No. 628,610. Patented July 11, 1899

S. G. REYNOLDS.

TROLLEY POLE.

(Application filed Jan. 7, 1899.)

(No Model.)

Fig. 1.

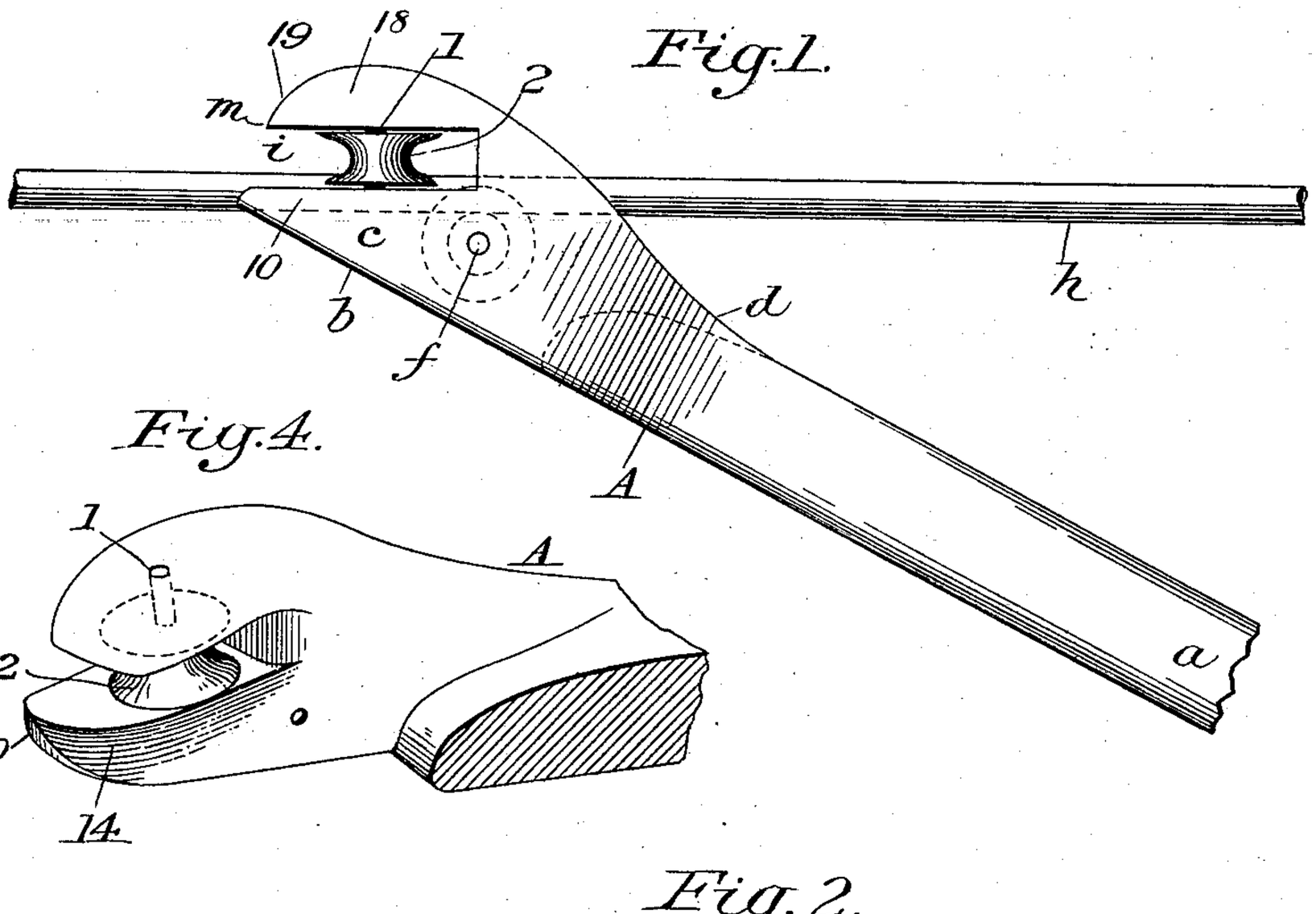


Fig. 4.

Fig. 2.

