

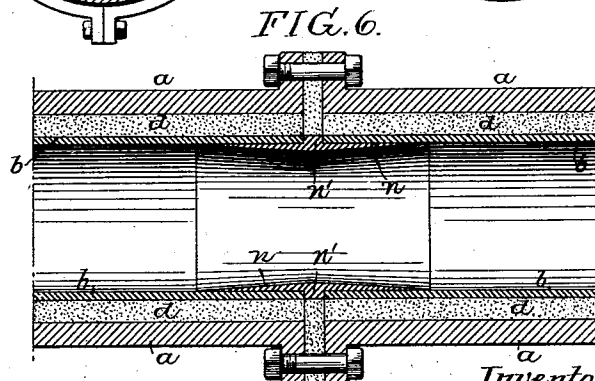
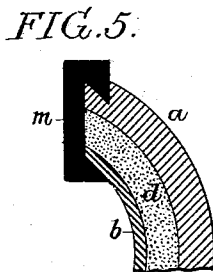
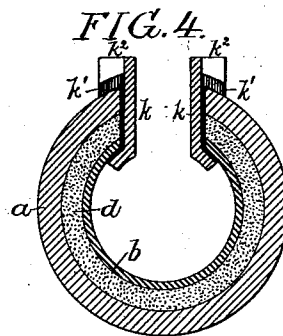
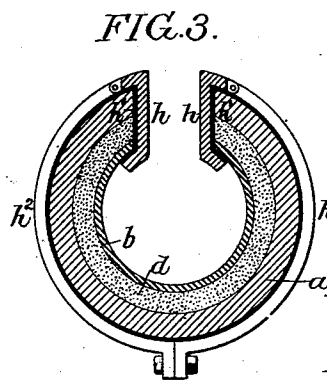
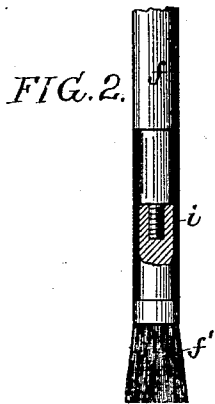
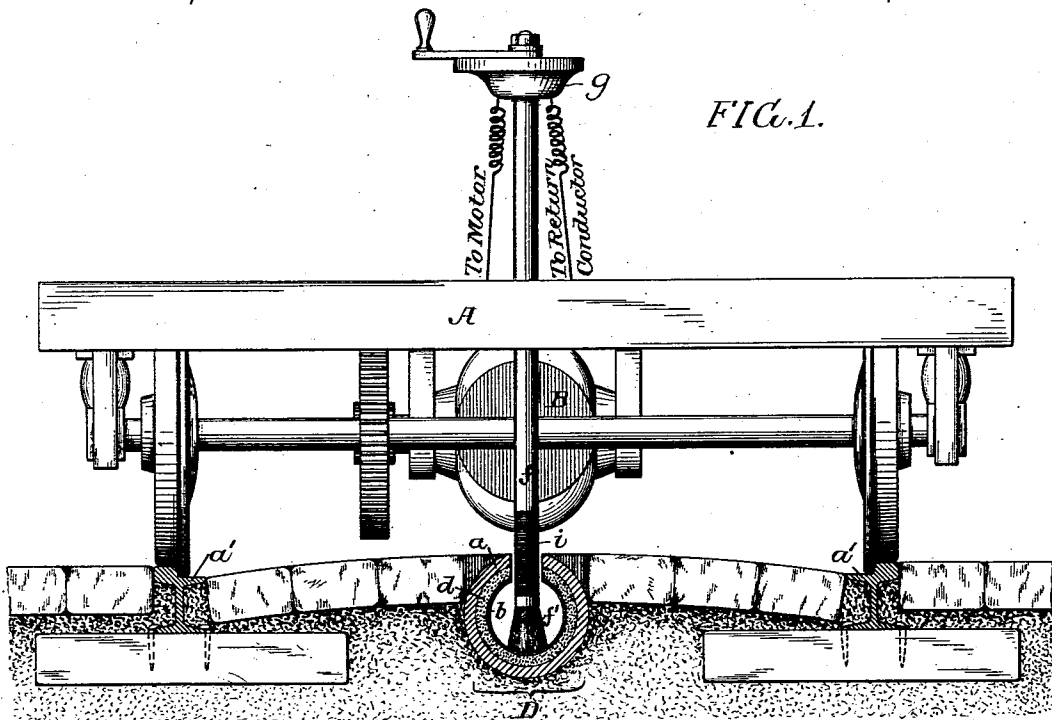
(No Model.)

