

C. J. VAN DEPOELE.

SUSPENSION DEVICE FOR ELECTRIC RAILWAY CONDUCTORS.

No. 396,312.

Patented Jan. 15, 1889.

Fig. 1.

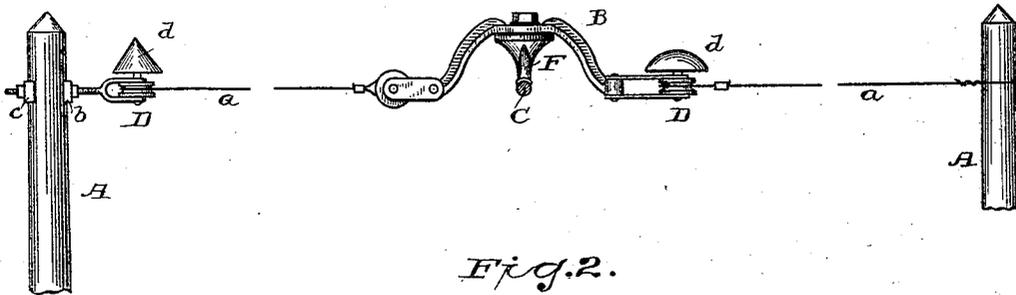


Fig. 2.

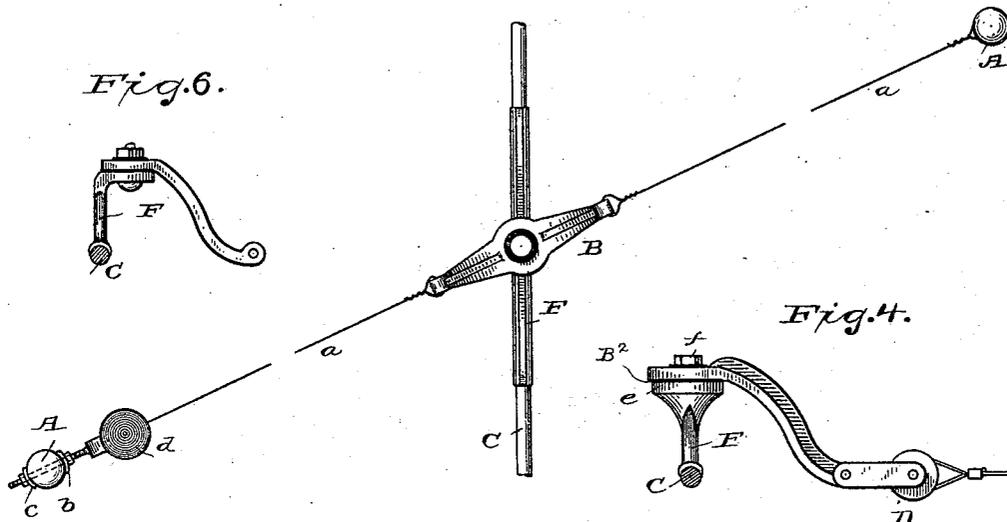


Fig. 6.

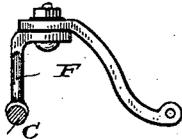


Fig. 4.

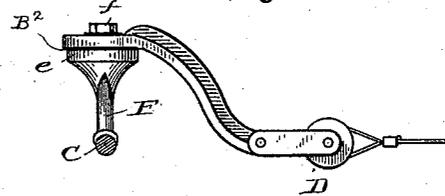


Fig. 3.

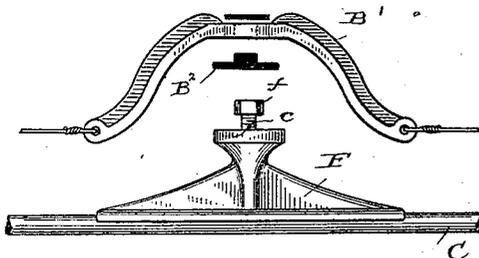
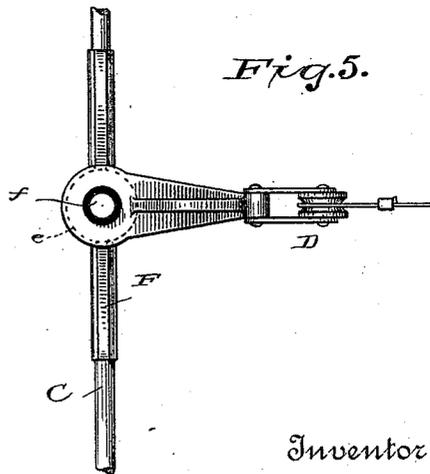


Fig. 5.



