J. F. McKINZIE.

TROLLEY HEAD.

APPLICATION FILED JAN. 15, 1910.

989,626.

Patented Apr. 18, 1911.

Fig. 2.

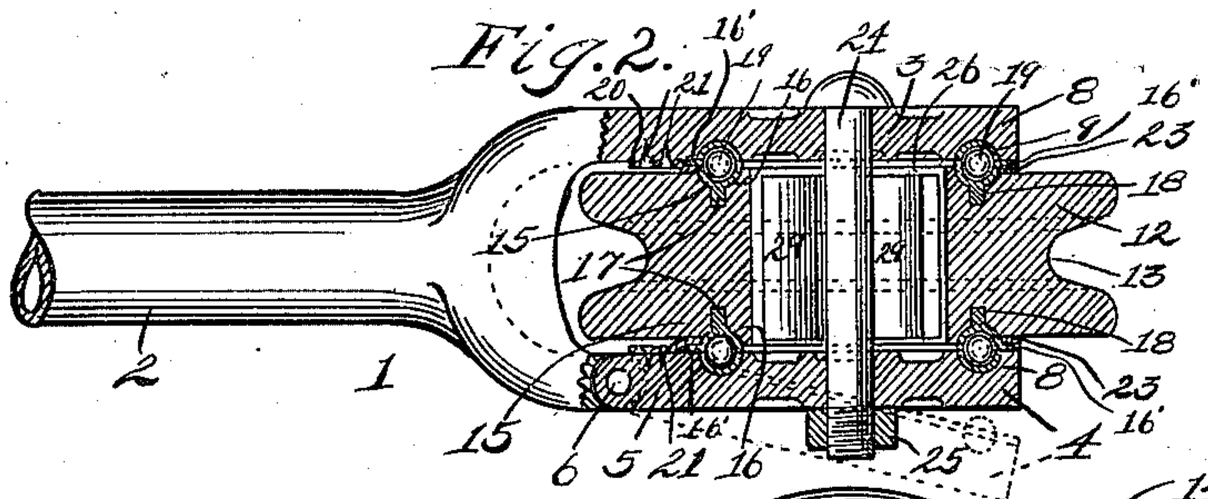


Fig. 6.

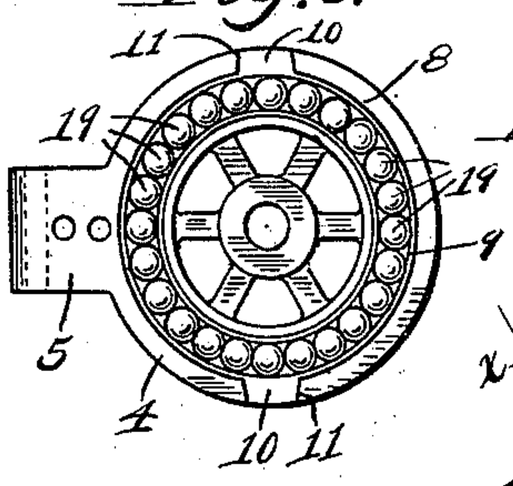


Fig. 1.

