(No Model.)

F. KRABAL.

TROLLEY.

No. 588,448. Patented Aug. 17, 1897.

Fig. 1.

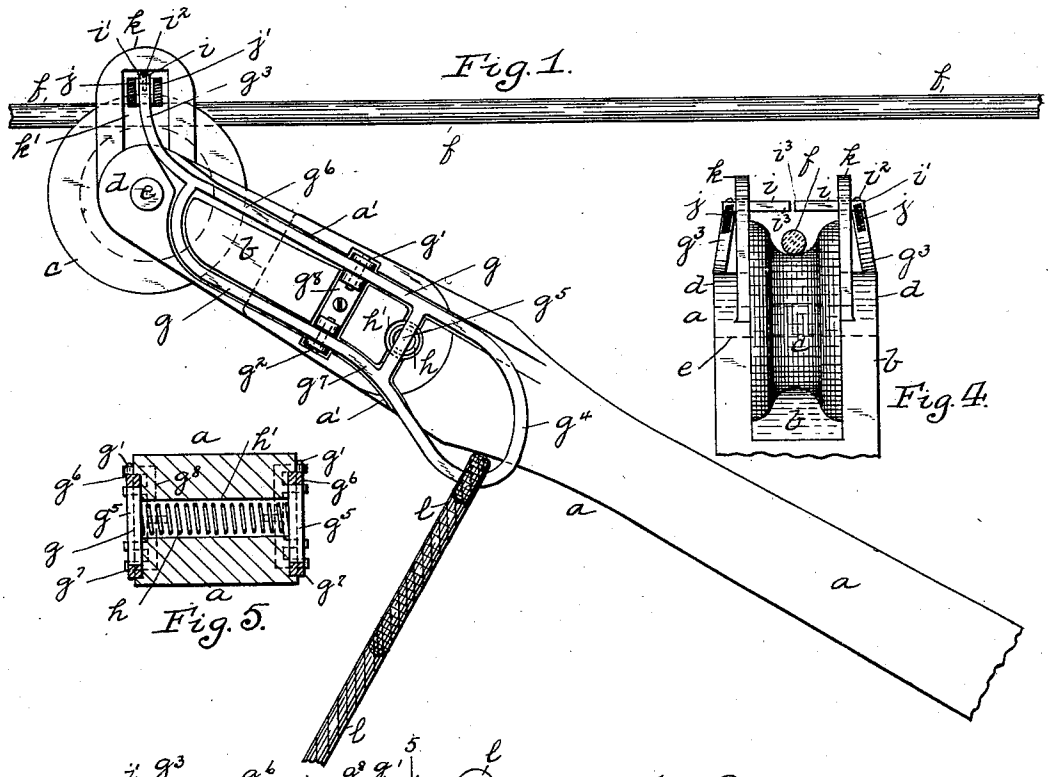


Fig. 4.

Fig. 5.

Fig. 2.

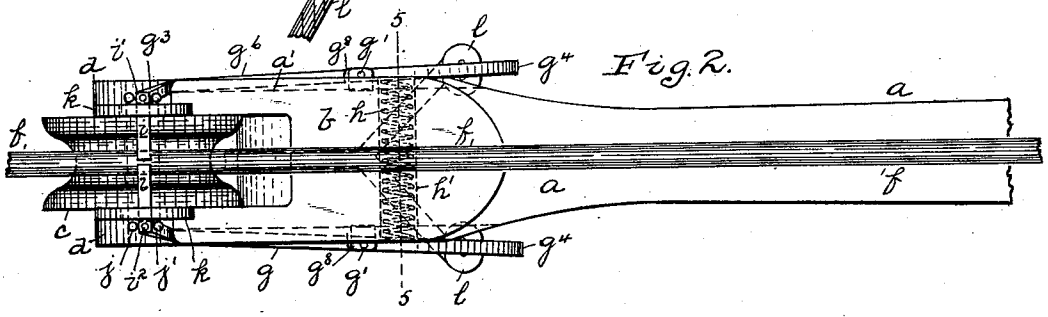
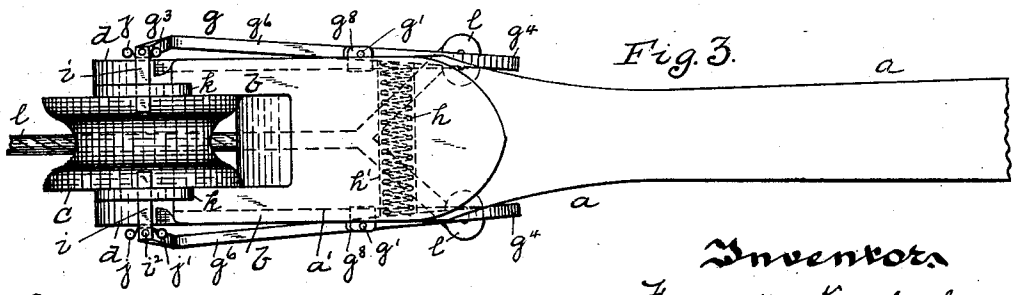