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Fig. 7.

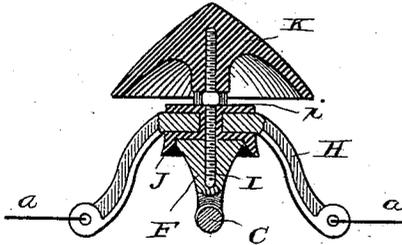


Fig. 8.

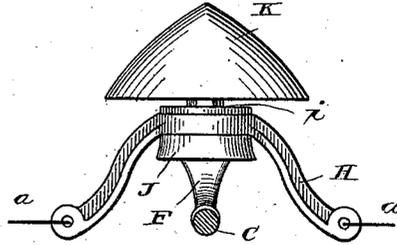


Fig. 9.

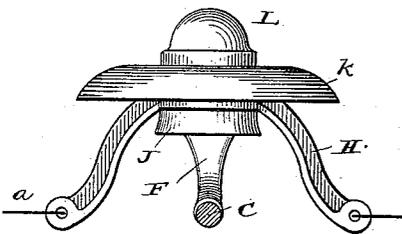


Fig. 10.

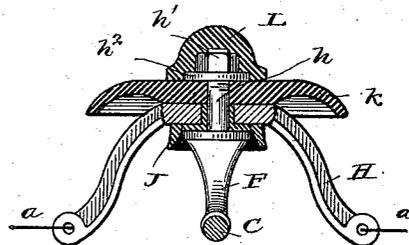


Fig. 12.

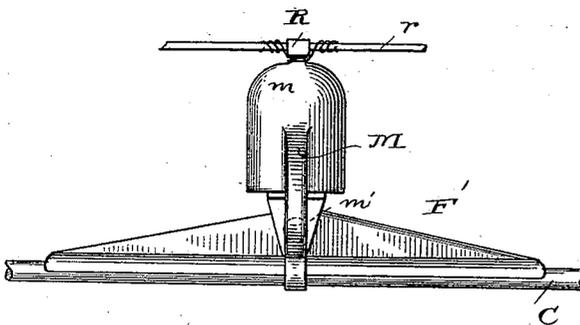
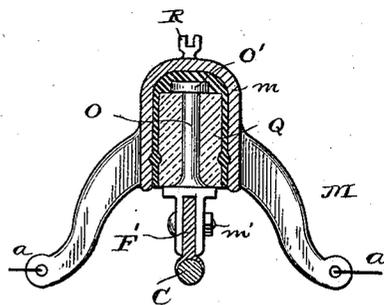


Fig. 11.



Witnesses.

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# UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF LYNN, MASSACHUSETTS.

## SUSPENSION DEVICE FOR ELECTRIC-RAILWAY CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 396,312, dated January 15, 1889.

Application filed November 7, 1888. Serial No. 290,177. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES J. VAN DE-  
POELE, a citizen of the United States, residing  
at Lynn, in the county of Essex, State of Mas-  
sachusetts, have invented certain new and  
useful Improvements in Suspension Devices  
for Electric-Railway Conductors, of which  
the following is a description.

My invention is an improved device for  
suspending, supporting, and insulating the  
conductors of electric railways of that class in  
which the current is supplied from an over-  
head conductor to a motor upon the moving  
vehicle.

In an application filed by me in the United  
States Patent Office on August 22, 1888, Serial  
No. 283,445, I have shown, described, and  
broadly claimed a device for this purpose, and  
the present invention relates to the same gen-  
eral style of suspender, but includes an im-  
proved form of construction, whereby it is  
adapted to other and additional uses.

It is sometimes impracticable to place the  
posts to which the cross-wires supporting the  
arched suspender are attached directly oppo-  
site each other, but yet it is desirable to have  
the conductors keep a perfectly straight line.  
In my previous application the conductor is  
shown as extending in a direction at right  
angles to the direction of the cross-wires; but  
my present invention includes, in connection  
with the bridge under which the conductor  
passes, a detachable and swiveled ear attached  
to the main wire and then connected or at-  
tached to the bridge, to the ends of which the  
cross-wires connected to the poles are secured,  
whereby no matter at what angle the poles  
are arranged the conductor may be properly  
sustained and kept in a straight line above  
the track.

My invention is also embodied in a sus-  
pending device in which the connection be-  
tween the conductor-supporting part and the  
bridge portion, to which the same is secured  
and by which it is sustained, is connected  
by insulated connections, so that the support-  
ing device will not only sustain the conductor  
in desired position, but also insulate it from  
the cross-wires and other sustaining-connec-  
tions.

