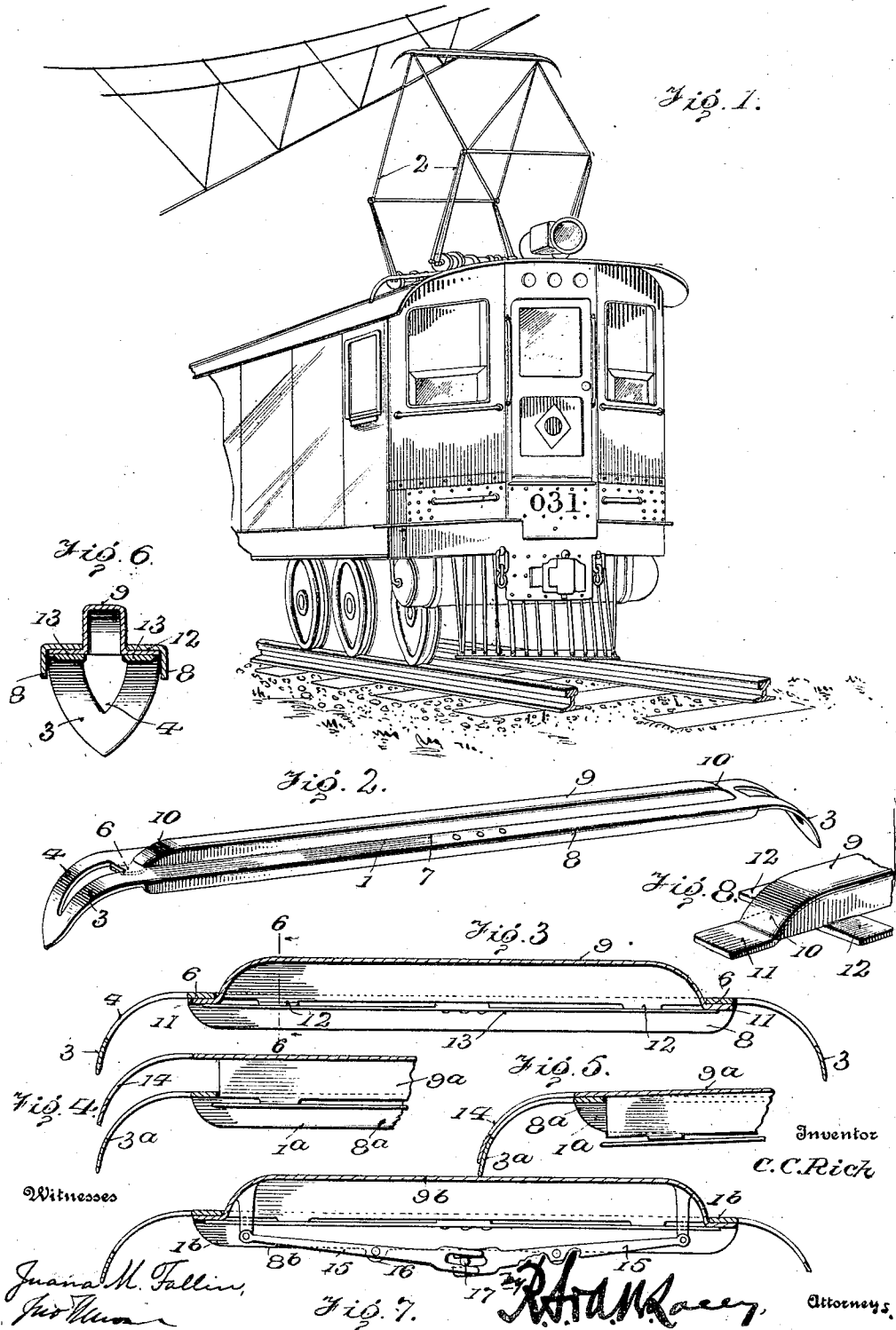


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ELECTRIC CONTACT SHOE.
APPLICATION FILED JULY 6, 1909.

977,401.

Patented Nov. 29, 1910.



UNITED STATES PATENT OFFICE.

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ELECTRIC CONTACT-SHOE.

977,401

Specification of Letters Patent.

Patented Nov. 29, 1910.

