(No Model.)

E. D. PRIEST.

TROLLEY.

No. 567,411. Patented Sept. 8, 1896.

FIG. 1.

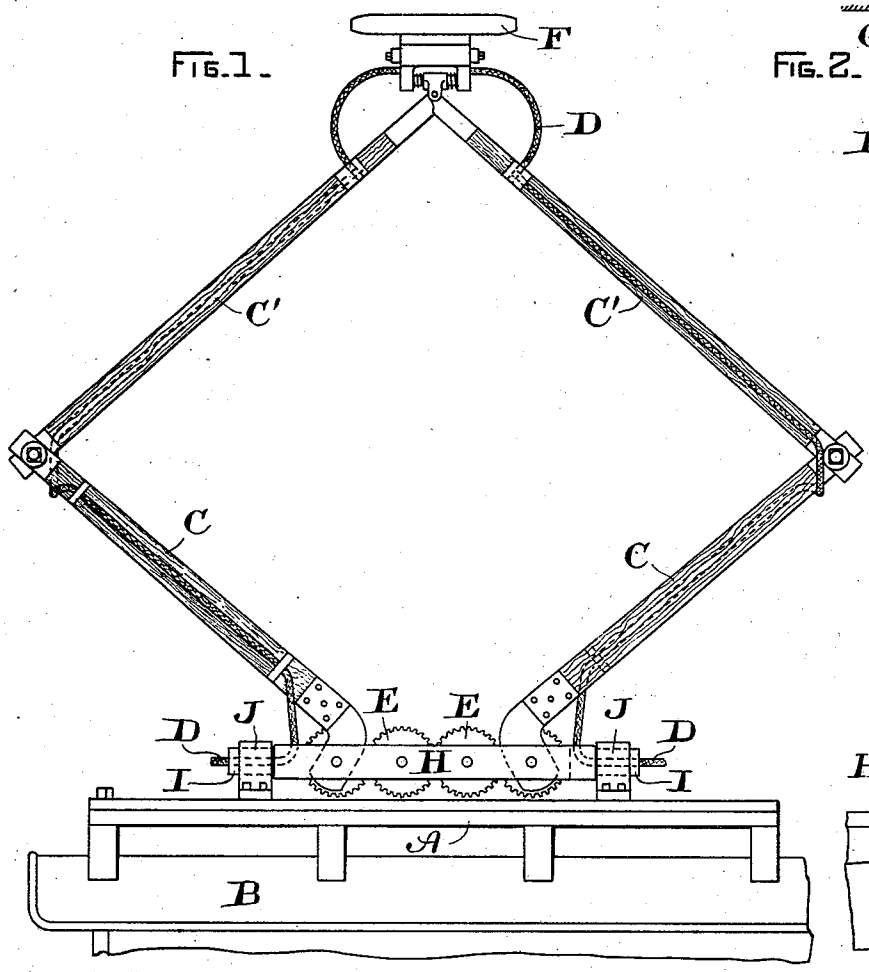

FIG. 2.

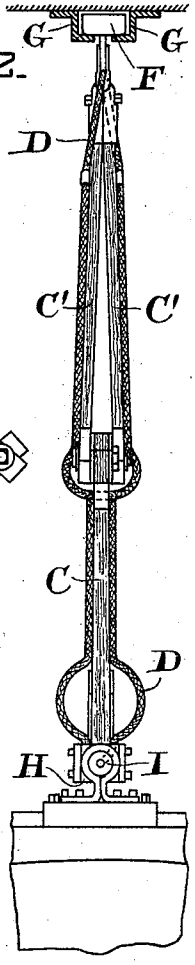

FIG. 3.

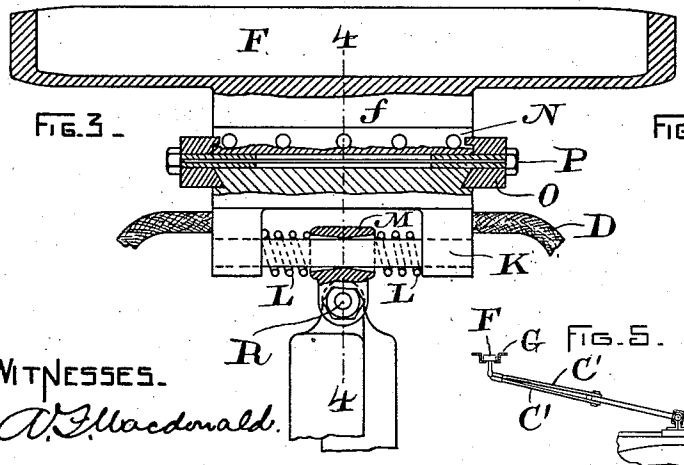

FIG. 4.

