No. 623,678. Patented Apr. 25, 1899.

C. B. LEBCHER.

TROLLEY WHEEL.

(Application filed Apr. 5, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

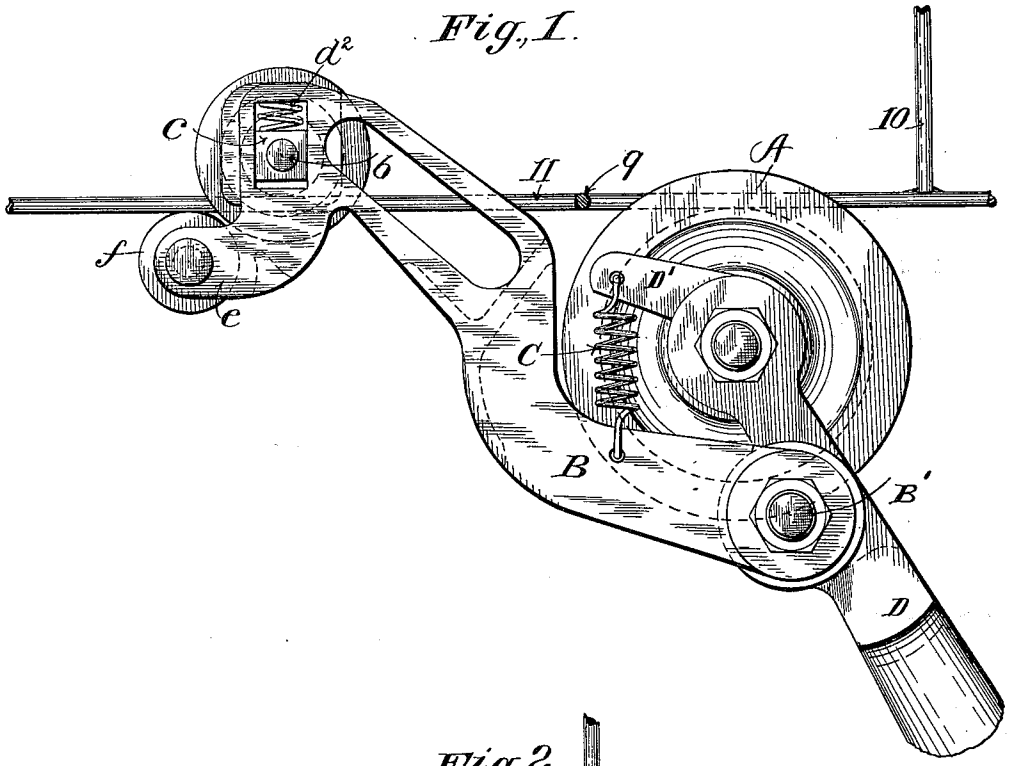
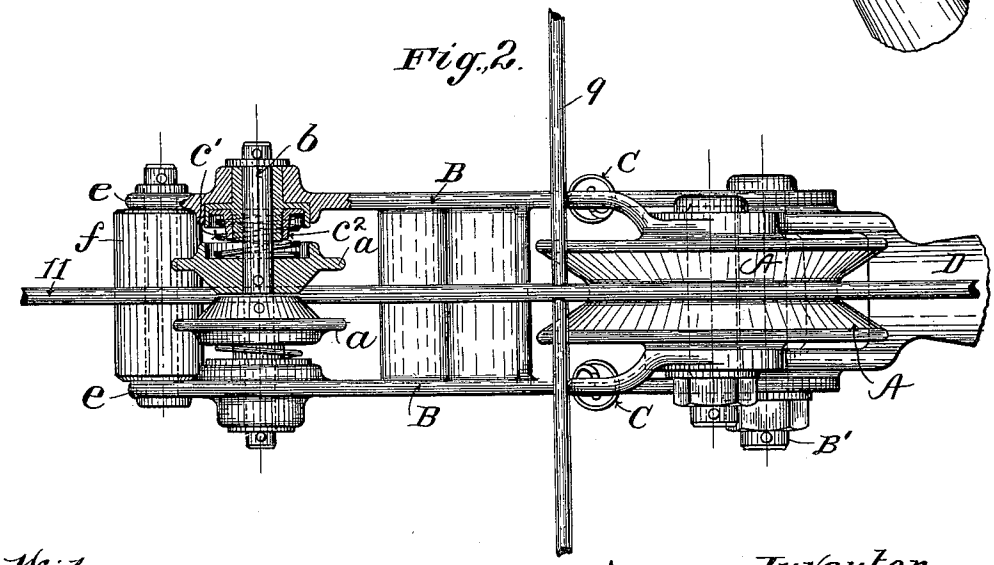