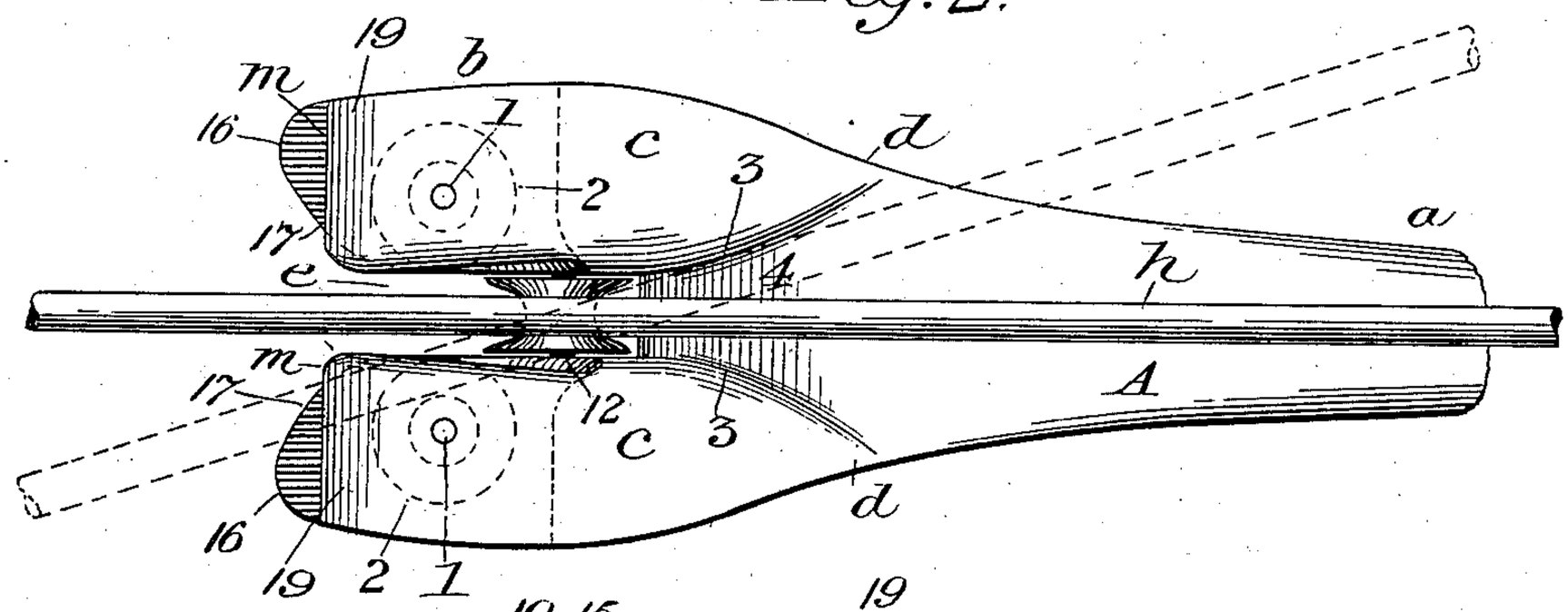
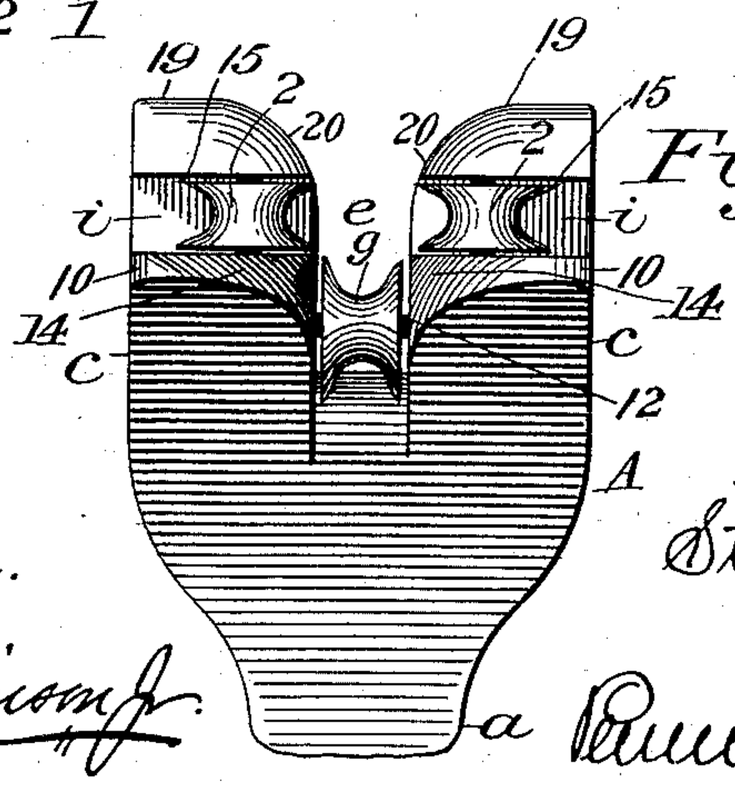


Fig. 3.