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To all whom it may concern:

Be it known that I, CHARLES CLAYTON RICH, citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Electrical Contact-Shoes, of which the following is a specification.

In the running and maintenance of electric railway systems employing high power electric locomotives for drawing ordinary railroad passenger coaches and other cars at a high rate of speed, considerable difficulty has heretofore been experienced in connection with overhead supply wires, owing to the fact that particularly when running at high speed, the supporting framework for the contact shoe, (which is in the nature of a pantograph device) will be caused to rebound when the shoe strikes the point of connection between the feed wire and the supporting trusses or frames, thereby causing destructive arcing of the contact members.

With a knowledge of these conditions and difficulties, my invention has for its primary object, improved means for maintaining a constant contact between the shoe or plow supported in an elevated position above the locomotive and the feed wire or wires.

With this object in view my invention consists essentially in an improved contact shoe which embodies an auxiliary contact member having a limited independent movement relative to the main member of the shoe and spring pressed upwardly with a tension less than the tension of the main springs of the pantograph device or other supporting framework, the parts being so arranged that in their normal position, the operative surface of both the auxiliary member and main member of the shoe will be flush with each other, the spring or springs of the auxiliary member yielding, the spring or springs of the auxiliary member being permitted to act, in case the main member should leave the feed wire or wires so as to cause the auxiliary member to protrude upwardly from the main member and constantly maintain the contact of the shoe with the supply wires. And the invention also consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawing, in which:

Figure 1 is a perspective view illustrating the application of my improved contact shoe; Fig. 2 is a perspective view of the shoe detached; Fig. 3 is a longitudinal sectional view through the shoe; Figs. 4 and 5 are similar views of a portion of a modified form of the device illustrating the parts in different relative positions; Fig. 6 is a transverse sectional view on the line 6-6 of Fig. 3, looking in the direction of the arrows; Fig. 7 is a longitudinal sectional view of another modification of the device, and Fig. 8 is a fragmentary perspective view of one form of auxiliary member.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawing, the numeral 1 designates the main member of my improved contact shoe, the same being secured in any desired way on top of an electric locomotive such as that illustrated in part in Fig. 1, the supporting means for the shoe being for instance as illustrated in that view in the nature of a pantograph device 2, as is customary in overhead systems of this character. The main member 1 is preferably formed with downwardly curved ends 3 formed with openings 4 to lighten the construction, such openings 4 being separated by end webs 6 from a main longitudinal opening 7 extending along the middle of the main member 1 and throughout nearly the entire length thereof, as best illustrated in Fig. 2. Preferably, the main member 1 is formed with depending side flanges 8.

9 designates the auxiliary member of the shoe. This member in the present instance is of inverted channel formation with rounded ends, as indicated at 10, the said auxiliary member 9 fitting in the opening 7 throughout the extent thereof and being provided in that form of the invention illustrated in Figs. 2, 3, 6 and 8, with outwardly projecting end tongues 11 designed to extend underneath the end web 6 of the main member 1 and with laterally extending and outwardly projecting side tongues 12 adapted to engage the lower surface of the main portion of the member 1, to limit the upward

independent movement of the auxiliary member. 13 designates the means for pressing the auxiliary member 9 upwardly with a tendency to cause it to protrude from the main member 1, said means in the present instance being in the form of two separate springs that are riveted or otherwise secured at middle points to the main portion of the member 1 on opposite sides of the opening 7 thereof, the free ends of the springs extending in opposite directions and engaging the lateral tongues 12 of the auxiliary member so as to cause said member to move upwardly into the position illustrated in Figs. 2 and 6.

From the foregoing description in connection with the accompanying drawing, it is believed that the operation of my improved contact shoe will be obvious. In the practical use of the device, it is manifest that, owing to the fact that the main springs of the supporting framework 2 are of greater tension than the spring 13, the upper operative surfaces of both the main member 1 and auxiliary member 9 will lie flush with each other and in contact with the feed or supply member of the electric current. Whenever, owing to the shoes striking a connecting point of the feed wire or wires, which is particularly imminent when traveling at high speed, or from any other cause the supporting framework 2 lowers slightly, it is clear that the springs 13 will then be permitted to exert their full tension to cause the auxiliary member 9 to remain properly in contact with the feed or supply wires, even if the main member 1 is slightly lowered. Hence constant contact will be maintained, which is a desideratum in the art to which this invention appertains.

