

M. W. MANZ.
SYSTEM OF OVERHEAD CONSTRUCTION.
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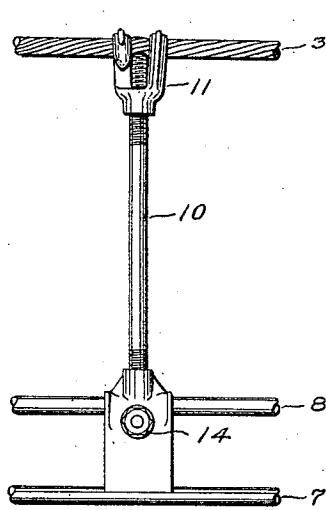


Fig. 2.

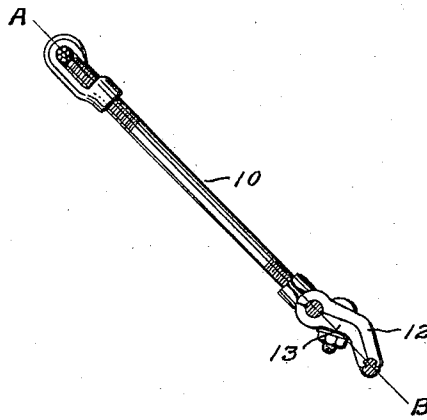


Fig. 3.

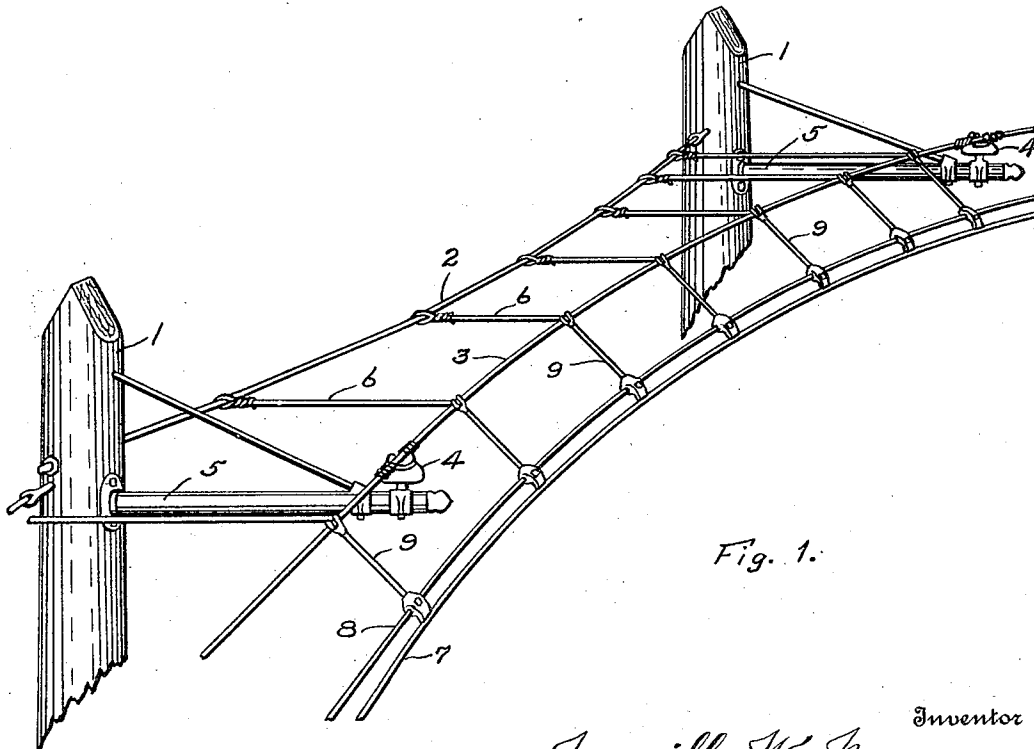


Fig. 1.

Witness

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By

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UNITED STATES PATENT OFFICE.

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SYSTEM OF OVERHEAD CONSTRUCTION.

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To all whom it may concern:

Be it known that I, MERRILL W. MANZ, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in a System of Overhead Construction, of which the following is a specification.

