1,166,912.

W. H. KEMPTON.

TROLLEY WIRE APPARATUS.

APPLICATION FILED APR. 8, 1912.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

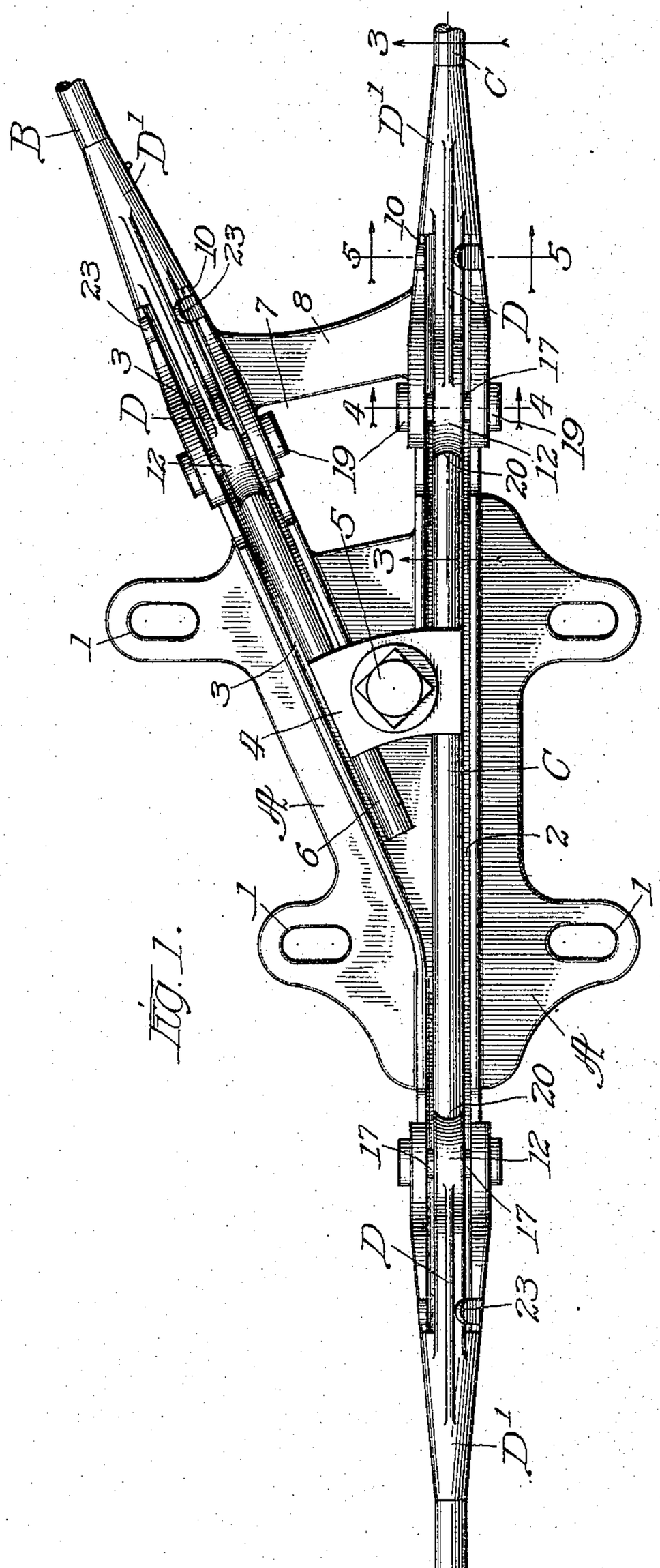

Fig. 1.

