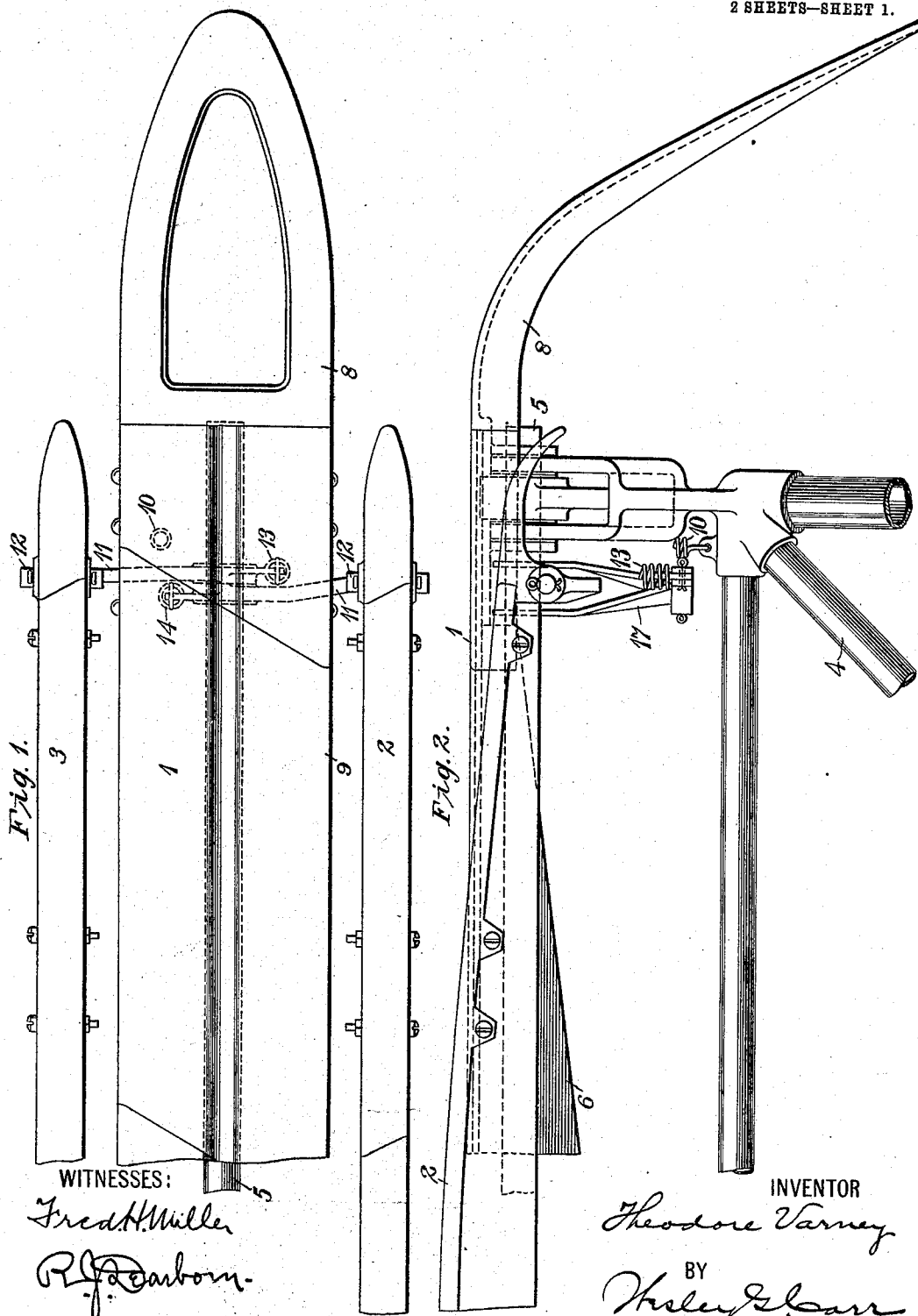


T. VARNEY.
TROLLEY FOR ELECTRICAL VEHICLES.
APPLICATION FILED APR. 5, 1907.

932,652.