My invention is illustrated in the accom-  
panying drawings, in which—

Figure 1 is an elevation of my improved  
device. Fig. 2 is a plan view showing the ar-  
rangement where the poles are set at an angle  
to each other. Fig. 3 shows a side elevation  
of the bridge, the ear being removed. Fig. 4  
is an elevation of a form of the invention de-  
signed for use where the conductors pass from  
one street to another or around curves. Fig.  
5 is a plan view of the device shown in Fig.  
4. Fig. 6 is a view in elevation showing a  
slight modification of the device shown in Fig.  
4. Fig. 7 is a sectional elevation of a form of  
suspender in which the conductor-sustaining  
part is insulated from the arch by which it is  
supported. Fig. 8 is an elevation of what is  
shown in Fig. 7. Fig. 9 is a view in elevation  
showing a slightly-different form of insulated  
suspender. Fig. 10 is a sectional elevation of  
the device seen in Fig. 9. Fig. 11 is a sec-  
tional elevation of an insulating-suspender of  
somewhat different construction. Fig. 12 is  
an elevation of what is seen in Fig. 11, to-  
gether with a portion of the main conductor  
and of the guard-wire.

Similar letters denote like parts through-  
out.

In the drawings, A A represent conductor-  
supporting poles located at desired or con-  
venient intervals along the line of way. a a  
are cross-wires attached at one end to the  
poles and at the other end to the extremities  
of an arched suspender, B, supporting the  
main electric supply-conductor C.

As shown in Fig. 1, insulators D D are in-  
terposed between the extremities of the cross-  
wires a a and the extremities of the arch B;  
but these insulators may be dispensed with  
and the cross-wires attached directly to the  
arch. In this case insulation is interposed  
between the conductor-supporting ears and  
the sustaining-arches, as will appear. Upon  
the left-hand side of Fig. 1 I have shown  
means for adjusting the tension of the cross-  
wires a, which consist of a screw-threaded  
bifurcated rod or hook, b, passing through  
the pole, having a nut, c, upon one end, the  
wire a being secured to an insulator attached  
between the forks of the rod or placed upon

the hook. By adjusting the nut *c* the tension of the wires *a* may be increased or diminished. An ordinary turn-buckle may, however, be used to adjust the wire instead of the means shown. The insulators are preferably provided with umbrella-shaped coverings, as *d d*, to keep off the rain from the ends of the cross-wires.

The suspender B is on the same general form of construction as that shown in my aforesaid application, though differing therefrom in various details of construction. It consists of an arch, B', to the ends of which the cross-wires are attached. This arch has a central opening formed in it, through which a bolt, *e*, is adapted to pass. The under side of the arch at its central portion is made flat, so as to form a bearing-surface, and the bridge may be insulated from the ear, as by a washer or disk, B<sup>2</sup>, of insulating material interposed between them. The ear F in the aforesaid application was rigidly secured to the central part of the arch, said ear being tapered toward its extremities and grooved upon its under side, the conductor to be suspended being firmly secured to the groove in the ear.

The invention shown and described in the previous application was best adapted for use where the poles were arranged directly opposite each other, and hence the cross-wires were directly at right angles to the conductor and exerted a direct pull upon the same; but in order to accomplish the objects stated herein I form the ear F flat upon its upper part and provided with a bolt, *e*, adapted to fit the central opening in the arch B'. A nut, *f*, fits the end of the bolt *e*, and it will be obvious that by this construction the suspending arch may be secured to the ear at any angle to the conductor, thus enabling the same to be supported equally well when the poles are arranged at an angle as when directly opposite each other.

It will be readily understood that I do not limit myself to the particular adjusting device shown in the drawings, as the construction might be varied to a great extent without departing from the spirit of my invention.

As shown and described in an application filed by me on the 10th day of September, 1888, Serial No. 285,072, when the conductors pass around curves it is not necessary to use the double-arched suspender. As there shown, the cross-wire *a* is secured at one end only of the suspender, the other end of said wire *a* being attached to a cable stretched between poles arranged on diagonally-opposite corners. Thus by arranging a number of the suspenders around a curve they would exert a side pull on the conductor and practically divide it up into a number of straight sections. The adjustable suspender herein shown enables me to further equalize the strain on curves by suitably locating and properly directing the suspenders and cross-wires.

In Figs. 4, 5, and 6 I have shown an adaptation of my present invention to curves, the construction in Figs. 4 and 5 being the same as that shown in the other figures, except that one side of the arch is cut away. In Fig. 6, however, the construction is slightly different, the arch being formed as in the previous figures; but the ear F has a horizontal flange upon which the end of the arch rests, the two being adjustably secured together by means of a bolt passing therethrough, clamping the ear, the insulation, and the arch securely together.

