

No. 791,013.

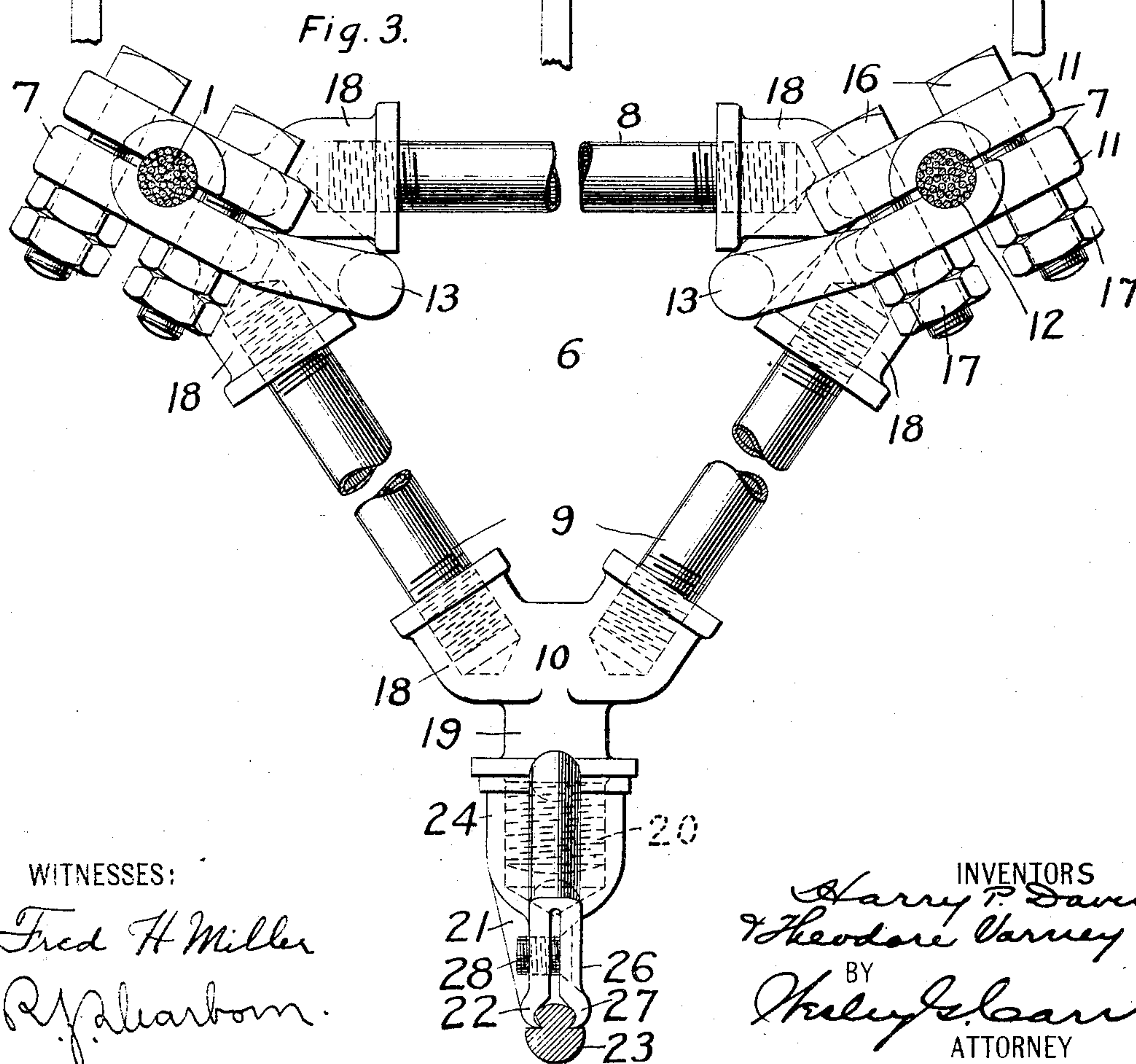
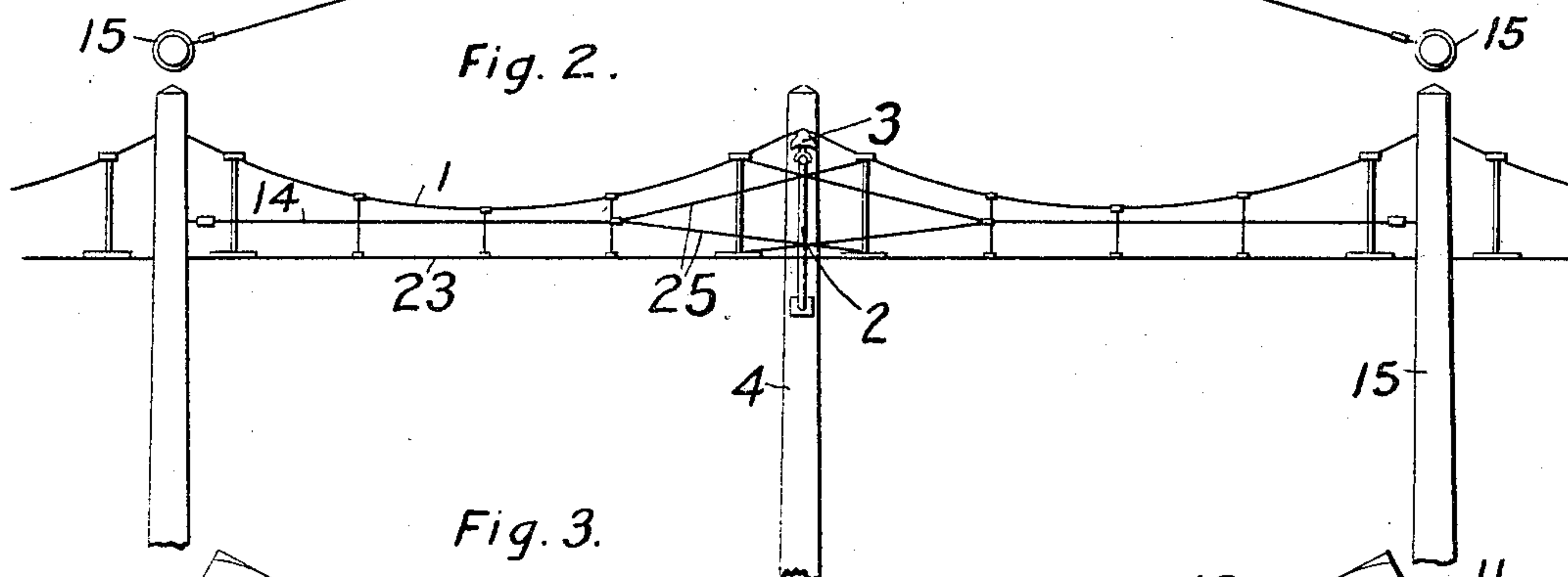