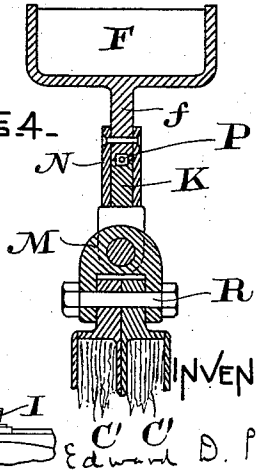

FIG. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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TROLLEY.

SPECIFICATION forming part of Letters Patent No. 567,411, dated September 8, 1896.

Application filed May 13, 1896. Serial No. 591,316. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. PRIEST, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Trolleys, (Case No. 226,) of which the following is a specification.

The present invention relates to electric railways, and has for one of its objects to provide a trolley structure in which the contact device is supported by the overhead conductor, and also to provide a positive mechanical connection between the contact device and the locomotive which will maintain the contact device in the same position with respect to the longitudinal dimension of the locomotive at all times, while permitting the contact to move freely in a vertical or horizontal direction, or a combination of both.

The invention also has for its object to do away with the springs which are ordinarily used to hold the contact device in engagement with the conductor.

The invention further provides means for permitting the contact device or shoe to separate from the locomotive, if any obstruction occurs to the passage of the shoe on the trolley, without destroying the apparatus.

In carrying out the invention an overhead conductor is provided, composed of two Z-bars arranged so that two of the flanges are secured to a support or supports and the other two flanges forming a support for the contact device. Although the Z-bar construction of trolley is shown and described, there is nothing in my invention to limit it to this. Any construction may be employed which will support the contact device or shoe and permit it to travel freely thereon.

Extending between the contact device and the locomotive is a system of arms forming a lazy-tongs construction. These are supported on a base which moves freely around a center in a direction transverse to the movement of the locomotive. The ends of the arms nearest the locomotive are secured to gears, and between these gears are idlers which are so arranged that equal angular movements in a vertical direction are imparted to the arms.

The contact device or shoe is adapted to travel on the lower flanges of the Z-bars, and between the shoe and the lazy-tongs system of arms or levers is a mechanical connection, weaker than the balance of the construction, consisting of a bolt which is so arranged that under a predetermined strain it will break, permitting the parts to separate without injury to the trolley mechanism, excepting the bolt, which is easily replaced.

In the accompanying drawings, attached to and made a part of this specification, Figure 1 is a side elevation of a trolley embodying my invention. Fig. 2 is an end elevation. Fig. 3 is a sectional view of the contact device or shoe. Fig. 4 is a section on the line 4 4 of Fig. 3, and Fig. 5 is a diagrammatic view.

Mounted on the top of the locomotive-cab B is a support A, to which the trolley is secured. The trolley is provided with a base H, composed of two side pieces, which form a support for the arms C C of the trolley and the gears E E. The latter are so arranged that a movement of one of the arms C imparts a corresponding movement to the other. In a structure of this kind the size and weight of the parts make it necessary to separate the arms C C at the base, so that the intermediate gears E E or some equivalent device becomes an important feature. The ends of the base H are provided with circular projections I, which are mounted in suitable bearings J, secured to the support A. The cables D in going from the arms C C to the cab pass through the center of the circular projections I.

Connected by swivel-joints to the arms C C are the arms C′ C′. These are pivotally secured at R to the casting M, which is provided with a hole slightly tapered toward its extremities to permit the shoe F to rock with respect to the arms C C′, the latter forming a lazy-tongs connection with the base, which is secured to the cab-roof.

