

No. 613,175.

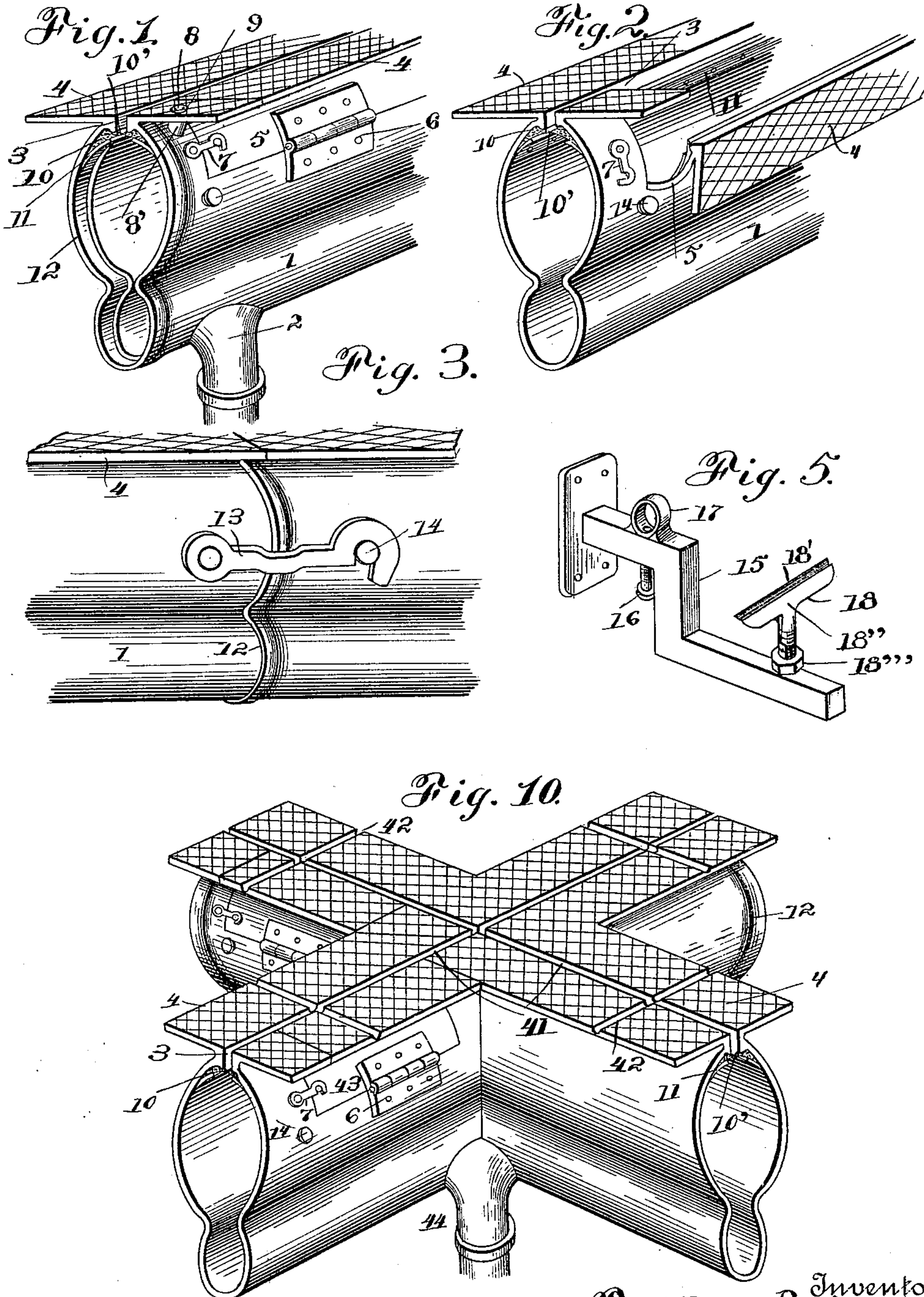
Patented Oct. 25, 1898.

F. D. ROBB.  
UNDERGROUND ELECTRIC RAILWAY SYSTEM.

(Application filed July 2, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
*L. C. Walker*  
*Victor J. Evans*

Inventor  
*Fred Duero Robb.*  
by *John Wedderburn*  
Attorney

No. 613,175.

Patented Oct. 25, 1898.

F. D. ROBB.

UNDERGROUND ELECTRIC RAILWAY SYSTEM.