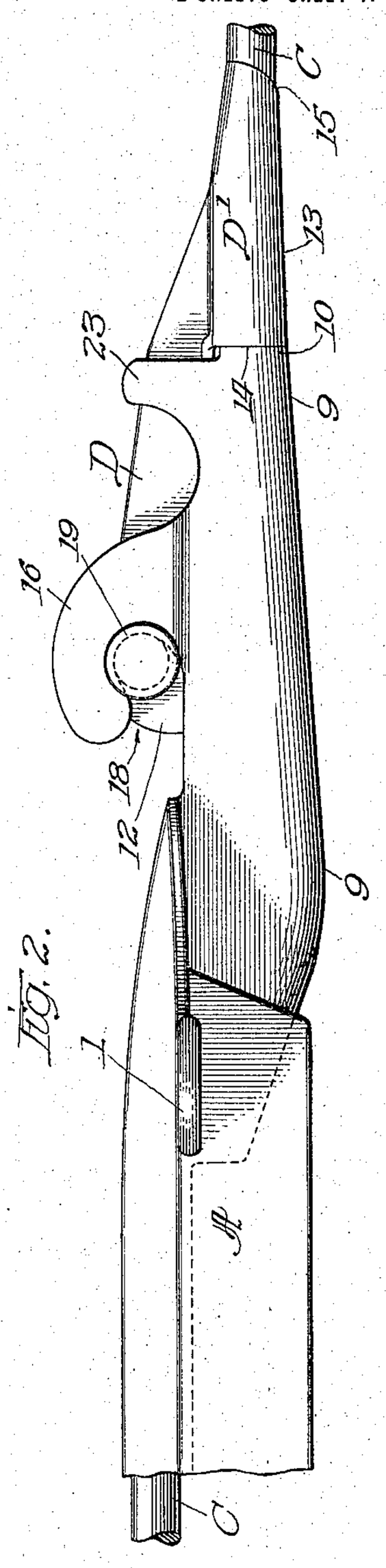

Fig. 2.

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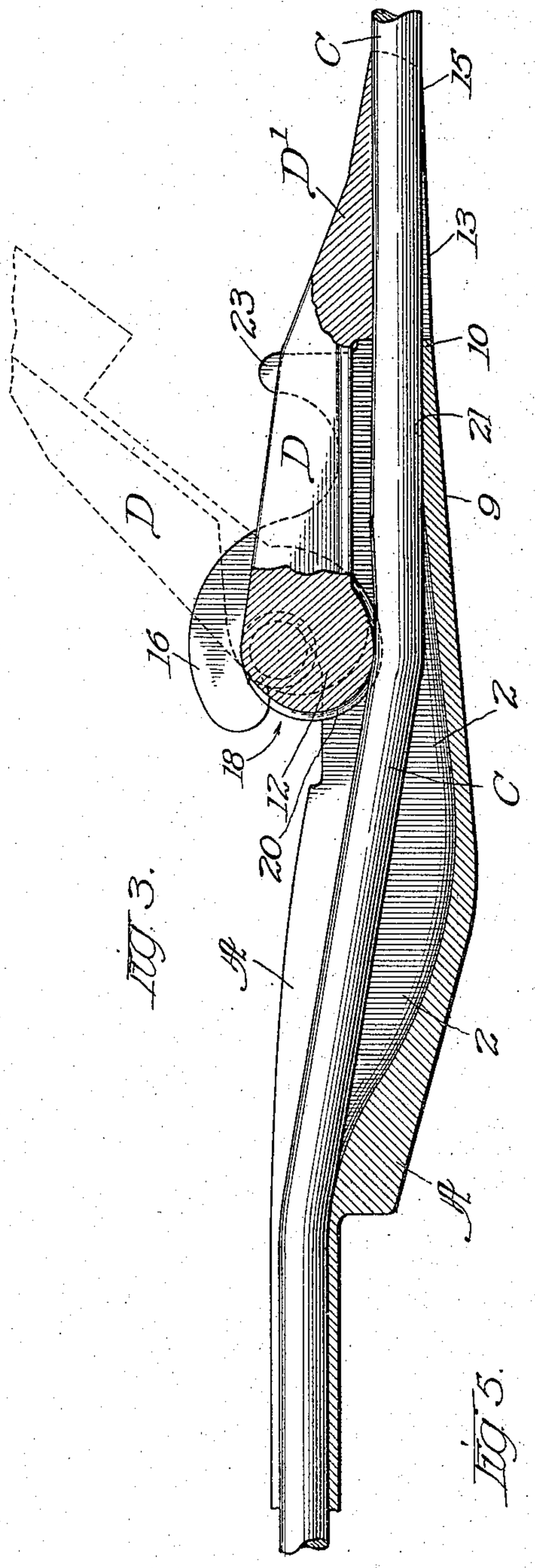