2 Sheets—Sheet 1.

J. TATHAM.
ELECTRIC RAILWAY.

No. 563,094.

Patented June 30, 1896.



Witnesses:
Hamilton D. Turner
R. Schleicher.

Inventor:
James Tatham
by his Attorneys
Howson & Howson

(No Model.)

2 Sheets—Sheet 2.

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FIG. 7.

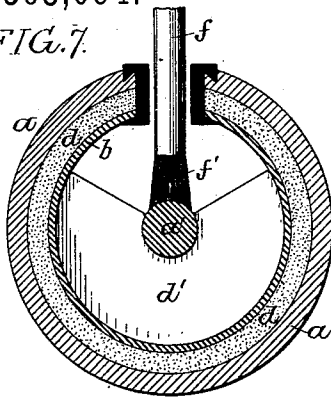


FIG. 8.

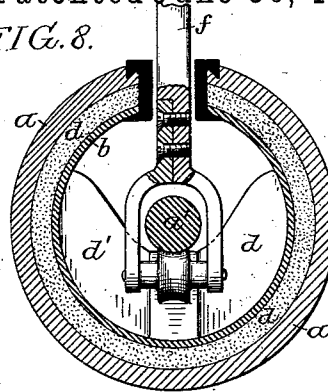
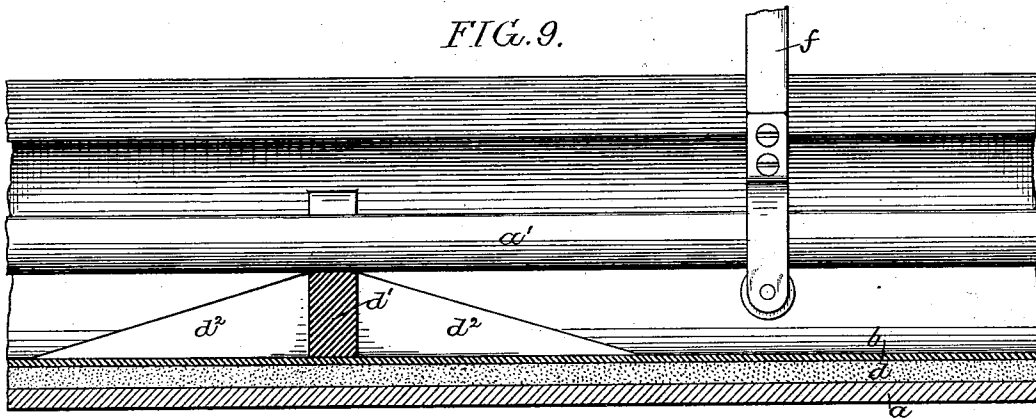


FIG. 9.



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UNITED STATES PATENT OFFICE.

JAMES TATHAM, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 563,094, dated June 30, 1896.

Application filed September 1, 1891. Serial No. 404,474. (No model.)

To all whom it may concern:

Be it known that I, JAMES TATHAM, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Electric Railways, of which the following is a specification.

My invention consists of certain improvements in electric railways involving, mainly, the use in this connection of a slotted electrical conductor-conduit such as is shown in my Patent No. 417,688, dated December 17, 1889, the special features of my present invention being so fully set forth and claimed hereinafter that special reference to them in this portion of the specification will not be necessary.

In the accompanying drawings, Figure 1 is a transverse section of part of a street-railway road-bed and truck, illustrating the use of my improved conductor-conduit in connection therewith. Fig. 2 is a view, partly in section and partly in elevation, of a portion of the conductor-rod which travels in the slot of the conduit. Figs. 3, 4, and 5 are sectional views of conduits, illustrating features of my invention. Fig. 6 is a longitudinal section of part of the conduit. Figs. 7 and 8 are transverse sections of conduits, illustrating another feature of my invention; and Fig. 9 is a longitudinal section of part of the conduit shown in Fig. 8.

It may be stated in the outset that my improved conduit or conductor is available for use either overhead, on the surface, depressed, or underground; but in Fig. 1 I have shown it as used in connection with a surface railway, of which $a' a'$ are the tracks, and A a truck running on said tracks and carrying a motor B of any suitable construction properly geared to one of the axles of the truck.