(Application filed July 2, 1897.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

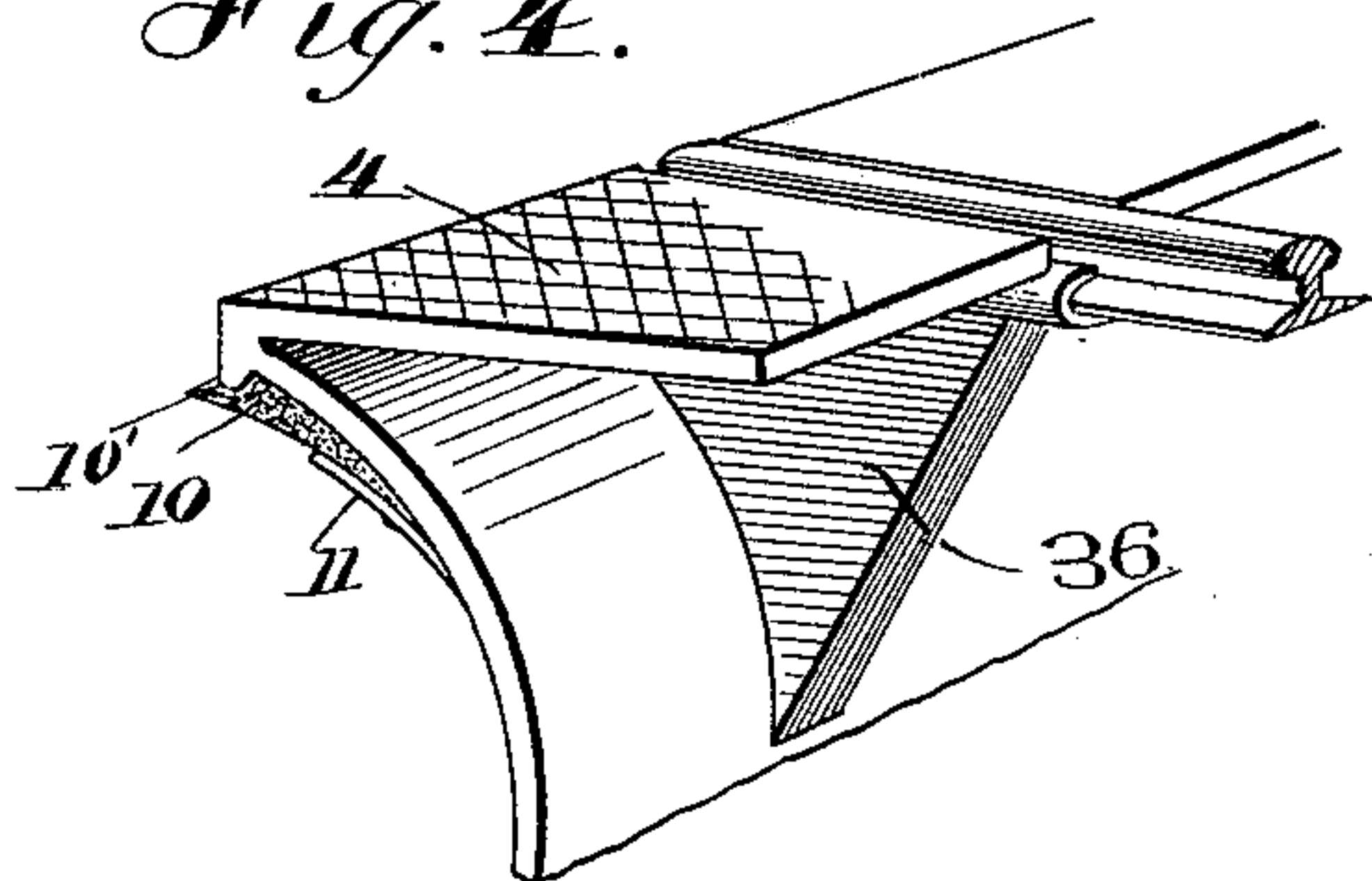


Fig. 6.

