C. E. GIERDING.

FROG FOR TROLLEY WIRES.

APPLICATION FILED FEB. 26, 1912.

1,166,898.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

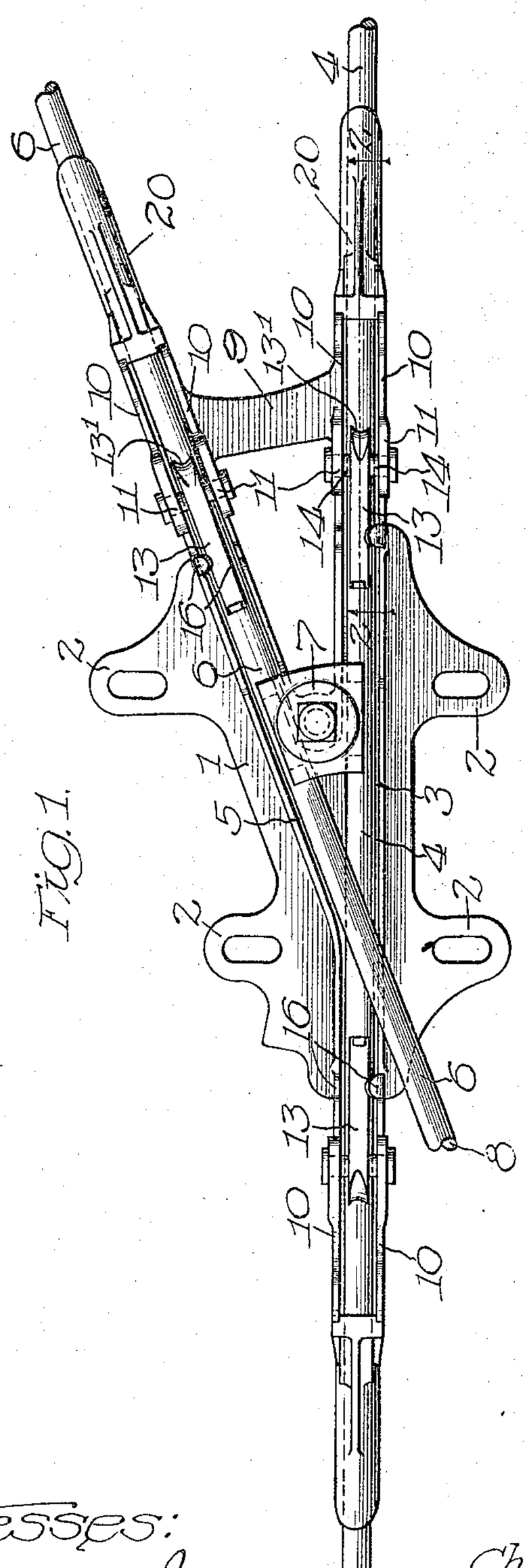

FIG. 1.

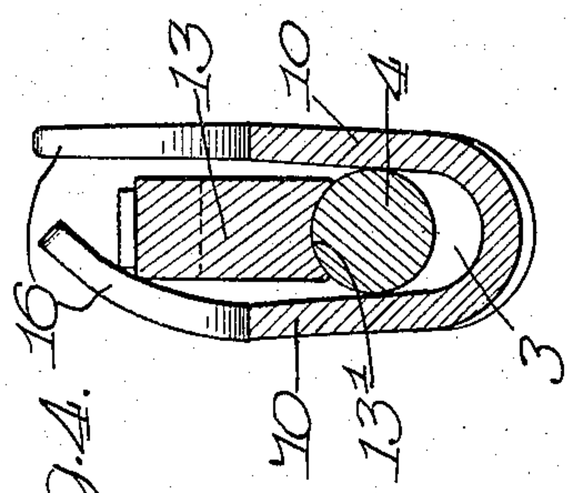

FIG. 4.

