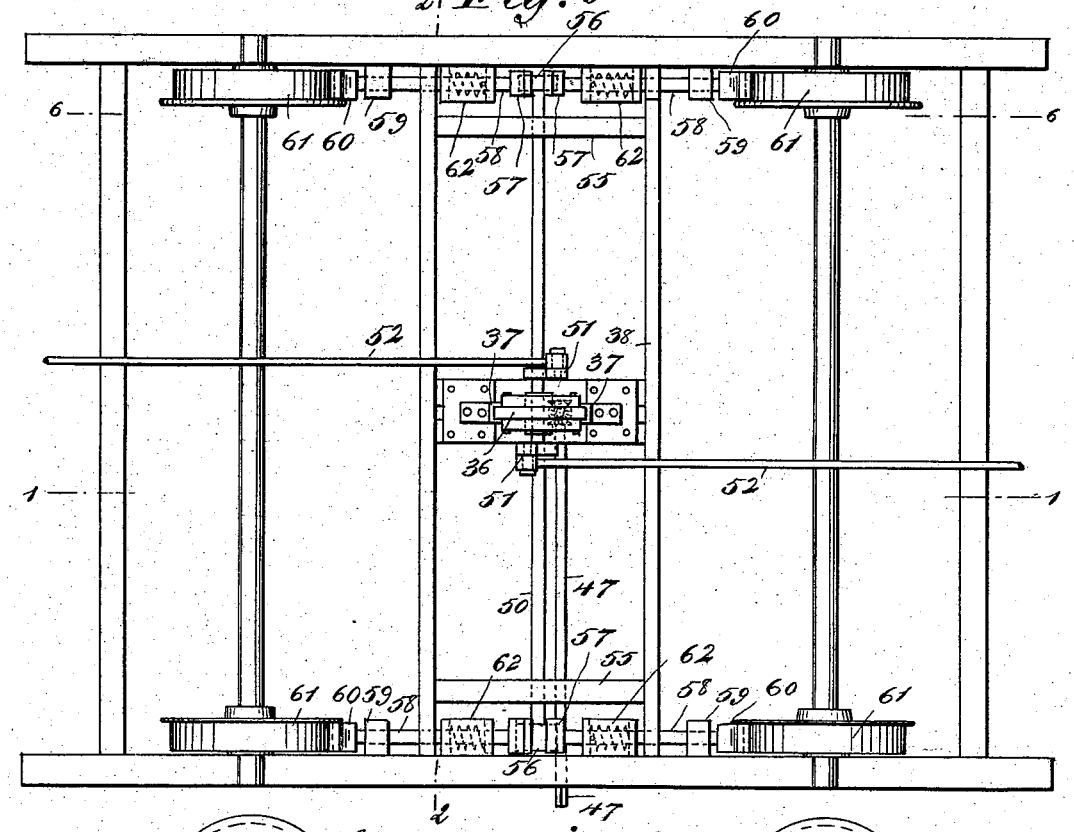


Fig. 6

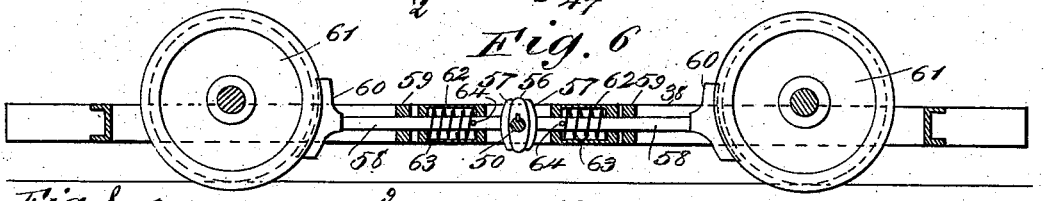
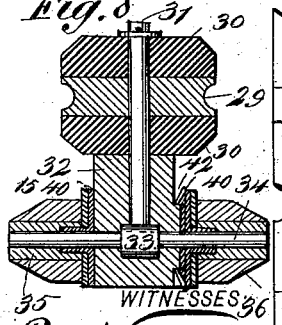


Fig. 8



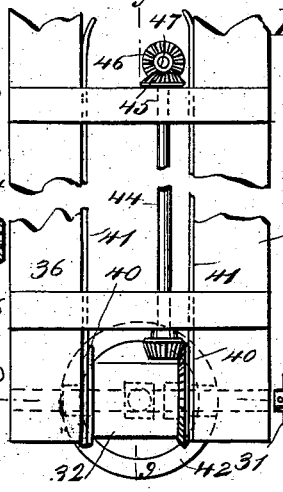


Fig. 7

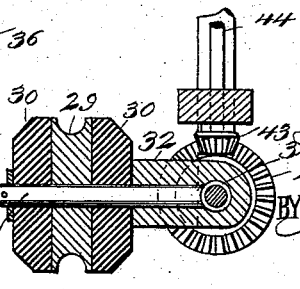
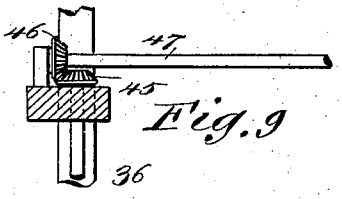


Fig. 9



WITNESSES

C. Neveux

C. Sedgwick

INVENTOR

J. H. Tyrrell

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN H. TYRRELL, OF NEW YORK, N. Y.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 522,440, dated July 3, 1894.

