

No. 703,297.

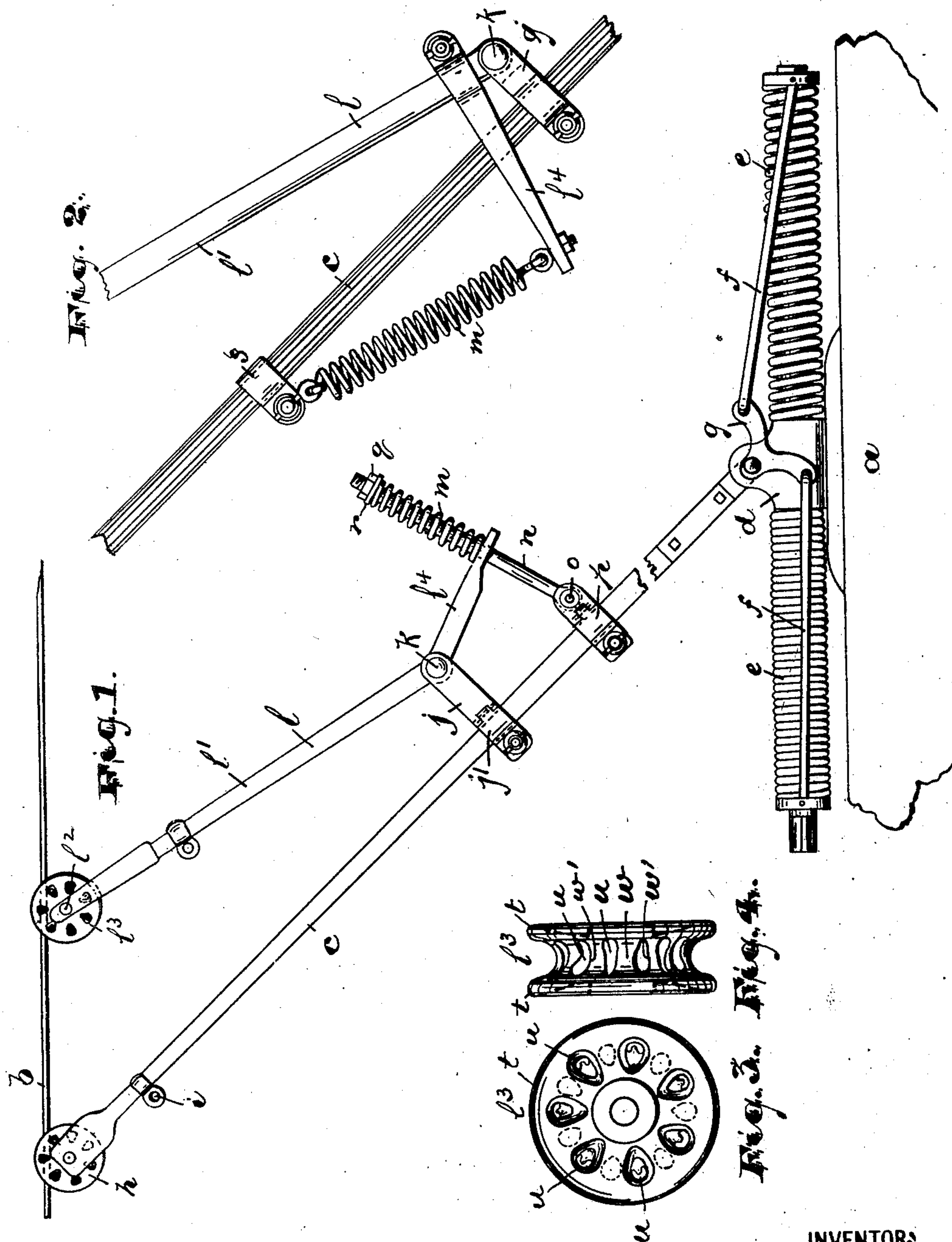
Patented June 24, 1902.

W. H. OLIPHANT.

AUXILIARY TROLLEY CONTACT AND SLEET AND ICE CUTTING DEVICE.

(Application filed Sept. 13, 1901.)

(No Model.)



WITNESSES:

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AUXILIARY TROLLEY-CONTACT AND SLEET AND ICE CUTTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 703,297, dated June 24, 1902.

Application filed September 13, 1901. Serial No. 75,252. (No model.)