Fig. 2.



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Fig. 3.

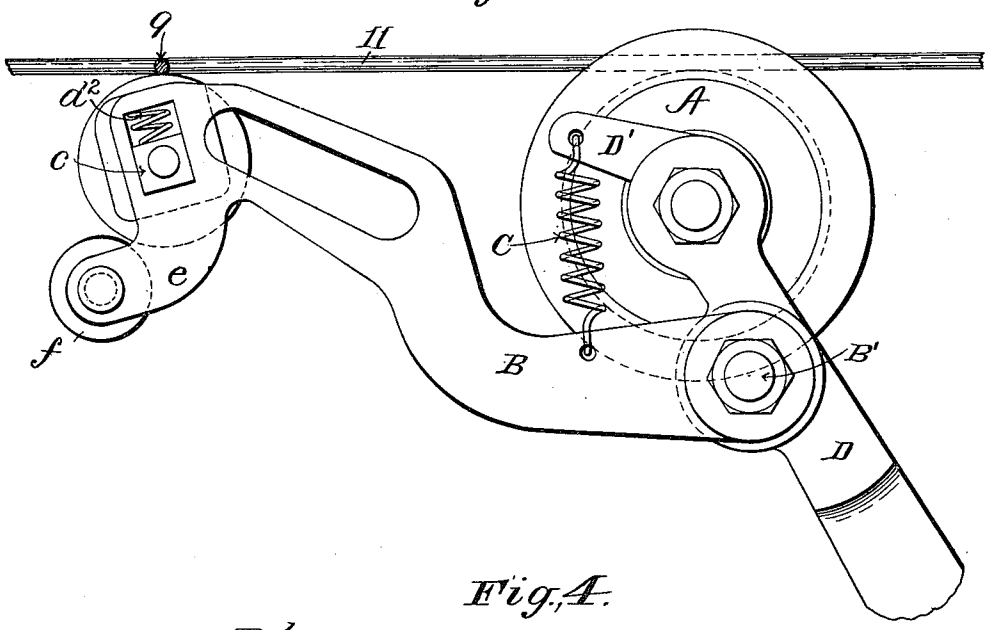
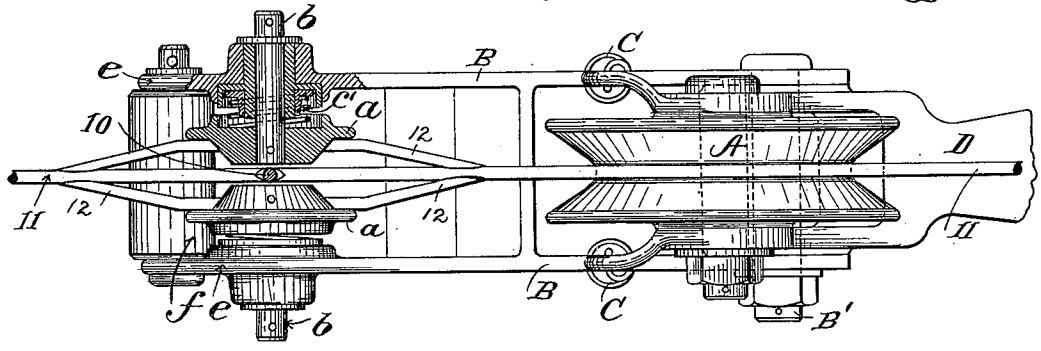


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHESTER B. LEBCHER, OF MILES CITY, MONTANA.

TROLLEY-WHEEL.