Patented Aug. 31, 1909.
2 SHEETS—SHEET 1.



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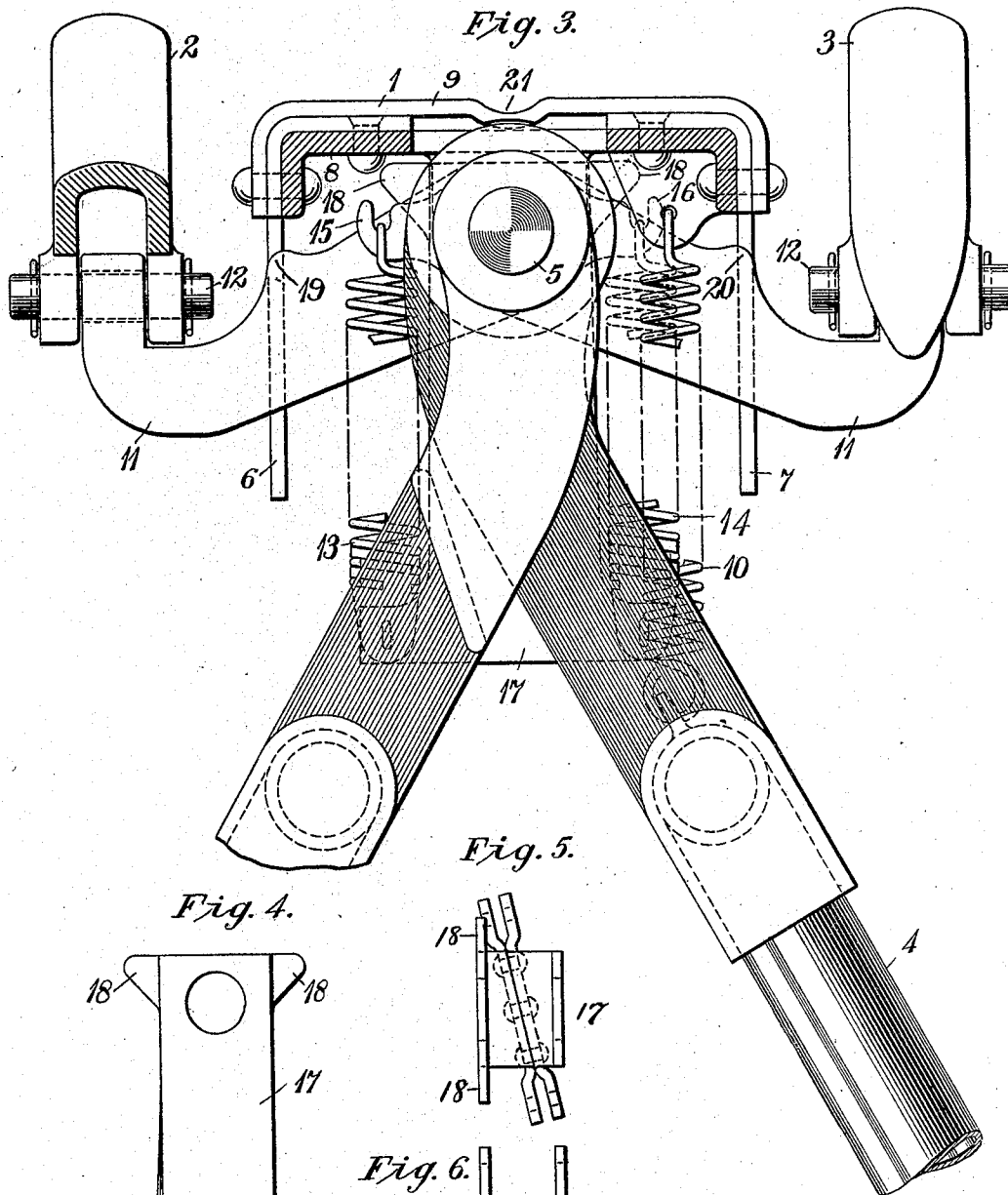


Fig. 4.

