

No. 755,999.

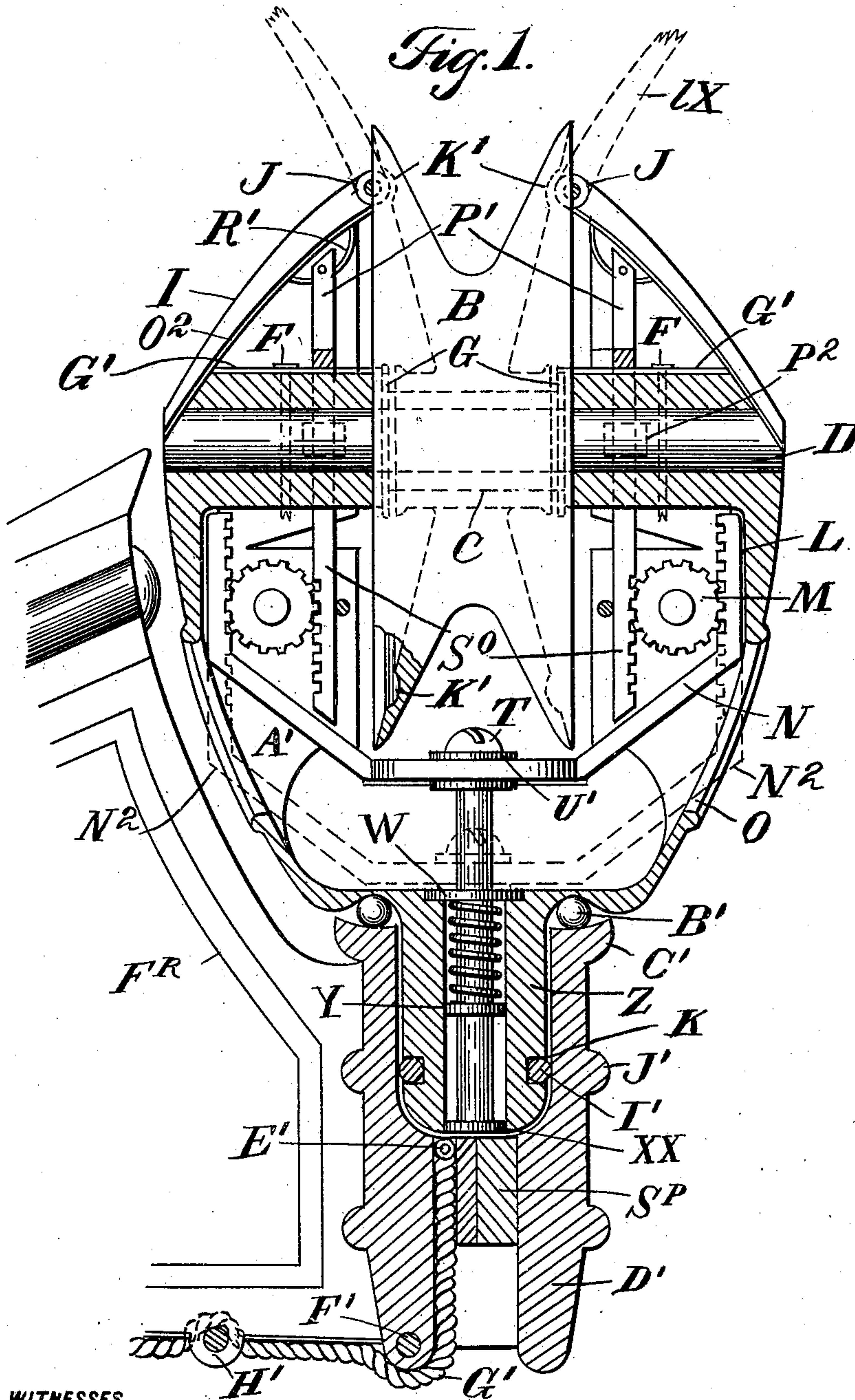
PATENTED MAR. 29, 1904.