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK KRABAL, OF PITTSBURG, PENNSYLVANIA.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 588,448, dated August 17, 1897.

Application filed August 22, 1896. Serial No. 603,582. (No model.)

To all whom it may concern:

Be it known that I, FRANK KRABAL, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Trolleys; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to trolleys.

The object of my invention is to provide a neat and simple trolley which is cheap and durable in construction and one which will enable the trolley-wheel to be easily placed against the trolley-wire and prevent the wheel from jumping off or displacement from contact with the wire.

My invention consists, generally stated, in the novel construction and arrangement of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view of my improved trolley, showing the trolley-wire in place upon the trolley-wheel. Fig. 2 is a top or plan view of the same. Fig. 3 is a like view showing the device open ready to have the wire inserted therein. Fig. 4 is an end or front view thereof; and Fig. 5 is a cross-section on the line 5 5, Fig. 2.

Like letters herein indicate like parts in each of the figures of the drawings.

My invention is shown as applied to the upper end of a trolley-pole *a*, which has the ordinary forked arm *b* therein for engaging with the trolley-wheel *c* by means of the bearings *d* formed therein. A shaft *e* passes through the bearings *d* and wheel *c*, upon which the wheel *c* is loosely mounted, so as to be free to revolve when in engagement with the trolley or line wire *f* above the same. Pivoted on each side of the pole *a* within the seats *a'*, by means of pivots $g' g^2$, are the spring-levers *g*, which are provided with the upwardly-projecting or bent ends g^3 and the loops g^4 at their lower ends. Fitting across and within a seat *h'* in the pole *a* is a spiral spring *h*, the ends of which are adapted to come in contact with the cross-braces g^5, connecting the longitudinal arms g^6 g^7 in the spring-levers *g*. The pivots $g' g^2$ are formed as part of the metal bearings g^8, which are secured on each side of the pole *a*. Fitting on top of the bent ends g^3 are the cross-arms or guards *i*, which are pivoted at one end *i'*, by means of the pivots i^2, to the bent ends g^3. The opposite or free ends i^3 of the cross-arms or guards *i* extend across the top of the wheel *c* to about the center thereof. Extending down along each side of the bent ends g^3 and arms or guards *i* are the spiral springs *j j'*, which have one of their ends connected to the arms or guards *i* and their opposite ends connected to the bent ends g^3 of the levers *g*. Extending on each side above and formed as part of the bearings *d* are the standards or guides *k*, which are provided with the openings *k'* therein. The standards or guides *k* are adapted to extend above the wheel *c* and trolley-wire *f*, and the bent ends g^3, springs *j j'*, and cross-arms or guards *i* fit within the openings *k'* therein. The trolley-rope *l* engages with the loops g^4 in the spring-lever *g*.

The operation of my improved trolley is as follows: When it is desired to place the trolley *a* upon the trolley-wire *f*, the operator grasps the trolley-rope *l*, and the pressure exerted upon the same draws in the loops g^4 of the spring-levers *g* against the trolley-pole *a* and spring *h*, as shown in Fig. 3, which forces out the ends g^3, carrying the cross-arms or guards *i*, through the medium of the pivots $g' g^2$ in the levers *g*, so as to allow the cross-arms or guards *i* to clear the trolley-wheel *c* and enable the wheel *c* to be placed against the trolley-wire *f*. After the wheel *c* is in contact with the wire *f* the operator releases or lets go the rope *l*, which causes the loops g^4 on the spring-levers *g* to spring out again through the releasing of the spring *h* and allowing the ends g^3 to be forced in toward the wheel *c*, through the medium of the pivots $g' g^2$, connecting the spring-lever *g* in the bearings g^8, as shown in Figs. 2 and 4. While in this position the cross-arms or guards *i* are thrown across the wheel *c* above the wire *f*, so holding the wire *f* in contact with the wheel *c*, and on account of the cross-arms *i* being pivoted at i^2 to the bent ends g^3 of the spring-lever *g* the cross-arms *i* are prevented from any upward or downward movement, although through such pivots i^2 they