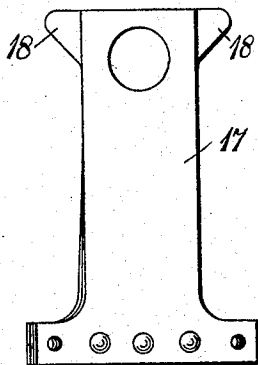


Fig. 5.

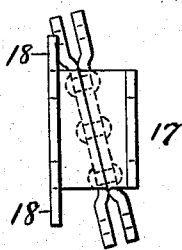


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TROLLEY FOR ELECTRICAL VEHICLES.

932,652.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed April 5, 1907. Serial No. 366,499.

To all whom it may concern:

Be it known that I, THEODORE VARNEY, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Trolleys for Electrical Vehicles, of which the following is a specification.

My invention relates to trolleys for electrically propelled vehicles and it has for its object to provide a device of this character which shall be specially adapted to transmit large amounts of electric power from a stationary line conductor to a vehicle operating at a high speed.

It is a well known fact that sliding or bow trolleys have been found preferable to other types for high speed service and particularly where relatively large amounts of electric power are transmitted from the supply line through a single contact member.

A spring pressure has usually been exerted upon the contact shoe tending to hold it in engagement with the supply conductor but, on account of the inertia of the moving parts and the unavoidable irregularities in the suspension of the supply conductor the contact member is, at times, separated from the supply conductor and destructive electric arcs result.

According to my present invention, I provide, in connection with a well known form of sliding or bow trolley, a pair of auxiliary contact members, the movement of which is partially independent of that of the main contact member, these auxiliary contacts being provided with springs so that they follow the variations in the supply line conductor more closely than the main contact member is always able to do.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a plan view and Fig. 2 a side elevation of a portion of a trolley constructed in accordance therewith. Fig. 3 is a partially sectional elevation of the device illustrated in Figs. 1 and 2 and Fig. 4 is an elevation, corresponding to Fig. 3, of one of the members shown in that figure, and Figs. 5 and 6 are, respectively, a plan view and an elevation at right angles to Figs. 3 and 4 of the part shown in Fig. 4.

I have shown in the drawing a trolley comprising a main contact shoe 1 and two auxiliary contact shoes 2 and 3 which may

be supported by any suitable frame that is capable of being extended or raised so as to bring the contact portions into engagement with a supply line conductor. The drawings disclose the uppermost portion of a pantagraph supporting frame 4 of a well known type, but the use of the trolley contact of my invention is not restricted to this form of support. A rod 5 is supported at each end of the main contact shoe by the frame 4 and the three contact members are rotatably mounted upon this rod as an axis.

The main contact shoe 1 comprises a frame which is built up of side strips 6 and 7 attached to end castings 8 (which extend outwardly and downwardly) and relatively thin contact plates 9 which are attached to the frame thus formed and are fitted together by mitered joints. The advantages of the detachable contact pieces are pointed out in Patent No. 803,252, granted October 31, 1905, to the Westinghouse Electric & Manufacturing Company, as assignee of Norman W. Storer, and an additional advantage is obtained by providing several independent contact pieces across the length of the shoe by reason of the fact that the middle portion receives the greater wear in service and may be replaced without removing the others. This contact shoe is kept in a substantially horizontal plane by springs 10 (only one of which is shown) that connect opposite sides and opposite ends of the shoe with an arm of the frame 4 which is directly beneath the point of connection with the shoe.

The structure of the auxiliary contact shoes is similar to that of the main contact shoe with the exception that the radius of curvature of each auxiliary shoe is shorter than that of the main shoe and the auxiliary shoe is relatively narrower. It is therefore lighter and very active in following the slight irregularities of the supply line conductor.

