No. 762,341. PATENTED JUNE 14, 1904.

J. J. O'CONNELL.

EARTH OR GROUND WIRE ATTACHMENT.

APPLICATION FILED MAR. 10, 1904.

NO MODEL.

Fig. 1.

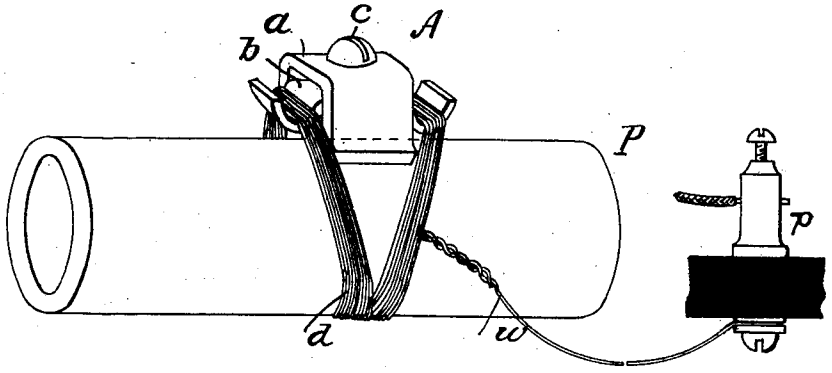


Fig. 3.

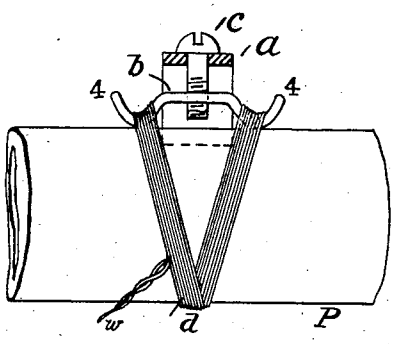


Fig. 2.

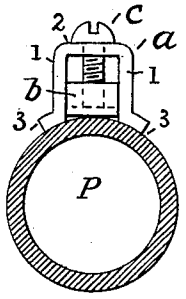


Fig. 4.

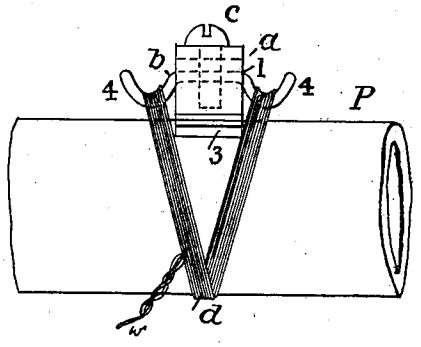
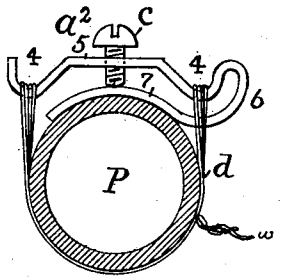


Fig. 5.



WITNESSES:

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No. 762,341. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH J. O'CONNELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

EARTH OR GROUND WIRE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 762,341, dated June 14, 1904.

Application filed March 10, 1904. Serial No. 197,432. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. O'CONNELL, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Earth or Ground Wire Attachments, of which the following is a specification.

The invention about to be described relates to earth or ground wire attachments employed with electric circuits as a return-conductor or as a discharge-conductor for lightning-arresters and similar protective devices. Such ground-wire connections are commonly wound around a metal gas or water pipe forming a part of a gas or water supply system from which the house or building at which the connection is located is supplied, branches from which enter the premises, and to make good electrical connections the wires are preferably soldered to the pipes. It is not always convenient to perform the operation of soldering, and consequently as the wire is not always wound tightly upon the pipe oxid forms upon the pipe and the wire helices, producing a joint of too high resistance for the free passage of electric currents, and consequently it happens that a lightning discharge goes to ground over another part of the circuit and frequently destroys the conductors and apparatus associated therein.

The purpose of the present invention is to provide effectual means for securing the ground-wire to a gas or water pipe and also for keeping the convolutions of the wire in a strained or taut condition, so that they will be in constant contact with the pipe and with each other, and so provide a path of low resistance for any current for which it is intended.

In carrying out the invention I provide a wire-straining device used in combination with the ground-wire and of the gas or water pipe consisting of three parts: first, a saddle-piece, which is placed across the gas or water pipe; second, a spring straining-nut, extending through the saddle-piece and provided at each end with spring-loops over which the grounding-wire is wound, and, third, an adjusting-screw, which extends through the arch of the saddle-piece and is threaded into the nut. When the grounding-wire is to be applied to a pipe, the latter is carefully scraped or filed and the saddle-piece placed across the pipe with the nut extending parallel therewith and resting upon the surface of the pipe, the screw being withdrawn to permit this to take place. The wire is then wound about the pipe and over the loop-terminals of the nut, giving at least ten turns over each loop, and the loose end of the wire is twisted back onto the main part of the wire, which is connected to a binding-post, from which a lead is made to the line-circuit or to the apparatus. In order to bring the wire into intimate contact with the surface of the pipe, the screw is turned, causing the nut to move away from the pipe, and thereby straining the wire, and as the loops of the nut are resilient they are bent downward by the pull of the wire convolutions, thus producing a resilient stress upon them, so that ordinary heat and cold will not cause them to slack off or loosen on the pipe.

