(No Model.)

O. F. SMITH.

Connector for Electric Conductors.

No. 242,388. **Patented May 31, 1881.**

Fig: 1.

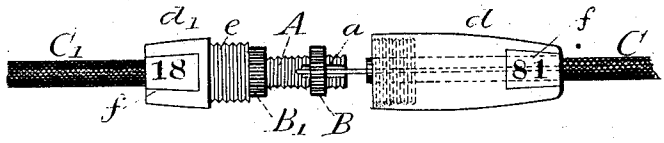


Fig: 2

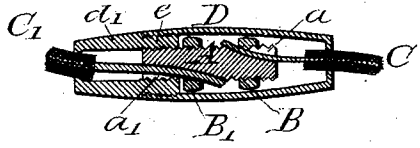
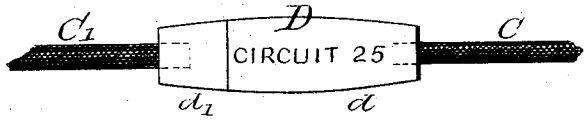


Fig: 3.



Witnesses;
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Miller & Earl

Inventor,
Orlando F. Smith
by his Attorney,
Frank L. Popp.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ORLANDO F. SMITH, OF NEW YORK, ASSIGNOR TO ADOLPHUS A. KNUDSON, OF BROOKLYN, N. Y.

CONNECTOR FOR ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 242,388, dated May 31, 1881.

Application filed April 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, ORLANDO F. SMITH, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Connectors for Electric Conductors, of which the following is a specification.

My invention relates more especially to that class of devices which are employed for uniting the terminals of separate wires or other similar conductors employed for the transmission of electric currents, so as to form a continuous conductor. These instrumentalities are extensively used in the test-boxes and connecting-chambers of underground and aerial telegraph-wires, and in forming connections between underground, submarine, and aerial wires under various other circumstances and conditions in which it becomes necessary to unite the ends of separate conductors in such a manner that they may be temporarily detached from each other for any purpose without delay or inconvenience.

The connecting device heretofore in general use for the purposes hereinbefore mentioned consists of a cylindrical piece of metal having a hole bored longitudinally through its axis, into the opposite ends of which the terminals of the conductors to be united are inserted, the latter being confined therein by a thumb-screw passing through a screw-hole bored at right angles to the axis near each extremity. This construction is objectionable for several reasons—first, the thumb-screws, being perpendicular to the direction of the strain upon the conductors, do not hold the latter securely in position, and are liable, moreover, to work loose, especially after the connector has been for some time in use, and thus allow the conductors to become disconnected; second, when the thumb-screw is tightly set up it is liable to sever the wire, and thus interrupt the electric circuit; third, in case the conductors to be connected vary from each other in respect to thickness or diameter, one being considerably larger than the other, it is difficult to clamp both wires securely, as a connector adapted for use with a wire of a particular size is not well adapted to hold a smaller-sized wire securely; fourth, no means are provided for insulating or protecting the joint formed by the connector, and it is thus liable to come in contact with the connectors of other circuits in test-boxes and other similar situations where a very large number of conductors are necessarily assembled together within a small space.

My invention is designed to obviate these objections, and to provide a simple, cheap, and efficient mode of attachment under all conditions, and to insulate the joint, when required, so that it cannot come into electrical contact with neighboring conductors.

The invention consists in the combination of a metallic conducting-rod having a screw-thread formed upon each of its ends, with inclined longitudinal grooves or channels for holding the conductors, and suitable nuts for clamping the conductors in position.

The invention further consists in providing the device hereinbefore described with an inclosing shell or case of non-conducting material, the said shell or case being formed in two parts, which are united together by means of a water-tight joint, one part of said case being preferably permanently secured to the inclosed clamp, while the other part is movable.

In the accompanying drawings, Figure 1 represents my improved connector with its inclosing shell or case, the movable portion of the latter being separated from the other portion, showing the position which the parts occupy while the connection is being made. Fig. 2 is a central longitudinal section through the connector and its inclosing-case, and Fig. 3 is an external view of the same with the parts in position.

A is a short cylindrical rod formed of some metal which is a conductor of electricity, preferably brass. This rod has a screw-thread formed upon each of its ends, which, for greater convenience of manufacture, may run the entire length of the rod, as shown in Fig. 1.

At each end of the rod A is formed an inclined longitudinal channel or groove, as shown at *a* and *a'*, each groove being of sufficient size to admit of an electrical conductor being laid therein, having its greatest vertical depth at the extreme end of the rod, and gradually decreasing toward the center of the rod, as best seen in Fig. 2.

The hollow metallic nuts B and B' are provided with an internal screw-thread, and are fitted to turn upon the threaded rod A, as shown, so that when conducting-wires C and

C′ are laid within their respective grooves or channels the nuts B and B′ may be screwed toward the center of the rod A until they come in contact at an acute angle with the conductors lying within the grooves. The said nuts are to be screwed firmly against the conductors, and as the latter are usually formed of soft metal the material composing them will be slightly compressed or indented by the pressure of the nut against the inclined surface, thus holding it in the most secure manner, while at the same time the friction between the wire and the nut will be sufficient to render it impossible for the latter to be turned so as to release the wire except by applying a considerable degree of force thereto.