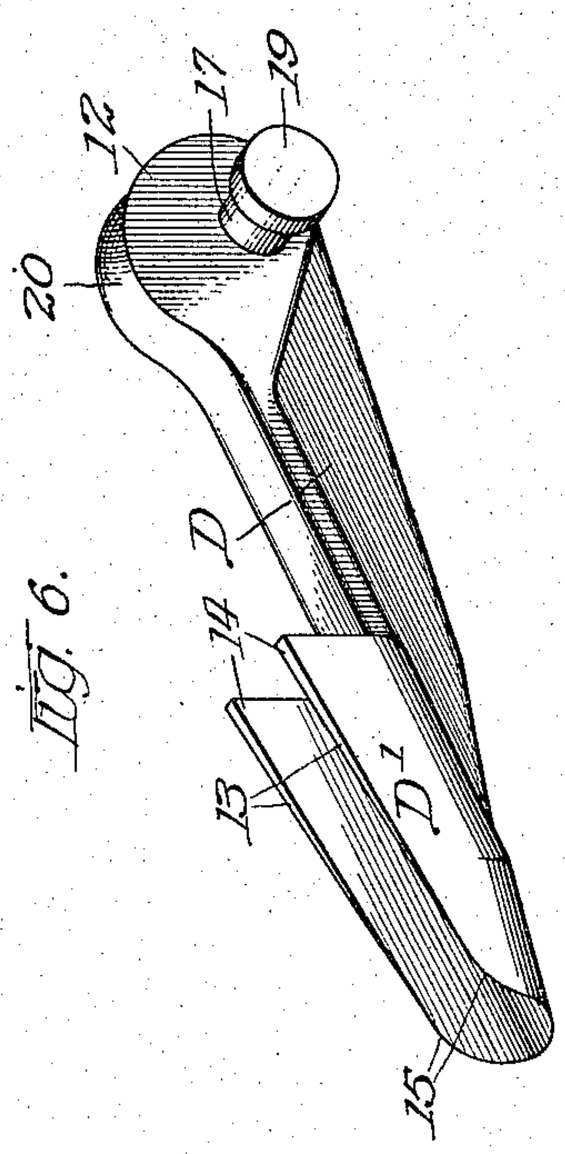

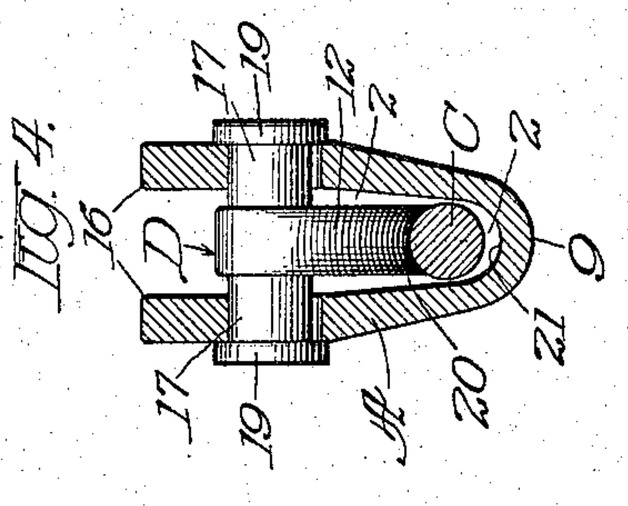

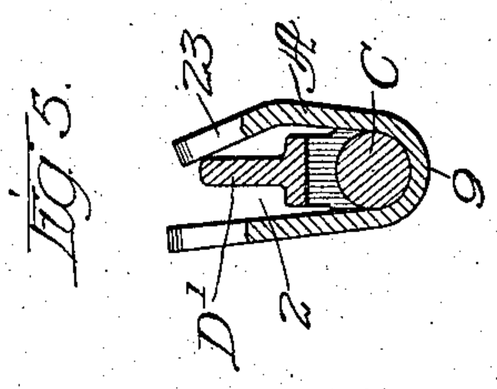

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UNITED STATES PATENT OFFICE.

WILLARD H. KEMPTON, OF MANSFIELD, OHIO, ASSIGNOR TO THE OHIO BRASS COMPANY, OF MANSFIELD, OHIO, A CORPORATION OF NEW JERSEY.

TROLLEY-WIRE APPARATUS.

1,166,912. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed April 8, 1912. Serial No. 689,219.

To all whom it may concern:

Be it known that I, WILLARD H. KEMPTON, 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 Trolley-Wire Apparatus, of which the following is a specification.

My invention relates to trolley wire apparatus and has more particular reference to improvements in apparatus of the class known as frogs, crossings and the like.

