

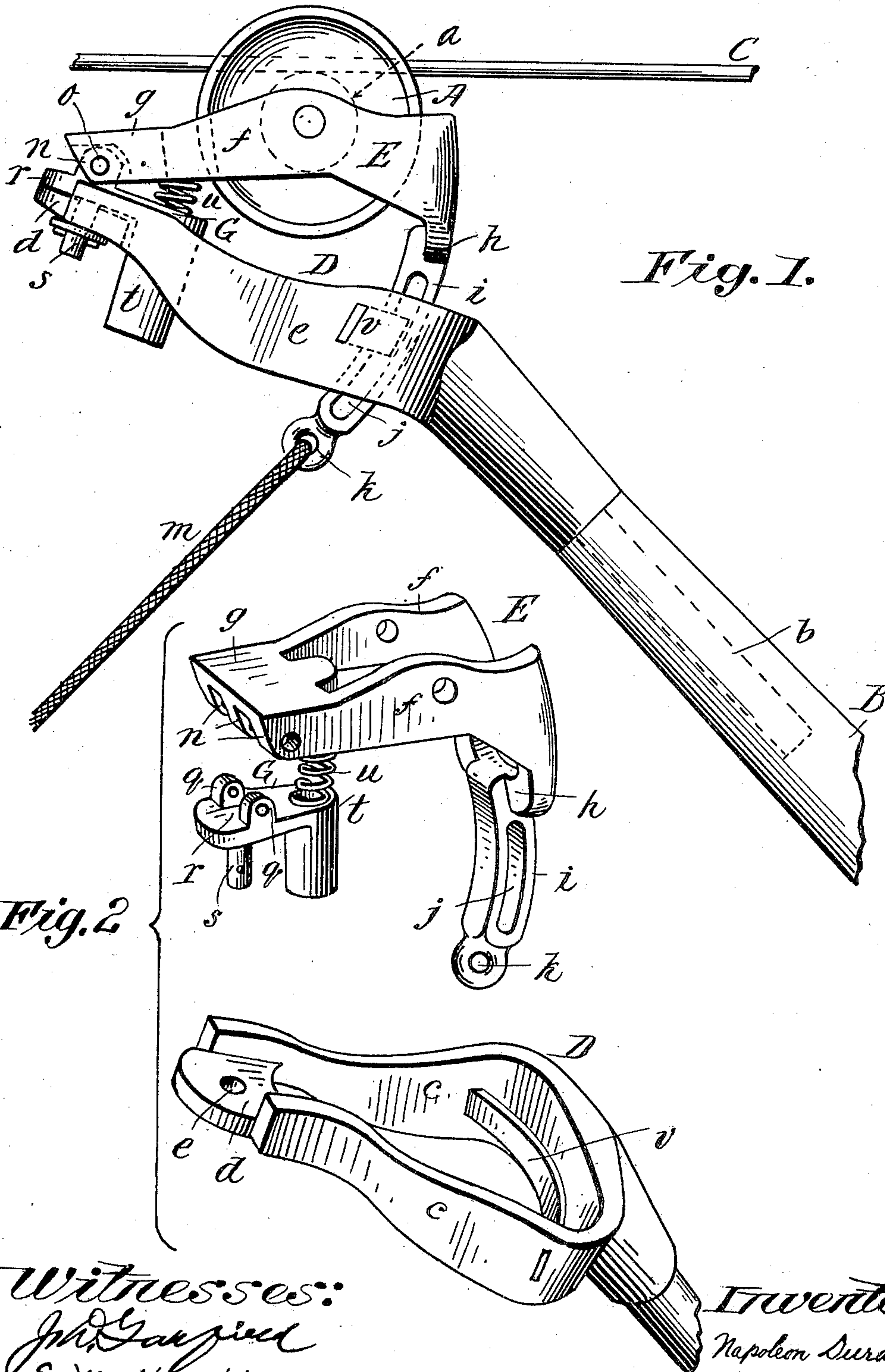
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Patented July 23, 1901.

N. DURANT.
TROLLEY.

(Application filed Aug. 18, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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TROLLEY.

SPECIFICATION forming part of Letters Patent No. 679,220, dated July 23, 1901.

Application filed August 18, 1900. Serial No. 27,233. (No model.)

To all whom it may concern:

Be it known that I, NAPOLEON DURANT, a citizen of the United States of America, and a resident of North Adams, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Trolleys, of which the following is a full, clear, and exact description.