J. T. CHERRY & E. H. CLIVE.
ELECTRIC TROLLEY HEAD.

APPLICATION FILED NOV. 3, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

W. B. Mattingly
F. A. Stewart

INVENTORS

BY *John Thomas Cherry*
Edward Henry Clive
Edgar Tate & Co
ATTORNEYS

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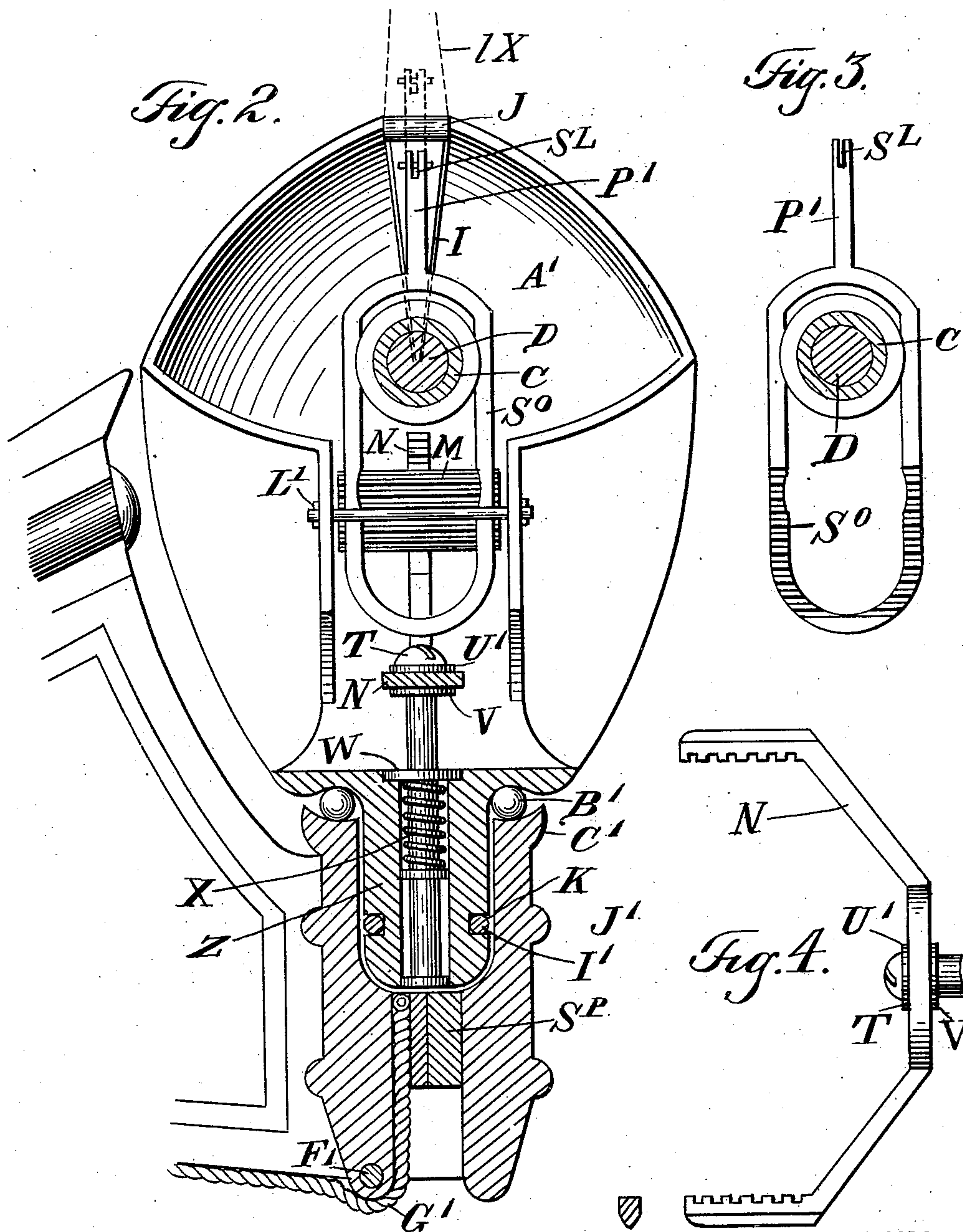
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WITNESSES

