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H. B. P. WRENN ET AL.

OVERHEAD ELECTRICAL CONDUCTOR SYSTEM

Filed May 17, 1923

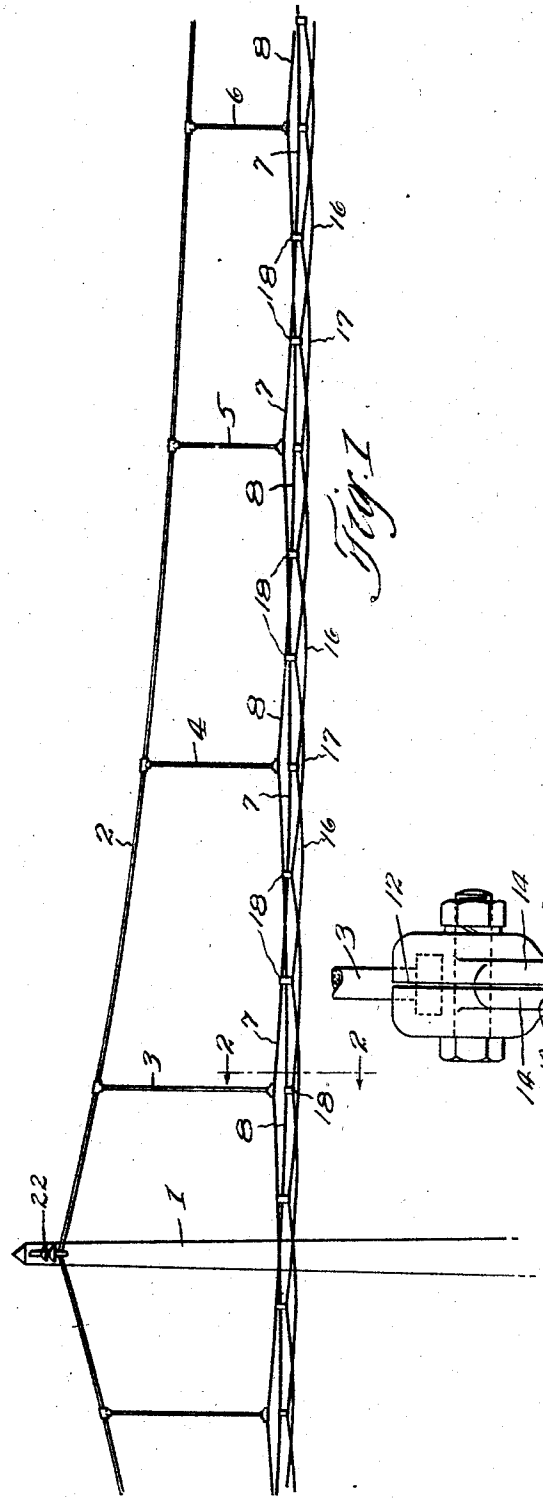


Fig. 1

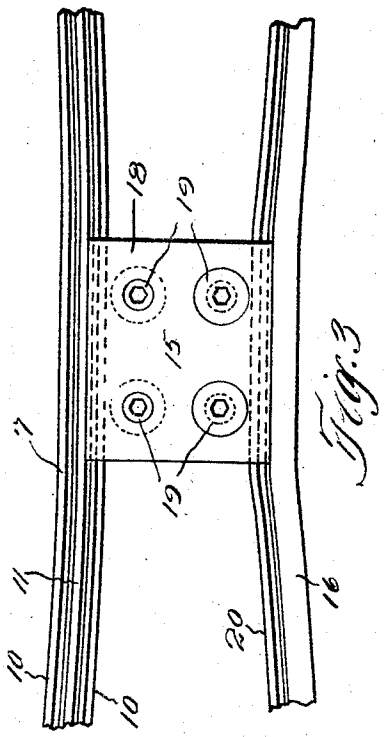


Fig. 3

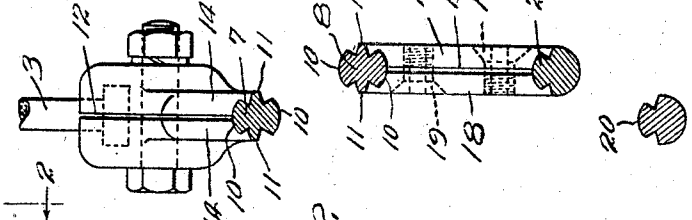


Fig. 2

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UNITED STATES PATENT OFFICE.