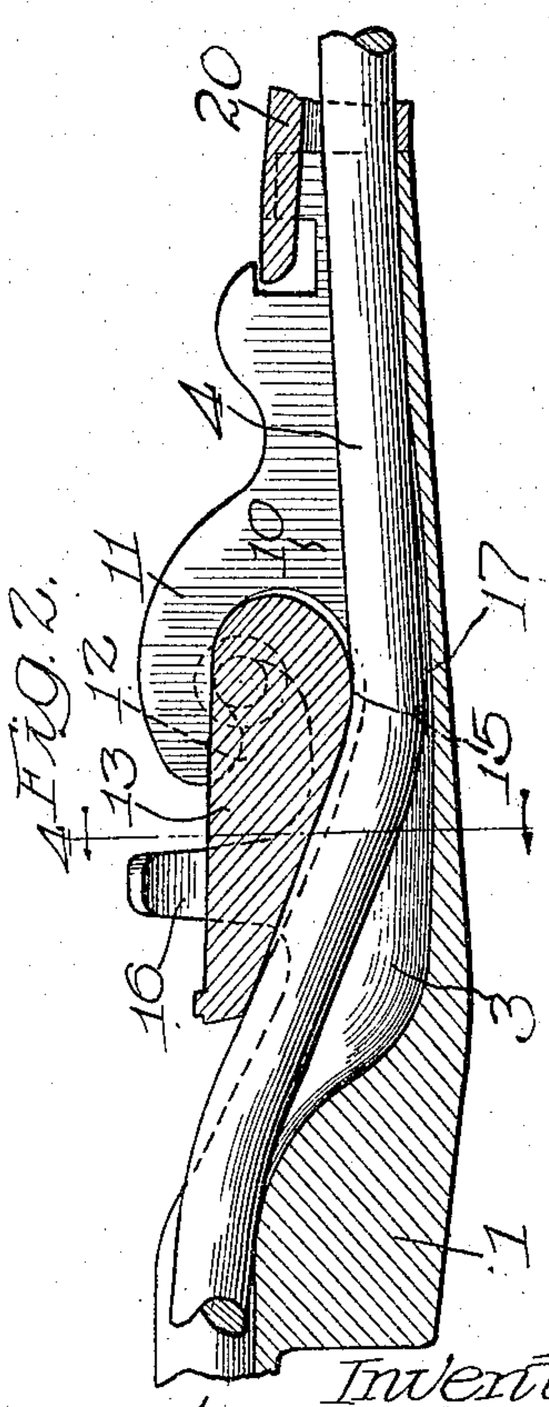

FIG. 2.

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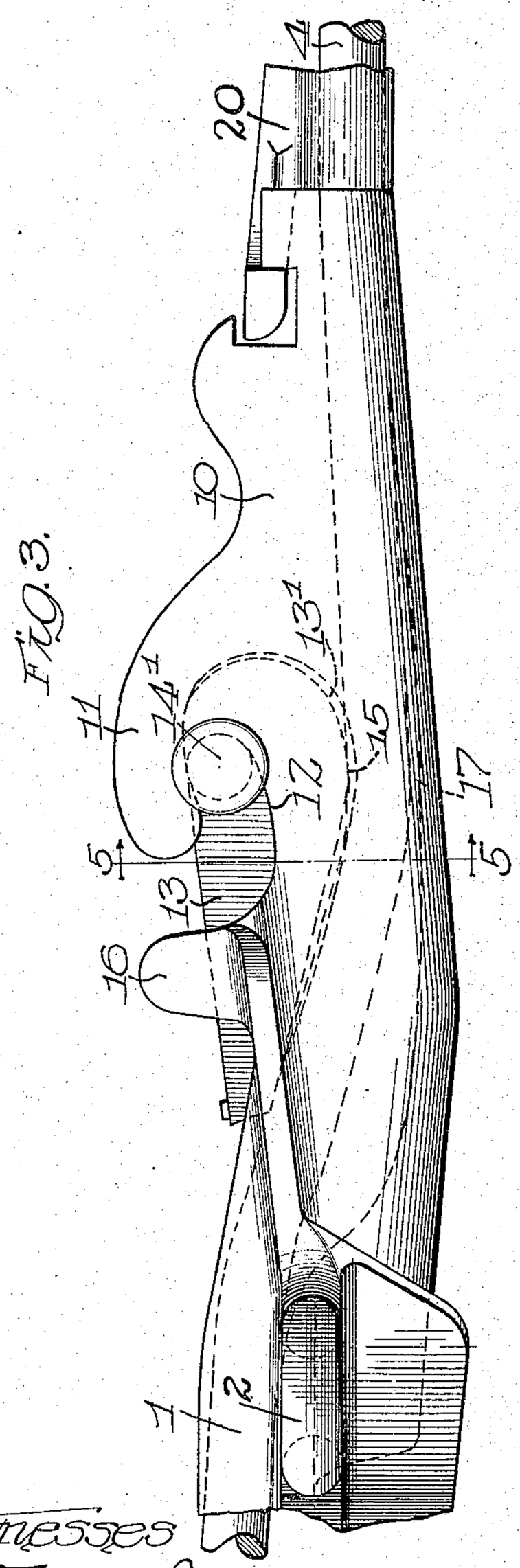

