

No. 721,147.

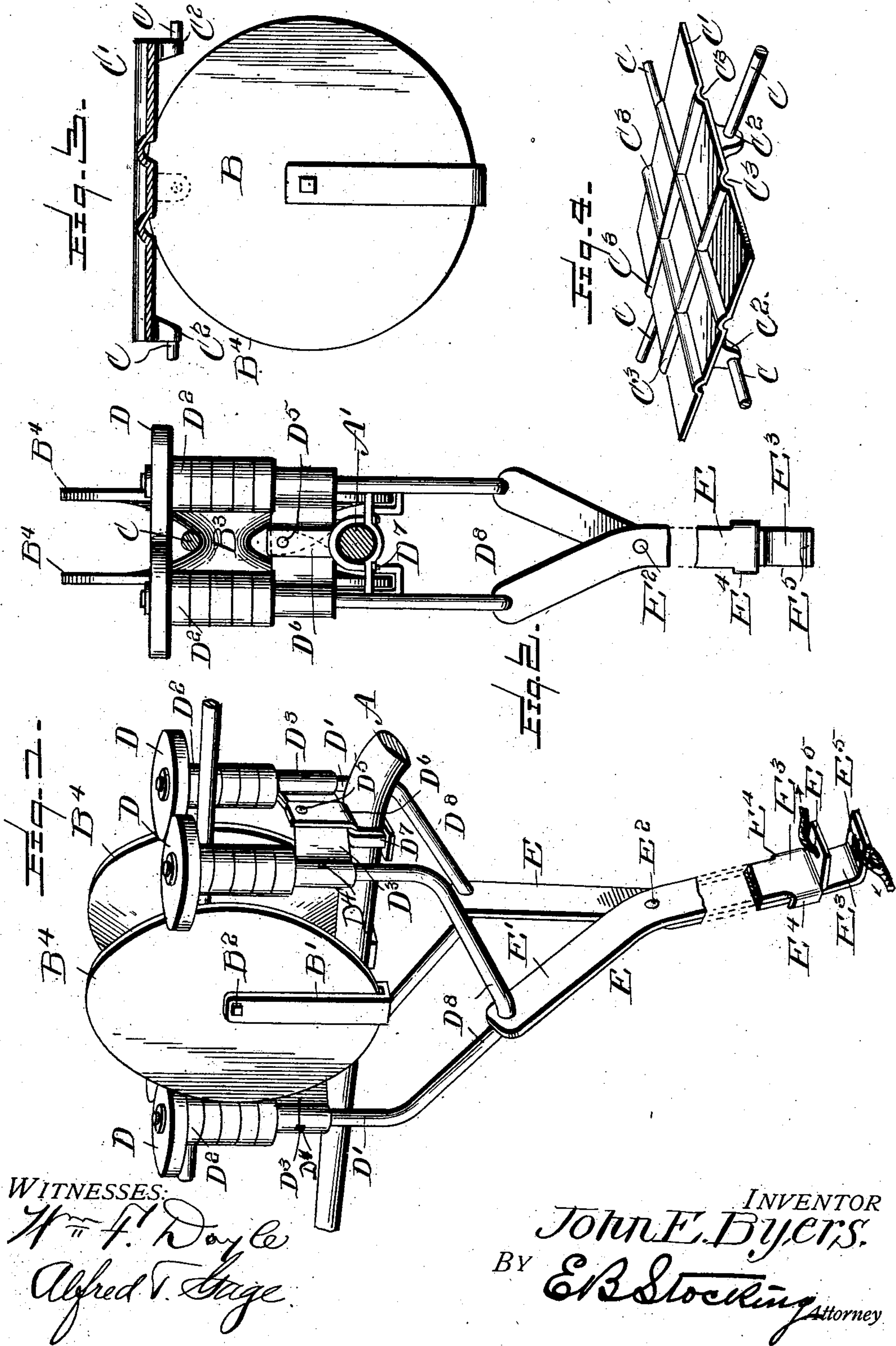
PATENTED FEB. 24, 1903.

**J. E. BYERS.**

# OVERHEAD TROLLEY.

APPLICATION FILED APR. 11, 1902.

NO MODEL.



W. H. HOBBS PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.



# UNITED STATES PATENT OFFICE.

JOHN E. BYERS, OF BUTLER, PENNSYLVANIA.

## OVERHEAD TROLLEY.

SPECIFICATION forming part of Letters Patent No. 721,147, dated February 24, 1903.

Application filed April 11, 1902. Serial No. 102,450. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. BYERS, a citizen of the United States, residing at Butler, in the county of Butler, State of Pennsylvania, have invented certain new and useful Improvements in Overhead Trolleys, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an overhead trolley, and particularly to means for retaining the trolley-wheel in contact with the wire and for insuring an electrical contact with the wheel when passing from one trolley-wire to another.

15 The invention has for its object to provide a construction of overhead trolley embodying guard wheels and rollers at opposite sides and in front and rear of the trolley-wheel and adapted to move toward and from each other to permit the free removal of the trolley-wheel from the wire when the wheels and rollers are separated.