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UNITED STATES PATENT OFFICE.

STEPHEN GIRARD REYNOLDS, OF EASTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO THOMAS A. H. HAY AND WILLIAM O. HAY, OF SAME PLACE.

TROLLEY-POLE.

SPECIFICATION forming part of Letters Patent No. 628,610, dated July 11, 1899.

Application filed January 7, 1899. Serial No. 701,503. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN GIRARD REYNOLDS, a citizen of the United States, residing in Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Trolley-Poles; 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.

This invention relates to trolley-poles for electric cars; and it consists, substantially, in such features of improvement as will hereinafter be more particularly described.

As is well known, the simplest form of overhead electric trolley comprises a wheel loosely suspended in the forked or bifurcated end of a yieldable trolley-arm and having a peripheral groove for receiving the conductor which is traversed by the wheel to supply the electric current to the motor or propelling devices for the car or other vehicle. Such a contrivance, however, is open to the objection that the trolley-wheel "jumps" the conductor or leaves the same from very slight causes, especially in the rounding of curves and upon entering or encountering switches or "crossovers," and also is the same thing liable to occur whenever the trolley passes the span-wires or overhanging supports for the conductor. Various attempts have been made to overcome these objections and disadvantages; but the constructions and arrangements resorted to involve the use of extra appliances or attachments requiring special manipulation or handling and which, too, in many cases are cumbersome and unreliable in action, besides affording practically no economy either in use or in cost of manufacture.

The object of the present invention is to provide an electric trolley-pole constructed practically of a single piece and which is self-acting in maintaining its connection with the overhead conductor, both in the movements of the pole itself and the changing directions of the moving car.

The above and additional objects are attained by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the upper end of an electric trolley-pole embodying my improvements, and Fig. 2 is a top or plan view thereof. Fig. 3 is an end view showing the construction and arrangement more clearly.

Preliminarily to a more detailed description it may be stated that my improved trolley-pole is supported, as usual, on the top of the car and is so constructed or formed at its upper end as to be capable of exercising all the functions for the performance of which additional or auxiliary means are required in other similar devices. In this class of devices the use of auxiliary devices is especially objectionable from the fact that they require separate or independent means for operating or controlling them, and besides, as is well understood, the greater the number of elements or parts in any device or mechanism the greater the liability to derangement of the whole.

My improved device is devoid of any movable parts excepting the grooved rollers for maintaining the electric connection with the current-conductor, and under all circumstances will be found to be more effective than the more complicated and expensive devices heretofore used for similar purposes.

From the peculiar form of the device the overhead conductor is easily and quickly embraced and the trolley is prevented from leaving or breaking contact with the conductor from any of the usual causes known to have such an effect.

In the accompanying drawings, A represents the upper end of an ordinary trolley-pole constructed in accordance with my invention. As best seen in Figs. 1 and 2, the upper end of the pole is widened laterally and vertically, beginning at about the point *d*, the object being to form the fork *b* at the outer end and to accommodate the rollers hereinafter described and allow for the formation of the spaces and inclines to be hereinafter referred to. In the space *e* between the members *c c* of the fork and at the crotch between said fork members is a grooved roller *g*, journaled on a pin 12. Normally the conductor *h* runs on this roller, the peripheral groove serving to center the same. Each member *c* of the fork *n* has a deep notch or recess *i* ex-

tending inwardly from its outer end, and said recesses occupy substantially horizontal positions when the trolley is in normal working connection with the conductor, as shown in Fig. 1. In each of said recesses I locate on a vertical axis 1 a peripherally-grooved roller 2, and I bevel the adjacent sides of the fork members *c c* on each side, as at 3, so as to form an outwardly-flaring recess, beginning with the crotch between the form members and which forms practically a continuation of the space *e* between the same. This flaring recess is indicated at 4 in Fig. 2, and its object is to provide for the lateral swinging of the pole and the conductor relatively to each other. Thus in Fig. 2 the normal location of the conductor with respect to the trolley is shown in full lines, and in dotted lines the relative position of the same parts is shown while on a curve. The object of the vertically-arranged rollers 2 2 in the fork members *c c* is to receive, accommodate, and hold the conductor laterally when the car is passing curves, and the peripheral grooves in these rollers enable the upper and lower edges of the rollers to overlap the conductor above and below and assist in preventing the trolley from leaving it. As best seen in Fig. 2, these rollers 2 2 are located a short distance from the end of the fork members, and the upper portions of these members above the recesses also form additional means for preventing the trolley from leaving the conductor by permitting the latter to pass into the open free end of the recesses *i i*, thereby further embracing the conductor above and below and affording additional means for holding the trolley in proper contact with it.

