

Jan. 1, 1935.

L. G. TERRY

1,986,028

ELECTRICAL CONDUIT AND WIRE GROUND CONNECTION

Filed Aug. 20, 1929

Fig. 1.

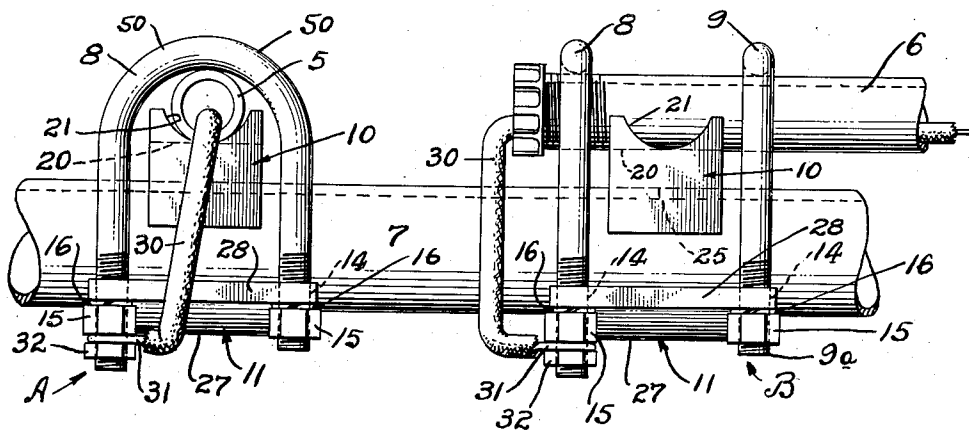


Fig. 2.

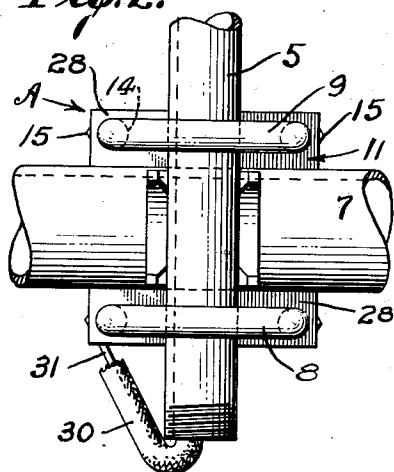


Fig. 3.

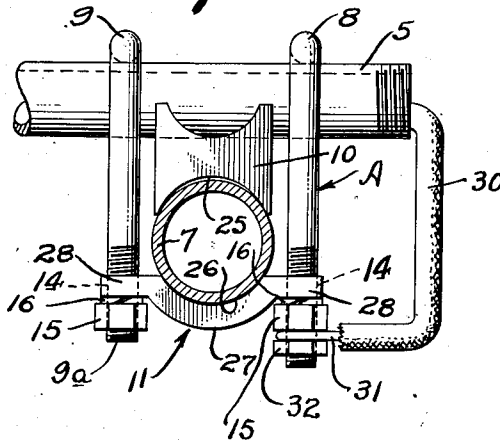
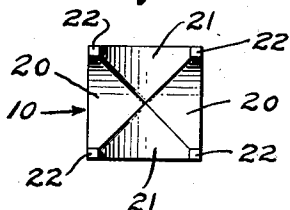


Fig. 4.



INVENTOR.
Lloyd G. Terry.

BY
C. J. Larrabee
his ATTORNEYS.

Patented Jan. 1, 1935

330,332.1

1,986,028

UNITED STATES PATENT OFFICE

1,986,028

ELECTRICAL CONDUIT AND WIRE GROUND CONNECTION

Lloyd G. Terry, Pasadena, Calif.

Application August 20, 1929, Serial No. 387,156

9 Claims. (Cl. 247—1)

This invention relates to a grounding device for electrical conduits and the so-called neutral or "white wire" of polarized circuits.

An object of the invention is to eliminate tapping and threading connections in a device of this character thereby reducing cost of manufacture or installing.

Another object is to provide a novel device having a wide range of adjustment, so that, even when made in a single size it may be used to form a dependable electrical connection between pipes which vary greatly in size.

A further object is to provide a safer, more efficient electrical bond, the effectiveness of which will not be impaired by changes in temperature or climatic conditions causing expansion and contraction in the device or conduits.

A still further object is to provide a novel grounding device which includes an angularly adjustable clamping device which adapts the appliance as a whole for forming an electrical bond not only between conduits which extend in parallelism to each other, but also to unite pipes which extend in an angular relation to each other.

In conjunction with the foregoing objects, it is also the purpose of the invention to provide a simple, compactly built, cheaply manufactured, non-corrosive appliance, adapted after installation, to perform effectively its intended functions for a very long period of time. Owing to its compact structure the device may readily be confined within the narrow space defined by an ordinary partition.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detail description and the appended claims.