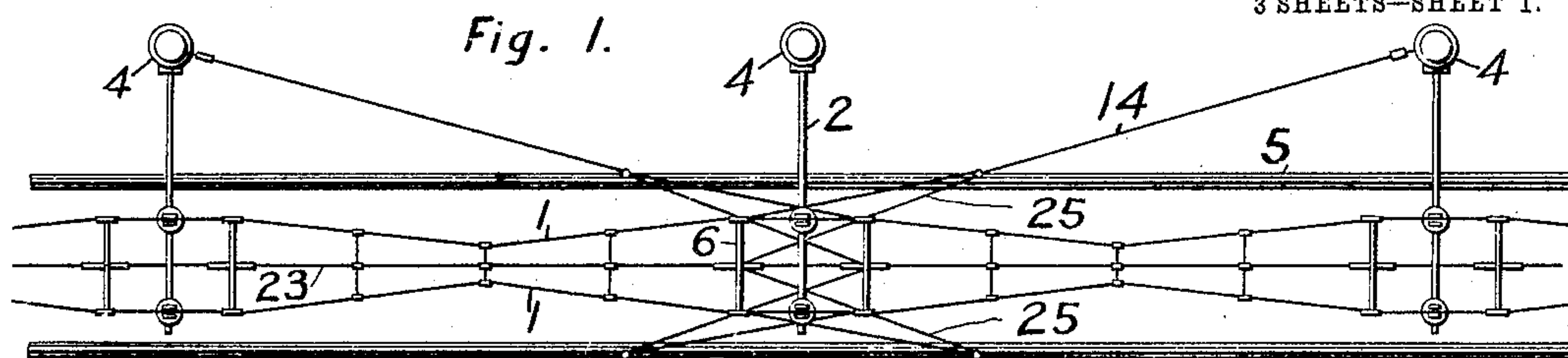
PATENTED MAY 30, 1905.