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OVERHEAD ELECTRICAL CONDUCTOR SYSTEM.

Application filed May 17, 1923. Serial No. 639,512.

To all whom it may concern:

Be it known that we, HENRY B. P. WRENN, and ALOYSIUS S. O'DONOGHUE, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Overhead Electrical Conductor Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to overhead conductor systems for electrical railways and has particular reference to a system similar to that described in our Reissue Patent No. 15,876, dated July 22, 1924.

The primary object of the present invention is to provide an overhead suspension system which shall be composed of a plurality of feeder conductors suspended in any suitable manner, and from each of which is suspended a contact wire which shall receive current from its feeder conductor at certain definite points.

Another object is to provide an overhead suspension system wherein the contact wires and feeder conductors shall be arranged in a series of overlapping loops so that a collector moving thereover shall cause a shearing action between adjacent wires and conductors in advance of said collector thereby freeing the wires and conductors of ice and snow.

Another object is to provide an overhead suspension system which shall mitigate what are commonly referred to as "hard spots" and which shall maintain contact between the collector and contact wires at all times and thus reduce arcing to a minimum.

A still further object is to provide a suspension system of the aforesaid character which shall be particularly adapted for efficient transmission of large currents and which shall be easy to erect and maintain, highly durable in operation, and which shall consist of few parts.

With these and other objects in view, the invention consists in the various novel features of construction and arrangement or combination, all of which will be fully described hereinafter and pointed out in the appended claims.

In the accompanying drawing wherein we have shown one form of our invention, Fig. 1 is a side elevation of a portion of an overhead suspension system employing our improved construction; Fig. 2 is an enlarged sectional view taken on the line 2—2 of Fig. 1; and Fig. 3 is an enlarged side elevation of a portion of a feeder wire and a contact wire showing the latter clamped to the former.

Describing the various parts by reference characters, 1 denotes a suitable support from which a catenary suspension cable 2 is hung. Depending from this cable are a plurality of hangers designated by the numerals 3, 4, 5 and 6. Alternate hangers such as those numbered 3 and 5 support a feeder conductor 7 while hangers 4 and 6 support a second feeder conductor 8. As shown in Fig. 1 these conductors are preferably arranged to define a series of freely suspended overlapping loops so that vertical movement of one with respect to the other will effect a shearing action and serve to dislodge ice and snow as will be more fully explained hereinafter. These conductors are preferably formed with a special cross section so that suitable clamps may be secured thereto without lateral projections which would interfere with the aforesaid shearing action. As shown in Figs. 2 and 3, we preferably form these conductors with upper and lower dovetail portions 10 and also with oppositely disposed and laterally projecting ribs 11. A clamp 12 connects each hanger with its respective feed conductor and each clamp is provided with a pair of jaws 14 which are recessed to receive the upper dovetail portion 10 of the conductor. The lower edges of the jaws are adapted to contact with the lateral projections 11 and lie flush with the outer side edges thereof so as to define a smooth vertical surface and permit vertical movement of one conductor with respect to the other.

Each feed conductor 7 and 8 has suspended therefrom, by clamps 15, a contact wire designated 16 and 17 respectively. These wires are preferably arranged in a series of freely suspended overlapping loops with respect to each other, and each wire is preferably supported from its conductor so that a clamp 12 will be positioned intermediate to a pair of clamps 15; or in other words each contact wire will be looped beneath the hangers supporting its feed con-

ductor. This arrangement provides flexibility to the system and mitigates what are commonly referred to as "hard spots".

The clamps 15 may be of any suitable construction and as an example of such, we have shown them composed of two plates 18 which are adapted to be clamped together by screws 19. The upper and lower edges of these plates are recessed to receive the lower dovetail portion 10 of one of the feed conductors and the dovetail portion 20 of its contact wire. These clamps are devoid of lateral projections which might interfere with the vertical movement of one wire with respect to the other.

