A. DEL VALLE.

TROLLEY FOR ELECTRIC CARS.

APPLICATION FILED JULY 5, 1910.

976,728.

Patented Nov. 22, 1910.

Fig. 1.

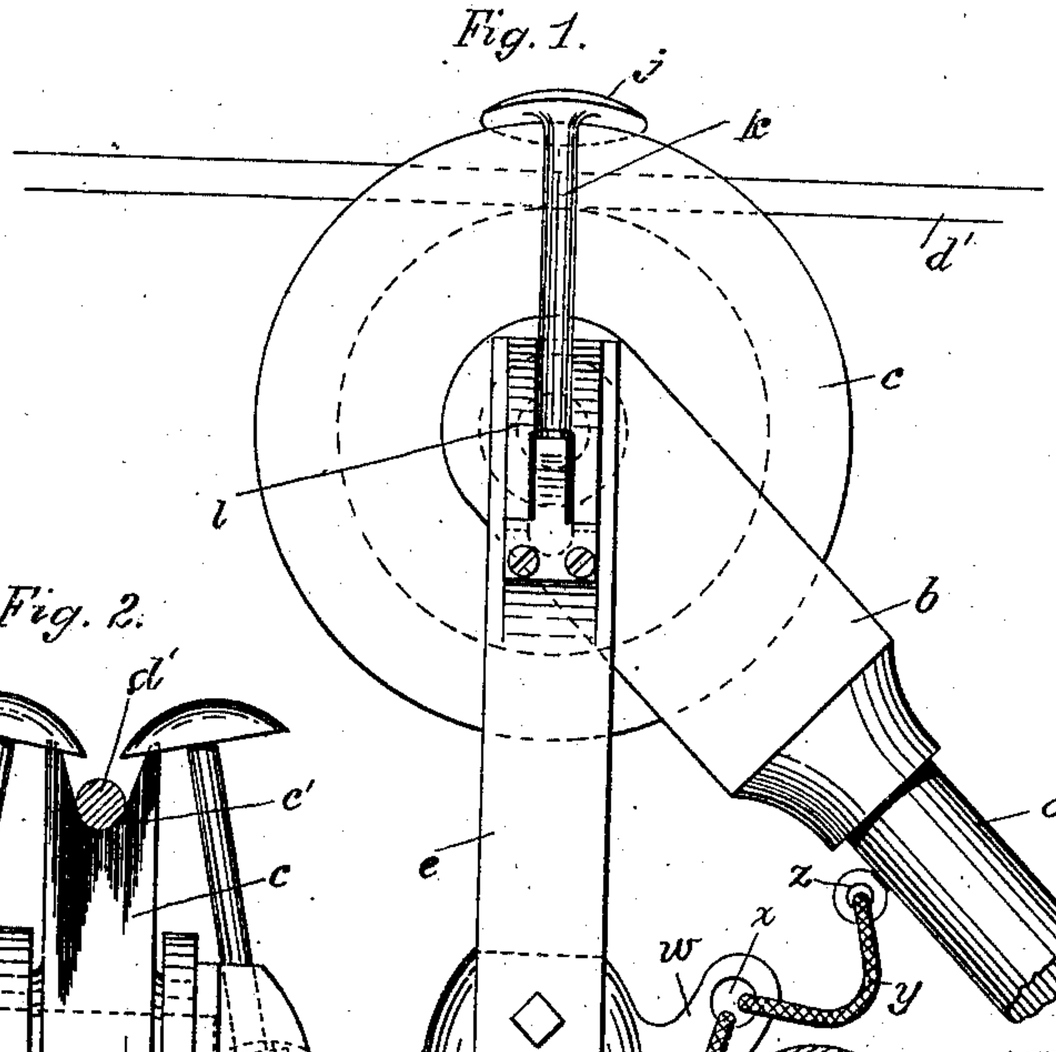


Fig. 2.

