June 10, 1924. 1,497,047

S. M. VIELE ET AL

MEANS FOR SUSPENDING WIRES, CABLES, AND THE LIKE

Filed March 12, 1923 3 Sheets-Sheet 1

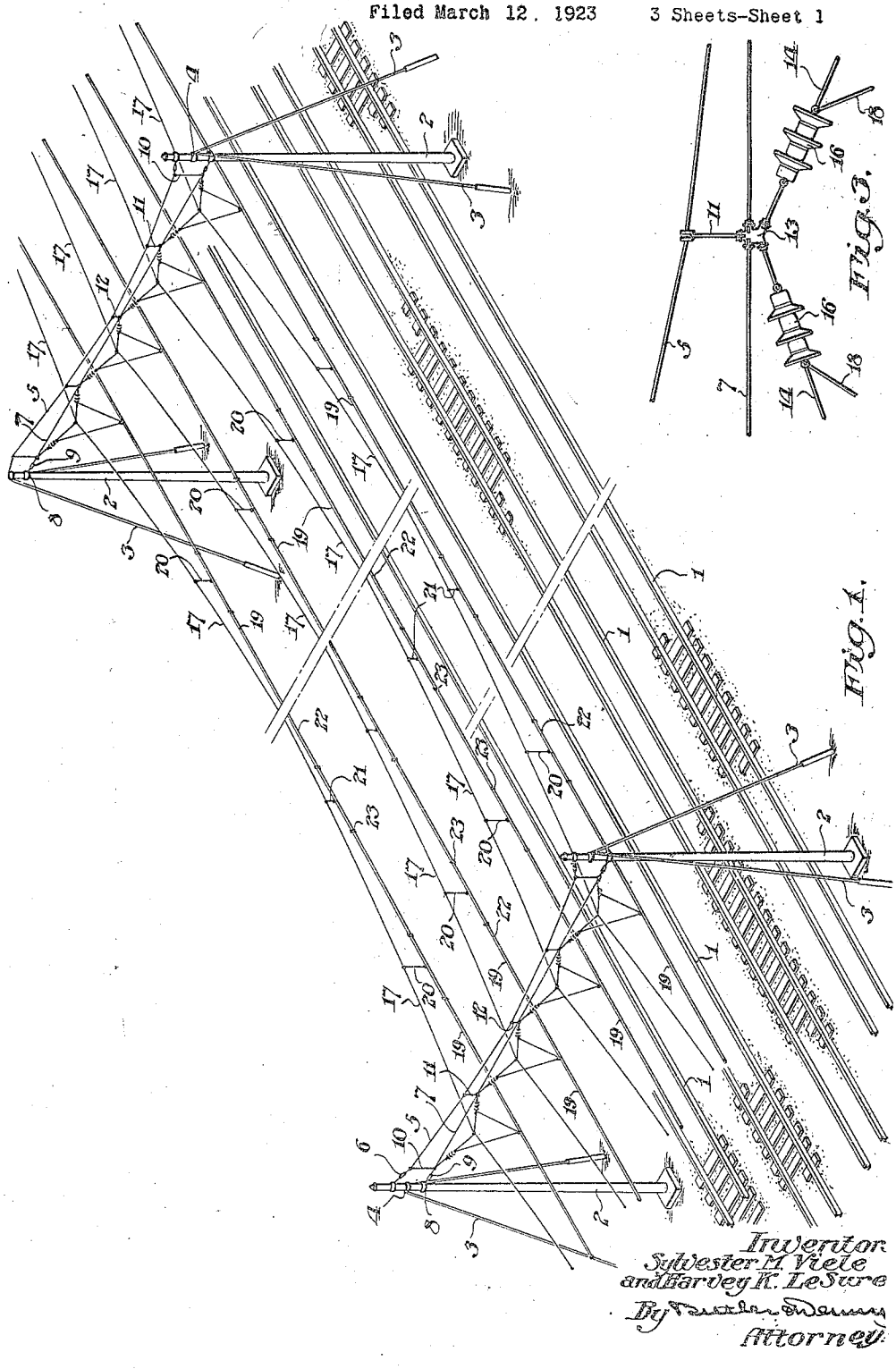


Fig. 4.

Fig. 3.