H. P. DAVIS & T. VARNEY.

SUPPORTING AND STRAIN DEVICE FOR ELECTRIC RAILWAYS.

APPLICATION FILED JAN. 23, 1905.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 4.

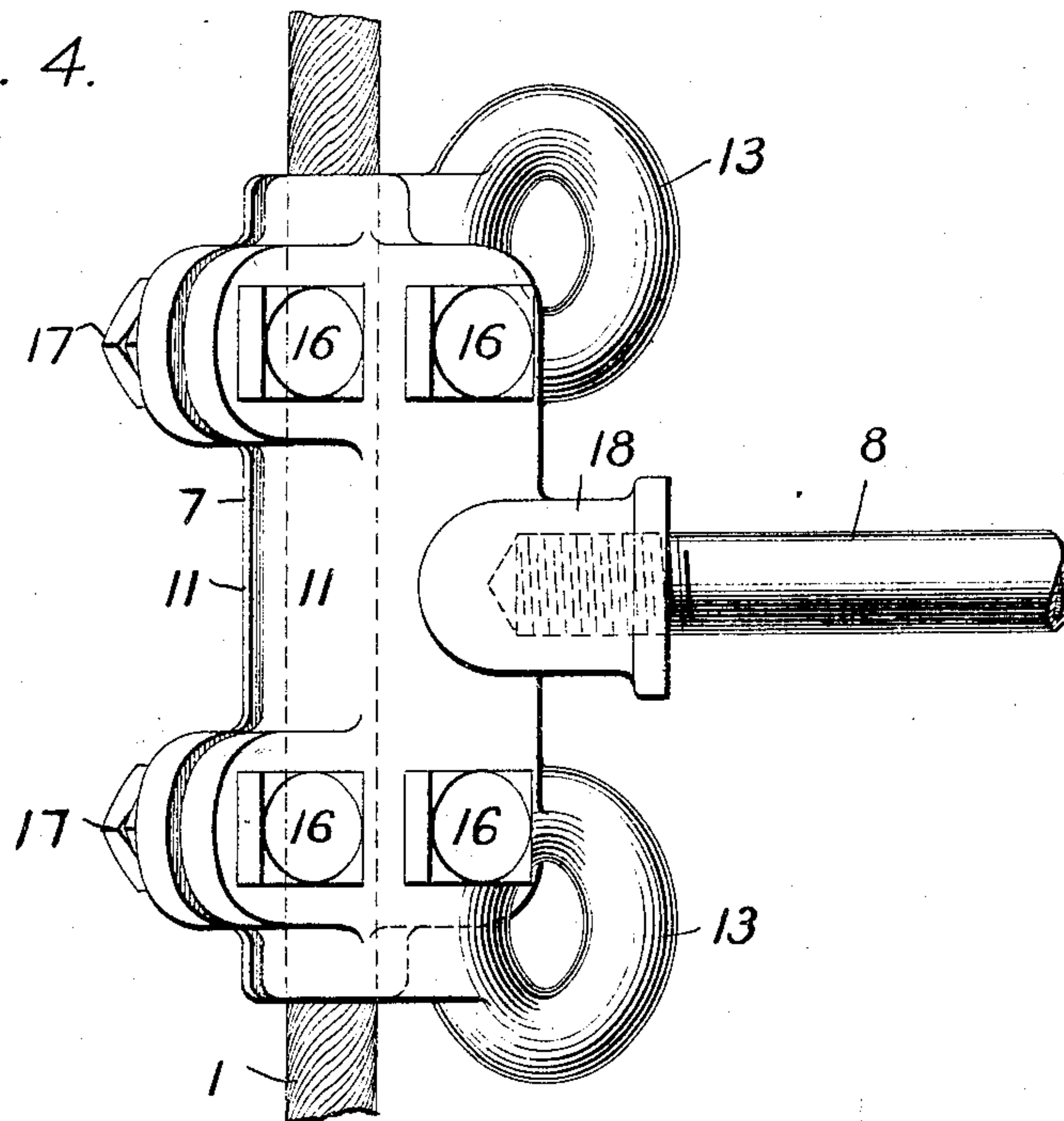


Fig. 5.

