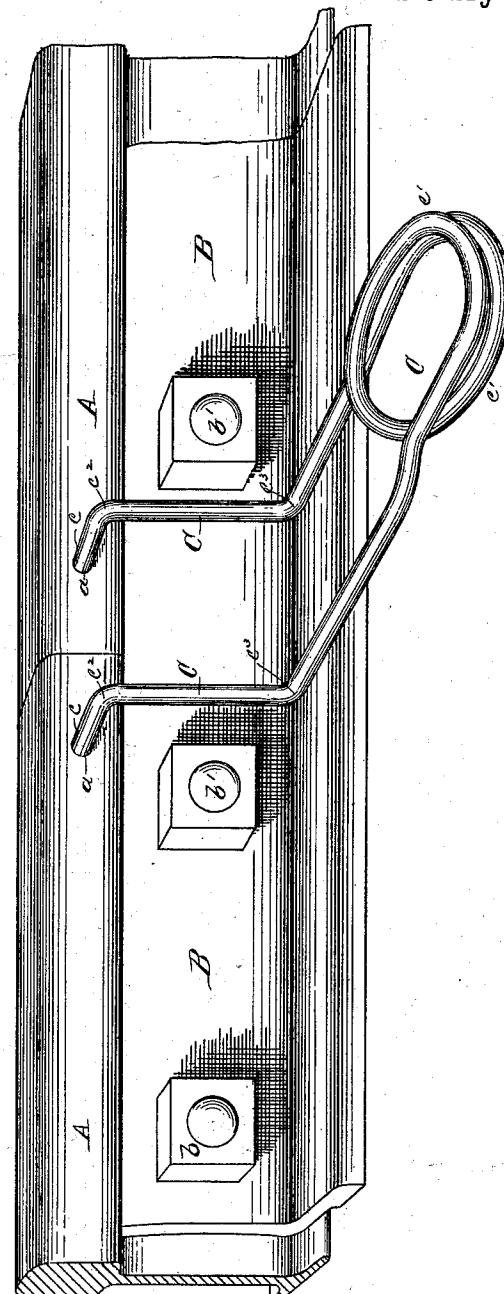


(No Model.)

G. WESTINGHOUSE, Jr.  
TRACK CIRCUIT CONNECTOR.

No. 282,249.

Patented July 31, 1883.



Witnesses.

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# UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

## TRACK-CIRCUIT CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 282,249, dated July 31, 1883.

Application filed May 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Track-Circuit Connectors; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, which illustrates by a perspective view my improved circuit-connector applied as in use in making electrical connection between two consecutive rails of a track.

15 In making track or rail circuits for electrical purposes on railways it is important that successive rails should be connected by metallic contact-surfaces of considerable area, and that such contact should be protected from rust or from coating with any substance calculated to retard free passage of electric current. This is especially important in the use referred to, because low-tension currents are ordinarily or often employed, and the main reliance for retaining such currents on the line of track is the superior conductivity of the track to earth.

20 In the class of connectors to which my present invention relates it has been customary heretofore to drive pins into suitable holes 30 drilled in the rails, and to connect such pins electrically by means of a wire wound tightly at its ends around and soldered to the pins. Such connectors are good and effective so long as they remain intact, but several difficulties are 35 encountered in the practical use of the same. For example, in manufacturing on a large scale it is very difficult and practically impossible to remove all trace of the acid employed in soldering, and any which may remain is active in corroding the wire, and thereby weakening it, usually at the point where it leaves the pin; also, in use an active vibration, more or less constant, is produced in the connecting-wire, which in time imparts a crystalline structure to the metal of the wire near to or at the pin. This also weakens the wire, and is the cause of frequent breakage at such points; also, when the vibratory and other movements of the wire expend their force directly upon the pins, as heretofore, they have a decided tendency to loosen the pins in their holes.

The purpose of my invention is, in part, to overcome these and other like difficulties or objections in the class of rail-connectors referred to, and, in general terms, it consists of a 55 metal rod or wire having its ends bent, forming angles for driving the ends into holes in the rails, and also having at some intermediate point in its length a coil or fold to afford elasticity or spring action, as hereinafter more 60 fully described and claimed.