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Filed March 12, 1923 3 Sheets-Sheet 2

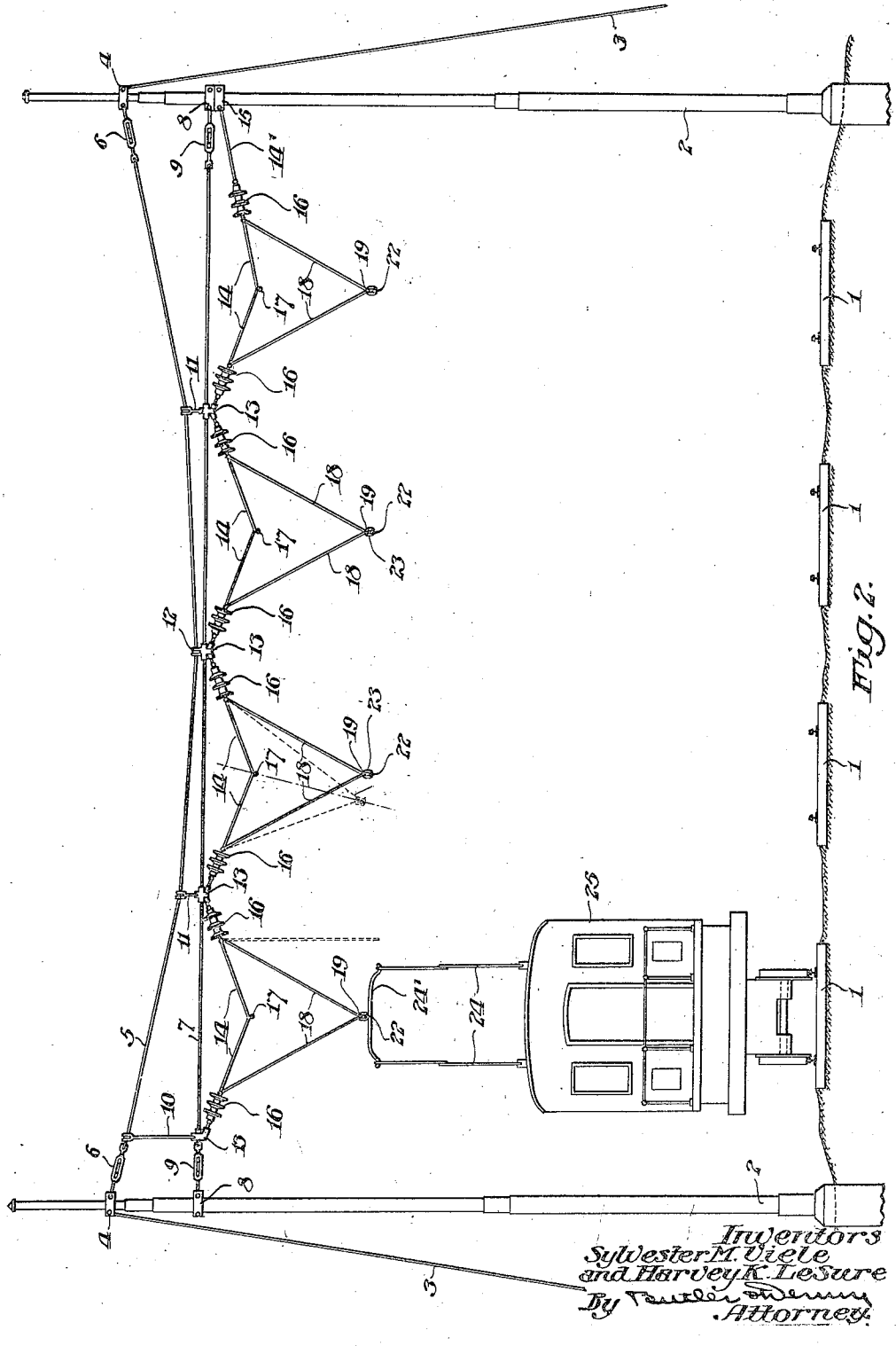


Fig. 2.

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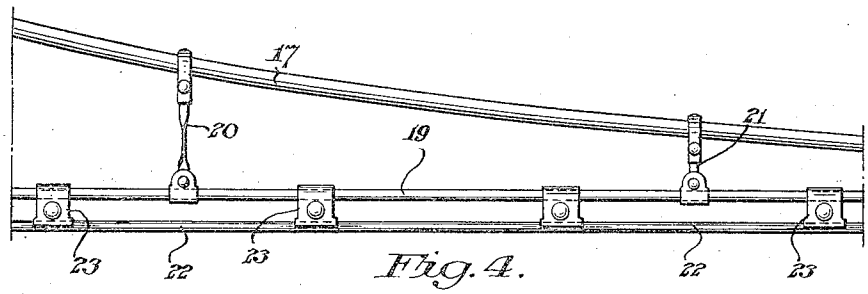


Fig. 4.

