(No Model.)

S. H. SHORT.

TROLLEY.

No. 457,378. Patented Aug. 11, 1891.

Fig. 1.

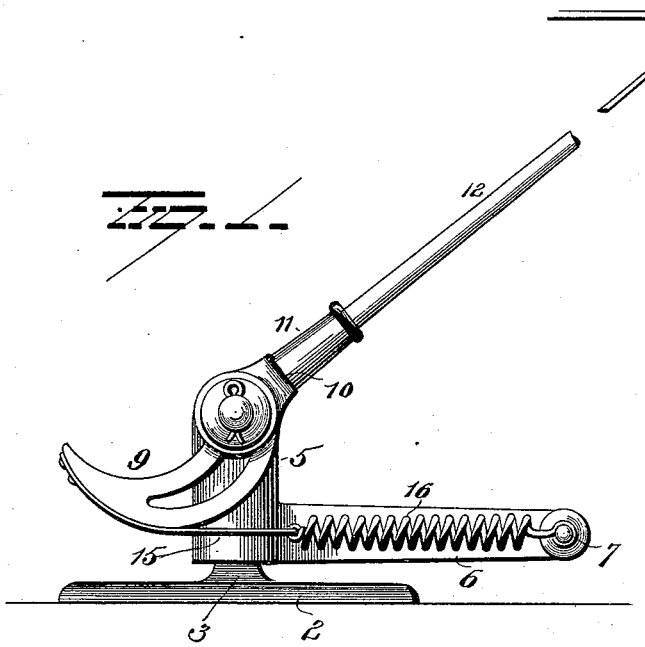


Fig. 3.

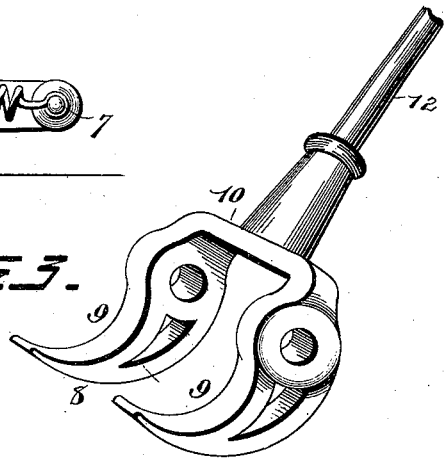
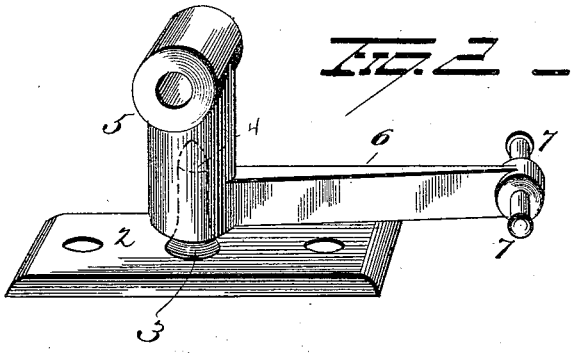


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO, ASSIGNOR TO THE SHORT ELECTRIC RAILWAY COMPANY, OF SAME PLACE.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 457,378, dated August 11, 1891.

Application filed March 26, 1890. Serial No. 345,424. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Trolleys; 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.

My invention relates to improvements in trolleys for electric railways, the same being more especially adapted for use in connection with such electric railways in which an overhead line conductor is arranged parallel to and extending along the line of travel, although the invention is also applicable to electric railways in which the line conductor is placed in an underground conduit or in which one or both rails are used as line conductors. In either case, and more especially in the case of overhead and underground conductors, the electric current for actuating the electric motor on the car is taken from the line conductor to the car by means of a trolley-arm carried by the car and carrying at its free end a traveling contact or collector, which may be either a wheel or a sliding shoe or brush. It is important that the contact of the collector with the line conductor be uniform—that is to say, that it be held against the line conductor with uniform pressure—and it is evident that such uniformity of pressure should be maintained automatically, and it is the object of my invention to secure such uniformity of contact-pressure, and I accomplish this result by the means which are set forth in the following detailed description, in which reference is made to the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved trolley as applied to an electric railway using an overhead line conductor. Fig. 2 represents a perspective view of the swiveled trolley-support, and Fig. 3 a like view of the equalizing-cam for the trolley.

Like numerals of reference indicate like parts in all the figures of the drawings.

