No. 765,003. PATENTED JULY 12, 1904.

J. E. GREENWOOD.

TROLLEY POLE HEAD.

APPLICATION FILED AUG. 29, 1903.

NO MODEL.

Fig. 3.

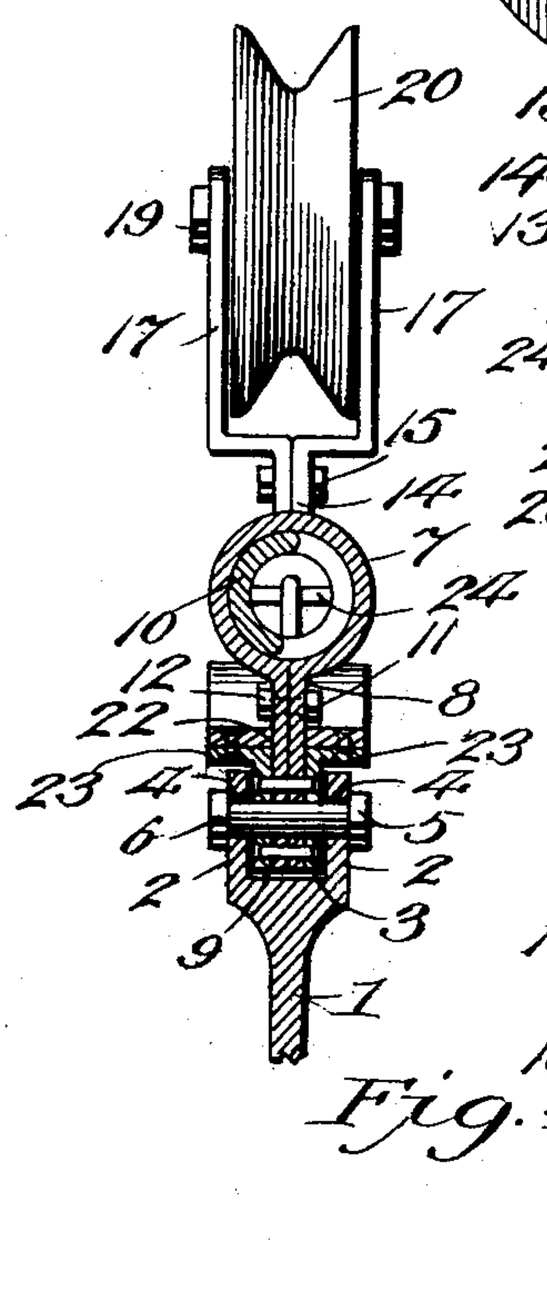


Fig. 1.