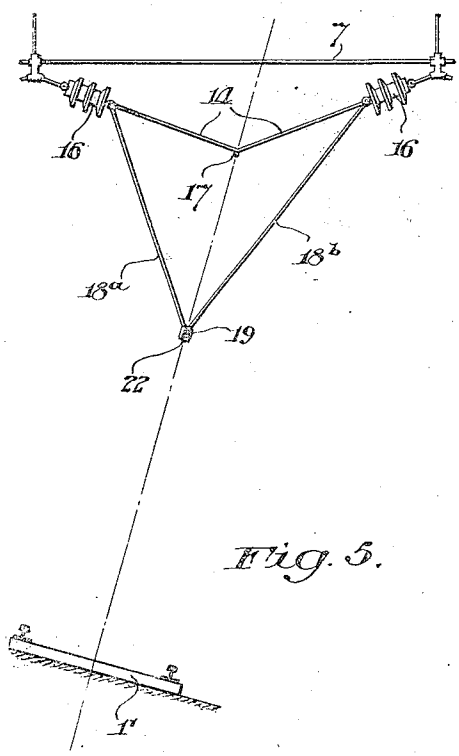


Fig. 5.

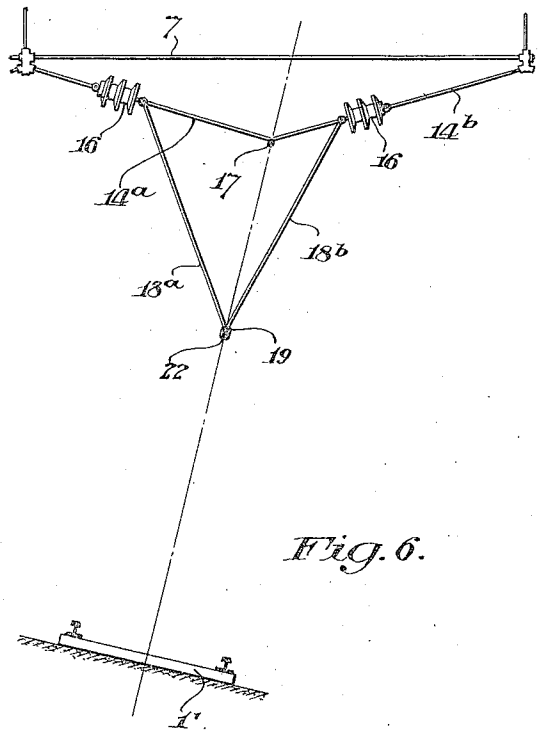


Fig. 6.

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UNITED STATES PATENT OFFICE.

SYLVESTER M. VIELE, OF ALTOONA, AND HARVEY K. LE SURE, OF PHILADELPHIA, PENNSYLVANIA.

MEANS FOR SUSPENDING WIRES, CABLES, AND THE LIKE.

Application filed March 12, 1923. Serial No. 624,460.

To all whom it may concern:

Be it known that we, SYLVESTER M. VIELE and HARVEY K. LE SURE, citizens of the United States, and residents, respectively, of Altoona, Blair County, and Philadelphia, Philadelphia County, both in the State of Pennsylvania, have jointly invented Improved Means for Suspending Wires, Cables, and the like, of which the following is a specification.

Our improved supporting means are designed especially for carrying overhead electric conductors, particularly for supplying electric current to the movable contact mechanisms carried by electric engines and cars, but it will be understood that our improved means are applicable to more general use.