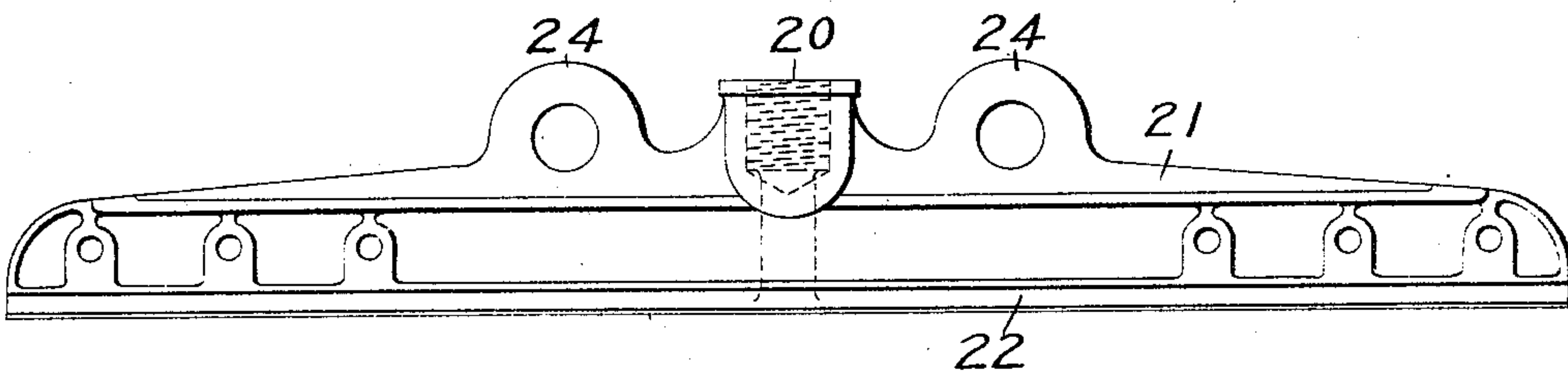
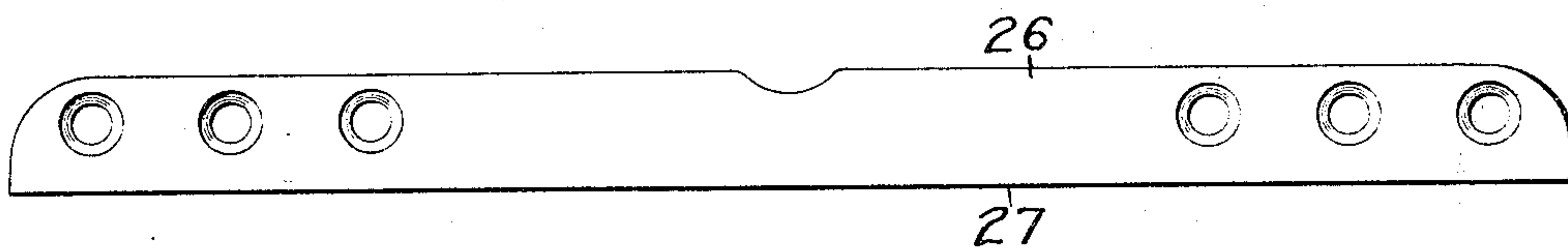


Fig. 6.



