

P. A. McCULLOUGH.
TROLLEY.
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1,045,867.

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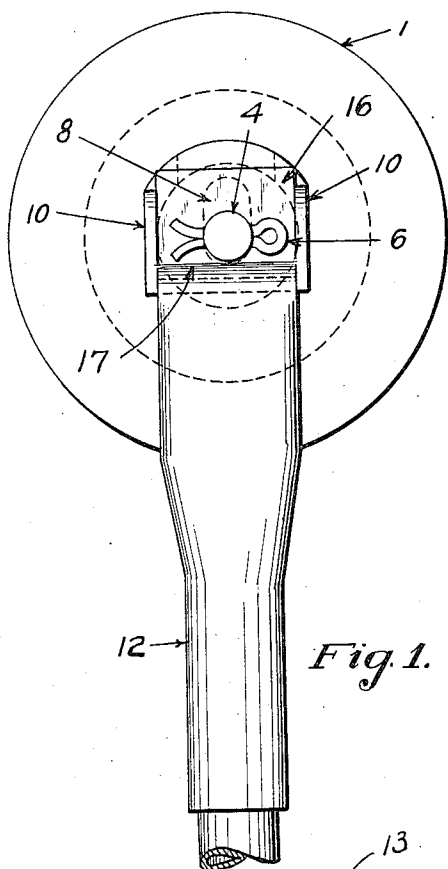


Fig. 1.

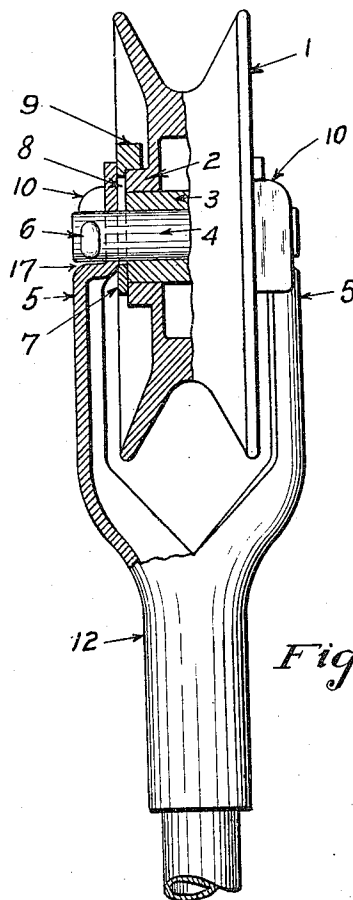


Fig. 2.

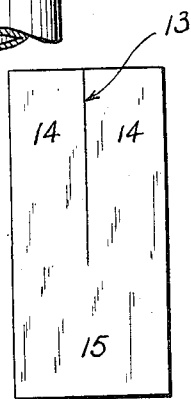


Fig. 4.

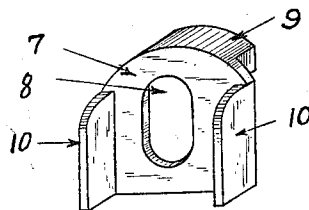


Fig. 3.

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TROLLEY.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PETER A. McCULLOUGH, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Trolleys, of which the following is a specification.

This invention relates to trolleys for electric cars.

10 The objects of the invention are, first, to provide a trolley harp which is very light, yet strong, and practically indestructible, and, second, to provide a trolley with a positive contact between the wheel and the harp
15 affording a path for the current and making it unnecessary for the current to pass through the bearings, thereby avoiding loss of current and the formation of arcs, said positive contact being obtained without the
20 use of any springs whatsoever, thereby permitting of the free rotation of the wheel without undue friction, and reducing wear to a minimum.

25 The invention comprises the features of construction, arrangement and combination hereinafter described and claimed.

In the accompanying drawing Figure 1 is a side elevation of the trolley; Fig. 2 on the right hand side is a front elevation of the same and on the left hand side is a vertical section in the plane of the axis of the wheel; Fig. 3 is a perspective view of the contact member; and Fig. 4 is a view of a blank from which the harp can be formed.

35 In the drawings the trolley wheel is indicated at 1. This is of the usual form provided with a hub 2 and the internal bushing 3 which is rotatably mounted on the journal 4, the latter extending through openings in the upper ends of the arms 5 of the harp
40 and being held in position by any suitable means, the drawings showing for this purpose cotter pins 6 in holes in the ends of said journal.