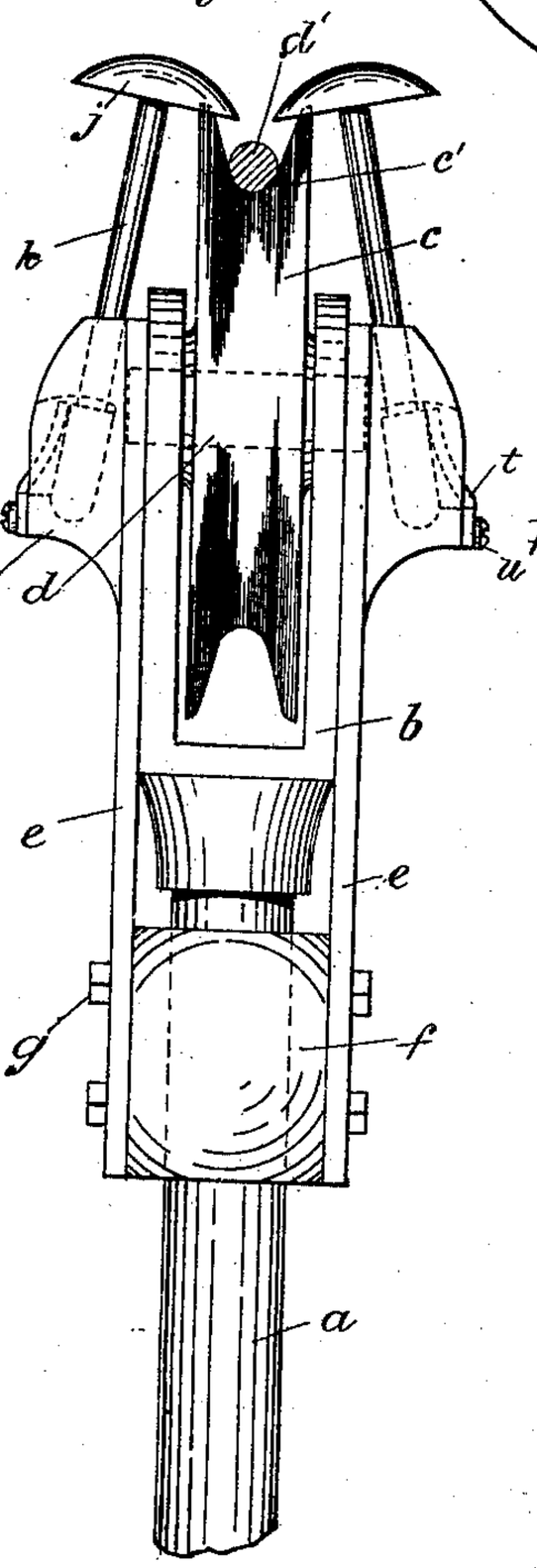
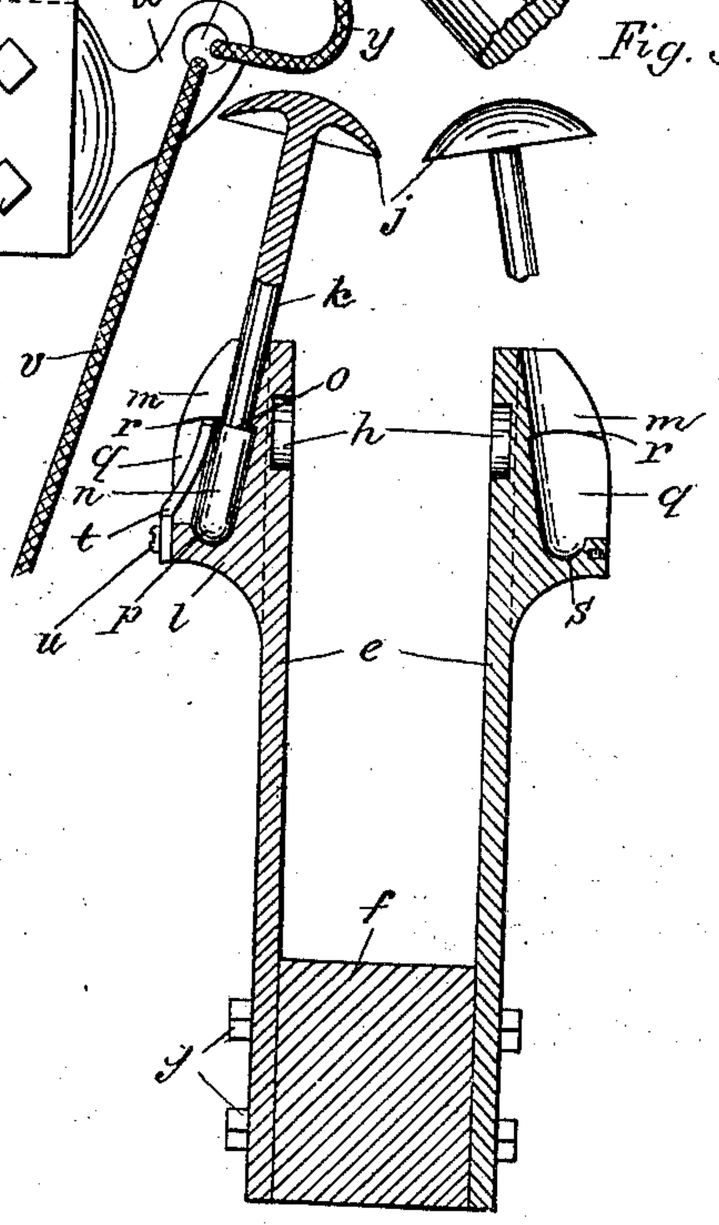