My invention relates to the supporting of conductors and more particularly to a system and device therefor in which there is a free and flexible suspending of the trolley wire and an auxiliary wire from a messenger or catenary cable at fixed intervals and a further support of the trolley wire from the auxiliary wire at intervening points and each of the three wires in a different horizontal plane and all three wires in the same oblique plane. My invention is particularly applicable when the wires follow a curve and when a bow or sliding collector is used, although it is applicable on straight line construction and with a wheel collector.

My invention resides in the novel combination, construction and arrangement of the several parts.

In the drawing—

Fig. 1 shows a system of supporting the trolley wire, by means of the device herein disclosed, upon a curve.

Fig. 2 is a front view of the device which I use in suspending the trolley wire from a messenger wire.

Fig. 3 is a side view of my device.

In high speed electrification for heavy traffic, it has been found of advantage to use the so-called catenary form of construction in which the trolley wire is suspended from a catenary or messenger cable and an auxiliary wire is used, and which is placed adjacent the trolley wire and which acts as a current feeder.

The trolley wire is hung quite frequently from the catenary cable and directly below the catenary and on curves the trolley wire is maintained below the catenary by means of rigid steady arms.

A better construction or system of suspending the trolley wire is to place it to one side of and below the catenary cable and let it assume its position of equilibrium due to the side pull of the trolley and auxiliary wires and their weight plus the weight of the fittings secured thereto.

This permits the trolley wire to "float" and to rise and fall freely with the passing of the current collector below and avoid so-called "hard spots" at the hangers as is the case when the trolley wire is suspended directly below the catenary.

In Fig. 1 my improved system of construction is shown upon a curve in which the numeral 1 represents the pole, 2 represents a backbone cable by means of which the messenger cable 3 is maintained in proper alinement above the track and is mounted on insulators 4 secured to bracket arm 5. The proper horizontal position of the catenary or messenger cable is maintained by the pull-off wires 6. Below and to one side are positioned the trolley wire 7 and the auxiliary wire 8.

In stringing the trolley and auxiliary wires a certain tension is placed thereon which tends to straighten out the wires but they are held in a fixed spaced relation to the messenger cable by means of my improved hanger 9. The trolley and auxiliary wires are held in a fixed relation to each other by my improved hanger 9 and to the catenary cable in such a manner that the three wires are always in the same plane and the angle of this plane coincides with the resultant of a horizontal and vertical stress as previously explained, and the direction of this resultant stress will pass through the three wires and the axis of the rod 10 (Figs. 2 and 3) as indicated by the line A—B. This construction of the hanger 9 relieves the various parts as far as possible of all bending strains.

My improved hanger comprises the rod 10 provided at one end with a holding member 11 whereby connection is made with the messenger cable and to the other end is secured a clamping member comprising the parts 12 and 13 for engaging and clamping the trolley and auxiliary wires, and held together by the bolt 14.

The holding member 11 may be of varied construction to grip the cable and permit the lower end of the hanger to pivot or swivel with the catenary cable acting as an axis and the holding member 11 having a tight or loose engagement with the catenary. This permits the members 7—8 to rise and fall, above and below a normal position, with the passage of the current collector.

It will be observed that the three wires 3, 7 and 8,

7 and 8 rest in the same plane as indicated by A—B in Fig. 3 and the line A—B represents the direction of the applied force which is the resultant largely of the weight and side pull of the members 7 and 8, which act practically as one conductor in that they are tied together within two or three inches of each other by the hanger 9.

The parts 12—13 forming the wire clamp are formed with a slight bend and this is necessary in order to permit my hanger and system of suspension to be used with a wheel current collector as otherwise the flange of the wheel would strike the member 13, but by forming a slight hook or bend therein this condition is avoided and the hanger is adapted for use with both sliding and wheel collector. The connection between the rod 10 and the clamp part 12 is rigid, thereby maintaining the holding and clamping means at a fixed distance apart and in the same oblique plane although the angle of such plane may vary as previously explained.