To all whom it may concern:

Be it known that I, WALTER HENRY OLIPHANT, a citizen of the United States, residing at Mount Holly, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Auxiliary Trolley-Contacts and Sleet and Ice Cutting Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates more particularly to that class of electrical conductors for trolley-cars in which the trolley-poles are supplied with not only a principal trolley-wheel for effecting a proper contact with the electrical wire, but an auxiliary wheel by which the wire may be cleared of incrustations of ice, &c., immediately prior to passage of said principal wheel thereover, the objects of the invention being to effect a more thorough clearing of the wire from said incrustations of ice, &c., to reduce the cost of construction, to render the device more efficient, while at the same time the construction remains simple, durable, and strong, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved trolley-pole and its conductive appliances and in the arrangements and combinations of parts, all substantially as will be hereinafter referred to, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in both figures, Figure 1 is a side elevation of a trolley-pole and its appliances in contact with an electrical conducting-wire. Fig. 2 is a detail side elevation illustrating a modification or variation of construction.

In said drawings, *a* indicates the top of an electrically-driven car or vehicle to which a trolley-pole is attached in any suitable manner, and *b* indicates the electrical conducting-wire. The said trolley-pole *c* is pivotally sup-

ported on bearings *d* and is controlled in its movements to some extent by springs *e e*, which latter operate by means of suitable connections *f f g* to hold the free end of the pole *c* or the wheel *h* thereon in contact with said wire *b* in any usual and efficient manner. Said trolley-wheel *h*, which I have herein referred to as the "principal" trolley-wheel, is pivoted at the free end of the pole and is free to rotate when in frictional contact with the electric wire *b* as the car or vehicle *a* and its connections move forward, all as usual. The pole may be provided with an eye *i* to receive the rope, by means of which the pole is reversed or guided into contact with the wire. Said pole *c* and wheel *h* provide suitable metallic circuit connections by which the "electric fluid," so called, may pass from the wire to or toward the motor for driving the car or vehicle also in any usual manner. Between the pivot and free extremity of the pole the same is provided with a removable fulcrum *j*, having pivotal bearings *k* for a supplemental trolley pole or arm *l*, and at its opposite end provided with clip-jaws, one of which is integral with the fulcrum *j*, and the other (marked *j'*) is hinged to the first, the said jaws being bolted or otherwise clamped around the pole *c*. The fulcrum *j* may be otherwise fastened or secured to the pole. Upon said fulcrum is arranged the lever *l*, the longer arm *l'* of which extends upward toward the trolley-wire at an acute angle to the pole *c*. At its extremity said longer arm *l'* is bifurcated and provided with pivotal bearings *l''* for a contact and ice-breaking wheel *l'''*, which contacts with the wire *b* in advance of the principal trolley-wheel *h*, supplementing said wheel as a conductor of the electrical current and having the additional function of breaking up and removing the incrustation of ice or other insulating matter, so that a more regular and perfect contact of the principal wheel with the wire is secured. The specific construction of this wheel whereby it is effective in removing the insulating incrustation without employing a complexity of working parts conducive to disarrangement and inefficiency will be described hereinafter. The shorter arm *l''* of the lever may be integral with the longer arm, as in Fig. 1, or be fastened thereto, as in Fig. 2. Said shorter

arm is acted upon by a spring *m*, either by tension of said spring, as in Fig. 2, or by pressure, as in Fig. 1, so that the longer arm of the lever *l* or the wheel thereon is forced to bear up against the under side of the wire with sufficient force to secure a good electrical contact or ice-breaking action. The force of the spring may be increased or diminished by suitable adjustable means. In the preferred construction (shown in Fig. 1) the spring *m* is carried by a pivotal stud or arm *n*, pivoted at or upon a collar *p*, adapted to be adjusted and fastened upon the pole *c* at a point below the fulcrum *j*. Said stud or arm *n* extends through a slot or opening in the short arm *l*, and at its free extremity is threaded and provided with a nut *q*, which bears, unless an intermediate washer *r* is provided upon the one end of the spring, so that the latter will press against the side of said shorter arm and effect the desired actions, as will be clearly understood upon examination of the drawings. In the variation of Fig. 2 the short arm is adjustably fastened upon the longer arm of the lever, and the spring *m* is secured to the arm *l* and to a collar *s* upon the pole *c*, said spring in this case being in a state of tension. Other arrangements of the spring may be employed without departing from the invention.