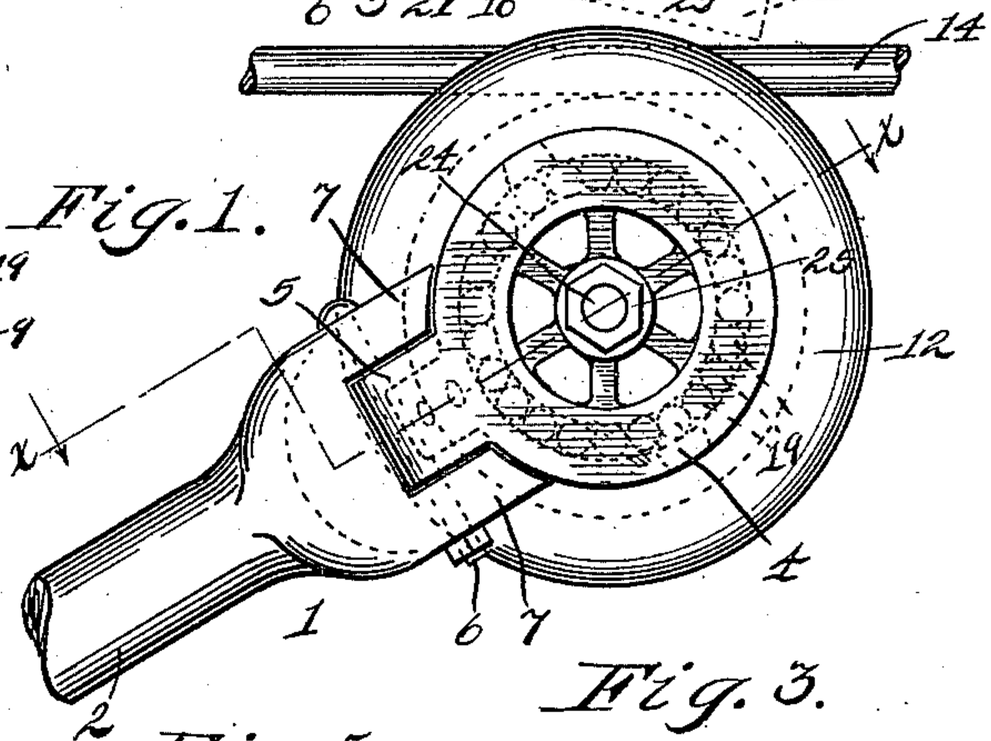


Fig. 3.

Fig. 4.

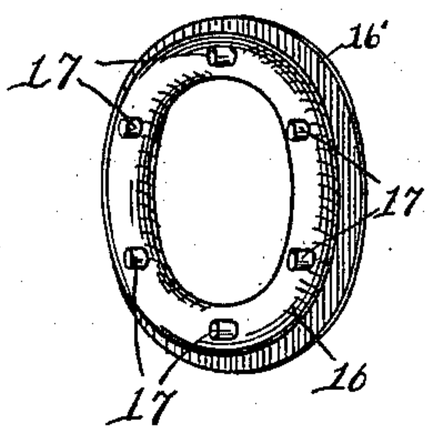
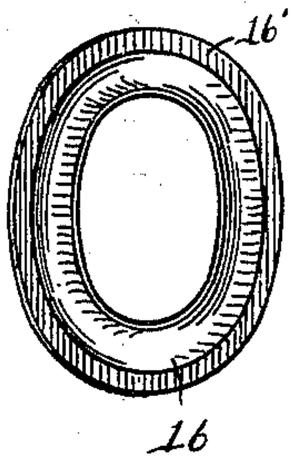


Fig. 5.



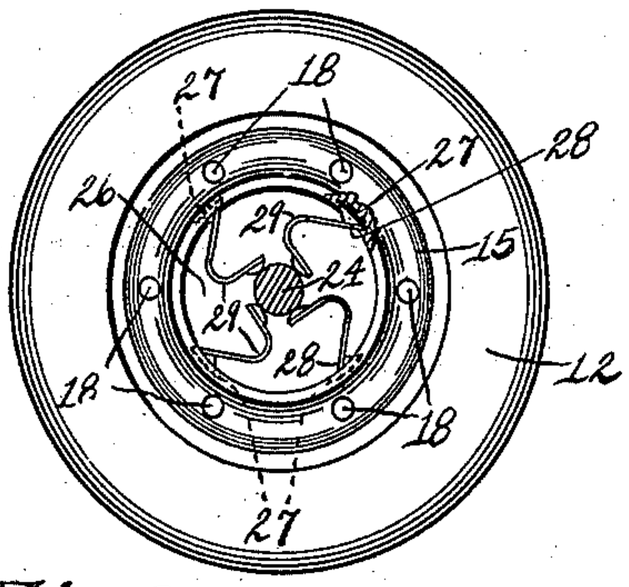


Fig. 7.

