

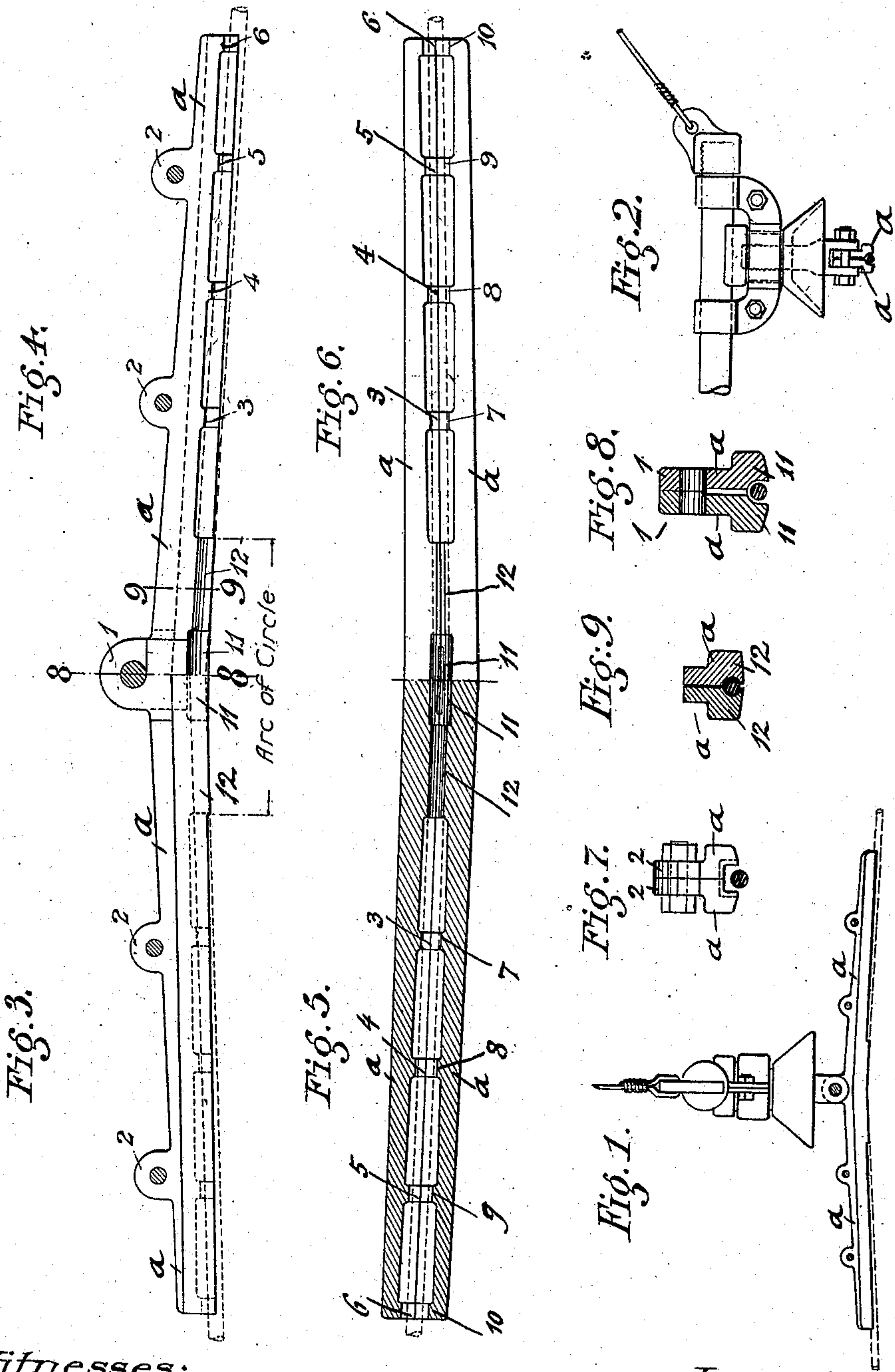
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PATENTED MAY 28, 1907.

J. MAYER.

SUSPENDER FOR THE CONTACT WIRES OF ELECTRIC RAILWAYS.

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UNITED STATES PATENT OFFICE.

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SUSPENDER FOR THE CONTACT-WIRES OF ELECTRIC RAILWAYS.

No. 855,114.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed February 5, 1907. Serial No. 355,894.

To all whom it may concern:

Be it known that I, JOSEPH MAYER, a citizen of the United States, residing in Rutherford, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Suspenders for the Contact-Wires of Electric Railways, of which the following is a specification.

This invention relates to an improved suspender for the contact-wires of electric railways.

For high speed electric operation by means of overhead contact-wires the ordinary trolley-wire suspension has been found unsatisfactory. Suspension by means of one or two wire-strands is therefore frequently used. In this case the wire is suspended at frequent intervals and is stretched so as to be nearly straight. This method, however, has serious defects.

First: The wire becomes slack at high temperature or is subjected at low temperature to excessive tension. To resist the pressure of the sliding bow and the upward bending of the contact-wire and its consequent overstraining at high speeds, its tension during the summer should not fall below a certain minimum. In winter this tension is so much increased that the wire is overstrained by the tension combined with the bending produced by the sliding bow. The safety and permanency of the contact-wire are thereby so much reduced as to render it liable to rupture. When the wire breaks the next following sliding bow rises above it, knocks off the suspenders, and the wire falls, endangering the lives of the passengers, and interrupting traffic.

Second: Another objection to this construction is the considerable cost of the wire-strands and suspenders, as well as the increased cost of the supporting structures due to the large increase of the surface exposed to the wind, and of the suspended weights.