The accompanying drawing illustrates the invention in a form I at present deem preferable.

Figure 1 is a side elevation illustrating two units of the complete device and showing the same applied to a ground pipe or conduit and connecting electrical wire conduits thereto to form an electrical bond between them. One of the electric conduits shown extends at right angles to the ground pipe and the other electrical conduit extends in parallelism to the ground pipe. Portions of said ground pipe and a part of one of said electrical conduits are broken away in order to contract the view.

Fig. 2 is a top plan view of the left-hand unit shown in Figure 1. Parts are broken away to contract the view.

Fig. 3 is a side elevational view of the device

shown in Fig. 2 looking toward the right from the left hand side of Fig. 2.

Fig. 4 is a top detail view of the spacer block.

Referring in detail to the drawing, I have illustrated two identical units A and B, the same being shown applied to end portions of electrical conduits 5 and 6 whereby an electrical bond is formed between said conduits and a larger or ground conduit 7, the latter conduit 7 being, for example, a water or gas pipe that serves as an efficient ground for an electrical current that may pass thereinto. The unit A is shown as connecting the conduit 5 which extends at a right angle to the ground pipe 7, and the unit B is shown as connecting the conduit 6 which extends in parallelism to said water pipe. These two units A and B, being of identical construction, a detailed description of one will suffice for both.

Each of said units comprises a pair of resilient U-bolts 8 and 9, a spacer block 10 and a base member 11. Said base member 11, in the illustrated embodiment of the invention, is shown as a square plate when viewed in plan as in Fig. 2, an aperture 14 being provided through each corner portion thereof to receive the threaded end portions of the arms of the U-bolts 8 and 9. It is understood that any desired outline of base member may be provided without departing from the spirit of this invention, but for universal adaptation with a minimum of parts the apertures 14 are equidistant from each other. The projecting ends 9a of the U-bolts 9, after insertion through the desired apertures 14 of the base member 11, have secured to them the clamping nuts 15, spring washers 16 being desirably interposed between said nuts and the adjacent face of the base plate 11.

The spacer block and saddle member 10, shown separately in Fig. 4 is provided with two intersecting grooves or seats 20 and 21 which are preferably of equal depth, and which intersect each other at a right angle, thus forming between them a projection 22 at each corner of the block to form retaining means for the conduits 5 or 6. The opposite side of the spacer block 10 is provided with a single groove or seat 25 adapted to engage and partially encircle the ground pipe 7. As the seats 20 and 21 are adapted to receive either the conduits 5 or 6, I provide, when the parts are completely assembled, means for connecting an electrical conduit to the ground conduit whether the same extends in parallelism with or at a right angle to the ground pipe 7. This is accomplished by merely changing the insertion of the U-bolts in the base plate.

The base plate 11 is provided at its mid-width (or mid-length) with a groove or seat 26 extending thereacross to engage the ground pipe 7. In the base plate the seat 26 is preferably formed by providing a convex deflection 27 in a plate of uniform thickness, a flange 28 resulting along each side of the convexity 27.

Owing to the holes 14 of the base plate 11 being equidistant from each other and at each side of said plate in the assembled device, both limbs of each U-bolt may be placed at the same side of the ground pipe 7 as shown at the left side in Fig. 1, or each U-bolt may be positioned to include said pipe 7 between its limbs as shown at the right side in Fig. 1.

An insulated neutral or "white wire" 30 is shown extending from the free end of conduit 6, this wire being grounded by inserting its exposed end 31 between the clamping nut 15 and a terminal nut 32, one end of the U-bolt 8 may be, if desired, lengthened and provided with additional threads at 8c in order to provide room for screwing on said terminal nut 32. Any suitable means may be provided to connect wire 30 to the base plate 11 so as to form a ground connection.

It will be seen that the device is very simple in its construction and use, each unit thereof comprising a plurality of U-bolts that are adapted to encircle two pipes, together with the spacer block 10 therebetween, in such a manner that when the nuts 15 are tightened the base plate 11 is brought into close contact with the ground conduit 7, and also the spacer block 10 is caused to form a close contact between the pipes or conduits between which it is placed. At the same time the curved portions 50 of the U-bolts are urged against the pipe over which they are placed. Hence a double bond of electric conduction is formed between the ground pipe 7 and the electrical conduit pipe associated therewith, the U-bolts and clamping block or base plate 11 forming one bond, and the spacer block 10 forming another bond.

It is not necessary, in order to form an efficient electric bond, that a pipe conform in curvature to the spacer block groove in which it is seated or that the pipe conform to the seat 26 in base plate 11, and therefore (by making such grooves of greater radii than the smallest pipe or conduit usually used), a single device embodying the invention may efficiently be used to embrace a number of pipes of greater and varying diameter.