This invention relates to improvements in trolleys for electric-railway cars, more especially overhead-trolleys, although applicable to depending or downhanging trolleys.

The objects of the invention are to provide a construction of the trolley whereby the liability of the same becoming disengaged from the trolley-wire, especially at the time the car is running over switches or other uneven places to occasion jolting or jarring, will be lessened, and, in fact, practically prevented, and whereby the liability of the trolley-wheel being crowded outwardly at the side of its groove relatively to the trolley-wire, which is likely to occur more especially in the rounding of curves, will be avoided.

The invention consists in the constructions and combinations of parts provided on the trolley pole, arm or carrier, and constituting the peculiar trolley-wheel support, all substantially as hereinafter described, and set forth in the claims.

The improved trolley is fully and clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a perspective view of the improved trolley-wheel support, the component parts of which are shown as disaggregated.

Similar characters of reference indicate corresponding parts in both views.

In the drawings, A represents the trolley-wheel, of the usual form, the same having the deep groove, the base of which is indicated by the dotted circle *a* in Fig. 1.

B represents the trolley-pole, and C represents the trolley-wire. Provided at the upper outer end of the trolley-pole B, as a fixture or a movable equipment thereof, is the metallic yoke or frame, comprising shank or tang *b*, (to have a socket engagement in the end portion of the pole,) the opposite side members *c c*, and the cross bar or web *d*, located between

and uniting the side members, said uniting-web being provided with the substantially vertical socket *e*.

The part which directly carries the trolley-wheel A is represented by the letter E, the same consisting of the movably-mounted yoke or frame, which comprises the opposite cheek *f f*, having transverse uniting portions *g* and *h* at and between their opposite ends, and the said portion *h* has the downwardly-extended limb *i*, with the curved slot *j*, and terminating in the attachment-eye *k* for the trolley-cord *m*. The said portion *g* of the trolley-carrying yoke E is provided with the depending ear-lugs *n*, through which passes the pivot-pin *o*, which also passes through the upstanding ear-lugs *q* of the casting or appliance G, which comprises, in addition to said ear-lugs, the base *r*, the depending pivot-stud *s*, and the depending upwardly-opening socket *t*. The said base *r* rests for the support of the device G on the cross-web *d* of the pole-carried frame D, its stud *s* being passed down through the perforation *e*, constituting a pivotal connection having an upright axis for the device *g* and the trolley-carrying yoke E in unison therewith, so that these two parts G and E may have a degree of horizontal swinging motion, while it will be perceived that the trolley-carried yoke E has in addition to its horizontal swinging motion also a range of vertical swinging motion, as permitted by the pivotal connection at *o*, having the horizontal axial line. The up-and-down swinging movement of the trolley-carrying yoke E is with and against the reaction of the spring *u*, the lower portion of which is set into the aforementioned socketed portion *t*, while the upstanding upper portion bears against the under side of the yoke E, at a middle portion thereof. The curve of the slot *j* is generated from the pivotal points *o*, and through the slot is passed the curved limiting-bar *v*, extending from the one cheek *c* to the other of the trolley-pole yoke D. The curve of the limiting-bar *v*, the length of which is transverse relatively to the length of the slot *j*, is generated from the center line or axis of the pivot-stud *s*.

It will be apparent from the constructions described that unusual swinging motions of the trolley-pole—such, for instance, as are

occasioned by running over switches or uneven places in the car-track—will be without effect to cause the disengagement of the trolley-wheel from its wire, for the reason that the downswinging of the extremity of the trolley-pole to widen the space between the yoke D and the trolley-wire will be compensated for or taken up by the spring-impelled and pivotally-mounted lever-like trolley-wheel yoke E. At times when the trolley is purposely disengaged from the wire and the upswinging of the yoke E is unrestrained, so far as the wire is concerned, the stop-bar *v* will restrain the yoke E from so far upwardly moving as to permit the parts to assume disordered relations one to another, such as might render them inoperative. It will also be apparent that when the car is rounding a curve or when the course of the trolley-wire is untrue, whereby a considerable transverse pressure is exerted at the side of the grooved trolley-wheel, such wheel may have bodily with this carrying-yoke E relatively to the pole-yoke D a sidewise swinging movement, as permitted by the motion which the appliance G has because of its pivot-and-socket engagement at *s e* with the part *d* of the pole-yoke D.

