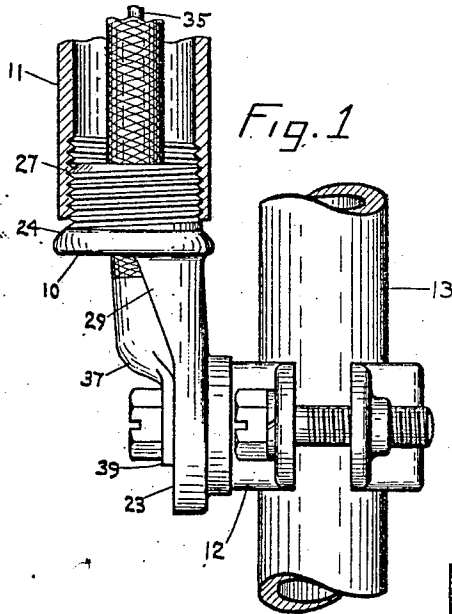
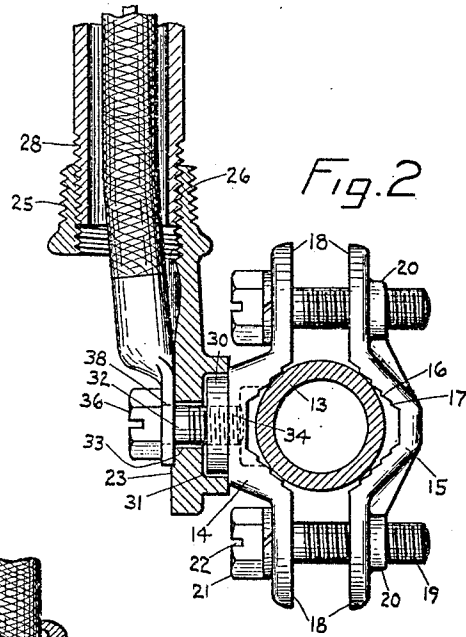
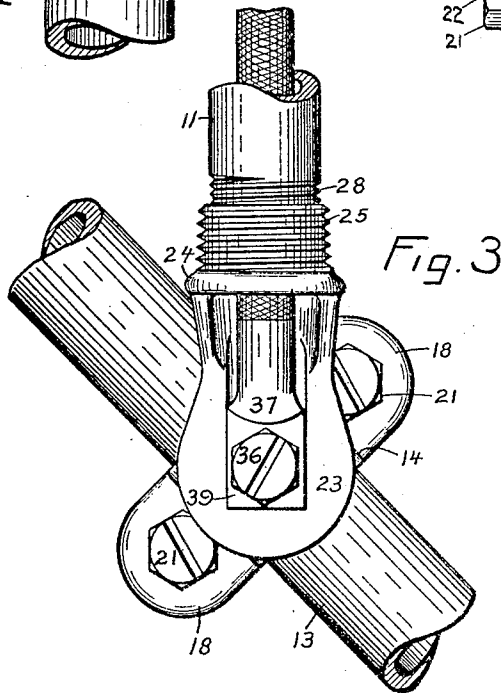


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ELECTRICAL CONNECTION

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ELECTRICAL CONNECTION

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This invention relates to electrical connections, and more particularly, to a connection for grounding a conduit and a conductor in an electrical system to a water or other grounding pipe.

An object of this invention is to provide such a connection which is simple and sturdy, and which may be securely fastened to the grounding pipe, electrical conduit, and electrical conductor in a very simple manner.

One of the features of this invention is the provision of a connector having two fixtures, one of which is rotatably mounted with respect to the other on an axis which is in a plane common to the axis of the grounding pipe and the conduit pipe and at the intersection of such planes, so that the two pipes may lie one directly in front of the other and parallel or at any angle with respect to each other which they happen to assume on a particular job.

Another feature of this invention is the provision of one of the fixtures on a clamp comprising a pair of jaws which are expandible and contractable to take grounding pipes of various diameters and including a pair of screws by means of which the jaws may be firmly drawn together to anchor the fixture to the grounding pipe. Preferably, according to the present invention, the screws for attaching the fixture to the grounding pipe are independent of the means for attaching the fixtures together or to the conduit pipe so that the fixtures may be separately attached to the conduit and grounding pipes and then be secured together.