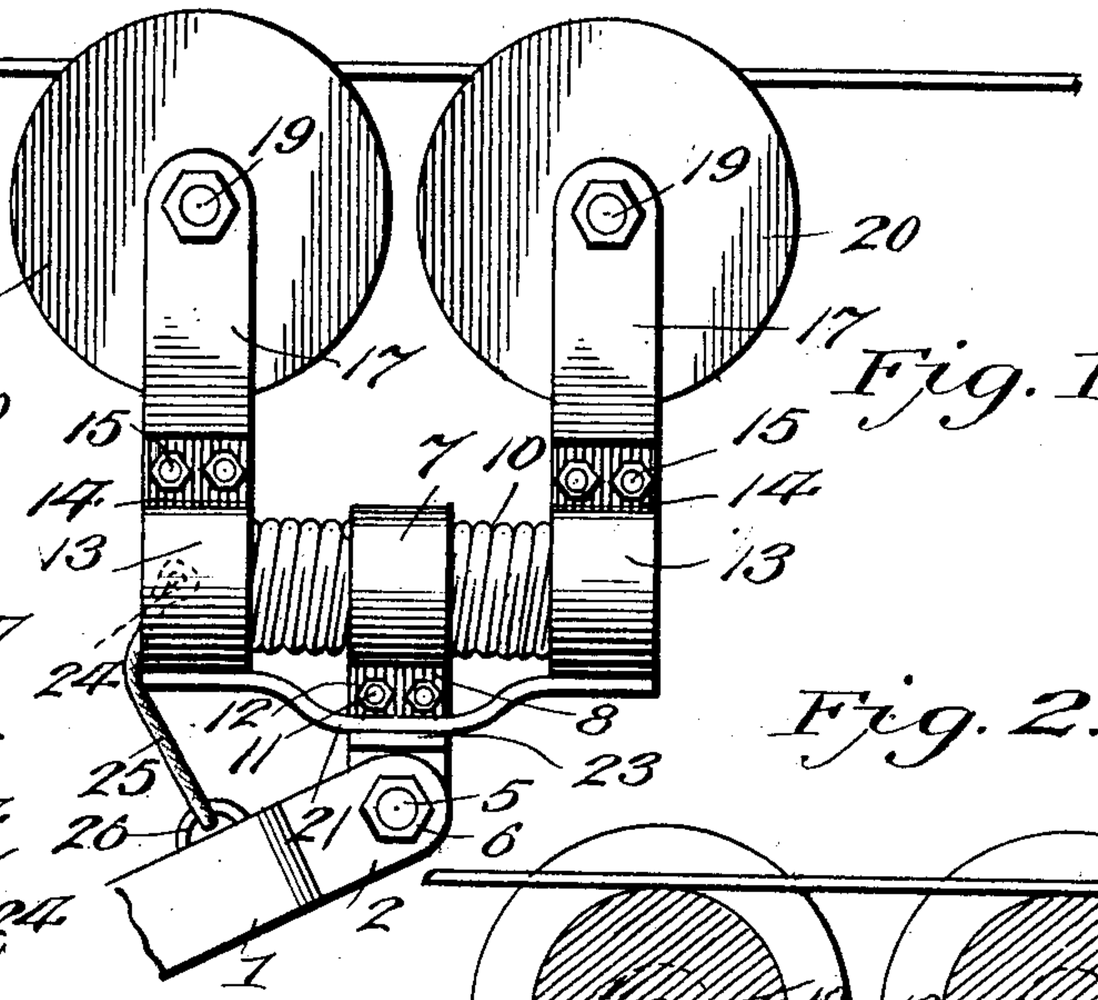


Fig. 2.

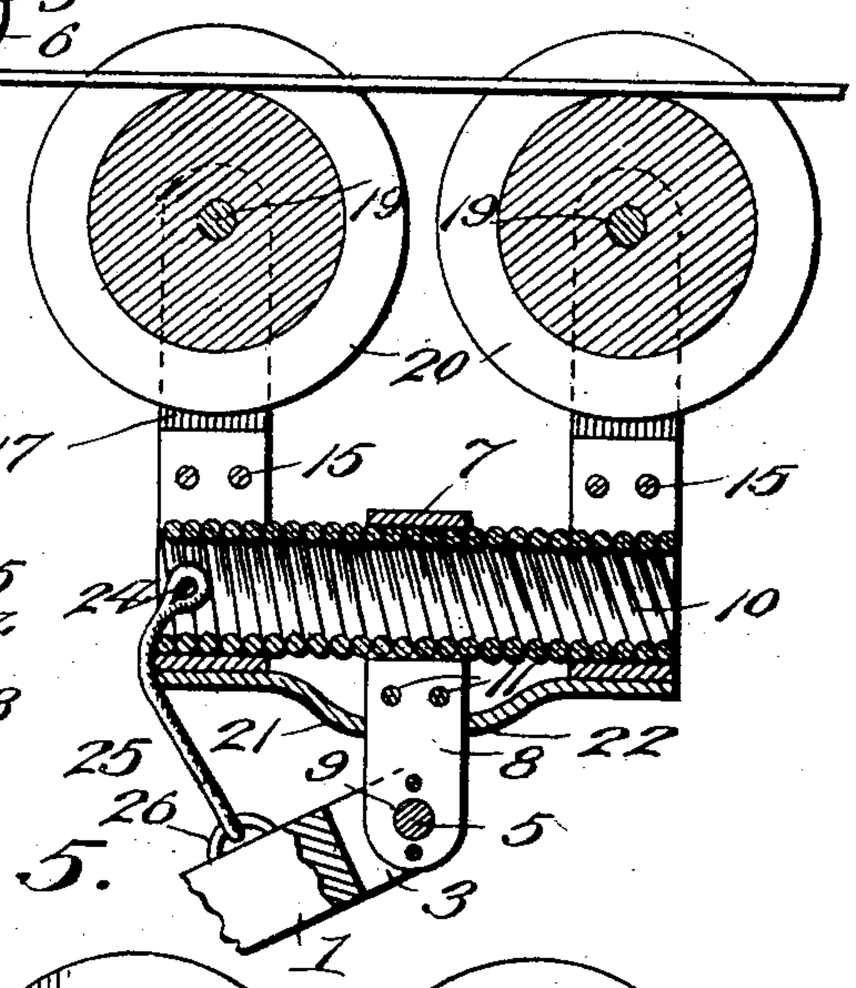


Fig. 4.

