(No Model.) 2 Sheets—Sheet 1.

C. McINTIRE.

ELECTRIC CONDUCTORS AND PROCESS OF UNITING THE SAME.

No. 389,314. Patented Sept. 11, 1888.

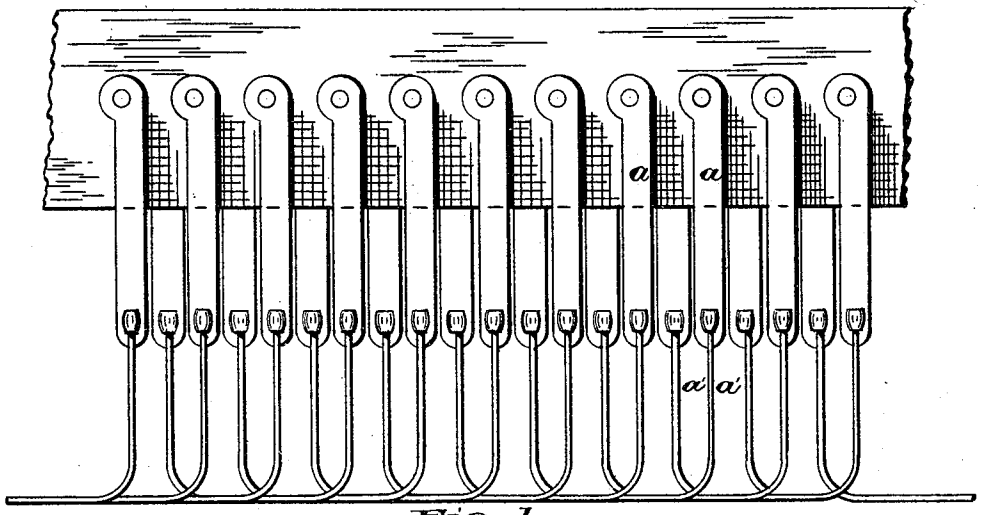


Fig. 1.

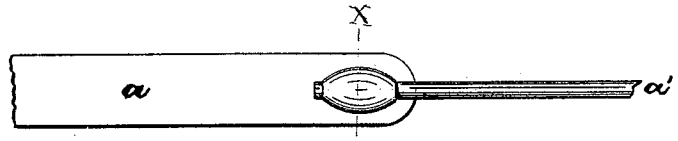


Fig. 2



Fig. 3.

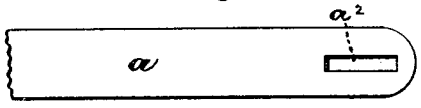


Fig. 4



Fig. 5

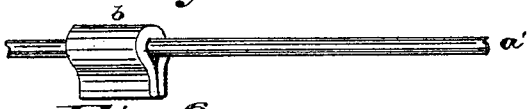


Fig. 6.



Fig. 7.

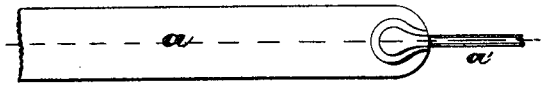


Fig. 8.

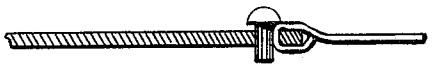


Fig. 9.

WITNESSES: INVENTOR.

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(No Model.) 2 Sheets—Sheet 2.

C. McINTIRE.

ELECTRIC CONDUCTORS AND PROCESS OF UNITING THE SAME.

No. 389,314. Patented Sept. 11, 1888.

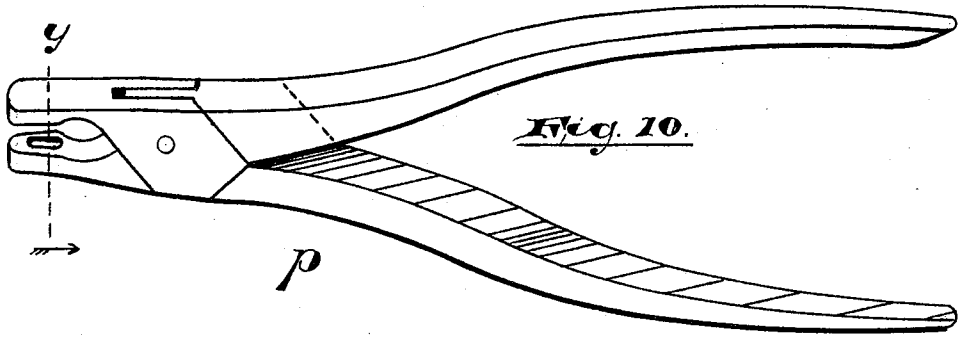


Fig. 10.