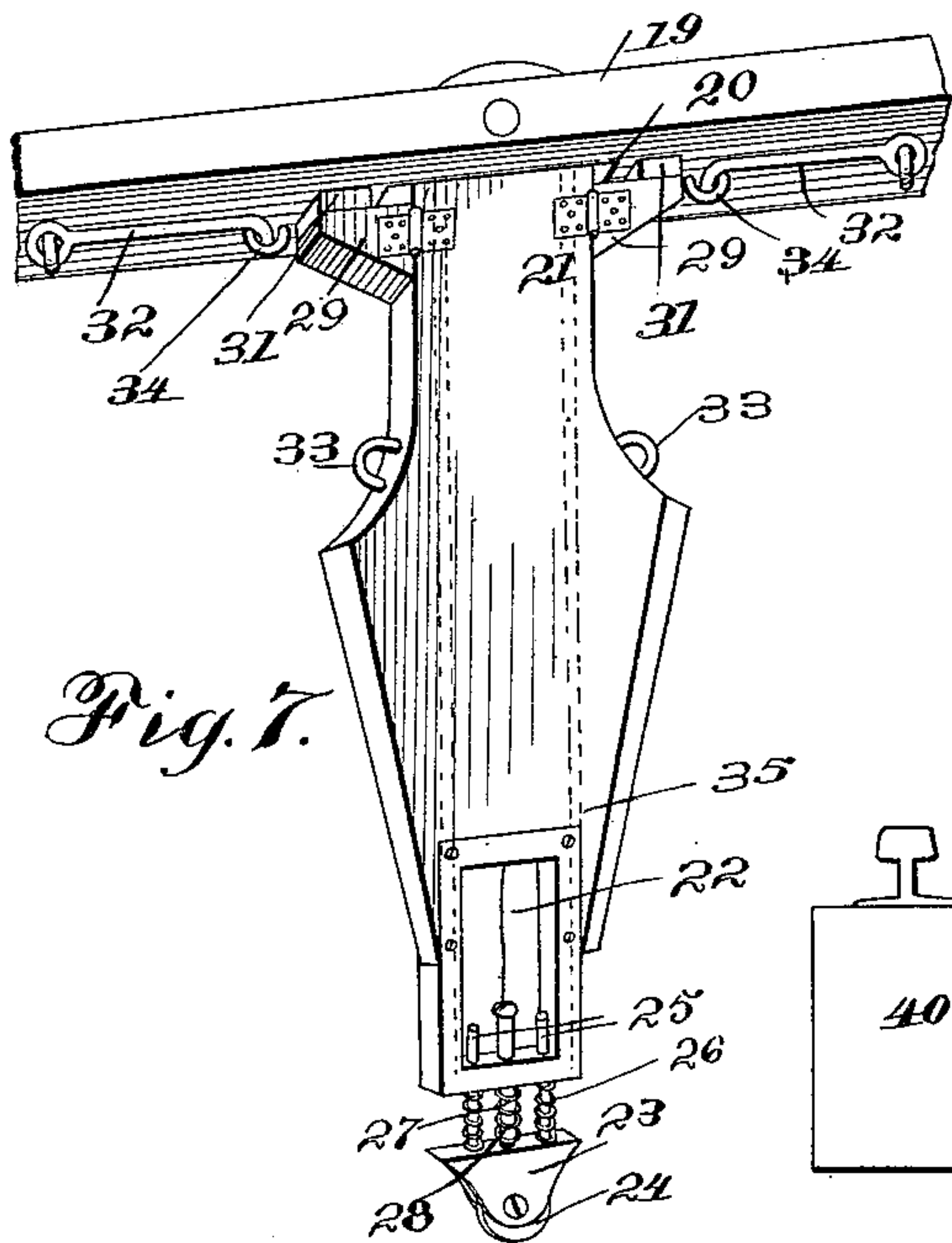