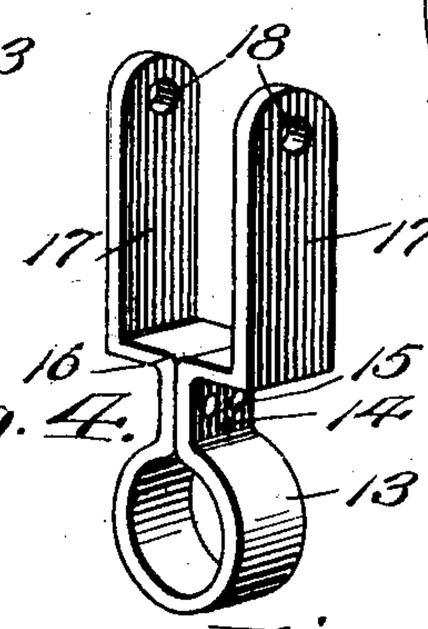
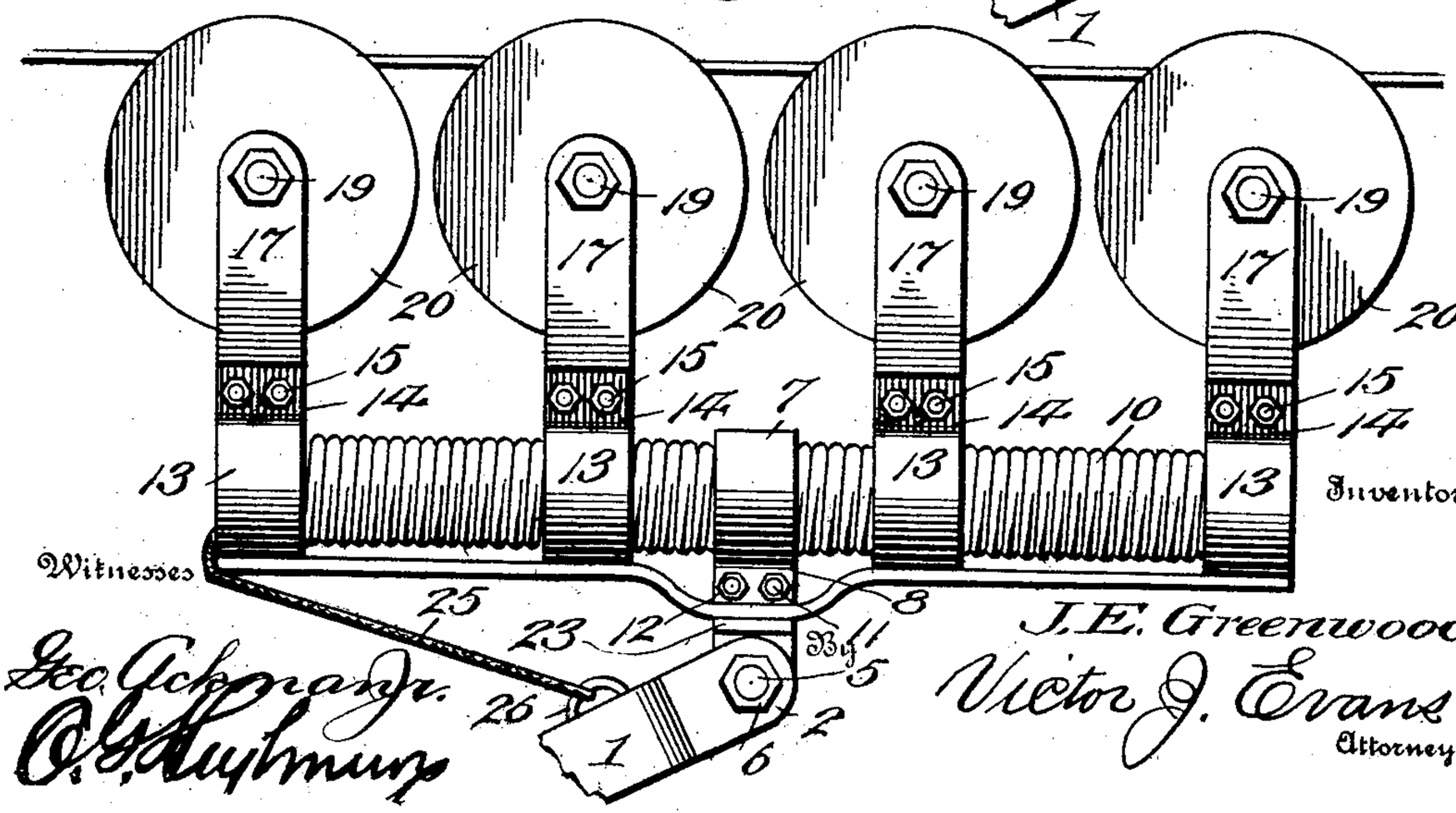


Fig. 5.