20 A further object of the invention is to provide a construction of trolley-wheel having an extended flange or rim adapted to cooperate with a novel construction of plate extending between the ends of adjacent trolley-wires at right-angle crossings, switches, and other angles and in electrical circuit therewith, whereby the flange of the wheel will keep the same in electrical circuit when passing from one wire to another in making crossings and switches.

35 Other and further objects and advantages of the invention will be hereinafter set forth, and the novel features thereof defined by the appended claims.

40 In the drawings, Figure 1 is a perspective of the overhead trolley; Fig. 2, an end view thereof; Fig. 3, a vertical section through a connecting-plate between adjacent trolley-wires, showing a trolley-wheel in contact with the plate; and Fig. 4, a detail perspective of the top of this plate.

45 Like letters of reference indicate like parts in the several figures of the drawings.

50 The invention is adapted to be applied to any desired form of trolley-pole—for instance, as indicated at A—which is provided with the horizontally-disposed portion A' at the upper end thereof, upon which the trolley-wheel B

is mounted by means of standards B', connected to the end A' of the pole beneath the wheel and having a pivot B<sup>2</sup> extending 55 through the core B<sup>3</sup> of the wheel. This core and contiguous part of flanges are adapted to contact with the trolley-wire C in the usual manner, while the rim or marginal edges of the flanges B<sup>4</sup> are extended for the purpose 60 of bearing upon a connecting-plate C', extending between adjacent wires C, as will be hereinafter described.

At the front and rear of the trolley-wheel B guard-wheels D and rollers D<sup>2</sup> are pivotally 65 mounted to move toward and from each other above and at either side of the conducting-wire. These guard-wheels D are preferably pivoted at the upper ends of the spring-arms D', which arms when in operating position stand perpendicular, and supported upon 70 the friction-rollers D<sup>2</sup>, which fill the space on D' between the clamps D<sup>3</sup> (upon which they rest) and the guard-wheels D, so as to rotate if brought in accidental contact with the 75 wire C when the car is in motion. Each pair of guard-wheels D is adapted to travel in a horizontal position, the rims of each pair of wheels squarely adjacent or contiguous with each other. The point of contiguity when 80 in position is directly over the trolley-wire, but admits of a sidewise-swinging motion when in operation. The arms D' are passed through clamps D<sup>3</sup>, within which they may be vertically adjusted, and held by a set- 85 screw D<sup>4</sup> or by swaging, riveting, or otherwise, and these clamps are pivoted at D<sup>5</sup> to a bracket D<sup>6</sup>, mounted upon and insulated from the end A' of the trolley-pole by means of a clamp D<sup>7</sup>. The pivoting brackets and clamps 90 are each similar in construction and located at the front and rear of the trolley-wheel B, while the lower ends of the arms D' converge toward each other and form a loop D<sup>8</sup>, adapted to receive an operating-lever E, which holds 95 the loops and causes them to act as a spring, allowing the wheels D to separate in passing the wire-hangers. A very desirable construction of this lever is herein shown and comprises the opposite separated members E', 100 connected to the loops D<sup>8</sup> at their upper ends and pivoted to each other at E<sup>2</sup>, so that a separation of the lower parallel ends E<sup>3</sup> of the operating-levers in the plane of their pivot



will cause the upper ends thereof to approach each other, thus separating the contact-wheels D and permitting the convenient removal of the trolley-wheel from the wire or the placing of the same in contact with the wire. For the purpose of preventing an accidental separation of the guard-wheels one of the ends  $E^3$  may be provided with lugs  $E^4$ , adapted to embrace the opposite end and to be separated from the same by springing the ends laterally from each other. Each of the ends is also shown as provided with an angular portion  $E^5$ , having an aperture for the connection of a suitable cord or rope, which may be fastened to rear end of the car to prevent levers from being thrown out of position while car is in motion, which levers may be separated by springing laterally and then moved away from each other in the plane of the pivot to operate each pair of the guard-wheels, one pair in front and the other at rear of the trolley-wheel.

The connecting-plate  $C'$ , before mentioned, may be constructed of any desired conducting material by pressing or molding and the trolley-wires electrically connected therewith by any preferred means—for instance, the depending hangers  $C^2$ . This plate may be of any desired configuration suitable for right-angle or other crossovers or switches at any angle and is provided with depressions  $C^3$  upon its face, either parallel with the trolley-wire C or in alinement therewith. In the present illustration the depressions  $C^3$  are formed in an integral plate by stamping the same to form a crossover-plate, as shown in Fig. 4, and extend upon opposite sides of the line of the wire C, so as to receive the extended flanges  $B^4$  of the trolley-wheel B, which travel therein and maintain a constant current to the motor of the car in passing from one conducting-wire to the other. It will also be seen that these flanges extend above the guard-wheels D, which are thus free to leave the wire at one side of the plate and pass over the wire at the opposite side without contacting with the plate, the anterior pair of wheels D passing over the crossing and coming in contact with the hanger and the wire in front before the rear pair of wheels has left the wire and hangers at rear of trolley-wheel. The construction of plate also guides the trolley-wheel in its passage from one wire to the other, preventing the possibility of lateral displacement and the consequent difficulty of engaging the wires at the opposite side thereof.