Upon the roof 1 of the car, or at any other suitable point of the same, is mounted a base-plate 2, from the middle of which rises a post 3, terminating in a swivel-pin 4, (shown in dotted lines in Fig. 2,) and upon this swivel-pin is pivoted a block 5, from one side of which at the lower end extends at right angles thereto an arm 6, in the free end of which is fixed a pin 7, projecting to both sides of said arm.

To the upper end of the block 5 is pivoted a cam-frame 8, the same consisting of two cams 9 9, connected at one end by a web 10, from which extends at right angles thereto a socketed arm 11, and in the socket of said arm is inserted the trolley-arm 12, which at its upper end carries the collector wheel or brush 13, which, by means presently to be described, bears on the under side of the overhead conductor 14.

By reference to Figs. 2 and 3 it will be seen that the two cams 9 being parallel to each other the cam-frame may be slipped over the end of the block 5 and a pintle passed through the two enlarged ends of the cams and through the block 5 into holes provided for this purpose, when the inner sides of the cams will loosely fit against the parallel faces of the block 5, so that the cam-frame, with the trolley-arm supported thereby, may be swung in a vertical plane upon the block 5 and horizontally with the block 5 upon the swivel-pin 4. To the forward end of each cam is secured a strap or chain 15, which runs back over the cam-face and is secured with its other end to one end of a helical spring 16, the other end of which is in its turn secured to the pin 7, fixed at the free end of the arm 6. These two springs are adjusted to exert a suitable pull upon the cam-frame, whereby the latter, with the trolley-arm connected therewith, will turn about its pivot and the contact wheel or brush 13 will make the required contact with the line conductor 14. This contact, as has been stated above, should be uniform under all circumstances, and the cams 9 are designed for this purpose.

It will be noticed that when the trolley-arm moves upward the leverage of the cam-frame is increased, and at the same time the springs 16, being partially relaxed, exert less power upon the cam-frame and trolley, and if the cam-faces are shaped with the proper pitch the variation of leverage will exactly com-

pensate for the variation of the tensions of the springs.

In accordance with my invention the cams 9 are shaped to such pitch that as the straps or chains 15 embrace more or less of the cam-faces the leverage of each cam will vary inversely as the variation of the tension of the springs 16 which accompanies such change, and I thereby secure at all times a uniform contact-pressure of the trolley wheel or brush upon the line conductor.

While I have described and shown the trolley-arm secured to a frame formed with two parallel cams with a separate spring acting through the medium of a strap or chain for each cam, it will be clear that the trolley-arm may terminate in a single cam, which may be pivoted to the block 5 on one side thereof. It will also be clear that I am not confined to the use of the identical details of construction herein shown and described, since the same may be greatly varied without in any way or manner deviating from the fundamental idea of my invention.

It will be observed that the cylindrical vertical bearing in the block or sleeve 5 for the reception of the swivel-pin 3 extends only partly through the block, and the swivel-pin, being of greater length than its bearing, serves to support the block above and free from the base-plate 2. By means of this construction the bearing for the cams may be located directly above the swiveled pin. The swiveled block, being wholly supported by the swivel-pin, insures a good and protected electrical contact between the pin and block and constitutes an exceedingly simple and efficient bearing for the trolley-pole.

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

1. The combination, with a base, a swivel-pin thereon, and a block having a vertical socket in its lower end adapted to receive the swivel-pin, and a horizontal bearing located directly above the upper end of said socket, the said block being mounted on and supported by the upper end of said pin, of an arm mounted on said bearing and carrying at its upper end a contact wheel or brush and connected at its lower end at a point below its axis with a spring, substantially as set forth.

2. The combination, with a base, a swivel-pin thereon, and a block having a socket for the reception of the swivel-pin, a horizontal bearing located directly above the top of the socket, and an arm located at right angles to and projecting from said block, the said block being mounted on and supported by the upper end of said pin, of an arm carried by the horizontal bearing and provided at its upper end with a contact wheel or brush, and a spring connected at one end to the arm projecting from the block and at its opposite end to the arm carried on the horizontal bearing, substantially as set forth.

3. The combination, with a base-plate provided with a vertical swivel-pin and a socket constructed with a vertical bearing closed at its top, said bearing being of less length than that of the swivel-pin, whereby the socket is wholly supported by the upper end of the swivel-pin and out of contact with the base-plate, of an arm or pole pivotally connected with the socket and provided at its free end with a trolley, substantially as set forth.

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

SIDNEY H. SHORT.

Witnesses:
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