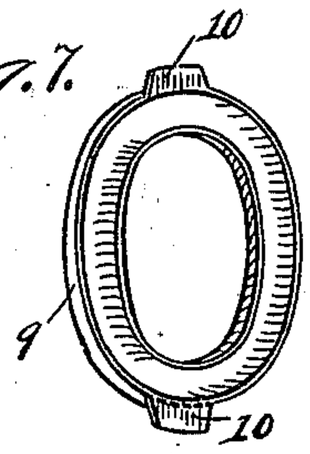
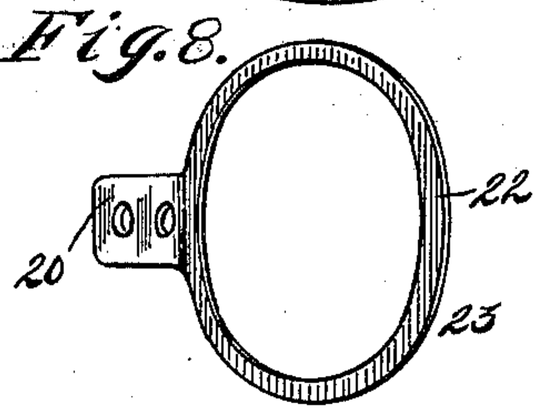


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES F. MCKINZIE, OF LA SALLE, ILLINOIS.

TROLLEY-HEAD.

989,626. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed January 15, 1910. Serial No. 538,273.

To all whom it may concern:

Be it known that I, JAMES F. MCKINZIE, a citizen of the United States, residing at La Salle, county of Lasalle, and State of Illinois, have invented certain new and useful Improvements in Trolley-Heads, of which the following is a specification.

My invention relates to trolley heads and has for its object the production of a device of such character which will be efficient in operation and of durable and lasting construction.

A further object is the provision of a trolley head in which the trolley harp will be of such improved construction as to adapt the same to support the trolley wheel in such a manner that the latter may be readily and expeditiously removed for renewal when desired without necessitating the detachment of the head from the trolley pole such as is required in devices of this nature in common use at the present time in order to effect such replacement.

Other objects will appear hereinafter.

With these objects in view my invention consists in a trolley head characterized as above mentioned and in certain details of construction and arrangement of parts all as will be hereinafter fully described and particularly pointed out in the appended claim.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a side elevation of my device in its preferred form, Fig. 2 is a section taken on line *x*—*x* of Fig. 1, Fig. 3 is a partially sectional side elevation of the trolley wheel, Figs. 4 and 5 are detail perspectives of the ball-race-forming members of the trolley wheel, Fig. 6 is a side elevation of the movable arm of the trolley harp, detached, Fig. 7 is a detail perspective of one of the ball-race-forming members of the harp arms, and Fig. 8 is a detail perspective of one of the retainers for holding the ball-race-forming members in position upon the harp arms.

Referring now to the drawings 1 indicates the body of the trolley harp comprised of the ordinary socket-forming portion 2 for the reception of the upper extremity of the trolley pole, the integral relatively stationary arm 3 and the relatively movable arm 4, an integral hinge lug 5 of the latter being secured by means of a hinge pin 6 between lugs 7 formed upon said harp body for the reception thereof. Said arms are preferably of a circular form and the inner surfaces thereof are provided with correspondingly positioned annular grooves 8. Arranged in each of said grooves is a correspondingly formed ring or ball-race-forming member 9 of a suitable hardened metal. In order to prevent rotation of said rings in said grooves, each of the former is provided with projecting peripheral ears 10 which engage correspondingly positioned recesses 11 provided in the inner surfaces of the harp arms adjacent the grooves therein, as clearly shown in Fig. 6.