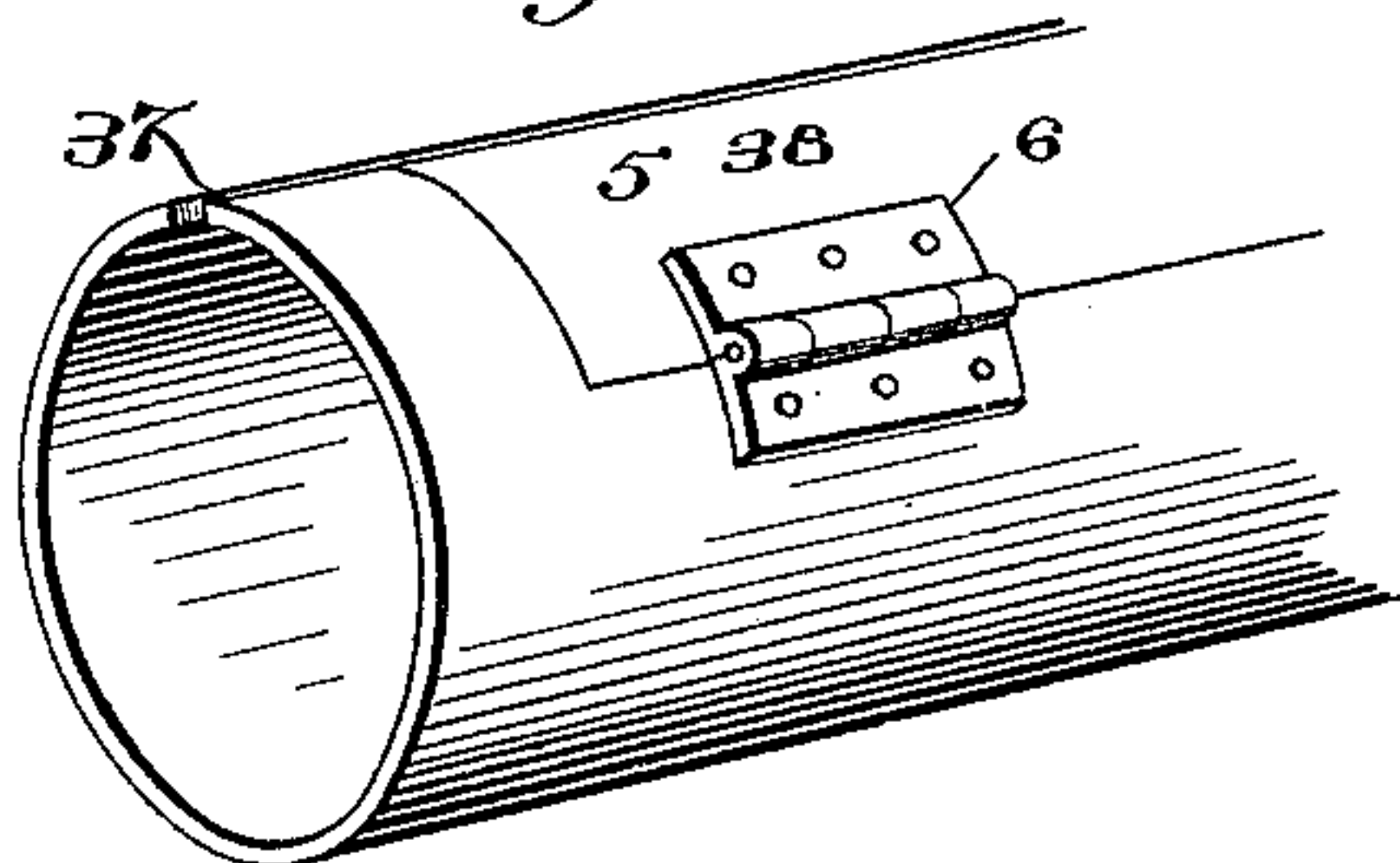