FIG. 3.

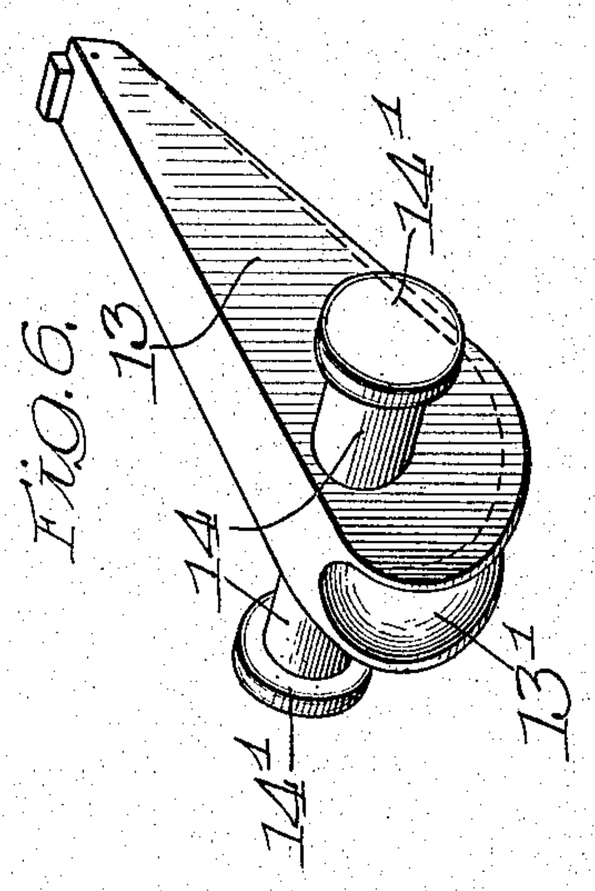

FIG. 6.

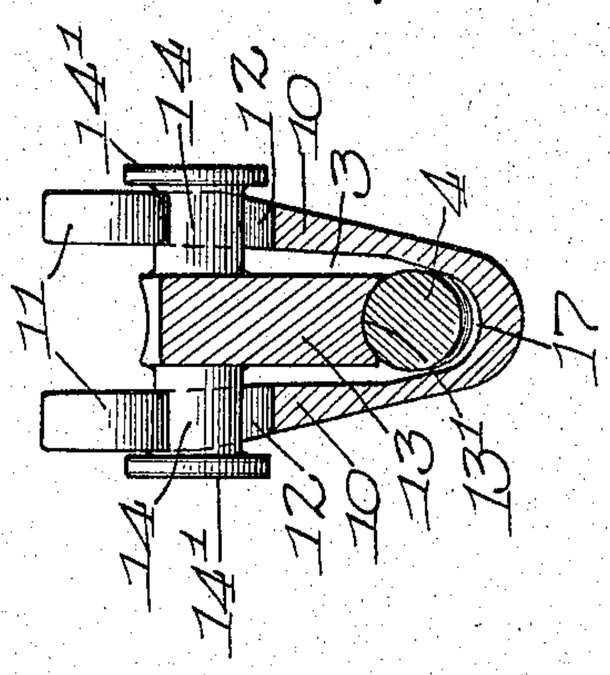

FIG. 5.

