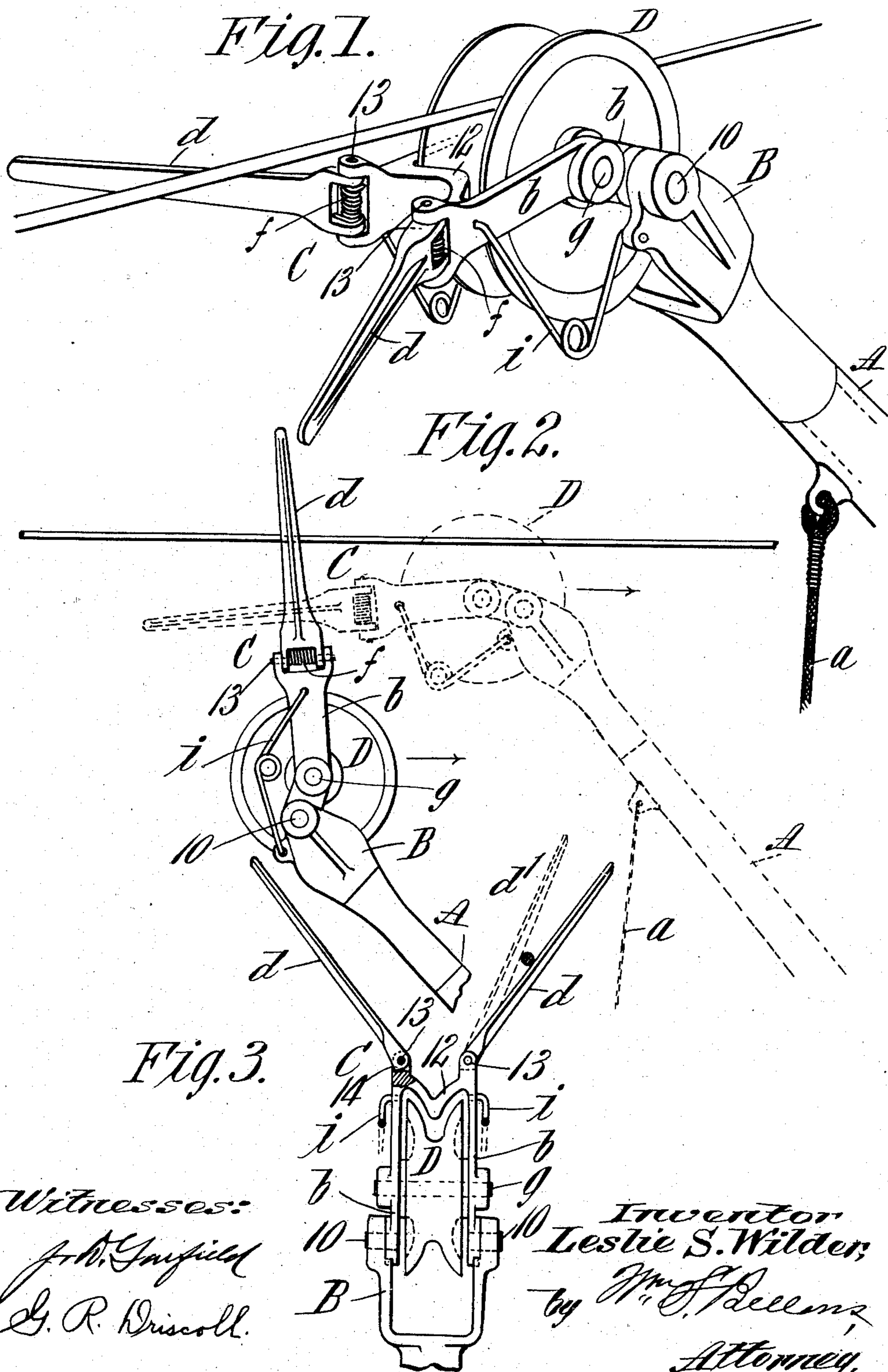


No. 865,323.

L. S. WILDER.  
TROLLEY.

PATENTED SEPT. 3, 1907.

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# UNITED STATES PATENT OFFICE.