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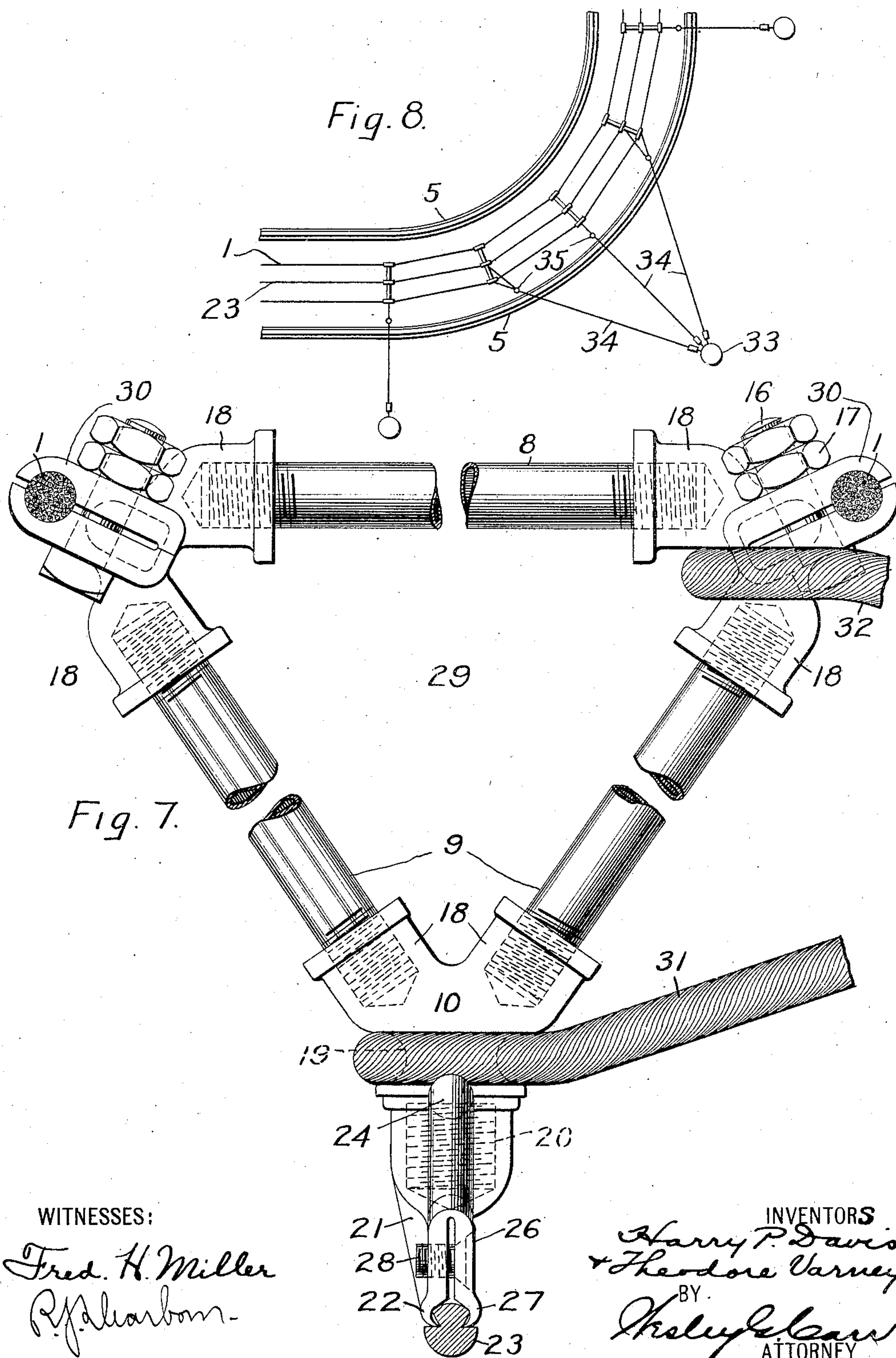
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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SUPPORTING AND STRAIN DEVICE FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 791,013, dated May 30, 1905.

Application filed January 23, 1905. Serial No. 242,336.

To all whom it may concern:

Be it known that we, HARRY P. DAVIS and THEODORE VARNEY, citizens of the United States, and residents of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Supporting and Strain Devices for Electric Railways, of which the following is a specification.

Our invention relates to electric railways, and particularly to means for supporting the trolley-conductors with which railways intended for the operation of cars and trains at high speeds are equipped.