45 The contact member is shown in detail in Fig. 3. This member comprises a web or plate 7 lying between the wheel and the inner face of the harp arm, and provided with an enlarged elongated opening 8
50 through which the journal 4 passes, which permits the contact member to rise and fall and also to move somewhat laterally. At its upper portion on the inner side said member is provided with the inwardly projecting
55 portion 9 which is arc-shaped and lies above the hub 2 of the wheel, and is adapted

to rest thereon by gravity. Projecting outwardly from the side edges of the plate 7 are flanges 10, one such flange lying on each side of an edge of the harp arm.

60 The contact member described is entirely loose between the wheel and harp arm, being free to rise and fall and move laterally at will. The plate 7 is of such thickness that it does not entirely fill the space between the side face of the wheel and the inner face of the trolley arm, and consequently does not
65 offer any friction to the rotation of the wheel. The arc-shaped inwardly projecting portion 9 rests on the hub of the wheel entirely by gravity, but sufficiently firmly to
70 offer a good contact through which the electric current passes. The member has sufficient contact with the harp arm, and particularly by the flanges 10 contacting with
75 the edges of the harp arm, as one or the other necessarily will do, due to the rotation of the wheel. Said contact member cannot escape, being guided on the journal and held
80 in proper upright position by the flanges 10. It cannot wear materially or break, and gives a positive contact and path of low resistance for the current directly from the
85 wheel to the harp and without the necessity of the current passing through the bearings, which generally are oiled and offer high resistance. There are no springs to get lame, to wear out, or to offer so much pressure as to frictionally retard the free rotation of
90 the wheel.

95 Various modifications in the form and arrangement of parts of the contact member may be made without departing from this part of my invention, the essential feature of which is a contact member between the harp and the wheel and arranged to contact with the wheel by gravity.

The trolley harp shown comprises a tubular lower portion or socket 12 of which the arms 5 are integral parts. This harp can
100 be conveniently formed from a seamless or other tube by splitting the same diametrically from one end, and then spreading the split part and suitably flattening the same to form the arms 5; or it may be formed
105 from a blank, such as shown in Fig. 4, of plate metal which is split in from one end, as at 13, for part of its distance, after which in properly shaped dies the portions 14 are shaped to form the arms 5 and the unsplit
110 portion 15 is bent into tubular form to form the socket 12, and which portion may be

left with an open seam or have the edges welded or brazed together.

The arms 5 are preferably somewhat concavo-convex in cross section for the major portion of their length to give the necessary stiffness, but have their upper portions 16 substantially flat and provided with the openings through which the journal 4 projects. The upper ends are offset toward each other from the main portions of the arms to a distance beyond the inner edges of the main portions, so that the wheel can be inserted and removed without bending the arms. The flattening down of the upper portions of the arms produces an external shoulder 17 immediately below the cotter pins 6.

The harp described is of very light weight, very simple construction, is cheap to manufacture and nevertheless is very strong and practically indestructible.

If desired, instead of a separate harp of the character shown, the upper end of the tubular trolley pole may be split and formed into the arms 5, thereby providing a harp integral with the pole.

What I claim is:

1. In a trolley, the combination of a harp, a wheel journaled therein, and a contact member between the harp and wheel, said contact member being movable transversely to the axis of the wheel and being provided with an inwardly projecting portion arranged to rest on the upper surface of the hub of the wheel and with a laterally projecting portion arranged to contact with and be guided by a substantially vertical edge of the harp.

2. In a trolley, the combination of a harp, a wheel journaled therein, and a contact

member between the harp and wheel, said contact member being provided with an opening through which the wheel journal loosely passes, with an inwardly projecting part adapted to rest on the hub of the wheel, and with laterally projecting flanges lying on opposite sides of the harp arm.

3. In a trolley, the combination of a harp, a wheel journaled therein, and a contact member between the harp and wheel and having opposite flat faces, one contacting with the harp and the other with the wheel, and provided with a laterally projecting portion arranged to ride upon and contact with a portion of the wheel, said member being freely movable transversely with respect to the wheel journal, and interengaging parts on the harp and member for guiding the latter during such movement.

4. In a trolley, the combination of a harp, a wheel journaled therein, and a contact member between the harp and wheel, said member being provided with an elongated slot through which the wheel journal loosely passes and arranged to be freely movable transversely with respect to the journal, said member having opposite flat faces contacting with the harp and wheel and a laterally projecting portion to ride upon a portion of the wheel, and interengaging parts on the harp and member formed to permit movement of the member in the direction of the length of the slot therein.

In testimony whereof, I have hereunto set my hand.

PETER A. McCULLOUGH.

Witnesses:

SUE B. FRITZ,
F. W. WINTER.