Witnesses

Geo. Schrader Jr.

O. L. Hathaway

Inventor

J. E. Greenwood,

Victor J. Evans

Attorney

No. 765,003. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

JOHN E. GREENWOOD, OF UTICA, NEW YORK.

TROLLEY-POLE HEAD.

SPECIFICATION forming part of Letters Patent No. 765,003, dated July 12, 1904.

Application filed August 29, 1903. Serial No. 171,268. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. GREENWOOD, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented new and useful Improvements in Trolley-Pole Heads, of which the following is a specification.

My invention has relation to new and useful improvements in trolley-pole heads for overhead electric railways, and more particularly to heads of that character or type which include in their structure a plurality of collectors or wheels arranged in tandem to travel simultaneously upon the trolley-wire.

The primary object of the invention is to provide a trolley-pole head of the character mentioned which is so constructed that all of the collectors or wheels will constantly remain in contact with the wire during the progress of the car.

A further object of the invention is to provide an improved mounting or support for the wheels, harps, or collectors, as the case may be, which will permit of a variety of movements of the harps to compensate for inequalities in the line-wire and which will be so constructed as to exert an upward force to hold the collectors in positive contact with said wire and reduce to a minimum the shock and vibration caused by the head striking switches, crossovers, supporting-wires, and other obstructions.

The invention consists in the construction of the parts and their arrangement in operative combination to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

I have fully and clearly illustrated my invention in the accompanying drawings, forming a part of this specification, and wherein—

Figure 1 is a view in side elevation of a trolley-pole head embodying my invention. Fig. 2 is a longitudinal central vertical section through the improved head. Fig. 3 is a vertical transverse vertical section through the head. Fig. 4 is a detailed perspective of the wheel or collector-harp. Fig. 5 is a view in side elevation of a modified form of the invention, showing a greater number of collectors which may be employed under special circumstances.

Referring to the drawings, 1 designates a trolley-pole which may be of any of the well-known constructions commonly employed in overhead electric-railway systems and in connection with which my improved head and collector is employed. At its extreme upper end or terminal this pole is forked to provide vertically-extending arms 2 2 and an intermediate space 3, as clearly shown in Fig. 3 of the drawings.

Extending through alining apertures 4 4, formed in the arms 2 2, is a headed bolt 5, which is held in position by means of a nut 6 and constitutes a transversely-extending bearing or pivot pin, upon which is pivotally arranged the head or carrier for the wheels or collectors. The head just mentioned comprises a strip of suitable metal, which at its central portion is constructed to provide a circular clamping device or holder 7, the ends of the strip being placed face to face in engagement with each other to form a depending arm 8, which at a point adjacent its free terminal is formed with an aperture 9, adapted to receive the bearing-pin 5, as shown in Fig. 3.

Arranged within the circular clamping device 7 at a point intermediate its ends is a flexible carrying member, disposed horizontally when in operative position and upon which the wheels or other collectors are carried, said member having its ends free to swing in different directions. This carrying member, as shown in the drawings, consists, preferably, of a strong coiled spring 10, which is carried horizontally the required distance either side of the clamping device 7, according to the number of collectors it is desired to mount on said member, which collectors are arranged in tandem, so that in passing obstructions one or more of the said collectors will always be in contact with the line-wire to receive the current therefrom.

In order that the spring-carrying member may be securely and rigidly held in position in the clamping device 7, suitable means is provided for forcing said device into positive

engagement with the said member, the means being shown in the drawings as consisting of bolts 11, projected through the ends of the strip adjacent the clamp and upon the ends of which are nuts 12 for the purpose of drawing the clamp tightly around the carrying member for the purpose mentioned.

Mounted upon the carrying member 10 at suitable intervals are a plurality of harps carrying the collector-wheels. These harps are constructed of a strip of suitable metal, which are bent at their intermediate portions to constitute a clamp 13 to receive and embrace the carrying member. From the clamping portion the ends of the strips are placed in engagement with each other and carried vertically to form an intermediate portion 14, through which extend clamping-bolts 15 for the purpose of forcing the clamp 13 into positive engagement with the carrying member 10. From the intermediate portion 14 the strips are spread and directed oppositely for a distance, as at 16, whence they are carried vertically to constitute bearing-arms 17, formed with alining apertures 18 to receive a bearing-pin 19, upon which the trolley-wheel 20 is rotatably mounted.

