

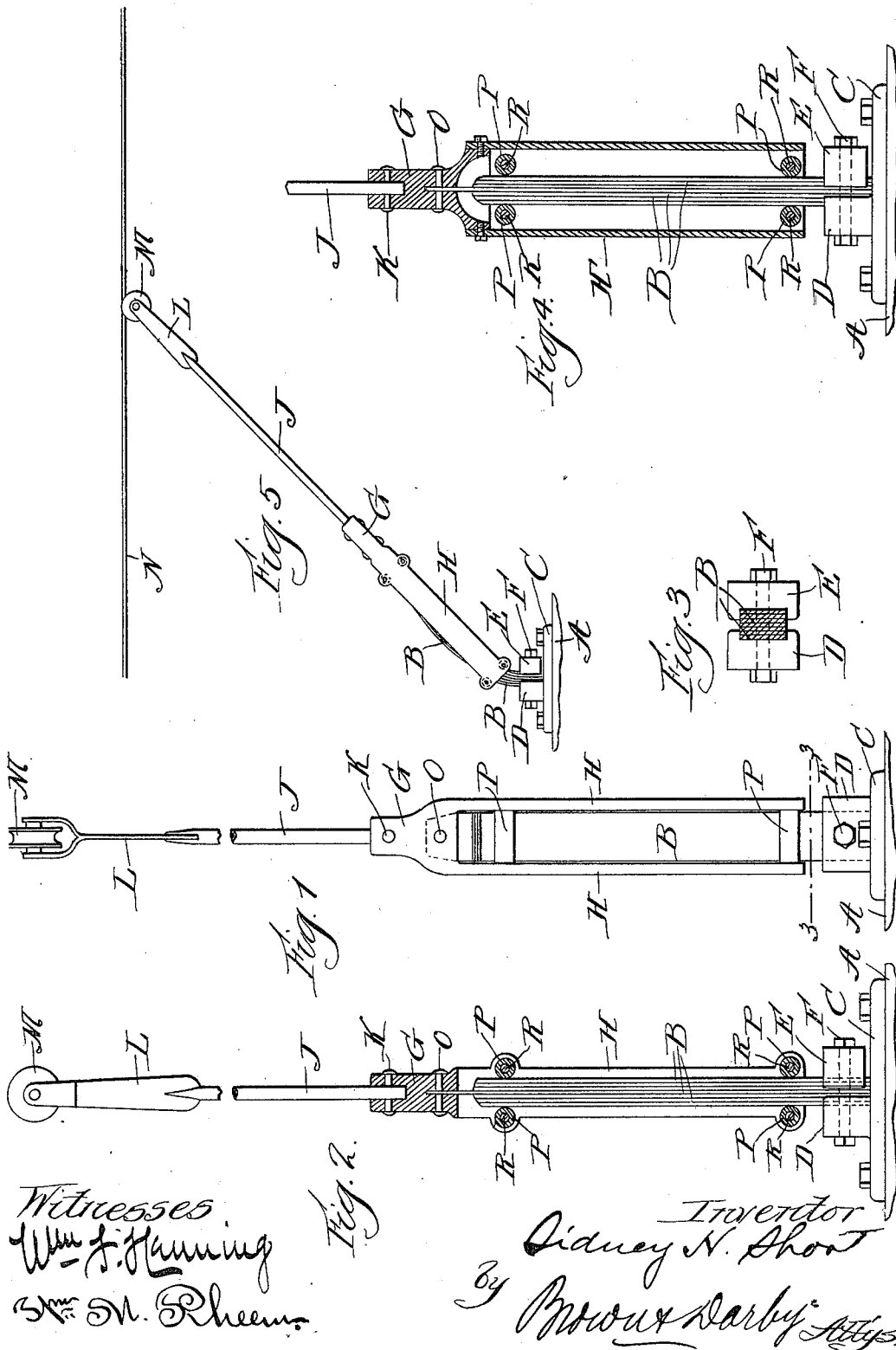
(No Model.)

S. H. SHORT.

TROLLEY SUPPORT FOR ELECTRIC RAILWAYS.

No. 566,345.

Patented Aug. 25, 1896.



UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO.

TROLLEY-SUPPORT FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 566,345, dated August 25, 1896.

Application filed April 20, 1896. Serial No. 588,279. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Trolley-Supports for Electric Railways, of which the following is specification.

This invention relates to trolley-supports for electric railways.