Fig. 8.

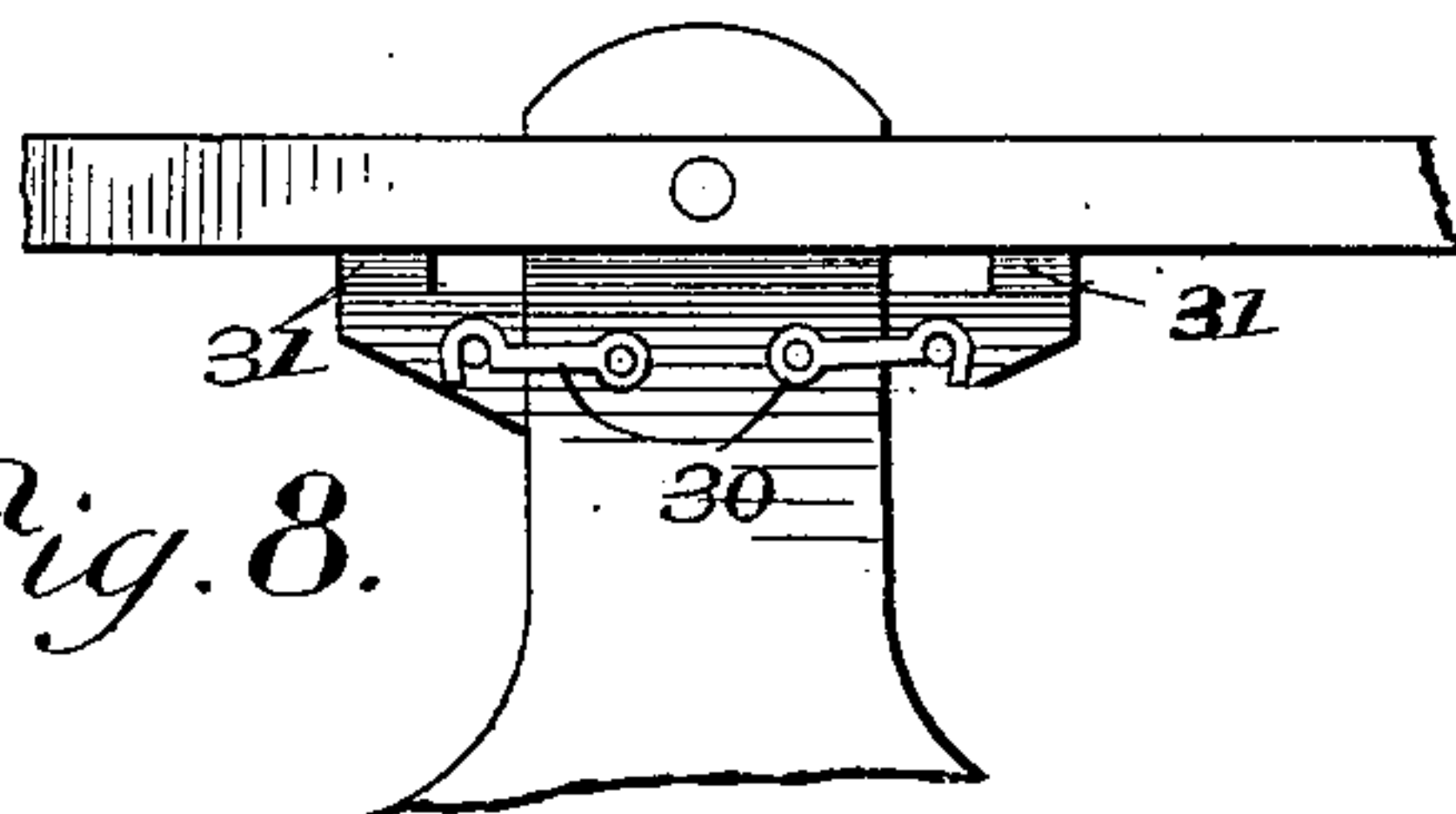


Fig. 9.