These improvements, in their preferred form as applied to railway electrification, comprise catenary chords or top truss members suspended from supports on opposite sides of a railway track or tracks; body chords or bottom truss members fixed on opposite sides of the track or tracks directly beneath the catenary chords; suspenders depending from fixed connections with the catenary chords along their lengths, at the sides of or between tracks, and fixed to the body chords so as to hold them relatively straight; downwardly converging suspenders or truss members depending from the body chords, by fixed connections joining them therethrough with the suspenders first named, and connected at their lower ends above the respective track sections; a messenger wire or wires depending by fixed connections from the junctions of the lower ends of the inclined suspenders so that the sections between the connections shall hang in catenary curves; downwardly converging suspenders or truss members depending from the respective downwardly converging suspenders first named and connected at their lower ends above the respective track sections; insulators in the converging suspenders first named between their connections with the converging suspenders second named and the body chords; an auxiliary messenger wire or wires fixed to the junctions of the lower ends of the converging suspenders second named; suspenders connecting the messenger wires at intervals along their lengths to support the second named wires substantially parallel to the tracks, and a contact wire or wires connected with and depending from the auxiliary messenger wire or wires so as to provide a uniform degree of stiffness with sufficient flexibility for coating with the movable contacts without usual and undue sparking. It will be understood, however, that this arrangement may be modified within the scope of the claims.

Character desiderata secured by our improvements are the provision of suspending means of requisite rigidity to prevent undue lateral movement under wind pressure and avoidance of entanglement with movable conductors and resulting damage to the mechanisms; the provision of the degree of flexibility in the contact wire that will prevent the sparking due to "hard spots" of former constructions; the avoidance of entanglement with insulators or other parts in case of the rupture of supports for the conductors; and the disposition of insulators in positions removed from the center lines of the tracks so that they shall not be in direct line with and directly affected by exhaust gases from steam locomotives.

In the accompanying drawings, Fig. 1 is a broken isometric view of several tracks together with a form of our improved means for suspending conductors thereover; Fig. 2 is a transverse view on an enlarged scale of the construction illustrated in Fig. 1 with certain modifications; Fig. 3 is an illustration on an enlarged scale of a detail of the construction, showing the connections between the transverse members, Fig. 4 is a fragmentary longitudinal view illustrating the connections between the contact wires, auxiliary messenger wires and main messenger wires, and Figs. 5 and 6 illustrate modifications in a detail of the construction that may be used with track curves.

As illustrated in the drawings, the set of tracks 1 has at the sides thereof the poles 2 which are braced by the guy wires 3, fixed to collars 4 clamped on the tops of the poles. Extending across the tracks between the tops of the poles are cables 5, having the form of catenary curves, which are fixed at their ends to the collars 4 and provided adjacent thereto with the turn buckles 6 for adjustment. Cables 7 extend across the tracks between the tops of the poles, directly below the members 5, and have their ends fixed to collars 8 on the poles, these cables

being provided with turn buckles 9 for adjustment. Suspenders 10, 11 and 12 are fixed at their tops to the members 5 and at their bottoms to the body members 7, respectively at the sides of or between the tracks; the members 7 being thereby held relatively straight or against sagging. The connections 13, for fixing the suspenders 10, 11 and 12 to the members 7, have joined thereto the inclined suspenders or truss members 14 arranged in pairs converging to a connection above the center of the corresponding track or in a position approximating the perpendicular to the track at the center thereof. The end suspender 14′ may, however, be connected at its upper and outer end with a corresponding post as by a collar 15. Insulators 16 are provided in the inclined suspenders 14 and 14′. The transverse supporting spans thus provided have the desired degree of rigidity with parts placed so that any break liable to take place (generally in the members 18 if at all) will permit the broken parts to swing away from the centre of the track.

Messenger wires or cables 17, extending longitudinally of the respective tracks, are fixed to the suspenders 14 at their junctions and hang between the points of connection in catenary curves.

Suspenders or truss members 18 are fixed at their upper ends to the suspenders 14 and 14′ (between the junctions of the latter and the respective insulators 16) and converge downwardly to respective connections above the centres of the several tracks. Auxiliary messenger wires or cables 19 are supported by the suspenders 18, by connections at the junctions thereof, and by the suspenders 20 and 21, which have their upper ends fixed to the main messenger wires or cables 17 and their lower ends fixed to the auxiliary messenger wires or cables 19 at such intervals as to maintain the auxiliary messenger wires substantially straight or parallel with the centres of the respective tracks.

Contact wires 22 are carried by the auxiliary messenger wires 19 through the uniformly spaced connections 23 which are removed from the suspenders 20 and 21, so that there is provided the desired degree of rigidity against vertical movement in the longitudinal supporting members together with the limited and uniform flexibility necessary to a uniform wave motion in the contact wire under the vertical pressure imposed thereon by the shoes 24′ of the pantographs 24 carried along the wires by cars 25 as they travel over the tracks 1.