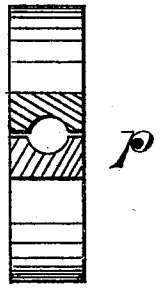


Fig. 11.

WITNESSES: INVENTOR.

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UNITED STATES PATENT OFFICE.

CHARLES McINTIRE, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-THIRD TO JOHN A. SEELY, OF BROOKLYN, NEW YORK.

ELECTRIC CONDUCTORS AND PROCESS OF UNITING THE SAME.

SPECIFICATION forming part of Letters Patent No. 389,314, dated September 11, 1888.

Application filed April 9, 1887. Renewed February 13, 1888. Serial No. 263,931. (No model.)

To all whom it may concern:

Be it known that I, CHARLES McINTIRE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric Conductors and Process of Uniting the Same; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to facilitate the process of connecting two electric wires or conductors, to avoid the use of solder, heat, or acid in making such connection, at the same time bringing the wires into a perfect contact, and when said process of connecting the wires or conductors is employed in connection with switch-boards to avoid the danger of accident or fire incident to the employment of the soldering process.

The invention consists in the improved joint for connecting two electric conductors, and in the process of making the same, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Heretofore, especially in the manufacture of switch-boards, the wires have usually been connected to the co-operating parts by the ordinary soldering process, thus employing acids and soldering-irons and solder, and as a result the joints were not only imperfect as regards neatness, but the fumes from the acid affected the wires, and in the use of the heated iron in close connection with the silk or other insulating material there has been considerable danger of fire.

Referring to the accompanying drawings, in which like letters indicate corresponding parts in each of the several figures, Figure 1 is a plan of a portion of an ordinary switch-board. Fig. 2 is a plan of one of the plates or metallic tongues by means of which a conducting-wire is connected with said board, said plate being in connection with a conducting-wire. Fig. 3 is a section of the same, taken through line X, Fig. 2. Fig. 4 is a plan of the plate prior to receiving the wire, showing a certain slot therein. Figs. 5, 6, and 7 illustrate certain details, and Figs. 8 and 9 illustrate a modified construction. Fig. 10, Sheet 2, is a perspective view of pliers such as may be employed in making connections; and Fig. 11 is a sectional view of the same through line *y*.

In said drawings, *a a'* are two electrical conductors. They may be ordinary electric wires, or one may be a wire and the other a portion of a switch-board or the terminal attachment for connecting an electric wire to the instrument.

b is a soft-metal rivet or envelope adapted to inclose the wire at the end thereof and secure it to the connecting portion when impressed by tools, as hereinafter described. The preferred construction is shown in Figs. 2, 3, and 5, in which *a* is a plate slotted as at a^2. *a'* is a wire to be connected therewith, and *b* is a soft-metal plate or connecting-piece doubled, as shown in Figs, 5, 6, and 7, which passes over and around the end of the wire, as shown in Fig. 6, the ends of the plate being then passed through the slot a^2 in the plate, as in Fig. 5. The said plate is then subjected to pressure by means of suitable dies or compressing-pliers *p*, Figs. 10 and 11, when the metal is forced into more intimate contact with the conductors, giving a rigid union of parts, the metal completely filling the slot in the plate and overlapping said plate, as at *b' b'*, at both the upper and under sides thereof, after the manner of an ordinary rivet, whereby the parts are held securely together, the joints are made durable and the contact perfect, and the use of solder and the attending objections is thus entirely avoided.

Various modifications may be made in the mode of securing the union of parts, and various changes may be made in the means employed in the process. For example, I may employ in connection with a perforated plate, Fig. 9, a wire having its end looped or hooked therein, as shown, and a tin or other soft-metal rivet, which is inserted in the perforation, as in Fig. 9, and when riveted by means of pliers of peculiar construction or dies is forced forward and around the hooked or looped wire, as in Fig. 8, securely and rigidly, and at the

same time neatly uniting the parts. For some purposes, especially where there is considerable longitudinal tension, this form of connection is preferred.

The connecting-piece, plate, or rivet may be of other metal than tin and may be of a variety of forms, suiting the various conditions under which it is placed.

Having thus described the invention, what I claim as new is—

1. The improved joint or connection for electric conductors, which consists, essentially, of the conducting parts *a a'*, one of which is perforated, and a soft-metal connecting-piece enveloping one of said parts and passing through the other and compressed to clamp the parts together and to make a perfect union.

2. In combination, the plate *a*, slotted as at a^2, a wire, *a'*, connecting therewith, and a soft-metal plate, *b*, doubled around the end of said wire and passing through the said slot a^2 and pressed to overlap the said plate *a*, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of April, 1887.

C. McINTIRE.

Witnesses:
CHARLES H. PELL,
OSCAR A. MICHEL.