In that form of the invention illustrated in Figs. 4 and 5, 1^a designates the main member of the shoe with its depending side flanges 8^a and downwardly curved ends 3^a, and 9^a designates the auxiliary contact member, all of these parts being substantially like the parts illustrated in Figs. 2, 3, 6 and 8, and hereinbefore described, with the exception that the auxiliary member 9^a omits the end tongues 11 and has its ends curved outwardly and downwardly over the downwardly curved ends 3^a of the main member 1^a, as indicated at 14. These ends 14 merely serve the purpose of limiting the inward or downward movement of the auxiliary member relative to the main member.

In all of the forms of the invention thus far described, it is evident that should the train be going around a curve it would cause the feed wire to assume a position relative to the contact shoe to one side of the middle of the latter, and thereby cause the auxiliary member to be tilted downwardly at one end only, the other end protruding. If it be desired to overcome this rocking or

tilting movement of the auxiliary member, any construction may be employed such as that illustrated in Fig. 7. In that modification of the device, the auxiliary member, here designated 9^b, is connected near its ends to the outer ends of levers 15, said levers extending toward each other and being fulcrumed intermediate of their ends, as on depending ears 16 forming parts of the side flanges 8^b of the main member 1^b. The inner ends of these levers 15 overlap and are secured together by a slot and pin connection, as indicated at 17, whereby when one end of the auxiliary member is depressed, the opposite end will be correspondingly depressed.

It is to be understood that my invention is not limited to the exact construction, arrangement and proportions of the parts herein shown and described, but that various changes may be made without departing from the scope of the invention, as defined by the appended claims.

Having thus described the invention, what is claimed as new is:

1. A contact shoe, comprising a main member formed with a longitudinal opening, an auxiliary member mounted in said opening and movable upwardly therethrough and formed with outwardly extending tongues adapted to engage the main member to limit the upward movement of the auxiliary member, and tensioning means arranged to move the auxiliary member upwardly in the slot above the upper surface of the main member.

2. A contact shoe, comprising a main member formed with a longitudinal opening, an auxiliary member mounted in said opening and formed with end tongues and side tongues, and springs secured to the main member at opposite sides of the slot and bearing upon the side tongues for the purpose specified.

3. A contact shoe, comprising a main member, an auxiliary member formed with tongues adapted to engage the main member and limit the upward movement of the auxiliary member relative to the main member, and springs exerting an upward tension on the auxiliary member, and carried by the main member.

4. A contact shoe, comprising a main member formed with a longitudinal opening between its side edges, an auxiliary member of inverted channel formation mounted in said opening and formed with outwardly extending tongues, and springs secured to the main member and having their free ends bearing upwardly upon said tongues for the purpose specified.

5. A contact shoe of the character described, embodying a main member formed with a longitudinal opening therein, an auxiliary member mounted in said opening, springs connected to the main member and

bearing upon the auxiliary member to effect a raising of the contact surface of the auxiliary member above the contact surface of the main member, and means connecting the auxiliary member and main member and arranged to effect the downward movement of one end of the auxiliary member relative to the main member by and upon the downward movement of the other end of said auxiliary member.

6. A contact shoe, comprising a main member formed with a longitudinal opening between its side edges, an auxiliary member mounted in said opening and formed with side tongues, and leaf springs secured intermediate of their ends to the lower surface of the main member on opposite sides of the opening, the free ends of the springs extending in opposite directions underneath and into engagement with said tongues.

7. A contact shoe, comprising a main member formed with a longitudinal opening between its side edges and with webs at the ends of said opening, an auxiliary member

mounted in said opening and formed with outwardly extending end tongues adapted to engage said webs to limit the upward movement of the auxiliary member relative to the main member; and tensioning means arranged to move the auxiliary member above the upper surface of the main member.

8. A contact shoe, embodying a main member, an auxiliary member, tension means arranged to raise the contact surface of the auxiliary member above the contact surface of the main member, and means connecting the auxiliary member and main member and arranged to effect the downward movement of one end of the auxiliary member relative to the main member upon the downward movement of the other end of said auxiliary member.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES CLAYTON RICH. [L. s.]

Witnesses:

W. N. WOODSON,
FREDERICK S. STITT.