The object of this invention is to provide a suspender which, even with long spans, will not produce unsafe strains in the contact-wire and which will also avoid the costs incidental to two carrying strands.

For this purpose the invention consists of the suspender which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side-elevation of my improved suspender for contact-wires of electric rail-

ways, Fig. 2 is an end-elevation of the same, partly in section, Fig. 3 is a side-elevation of one-half of the suspender, Fig. 4 is a side-elevation of the other half of the same, with one of the sections removed, Fig. 5 is a longitudinal section taken at right angles to the vertical center-plane of the suspender and on the center-line of the contact-wire, Fig. 6 is a bottom-view of one-half of the suspender, Fig. 7 is an end-view of the suspender, and Figs. 8 and 9 are vertical transverse sections respectively on lines 8, 8, and 9, 9, Figs. 3 and 4.

Similar characters of reference indicate corresponding parts throughout the several figures.

The suspender consists of two castings or sections *a, a* which are firmly connected by means of bolts or rivets passing through perforated ears 2, 2 at the upper part of the castings *a, a*. The suspender is hung from the carrying structure by means of central perforated ears 1 and a suitable insulator and insulator-pin. The suspender is open at the lower end, and provided with a central portion 11 and with closed clamping-portions 12 adjacent thereto for holding the contact-wire firmly and protect it against bending strains due to the pressure of the passing sliding bow. Where the contact-wire leaves the central portions 12 it has approximately the direction of the pull at highest temperature, if it were hinged at these points. The sliding bow moves under the central portions 11 and 12 along a curve which forms an accurate or approximate arc of a circle. This curve is tangential to the lower face of the wire where it leaves the central portion.

Adjacent to the ends of the central portions 11 and 12 are formed in the suspender longitudinal channels of approximately rectangular cross-section, open below. The cross-sections of these channels are gradually enlarged toward the ends of the suspender in such a manner that the wire will bend in these channels along arcs of circles, when it rises by cold or is deflected laterally by the wind. This is accomplished by making the upper wall of each channel a cylindrical surface with horizontal axis, which surface is tangent to the upper face of the wire where the latter leaves the central part of the suspender. These upper walls of the channels may be either continuous surfaces or they may be recessed to facilitate the manufacture, leaving only a few projections or cheeks 3, 4, 5, 6 which give support to the

wire when it bends up at low temperature. The two side-surfaces of these channels are also parts of vertical cylindrical surfaces tangential to the sides of the wire where it leaves the central part of the suspender. They may also be recessed so as to leave only projections or cheeks 7, 8, 9, 10 for the support of the wire when it bends laterally by wind-pressure.

10 The radii of the cylindrical surfaces of the longitudinal channels are so chosen that the total strain in the inclosed wire, due to the combined tension and bending produced by weight, wind, temperature, and sliding bow, 15 does not exceed a safe limit, dependent on the strength of the material of the wire. The length of these channels is so determined that the combined bending strain and tension in the wire, after it leaves the channels, 20 never exceeds a safe limit. The sliding bow runs below the ends of the suspender along the bottom of the wire and does not touch the lower edge of the sections *a, a*. The lower edge of the channeled sections is for 25 every position of the wire above its under side and below its center-line. By this arrangement the motion of the sliding bow is made smooth while it passes the suspender. To spread the wear of the sliding bow over its 30 length, the suspenders are placed alternately to the right and left of the center of the track; the front and rear half of the suspender forming an obtuse angle, the apex of which is at the center, as shown at the dividing line 35 between Figs. 5 and 6.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

40 1. A suspender for the contact-wires of electric railways, consisting of two longitudinal sections, and means for connecting them, said sections having a central portion which firmly clamps the wire and protects it from bending strains due to the pressure of the 45 sliding bow, and two channels gradually enlarged toward the ends.

2. A suspender for the contact-wires of electric railways, consisting of two longitudinal sections and means for connecting them 50 at their upper edges, said sections having a central curved portion for supporting the

contact-wire and longitudinal channels gradually enlarged toward the ends both in height and width.

3. A suspender for the contact-wires of 55 electric railways, consisting of two longitudinal sections, and means for connecting them at their upper edges, said sections having a central curved portion for supporting the contact-wire, and channels gradually en- 60 larged from the center-portion toward the ends in vertical and lateral directions and provided with recesses and intermediate projections or cheeks.

4. A suspender for the contact-wires of 65 electric railways, consisting of two longitudinal sections connected at their upper parts and provided with a central curved portion for supporting the contact-wire and with longitudinal channels open at their lower ends 70 and formed at the top and sides of cylindrical surfaces tangential with the top and sides of the contact-wire where it leaves the central portion.

5. A suspender for the contact-wires of 75 electric railways, consisting of two longitudinal sections connected at their upper parts and provided with a central curved portion for supporting the contact-wire and with longitudinal channels open at their lower ends 80 and formed at the top and sides of cylindrical surfaces tangential with the top and sides of the contact-wire.

6. A suspender for the contact-wires of 85 electric railways, consisting of two longitudinal sections connected at their upper parts and open at their lower parts, and provided with a central curved portion for supporting the contact-wire, and with longitudinal chan- 90 nels formed at the top and sides of cylindrical surfaces tangential with the top and sides of the wire, said cylindrical surfaces being recessed so as to form projections or cheeks.

In testimony, that I claim the foregoing as 95 my invention, I have signed my name in presence of two subscribing witnesses.

JOSEPH MAYER.

Witnesses:

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