The ice-breaking wheel *l*³ is of peculiar construction and is shown in detail in Figs. 3 and 4. Said wheel comprises a single casting with peripheral flanges *t t*, adapted to receive the wire *b* therebetween, the groove between said flanges being rounded, as in Fig. 4, so that the wire will be led normally to the bottom of the groove *v* between said flanges. At said bottom the said wheel is provided with a series of flaring openings *u u u* a quarter of an inch (more or less) apart, which openings extend inward toward the center of the wheel and open out at the opposite sides of said wheel, one opening preferably extending out at one side of the wheel and the next in order opening out at the opposite side of the wheel, as indicated. Each opening flares from a point on one side wall of the groove close to its bottom downward through said bottom and out through the opposite side of the wheel, the course of the passage thus formed being along a curved line, so that there can be no obstruction or choking of said passage; but by reason of its curved form and flaring shape said passage will positively discharge the ice-chips at the sides of the wheel. Within the groove and between the openings the bottom of the groove *v* presents a series of broad contact-surfaces *w w*, bordered by breaking or cutting edges *w'*, by which latter the ice is loosened from the wire and permitted to fall through said openings *u* clear of the wheel, so that the broad contact-surfaces may engage the wire and serve in conducting the high-tension current to the motor, supplementing the principal trolley-wheel and rendering a second trolley for contact and conducting purposes unnecessary. The out-

ward-flaring walls of the openings prevent the ice from becoming clogged therein.

I am aware that modifications and variations may be made in the construction of my improvements without departing from the spirit and scope of the invention, and consequently I do not wish to be understood as limiting myself by the positive use of the foregoing description terms, excepting as the state of the art may require.

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

1. An ice-cutting trolley-wheel, having a peripheral groove or wire-seat, and openings extending from the bottom of said groove or wire-seat inward with respect to the axis of the wheel, and leading out through the side of said wheel, the edges of said openings which lie transversely of the wire-seat being obliquely disposed with reference to said wire-seat, whereby a shearing cut is obtained.

2. An ice-cutting trolley-wheel, having a peripheral groove or wire-seat, and openings extending from the bottom of said groove or wire-seat inward with respect to the axis of the wheel, and leading out through the side of said wheel, said openings flaring away from the bottom of the wire-seat whereby sharp ice-cutting edges are obtained across the bottom of said wire-seat and any possible packing of ice chips in the openings is avoided.

3. An ice-cutting trolley-wheel, having a peripheral groove or wire-seat, and openings extending from the bottom of said groove or wire-seat inward with respect to the axis of the wheel, and leading out through the side of said wheel, and continuously-flaring openings or passages each starting at a point on one inner side wall of said groove or wire-seat near its bottom and curving downward through the bottom of the groove and out through the opposite side of the wheel, whereby ice-cutting edges are formed across the bottom of the grooves and a discharge-passage for the cuttings provided which will conduct said cuttings clear of the wheel.

4. The improved trolley-pole appliance for electric cars, comprising a pole adapted to be supported upon the car, a wheel to contact with the electric conducting-wire, springs for holding said wheel normally in contact with said wire, a lever removably supported on said pole and having a long and a short arm, an ice-breaking wheel arranged upon said long arm, a spring *m*, for holding said ice-breaking wheel against the wire, a stud *n*, carrying said spring and a collar *p*, separably secured to said pole and providing pivotal bearings for said stud, substantially as set forth.

5. An ice-cutting attachment for trolley-poles, comprising a lever having long and short arms and being provided with fulcrumal means of attachment to a trolley-pole, an ice-cutting wheel on said longer arm, guiding means adapted to connect said short arm with the trolley-pole and hold it in a fixed

plane with respect thereto, and a spring for holding the ice-breaking wheel against the trolley-wire.

5 6. The combination with a trolley-pole, of a lever fulcrumed thereon, an ice-cutting wheel on said lever adapted to engage the trolley-wire, guiding means connecting said lever with the trolley-pole at a point other than its fulcrum and holding the lever in a
10 fixed plane, and a spring adapted to force the ice-cutting wheel against the trolley-wire.

15 7. An ice-cutting trolley-wheel having a peripheral groove with smooth transversely-rounded inner walls which in cross-section lie in a continuously-curving line and form a smooth wire-seat, ice-cutting edges transversely disposed in and between the interior facing sides of said groove or wire-seat and

being in the same geometrical surface as the said walls of the groove or wire-seat or having 20 every point equally distant on a line radiating from the axis of the wheel with the intersection of said line with the walls of the groove or wire-seat, whereby there are no projections into the said groove, said cutting edges be- 25 ing formed by openings from the groove inwardly into, through, and out of the body of the wheel, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of 30 December, 1900.

WALTER HENRY OLIPHANT.

Witnesses:

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S. O. ALCOTT.