SPECIFICATION forming part of Letters Patent No. 623,678, dated April 25, 1899.

Application filed April 5, 1897. Serial No. 630,891. (No model.)

To all whom it may concern:

Be it known that I, CHESTER B. LEBCHER, a citizen of the United States, residing at Miles City, in the county of Custer and State of Montana, have invented a new and useful Trolley Device, of which the following is a specification.

My invention relates to a trolley circuit-controller; and it consists in certain details of construction and arrangement of parts hereinafter more particularly described in the specification, illustrated in the drawings, and pointed out in the claims. Its object is to provide a trolley circuit-controller which will maintain a continuous, steady, and uniform contact with the trolley-wire and obviate the difficulties heretofore experienced from the trolley-wheel flying off and becoming detached or out of contact, whereby the current is broken or interrupted and much inconvenience and delay occasioned, besides great wear and tear upon the wire, as it is well known that an uneven and interrupted contact which creates sparks causes great injury and consequent weakening of the wires.

Another object is to provide a device that will maintain a steady and constant contact with the trolley-wire while encountering and passing cross-wires, guy-wires, and vertical supports, by which the wire is suspended from the cross-arms of the supporting-poles.

These objects I accomplish by providing a trolley-fork within which a trolley-wheel is mounted with a frame or rearwardly-extending arms, each carrying half of a double or divided wheel designed to bear upon the upper surface of the wire, which are arranged to separate and pass around the vertical supports upon which the wire is suspended without interrupting the contact and also beneath the horizontal cross-wires and guy-wires.

In the accompanying drawings like letters and figures indicate like parts.

Figure 1 is a side elevation of my improved circuit-controller in an operative position. Fig. 2 is a plan view, partly in section, to more clearly elucidate the automatic mechanism. Fig. 3 is a view similar to Fig. 1, showing the split or divided trolley-wheel in the position when passing beneath a cross-wire. Fig. 4 is a plan view showing its position when passing a vertical support.

Referring more specifically to the drawings by letters and figures, D is the ordinary trolley-fork.

A is a trolley-wheel of the ordinary construction, journaled in the trolley-fork. This fork is provided with a pair of rearwardly-extending horns D′ for supporting tension-springs C.

B represents a rearwardly-extending frame or pair of connected arms pivoted at its inner end to the part D at the point B′ and suspended therefrom by the tension-springs C, the whole forming the trolley-head proper. Between the outer bifurcated ends of the frame B is secured a split or divided wheel *a a*, each half of which is conical in shape and provided with an elongated hub *b*, journaled in one of the sides of the frame in a vertically-sliding block *c*, which is normally held down by a superimposed spring d^2. Surrounding the elongated hub *b* of each half of the split wheel and interposed between it and the vertically-sliding bearing-block *c* is a spiral spring *c′*, designed to normally force the two sides of the split wheel toward each other or together and in contact with the trolley-wire 11, as shown in Fig. 4. This spring is made to revolve with the elongated hub by means of an interposed washer c^2, to which its outer end is secured, its inner end being seated in the side of the split wheel.

e e represent rearwardly-extending arms on the under side of the rear end of the frame B, (shown in Figs. 1 and 3,) in the ends of which is journaled a transverse roller *f*, the purpose of which will be hereinafter explained.

12 12 are switches arranged on the sides of the trolley-wire adjacent to its vertical supports or hangers 10, by which it is suspended, and are designed to cause the sides of the split wheel *a a*, by means of its deep flanges, to automatically separate for the purpose of passing around said vertical hanger and unite after passing same without interrupting the current or breaking the contact. These curved switches are not indispensable, as the inclined sides of the wheel will accomplish the same purpose.

9 represents a horizontal cross-wire or guy-wire, such as are usually encountered in all overhead-trolley systems.

Having described the various parts in de-

tail, I will now proceed to describe its operation.