Fig. 3.



Witnesses:
E. B. Yeaton
E. P. Holstein

Armando Del Valle Inventor

By his Attorney
S. Charles Yeaton.

UNITED STATES PATENT OFFICE.

ARMANDO DEL VALLE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO CHARLES J. BENDER, OF NEW YORK, N. Y.

TROLLEY FOR ELECTRIC CARS.

976,728. Specification of Letters Patent. **Patented Nov. 22, 1910.**

Application filed July 5, 1910. Serial No. 570,319.

To all whom it may concern:

Be it known that I, ARMANDO DEL VALLE, a citizen of the United States, and a resident of the city of New York, borough of Queens, county of Queens, and State of New York, have invented certain new and useful Improvements in Trolleys for Electric Cars, of which the following is a full, clear, and exact specification.

The primary object of my invention is to provide a device for assisting the overhead wire and the wheel of the trolley in retaining their intended contact.

A secondary object is to provide a finder, which will enable an easy and quick replacement of the wheel in contact with the wire when so desired.

My invention comprises a single device adapted to accomplish both these ends; that is, the same means that are devised for retaining the proper contact between the wheel and wire is adapted to assist in replacing the two in proper contact when desired.

To attain these ends I have provided a device that is easily attachable to the trolley, is simple in construction, durable and certain of operation. It is not necessary that any particular design of trolley be used, as my device is an attachment independent of the trolley. The means employed comprise two members positioned above the trolley wheel and wire when in contact. The are so arranged that they are free to revolve in their own planes; to swing in the direction of the wire, and to spread outwardly away from the wire. By such a possibility of movements the members will adapt themselves to almost any contingency that may arise. For instance, the members will always retain their proper vertical position, irrespective of the angularity of the trolley pole. They will rotate, swing or spread outwardly as occasion requires if they accidentally come in contact with any obstruction such as a cross-wire, wire fastening or the like, and will thus easily avoid them. Were rigid members used, such contact with a cross-wire or the like would probably result in breaking the wire or injuring the device. By leaving the members free to swing in the direction of the wire, I derive a further advantage in that I am enabled to better utilize the members to assist in finding the wire when the trolley is being replaced in contact therewith.

Referring for a fuller understanding to the drawings forming part of this specification—Figure 1 is a side view of the upper end of a trolley with my device attached. Fig. 2 is a view looking from left to right in Fig. 1, and Fig. 3 is a central sectional view of my attachment.

Trolleys as used in the overhead wire system of electric railways are very free to become disconnected from the wire. This is likely to happen at any point of the road, but generally at places where two roads cross and on curves. The trolley wheel is normally retained in spring-pressed engagement with the wire from the underside thereof and when the wheel leaves the wire, it immediately shoots upward with often serious injuries to or breaking of the wires. These defects in the present methods pursued are well known and it is to improve upon this condition that my invention is directed; that is, to insure a more stable engagement of the trolley with the wire and to facilitate an easier replacement when they are disengaged.

I am aware that other inventions have been directed toward these ends. I am also aware that the placing of the retaining means above the trolley wheel and wire is not new, nor the fact that the said means is permitted to swing or rotate in their own planes or to swing to and fro in the direction of the wire to adapt them to different angularities of the trolley pole. I therefore do not claim these features broadly, but only with regard to the novel means which I employ in my device.