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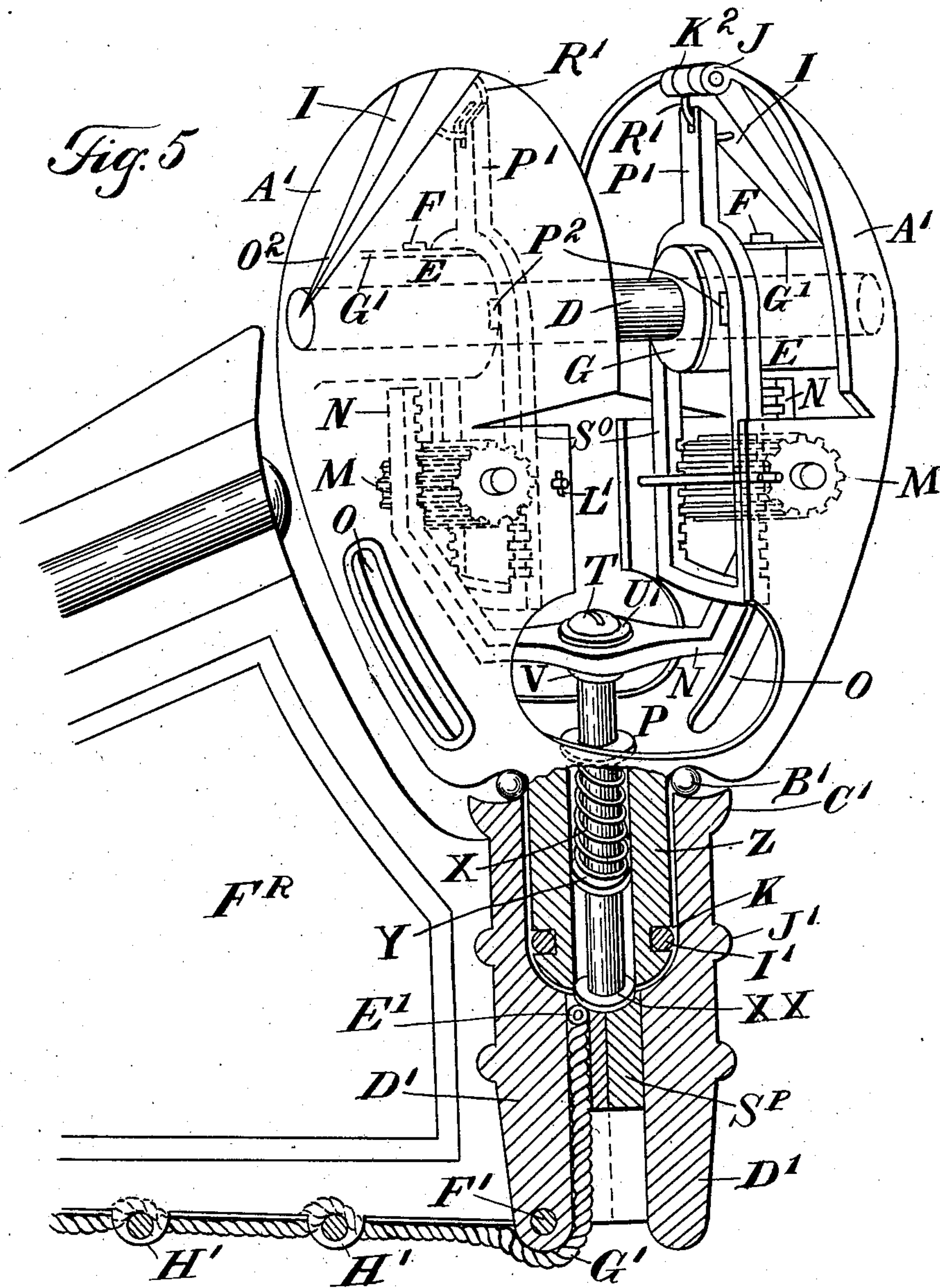
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN THOMAS CHERRY, OF PLYMOUTH, AND EDWARD HENRY CLIVE,
OF DEVONPORT, ENGLAND.