Application filed January 23, 1894. Serial No. 497,780. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. TYRRELL, of New York city, in the county and State of New York, have invented a new and Improved Conduit Electric Railway, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of electric railways in which the main conductor or line wire is arranged in a conduit beneath the road bed; and the object of my invention is to produce a railway of this class having the conduit constructed and arranged in such a manner that easy contact may be made with the line wire and that the line wire may be perfectly protected and insulated, also to provide means for easily shifting the trolley from side to side, and further, to construct the apparatus so that the trolley may be easily disconnected and that at the same time the brakes may be applied, thus enabling the car to be easily stopped.

To these ends my invention consists of certain features of construction and combinations of the same, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section of the railway and the car thereon, the section being taken on the line 1—1 of Figs. 2 and 5. Fig. 2 is a cross section on the line 2—2 of Figs. 1 and 5. Fig. 3 is cross section on the line 3—3 of Fig. 1. Fig. 4 is a broken side elevation, partly in section, of the clamp which supports the line wire and conductor; and Fig. 5 is a detail plan view of the car truck and the arrangement of the trolley arm and brake mechanism. Fig. 6 is a longitudinal section, on the line 6—6 of Fig. 5, of the car truck. Fig. 7 is a broken side elevation of the trolley and its supporting arm. Fig. 8 is a sectional plan of the trolley and support; and Fig. 9 is a broken vertical section on the line 9—9 of Fig. 7.

The railway is provided with a conduit comprising a trough-like structure 10, which is preferably of metal and which has base flanges 11 adapted to be secured to supporting sleepers 12, or equivalent supports, and above the conduit are transverse beams 13 which are preferably of metal and which are arranged between the track rails 13^a, the beams being separated in the center so as to form the longitudinal slot 14 in the top of the conduit, through which slot extends the trolley arm 15. The top of the conduit is covered in any suitable manner and it is braced by diagonally arranged braces 16 which are bolted to the beams 13 and to the sides of the conduit.

The upper portion of the conduit adjacent to the slot 14 is inclined preferably, as shown at 17 in Fig. 3, and on the opposite side of the slot 14 is a vertical and longitudinal guard plate 18 which hangs down in the conduit and protects the main conductor or line wire 20 from water, snow, and other matter which might drop through the slot 14. It will be seen by reference to Fig. 3 that the conduit need be covered but on one side of the slot. The line wire 20 is made up in sections so that it may be easily placed in position, these sections being placed end to end and bolted together by means of suitable bolts and clamping plates 21, as illustrated in Fig. 3, although the wire may be continuous, if desired.

The wire 20 is supported in an inverted U-shaped clamp 22, which extends the full length of the wire and which is arranged with its open side down and with its edges entering grooves in the upper portion of the wire, which is oblong in cross section and grooved on the sides, as shown clearly in Fig. 3. The edges of the clamp are fastened against the wire by means of cross bolts 23 which compress the sides of the clamp. The wire 20 is insulated in the clamp, as shown in Figs. 2 and 3 and the clamp and upper portion of the wire are embedded in insulating material which fills the body portion of the supporting tube 24, this tube being of a generally cylindrical shape and having its under side open so that the bare wire may project from it, this part of the wire being shielded by diverging flanges 25 on the lower edges of the hanger. The supporting tube is continuous and is, for convenience, made up in sections and the sections are preferably united, as illustrated in Figs. 1 and 3, by means of couplings 27 which comprise plates of the same general shape as the supporting tube, so as to form

continuations of it, the plates having meeting flanges 28 at the top, which are bolted together, as shown in Figs. 1 and 3. The supporting tube may be supported in any convenient way, but, as illustrated, it is fastened at the top to the cross beams 13, as shown at 26 in Fig. 1.

The line wire 20 is half round, on its lower face, and on it runs the trolley wheel 29, which is of conducting material and is held between insulating washers 30 and on a shaft 31, which is also of conducting material, and is held in a support 32, the shaft connecting, as shown at 33, with a conducting shaft 34 which is arranged at right angles to the shaft 31 and is held in insulating material 35 at the lower end of the trolley arm 15. The trolley wheel and the support 32 swing in the lower end of the trolley arm 15, the shaft 34 serving as the journal for the trolley. This arrangement enables the trolley to be swung from one side to the other so as to fit against a wire hung on either side of the slot 14.