From the foregoing description it will be obvious that a collector passing over the contact wires will force said wires to a level and thus raise the lowest loop to the level of the point of suspension of the other wire. This will effect a shearing action in advance of the collector and dislodge ice and snow from the wires so that good electrical contact between said collector and contact wires is assured. It will be noted that the collector will make contact with both wires at all times and thus a maximum area of contact is obtained and sparking and arcing is reduced to a minimum. As the collector passes over the points of suspension of the contact wires from the conductors, there will be a slight upward movement due to the fact that these points are disposed along a loop of the feed conductors, and hence all hard spots are eliminated and the collector will move freely thereover. Our system is particularly adapted for heavy duty service requiring a large amount of current as each contact wire receives its current at a plurality of points from a single feed conductor.

The system as a whole may be insulated in any suitable manner as by insulators 22 interposed between cable 2 and the supports therefor.

It will be understood that the terms wire, cable and conductor are used in the specification and claims in their broadest sense to include any conductor of either solid or stranded form, or any combination thereof.

Having thus described our invention, what we claim is:

1. An electrical system of the character set forth comprising a plurality of feeder conductors, and a contact wire connected to each conductor, said contact wires being arranged in a series of overlapping loops.

2. An electrical system of the character set forth comprising a plurality of feeder conductors suspended from a plurality of points to define a series of overlapping loops, and a contact wire connected to each feeder conductor.

3. An electrical system of the character set forth comprising a plurality of feeder conductors suspended from a plurality of points to define a series of overlapping loops, and a contact wire connected to each feeder conductor, said contact wires being arranged in a series of overlapping loops.

4. An electrical system of the character set forth comprising a plurality of feeder conductors suspended from a plurality of points to define a series of overlapping loops, and a contact wire connected to each feeder conductor, the points of suspension of said contact wires lying intermediate the points of suspension of their respective feeder conductors.

5. An electrical system of the character set forth comprising a plurality of feeder conductors, and a contact wire connected to each feeder conductor, said contact wires being arranged in a series of freely suspended overlapping loops.

6. An electrical system of the character set forth comprising a suspension cable, a plurality of feeder conductors suspended from said cable, and a contact wire carried by each feeder conductor.

7. An electrical system of the character set forth comprising a suspension cable, a plurality of feeder conductors suspended from said cable, said feeder conductors being arranged in a series of overlapping loops, and a contact wire connected to each feeder conductor, said contact wires being arranged in a series of overlapping loops.

8. An electrical system of the character set forth comprising a suspension cable, and a plurality of feeder conductors suspended from said cable, said conductors being arranged in a series of overlapping loops.

9. An electrical system of the character set forth comprising a suspension cable, a pair of feeder conductors suspended from said cable, said conductors being suspended at alternate points to define a series of overlapping loops, and a contact wire connected to each feeder conductor and adapted to receive electrical energy therefrom, said contact wires being arranged in a series of overlapping loops.

10. An electrical system of the character set forth comprising a plurality of feeder conductors suspended from a plurality of points to define a series of overlapping loops, and a contact wire connected to said feeder conductors.

11. An electrical system of the character set forth comprising a plurality of feeder conductors, a contact wire positively and independently connected to each of said feeder conductors to form a positive electrical connection thereby to permit the transfer of electrical energy from said feeder conductors to said contact wires without arcing or sparking, said contact wires being arranged in a series of freely suspended overlapping loops whereby a shearing action between

said contact wires will be effected at substantially all points along said wires as a current collecting device moves therealong.

12. An electrical system of the character set forth comprising a plurality of feeder conductors, a contact wire positively and independently connected to each feeder conductor at a plurality of points, said points of connection between said feeder conductors and contact wires each serving as a positive electrical connection to permit the transfer of electrical energy from said feeder conductors to said contact wires without arcing or sparking, said contact wires being arranged in a series of freely suspended overlapping loops whereby a shearing action between said contact wires will be effected at substantially all points along said wires as a current collecting device moves therealong.

In testimony whereof, we hereunto affix our signatures.

HENRY B. P. WRENN.
ALOYSIUS S. O'DONOGHUE.