The construction may be variously modified. For instance, upon curves inclined suspenders 18ª and 18ᵇ of different lengths may be used, instead of the members 18 of like length, so that the perpendicular from the middle of the inclined line connecting the rails of the inclined track 1′ will coincide approximately with the wires or cables 17, 19 and 22, as illustrated in Fig. 5, and suspenders as 18ª and 18ᵇ may be connected with suspenders 14ª and 14ᵇ at different distances from the junctures of the latter, so that the perpendicular from the middle of the inclined line connecting the rails of the inclined track will coincide approximately with the wires or cables 17, 19 and 22, as illustrated in Fig. 6.

It will be understood that varying conditions will call for adjustments within the province of the designing engineer and within the principles of our invention as covered by the following claims.

Having described our invention, we claim:—

1. The supporting means comprising a catenary member, suspenders depending from said member, a body member supported by said suspenders, and oppositely inclined suspenders fixed to said body members and converging to a connection.

2. The supporting means comprising a catenary member, suspenders depending therefrom, a body member supported by said suspenders, inclined suspenders fixed to said body member and converging to a connection, and inclined suspenders fixed to said inclined suspenders first named and converging to a connection beneath said connection first named.

3. The supporting means comprising a catenary member, suspenders depending therefrom, a body member supported by said suspenders, and inclined suspenders containing insulators fixed to said body member and converging to a connection.

4. The supporting means comprising a catenary member, suspenders depending therefrom, a body member supported by said suspenders, inclined suspenders containing insulators fixed to said body member and converging to a connection, and inclined suspenders fixed to said suspenders first named between said insulators and said connection and converging to a connection.

5. The supporting means comprising inclined suspenders converging downwardly to a connection, inclined suspenders supported by said suspenders first named and converging downwardly to a connection beneath said connection first named, and insulators for said connections.

6. The supporting means comprising a plurality of body members, inclined suspenders containing insulators supported by each of said body members and converging downwardly to a connection, and a conductor carried by said suspenders through connections aforesaid.

7. The supporting means comprising a plurality of body members, inclined suspenders containing insulators fixed to each

of said body members and converging downwardly to a connection, a conductor carried by said connections, suspenders depending from said conductor, inclined suspenders fixed to said suspenders first named between their connections and said insulators and converging to connections below said connections first named and a conductor supported by said connections second named and said suspenders depending from said conductor first named.

8. The overhead supporting and electrifying means comprising a span having a top catenary member, suspenders depending from said member, a body member carried by said suspenders, members converging downwardly from said body member to a connection insulators electrically separating said connection from said body member, and a conductor supported by the specified structure through said connection.

9. The overhead supporting and electrifying means comprising a plurality of spans, each having a top catenary member, suspenders depending from said member, a body member carried by said suspenders, members provided with insulators and converging from said body member to connections above respective tracks, and a conductor extending transversely to said spans and supported by said converging members through said connections.

10. The overhead supporting and electrifying means comprising a plurality of spans each having a top catenary member, suspenders depending from said member, a body member carried by said suspenders, members fixed to said body member and converging to connections, members fixed to said converging members and converging to connections, means for insulating said converging members from said body member, a cable disposed transversely to said spans and fixed to the connections first named, suspenders depending from said cable, a cable carried by said suspenders and said connections second named, and a conductor connected with said cable last named so that a wave motion can be imparted thereto by upward pressure moving along it.

11. The supporting and electrifying means comprising a supporting device, converging downwardly inclined hangers depending therefrom, a wire or cable depending from said hangers, a conducting wire or cable, and connectors by which said conducting wire or cable is suspended from the wire or cable first named, said connectors spaced relatively to each other and said hangers to permit a continuous wave motion in said conducting wire or cable under pressure of a traveling contact member.

12. In apparatus of the character described, the combination of a support, converging hangers depending therefrom, a cable connected with said hangers, converging hangers depending from the hangers first named, a conductor connected with said hangers second named, connectors joining said cable and conductor at points spaced from said hangers, a contact wire, and connectors joining said wire and conductor at points between the points of connection of said conductor with said second named hangers and first named connectors so as to permit a continuous wave motion in said wire under the action of a moving contact member thereon.

In testimony whereof we have hereunto set our hands this 24th day of February, 1923.

SYLVESTER M. VIELE.
HARVEY K. LE SURE.