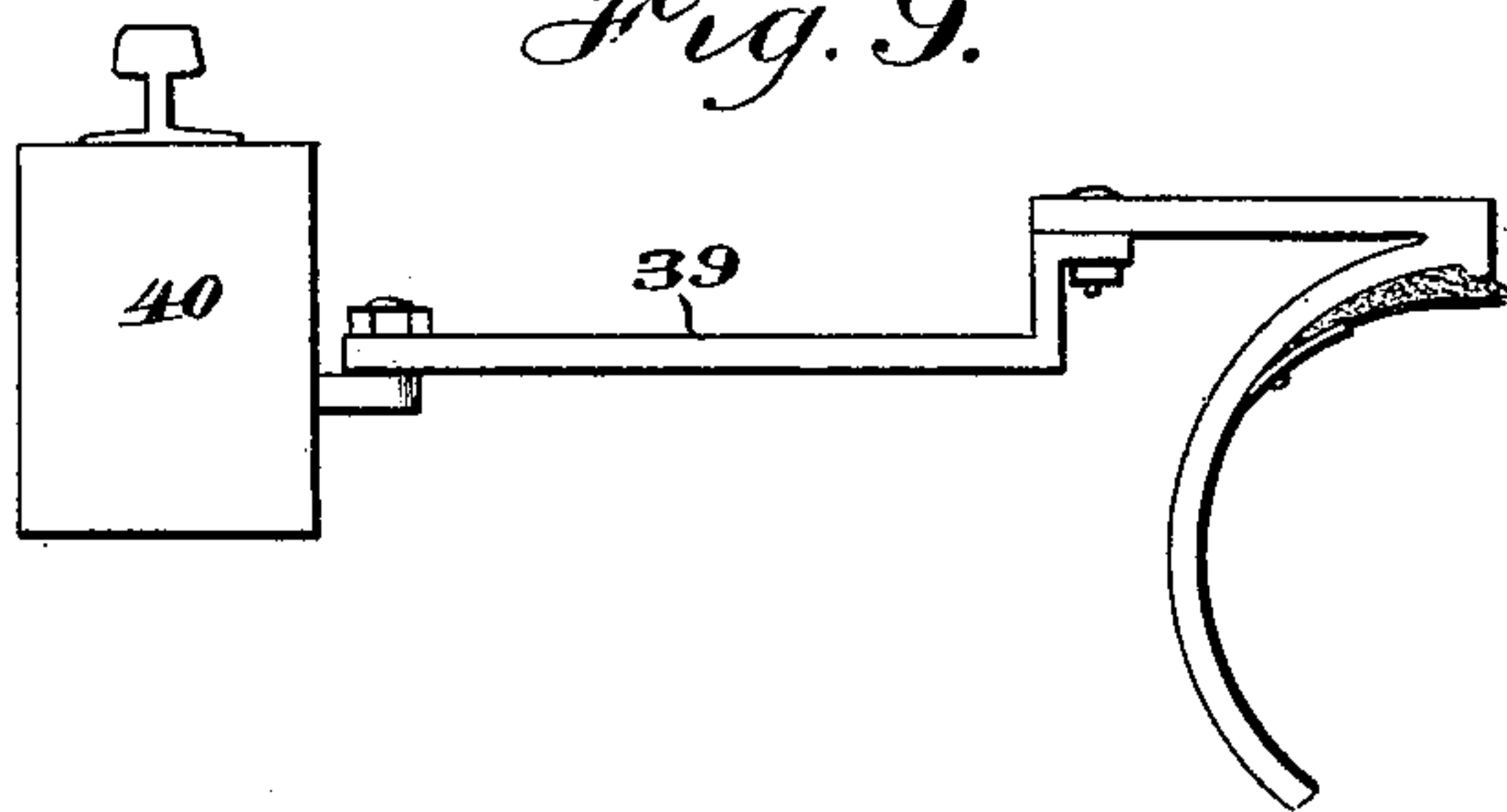
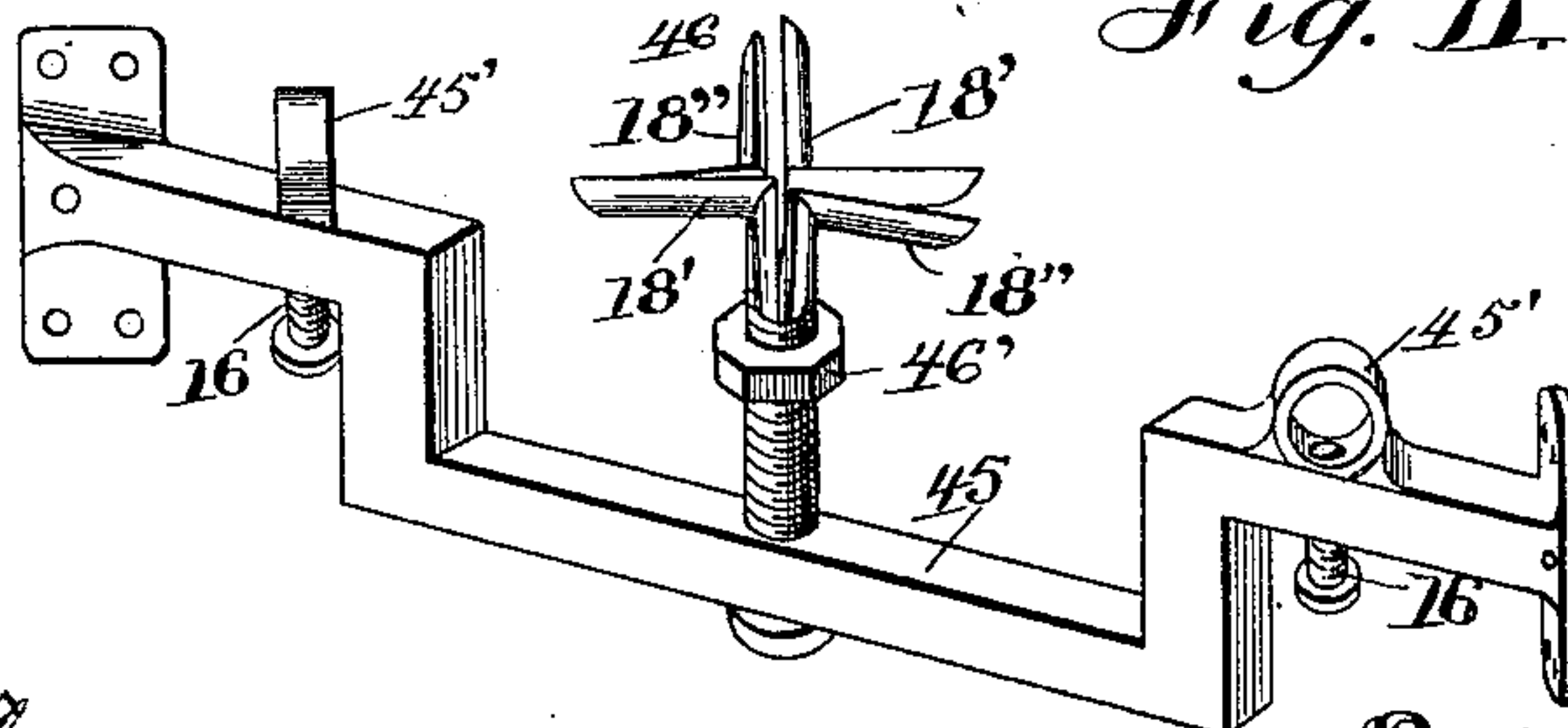