The trolley arm 15 consists of a vertically movable frame 36, which moves in slideways 37 on the truck frame 38 on which is mounted the car 39. On each side of the support 32 are conducting collars 40 which fit close on the shaft 34 and these contact collars or washers connect with wires 41 which are adapted to connect with the motor on the car in the usual way.

On the shaft 34 is a beveled gear wheel 42 which meshes with a pinion 43 on the lower end of a vertical shaft 44, which shaft is hung on the frame 36 and has, at its upper end, a beveled pinion 45 meshing with a similar pinion 46 on a shaft 47, which is mounted in suitable supports and extends laterally from the truck frame 38, as shown best in Fig. 5, and if the trolley is to be shifted from one side to the other, a wrench may be applied to the shaft 47 and the shaft turned, which movement, by means of the gear mechanism just described swings the support 32 and the trolley wheel 29.

The trolley arm or frame 36 is slotted in the middle and is provided with a cross spring 48, see Fig. 1, which is adapted to be engaged on its under side by a cam 49 on the transverse shaft 50, which is mounted in suitable supports on the truck frame and consequently, by turning the shaft and cam, the trolley frame may be raised or lowered. The shaft 50 is provided with cranks 51 which are pivoted to rods 52 extending longitudinally beneath the car, to the ends thereof, where each is pivoted to the lower end of a lever 53 extending upward through the car platform and moving opposite a quadrant 54 to which the lever may be fastened by the usual hand latch. This arrangement enables the trolley to be raised or lowered by simply moving one of the levers 53.

The shaft 50 extends through suitable supports 55, near opposite ends of the truck frame, and on the ends of the shaft are elliptical cams 56 against opposite sides of which press the curved plates 57 of the brake rods 58 which are hung in suitable guides 59, see Fig. 6, and the rods carry brake shoes 60 which are adapted to press against the wheels 61. The rods 58 extend through spring cases 62 on the truck frame, in which cases are spiral springs 63 pressing against studs 64 on the brake rods, and the pressure of these springs normally retracts the rods and holds the brake shoes off the car wheels.

When the brakes are to be applied, one of the rods 52 is pulled by means of the lever mechanism described, and this oscillates the shaft 50 and turns the cams 56 so as to spread the plates 57 and force the brake shoes against the car wheels. At the same time the oscillation of the shaft 50 swings the cam 49 from beneath the spring 48, thus permitting the trolley arm to drop and forcing the trolley wheel 29 off the line wire 20, thus breaking the motor circuit at the same time the brakes are applied and, of course, this permits the brakes to be set with much greater effect than they could be if the motor circuit were not broken.

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

1. The combination, with the supporting tube having a longitudinal opening, and the insulating material in the said tube, of a continuous clamp embedded in the said insulating material, and a line wire held by the clamp with its outer face projecting beyond the insulating material, substantially as described.

2. The combination, with the slotted conduit, of the metallic supporting tube having diverging flanges at its lower side, an open bottomed clamp imbedded in insulating material within the supporting tube, and the line wire held by the clamp and projecting from the insulating material, substantially as described.

3. A conduit for electric railways, comprising a trough-like structure provided with a longitudinal slot in its top, the upper portion of one of the side walls of said structure being inclined toward the said slot, a guard plate arranged on the opposite side of the slot, and a cover located on top of the structure between the guard plate and the other side wall of the structure, substantially as described.

4. The combination, with the car, of the trolley arm suspended beneath it, a support mounted on the lower end of the arm and adapted to swing relatively thereto and transversely of the car, and a trolley on the said support, substantially as described.

5. The combination, with the car, of the trolley arm suspended beneath it, a support mounted on the lower end of the arm and adapted to swing in an essentially vertical plane extending transversely of the car, and a trolley on the said support, substantially as described.

6. The combination, with the trolley arm

having a transverse shaft on its lower end, of a trolley hung on the said transverse shaft, and means for turning the transverse shaft and swinging the trolley, substantially as described.

7. The combination, with the trolley arm having a transverse shaft on its lower end, of the trolley hung on the transverse shaft, contact collars on the transverse shaft adapted to connect with the motor wires, and a gear mechanism for turning the transverse shaft and swinging the trolley, substantially as described.

8. The combination, with the truck frame, of the vertically movable trolley arm mounted thereon and provided with a trolley, the oscillating shaft arranged adjacent to the trolley arm, a lever mechanism for turning the shaft, and means, as the cam and spring, for raising the trolley arm by the turning of the shaft, substantially as described.

9. The combination, with the truck frame and the vertically movable trolley arm, of the oscillating shaft adjacent to the trolley arm, means for raising the arm by the turning of the shaft, slidable brake rods opposite the shaft, brake shoes on the rods to engage the car wheels, plates carried at the inner ends of the rods, and cams on the shaft to engage the plates, substantially as described.

JOHN H. TYRRELL.

Witnesses:
WARREN B. HUTCHINSON,
C. SEDGWICK.