The object of the invention is to provide a thoroughly efficient practical trolley-support of simple and economical construction.

The invention consists, substantially, in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the drawings and to the various views and reference-signs appearing thereon, Figure 1 is a broken view in front elevation of a form of apparatus embodying the principles of my invention. Fig. 2 is a side elevation of the same, partly broken and partly in vertical section. Fig. 3 is a transverse sectional view of the same on the line 3 3, Fig. 1. Fig. 4 is a broken vertical section showing a slightly-modified form of apparatus embodying the principles of my invention. Fig. 5 is a view in side elevation illustrating a trolley-support constructed in accordance with my invention in practical use.

The same reference-sign is employed throughout the several views to designate the same part wherever it occurs.

In the construction and operation of an electric railway wherein is employed an overhead conductor and wherein current is supplied from such conductor to the motor on the car through a contact device arranged to make contact with the conductor on the under side thereof it has heretofore been the custom in commercial practice to mount the underrunning contact or trolley upon an arm or support, which in turn is pivotally mounted upon a horizontal pivot or axis and also upon a vertical pivot or axis, whereby such arm or support may rock or swing vertically about such horizontal axis toward or away from the conductor, and whereby said arm or support may rock or swing laterally about or upon such vertical axis to reverse the direction of

lead of such arm or support or to compensate for variations in the position of the conductor. The present invention is designed upon entirely different principles. Instead of mounting the trolley support or arm upon pivots or axes I entirely dispense with all pivots or axes and employ in the construction of my trolley support or arm yielding or resilient parts in the arm or support itself which have sufficient flexibility and resiliency to permit the support to bend under practice requirements.

In the practical application of my invention I mount at a suitable or convenient point upon the car, say, for instance, for an overhead conductor upon the roof A of the car, a spring B. I have shown a simple construction wherein one end of the spring B is rigidly clamped between clamping-jaws D E, one of said jaws being formed on a plate or casting C, which is suitably bolted to the roof A of the car. The bolt F, by which the clamping-jaws D E are bolted together and upon the end of spring B, is also preferably arranged to pass through the spring, as shown.

Of course it will be understood that the end of the spring may be conveniently bolted rigidly to the roof of the car in many other ways, the particular construction shown being designed as merely illustrative of an operative arrangement which is simple and economical.

In practice I prefer to employ a flat bar or plate of suitable spring material and arrange the same with the flat side thereof in a plane transverse to the length of the car, whereby said spring may readily bend in the direction of the length of the car.

Instead of using a single spring-plate and in order to provide sufficient rigidity and strength to maintain the contact device in good electrical connection with the conductor I prefer to employ a spring composed of several flat spring bars or laminations, as shown, placed face to face and rigidly clamp the same together upon the car at the ends thereof by means of the clamping-jaws D E and bolt F, as above described.

From the foregoing description it will be seen that I provide a strong resilient spring, which is rigidly secured at one end thereof to the car, which normally projects vertically

from the car-roof in the case of an overhead conductor, and which may bend in either direction toward the front or rear ends of the car from its normal position, the tendency of the spring-plates employed being always to return to their vertical position.

Upon the spring B, I mount and suitably secure a casting G. In the form shown in Figs. 1, 2, and 5 said casting is provided with arms H, extending therefrom on opposite sides of and parallel and in proximity to the edges of the spring-plates, and I suitably connect the arms H at their upper and lower ends by the cross-bars R, arranged in pairs, the members of each pair being respectively on opposite sides of the spring. By this construction it will be seen that the arms H', which form an inclosing bracket for the spring B, engage said spring upon the flat sides thereof, thereby effecting a purchase upon the spring, whereby it may be bent over in either direction of inclination relative to the car-roof, as above explained.

Instead of the arms H, I may use a cylindrical sleeve H', as shown in Fig. 4, which is arranged to surround the spring.

In order to reduce friction and to permit the spring-plates to readily and easily bend under service requirement, I may provide the connecting-bars R with antifriction-rollers, as shown. In the same manner similar rollers may be provided in the case of the cylindrical sleeve.

In order to secure and hold the casting G and its depending arms or casings H H' to the spring B, I bolt or rivet said casting to the spring in any suitable or convenient manner. In the form shown and preferably I make one of the flat spring-bars, say the central or middle one, of a greater length than the others and arrange the projecting end thereof to be received in a socket formed in the casting G, and I pass the bolt or rivet O through said projecting end and the casting, as shown.