can have any lateral movement and spring back to place through the medium of the springs $j\,j'$ in case the cross-arms i come in contact with any obstruction, such as guide-wires, insulators, frogs, &c. The standards or guides k also prevent any possible injury to the cross-arms i, springs $j\,j'$, and bent ends g^3 through contact with any obstructions, such as guide-wires, insulators, frogs, &c.

It will be seen that by my improved trolley all liability of the trolley jumping off or releasing itself from contact with the trolley-wire is overcome. The operator can easily place the trolley in contact with the wire without the parts interfering with the same and the trolley can be released at any time without the parts coming in contact with the wire. The parts cannot be injured by any obstructions on the line, as they are sufficiently protected therefrom. The device is simple and easily operated and can be applied to any form of trolley. The device is practical, strong, and will not get out of order.

Various modifications in the construction and position of the various parts of the device may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the trolley-pole having the trolley-wheel journaled therein, of standards or guides on said trolley-pole, spring-operated levers on said trolley-pole, and pivoted spring-arms or guards on said levers within the standards or guides extending across the trolley-wheel and movable laterally and toward each other, substantially as described.

2. The combination of the trolley-pole having the trolley-wheel journaled therein, standards or guides on said trolley-pole, spring-operated levers on said trolley-pole, and pivoted arms or guards on said levers between the standards or guides extending across the trolley-wheel and adapted to move laterally, substantially as described.

3. The combination with a trolley-pole having the trolley-wheel journaled therein, of standards or guides on said trolley-pole, spring-operated levers pivoted to the sides of the trolley-pole, and pivoted spring-arms or guards on said levers within the standards or guides extending across the trolley-wheel and movable laterally and toward each other, substantially as described.

4. The combination with a trolley-pole having the trolley-wheel journaled therein, of standards or guides on said trolley-pole, spring-operated levers pivoted to the sides of the trolley-pole having the trolley-rope connected thereto, and pivoted spring-arms or guards on said levers within the standards or guides extending across the trolley-wheel and movable laterally and toward each other, substantially as described.

5. A trolley having a trolley-wheel therein, spring-operated levers pivoted to the sides of the trolley having the trolley-rope connected thereto, movable cross-arms or guards on said levers above the wheel to hold the wire upon the wheel, and springs connecting the cross-arms or guards and levers, substantially as shown and described.

6. A trolley having a trolley-wheel therein, spring-operated levers pivoted to the sides of the trolley having the trolley-rope connected thereto, movable cross-arms or guards on said levers above the wheel to hold the wire in contact with the wheel, springs connecting the cross-arms or guards and levers, and standards or guides on said trolley extending over and above the cross-arms or guards and springs, substantially as shown and described.

7. A trolley having a trolley-wheel therein, seats within the sides of said trolley, spring-operated levers pivoted within said seats having the trolley-rope connected thereto, movable cross-arms or guards pivoted on said levers above the wheel to hold the wire in contact with the wheel, springs connecting the cross-arms or guards and levers, and standards or guides on said trolley extending over and above the cross-arms or guards and springs, substantially as shown and described.

8. A trolley a having the forked arm b thereon, the trolley-wheel c fitting within the bearings d on the shaft e in the forked arm b, levers g fitting within the seats a' in the sides of the trolley a, the said levers g being pivoted by pivots $g'\,g^2$ in the bearings g^8 and provided with the upwardly-projecting ends g^3 thereon, loops g^4 formed on said levers g having the trolley-rope attached thereto, a spiral spring h fitting with a seat h' in the trolley a and extending across the same, cross-arms or guards i pivoted to the ends g^3 of the lever g, springs $j\,j'$ connecting the levers g and cross-arms or guards i, and standards or guides k having openings k' therein secured on the trolley a and extending over and above the cross-arms or guards i and springs $j\,j'$, substantially as described.

In testimony whereof I, the said FRANK KRABAL, have hereunto set my hand.

FRANK KRABAL.

Witnesses:
JOHN H. HENDERSON,
JOHN WILSON.