Arranged between the arms 3 and 4 coaxially therewith is a trolley wheel 12 provided with the usual peripheral groove 13 for the reception of the ordinary overhead electric wire or conductor 14. Concentrically arranged in each of the sides of said trolley wheel is an annular groove 15 of a diameter such as to adapt the same for registration with the grooves 8. Arranged in each of the grooves 15 is a correspondingly formed ball-race-forming ring 16 of hardened metal, the same being held against rotary movement therein by means of projecting lugs 17 formed upon the inner side thereof and which engage correspondingly positioned recesses 18 formed in the bottom of said grooves. Interposed between the opposing race-forming members 9 and 16 are sets of bearing balls 19, the latter evidently constituting the supporting medium for the trolley wheel in the harp.

Having an enlargement or projecting ear 20 thereof secured, as by screws or other suitable securing devices 21, to the inner surface of each of the harp arms 3 and 4, the body 22 thereof being disposed concentrically to and in engagement with peripheral flange 16′ of the ball-race-forming member 16 contiguous to each of said arms 3 and 4, is a resilient retaining member 23. Hence, with this provision, the trolley wheel, it is evident, may be removed from the harp without occasioning the displacement of the bearing balls or the ball-race-forming members 16 from, or altering their relative arrangement upon, the harp arms.

Centrally arranged in and extending between the harp arms 3 and 4 is a headed pin 24. By means of a nut 25 threaded upon the extremity of said pin and engag-

ing the movable harp arm 4, the latter evidently is held in operative position and may be adjusted thereby relative to the stationary arm 3 to effect a free or proper operation of the ball bearings coöperating therewith.

The trolley wheel is provided with a central opening 26 through which extends in a central position the pin 24. The sides of said opening are provided with a plurality of longitudinally extending slots 27. Having their base portions 28 dove-tailing with said slots are inwardly projecting contact brushes 29 contacting at their inner extremities with the pin 24, as clearly shown in Fig. 3. With this provision the current from the conductor engaged by the trolley wheel is conducted from the latter through said brushes 29 to the pin 24, through the latter to the harp arms and thence to the trolley pole. By the provision of said brushes the current is not required in its passage from the trolley wheel to the trolley pole to pass through the ball bearings of the trolley wheel, and whereby an unreliable means of connection is avoided and an efficient and reliable connection established.

With a trolley wheel and harp of the construction as shown and described, upon the former wearing out or for other reasons requiring renewal, the nut 25 needs only to be removed and the pin 24 slid outwardly to disengage the trolley wheel, whereupon the latter, upon swinging the movable harp arm outwardly to the position, as shown in dotted lines in Fig. 2, may be lifted out of place. The bearing balls, and the ball-race-forming members 16, because of the provision of the retainers 23, will, in such removal, be held in position upon the harp arms, as before described. The contact brushes provided in the removed wheel may now be readily removed therefrom and arranged in the new wheel, whereupon the latter may be easily and quickly arranged in position between the trolley harp arms and locked therebetween by reinserting the pin 24 and adjusting the nut 25 thereon. This operation, it will be observed, may all be carried on without necessitating the removal of the trolley harp. Therefore, with the provision of a trolley head of the construction shown and described one in which the trolley wheel will be free to operate in the trolley harp, one in which the current will be effectually conducted from the trolley wheel to the trolley harp and one in which the trolley wheel may be readily replaced, will be provided.

While I have shown what I deem to be the preferable form of my device I do not wish to be limited thereto, as there might be various changes made in the details of construction and the arrangements of parts described without departing from the spirit of the invention comprehended within the scope of the appended claim.

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

In a device of the character described, the combination of a support having a stationary and a movable bearing piece; a wheel arranged between said bearing pieces; registering annular grooves arranged in the adjacent surfaces of said wheel and bearing pieces; hardened ball-race-forming rings removably arranged in said grooves; bearing balls arranged between adjacent of said rings; and a resilient ring arranged upon each of said bearing pieces engaging the contiguous ball-race-forming ring of the wheel for retaining the same in position upon the adjacent bearing piece, upon the removal of the wheel, substantially as described.

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

JAMES F. MCKINZIE.

Witnesses:
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