My improved circuit-controller is mounted on the ordinary trolley-pole, connected with the car in the usual manner, and the wheel A bears against the under side of the trolley-wire. The divided or split wheel *a a* is mounted in the rear end of the bifurcated pivoted frame B, forming a part of the trolley-head, and bears upon the upper surface of the trolley-wire, its sides being held normally together by the springs *c'*, surrounding the elongated hubs *b*. A transverse roller *f*, mounted in the arms *e e*, also bears upon the under side of the trolley-wire in rear of the divided wheel and is maintained normally in contact by the larger springs C, by which the frame B is pivotally suspended from the horns D', thereby forming three separate and distinct points of electrical contact of the trolley circuit-controller with the wire. When a cross-wire 9 is encountered by the rapidly-moving wheel A, its sudden collision with the flange of the wheel has a tendency to cause the wheel to bound away from the wire, interrupting the contact and current until it resumes its position after passing; but in my device the continuous contact is maintained meantime by the roller *f* and split wheel *a a* in the rear, which have not yet reached the cross-wire, and as the forward movement continues the inclined upper face of the bifurcated frame B comes in contact with the cross-wire and is forced down to the position shown in Fig. 3 until it has passed the wire, when it is caused to resume its normal position by the springs C, the roller *f* preventing the latter from lifting the split wheel away from the upper surface of the wire, and when the vertical hanger 10 is encountered the split wheel is caused by its cone-shaped sides and the curved switches to automatically open and pass around it, as shown in Fig. 12. Thus a continuous electrical contact is maintained at all times and a steady continuous current is secured under all conditions.

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

1. A trolley circuit-controller, consisting of a main circuit-closer below the conductor, and an auxiliary circuit-closer above the conductor the latter adapted to change its contact from the upper to the under surface when encountering a cross-wire, one maintaining the closed circuit while the other passes the cross-wire whereby sparking is avoided, substantially as described.

2. A trolley circuit-controller consisting of a main and an auxiliary contact, the auxiliary contact having beveled faces bearing on the upper surface of the conductor and having its sides adapted to be automatically separated thereby when a cross or connecting wire is encountered, and resume their normal position after the cross or connecting wire is passed without breaking the circuit, whereby a constant closed circuit is maintained and sparking prevented, substantially as described.

3. In a trolley circuit-controller of the nature described, a trolley circuit-controller consisting of a fork carrying a trolley-wheel, a rearwardly-extending frame pivoted to said fork, a trolley-wheel made in two parts mounted in said frame adapted to contact with the upper side of the wire, and a transverse roller journaled in said frame in rear of the divided trolley-wheel adapted to contact with the under side of the wire, substantially as described.

4. In a trolley circuit-controller, a fork containing a trolley-wheel adapted to bear upon the under side of the trolley-wire; a frame pivoted to the fork carrying a divided trolley-wheel having its sides separately and movably journaled in the pivoted frame, and adapted to bear on the upper side of the trolley-wire and automatically separate and reunite when passing a connection with said wire; substantially as described.

5. In a trolley circuit-controller, a fork provided with a trolley-wheel adapted to bear against the under side of the trolley-wire; a rearwardly-extending frame pivoted to the fork carrying a divided trolley-wheel having its sides separately and movably journaled in the frame whereby they are adapted to contact with the trolley-wire in rear of the fork, and automatically separate and reunite when encountering and passing connections with the wire, substantially as described.

6. In a trolley circuit-controller a fork carrying a trolley-wheel adapted to bear against the under side of the wire; a rearwardly-extending frame pivoted to the fork; springs suspending the frame from the fork; and a divided trolley-wheel having its sides separately and movably journaled in the frame; each side having an inner beveled face and an outer spring interposed between the frame and side whereby the sides of the divided wheel are normally held in contact and caused to automatically separate and reunite when encountering and passing a connection with the trolley-wire, all arranged and combined substantially as described.

7. In a trolley circuit-controller, a fork carrying a trolley-wheel adapted to contact with the under side of the wire; a rearwardly-extending frame pivoted at its inner end to the fork, and having its outer end suspended from the fork by springs; a divided trolley-wheel having its sides separately and movably journaled in the sides of the frame and held normally in contact by springs, the sides of said wheel adapted to bear on the upper side of the trolley-wire and automatically separate and reunite when passing a connection with the wire; and means for holding the divided trolley-wheel normally in contact with the upper side of the wire; all arranged and combined substantially as described.