One of the objects of my invention is to provide an improved device of this character which will be simple and durable in construction and effective and efficient in operation.

A further object of my invention is to provide an improved trolley wire frog or like device, the parts of which are interrelated and arranged in such manner that they may be manufactured as castings ready for assemblage and installation without any preliminary or preparatory expensive machine work and without the need of bolts, nuts and other separate fastening devices for holding the parts in their assembled relations.

To the attainment of these ends and the accomplishment of other new and useful objects hereinafter appearing, my invention consists in the features of novelty disclosed in the construction, combination and arrangement of parts herein dscribed and claimed, and shown in the accompanying drawings, which illustrate one embodiment of my invention and wherein;

Figure 1 is a top plan view of a so-called trolley-wire frog embodying my invention. Fig. 2 is an enlarged view in side elevation of the end portion of the frog shown in Fig. 1. Fig. 3 is a longitudinal sectional view on the line 3—3 of Fig. 1. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1. Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 1. Fig. 6 is a perspective view of the removable tip and clamping member hereinafter more fully explained.

The device shown in the drawings and illustrating one embodiment of my invention is a so-called trolley frog used in overhead trolley construction for taking off a branch trolley wire from the main trolley wire, and, while I will describe my invention in connection with this frog, it will be obvious to one skilled in the art after having obtained an understanding of my invention from the disclosures herein made, that my invention is not limited or restricted to the particular structure shown but on the contrary is applicable to other types of trolley wire apparatus, such as crossings, strain plates and the like, wherein analogous requirements are to be met.

Referring now to the drawings, it will be seen that this frog has a peculiarly formed body member A adapted to be positioned at the juncture of a branch trolley wire B and the main trolley wire C, and, as is well known, to serve as means for connecting the branch wire to the main trolley wire. It is generally advisable to guy or anchor devices of this character so that the trolley wires will be firmly held against any swinging movement, and for this reason the body member A may be provided with a number of eye-lugs 1 to which the usual guy wires may be conveniently attached. In the structure shown in the drawings the body member has a straight channel or groove 2 running the full length thereof for the reception of the main trolley wire C, and it also has another groove or channel 3 disposed at an angle to the main channel 2 for the branch trolley wire B. Both of these channels are preferably open at their tops or upper sides throughout their entire length so that the body member may be placed in position on the wires from below. In order, however, to clamp or fasten the body member to the trolley wires and prevent any longitudinal movement thereof, I provide a main or central clamping member which may comprise a plate 4 and a heavy clamping bolt 5, the bolt 5 being passed through the plate and screwed into the body member A. If desired, as a further precaution, a "pull-off" may be attached to the end 6 of the branch trolley wire to take up any longitudinal strains thereon. A central opening 7 may be provided in the body member for the purpose of reducing the weight thereof, the bridge portion 8 which is left serving admirably to prevent the trolley wheel from wedging in between the wire channel portions of the body member, in the event that the wheel leaves the trolley wires. The end portions of the main and branch wire chan-

nels are deeper than and drop below the central portion thereof, so as to provide a suitable underrunning portion or surface 9, this surface being rounded off on its underside so as to properly accommodate the trolley wheel (see Figs. 2, 4 and 5.) It will be observed that in a device of this character, it is desirable that the end portions of the body member where the trolley wires enter or leave their channels, be maintained firmly in contact with the trolley wires, so that there will be no bumps or raised portions in the continuity of the trolley line, but the walls of the trolley wire channels at the extreme ends 10 thereof, must of necessity be of sufficient thickness to withstand the blows to which they are subjected by the trolley wheel.

I provide simple and durable mechanism which not only relieves the body member or casting of wear but operates to clamp and firmly hold the parts in position on the trolley wire more particularly at the ends thereof. This mechanism may be spoken of as auxiliary clamping mechanism D, and preferably is of the form shown in Fig. 6. It is arranged to operate in conjunction with the body member A and is positioned preferably at the end portions of the trolley wire channels. It will be seen that this member D has a cam shaped portion 12 at one end which sets into the trolley wire channel at a short distance back from the end thereof. At its other end it has a portion D^1 which is formed to embrace the trolley wire immediately adjacent the end of the body member. These parts, as is obvious, may be integrally formed as a single casting. The portion D^1 constitutes a tip or wear extension which takes up the wear due to the action of the trolley wheel and thereby preserves the body member. The members D are relatively small in comparison with the body member and can be manufactured very cheaply, hence they may be renewed at comparatively little expense. The lips 13 are preferably arranged so that they may be formed around or otherwise attached directly to the trolley wire, and if desired solder may be used in addition. The inner ends 14 of the lips are substantially as thick as the wall of the wire channel in the body member at the end 10 thereof, so that when the lips 13 are bent around the trolley wire, they will lie flush with the underrunning surface 9. The lips 13, as is seen, are gradually thinned or tapered toward their outer ends 15, so that they practically merge into the surface of the trolley wire, and in this way form an "easy approach" for the trolley wheel.