Fig. 11.



Witnesses  
*Victor J. Evans*

Inventor  
Fred Duero Robb.  
by *John Wedderburn*  
Attorney



# UNITED STATES PATENT OFFICE.

FRED DUERO ROBB, OF HOT SPRINGS, ARKANSAS.

## UNDERGROUND ELECTRIC-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 613,175, dated October 25, 1898.

Application filed July 2, 1897. Serial No. 643,266. (No model.)

*To all whom it may concern:*

Be it known that I, FRED DUERO ROBB, of Hot Springs, in the county of Garland and State of Arkansas, have invented certain new and useful Improvements in Underground Electric Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved underground electric system for street-railroads; and the object of the same is to provide an improved conduit and trolley for operating in conjunction therewith.

The invention consists in the novel features of construction hereinafter fully described, claimed, and illustrated by the accompanying drawings, in which—

Figure 1 is a perspective view of a section of my conduit. Fig. 2 is a similar view showing the hinged section or door swung downwardly for gaining access thereto. Fig. 3 is a perspective view of the meeting ends of two sections of the conduit, showing the manner of connecting the same. Fig. 4 is a section showing the construction for a railroad-crossing. Fig. 5 is a detail view of the arm for supporting the wire. Fig. 6 illustrates a section of the conduit used for car-sheds. Fig. 7 is a perspective view of the trolley. Fig. 8 is a view of the opposite side thereof. Fig. 9 shows the braces for connecting the conduit to the stringers upon which the rails are supported. Fig. 10 is a perspective view of the crossing construction of my conduit. Fig. 11 is a view of the arm used in the above construction for supporting the wires at the crossing.

The conduit is formed in sections of any desired length and is oval in cross-section, with its lower end contracted to form the drain 1, which is lined with porcelain or other similar material and connects with the sewer by a pipe 2, said pipe being large at its upper end and tapering so as to connect with the sewer-pipe, and thus the passage therethrough of the drainage is unobstructed.

The upper portion of the conduit is slotted, as illustrated at 3, and formed on each side of the slot are the horizontal plates or wings 4, which rest upon the surface of the earth and support the conduit.

5 indicates a door or swinging section, which is formed in one side of the conduit and extends to points adjacent the ends of each section, said door being hinged to the main portion by hinges 6 and secured in position by hooks 7, so that the same may be swung downwardly when it is desired to gain access to the conduit for any reason, all that is necessary being to excavate along the swinging side sufficiently to permit the same to be opened. An opening 8 is formed in the stationary section, which communicates by a pipe 8' through the wing or plate with the interior of the conduit, the same being closed by a cap 9, which may be manipulated by a suitable key, so that the same may be removed and the nozzle of a hose inserted therethrough to flood the drain.

Rubber plates 10 are secured to the under side of the conduit and beneath the slot on opposite sides thereof and are formed with lips 10', which normally close the communication through said slot to the conduit. These plates extend the entire length of the conduit and are provided with a smooth surface and secured to the conduit by vulcanized fibered strips 11. The screws which secure the same do not extend through the conduit and are provided with insulated heads. These rubber plates prevent the passage of foreign matter into the conduit and readily separate to permit the trolley to pass through the slot.

One end of each section carries a flange 12, which receives the end of the opposite section to unite said sections, sheets of fiber being provided to serve as a packing for the joint. One of the sections carries a hook 13, which engages a headed screw or projection 14 in the opposite section, so that they are held securely together, said hook being bent to extend over the connecting-flange.

15 indicates the arm for supporting the wire, which is secured to the inner side of the stationary section of the conduit and insulated therefrom, there being as many of these arms as desired. The screw 16 is provided with a ring 17 to receive the feed-wire, and the clasp 18 supports the trolley-wire. This clasp comprises a stem which is screw-threaded and formed at its upper end with the stationary jaw 18'.

18'' is a pivoted jaw which is held in engagement with the wire by the nut 18''', said



nut engaging the screw-threaded stems of the jaws.

The trolley consists of a frame or support 19, which is suitably positioned beneath the car and provided with a central opening 20 to receive the stem 21 of the trolley, said stem being balanced within said opening by a bolt which passes therethrough and pivots the stem therein. The lower portion of this stem is substantially spear shape and has the opening 22 formed therein.

23 is a casting in which the trolley-wheel 24 is journaled, said casting having the pins or rods 25, which extend through perforations in the lower wall of the opening and receive coil-springs 26 between the lower end of the stem and casting.

27 is a bolt or pin which is headed at its upper end and passes downwardly through the stem and is secured to the casting, a coil-spring 28 being positioned upon the bolt between the stem and the casting, and to this bolt is connected the wire by means of which the current is received from the trolley and conducted to the motors.

29 are blocks which are hinged on the front and rear edges of the trolley-stem, to one side thereof, and are held in position by hooks 30 on the opposite side of the stem, said blocks carrying buffers 31 upon their upper sides of flexible material. It will be understood that when these blocks are in position the trolley is held in proper position, the same being permitted a slight movement, and when they are unhooked and swung out of engagement with the under side of the trolley-frame the trolley may be raised from the slot, hooks 32 being carried by the trolley-frame for engaging staples 33 in the trolley-stem when the same is raised, so that it is held in its raised position. When these hooks are not in use, they engage staples 34 in the under side of the trolley-frame. The edges of the trolley-stem are sharpened, so that the trolley will cut through ice or other obstructions which may form in the slot of the conduit. Oil-passages 35 extend downward through the spear-point, so that oil may be inserted for lubricating the parts. This construction of trolley is very convenient, as should the motors burn out or for some reason the cars become dead on the main line all that is necessary is to unhook the buffer in the rear of the direction in which the car is going, and pull the trolley from the wire and hook it in position, so that the stem will be separated from the wire. In the figure illustrating the railroad-crossing a slot is cut in the plates of the conduit for the flanges of the wheels and a brace or bracket 36 is provided for supporting the end of the rail and also strengthening the plates.