It is obvious that a wire placed in the inclined groove in the manner shown, and clamped by the nut will be held with equal security, whether of greater or less size, in consequence of its inclined position.

It is preferable, although not essential, to form the inclined grooves at the respective ends of the rod A diametrically opposite to each other, as each groove may in such case be made of greater length without interfering with the other.

In order to insulate or protect the metallic conducting-joint thus formed, I provide an inclosing case or shell, D, formed of some suitable non-conducting material—such, for example, as hard rubber or celluloid. This inclosing case or shell I prefer to construct in the form of a hollow cylinder having an internal diameter a little greater than that of the nuts B and B′. I prefer, also, to construct the inclosing-case D of somewhat smaller diameter at its ends than in the middle, but this is by no means essential.

The case or shell D is constructed in two separate parts, *d* and *d′*, which I prefer to unite by means of a screw-joint, *e*, as shown in the figure. I do not confine myself to this particular construction, as a flanged joint, or any water-tight joint, will serve the purpose.

The shorter portion *d′* of the inclosing-shell may be permanently secured to the rod A, either by screwing the rod into a suitable aperture formed therein, as shown in Fig. 2, or otherwise. Each end of the shell is perforated with a circular opening large enough to admit the conductors C and C′, either with or without their insulating-coating, as preferred, which are passed through them into the interior of the shell.

The manner of using my improved connection is as follows: The two parts of the shell D are first separated from each other in the manner shown in Fig. 1. The end of the conductor C is then passed through the aperture in the end of the portion *d* of the shell laid in the groove *a* of the rod A, and then clamped by means of the nut B, as hereinbefore explained. In like manner the end of the conductor C′ is passed through the aperture in the end of *d′* into the groove *a′*, and clamped by means of the nut B′. The separate parts *d* and *d′* of the shell D are then united by screwing them together or otherwise, as shown in Figs. 2 and 3. Thus the united conductors and the joint are securely inclosed.

The exterior of the shell D may be formed with flat surfaces *f* at convenient places upon its exterior, which serve as convenient tablets, whereon may be inscribed the designating word, number, letter, or other character which serves to identify the inclosed conductor.

When my improved connector is used in connection with uninsulated wires—such, for instance, as ordinary telegraphic-line wires—the inclosing shell or case is unnecessary, and may be dispensed with. The device may be used in this manner as a permanent joint, in lieu of the ordinary method of twisting the ends of the conductors around each other, as it possesses much greater mechanical strength than a twisted joint. In such cases it is advisable to solder the joint for additional security.

By permanently securing one end of the rod A to a conductor my device constitutes a cheap, convenient, and effective binding-post, suitable for use in connection with all kinds of telegraphic and electrical apparatus.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a metallic conducting-rod having a screw-thread formed thereupon, an inclined longitudinal groove or channel formed upon the side and at the end of said rod, for receiving the end of an electric conductor, and a hollow clamping-nut turning upon said screw-thread.

2. The combination, substantially as hereinbefore set forth, of a metallic conducting-rod having a screw-thread formed upon each of its ends, inclined longitudinal grooves or channels formed in the side thereof at the respective ends, and diametrically opposite to each other, for receiving the ends of electric conductors, and hollow clamping-nuts fitted upon the screw-threads at each end of said rod.

3. The combination, substantially as hereinbefore set forth, of a clamp for connecting the terminals of two electric conductors, and an inclosing shell or case, of non-conducting material, formed in two parts, one of said parts being permanently secured to the inclosed clamp and the other part being detachable therefrom.

4. The combination, substantially as hereinbefore set forth, of a clamp for connecting the terminals of two electric conductors, and a shell or case of non-conducting material inclosing the same, formed in two parts, which are united together with a water-tight joint, as described.

In testimony whereof I have hereunto subscribed my name this 18th day of April, A. D. 1881.

ORLANDO F. SMITH.

Witnesses:
MILLER C. EARL,
CHAS. A. TERRY.

Correction of Letters Patent No. 242,388.

It is hereby certified that Letters Patent No. 242,388, issued May 31, 1881, for an improvement in "Connectors for Electric Conductors," upon the application of Orlando F. Smith, were improperly granted to Adolphus A. Knudson as owner of the entire interest by assignment from Orlando F. Smith; whereas it appears by the assignment upon record in this Office (Liber S 26, page 207;) that said Adolphus A. Knudson was assignee of one-half only of said Orlando F. Smith's interest, and that the said Letters Patent should have been granted to said Orlando F. Smith jointly with said Adolphus A. Knudson; that the proper corrections have been made in the files and papers relating to the case in the Patent Office, and are hereby made in said Letters Patent to make the title therein conform to the records of the Office.

Signed, countersigned, and sealed this 14th day of June, A. D. 1881.

[SEAL.]

A. BELL,
Acting Secretary of the Interior.

Countersigned:

E. M. MARBLE,
Commissioner of Patents.

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Countersigned:

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