ELECTRIC-TROLLEY HEAD.

SPECIFICATION forming part of Letters Patent No. 755,999, dated March 29, 1904.

Application filed November 3, 1902. Serial No. 130,116. (No model.)

To all whom it may concern:

Be it known that we, JOHN THOMAS CHERRY, residing at 2 Bedford Park, Plymouth, and EDWARD HENRY CLIVE, residing at 103 Fore street, Devonport, England, subjects of His Britannic Majesty King Edward VII, have invented a new and practical Electric-Trolley Head for Tram-Cars or any other Vehicle or Carriage Using the Overhead System, of which
10 the following is a specification.

This invention relates to trolley devices for trolley-cars; and the object thereof is to provide an improved electric-trolley head adapted to be connected with the trolley-arm in the
15 usual or any desired manner and by means of which the trolley-wheel may be kept or placed in contact with the trolley wire or conductor at all times, either in the day-time or night-time.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the
25 views, and in which—

Figure 1 is a sectional side view showing our improved trolley head or support with the trolley-wheel and the operative parts shown at right angles to the carrying parts; Fig. 2, a sectional side view with parts of the construction removed; Fig. 3, a side view of a detail of the construction; Fig. 4, a similar view of another detail of the construction in a tilted position, and Fig. 5 a perspective view
35 of the entire apparatus with parts thereof shown in section and the trolley-wheel removed.

In the practice of our invention we provide a main fork-frame, (designated in the drawings by the reference characters A', L, and Z,) and this fork-frame is cast from good conducting metal, such as gun-metal, bronze, or finest hard brass.

In the accompanying drawings we have
45 shown at D' a holder, which is connected with or formed integrally with a bracket F', which is connected with or suspended from the trolley-arm in the usual or any preferred manner, and this holder D' is provided with a hole S^p,

which is angular or square in cross-section 50 from the base of the holder up to the point marked X X, above which said hole is enlarged and made round, and the bottom or base portion Z of the fork-frame fits in said enlarged portion of the hole S^p and is adapted 55 to turn therein, and in the top portion of the part Z of the fork-frame is secured a disk or plate W. The bottom or base portion Z of the fork-frame is also provided with a central vertical bore, and passing downwardly 60 therethrough and through the disk or plate W is a shaft or rod P, the lower end portion of which is angular or square in section and fits in the corresponding part of the hole S^p in the holder D', and the upper end of said 65 shaft or rod P extends above the base or bottom portions Z of the fork-frame, and the top portion of said shaft or rod is provided with a washer U', and mounted on said shaft or rod is a U-shaped piece N, below which is 70 another washer V, and the U-shaped piece N is secured to the shaft or rod P by a screw T or in any desired manner, and said U-shaped piece N is free to turn on the top of the shaft or rod P when necessary. To the disk or 75 plate W is secured a spring X, which is coiled around said shaft or rod, and below said spring the said shaft or rod is provided with a collar Y, on which said spring bears.

The sides of the fork-frame (designated in 80 the drawings by the reference characters A', L, and Z) are provided with two slots O O, through which the U-shaped piece N is passed when assembling or repairing parts of the device and through which said U-shaped piece 85 may move for a limited distance when drawn down by the shaft or rod P in the operation thereof. After the U-shaped piece has been inserted it is slid up into the fork-frame close to the portion marked L and fitting snugly 90 therein, and said U-shaped piece N is then attached to the shaft or rod P, as shown in the drawings and as hereinbefore described. We also provide, as clearly shown in the drawings, cylindrical gear or cog wheels M, which en- 95 gage teeth on the inner face of the U-shaped piece N and are supported, preferably, by the sides of the forked portion A' of the fork-

frame A', L, and Z, but which may be supported in any desired manner.