The auxiliary contact shoes 2 and 3 are directly attached to arms 11 by means of pins 12, the arms being rotatably mounted upon the rod 5. The main contact shoe is held in engagement with the trolley conductor by reason of a pressure which is exerted upon the lower parts of the supporting frame 4, by any suitable means, such as springs or fluid pressure. The auxiliary contact shoes are held in engagement with the trolley conductor by springs 13 and 14 the

upper ends of which engage hook projections 15 and 16 on the arms 11, the lower ends of the springs are secured to a support 17 that is suspended from the rod 5. The support 17 is prevented from rotating about the rod 5, independently of the main contact shoe 1, by reason of projecting ears 18 that engage the end casting of the shoe.

In operation, the auxiliary contact members are held in engagement with the supply line conductor even if the main contact shoe is slightly separated therefrom since the springs 13 and 14 and the auxiliary shoes are relatively light and have a negligible inertia. The contact surfaces of the auxiliary shoes are permitted to rise materially above the plane of the main contact shoe and are limited in their motion in this direction by projections 19 and 20 upon the arms 11 which engage the outer edges of the main contact shoe.

Although the contact surface of the main shoe has been referred to as lying in a horizontal plane it may preferably be bowed slightly in order to avoid, as far as possible, the grooving of its surface by the continual wearing of the supply line conductor.

The contact plates, with which the main trolley shoe is provided, may preferably be so formed as to have a longitudinal lubricant-containing groove 21.

The means for supporting the auxiliary contact shoes may be considerably varied, and other modifications effected, without departing from the spirit of my invention and I desire that only such limitations be imposed as are indicated in the appended claims.

I claim as my invention:

1. A trolley for electric railway vehicles comprising a main contact shoe having a plurality of removable contact strips which abut end to end along diagonal lines, and independently movable auxiliary contact shoes disposed parallel to the main contact shoe and at opposite sides thereof.

2. A trolley for electric railway vehicles comprising a main contact shoe having a plurality of removable contact strips disposed end to end, and independently movable auxiliary contact shoes located adjacent to opposite sides of the main contact shoe.

3. A bow trolley comprising a frame having a broad upper surface provided by a plurality of removable end to end contact strips, and a pair of auxiliary contact members ca-

pable of movement independently of the main contact member.

4. In a trolley for electric vehicles, a bow frame having a substantially horizontal portion, a plurality of removable contact strips mounted thereon, auxiliary bow contact members, the radius of curvature of which is less than that of the main bow frame, stops for limiting the independent movement of the auxiliary members, and resilient means tending to hold said members in engagement with said stops.

5. In trolley for electric vehicles, a bow frame having end castings and side strips, and a plurality of contact plates mounted thereon in end-to-end engagement along diagonal lines.

6. In a trolley for electric vehicles, a bow frame, end castings and side strips therefor, and a plurality of contact plates detachably mounted on the frame in end-to-end engagement along diagonal lines.

7. In a trolley for electric vehicles, the combination with a horizontal rod and a bow frame tiltingly mounted thereon and comprising end castings, side pieces and detachable contact plates, of auxiliary bow contact members, supporting arms rotatably mounted near the extremities of the rod, and resilient means for exerting an independent upward pressure upon the auxiliary contact members.

8. In a trolley for electric vehicles, the combination with a horizontal rod and a bow frame tiltingly mounted thereon and comprising end castings, side pieces and detachable contact plates, of auxiliary bow frames, detachable contact plates mounted thereon, supporting arms for the auxiliary frames rotatably mounted near the extremities of the rod, and resilient means for exerting independent upward pressure upon the auxiliary contact members.

9. A trolley for electric railway vehicles, comprising a main contact shoe and independently movable auxiliary contact shoes located at opposite sides of the main contact shoe and comprising bow frames and detachable contact strips mounted thereon.

In testimony whereof, I have hereunto subscribed my name this 29th day of March, 1907.

THEODORE VARNEY.

Witnesses:

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