The trolley shown is intended to represent that usually employed. It consists of the pole *a* terminating at its free end in the fork *b*. The trolley wheel *c* is mounted to revolve within this fork upon a shaft *d* and is formed with the groove *c'* to receive the wire *d'*.

My device comprises two side members *e*—*e* made identical in all respects and therefore interchangeable. They are secured at their lower ends to a spacer *f* by means of bolts *g*. The upper ends of these members are secured one on either side of the fork *b* in any suitable manner to permit them to swing. I have preferred to continue the shaft *d* through the sides of the fork *b* and to mount my device on the extended ends thereof. To do this the sides *e*—*e* are provided with cylindrical recesses *h*—*h* for receiving the ends. Instead of the extended

ends of the shaft, lugs can be formed integral with the sides of the fork. They may be placed at any part thereof that is desired or the lugs may be formed on the side members *e*—*e* and depressions similar to the recesses *h*—*h* may be made in the fork to receive the lugs. In any event, it is necessary when in installing my device to remove at least one of the side members *e*—*e* from the spacer *f*. I have shown tap bolts for securing the sides to the spacer but through bolts may be used if desired. I have also termed the member *f* a spacer, but it also answers for a weight or load to insure the necessary amount of stability to my device. It is given the required weight to perform this function, and I have preferred to give it a somewhat spherical formation, but it could be rectangular or any other shape if desired.

In the upper parts of the side members *e*—*e* are secured the wire retainers. They each comprise a circular top *j* positioned above the trolley wheel and partly overhanging it, so that the overhanging portions serve as retainers to keep the trolley in place. For when the trolley wheel and wire would otherwise become disengaged, the overhanging parts will hold them back in proper contact.

The circular retainers *j*—*j* may be formed flat but I prefer to form the top spherical or conical. They are preferably tilted to dip slightly in the groove *c'* of the trolley wheel to make them more effective. By making them spherical or conical in form the required slant is attained at the point needed while the remainder of the retainer is brought down out of the way of the cross wire, especially at the back of the retainer. If a flat disk were used this part would be dangerously high, while in the retainer shown the back is brought down considerably below the center. This form is especially well adapted to facilitate an easy passing of the trolley where two wires cross as at intervening roads. The uniformly sloping or receding surface permits the retainer to gradually come in contact with and gradually to leave such a cross-wire or other overhead obstructions while otherwise it might strike them and cause serious damage. The retainer is preferably hollow on the underside which permits it to set more closely to the trolley wheel to make it more effective as clearly shown in Figs. 1 and 2. The retainer is secured to a stem *k*. It is preferably made integral therewith for then there need be no securing means and the top of the retainer may be made smooth as shown. When the parts are formed integral it is preferable to gradually increase the thickness of the retainer from the periphery toward the center as shown in the drawings. The stems *k* are mounted to revolve. It is therefore necessary in order to give the retainers the proper revolving motion that the stems spread out at the bottom as shown in Figs. 2 and 3. The stems are also mounted to permit the retainers to be spread apart if occasion requires. To secure such movements I mount the stems in the following manner. On each of the side members *e*—*e* I provide an extension *l*. A recess *m* is formed in each extension for receiving its respective stem. The recess is open at front and top and is of a width equal to the thickness of the stem. Its back wall slants to give the stem the required slant and is preferably semi-cylindrical to afford a good rest for the stem. To prevent the stem from being lifted upward out of the recess (which would destroy the effectiveness of the retainer) the lower end *n* is increased in diameter forming the shoulder *o*. The foot *p* is formed spherical to enable the stem to revolve and at the same time to swing outward at the top. The lower portion *q* of the recess *m* is correspondingly increased in diameter to receive the enlarged end of the stem. This forms a shoulder *r* which coacts with the shoulder of the stem to retain the stem against upward raising. The bottom of the recess is provided with the spherical socket *s* to receive the end of the stem. It is obvious that a stem can be easily inserted within the recess by first placing the foot in the socket *s* and then swinging the remainder of the stem within the recess; the shoulder *r* is given a slight curvature for this purpose. To retain the stem in its place in the recess and at the same time to permit the retainer to be forced outward when occasion requires the flat spring *t* is provided. This is secured to the face of the extensions by means of screws *u* and is contracted to fit within the recess. Its free end presses against the stem to retain it normally in the position shown in the drawings but permitting it to be forced out at the top when desired.