Reference is made to the accompanying drawings, which illustrate the invention, of which—

Figure 1 is a perspective view of a pipe with the invention applied. Figs. 2 and 3 are respectively an end and side view of a pipe to show the application of the device thereto. Fig. 4 is a side view of a pipe with the device in operative condition; and Fig. 5 is an end view of a pipe, showing a modification of the device.

In the drawings, A represents the device as a whole, and P the pipe to which it is applied. The device A is represented of the actual size and may be carried about in the tool-bag of the inspector or other person whose duty it is to perform the work of making such electrical connections. It consists of three parts: a saddle-like piece *a*, composed of sides 1 1, terminating in feet 3 3 and united by an arch 2, a second piece *b*, extending through the saddle-piece between its sides and having hooking or looping ends 4 4, extending beyond the sides, and a central hole, screw-threaded, into which

is inserted the end of the screw *c*, which forms the third piece of the device. The screw passes through a hole in the arch 2 of the saddle-piece *a*, upon the top of which its head has a bearing or an abutment. The parts are made of metal and preferably of brass, excepting the spring nut-piece *b*, which I prefer to make of phosphor-bronze spring metal in order to obtain the requisite resiliency.

When the device is to be applied to a pipe, the latter is scraped or filed bright at the place of application and the device *a* placed upon the scraped place, as represented in Figs. 2 and 3, the feet 3 3 resting or bearing upon the pipe and also the spring-nut *b*, whose screw has been partly turned outward therefrom for that purpose. Holding the device upon the pipe firmly, the wire *d* is wound about the pipe and upon the loops 4 4 at least ten turns over each loop, all of the turns being wound upon one loop and then the same number upon the second loop, or, alternately, one turn being made upon one loop and the second turn upon the second loop until ten turns have been made upon each loop, when the end of the wire is twisted back upon the main wire *w*, (which is secured to a binding-post *p*,) so that it will not become loose. A screw-driver is then inserted into the slot of the screw and turned, causing the thread of the screw to raise the nut *b* from the pipe and strain the convolutions of wire so tightly that the loops 4 4 will be depressed toward the pipe, as represented in Fig. 4, and thus keep a constant tension upon the wire. When thus strained, the wire can expand and retract with the rise and fall of temperature without being loosened relatively to the pipe, owing to the resiliency of the loops 4 4, and at the same time should the wire become attenuated by the strain upon it any slack can be readily taken up by turning the screw.

I prefer to make the parts of the device of metal not liable to rust and of brass and phosphor-bronze, as referred to, and also to use wire that has been tinned for the same reason.

In the modification shown in Fig. 5 the saddle-piece *a* is omitted, while the piece embodying the nut with the loops 4 4 has an extension continuing from one of the loops 4, with a curve 6 leading back under the straight part 5 of the device and ending in a flat curve 7, which is adapted to rest upon the pipe P crosswise. A screw *c* is threaded into the part 5 and bears upon the upper surface of the curved end 7. In this modification the curved end 7 serves as an abutment for the screw, and when the wire *d* is to be wound upon the pipe and over the loops 4 4 the screw *c* is withdrawn from the face of the end 7 to permit the part 5 to be depressed, in which position it is held while the wire is wound, and to strain the wire the screw is turned, as in the previous case.

Having fully described my invention, I claim—

1. In earth or return wire connections for electric circuits, the combination with a metal pipe in permanent contact with the earth; of a wire-straining device bearing upon the pipe provided with a screw and a nut having resilient terminals; and an earth-wire wound about the pipe and over said terminals, as set forth.

2. In earth or ground connections for electric circuits, the combination with a metal pipe in permanent connection with the ground; of a wire-straining device bearing upon the pipe provided with a screw and a nut having resilient terminal loops; and a ground-wire one end of which is wound about the pipe and over said terminals, as set forth.

3. In earth or ground wire connections for electric circuits, the combination with a metal pipe in permanent contact with the ground; of a wire-straining device composed of a saddle-piece with feet bearing upon the pipe, a nut-piece having terminal loops, and a screw threaded into said nut and having an abutment for its head upon the saddle-piece; and a ground-wire wound about the pipe and over said terminals, as set forth.

4. In earth or ground wire connections for electric circuits, the combination of a metal pipe in permanent contact with the ground, of a wire-straining device composed of a saddle-piece with sides united by an arch and terminating in feet bearing on the pipe, a nut-piece between said sides having terminal loops extending beyond the sides, and a screw passing through a hole in said arch and threaded into the nut, with a ground-wire wound about the pipe and over said terminals, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of March, 1904.

JOSEPH J. O'CONNELL.

Witnesses:
IVOR JEFFREYS,
MARION A. REEVE.