There are of course modifications in my improved system and hanger which will readily suggest themselves to one skilled in the art, as for instance an inspection of Fig. 1 discloses the fact that the members 2 and 6 can be eliminated and the messenger cable 3 allowed to take its natural position which would be that of a cable suspended between the insulators 4—4. In that case it will be readily understood that the member 10 of the hangers 9 will necessarily be of different lengths so as to maintain the proper curvatures to the wires 7 and 8.

In view of various modifications which can be made without departing from my invention, I do not wish to be limited other than as set forth in the following claims.

Claims—

1. A system of suspension for conductors comprising a supported catenary cable, two conductor wires adjacent each other but in different horizontal planes below and to one side of the catenary and both conductor wires positioned on the same oblique straight line passing through the points of their intersection with any vertical plane, and means for normally suspending the conductors from the catenary cable but permitting their distances below the catenary varied between limits.

2. A system of suspension for conductors comprising a supported catenary cable, two conductor wires adjacent each other but in different horizontal planes below and to one side of the catenary and both conductor wires positioned on the same oblique straight line passing through the points of their intersection with any vertical plane, and means for suspending the conductors from the catenary cable.

3. A system of suspension for conductors

comprising a supported catenary cable, two conductor wires adjacent each other but in horizontal planes below the catenary cable and all three wires lying on the same oblique straight line passing through the points of their intersection with any vertical plane.

4. A system of suspension comprising three wires arranged each in a different horizontal plane and each in a different vertical plane and all three lying on the same straight line passing through the points of their intersection with any vertical plane, and means for maintaining them in said relation free to change the direction of the oblique line without changing the distance between the wires measured in said oblique line.

5. A system of suspension comprising three wires, one of which wires constitutes a supporting wire, each of the three wires at all times arranged in a different horizontal and vertical plane and lying on the same straight line passing through the points of their intersection with any vertical plane, and means for maintaining them in said relation.

6. A system of suspension comprising a supported catenary cable, two conductors each below and to one side of the catenary and each conductor in a different horizontal and vertical plane relative to each other and to the catenary cable and means for suspending the conductor from the catenary cable such that the three wires will lie on the same straight line which will pass through their points of intersection with any vertical plane, the direction of which is the resultant of the component forces acting on the two conductors.

7. A system of suspension comprising three wires of which one wire is fixed and acts as a supporting wire for the other two wires and means for suspending the two wires from the supporting wire such that the three wires will all lie on the same oblique straight line which is the resultant of the stresses upon the two wires tending to draw them away from the supporting cable.

8. A system of suspension comprising three wires of which one wire is fixed and acts as a supporting wire for the other two wires and means for supporting the two wires from the supporting wire such that the two wires and the supporting wire will lie on a straight line passing through their points of intersection with any vertical plane and normally assume a position relative to the supporting wire which is the resultant of the stresses upon the two wires but are free to rise and fall above or below the normal position.

9. A device for suspending two wires from a support as described comprising

means for attachment to the support, means for engaging and gripping the two wires and means engaging the two said means to maintain the two wires a fixed distance 5 from the support and to maintain the two wires and support at all times in a common plane which is the resultant when the two wires are subjected to unequal vertical and horizontal stresses.

10 10. A device for suspending two wires from a support as described comprising holding means for attachment to the support, clamping means for engagement with the two wires, means to coact with the 15 clamping means to hold the clamping means in clamping engagement with the two wires and connecting means extending between the clamping and holding means and retaining the two wires and the support such that their 20 intersection with any vertical plane will lie on the same oblique straight line.

11. A device for suspending two wires from a support as described comprising

holding means for attachment to a support, clamping means for engaging and grip- 25 ping the two wires, the clamping means comprising two members to engage each wire and the portion intervening the two wires formed out of alinement with the two wires and having means to hold the two 30 members in engagement with the two wires and rigid means connecting the holding and clamping means in a fixed relation.

12. A device for supporting two wires from a support comprising holding means 35 for attachment to a support, clamping means for engaging a wire spaced from the support, connecting means extending between the holding and clamping means to maintain them in a fixed relation and means 40 projecting from the clamping means at an angle to the connecting means to engage and clamp a wire to be held at a fixed distance from the first named wire.

In testimony whereof I affix my signature. 45
MERRILL W. MANZ.