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UNITED STATES PATENT OFFICE.

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FROG FOR TROLLEY-WIRES.

1,166,898. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed February 26, 1912. Serial No. 679,827.

To all whom it may concern:

Be it known that I, CHARLES E. GIERDING, 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 Frogs for Trolley-Wires, of which the following is a specification.

My invention relates to overhead line apparatus for electric railways, and has more particular reference to apparatus of the kind generally known as frogs, crossings and the like.

One of the objects of my invention is to provide an improved trolley frog or like apparatus of simple, durable and reliable construction which shall be effective and efficient in operation and capable of being conveniently handled and installed.

Another object of my invention is to provide an improved device of this character embodying few parts, capable of being cheaply formed of cast metal ready for assembling and installation without the aid of expensive machine work.

Another object is to provide an improved trolley wire device embodying means for detachably securing the device in position in relation to the trolley wire.

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

Figure 1 is a top plan view of a trolley frog embodying my invention; Fig. 2 is an enlarged vertical section on line 2—2 of Fig. 1; Fig. 3 is a side elevation of the end portion of the frog, enlarged to better show the parts; Fig. 4 is an enlarged, transverse vertical section on line 4—4 of Fig. 2; Fig. 5 is an enlarged, transverse vertical section on line 5—5 of Fig. 3; and Fig. 6 is a perspective view of the cam wedge.

The drawings illustrate one form of trolley frog wherein I have embodied my invention. This frog is designed for taking off a switch or branch line, and is of the type which has a continuous channel into which the main trolley wire is placed from above. This type of frog is preferably made in the form of a casting 1. It has a number of integral metal loops or eye-lugs 2 cast on its edges for the purpose of attaching strain wires in the usual way. This body casting has a straight channel or groove 3 for the reception of the main trolley wire 4, and a merging, angularly disposed channel 5 of similar character for the reception of the branch trolley wire 6. The central portion of the body casting may, if desired, be left open to lessen the weight of the device. In order to prevent the trolley wheel from wedging in between the portions of the body, a bridge or web member 9 may be formed integrally with the body casting. This will deflect the trolley wheel in case it should leave the wire, and it also serves to render the body casting rigid at this point. The under side of the metal which forms the walls of these channels is smooth and rounded, as clearly shown, in order to provide a smooth underrunning surface for the trolley wheel or contactor carried on the car. The trolley wire channels are open at their tops from end to end, so that the wires may be entered, thus enabling the frog to be placed on the main trolley and a branch taken off at any point without disturbing the continuity of the line. The central portions of the wire channels are elevated above the end portions thereof, and, at about the center of the casting there is provided a heavy clamping device 7, which may be put on after the wires are in their channels, and which clamps the frog and wires at this point firmly together. It is the general practice to relieve this clamping device of the pulling strains of the branch wire by attaching a strain wire (not shown) to the free end 8 of the branch wire. (See Fig. 1.)

In the structure shown the outer portions of the body casting where the trolley wires enter and leave are made substantially U-shaped in cross-section as shown in Figs. 4 and 5, so as to form comparatively deep channels 3 and 5, for the wires. The walls 10 rise considerably above the wires and have integral hook-forming lugs or portions 11, these hooks being preferably formed by casting undercut slots or openings 12 in the walls. The inner ends of these slots form bearings for a removable clamp member 13, which for convenience in manufacture is preferably

of the form shown in the drawings, that is, rounded on one end and tapering to a smaller size at the other end. This device is adapted to be placed between the walls 10 and rotated to firmly clamp the trolley wire against the bottom of its channel. It has pivot lugs or studs 14 on opposite sides, as clearly shown in Fig. 6, which are hooked under the hook-lugs 11 when the cam-wedge is placed in position. These pivot studs are eccentrically positioned so that when the member is rotated it exerts a clamping pressure upon the wire.