It will be obvious that changes may be made in the details of construction and configuration without departing from the spirit of the invention as defined by the appended claims.

Having described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In an overhead trolley, a trolley-pole and trolley-wheel mounted thereon, and guard-

wheels at the front and rear of said trolley-wheel and pivoted arms mounted upon opposite sides of said trolley-wheel and carrying said guard-wheels at their upper ends and adapted to be simultaneously moved toward and from each other; substantially as specified.

2. In an overhead trolley, a trolley-pole and trolley-wheel mounted thereon, guard-wheels at the front and rear of said trolley-wheel and adapted to be simultaneously moved toward and from each other, depending loops connecting the guard-wheels upon each side of the trolley-wheel, and an operating-lever for moving these loops toward and from each other; substantially as specified.

3. In an overhead trolley, a trolley-pole and trolley-wheel mounted thereon, guard-wheels at the front and rear of said trolley-wheel and adapted to be simultaneously moved toward and from each other, depending loops connecting the guard-wheels upon each side of the trolley-wheel, an operating-lever for moving these loops toward and from each other comprising pivoted members having separated upper ends and parallel lower ends; substantially as specified.

4. An overhead trolley comprising a pole, a wheel supported thereby, opposite guard-wheels at one side of said wheel, arms for supporting said wheels, clamps connected to said arms, and a bracket supported and insulated from the trolley-pole within which the inner ends of said clamps are pivoted; substantially as specified.

5. An overhead trolley comprising a pole, a wheel supported thereby, opposite guard-wheels at one side of said wheel, arms for supporting said wheels, clamps connected to said arms, a bracket supported and insulated from the trolley-pole within which the inner ends of said clamps are pivoted, means for supporting said arms in a substantially vertical position when the guard-wheels are in contact, and means for throwing said arms into a position at an angle to the vertical position; substantially as specified.

6. In an overhead trolley, a pole, a trolley-wheel supported therefrom, guard-wheels in front and rear of said trolley-wheel, arms upon which said wheels are mounted connected at their lower portions by a loop, a pivoted lever having separated upper ends connected to said loop and parallel lower ends, and a flange carried by one of said lower ends to engage the other end for retaining the same against movement; substantially as specified.

7. In an overhead trolley, a pole having a horizontally-disposed upper end, a trolley-wheel supported therefrom, guard-wheels and friction-rollers in front and rear of said trolley-wheel, pivoted arms upon which said wheels and rollers are mounted connected at their lower portions by a loop, a pivoted lever having separated upper ends connected to said loop and parallel lower ends, a flange carried by one of said lower ends for retain-



ing the same against movement, an extended flange upon said trolley-wheel, and insulated brackets upon the upper end of said pole to which each pair of arms is pivoted; substantially as specified.

8. In an overhead trolley, a pole, a conducting-wheel having an extended flange thereon, conducting-wires, and a conducting-plate connecting said wires and provided with a groove extending entirely across the plate in a parallel plane above said wires to receive the flange from said wheel; substantially as specified.

9. In an overhead trolley, a pole, a conducting-wheel having an extended flange thereon, conducting-wires, a conducting-plate provided with a plurality of intersecting depressions extended entirely across one face thereof disposed in a parallel plane above said wires adapted to receive the flange of a trolley-wheel and guide the same from one wire to the other; substantially as specified.

10. In an overhead trolley, a pole, a trolley-wheel supported thereon, arms supported by said trolley-wheel at opposite sides thereof and having extended ends at the front and rear of said trolley-wheel, guard-wheels pivoted on said arms, a flange extending from the core of said trolley-wheel above said guard-wheels, and means for simultaneously shifting said arms and guard-wheels at the front and rear of the trolley-wheel; substantially as specified.

11. In an overhead trolley, conducting-wires, a flat connecting-plate extending between said wires and having grooves or de-

pressions impressed upon the body of said plate and extending entirely across the same parallel to and above said wires; substantially as specified.

12. In an overhead trolley, conducting-wires, a flat connecting-plate extending between said wires and having parallel intersecting grooves or depressions impressed upward from the body of said plate and extending entirely across the same, and depending hangers at the edges of said plate for supporting said parallel wires in a plane parallel to and below said grooves; substantially as specified.

13. In an overhead trolley, a trolley-pole, a trolley-wheel mounted thereon, pivoted arms at opposite sides of said poles and extended to the front and rear of said trolley-wheel, and friction-rollers adapted to rotate on said arms; substantially as specified.

14. In an overhead trolley, a trolley-pole, a trolley-wheel mounted thereon, arms at the front and rear of said trolley-wheel, a series of friction-rollers adapted to rotate on said arms, guard-wheels at the upper ends of said arms rotatable independently of said rollers, and means for simultaneously moving said arms toward and from each other; substantially as specified.

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

JOHN E. BYERS.

Witnesses:

S. M. BIPPUS,  
NETTIE L. TURNER.