As seen in Figs. 7 and 8, the insulation is more complete and thorough than that shown in the preceding figures, and it is furthermore protected by a hood or cover. H represents an arch-suspender similar in its general construction to the arch B. (Seen in plan in Fig. 2.) To the extremities of the arch H the cross-wires *a a* are secured, as in the other instances. F represents an ear similar to the one shown in Fig. 3. The ear F is secured to the arch H by a bolt, I, which said bolt passes through insulation, *i*, by which it is isolated from the metallic portion of the suspender H. An inverted cup, J, also of insulating material, is located between the ear F and the under side of the arch, so as to effectually prevent access of water. The bolt I is continued upward and receives at its upper extremity a hood or cap, K, of insulating material, by which water is deflected away from the central portions of the insulator. With this construction it will be understood that the attachment between the conductor-supporting ear F and the arch H is adjustable, so that the said portions may be put up and secured in any desired positions.

In Figs. 9 and 10 is seen a slightly-different form of the construction just described. The arch H, ear F, and insulating-cup J are the same as in Figs. 7 and 8; but instead of the cap K, supported upon an upward extension of the bolt I, a bolt, *h*, is provided, which bolt extends upward through the arch, from which it is insulated, and through an insulating-disk or saucer, *k*, the saucer *k* and ear F, carrying the conductor, being firmly secured to the suspender H by a nut, *h'*, on the outer extremity of the bolt *h*, which nut has a solid bearing upon a metallic washer, *h<sup>2</sup>*, on the upper surface of the inverted saucer *k*. This makes a very strong and simple construction, and may be preferred in some instances. A cap, L, of insulating material may be fitted over the nut *h'* to protect the same from the weather.

In Figs. 11 and 12 a slightly-different construction is illustrated, in which an arch, M, is formed with a central inverted-cup-shaped portion, *m*, the arch and the cup being desirably cast in a single piece to give the necessary strength and rigidity. The conductor C is attached to an ear, F', which ear is supported by a shank, O, secured at its lower extremity to the central portion of the ear F'—

as, for example, by a bolt,  $m'$ , passing through the ear and the lower portion of the shank  $O$ . The upper part of the shank  $O$  is formed or provided with an extension,  $O'$ . The shank  $O$  is fitted loosely into a block,  $Q$ , of glass, porcelain, or other good insulating material, in which it is secured by the extension  $O'$  on its upper end. The insulating-block  $Q$  is secured within the cup  $m$  by a filling of insulating material, such as sulphur, bitumen, plaster-of-paris, or any other insulating material that can be used while in a plastic condition. With this construction the shank  $O$  will constitute a swivel by which the conductor will be movably supported, although, of course, it may be rigidly secured in its supporting-block  $Q$ , if desired. An extension,  $R$ , is desirably formed on the top of the inverted cup  $m$ , in which a guard-wire,  $r$ , is desirably carried.

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

1. A device for suspending electric conductors, consisting of an arch secured to a transverse support or supports, and an ear or bail connected to the conductor to be suspended and adjustably secured to the arch, substantially as described.

2. A device for suspending electric conductors, consisting of an arch secured to transverse supports, and an ear or bail depending from said arch and connected to the conductor to be suspended, said arch being adjustably secured to the ear and insulated therefrom, substantially as described.

3. A device for suspending electric conductors, consisting of an arch secured to transverse supports, an ear or bail depending there-

from, the upper end of said ear forming a bearing upon which the arch rests, and a bolt secured to said ear and passing through the arch, whereby the same may be adjusted, and insulating material between the ear and its support, substantially as described.

4. A device for suspending electric conductors, consisting of an arch secured to a transverse support or supports, an ear depending therefrom supporting the electric conductor, said ear having a horizontal flange formed at or near its upper part upon which the arch is adapted to rest, and a bolt passing through said flange and arch, whereby the same is rendered adjustable, substantially as described.

5. A device for suspending electric conductors, consisting of a metallic arch spanning the conductors to be supported, an ear attached to said conductor, insulating material secured to the arch, and means securing the conductor-supporting ears to the said insulating material, substantially as described.

6. A device for supporting electric conductors, consisting of an arch supported so as to present its opening below, an ear secured to the conductor to be carried, means for connecting the ear and arch, and an insulating medium interposed between the ear and the arch to prevent passage of the main current to the supporting devices, substantially as described.

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

CHARLES J. VAN DEPOELE.

Witnesses:

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CHAS. L. OECHSNER.