The object of our invention is to provide a serviceable strain and pull-off apparatus for use in erecting and supporting overhead conductors for electric railways that shall be as simple and inexpensive as proper stability and durability may permit.

In the accompanying drawings, Figures 1 and 2 are respectively a plan view and a side elevation of a section of overhead-trolley-line structure embodying our invention. Fig. 3 is an end elevation of one of the trolley-conductor hangers, parts being broken out to reduce the size of the illustration. Fig. 4 is a plan view of a portion of the hanger device shown in Fig. 3. Figs. 5 and 6 are side-elevation views of the two members of the trolley-conductor clamp. Fig. 7 is a view corresponding to Fig. 3 of a slightly-modified device for use in connection with curve pull-offs. Fig. 8 is a diagrammatic plan view of a curved section of road equipped with our invention.

A desirable means for supporting an overhead structure of an electric road intended for high-speed operation comprises a messenger wire or cable, which hangs in catenary curves between poles located at suitable intervals along the roadway, and substantially vertical hangers of different lengths, according to their positions, distributed along the catenary curves of the messenger-cable, which are clamped at their upper ends to the cable and at their lower ends to the trolley-conductor, the forms of the hangers and their locations being such that the trolley-conductor shall be

securely supported at an approximately uniform distance above the track-rails.

On account of the high speeds which are attained by vehicles and trains on roads of the character indicated and the comparatively long spans between the supporting-poles it will generally be found desirable to utilize strain wires or cables in erecting the structure, which may subsequently serve as an effective steadying means. We have also found that in some cases a single messenger wire or cable does not afford a sufficiently strong and rigid supporting means for the trolley-conductor and that when a single cable is employed special steadying devices for the trolley-conductor, which connect the conductor with each pole or bracket-arm, are generally found necessary or extremely desirable in order to prevent lateral vibration or displacement by the action of the wind or other agency, and we have therefore devised the means herein set forth, which embodies two side-by-side messenger-cables and suspension devices which connect these cables together and to the trolley-conductor in such manner as to guard against lateral vibration or displacement of the trolley-conductor without the employment of additional steadying means and also insure a permanent structure which is capable of withstanding all strains and weather conditions to which it may be subjected in any locality.

Referring first to Figs. 1 to 6 of the drawings, the messenger-cables 1 are supported side by side by bracket-arms 2, having suitable insulators 3 and projecting laterally from poles 4, located at proper intervals along one side of a roadway that is here represented by two track-rails 5. At each side of each of the supporting bracket-arms 2 a hanger 6 is provided, which comprises two clamps 7 for the messenger-wires 1, a connecting-rod 8 between the two clamps, and similar connecting-rods 9 between the clamps, and a head or block 10, which supports the trolley-conductor clamps, to be hereinafter described, the hanger device formed by these parts being substantially triangular in shape and of rigid and durable

construction. Each clamp 7 comprises two blocks or plates 11, which may be duplicate castings and each of which has a semicircular recess 12 to receive the messenger-cable 1 and also has at one corner a ring 13 to receive a strain wire or cable 14, which branches and is connected to either the supporting-pole 4 or a corresponding pole 15 at the opposite side of the track. The two blocks 11 are clamped together and to the messenger-cable by means of bolts 16 and nuts 17, and each is provided with a socket-piece 18, having an internal screw-thread to receive the screw-threaded end of either the connecting-rod 8 or one of the connecting-rods 9, these rods 8 and 9 being here shown as cylindrical tubes, though they may be made of any desired form in cross-section and either hollow or solid. The head 10 is also of triangular form and is provided with two socket projections 18, having internal screw-threads which receive the corresponding screw-threaded ends of the connecting-rods 9. The downwardly-projecting portion 19 of the head 10 is screw-threaded to engage with a corresponding screw-threaded socket 20 in one member 21 of the trolley-conductor clamp, this member 21 having a hook or claw shaped lower edge 22 to engage a corresponding groove in one side of the trolley-conductor 23 and having at each side of the socket projection 20 an ear 24, from which connection is made to the strain wires or cables 14 by means of wires or cables 25. The other member 26 of the trolley-conductor clamp is also provided with a lower hook or claw-shaped edge 27 to engage the corresponding groove in the side of the trolley-conductor 23, the two members of the trolley-clamp being fastened together by screws 28 or other suitable fastening devices.