The contact device or shoe F is made of cast metal in the form of an oblong box with the top missing, having slightly-upturned ends to enable it to ride over any irregularities in the trolley-conductor G and cored out to reduce the weight. The width of the shoe is such that the sides will rub on one vertical flange or the other of the two Z-bars G, which

form the conductor. This protects the downwardly-extending lug *f* from wear; otherwise this, being thin, would soon become worn and break, and a new shoe would be required. The lug *f* is provided with small notches on both ends, and in these notches are secured pieces O by means of a bolt P. This bolt has a cross-section of comparatively small dimensions, as it is intended to break and allow the shoe and its connecting-levers to separate when an obstruction occurs to the passage of the shoe F. The casting K is provided at its upper end with notches receiving the pieces O. Projecting downward from K are two lugs forming a support for the rod on which the piece M is adapted to slide. Between these lugs and the casting M are buffer-springs L L, which relieve the trolley-support from any sudden shock. To prevent the lateral separation of the parts *f* and K, side plates N are provided, which are riveted or otherwise secured to the lug *f*. When the bolt P breaks, these permit the casting K to slide in the direction of travel of the locomotive. Cables D D, running down the arms C′ C, are employed to carry the current from the shoe to the cab. Preferably one cable is arranged to be carried by each pair of arms.

Referring to Fig. 2, the relation of the contact device F and the Z-bars G G will be seen. The width of the slot between the bars G G is such that the side of the shoe F will engage with the vertical web of the Z-bars before the projection *f* will engage with the lower horizontal portion. In practice the shoe travels from side to side and collects current from the vertical portions of G whenever it is in engagement therewith; but the lower portion of the shoe is relied on for contact purposes. When the current-carrying capacity of one shoe is not sufficient, a second shoe is placed in the slot and connected in multiple with the first, the same arrangement of connection between the shoes and the cab being maintained as before.

In Fig. 5 is shown a diagrammatic view of the trolley, illustrating the condition under which it works at times, the conductor G being very near the level of the top of the cab and to the extreme left of the center. The bearings between the shoe F and the arms C′ C′ and the bearing-piece I and the base permit a very wide range of movement, and it will readily be seen that any intermediate movement can be obtained either on one side or the other.

The entire absence of springs for operating the lazy-tongs device is a prominent feature in this construction and one possessing many advantages, for it does away with a large number of parts and lessens the trouble and expense of maintenance.

The weight of the arms, &c., would be carried largely by the shoe F. This tends to preserve the contact between the shoe and the trolley G at all times, and the mechanical connection between the shoe and the cab is such that the shoe is always maintained in the same position with respect to the longitudinal dimension of the locomotive.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric railway, the combination of a vehicle, an overhead conductor, a contact device carried thereby, a lazy-tongs connection between the contact device and the vehicle, gears mounted on the base and secured to the lazy-tongs, and intermediate gears for imparting corresponding movements to the arms.

2. In a trolley, the combination of lazy-tongs between a sliding contact device and the base, buffer-springs between the contact device and the lazy-tongs, gears secured to the ends of the arms, gearing between the gears, and a base supporting the gears adapted to rotate in a direction transverse to the longitudinal dimension of the vehicle.

3. In a trolley, the combination of a contact device provided with an extension *f*, pieces O secured by a breaking connection P, plates N situated on both sides of the extension *f* for preventing the lateral displacement of the casting K, and a piece M secured to the mechanical connection from the vehicle provided with means for permitting a motion of the shoe independent of the mechanical connection.

4. In an electric railway, the combination of a vehicle, an overhead conductor, a contact device supported thereby, arms extending between the contact device and the vehicle, and a piece pivotally secured to the contact device and the arms, permitting movement between them.

5. In an electric railway, the combination of a vehicle, an overhead conductor, a contact device supported thereby, a rod supported by the contact device, a piece mounted to slide on the rod, metal caps secured to the ends of the insulating-arms which extend between the contact and the vehicle, and a means for securing the caps to the sliding piece.

6. In an electric railway, the combination of an overhead conductor, a contact-shoe adapted to slide thereon, a joint permitting universal movement between the contact and arms which form a mechanical connection between it and a vehicle, a base secured to the vehicle, and a pivotal joint between the base and the arms.

In witness whereof I have hereunto set my hand this 11th day of May, 1896.

EDWARD D. PRIEST.

Witnesses:
B. B. HULL,
A. F. MACDONALD.