LESLIE S. WILDER, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HENRY S. WILDER, OF EASTHAMPTON, MASSACHUSETTS.

## TROLLEY.

No. 865,323.

Specification of Letters Patent.

Patented Sept. 3, 1907.

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*To all whom it may concern:*

Be it known that I, LESLIE S. WILDER, a citizen of the United States of America, and a resident of Northampton, in the county of Hampshire 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.

10 An object of the trolley is to provide, in conjunction with the trolley-wheel and harp or yoke by which the wheel is carried, means which is,—in the ordinary running bearing of the wheel on the trolley-wire,—in a position somewhat remote from the wire, but which in  
15 case of the disengagement of the wheel from the wire is automatically operable to assume a position of engagement with the wire, and to act as a guard whereby the trolley device, as a whole, not only will remain in engagement with the wire, but whereby the wheel will  
20 shortly be quickly guided back to its running engagement with the wire. And another object, accomplished by the improved device, is the quick and convenient bringing of the trolley wheel to its running engagement with the wire at times after the trolley has  
25 wilfully or otherwise been so far lowered below the wire as to be altogether out of engagement therewith.

The invention consists in a trolley support or harp, a fork or trough shaped guard having a swinging connection with the support, a spring for maintaining the  
30 guard yieldingly in an upwardly distended relation to the support, and a trolley wheel movably mounted relatively to the harp, and adapted by a pressure relatively downwardly thereon by the trolley wire to swing the guard to a position below the upper wire bearing  
35 edge of the wheel. And the invention furthermore and otherwise consists in combinations and arrangements of parts and the forms and constructions of certain of the parts all substantially as hereinafter fully described and set forth in the claims.

40 The trolley comprising the improved guard and guiding devices which constitute the prominent features of this invention is illustrated in the accompanying drawings in which,—

Figure 1 is a perspective view showing the trolley wheel as in its proper running bearing or engagement with the trolley wire and the guard in its position below and out of engagement with the wire. Fig. 2 is a side elevation of the device, the portion in dotted lines showing the positions of the parts corresponding to  
50 those represented in Fig. 1, while the portion of this view in full lines shows the position which the guard will immediately and automatically assume in case of the wheel jumping from engagement with the wire. Fig. 3 is an elevation at right angles to Fig. 2 and as seen  
55 looking from the left.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings,—A represents the trolley pole understood as having at or near its connection with the top of the trolley car a spring or springs exerting an upwardly swinging force on the pole of greater potentiality than the force of any springs comprised in the trolley device here illustrated. 60

a represents the usual trolley pole cord.

B represents the frame, yoke or harp. 65

C is a reference to indicate the guard as a whole. The guard comprises a stirrup shaped lever *b* having by the pivots 10, 10 a connection of its opposite side bars, on a horizontal axis to the opposite side members or cheeks of the harp, and having its uniting portion 70 12 of a general trough-shape which may in practice be a V-shape, as particularly shown, or a U-shape. This uniting trough shaped portion constitutes a trolley wire bearing portion or runner. Attention is called to the fact that the side bars of the lever *b* are angled rearward at the region of the pivot *g*. This enables the portion of the lever *b* between the pivots 10 and *g*, in other words the wheel-carrying portion of the lever, to diverge rearward from alinement with the trolley pole to the minimum degree in order to carry the outer part  
75 of the guard below the trolley wire. It is further to be noted that the angling of these side bars occurs closely adjacent their pivoted inner ends, an arrangement which, in view of the fact that the trolley-wheel axle is journaled between the points of angling, conduces  
80 to compactness and insures that the axle of the trolley wheel, when the latter is in engagement with the wire, will not be far out of alinement with the pole. The guard furthermore comprises oppositely arranged arms *d d* which by the pivots 13, 13, are jointed to the stirrup shaped lever at the opposite outer corners of the uniting and bearing portion 12 of the latter; and said arms are normally outwardly and transversely divergent, as shown in Figs. 1 and 3. 85

Springs are applied and connected to and between 95 the stirrup shaped lever and the arms for maintaining the latter normally in their divergent relations, and a squared corner 14 of each arm, as represented at the left hand portion of Fig. 3, serves as a stop to limit the outwardly inclined position which each arm may normally have. 100

The dotted lines at *d'* indicate the capability of the side arm *d* for an inwardly swinging movement,—the degree of such movement being indefinite or unlimited, so that each arm may be swung against its spring to or  
105 beyond a vertical line.