My device as thus described will serve both as a wire retainer and also as a wire finder. The formation of the upper surfaces of the retainers and the manner of tilting them aid in finding the wire to reëngage the trolley wheel therewith.

In order to expeditiously remove the trolley from the wire when desired, the retainers must be moved from their normal positions. This could be done by spreading them apart to a suitable amount, but I prefer the method shown in Fig. 1.

The controlling cord *v* which leads to the back of the car to be operated by the conductor is secured at its upper end to my device. To obtain the proper swinging I provide an arm *w* extending from the spacer toward the pole for a suitable distance, and provided with a hole *x* in which is secured the end of the rope. When the rope is

pulled to lower the trolley pole my device is so swung that the retainers at the top move downward and in the direction of motion of the car. They will thus easily pass the wire. If they touch the wire the angularity at which they are swung will cause them to revolve if necessary and also to spread out. When this is accomplished I prefer to have another rope *y* to arrest any further swinging motion of the device. One end of this rope is secured to the arm *w* and the other end is secured to the trolley pole as by a ring *z*. The rope *y* is slack when the device is in normal position and becomes taut when the retainers have passed the wire. Further pulling on the controlling rope acts directly on the pole to lower it. Sufficient slack must be given the rope *y* to allow the trolley pole to assume the different degrees of angularity necessary without affecting the perpendicularity of the retainers. The retainers when swung to remove the trolley wheel from the wire are held in that position so long as the controlling cord is held taut and in this position the retainers are best suited as finders when the trolley is replaced.

Having thus described my invention I claim—

1. In combination with a trolley having a wheel pinned to revolve within a forked end of the trolley pole, a contact retainer comprising two sides pivoted near their upper ends to the fork of the trolley to swing in the plane of the trolley wheel, a weight secured between the sides near the lower ends to space said sides and insure stability, and retainers positioned above the trolley wheel having stems mounted to revolve in the side members and to spread outwardly.

2. In combination with a trolley having a wheel pinned to revolve within a forked end of the trolley pole, a contact retainer comprising two sides pivoted near their upper ends to the fork of the trolley to swing in the plane of the trolley wheel, a weight secured between the sides near their lower ends to space said sides and insure stability, retainers positioned above the trolley wheel, stems extending from the lower sides of the retainers, receptacles formed in the side members for receiving the stems to permit them to revolve and swing outwardly and springs pressing against the stems to retain them normally in position to assist continuous contact of the trolley wheel with the wire.

3. In combination with a trolley having a wheel pinned to revolve within a forked end of the trolley pole, a contact retainer comprising two sides pivoted near their upper ends to the fork of the trolley to swing in the plane of the trolley wheel, a weight secured between the sides near their lower ends to space said ends and insure stability, circular retainers having convex upper surfaces and concave lower surfaces positioned above the trolley wheel, stems extending from the lower sides of the retainers having enlarged lower ends convex at the bottoms, receptacles formed in the side members open at the top and front and having enlarged lower parts concave at the bottoms for receiving the stems to permit them to revolve and swing outwardly and springs pressing against the stems to retain them normally in position to assist continuous contact of the trolley wheel with the wire.

4. In combination with a trolley having a wheel pinned to revolve within a forked end of the trolley pole, a contact retainer comprising two sides mounted near their upper ends on extended ends of the trolley wheel pin to swing in the plane of the trolley wheel, a weight secured between the sides near their lower ends to space said sides and insure stability, circular retainers having convex upper surfaces and concave lower surfaces positioned above and inclined toward the trolley wheel, stems extending from the lower sides of the retainers having enlarged lower ends convex at the bottoms, receptacles formed in the side members open at the top and the front and having enlarged lower parts concave at the bottoms for receiving the stems to permit them to revolve and swing outwardly but locked against upward displacement, springs secured to the front of the receptacles and having free ends extending in the open fronts of the receptacles and pressing against the stems to retain them normally in position to assist continuous contact of the trolley wheel with the wire, a controlling cord secured at one end to the lower part of the contact retainer and having its other end free to be pulled by the operator to swing the upper part of the contact retainer forward when disengaging or engaging the trolley and wire, and a stop cord having one end secured to the contact retainer and the other end secured to the trolley pole to limit the swinging of the contact retainer.

ARMANDO DEL VALLE.

Witnesses:
JOHN NOLL,
WILLIAM KLEIN.