On account of the fact that the channels of the body member must be open throughout their length at the top so as to permit the trolley wires to be laid therein or removed therefrom, the members D are made demountable or removable. This may be done by the use of pivot bolts or otherwise, but as previously stated, one of the objects of my invention is to avoid machine work, and for this reason I extend the walls of the wire channels upwardly so as to form undercut lugs or hooks 16 (Figs. 1, 2, 3 and 4) which as is seen are spaced apart and do not obstruct the entrance to the channels. The cam ends of the members D have laterally projecting pivot-studs 17 eccentrically positioned thereon. These studs are adapted to be passed through or into the slots 18 formed by the undercut lugs 16 and seated in pivotal engagement with said lugs. Thus the members D may be quickly and conveniently placed in position or removed therefrom without the need of handling bolts, nuts and the like.

The pivot studs have end collars 19 which lie outside of the lugs 16 and prevent the lugs from bending outwardly when subjected to the clamping strains. That portion 20 of the periphery of the cam 12 which engages the trolley wires is grooved to prevent relative lateral displacement of the member D and the wire. It will thus be seen that the members D in conjunction with the body member form rotary wedges or clamps which firmly clamp the trolley wires against the bottom walls 21 of their channels, more particularly at the extreme ends thereof, as is shown in Fig. 3. The clamping member is so proportioned that the wire will always be bent slightly downward below its level at the end of the channel or groove and thus insure a firm bearing against the bottom of the groove where it leaves the body casting. The wire does not bear on the bottom of the groove at a point immediately under the cam pivot and thus provision is made for variations in the cast parts. The body member may be placed in position from below the wires, as previously mentioned, and the clamping members may then be placed in pivotal engagement with the lugs 16 while they are at about the angle shown in the dotted lines in Fig. 3. By rotating the members D the cam ends thereof clamp the trolley wires firmly in their channels. The rotation of the members D in this manner brings the wear portions D down into position on the trolley wires adjacent the ends of the body member. The lips 13 may then be formed around the wire and soldered, if desired, thus directly locking the rotary clamps to the trolley wires. As a further precaution, the walls of the wire channel adjacent the extreme ends thereof may be extended upwardly to form bendable lugs 23, which may be bent over into engagement (Fig. 5) with the members D by the blow of a hammer, thus additionally locking the members D in position.

The advantages of my improved structure are obvious. The body member may be formed as a single casting ready for use without the need of any machine work except the drilling and threading of a hole for the main clamping bolt 5. In like manner the renewable members D may be formed as single castings, requiring no machine work to place them in condition for use. The renewable members D are sufficiently large to enable a man to handle them conveniently without fear of dropping and losing them while he is installing a frog in position, and the facility with which the members D may be attached to or detached from the body member is particularly advantageous from a manufacturing and installing standpoint. Furthermore, the life of the appartus is materially increased since those parts (the wear members) which are subjected to the greatest wear may be readily and cheaply renewed.

I claim:—

1. In a device of the class described, the combination of a body member adapted for attachment to a trolley wire and having a channel therein for the wire, a separate detachable wear extension adapted to be positioned on the trolley wire on the end of the said body member, and a rotary wedge formed on said wear member and pivotally mounted on said body member for clamping the wire in its channel.

2. In a device of the class described, a body member having a wire receiving channel, in combination with a rotary member pivoted on said body member for clamping the wire in its channel, and having an extension projecting beyond the end of said body member and adapted to be secured to the wire after the rotary member has been rotated to its clamping position.

3. In a device of the class described, a body member having an open-top, wire-receiving channel, in combination with a rotary clamp detachably mounted on said body member and adapted to clamp the trolley wire in its channel when rotated to a given position, and an extension on said rotary clamp arranged to be secured to the trolley wire and hold said clamp in its clamping position.

