

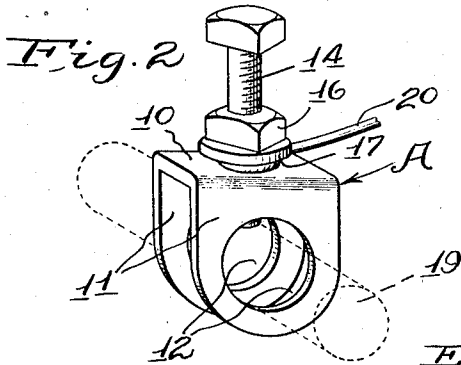
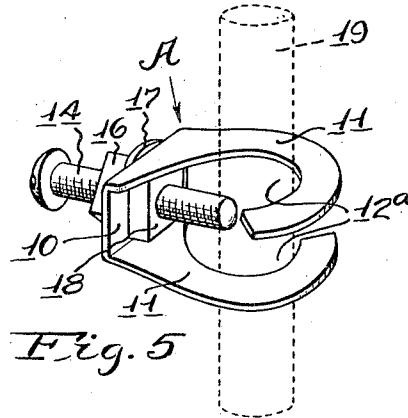
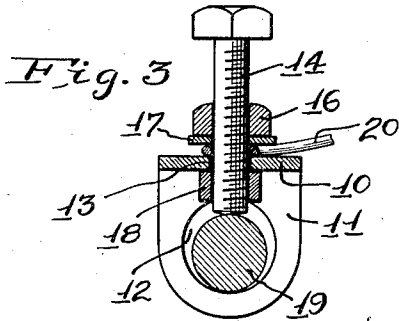
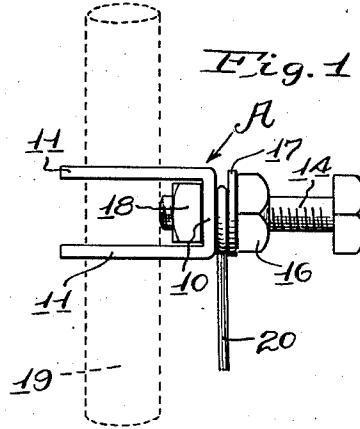
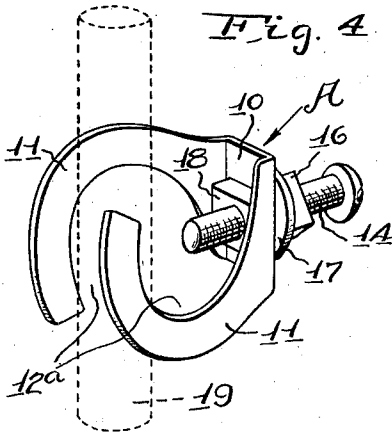
July 21 1925.

E. L. KLINGEL

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GROUND CLAMP

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UNITED STATES PATENT OFFICE.

EDWARD LOUIS KLINGEL, OF WEST ST. PAUL, MINNESOTA.

GROUND CLAMP.

Application filed April 2, 1923. Serial No. 629,366.

To all whom it may concern:

Be it known that I, EDWARD LOUIS KLINGEL, a citizen of the United States, residing in West St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Ground Clamp, of which the following is a specification.

My invention relates to improvements in ground clamps.

Its object is to improve devices of this nature from the standpoint of durability and efficiency and at the same time reduce the manufacturing cost and expense of application thereof, whereby the same will meet the requirements for general use.

With the foregoing and other objects in view, which will appear in the following description, the invention resides in the novel combination and arrangement of parts and in the details of construction hereinafter described and claimed.

In the drawings, Fig. 1 is an elevational view of a device embodying my invention, the same being illustrated as applied to a ground rod; Fig. 2 is a perspective view of said device; Fig. 3 is a central, longitudinal, sectional view thereof and Figs. 4 and 5 are perspective views of an alternate form of the invention, Fig. 5 illustrating the device in the act of being applied to a ground rod, and Fig. 4 illustrating the same clamped on said rod.

My improvement, as will be observed from the drawing, includes a yoke-like body A. This body is struck from sheet metal and comprises a shank 10 and spaced branches 11 turned in parallel planes at right angles with respect to said shank. Said branches have registering cut-away portions therein to receive a ground rod. In the form shown in Figs. 1, 2 and 3, circular openings 12 are formed in said branches 11. In the other form recesses 12^a are cut in opposite sides of the branches 11 which form reversed hooks. In both forms, the rod engaging portions of the branches 11 define curves having greater radii than the rods to which they are to be applied, whereby a rod 19 brought into engagement with said portions will have only a point of contact with each portion. The shank 10 has a medial bolt receiving opening 13 therein. A rod clamping bolt 14 reaches freely through this opening, the threaded end thereof extending between the branches 11. A nut 18, which backs against the shank 10, receives the bolt 14, said nut