In the accompanying drawing—

Figure 1 shows the connection in elevation attached to a grounding pipe and a conduit, the latter being shown in section, and the pipes being arranged parallel one in front of the other.

Fig. 2 shows the connection partly in section, with the pipes arranged at right angles to each other.

Fig. 3 is a front view showing the pipes at approximately a 45° angle with respect to each other.

In the embodiment of this invention shown in the accompanying drawing, the connection

comprises two fixtures, a fixture 10 adapted to be connected to a conduit 11 and a fixture 12 adapted to be connected to a grounding pipe 13.

The latter fixture comprises two jaw portions 14 and 15 provided with angularly disposed clamping surfaces 16 having teeth 17 adapted to bite into the material of the grounding pipe and thus form good electrical and mechanical connection therewith. The two jaws 14 and 15 are structurally separate and are secured together by screw means which may be constituted by bolts passing through ears 18 on the jaws, but preferably, according to the present invention, the screw means is constituted by a pair of screws 19 passing through holes in the ears 18 on the clamping member 14 and into threaded bosses 20 on the clamping member 15.

Thus, to attach the fixture 12 to the grounding pipe, the screws 19 are removed from the threaded bosses 20 by engaging the heads 21 thereof with a wrench or by using a screw-driver in a kerf 22 provided in each head, and then the two clamping pieces 14 and 15 are placed on opposite sides of the grounding pipe. After this, the screws 19 are threaded through the bosses 20 on the clamping member 15 until the clamping members are tightly drawn against the pipe in desired position vertically on the pipe and rotatably about the pipe 13.

The fixture 10 adapted to be connected to the conduit 11 has a flat portion 23 and a cylindrical screw-threaded portion 24, the latter being provided with external screw-threads 25 and internal screw-threads 26 so that, as shown in Fig. 1, the screw-threaded portion 24 may receive an end of the conduit 11 having internal threads 27 of say a 3/4" conduit pipe, while, as shown in Fig. 2, the screw-threaded portion 24 of the fixture 10 may receive in its internal threads 26 the external threads 28 of a 1/2" pipe, for instance. In this way, the fixture 10 is made so that it will accommodate without the use of reducers, two sizes of pipe—one to be taken on the external threads 25 and the other to be taken in the internal threads 26. The flat portion 23 of the fixture 10 is preferably

formed integral with the cylindrical screw-threaded portion 24, and for strengthening purposes webs or fillets 29 may be provided, and yet these fillets should not obstruct free access to the end of the flat portion 23 of the fixture.

As stated above, the fixtures 10 and 12 are rotatably adjustable relative to each other so as to accommodate the connection to pipes having various angularities relative to each other. For this purpose, in the form of the invention shown herein, there is provided a cylindrical boss 30 on the clamping member 14 of the fixture 12 and a cylindrical socket 31 on the flat portion 23 of the fixture 10. The boss and socket have a comparatively loose fit and are provided for the purpose of conveniently locating the two parts, one relative to the other, for rotary relative movement preparatory to the securing of the parts together. When the fixtures are located in the desired angular positions relative to each other with the cylindrical boss 30 in the socket 31, a screw 32 is passed through a hole 33 in the flat portion 23 of the fixture 10 and enters a threaded hole 34 in the boss 30 of the clamping member 14. Tightening of the screw causes the engaging surfaces at the base of the boss and at the outside of the cylindrical socket to be clamped in intimate contact with each other, and thereby rotation of the fixture 10 about the fixture 12 is prevented.

In this way, the conduit pipe 11 is held in firm and good electrical and mechanical contact and connection with the grounding pipe 13.