4. In a device of the class described, a body member having an open-top, wire-receiving channel, in combination with a rotary clamp detachably mounted on said body member and adapted to clamp the trolley wire in its channel after being rotated to a given position, and a wear extension member arranged to embrace and to be secured to the trolley wire adjacent the end of said body member for locking said clamping member in its clamping position and for taking up the wear on said device.

5. In a device of the class described, the combination of a body member having a wire-receiving channel, a clamping member eccentrically pivoted on said body member and adapted to be rotated to clamp the wire firmly in said channel, and means carried by said clamping member for direct attachment to the trolley wire to lock said clamping member in its clamping position.

6. In a device of the class described, the combination of a body member having a wire-receiving channel, a clamping member eccentrically pivoted on said body member and adapted to be rotated to clamp the wire firmly in said channel, and an integral extension on said clamping member adapted to be formed around the trolley wire after said clamping member has been rotated to its clamping position.

7. In a device of the class described, the combination with a body member, a rotary clamp mounted on said body having means adapted to be rotated into position with said clamp and then attached directly to the trolley wire to lock said clamp.

8. In a device of the class described, a body member having a relatively deep wire-receiving channel open at its top, a cam member pivoted on said body member and adapted to be rotated to a clamping position, and an integral extension on said cam formed for attachment directly to the trolley wire after said cam has been rotated to its clamping position and constituting an extension of said body member for taking up the wear.

9. In a device of the class described, the combination of a body member adapted to be positioned on the trolley wire and having a continuous channel into which the trolley wire may be placed, a demountable extension adapted to be attached directly to the trolley wire adjacent the end of said body member and having a cam portion pivoted on said body member for clamping the trolley wire in its channel.

10. In a device of the class described, the combination of a body member having an open-top, wire-receiving channel whereby it may be mounted in position on the trolley wire without severing the continuity of the wire, rotary clamps mounted on said body member and positioned adjacent the ends thereof for clamping the trolley wire against the bottom wall of the channel, extension wear members on said clamps adapted, by rotation of the clamps to clamping position, to be alined with the trolley wire and directly attached thereto, whereby to lock said clamps in position and to protect the body member from the wear incident to the travel of the trolley wheel.

11. In a device of the class described, the combination of a body member having an open-top, wire-receiving channel whereby it may be mounted in position on the trolley

wire without severing the continuity of the wire, rotary clamps mounted on said body member and positioned adjacent the ends thereof for clamping the trolley wire against the bottom wall of the channel, extension wear members on said clamps adapted, by rotation of the clamps to clamping position, to be alined with the trolley wire for direct attachment thereto, whereby to lock said clamps in position and to protect the body member from the wear incident to the travel of the trolley wheel, and demountable means intermediate the ends of said body member for clamping said device to the wire.

12. In a device of the class described, a body plate having an open-top channel into which the wire may be laid, a cam member removably pivoted on said body member for clamping the trolley wire in the bottom of its channel, and a locking member carried by said cam and rotatable therewith into direct engagement with the trolley wire whereby it may be attached thereto and lock said cam against rotation.

13. In a device of the class described a body member having a channel for the trolley wire, in combination with undercut lugs on said body member, and a rotary clamp member removably pivoted in said lugs for clamping the trolley wire in its channel, and having an extension member directly attachable to the trolley wire.

14. In a device of the class described, a body member having a channel for the trolley wire open at its top, in combination with upstanding lugs on said body member disposed on each side of said channel and having undercut slots therein, a renewable clamp having a clamping member rotatably pivoted in said slots and having means directly attachable to the trolley wire for locking said clamp and for taking up the wear on said device.

15. In a device of the class described, a body member having a channel for the trolley wire open at its top, in combination with upstanding lugs on said body member disposed on each side of said channel and having undercut slots therein, a renewable clamp having a clamping member rotatably pivoted in said slots, and having a wear extension adapted to be formed around the trolley adjacent the end of body member and preventing said clamp from accidentally unclamping.

16. In a device of the class described, a body member having a channel for the trolley wire open at its top, in combination with upstanding lugs on said body member disposed on each side of said channel and having undercut slots therein, and a cam member having pivot lugs removably mounted in said slots and having an extension adapted to be formed around the wire.