The conduit or conductor D is constructed in the same manner as that shown in the patent alluded to, and comprises an outer protecting or armoring tube a , an inner conducting-tube b , and an intervening layer d of insulating material, all of the tubes being slotted for the passage of the conductor-bar f of the car, which has at the lower end a suitable brush f' , making contact with the internal conductor b of the conduit, and is connected at the upper end with any appropriate form of switchboard g for governing

the direction of the current, either of the switches shown in my application, Serial No. 400,099, filed July 20, 1891, being available for the purpose. When the conductor is used in this way, however, it becomes necessary that the conductor-bar f , which travels in the slot of the conduit, shall be insulated from the edges of said slot, so as to prevent grounding or short-circuiting by contact of the conductor with the outer protecting or armoring tube of the conduit. A simple way of effecting this result is to provide that portion of the conductor-bar which travels in the slot of the conduit with a sleeve i , of vulcanized fiber or like insulating material, the conductor being, if desired, made in two parts, so as to be fitted together within this sleeve, as shown in Fig. 2. It may be advisable in some cases, however, to apply to the edges of the slot itself special insulated or insulating plates or bars, and in Figs. 3, 4, and 5 I have shown various methods of accomplishing this result.

In the construction shown in Fig. 3 the slot-irons h , in the form of channel-bars, embrace the edges of the slot, insulating material h' being interposed between these slot-irons and the conduit, and the irons being held in proper position by clamping-arms h^2 , connected to the slot-irons at suitable intervals, these clamping-arms embracing the conduit and being insulated therefrom and secured together beneath the same.

In the construction shown in Fig. 4 the slot-irons k are insulated from the conduit in the same manner as the slot-iron h , but are secured to the conduit by means of wedges k' of vulcanized fiber or other insulating material driven between the outer pipe a and undercut lugs or projections k^2 , projecting from the upper portions of the slot-irons, and in Fig. 5 I have shown a slot-bar m of insulating material which is self-retaining on the edge of the conduit, this bar being applied longitudinally and having such frictional hold upon the conduit as will prevent its accidental displacement, the outer tube a being, if desired, grooved adjacent to the slot for the reception of an undercut portion of the bar to prevent any inward movement of the latter.

To insure good electrical connections be-

tween the internal tubes *b* of successive sections of the conduit, I prefer to employ internal sleeves *n*, which taper from the center to opposite feather-edges, and have an external ring or collar *n'*, which is clamped between the ends of the tubes *b* when the sections of conduit are secured together.

In all of the conduits which I have thus far shown and described the inner tube *b* constitutes the electrical conductor, but this inner tube may, if desired, simply serve as a means of retaining the insulating material *d* in place, a special conductor mounted upon suitable insulating-supports in the conduit being used to convey the current.

In Fig. 7, for instance, *a'* represents such a conductor intended to be mounted upon insulating-blocks *d'* at intervals in the length of the conduit, preferably at the joints between successive sections of the conduit, so that the outer edges of the blocks may be clamped between said sections in order to hold the blocks in place.

When the brush makes contact with that face of the conductor which is adjacent to the slot, as shown in Fig. 7, the insulating-block may be such as to embrace more than one-half of the conductor, so as to prevent removal of the latter from the block, but, where the brush or current-collector runs against the under side of the conductor, as shown in Fig. 8, the conductor must be lifted from its insulating-support in order to permit this current-collector to pass the latter. Each of said supports therefore has a flaring opening for the reception of the conductor, and has on each side of the supporting portion an inclined rib *d''*, the current-collector riding on this rib and over the supporting-block, and

the conductor falling back into position on the block as soon as the current-collector has passed the same.

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

1. The combination of the slotted conduit consisting of an outer slotted tubular casing, an inner and correspondingly-slotted tubular conductor, a mass of insulating material interposed between the two, and bars or plates embracing the edges of the outer casing, inner conductor and interposed layer of insulating material at each side of the slot, said bars or plates being insulated from the outer casing, substantially as specified.

2. The combination of the conductor-conduit composed of sections, each comprising an outer pipe, an inner conductor-tube and interposed insulating material, with the splicing-sleeves having opposite internal bevels and external collars clamped between the ends of the conductor-tubes of adjoining sections of conduit, and insulating material interposed between the outer pipes at the joints substantially as specified.

3. The combination of the slotted conduit, a conductor therein, an insulating-lining within the conduit, and insulating-blocks for supporting the conductor therein, said blocks having inclined approaches for lifting the current-collector, substantially as specified.

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

JAMES TATHAM.

Witnesses:

EUGENE ELTERICH,
HARRY SMITH.