By tightly screwing up the nuts 15 the arms of each U-bolt are sprung inwardly or toward each other with the result that a continuous spring tension is always exerted on the parts to maintain them in close connection so that expansion or contraction will not destroy the effectiveness of the bond.

When the electric conduit 5 extends at a right angle to the ground pipe 7, said pipe 5 is seated in the groove 21 of the spacer block 10 as seen in the unit A at the left end of Fig. 1; but when the electric conduit extends parallel to the ground pipe 7, said electric conduit (designated 6 in unit B) is seated in the groove 20 of said block 10. The interchangeable relation of the U-bolts to the base plate 11, already explained, makes possible the adjustment just described without requiring additional parts.

From the foregoing description, it will be seen that the invention is adapted to secure together two elongate members, the axes of which extend in adjacent, substantially parallel planes, the spaced or seating element occupying the space between these planes. The spacing function of

the spacing element is not so important as its capacity for affording seats in which the two elongate members are held in the proper relative positions under the binding action of the clamping means.

I claim:

1. In a grounding device, two elongate members one of which is adapted to form a ground, a spacer between said members, and clamping means to draw said members forcibly into contact with opposite sides of said spacer, said spacer having a two-way seat, to adjustably receive one of said members and an opposed seat to receive the other member.

2. In a grounding connection, a connecting device comprising two co-operating U-bolts; a base plate having holes to receive the limbs of said U-bolts to permit them to be arranged in either of two directions which are at angles to each other; two elongate members adapted to be included within said U-bolts, the axes of said members lying in substantially parallel planes; and a spacer for insertion between said tubular members, said spacer occupying the space between said parallel planes and having a two-way seat for one of said members and also a seat for the other of said members.

3. In a grounding connection, a connecting device comprising two co-operating U-bolts; a base plate having four quadrangularly disposed holes to receive the limbs of said U-bolts to permit them to be arranged in either of two directions which are at angles to each other; two elongate members adapted to be included within said U-bolts the axes of said members lying in substantially parallel planes; and a spacer for insertion between said tubular members, said spacer being located between said planes and having intersecting grooves on one surface and having a groove in its opposite surface, said members adapted to be received in said grooves.

4. In a grounding connection for elongate cylindrical bodies, a connecting device comprising a base plate having a plurality of apertures therein and a groove extending from end to end; a spacer having a groove which forms a seat on one surface and oppositely disposed grooves which form seats on its opposite surface; and clamping means adapted to extend through said apertures for the purpose set forth.

5. In a grounding connection, a connecting device; comprising a base plate having a seat extending along its mid length from end to end thereof and into which a ground connection is adapted to be seated; a spacer having a seat adapted to receive said ground member and being adapted on the side opposite said seat to receive a conduit in parallelism with said ground member and in angular relation with said ground member; said base plate having apertures therein equidistant from each other; and means extending through said apertures and embracing said conduit member to secure said parts and members together to form an electrical bond therebetween.

6. In combination, two elongate members the axes of which extend in adjacent substantially parallel planes which are in spaced relation to each other; a spacer having grooves forming seats to receive said members; and a clamping device to draw said members toward each other and in contact with the seats of said spacer; said clamping device comprising two co-operating U-bolts the limbs of each of which straddle one of said members, and a base plate which engages the

outer side of the other of said members, the end portions of said U-bolts being operatively related to said base plate.

7. An article of manufacture comprising a base
5 plate having a seat extending along its mid length from end to end thereof and into which a ground connection is adapted to be seated; a spacer having a groove forming a seat adapted to receive said ground member and also having grooves to
10 form seats on the side opposite said first mentioned seat adapted to receive a conduit in parallelism with said ground member and in angular relation with said ground member; said base plate having apertures therein symmetrically arranged around the center portion thereof; and
15 means extending through said apertures and adapted to embrace a conduit member seated in one of said seats to secure said parts and members together.

20 8. An article of manufacture comprising a base

plate having a seat into which a member is adapted to be seated; a spacer having a seat adapted to receive said member, and being provided on its side opposite said seat with a plurality of seats
5 adapted to receive a conduit that extends in parallelism with or in angular relation to said member; and means to draw said member and conduit toward each other and into their respective seats in said spacer to provide an electrical bond
10 therebetween.

9. An article of manufacture comprising a spacer having a groove forming a seat on one side thereof and having on its side opposite said seat, intersecting grooves forming a two-way
15 seat; said seats being adapted to receive members therein; and means adapted to engage said members and draw them toward each other and into their respective seats to provide an electrical bond therebetween.

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