I provide the casting G with a socket adapted to receive the end of a suitable rigid bar or arm J of any suitable or convenient material, size, and shape. I prefer, however, to employ in this relation a steel tube, and I rigidly secure the end thereof in the socket in the casting G, as by means of bolt or rivet K.

The free end of the rod or arm K is formed into or has suitably mounted thereon a spring L, which carries the contact device M. I prefer to use in this connection a flat spring-plate, or the end of the steel rod or bar J may be flattened out with the flat side of such plate or flattened portion in a plane parallel with the length of the car, whereby said spring may bend in a direction transverse to the length of the car. The bending of this spring enables the contact device to follow readily any lateral variations of the conductor relative the rails of the car-track.

In practice the contact or trolley-support is longer than the distance between the conductor and the car. Therefore it will be seen

from the foregoing description that the spring B will bend to permit the contact M to make contact with the conductor N or to pass any overhead obstruction. It will also be seen that by disengaging the contact M from the conductor the trolley-support may be bent toward the opposite end of the car to reverse the direction of inclination thereof relative to the length of the car. The tendency of the spring B to resume its normal or vertical position serves to maintain and press the contact M into efficient electrical connection with the conductor. It will also be seen that the spring L will readily bend laterally through a sufficient range of movement to fulfil all service requirements.

In the case of a laminated spring B the individual spring-plates composing the same are rigidly held together and to the car only at one point, namely, at their lower ends, by the clamping-jaws D E, and hence at their free ends said spring-plates have a sliding longitudinal movement upon each other during the bending of said spring.

By the construction above described I produce an exceedingly simple, efficient, and economical trolley-support, whereby I avoid the use of pivots or axes and wherein the support itself will bend against resistance to meet the conditions of service requirements.

Having now set forth the object and nature of my invention and a preferred form of apparatus embodying the same and having explained the construction, function, and mode of operation thereof, I desire it to be understood that my invention is not limited or restricted to the exact details of construction and arrangement shown and described, as many variations therefrom would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention; but

What I do claim as new and useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In a trolley-support a spring rigidly secured at one end to the car-body, an arm or rod mounted on said spring and adapted to engage the same at different points in the length thereof, and carrying a spring at the outer or free end thereof, and a contact device mounted on said last-mentioned spring, as and for the purpose set forth.

2. In a trolley-support, a spring rigidly secured at one end to the car-body, and adapted to be bent in either direction toward the front or rear ends of the car, an arm or rod mounted thereon and carrying a spring in the outer or free end thereof adapted to bend in a direction transverse to the direction in which said first-mentioned spring bends, and a contact device carried by said spring, as and for the purpose set forth.

3. In a trolley-support a laminated spring rigidly secured at one end to the car-body, a trolley-pole carried by said spring and carrying at its free end a spring adapted to bend

in a direction transverse to the direction of bend of said first-mentioned spring, and a contact device carried by said last-mentioned spring, as and for the purpose set forth.

5 4. In a trolley-support a spring rigidly secured at one end to the car-body and adapted to bend in the direction of the length of the car, a casting adapted to receive the free end of said spring, and having bearings against
10 said spring adjacent to opposite ends thereof, an arm rigidly mounted at one end in said casting and carrying a spring at the free end thereof, adapted to bend in a direction transverse to the length of the car, and a contact
15 device carried by said last-mentioned spring, as and for the purpose set forth.

5 5. In a trolley-support, a spring rigidly secured at one end to the car-body and adapted to bend in the direction of length of the car,
20 a casting having arms arranged to extend on opposite sides and adjacent and parallel to the edges of said spring and having cross-bars arranged to bear against the sides of said spring, an arm or bar rigidly secured at
25 one end in said casting and carrying a spring

in the free end thereof adapted to bend in a direction transverse to the length of the car and a contact device carried by said last-mentioned spring as and for the purpose set forth.

6. In a trolley-support, a spring rigidly secured at one end to the car-body and adapted to bend in the direction of length of the car, a casting having arms arranged to extend on opposite sides of, adjacent and parallel to the edges of said spring and having antifriction-
35 rollers arranged to bear against the sides of said spring, an arm or bar rigidly secured at one end in said casting and carrying a spring in the free end thereof adapted to bend in a direction transverse to the length of the car, and a contact device carried by said spring,
40 as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 16th day of April, 1896, in presence of the subscribing witnesses.

SIDNEY H. SHORT.

In presence of—

FRANK T. BROWN,
M. I. CAVANAGH.