To ground the electric system, a grounding wire 35 which is carried by the conduit pipe 11 may have its end coiled and placed under the head 36 of the screw 32, but preferably, according to the present invention, it is soldered in a lug 37 and this lug has an aperture 38 through which the screw 34 extends so that the end 39 of the lug may be disposed between the head 36 of the screw and the flat portion 23 of the fixture 10. By thus arranging the parts, it will be seen that even should the lug 38 on the end of the contact 35 be insulated by a film of dirt or other matter from the flat surfaces 23 of the fixture 10, or only form poor electrical connection therewith, grounding current will pass from the lug to the head 36 of the screw 32 and from this directly through the screw to the clamping member 14, which, it will be remembered, is in direct electrical and mechanical engagement with the grounding pipe.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

Having thus described the invention, what is claimed as new and for which it is desired to obtain Letters Patent, is:—

1. An electrical connection comprising a fixture for attachment to a grounding pipe, said fixture including a pair of clamping arms adapted to embrace a ground pipe and screw-means for securing said clamping arms together on a grounding pipe; a fixture for attachment to a conduit pipe and having a bearing on one of said clamping arms to permit rotary relative movement between the fixtures to accommodate the connection to pipes having various angularities relative to each other; and a screw having its axis always located perpendicular to the axis of each pipe for securing the fixtures together in the desired angular positions one relative to the other.

2. An electrical connection comprising a fixture for attachment to a grounding pipe; a fixture for attachment to a conduit pipe; cooperating bearing surfaces on said fixtures to permit relative rotary movements between the fixtures to accommodate the connection to pipes having various angularities relative to each other; and a screw having its axis always located perpendicular to the axis of each pipe for securing the fixtures together in desired angular positions one relative to the other.

3. An electrical connection comprising a fixture for attachment to a grounding pipe; a fixture for attachment to a conduit pipe; and means connecting the fixtures together for relative rotary movements to accommodate the connection to pipes having various angularities relative to each other, said rotary movement being about an axis always located perpendicular to the axis of each pipe.

4. An electrical connection comprising a fixture for attachment to a conduit pipe; a fixture for attachment to a grounding pipe, said last-named fixture including a pair of V-shaped solid jaws and screws connecting the jaws together to permit relative spacing from and toward each to accommodate other ground pipes of various diameters; and separate means connecting said fixtures together in any angular position relative to each other in parallel planes.

5. An electrical connection comprising a fixture for attachment to a grounding pipe and having a cylindrical boss; a fixture for attachment to a conduit pipe having a cylindrical socket adapted to receive said boss and about which said fixtures may have rotary movement one relative to the other to accommodate pipes having various angularities relative to each other, said boss and socket having an axis always located perpendicular to the axis of each pipe; and means for securing the fixtures together.

6. An electrical connection comprising a fixture for attachment to a grounding pipe and having a cylindrical boss; a fixture for attachment to a conduit pipe having a cylin-

drical socket adapted to receive said boss and about which said fixtures may have rotary movement one relative to the other to accommodate pipes having various angularities relative to each other, said boss and socket having an axis always located perpendicular to the axis of each pipe, said boss having a screw-threaded portion and said socket having a screw-hole; and a screw passing through said screw-hole and threaded in said threaded portion of the boss for holding the fixtures together.

7. An electrical connection comprising a fixture for attachment to a grounding pipe; a fixture for attachment to a conduit pipe; and a pivotal and locking connection for said fixtures adapted to permit rotary movement of the fixtures to accommodate a pipe and conduit having various angularities relative to each other, said connection having an axis always located perpendicular to the axis of the pipe and conduit.

8. An electrical connection, comprising a fixture for attachment to a grounding pipe, said fixture including a pair of solid clamping arms having straight line relative movement, adapted to embrace a grounding pipe; a pair of screws on the ends of said arms for securing said clamping arms together on a grounding pipe; a fixture for attachment to a conduit pipe; cooperating sections on said fixture and one of said clamping arms; and screw means independent of and located midway between the first-named screw means for securing the cooperating sections of the fixture and the clamping arm together in desired angular position one relative to the other and at the same time to clamp a conductor which extends through the conduit, rigidly to the electrical connection.

9. An electrical connection, comprising a jaw-like member capable of seating on a grounding pipe; a fixture threaded to receive a conduit pipe; a solid jaw capable of movement toward and away from said jaw-like member; screw means for moving said jaw toward said member for rigidly clamping the grounding pipe therebetween; and screw means independent of the first-named screw means for securing the fixture and the jaw-like member together in a desired angular position one relative to the other.

Signed at Terryville, in the county of Litchfield, and State of Connecticut, this 25th day of August, 1930.

WILLIAM E. ECCLES.