It will be perceived that inasmuch as the carrying member 10 is flexible and resilient in its nature during the progress of the car said member will bend and give as the wheels or collectors pass around curves in the line-wire or when striking supporting-wires, cross-overs, and other obstructions.

For the purpose of holding the carrying member 10 normally horizontal and to prevent sagging of the ends thereof incident to continued use and the weight of the wheel-harps I provide a spring 21, which is formed at its central portion with an aperture 22, through which the arm 8 extends, said spring being rigidly secured to brackets 23, arranged and secured upon opposite sides of said arm 8. The ends of this spring are directed oppositely in front and rear of the point at which it is secured on the brackets 23 and are arranged to engage the clamping portion 13 of each wheel-harp in order that the force of the blows upon said wheels will be shared partially by the said spring 21, and the weight of the wheels and harps will be partly borne thereby.

In order to prevent the head and the elements carried thereby from falling over rearwardly, so as to assume an inverted position, which would cause trouble in placing the wheels in contact with the wire, I provide a transverse bar 24 on the carrying member 10, to which is connected one end of a flexible connection 25, the other end of which is connected to an eye 26 on the trolley-pole, the rearward movement of the head being limited by the length of said flexible connection. The forward movement of the head is limited by its engagement with the pole.

Having thus described the invention, what I claim as new is—

1. The combination with a trolley-pole, of a head, a flexible member on the head, collectors mounted on the member, and means on the head engaging the member beneath the collectors to maintain the member in horizontal position.

2. The combination with a trolley-pole, of a head, a flexible member secured on the head at a point intermediate its ends, and having its ends free, collectors mounted on said member at either side of its central point, and a member on the head and having its end portions in engagement with the flexible head beneath the collectors.

3. The combination with a trolley-pole, of a head, a flexible member secured on the head, collectors on the member, and means to limit the movement of said member.

4. The combination with a trolley-pole, of a head, a coiled spring secured on the head, collectors on the spring, and means to limit the movement of the spring.

5. The combination with a trolley-pole, of a coiled spring secured thereto at a point intermediate its ends, collectors on the spring, and means engaging the ends of the spring to maintain it in horizontal position.

6. The combination with a trolley-pole, of a head including a clamp, a flexible member secured in said clamp, at a point intermediate its ends and collectors on the member.

7. The combination with a trolley-pole, of a head including a pivotally-mounted clamp, a flexible member arranged in the clamp at a point intermediate its ends, means to force the clamp into engagement with the member and collectors on said member.

8. The combination with a trolley-pole, of a head, a flexible member thereon disposed horizontally when in operative position, collectors on said member and means to maintain the said member in horizontal position.

9. The combination with a trolley-pole, of a head, a flexible member thereon disposed horizontally when in operative position, collectors on said member and means carried by the head to maintain said member in horizontal position.

10. The combination with a trolley-pole, of a head, a flexible member thereon having its ends free and disposed horizontally when in operative position, collectors on the member, and a spring secured to the head intermediate its ends, which engage said member to maintain it in horizontal position.

11. The combination with a trolley-pole, of a coiled spring secured thereto at a point intermediate its ends and having its ends free, collectors supported by the spring and a flat spring secured to the pole and engaging the coiled spring to maintain it in horizontal position.

12. The combination with a trolley-pole, of

a head pivotally mounted thereon, and including a clamp, a flexible member engaged by said clamp, and having its ends free, means to force said clamp into engagement with said member, harps arranged in tandem on the member, wheels carried by the harps, a spring secured to the head at a point intermediate its ends which engage the harps and member to maintain said member in horizontal position.

13. The combination with a trolley-pole, of a head, a flexible member on the head, harps on the member, each harp being constructed from a strip of metal formed at an intermediate point to provide a clamp to embrace the flexible member, the side portions of the strips being brought into engagement with each other, means for clamping the said side portions together at their point of engagement, and the end of the strips being directed upwardly to provide bearing-arms, and a collector carried by the arms.

14. The combination with a trolley-pole, of a head, provided with a bracket, a flexible member on the head, collectors on the member, and means on the bracket to maintain the member in horizontal position.

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

JOHN E. GREENWOOD.

Witnesses:
E. J. BROWN,
B. V. BUTTS.