Two saddle-pieces S^0 are provided, which saddle-pieces being toothed on one side to engage the cogs or teeth of the wheels M, are slipped over the axle-bearings E of the trolley-wheel A and into niches or grooves provided for them and held in said engagement, but are allowed to slide up and down freely by reason of pins L' passed through the sides of the forked part A' of the fork-frame. A side view of both of these saddle-pieces in their places is given in the drawings, (see Fig. 1,) and one of said saddle-pieces is shown in Fig. 3, and these parts are designated by the reference characters S^0 and P'. At the top of each saddle-piece is a slot S^L , which receives the sliding loops R', attached to the wire-finders I, as shown in the drawings, and these slots S^L are adapted to receive the pin-fastening to hold the loops R' safely, while permitting them to move freely and smoothly at the time of action.

We will now proceed to describe how the separate parts of the trolley-head are assembled and placed on the axle D, which carries the trolley-wheel B. At each side of and at a suitable distance from the outer edge of the trolley-wheel the sides of the trolley-wheel are provided with grooves K', which allow the hinges J of the wire-finders to pass under the body of the trolley-wheel and yet permit the said wheel to revolve freely. The shape of the trolley-wheel in cross-section is clearly shown by the dotted lines in Fig. 1, said trolley-wheel being much thinner adjacent to the hub than at the perimeter thereof, and this shape constitutes one of the chief features of our invention. The annular grooves K' are formed in the casting of the wheel and are skilfully finished afterward, or are made wholly by turning in a lathe after the casting of the wheel. At the sides of the central tubular bearing of the wheel are placed two copper washers G, each of which is provided with an arm G', and these arms extend above the top of the axle-bearings E, and the said washers being of copper greatly help the distribution of the current through the entire trolley-head and thence to the pole-wire. The central tubular bearing or hub of the trolley-wheel is provided with a bushing or tubular casing c, which is renewable or replaceable when necessary. By using this renewable central bushing or bearing, which should be of softer metal than the axle, unevenness of wear occasioned by friction between the wheel and the axle can be eliminated and a straight-running and accurate adjustment may always be provided. The wire-finders are shown in full lines in their normal positions in Fig. 1 and by dotted lines in their operative position. The two lines marked O^2 show grooves which are provided in the wings of the fork of the main fork-frame, which are designed to receive the

wire-finders, which latter are adapted to drop into said grooves when at rest. The base of the fork portion A' of the main fork-frame, which is designated by the reference character Z, has an annular groove cut in it at K and designed to receive pins I' to hold it down just sufficiently to permit of its running freely upon the ball-bearings B' and C' at the top of the holder D'. The holder D' is strengthened by means of a series of rings or ribs J', cast on the outside thereof, and attached to the squared portion of the shaft or rod P and E' is an insulated cord G', which passes over and under carriers H', each of which is provided with a revolving pin F' and is connected with the loop generally used by the operator of the car or by the conductor.

It is necessary now to describe the complete assembling of the parts in the operation of our invention, and this process is as follows: All the parts being ready to be assembled, we begin by taking the shaft or rod P, to which the cord G' is secured by the catch E'. The spring X is then placed over the top of the shaft or rod P and pinned under or secured to the washer or collar Y. The shaft P is then passed through the square part of the hole S^P in the holder D' and the base Z of the main fork-frame, and the said spring X is drawn up above the top of said hole in the part Z. To the top part of the spring X is now fastened the disk or plate W, which disk or plate is fastened to the top of the part Z of the main fork-frame. The shaft P is then pulled out, and the U-shaped piece N is passed through one of the slots O O and slid up into the side grooves at L, and the shaft or rod P is passed upwardly through the bottom of said U-shaped piece, and the washer V' is then placed in position, after which the screw T is screwed into the top of said shaft or rod, and the U-shaped piece N is rigidly secured to said rod or shaft. Following this operation the gear cylinders or wheels M are placed in their bearings, and the saddle-pieces S^0 are slipped into their niches or recesses P' and fastened by the pins L' through the box part of the forked portion A' of the main fork-frame. The loops R' of the wire-finders are then put in the slots S^L of the parts P' of the saddle-pieces and pinned, so as to permit of their free movement. The wire-finders I are then attached to the frame by suitable pins or rivets at the points J, about which said wire-finders are free to swing. The axle D being passed part through the bearings E, one of the washers G is slipped on, and then the trolley-wheel B is placed in position, and the axle D is passed through it. The other copper washer G is then placed in position, after which the axle D is pushed through the other half of the bearing E and secured in position. The base Z of the main fork-frame, being already in the holder D', is lifted sufficiently to place the required number of steel spheres or