The conduit for a car-shed is illustrated as being circular and provided with a slot 37, the horizontal plates being omitted, the conduit provided with a hinged side 38 in a manner similar to the main conduit.

The conduit is supported in proper position by the brace-rods 39, which are secured to the plate and to the stringer 40, upon which the rails are supported.

The form of crossing used is illustrated in Fig. 10 and consists of four short sections of the conduit formed integral and provided with the slots 41, having the wings thereof provided with the grooves 42 to receive the flanges of the car-wheels. These sections of the conduit are formed with the swinging portions 43, similar to the conduit-section first described. An outlet-pipe 44 communicates with the drain and with the sewer, the said pipe receiving the drainage from the four sections. For supporting the trolley-wire I provide the double supporting-arm 45, which extends diagonally from one of the sections to the other and has the clamps 45' for the feed-wires and carries at its center the trolley-wire 46, said clamps being beneath the point of intersection of the slots in the conduit-sections. This clamp is constructed similarly to the one before described, with the exception that it is provided with four jaws instead of two to receive and clamp the crossed wires, said jaws being secured by the nut 46', as in the first-described construction.

From the above description it will be seen that I have produced an improved conduit and trolley to be used in connection therewith, the conduit being so formed that access may be readily had to the same and the trolley so constructed that the same may be readily withdrawn and held out of engagement with the conduit and also effectually cut its way through ice or any obstruction which may form in the slot.

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

1. A conduit comprising a sectional casing, means for uniting the sections of the casing, each of said sections having one of the sides of the curved body portion cut out longitudinally entirely through the same below and communicating with an upper trolley-slot, and a curved hinged door adapted to close or open the space formed in said cut-out portion, substantially as described.

2. A conduit comprising a sectional casing, means for uniting said sections, each section provided with a longitudinally-extending slot at its upper portion, horizontally-extending plates formed on opposite edges of said slot, one of the curved side walls of the casing-section being cut out longitudinally entirely through below and communicating with the said slot, and a hinged door adapted to close the space formed by said cut-out portion, said door being of the same contour as the casing and carrying a portion of the horizontal plate at its upper edge to unite with the portions of the plate on opposite sides of the cut-out portion, substantially as described.

3. A conduit consisting of a sectional casing having a longitudinal slot formed in the



one side of the curved body portion thereof, below and continuous with the upper trolley-slot therein, flexible plates secured to the inner sides of the casing in the trolley-slot and adapted to normally close the latter, means for uniting said casing-sections, and doors of the same form as the body part of each casing and hinged to the latter for closing the openings therein, substantially as described.

10 4. A conduit comprising a sectional casing with an upper central trolley-slot, said casing having its lower portion contracted to form a cylindrical drain provided with a lower rounded portion, horizontally-extending plates or wings on opposite sides of the said trolley-slot having openings formed therein and extending downwardly through and into the casing and also communicating with the exterior thereof for the attachment of a hose-pipe or analogous water-supply, caps for closing said openings through the plates or wings, and means for uniting the several sections of the casing, substantially as described.

25 5. A conduit comprising a sectional casing, hooks and studs on opposite sections for uniting the same, the upper part of one side of the curved body of each section being cut out to form an opening communicating with the interior of the casing, curved hinged doors adapted to close said openings, and means for securing the doors in a closed position, substantially as described.

35 6. An electric system comprising a conduit, arms adapted to be secured therein and insulated therefrom, having rings thereon for receiving the feed-wire, clasps on the said arms for supporting the trolley-wire and each comprising a stationary jaw and a pivoted jaw, each of which is screw-threaded and engaged by a nut to hold them in clamping position, substantially as described.

7. The combination of a frame adapted to be secured to the car, a stem pivotally supported therein, stop-blocks pivotally secured to one side of the stem and adapted to be moved in line therewith, means for securing said blocks in line with the stem and abutting against the under side of the frame, and a trolley-wheel carried by said stem, substantially as described.

50 8. The combination of a frame adapted to be secured to the car, a trolley comprising a stem adapted to be pivotally secured in said frame, stop-blocks hinged to one side of said trolley and adapted to be moved in line therewith, flexible buffers carried by the upper sides of said stop-blocks and adapted to abut against the under side of the frame when the blocks are in line with the trolley-stem, means for securing said blocks in position to limit the movement of said stem, and a trolley-wheel carried by the stem, substantially as described.

65 9. A trolley comprising a stem, said stem provided with a slot, a trolley-wheel, a casting to which said wheel is journaled, pins carried by said casting and extending through perforations formed in the lower wall of the stem, coiled springs surrounding said pins, a bolt or pin extending through the lower wall of the slot and engaging the casting, said pin being headed at its upper end, and a spring coiled about said pin, substantially as described.

75 In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRED DUERO ROBB.

Witnesses:

GEO. E. CRITTENDEN,  
JAMES M. ANDERSON.