The axle on which the trolley-wheel A loosely runs is not set or fixed in the yoke or frame E, but is capable of turning therein, so that when by unusually-speedy running the friction becomes too great between the wheel and its axle the latter will turn in its journal-supports in the yoke, and thus the wear on the bushing of the trolley-wheel will be materially reduced.

The device is susceptible of cheap production, largely by being constructed of cast metal and requiring but little machine-work and finishing, and is also durable and not likely in protracted use to become deranged.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a trolley-pole, of a trolley-wheel, and a frame carrying said wheel pivotally connected to the trolley-pole at a point in the rear of said wheel, substantially as described.

2. The combination with a trolley-pole, of a supporting-frame carried by said pole, a trolley-wheel frame pivotally connected to the supporting-frame and a trolley-wheel carried by the wheel-frame in advance of the pivotal connection, substantially as described.

3. The combination with a trolley-pole, of a trolley-wheel and a frame carrying said wheel pivotally mounted, and supported by said pole, the point of the pivotal connection of the wheel-supporting frame being in the rear of the wheel, and a spring for exerting an upward pressure on the wheel-carrying frame, substantially as described.

4. A trolley pole or carrier provided with a yoke D having combined therewith a second yoke E in which the trolley-wheel is jour-

naled, said wheel-yoke being pivotally mounted for an up-and-down swinging motion relatively to said yoke D, and provided with a depending limb *i* having the slot *j* therein, the stop-bar or limiting member *v* provided to the yoke D, and extended through said slot and a spring for exerting a pressure upon the trolley-wheel yoke in a direction away from the trolley-pole yoke.

5. A trolley pole or carrier provided with a yoke D having combined therewith a second yoke E in which the trolley-wheel is journaled, said wheel being pivotally mounted for an up-and-down swinging motion relatively to said yoke D, and provided with a depending limb *i* having the slot *j* therein, and having at its lower end the eye *k* the stop-bar or limiting member *v* provided to the yoke D and extended through said slot, *j*, and a spring for exerting a pressure upon the trolley-wheel in a direction away from the trolley-pole yoke.

6. The combination with the pole-carried yoke having the supporting portion *d* of a part G pivotally jointed to said part *d* for a swinging movement horizontally and transversely, the yoke E, and a spring applied for reaction between the said part G and said yoke E, substantially as and for the purposes set forth.

7. The combination with the yoke D having the uniting cross-web provided with the perforation *e*, of the part G having the depending stud, passed through said perforation, and having the upwardly-open socket *t*, the trolley-wheel yoke E, pivotally connected to the part G on a horizontal axis and having the wheel journaled therein, and the spring interposed between said part G and the under side of the trolley-wheel yoke, substantially as described.

8. In a device of the character described, in combination yoke D comprising opposite cheeks *c c* and uniting horizontal web *d* having the vertical socket *e*, and the cross-bar *v* having an arc form generated from said socket, the part G comprising the base *r*, with upstanding ear-lugs *q q*, depending stud *s* and depending upwardly-open socket *t*, the trolley-wheel yoke E comprising uniting cross member *h* having the depending curve-slotted limb *i*, the uniting-pivot *o*, the trolley A journaled in the yoke E, and the spring *u* set in the socket *t* and exerting an upward force against the under side of the said yoke E all arranged as described and shown.

9. A trolley pole or carrier provided with a yoke or frame D having combined therewith a second yoke or frame E in which the trolley-wheel is journaled, said yoke E being pivotally supported for an up-and-down swinging motion relatively to the yoke D at a point in the rear of the wheel, and a spring for exerting a pressure upon the trolley-wheel yoke in a direction away from the trolley-pole yoke.

10. A trolley pole or carrier provided with

a yoke or frame D having combined there-
with a trolley-wheel-carrying yoke having
pivotal supporting connections on the trol-
ley-pole yoke, at a point in the rear of the
5 wheel, whereby it has swinging motions both
vertically and horizontally, a spring for im-
parting an upward swinging pressure on the
wheel-carrying yoke, and means for limiting
the extent of upward-swinging motion of

said yoke and the wheel which is carried to
thereby.

Signed by me at Springfield, Massachu-
setts, this 16th day of August, 1900.

NAPOLEON DURANT.

Witnesses:

WM. S. BELLOWS,

E. M. KNIGHT.