A spring or duplicated springs *i* are provided for reaction between the harp and the lever *b* and for exerting a constant pressure to swing the lever in an upward direction relatively to the lever connection or pivot 10 110

with the harp,—this last referred to position being seen in full lines in Fig. 2. These springs are in the nature of bent rod springs, one end of each being secured to the harp of the trolley pole and the other to a side bar of the lever *b*. It is to be noted that the springs are attached to the side bars considerably beyond the point of angling.

On reference to Fig. 2 it will be assumed that the trolley wheel which had been running on the wire has jumped therefrom; the stirrup shaped lever *b* being now unrestrained may respond to the reaction of the duplicated spring *i* and the guard including the divergent extension arms will assume the upright position positively shown. Unless the displacing movement of the trolley wheel and with it the pole and harp, is an extreme and unusual one, the extension arms of the guard will not be fully lowered so as to be below and out of engagement with the trolley wire. The upwardly returning trolley pole, spring forced as usual, will, of course, immediately elevate the harp and trolley wheel and if the trolley in its displacement from, and below, the wire is also laterally displaced, the wire will have a sidewise bearing on one or the other of the downwardly and inwardly inclined guard arms, which latter will serve to guide the trolley as it moves upwardly in contact sidewise against the wire to centralize the trolley and bring the bearing or runner portion 12 of the guard to contact on the wire. The pressure now against the bearing part 12 by the wire being relatively a downward one,—the pole and harp exerting an upward force, the wheel will instantaneously be brought to its running engagement on the trolley wire. And immediately the wheel resumes its bearing with an upward pressure against the wire it will be appreciated that there is relatively between the wheel and wire a downward force or resistance imposed by the wire against the wheel which acts as a medium of connection between the wire and stirrup lever to force the latter downwardly to a more or less horizontal position below the wire and as represented in the dotted lines in Fig. 2. At times when the trolley pole is being reversed, as for running the car in the opposite direction, or on some other occasions in letting the pole up the guard may be swung to a position where-

in the side extension arms *d* are above, and both outside of the wire, but through means of the cord the trolley pole may be swung slightly, but sufficiently, transversely to bring one of the guard arms against the wire, and then by slightly pulling downwardly on the pole such guard arm will be sprung inwardly until its free end comes to the level of the under side of the wire, whereupon the arm will be spring returned outwardly and will serve as a guide as the trolley is permitted to then rise to centralize the device and bring the bearing portion to contact against the wire to be followed by the assumption of the parts of the device in the positions represented by the dotted lines in Fig. 2.

It will be clearly seen that if the trolley pole is being carried with the wheel free and disengaged from the wire and the guard arm should strike against the cross wires which support the trolley wire the guard will give downwardly and immediately thereafter return, each time the cross supporting wire is encountered.

In this trolley the axle or the trolley wheel may be removed from the stirrup support for the wheel, for the replacement of a worn out wheel or worn out axle or both, with as great facility as a wheel or axle can be removed and replaced in the ordinary harp.

I claim:—

In a trolley guard and finder, the combination with a harp, and a trolley wheel, of a stirrup-shaped lever consisting of side bars angled rearward closely adjacent their inner ends and pivoted at such inner ends to the harp, and consisting also of a grooved uniting member formed integral with the outer ends of said side bars, an axle for the trolley wheel extending between and connecting said side members at the points of angling, pivots carried at the junctions of said side bars and uniting member, guiding fingers mounted on said pivots, coil springs encircling said pivots and maintaining said fingers normally divergent, and a pair of bent rod springs secured at their inner ends to the rear portion of the harp and at their outer ends to said side bars considerably beyond the points of angling thereof.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

LESLIE S. WILDER.

Witnesses:

WM. S. BELLOWES,  
G. R. DRISCOLL.