17. A trolley frog or like device of the class described comprising a body member formed as a single casting and having a wire receiving channel open at its upper side, in combination with a cast metal, one-piece clamping member positioned above the wire and having a portion adapted to be bent around the trolley wire, and a cam-shaped portion positioned in said channel, integral upstanding lugs on said body member having open undercut slots, and integral pivot studs on said cam removably seated in said slots.

18. In a device of the class described, a body member having a wire-receiving channel upon the end portion of the bottom wall of which the trolley wire rests, said bottom wall having a depressed portion removed from the end of the channel, in combination with a rotary clamp removably mounted on said body above said depressed portion and adapted to bear upon and slightly spring the wire into said depressed portion, whereby the wire will be firmly clamped against the end portion of the bottom wall, and a wear extension on said clamp projecting beyond the end of the body and adapted to be directly attached to the trolley wire after the clamp has been rotated to clamping position.

19. The combination of a body plate having an open-top channel into which the wire may be laid, a cam member removably pivoted to said body member for clamping the trolley wire in the bottom of its channel, and a locking member carried by said cam and rotatable therewith into direct engagement with the trolley wire whereby it may be attached thereto and lock said cam against rotation, a removable clamp member on said body member operable in conjunction with said cam member to prevent the relative longitudinal movement of said body plate and trolley wire, and fastenings on said body plate whereto guy wires may be attached.

20. The combination of a body member having a relatively thin, bottom-walled channel open at its top through which the trolley wire passes, and means for clamping said body member in position on the trolley wire, comprising rotary cams detachably mounted adjacent the side of said channel and adapted to press the wire in firm contact with the bottom wall of the channel whereby said bottom wall will form practically a continuation of the trolley wire, and means attachable to the trolley wire adjacent the ends of said channel for locking said cams in their clamping position.

21. The combination of a trolley wire-receiving member, a removable rotary wedge adapted to clamp the trolley wire in position upon said member, and a bendable member on said receiving member for locking said wedge in position.

22. The combination of a metal casting having upstanding walls forming a wire-re-

ceiving groove therebetween, integral members formed on said walls, a clamping device adapted to be placed in pivotal engagement with said members and rotated to clamp the trolley in said groove, and a bendable lug on said casting for locking the clamping device in clamping position.

23. The combination of a metal casting having upstanding walls forming a wire-receiving groove therebetween, integral slotted members formed upon said walls, a rotary clamping device adapted to be placed in pivotal relation with the slots in said members and rotated to clamp the trolley wire in said groove, and bendable lugs formed on said casting and adapted to be bent into locking engagement with said clamping device.

24. The combination of a metal casting having an open-top wire channel, integral upstanding members formed on said casting on opposite sides of said channel and spaced apart so as not to interfere with the removal or replacement of the trolley wire, said members being undercut, a wire-clamping rotary cam having pivotal studs adapted for detachable engagement with said members, and an integral lug on said casting adapted to be bent into engagement with said cam to lock it in position.

25. The combination with a body member, a rotary clamp mounted on said body having means adapted to be rotated into position with said clamp and then attached directly to the trolley wire, and means integral with said body member for locking said clamp and means in position.

26. The combination with a body member, a rotary clamp mounted on said body having means adapted to be rotated into position with said clamp and then attached directly to the trolley wire, and a lug on said body member adapted to be bent over to lock said clamp and means after they have been rotated into position.

27. The combination of a body member, a pivotally mounted lever having a wire clamping cam adjacent its pivotal point for clamping the wire on the body member and having means adjacent its other end for direct attachment to the trolley wire after the lever has rotated the cam into clamping position, and means integral with said body member for locking said lever in the position to which it has been rotated.

28. The combination of a body member, a pivotally mounted lever having a wire clamping cam adjacent its pivotal point for clamping the wire on the body member and having means adjacent its other end for direct attachment to the trolley wire after the lever has rotated the cam into clamping position, and an integral lug on said body member adapted to be bent across the path of movement of said lever to lock it in position.

29. The combination of a body member adapted for attachment to a trolley wire and having a channel therein for the wire, a separate detachable wear extension adapted to be fastened on the trolley wire at the end of said body member, a rotary cam formed on said wear extension and pivotally mounted on said body member for clamping the wire in its channel, and an integral lug on the body member adapted to be bent across the path of movement of said wire extension to retain it in position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 5th day of April, A. D. 1912.

WILLARD H. KEMPTON.

Witnesses:

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J. C. PAINTER.