8. In a trolley circuit-controller a fork car-

rying a trolley-wheel adapted to bear against the under side of the trolley-wire; a rearwardly-extending frame pivoted at its inner end to the fork; helical springs suspending the outer end of the frame from the fork; a divided trolley-wheel having its sides separately and movably journaled in the sides of the frame and adapted to bear on the upper side of the wire; means whereby the sides of the divided trolley-wheel are normally held in contact and permitted to automatically separate and reunite when said wheel encounters and passes connections with the trolley-wire; and means for preventing said divided trolley-wheel from being lifted away from the wire by the springs suspending its supporting-frame, substantially as described.

9. In a trolley circuit device, a fork carrying a trolley-wheel; a rearwardly-extending frame having its inner end pivoted to the fork; springs suspending the outer end of the frame from the fork; a divided trolley-wheel having its sides separately and movably journaled in the sides of the frame; springs surrounding the hubs of the divided trolley-wheel whereby they are held normally in contact; vertically-moving journal-boxes in the sides of the frame holding the journals of the divided trolley-wheel; superimposed springs holding said journal-boxes normally down in the frame; and means for holding the divided wheel in contact with the wire, all arranged and combined substantially as and for the purpose set forth.

10. In a trolley circuit-controller, a fork adapted to carry a trolley-wheel; a rearwardly-extending frame having its inner end pivoted to the fork; a divided trolley-wheel having its sides independently and movably journaled in the sides of the frame and adapted to bear on the upper side of the trolley-wire; means for holding said sides normally in contact, and permitting them to automatically separate and reunite when encountering connections with the trolley-wire; springs suspending the outer end of the frame from the fork; rearward extensions of said frame carrying a transverse roller journaled therein adapted to bear normally against the under side of the trolley-wire; all arranged and combined substantially as described.

11. In a trolley circuit-controller a fork carrying a trolley-wheel adapted to bear against the under side of the trolley-wire, a rearwardly-extending frame pivoted at its inner end to the fork, springs suspending said frame from the fork, a divided trolley-wheel having its sides separately and independently journaled in the sides of the frame and adapted to bear on the upper side of the wire, each side having an inner beveled face and an outer spring interposed between the frame and side whereby said sides are caused to automatically separate and reunite when said wheel encounters and passes a connection with the conducting-wire, and a stop limiting the upward movement of said frame, substantially as described.

12. In a trolley circuit-controller, a fork carrying a trolley-wheel; a rearwardly-extending frame having its inner end pivoted to said fork and its outer end suspended by springs connecting the frame with the fork; a divided trolley-wheel having its sides separately and movably journaled in the sides of the frame; means for holding said sides normally in contact and permitting them to automatically separate and reunite when encountering and passing a connection with the trolley-wire; movable journal-boxes in the sides of the frame holding the journals of the divided wheel; and superimposed springs holding said journal-boxes normally down in the slots of the rearwardly-extending frame; projections on the under side of the rearwardly-extending frame; and a transverse roller journaled in said projections beneath the trolley-wire, all arranged and combined substantially as described.

13. In a trolley circuit-controller, a fork carrying a trolley-wheel; a frame having its forward end pivoted to the fork; and extending rearwardly; springs connecting the pivoted frame with the fork whereby its outer end is held suspended near the wire; a divided trolley-wheel having its sides separately and movably journaled in the sides of the pivoted frame and adapted to bear on the upper side of the wire; superimposed springs adapted to hold the movable journal-boxes normally down in the bottom of the slot in the frame; rearwardly-extending arms projecting from the outer end of the frame beneath the bearings of the divided wheel, and provided with bearings for a transverse roller; and a transverse roller journaled in the bearings of said arms adapted to bear against the trolley-wire and limit the vertical movement of the frame caused by its suspending-springs, all arranged and combined substantially as described.

Signed at Washington, District of Columbia, this 3d day of April, 1897.

CHESTER B. LEBCHER.

Witnesses:
W. J. JOHNSTON,
W. R. JOHNSTON.