In order to prevent the member from slipping laterally off the wire it is provided with a groove 13^1 in that portion of its edge which comes in contact with the wire. The highest portion 15 of the cam is so arranged that when the cam is in its clamping position, this highest portion passes beyond center and the cam locks in position. As a further precaution against the cam being jarred loose an integral lug 16 is provided on the upper edge of each wall. These lugs are bendable and after the cam is in clamping position, one or both of the lugs may be given a blow or two with a hammer to bend them over the cam member, as shown in Fig. 4. The cam, however, may readily be released by bending the lug back to its original position. The outer ends of the pivot lugs 14 are provided with heads or collars 14^1 which prevent the hook-lugs from being spread or forced apart. The bottom walls of the wire receiving channels may be provided with depressions 17 below the cam wedge, as a further insurance that the trolley wire will be firmly held by the cams against the bottom walls of the channels, more particularly at the outer or end portions thereof, and allow for variations in the sizes of wires.

It will thus be seen that my improved trolley frog may be of cast metal. The hook-forming parts and the bendable lugs may be cast integrally with the body casting all in one piece. The cam member and its pivot lugs may be formed in one casting. Thus no expensive machine work is necessary in order to place these parts in condition for assembling and installation, and the use of clamping bolts is eliminated. The members may be readily removed and replaced as desired, and are in practice large enough so that a man may handle them conveniently without fear of dropping them while he is at work, and no special tools are necessary.

In the drawings I have also shown the frog as provided with removable tips or extensions 20. These tip members are adapted to take the wear and are also preferably tapered to provide a smooth, gradual approach to the metal of the body casting which is beneath the trolley wires, and which forms the bottom of the wire receiving channels. These tips may be detachably connected with the main or body member in any suitable manner, so that they may be removed and renewed at small expense.

It is obvious that my invention is equally as well adapted to other forms of frogs and similar apparatus without departing from the scope and spirit of the invention, and I wish it to be understood that I am not limited to the particular construction shown and described herein.

What is claimed as new is:—

1. In apparatus of the class described, the combination of a body member having a wire receiving channel open at its top, and a removable cam detachably interlocked with said body member rotatable to clamp the trolley wire in the bottom of the channel.

2. In apparatus of the class described, the combination of a body member having a wire receiving groove with upstanding walls and open at its top, hook portions formed on said walls and a cam member removably positioned between said walls and adapted to clamp the trolley wire firmly against the bottom of said groove.

3. In a trolley frog of the class described, the combination of a metal casting having upstanding walls forming an open top wire receiving channel, integral hook members formed on said walls, and a removable rotary clamp engaging said hooks adapted to firmly clamp the trolley wire in said channel.

4. In a device of the class described, the combination of a metal casting having upstanding walls forming a wire-receiving groove therebetween, integral hook members formed on said walls, and a rotatable clamp adapted to be removably placed into engagement with said members and actuated to clamp the trolley wire in said groove.

5. In a device of the class described, the combination of a metal casting having upstanding walls forming a wire-receiving groove therebetween, integral hook members formed on said walls, and a clamping device adapted to be placed in pivotal engagement with said hook members and rotated to clamp the trolley wire in said groove.

6. In a device of the class described, the combination of a metal casting having an open-top wire channel, integral upstanding open-slotted ear members formed on said casting and spaced apart so as not to interfere with the removal or replacement of the trolley wire, and a rotary cam adapted to be removably attached to said members and rotated to clamp the trolley wire in said channel.

7. In a device of the class described, the combination of a metal casting having an open-top wire channel, integral upstanding members formed in said casting and spaced apart so as not to interfere with the removal or replacement of the trolley wire, said members having open-sided slots, and a wire-

clamping, rotary cam having pivot studs adapted for detachable engagement with said members.

8. The combination of a trolley wire supporting member, a lever pivotally mounted thereon having an arm extending from the pivotal end and having a cam portion at its pivotal end for clamping the wire upon the support when the lever is rotated about its pivot, and means to engage said arm for locking said lever in the position to which it is rotated.

9. The combination of a trolley wire supporting member, and a lever pivoted at one end to said supporting member having an extending arm and having a rotary clamping cam formed at its pivotal end portion for clamping the wire against the support when the lever is rotated by the arm about its pivot.

10. The combination with a trolley wire supporting member, a cam rotatably mounted upon said member for clamping the trolley wire upon it, and a free extending arm on said cam for rotating it into and out of clamping position.