It is obvious that all of the rings 13 with which the clamps 7 are provided are not necessarily and, in fact, not generally utilized for connection with strain-cables; but by making the parts 11 all alike these devices are available for strain-cables branching in either direction and also in both directions, if desired.

It will be understood that each hanger 6 may be located substantially midway of a span or at any other suitable point instead of at the point specifically indicated in the drawings.

The use of two messenger-cables and triangular hangers for the support of a trolley-conductor therefrom in connection with sections of a road having curves of small radii makes it advisable to slightly modify the construction, and such modification we have illustrated in Figs. 7 and 8. The hanger 29, as shown in Fig. 7, has the same constituent parts as the hanger 6, (shown in Fig. 3,) and except as hereinafter specifically pointed out the said parts are designated by the same reference-numerals as those employed in Fig. 3, and hence the description heretofore given may be read in connection with what is shown in

Fig. 7. The clamps 30 for clamping the hanger 29 to the messenger-wires 1 are similar to the clamps 7 of the hanger 6 of Fig. 3, but are shown as severally provided with a smaller number of clamping-bolts 16, and the members of the clamp are unprovided with rings or eyes corresponding to the rings or eyes 13 of the clamp 7. One end of a pull-off cable 31 is fastened to the portion 19 of the triangular member 10 of the hanger, and another cable 32 is similarly fastened to one of the clamps which connect the rods 8 and 9 together and to the corresponding messenger-cable. The two cables 31 and 32 may be connected together at any suitable point and be connected to a pole 33 at the side of the track by means of a third cable 34 of proper dimensions. The two cable portions 31 and 32 may be fastened to the other portions by any suitable means, a ring 35 being indicated in Fig. 8 as utilized for this purpose.

The specific number and arrangement of pull-off cables or cable-sections will of course be varied in accordance with the service to which they are to be applied, and what we have shown is therefore to be understood as merely indicative of a suitable arrangement of such devices. The details of construction may also be otherwise varied from what is shown without departing from our invention.

We claim as our invention—

1. The combination with two side-by-side messenger wires or cables and a trolley-conductor, of a triangular hanger having a clamp for each messenger-wire and for the trolley-conductor, and strain-wires branching from one of the messenger-wire clamps.

2. The combination with two side-by-side messenger-wires and a trolley-conductor, of a triangular hanger having clamps at its respective corners for the messenger-wires and the trolley-conductor, each of the messenger-wire clamps having a ring or rings for the attachment of strain-wires.

3. In an overhead structure for electric railways, two side-by-side messenger-wires, supporting means therefor, a trolley-conductor, and triangular hangers for supporting the trolley-conductor from the messenger-wire, each of which comprises a two-part clamp for each messenger-wire provided with rings or eyes for strain-wires.

4. The combination with two side-by-side messenger-wires and a trolley-conductor, of a triangular hanger having clamps for the messenger-wires each comprising two blocks or members having rings or eyes for the reception of strain-wires.

5. A strain-clamp comprising two complementary parts each of which has a longitudinal recess in one face, an eye or ring at one corner and a socket-piece at approximately the middle of one of its edges.

6. A hanger for trolley-conductors comprising a triangular head having a clamp for

the trolley-conductor, two pairs of clamping-blocks, and rods connecting said head and said clamping-blocks, said blocks having means for attaching them to messenger-wires 5 and having eyes or rings for the attachment of strain-wires.

10 7. The combination with two side-by-side messenger-wires and a trolley-conductor, of a triangular hanger having clamps at its apices for the trolley-conductor and messenger-wires, and means for connecting said hangers to supporting poles or structures.

8. The combination with side-by-side messenger-wires and a trolley-conductor, of a

triangular hanger having means for clamping 15 its respective apices to the messenger-wires and to the trolley-conductor, and pull-off or strain wires or cables leading therefrom to poles at the side or sides of the track.

In testimony whereof we have hereunto subscribed our names this 20th day of January, 20 1905.

HARRY P. DAVIS.
THEODORE VARNEY.

Witnesses:

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