In the drawing, A A represent portions of two rail ends connected by the usual splice-bar, B, and bolts *b b'*. In making electrical connection between such rails I employ a 65 metal rod or wire, C, preferably of iron or steel. The two ends *c c'* of this rod are bent at or near right angles, forming thereby angles or shoulders *c' c''* at a little distance from the ends, to facilitate driving the latter into holes in the 70 rails, as presently described. At some convenient point, preferably a central point between the shoulders *c'*, the rod or wire is looped, bent, or coiled with one or more turns or convolutions, as at *c'*, whereby vibration or 75 movement produced in either part or end of the rod will in a great measure be neutralized or taken up by the spring elasticity afforded by such bend or coil.

In connecting the two rails for electric circuit it is desirable, in many cases, that the parts of the rails through which the bolts *b b'* pass should be included in the circuit-line; or, in other words, that the connections should be made between the bolt *b'* and the rail ends, 80 so that in case a rail breaks across the bolt-holes the circuit shall also be broken and the danger be indicated. To this end I make the holes *a a*, which receive the ends *c c'* of the connector, in the side of the head of the rails, near 85 their ends; and in order to prevent interference with wheel-flanges the holes are made in the outer side of the rails. The connectors are also bent downward and outward by angles *c' c''*, nearly to the level of the foot and away 90 from the side of the rails—say some six inches (more or less)—so as to be out of the way of workmen.

95 By these features of construction I am enabled to set the connector in such manner that 100 rotary strain is not imposed upon the ends *c c'* by vertical movement of the rail ends, and the

tremors or vibrations caused by these and other movements in use will in a great measure be reduced or neutralized by the coil  $c'$ .

Another feature of advantage is secured by 5 making the parts  $c$   $c$ , which are driven into the holes  $a$   $a$ , integral with the remaining or connecting part of the rod, thereby avoiding the expense of soldering and the injury resulting from the use of acid.

10. By reducing or neutralizing the force of vibrations in the connector, as above described, the tendency to formation of crystalline structure is removed, and a fruitful source of breaking, with consequent expense and trouble, is obviated; also, my improved connector is cheaper 15 of construction, easier of application, and more durable in use than those of the same class heretofore made and used.

In a separate application filed even date 20 herewith I have described a track-circuit connector embodying in part the features of construction described and claimed herein, but also having other features of improvement by which such connector is adapted to special 25 conditions of use. Such features of special adaptation are not claimed herein, but form the subject-matter of claims in the application referred to. The present invention has reference more particularly to a connector adapted 30 by its construction to make attachment to the rails between the bolt-holes and ends and to the outside of the rails or track.

In preparing the ends  $c$  for insertion in the holes  $a$  they may be filed bright or scaled, and 35 galvanized, or otherwise fitted to make and preserve good metallic contact with the rails.

I claim herein as my invention—

1. A track-circuit connecting-rod of metal, having its ends integral with and bent at or

near right angles to the intermediate portion, 40 such ends having cleaned metallic surfaces, substantially as and for the purposes set forth.

2. A track-circuit connecting-rod of metal, having ends integral with and bent at an angle to the intermediate portion, and having a coil 45 in such intermediate portion to afford spring action, substantially as and for the purposes set forth.

3. The track-circuit connecting-rod  $C$ , having 50 bent ends  $c$ , forming shoulders  $c^2$   $c^2$ , for driving, and a spring-coil,  $c'$ , at or near the central part of its length between ends, substantially as and for the purposes set forth.

4. The rod  $C$  for making electrical connection between railway-rails, having therein a 55 central yielding or spring coil,  $c$ , bent ends  $c$ , forming shoulders  $c^2$ , and bend  $c^3$ , setting the spring laterally away from the ends  $c$  and from the rails, substantially as set forth.

5. The rails  $A$   $A$ , having holes  $a$   $a$  in the 60 head, in combination with a connecting-rod,  $C$ , having its ends  $c$  driven tightly into such holes, and having a yielding or elastic coil,  $c'$ , therein at some intermediate point in its length, substantially as set forth.

6. The rails  $A$   $A$ , having holes  $a$   $a$  therein on the outer side of their heads, in combination with connecting-rod  $C$ , having ends  $c$ , with shoulders  $c^2$ , for driving the ends into the holes  $a$ , and having a central coil,  $c'$ , extended laterally away from the outer side of the rails, substantially as and for the purposes set forth. 70

In testimony whereof I have hereunto set my hand.

GEORGE WESTINGHOUSE, JR.

Witnesses:

C. L. PARKER,  
R. H. WHITTLESEY.