balls B' in the ball-race, and the said base member Z is then dropped and fastened by the regulating-pins I', inserted in the grooves K.

The operation of the trolley is as follows:

5 When the cord G' is pulled, the shaft or rod P being non-elastic stretches the spring X and pulls down the U-shaped piece N, which by means of the gear-teeth on its inner face revolves the wheels M, and they being in en-
10 gagement with the teeth of the saddle-pieces impart an upward motion to said saddle-pieces and the wire-finders, to which the latter are attached by means of the parts P' and R', and by this operation the wire-finders are raised to
15 the position shown by the dotted lines 1^x.

The operation of this device is exceedingly simple, and by means thereof the trolley-head and the trolley-wheel may always be held in proper position relative to the trolley wire or
20 conductor, and connection between the trolley-wheel and the trolley wire or conductor may be quickly and easily made at all times, whether in the day-time or the night-time, by the manipulation of the cord G', which is under the
25 control of the car operator or conductor.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a device of the class described, a trol-
30 ley-head provided with a vertically-movable member, a trolley-wheel mounted therein, vertically - movable spring - operated members mounted therein and comprising separate side parts, wire-finders pivoted to the top of the
35 head at the opposite sides of the trolley-wheel and adapted to swing in a vertical plane transversely of said wheel said wire-finders and said vertical movable members being in operative connection, and means for depressing said ver-
40 tical movable member and thereby raising said wire - finders, substantially as shown and described.

2. In a device of the class described a holder provided with a central vertical opening larger
45 at the top than at the bottom, a fork-frame composed of vertically-arranged side members and provided with a bottom member adapted to enter said holder and to turn therein, a

spring-supported shaft mounted in said holder and passing upwardly through the bottom 50 member, a cord connected with the lower end of said shaft, a trolley-wheel mounted between the said side members of the fork-frame, wire-finders hinged to the tops of the side members and adapted to swing vertically transversely 55 of the wheel, and devices in operative connection with said shaft and with said wire-finders, whereby the depression of the shaft will raise said finders, substantially as shown and described. 60

3. A trolley device comprising a support having a vertical opening, a vertically-mov-
able non-rotatable and spring-supported shaft mounted therein, a rotatable member mount-
ed in said support and comprising separate 65 sides between which a trolley-wheel is mounted, wire-finders hinged to the said sides at the top thereof and transversely of said wheel, and devices in operative connection with said
shaft and said wire-finders whereby the de- 70 pression of said shaft will operate or raise the wire-finders, substantially as shown and described.

4. In a device of the class described, a ver-
tically-movable spring-supported and non-ro- 75 tatable shaft, a rotatable member mounted thereon and comprising side members between which a trolley-wheel is mounted, wire-finders pivoted to the side members at the top
thereof, a transverse member secured to said 80 shaft and provided with upwardly-directed side portions having teeth, vertically-movable bars or members connected with the wire-finders and provided with teeth and gear-cylinders
mounted between the separate toothed mem- 85 bers, substantially as shown and described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 16th day of
October, 1902, at Devonport, Devon, England. 90

JOHN THOMAS CHERRY.
EDWARD HENRY CLIVE.

Witnesses:

JOHN ROBERTS,
ELI PILLAR.