

UNITED STATES PATENT OFFICE.

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TROLLEY HEAD AND WHEEL.

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To all whom it may concern:

Be it known that I, JOSEPH W. SHARP, residing at Mohawk, in the county of Herkimer and State of New York, have invented a new and Improved Trolley Head and Wheel, of which the following is a specification.

My invention seeks to provide an improved construction of combined trolley head and wheel of a very simple, durable, and economical character in which the trolley-wheel is arranged to readily adapt it for high-speed work with a minimum amount of wear on the operating parts.

Generically, my invention comprehends a pair of opposing head-sections of resilient metal adapted to be conveniently and detachably connected with the trolley pole or arm and whose upper ends are provided with adjusting means whereby to adjust the said head-sections toward or from each other, the ends of such head-sections being provided with sockets each having an internal ball-race and a lubricating-aperture, and a trolley-wheel fixedly mounted upon an axle provided at each end with a ball-journal for engaging the sockets in the head-sections and which have annular grooves for opposing the ball-races in the head-sockets to receive supplemental bearing-balls.

In its more subordinate features my invention consists in certain details of construction and arrangement of parts, all of which will be first fully explained and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a trolley head and wheel embodying my invention. Fig. 2 is a transverse section thereof on the line 2 2 of Fig. 3. Fig. 3 is a vertical section of the same on the line 3 3 of Fig. 2. Fig. 4 is a detail section on the line 4 4 of Fig. 3. Fig. 5 is a detail view of the wheel and the ball-equipped axle.

Referring now to the accompanying drawings, in which like numerals and letters of reference indicate like parts in all the figures, the trolley pole or arm A may be of the usual construction, the upper end in the application of my invention being round, as at *a*, to re-

ceive the semicircular ends *b* of the trolley-head sections B B', which sections are divergently held on the said bearing end *a* by the bolt and nut devices 1 1^a, as shown. The sections *b b* are stamped, cast, or otherwise formed of steel or other resilient material, the spring of which is outwardly in the direction indicated by the arrow in Fig. 3 to normally keep their wheel-bearing ends *b² b²* spread for the purposes presently explained. The spring tension of the divergently-held head-sections is controlled by the bolt C, that passes through the two sections and receives a nut *c*, as clearly shown in Fig. 3. The opposing faces of the two head portions of the sections B B' are cut out, as at *b^x b^x*, to provide a space for the trolley-wheel D, and the said ends *b² b²* are thickened and formed with substantially hemispherical pockets or recesses 3 3, provided with annular grooves or ball-races 3^a 3^a, and each of the said ends *b² b²* has a diagonally-disposed aperture 3^b 3^b, that opens through the top of the head ends *b² b²* and communicates with the grooves or ball-races 3^a 3^a, as shown. The said apertures 3^b 3^b serve as feedways for the small ball-bearings, presently referred to, as well as oil-admitting apertures.

The feedways to the channels 3^a 3^a are screw-threaded to receive tubular plugs, which prevent the small bearing-balls from coming out of their race and which also serve as simple and convenient lubricant-conveyers, the said plugs being threaded to cooperate with the threads formed in the feedways or apertures, as clearly shown in Fig. 4, and are themselves closed by the screw-plug, as shown.

The trolley-wheel D is of the usual type; but in my invention it is fixedly connected to and revolves with its axle G, which is square or of other non-circular shape. Upon each end of the axle G is mounted a large ball-bearing E E, and the said bearings E E are adapted to snugly fit the sockets in the opposing head members *b² b²*, as clearly shown in Fig. 3, from which it will be noticed that through the medium of the bolt-and-nut connection C the two head portions *b² b²* can be readily adjusted to hold the axle G from unnecessary longitudinal play within its bear-

ing, and in case of wear on the bearings E the faces of the socket can be readily moved up to and close against the ends of the bearing-balls E E by tightening up the nut *c*.

5 Each of the ball-bearings E E has an annular groove or ball-race *ee*, that opposes the ball-races in the heads *b² b²* and receives the small bearing-balls *f*, which are fed into the grooves or races through the feedways *3^b 3^b*
10 when the lubricating-plugs are removed. One or both of the ball-bearings E are detachably mounted on the axle G to provide for replacing them when worn and also to facilitate the operative assembling of the parts.

15 To insure a good electrical connection between the wheel and the head, I use the usual copper contact-plates P P, as shown.

From the foregoing description, taken in connection with the accompanying drawings,
20 the complete construction, operation, and advantages of my invention will be readily understood by those skilled in the art to which it appertains, and it will be noticed that by having the wheel turn with the axle the same
25 can be run under a very high speed with a uniform bearing on the axle in the journal-receiving portions of the trolley-head, and the wear of the said journals is reduced to the minimum. Furthermore, by reason of the
30 ball-bearing ends of the axle fitting into the hemispherical recesses of the head in the manner shown and described the wheel also has a slight lateral play sufficient to accommodate itself to curves, &c.

35 I am aware that trolley head and wheels have heretofore been provided in which a wheel has been mounted in the socket of the divided trolley head or harp and in which the trolley-wheel rotates with its axle or shaft.
40 My invention differentiates from what has been heretofore provided in this art, so far as I know, in the peculiar combination of the divided head, its special construction of bearing ends or wheel, with its fixedly-held axle, having large bearings at the ends which are constructed in connection with their securing-
45 sockets to sustain the small bearing-balls.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—
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1. A trolley-head consisting of two opposing sections, the upper ends of such sections having substantially opposing hemispherical

pockets and apertures communicating therewith, a wheel rotatably mounted between the 55 upper ends of the head-sections, an axle for the said wheel rotatable therewith, and ball members at its ends to engage the hemispherical pockets, and means for clamping the upper ends of said head-sections to close toward each other and over the ball ends of the wheel-axle, as specified.

2. A trolley-head composed of a pair of opposing head-sections of resilient material and bifurcated at the upper end to receive the 65 trolley-wheel, each head-section having a substantially hemispherical pocket, and an internal ball-groove, each head having a ball-feedway that communicates with the said internal ball-groove, a tubular plug for each 70 feedway, an axle and a bearing-ball at each end thereof to engage the opposing head-pockets, said end bearing-balls each having an annular ball-receiving groove adapted to oppose the internal groove of the pockets 75 whereby to form ball-races to receive the bearing-balls adapted to be fed through the aforesaid feedways, and means for forcing the opposing head-sections together, substantially as shown. 80

3. The hereinbefore - described improvement in trolley heads and wheels comprising in combination; a bifurcated head formed of a pair of opposing sections whose lower ends are shaped to embrace the upper end of the 85 trolley head or arm, the upper end of the head-sections each having a substantially hemispherical pocket provided with an internal annular groove and with a feedway extending through the top of the said ends and 90 communicating with the groove in the pocket; the clamping device for adjusting the upper ends of the two head-sections together, a tubular plug for each of the feedways, a trolley-wheel and an axle turning therewith, and a 95 bearing-ball at each end of said axle, said bearing-balls being adapted to seat in the head-pockets and provided with annular grooves for opposing the grooves in the pockets, and supplemental bearing-balls for engaging the 100 pockets and the axle bearing-balls, for the purposes specified.

JOSEPH W. SHARP.

Witnesses:

GUY DOUBLEDAY,
PETER HESS.