being proportioned so that the shoulders thereof are closely embraced between the branches 11 and the nut 18 held against rotation thereby. With a rod 19 reaching through the cut-away portions of the branches 11, the bolt 14 is turned in the nut 18 to bring the end of the former against said rod. The tightening of the bolt 14 results in the gripping of the rod 19 by the clamp at three triangularly related points in a common plane, viz; the end of said bolt at one side of the rod and a point on each branch 11 at the other side of the rod. The pressure of the clamp being divided between these limited areas of contact with said rod 19 provide an efficient electrical connection, which remains substantially unimpaired against corrosion. A standard nut 16 fitted on the bolt 14 on the side of the shank 10 opposite the nut 18, is faced, if desired, with a washer 17, said nut 16 serving to clamp a wire 20 between the same and said shank 10 and thereby connect said wire with said bolt 14 and also with the body A. The nut 16 further serves in connection with the nut 18 to limit play of the bolt 14 in the shank 10 prior to the application of the clamp to a rod. Instead of using the nut 16 to connect a conductor with the clamp, it will be understood that the conductor may be inserted between the shank 10 and the nut 18 before the bolt 14 is tightened against the ground rod. Co-operating with each other, the branches 11 and shank 10 and nut 18 hold and guard the turn of a conductor applied to the bolt 14 between said shank 10 and nut 18. From the foregoing it will be understood that the branches 11 not only keep the nut 18 from turning therebetween, but also serve in the capacity of clip members to hold a conductor in position between the shank 10 and nut 18, when said nut is employed as a binding element for a conductor. Further, it will be understood that the nut 18, in addition to fitting the threads of the bolt for clamping purposes, reinforces the body A at the crotch thereof. This use of the nut 18 permits of the employment of thin stock in the body, with the result that weight, bulk, cost of materials and cost of machining is minimized without sacrifice to strength and serviceability of the article.

Where conditions are such that the clamp cannot be passed over a rod 19 or the rod inserted therein, the form of device shown

in Figs. 4 and 5 may be readily employed. This clamp is applied to a rod or pipe by passing the branches 11 on opposite sides thereof as shown in Fig. 4. If the diameter of the rod is greater than the width of the shank 10, the resiliency of the branches 11 permits of the spreading thereof when the same are forced against opposite sides of the rod. After the ends of the hook-like branches 11 pass the rod, the body A is turned through ninety degrees to the position shown in Fig. 5, whereupon the branches 11 spring back into their normal parallel planes in rod embracing relation. The bolt 14 is then tightened against the rod 19 and a conductor secured to the clamp as in the other form. The hook-like branches 11 (Figs. 4 and 5) are arranged so that the reaches between the shank 10 and the turns at the ends thereof will bear against the rod 19 as the bolt 14 is tightened. This arrangement is advantageous, since the reverse arrangement would result in a tendency of the clamp to turn out of rod embracing relation upon the tightening of said bolt 14.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a device of the class described, a yoke-like body of relatively thin stock comprising a shank having a bolt receiving opening therein and branches forming spaced rod engaging hooks, a bolt passing freely through said opening and between said branches, a nut backed by said shank and having opposite shoulders closely braced by said branches, the bolt being threaded in said nut and adapted upon turning therein to grip the rod between said hooks and the end of said bolt.

2. In a device of the class described, a yoke-like body comprising a shank having a bolt receiving opening therein and branches forming spaced, reversed rod engaging hooks, a bolt passing freely through said opening and between said branches, a nut backed against said shank and held against rotation by said branches, the bolt being threaded in said nut and adapted upon turning therein to grip the rod between said hooks and the end of said bolt, and means on the bolt for connecting a conductor therewith.

3. In a device of the class described, a yoke-like body comprising a shank having a bolt receiving opening therein and resilient branches forming spaced, reversed rod engaging hooks, a bolt passing freely through said opening and between said branches, a nut backed against said shank and held

against rotation by said branches, the bolt being threaded in said nut and adapted upon turning therein to grip the rod between said hooks and the end of said bolt, and means on the bolt for connecting a conductor therewith.

4. In a device of the class described, a yoke-like body comprising a shank and spaced branches thereon, the latter forming reversed rod engaging hooks and a clamping bolt carried by the shank and adapted to grip the rod between the end of said bolt and said hooks.

5. In a device of the class described, a yoke-like body comprising a shank and spaced resilient branches thereon, the latter forming reversed rod engaging hooks, a clamping bolt carried by the shank and adapted to grip the rod between the end of said bolt and said hooks, and means on the bolt for connecting a conductor therewith.

6. In a device of the class described, a yoke-like body, the branches thereof being formed with openings therein to freely receive a ground rod, the shank having a bolt receiving opening therein, a nut backed by the shank and closely embraced between the branches of said body, said nut serving to reinforce the body at the crotch thereof, a bolt passing freely through the opening in said shank and threaded in said nut, the turning of said bolt in said nut, which is held against rotation by said branches and backed against said shank, resulting in the gripping of the rod at three triangularly related points in a common plane, viz; the end of said bolt at one side and a point on each branch at the other side of the rod, a second nut threaded on the bolt at the side of the shank opposite said first mentioned nut for securing a wire in contact with the bolt and body and serving with the first mentioned nut to limit play of the bolt in said shank prior to the application of the device to a rod.

7. In a device of the class described, a yoke-like body struck from sheet metal and comprising a shank with branches turned in spaced parallel planes at right angles with respect to said shank, said branches having registering cut-out portions to receive a ground rod and the shank having an opening therein, a bolt passing freely through said opening between said branches, nuts threaded on the bolt on opposite sides of said shank, the inner nut being held against rotation by the branches and, in turn, reinforcing the body at the crotch thereof, the turning of the bolt in said inner nut serving to clamp the device on said rod, the outer nut serving to clamp a conductor on the device.

8. In a device of the class described, a yoke-like body struck from sheet metal and comprising a shank with two branches

turned in spaced parallel planes at right angles with respect to the shank, said branches having registering cut-out portions to receive a ground rod, the shank having a bolt receiving opening therein, a rod clamping bolt reaching freely through said opening between said branches and a nut backed against said bank and receiving said bolt, said branches holding said nut against rotation and said nut, in turn, reinforcing said branches and shank against strains set up by the bolt and tending to distort the body at the crotch thereof. 10

In testimony whereof, I have signed my name to this specification.

EDWARD LOUIS KLINGEL.