It will be observed that the vertical rollers 2 2 are set somewhat above and nearer the outer end of the pole than the center roller *g;* also, as best seen in Fig. 2, that the flaring sides of the recess 4 are approximately in line with the periphery of said rollers 2 2, so that as the car is rounding a curve the conductor will occupy a position diagonally above the center roller *g* and be engaged by one or other of the vertical rollers and also be overhung by the projecting end of the upper portion of the corresponding fork member.

The lower part 10 of each of the fork members *c c* is rounded off or formed with a beveled longitudinal inner edge 12, as best shown in Figs. 3 and 4. The lower flange of the side rollers 2 2 is also beveled or inclined, and the beveling of the two parts is such that the flanges of the rollers form practically continuations of the inclined sides or edges of the lower parts of the fork members. This serves to easily and quickly guide the conductor into its place in the groove of one of the rollers as the car rounds a curve. The upper flanges 15 of the said rollers 2 are wider or of greater diameter than their lower flanges, as best shown in Fig. 1, the purpose being to have the flanges extend more nearly across the conductor at the top than underneath, thereby holding the trolley up to the conductor at the time when it is most liable to jump therefrom.

It will further be observed that the ends of the lower parts 10 of the fork members *c c* are rounded off at 16, and also that they are flared, as at 17, so as to diverge outwardly at their inner adjacent ends for a short distance, this being for the purpose of permitting switches and crossovers to easily and quickly enter the space between the members.

The upper parts 18 of the fork members *c c* are rounded or beveled off on their top surfaces at 19, both toward the outer end, as seen in Fig. 1, and toward each other, as seen in Fig. 3. This permits the trolley to easily ride between the span-wires or overhanging supports for the conductor without liability of displacement and also greatly assists the trolley in returning to its place on the conductor or in originally connecting it therewith.

Such being the form and construction of my improved trolley-pole, no further description of its operation seems to be required, and

What I desire to secure by Letters Patent is—

1. A trolley-pole for electric cars, having an integral forked upper end, a central vertically-disposed grooved roller, and grooved horizontally-arranged side rollers mounted in the fork branches substantially at right angles to said central roller.

2. A trolley-pole for electric cars, having an integral forked upper end, a central vertically-disposed grooved roller mounted in the crotch of the fork, and grooved horizontally-arranged side rollers mounted in the fork branches above and in rear of said central roller substantially at right angles thereto.

3. A trolley-pole for electric cars, having an integral forked upper end, the branches of the fork being formed with horizontal recesses having their adjacent lower edges rounded or beveled in opposite directions upwardly and outwardly, a central vertically-disposed grooved roller mounted in the crotch between the fork branches, and grooved horizontally-disposed side rollers mounted in said recesses and having the lower flanges thereof beveled in the direction of the beveled edges of the fork branches.

4. A trolley-pole for electric cars, having an integral forked end, the branches of the fork being formed with horizontal recesses, a central vertically-disposed grooved roller mounted in the crotch between the fork branches, and grooved horizontally-disposed side rollers mounted in said recesses, and having their top flanges wider than the lower flanges thereof.

5. A trolley-pole for electric cars, having an integral forked end, a grooved roller vertically disposed in the crotch of the fork, an outwardly-flaring recess in front of said roller on the upper side of the pole, and grooved

side rollers horizontally disposed in the branches of the fork, said side rollers having flanges at their upper ends.

6. A trolley-pole for electric cars, having an integral forked end, an outwardly-flaring recess on the upper side of the pole in line with and adjacent to the crotch of the fork, a grooved roller vertically mounted in the end of the crotch adjoining the end of the flaring recess, horizontal recesses in the branches of the forked end, and grooved rollers mounted in said recess, the ends of the fork branches projecting above and beyond the rollers.

7. A trolley-pole for electric cars, having an integral forked end, an outwardly-flaring recess on the upper side of the pole at the base of the crotch between the forks, horizontal recesses formed in the branches of the fork, a grooved roller vertically disposed in the fork-crotch, and grooved side rollers mounted in the horizontal recesses in the fork branches, the upper adjacent surfaces of the fork branches being beveled or rounded off downwardly and inwardly, and the upper adjacent edges of the recesses in said branches being beveled or rounded off upwardly and outwardly.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN GIRARD REYNOLDS.

Witnesses:
H. L. LEIDICH,
CHAS. B. BRUNNER.