11. The combination with a trolley wire supporting member, a cam rotatably mounted upon said member for clamping the trolley wire upon it, an extension on said cam for rotating it into and out of clamping position, and a bendable part for directly engaging said extension to lock the cam in the clamping position in which it is rotated.

12. The combination of a trolley wire supporting member having a groove for receiving the trolley wire, a cam pivoted between the walls of said groove and adapted to be rotated to clamp the trolley wire in the groove, and a free extension arm on said cam for manually rotating the cam into and out of its wire clamping position.

13. The combination of a trolley wire supporting member having a groove for receiving the trolley wire, a cam pivoted between the walls of said groove and adapted to be rotated to clamp the trolley wire in the groove, an extension arm on said cam for operating the cam into and out of wire engaging position and adapted to be rotated into a position close to the wire in the groove, and bendable means for directly engaging said extension arm and locking the cam in the position in which it is rotated.

14. The combination of a trolley wire supporting member, a lever having integral pivotal lugs at one end portion, means forming a bearing for said lugs, and a cam at the pivotal end of said lever for clamping the wire upon the supporting member when the lever is rotated.

15. The combination of a trolley wire supporting member, a lever having pivotal lugs at one end portion, means in the member forming a bearing for said lugs, a cam at the pivotal end of said lever for clamping the wire upon the supporting member when the lever is rotated, and bendable means for directly engaging and locking said lever after the cam has been rotated into clamping position.

16. The combination with a trolley wire supporting member, a lever having integral pivotal lugs at one end portion, slotted undercut members on said supporting member forming bearings for said pivotal lugs and with which said pivotal lugs detachably interlock, and an integral cam portion formed at the pivotal end of said lever for clamping the wire on the supporting member when the lever is rotated.

17. The combination with a trolley wire supporting member, a lever having integral pivotal lugs at one end portion, slotted undercut members on said supporting member forming bearings for said pivotal lugs and with which said pivotal lugs detachably interlock, an integral cam portion formed at the pivotal end of said lever for clamping the wire on the supporting member when the lever is rotated, and means for locking said lever after the cam has been rotated thereby to clamping position.

18. The combination of a trolley wire supporting member having an unrestricted open top and having undercut open-ended slots in its walls, a rotary cam having integral pivotal lugs adapted to removably interlock with said undercut slots to form a pivot for the cam, and an integral arm extension on said cam for rotating it about its pivot to clamp the wire in the groove.

19. The combination of a trolley wire supporting member having an unrestricted open top and having undercut open-ended slots in its walls, a rotary cam having integral pivotal lugs adapted to removably interlock with said undercut slots to form a pivot for the cam, an integral arm extension on said cam for rotating it about its pivot to clamp the wire in the groove, and means for holding said arm extension after the cam has been rotated thereby to clamping position.

20. The combination of a trolley wire supporting member having an unrestricted open top and having undercut open-ended slots in its walls, a rotary cam having integral pivotal lugs adapted to removably interlock with said undercut slots to form a pivot for the cam, an integral arm extension on said cam for rotating it about its pivot to clamp the wire in the groove, and integral flanges on said pivotal lugs disposed outside of the walls of said groove for preventing the spreading of said walls.

21. The combination of a body member having an unrestricted open top trolley wire receiving channel and having open-ended undercut slots in the walls of said channel, a rotary clamping cam having integral pivot

lugs arranged to detachably interlock with said undercut slots to form a pivot for said cam, and an arm extension on said cam for operating the cam and adapted, when the cam is in clamping position, to substantially rest upon the wire in the channel.

22. The combination of a body member having an unrestricted open top trolley wire receiving channel and having open-ended undercut slots in the walls of said channel, a rotary clamping cam having integral pivot lugs arranged to detachably interlock with said undercut slots to form a pivot for said cam, an arm extension on said cam for operating the cam and adapted, when the cam is in clamping position, to substantially rest upon the wire in the channel, and means for locking said arm extension after it has been rotated to its resting position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 19th day of February A. D. 1912.

CHARLES E. GIERDING.

Witnesses:
J. ROWLAND BROWN,
J. C. PAINTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."