

No. 647,471.

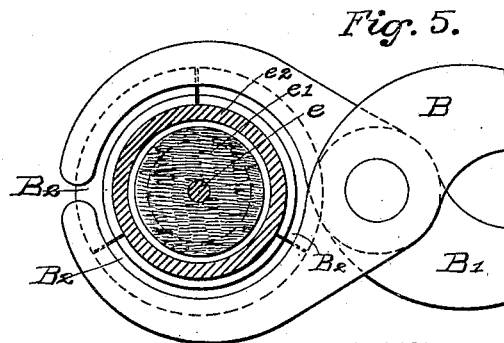
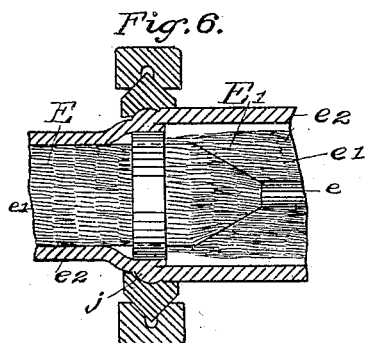
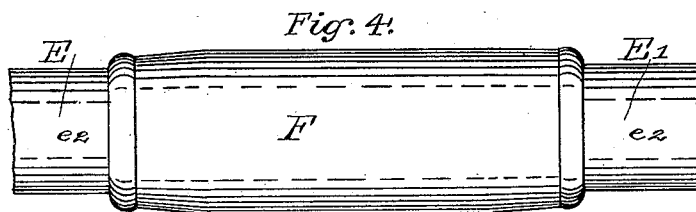
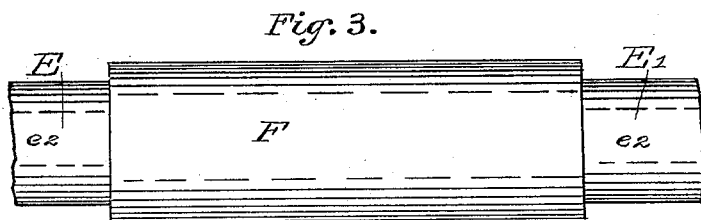
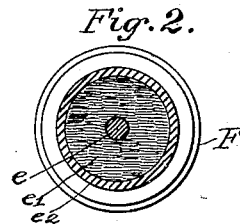
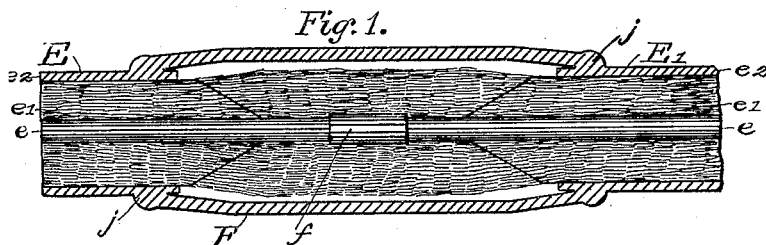
Patented Apr. 17, 1900.

W. M. BROWN & G. H. McFEATERS.

CABLE JOINT.

(Application filed Aug. 23, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE

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CABLE-JOINT.

SPECIFICATION forming part of Letters Patent No. 647,471, dated April 17, 1900.

Original application filed May 5, 1899, Serial No. 715,678. Divided and this application filed August 23, 1899. Serial No. 728,381. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM MILTON BROWN and GEORGE H. McFEATERS, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Cable-Joints, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to means for connecting electric cables, and more particularly to an improved joint for the lead covering of such cables.

Heretofore it has been usual to connect the sections of the lead covering in which the conducting wires or cables are inclosed by means of "wiped" joints. These, as well known, are difficult to form, requiring the employment of highly-skilled labor, which makes the work expensive. Considerable time is also required to form these joints, and they often have to be made at points to which access is difficult. By our present invention we provide a joint which is of highly-desirable character, superior in many respects to the wiped joint, and which can be rapidly made at a small cost and without the aid of highly-skilled labor.

With this object in view our invention consists in a joint in which the sections of lead covering are united by means of a sleeve slipped over and connecting their end portions and joined thereto by pressing together and heating originally-amalgamated contacting surfaces of the sleeve and cable.

It also consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the drawings, Figure 1 is a longitudinal section of a joint between two lead-covered electric cables. Fig. 2 is a cross-section of the same. Fig. 3 is a side elevation of the joint shown in Fig. 1 before the heat and pressure have been applied. Fig. 4 is a similar view of the completed joint, and Fig. 5 is a view of a portion of a tool suitable for applying heat and pressure in forming the

joint. Fig. 6 is a detail sectional view showing a modified form of the joint.

In the drawings the letters E and E' represent two lead-covered cables, each comprising the copper conductor *e*, the insulation *e'*, and the lead covering *e*².

f is a sleeve which connects the copper conductors in the usual manner.

F is a lead sleeve whose ends fit over and connect the end portions of the two lead coverings *e*², being united to said coverings in the novel manner now to be described.

Before placing the sleeve F in position the interior of its end portions are coated with a thin film of mercury in accordance with the novel process which we have described and claimed in our pending application, Serial No. 715,678, filed May 5, 1899, of which the present application is a division. The end portions of the coverings *e*² may also have applied thereto a similar coating. We then by means of a suitable tool—such, for instance, as that described and claimed in our pending application, Serial No. 715,679, filed May 5, 1899 and shown generally in Fig. 5 of the accompanying drawings—apply heat and pressure to the end portions of the sleeve F. The tool shown consists of a pair of inter pivoted members B B', having recessed jaw portions, in which are seated suitable dies B², adapted, when the two members B B' are actuated, to surround and embrace the sleeve F to press the same firmly against the coverings *e*². We have generally heated these dies after they are in place, their heat being gained by contact with the heated jaws of the compressing-tool, which may be heated in any suitable manner, as by contact with a heated soldering-iron. Of course either the tool or the dies may be heated in any other suitable manner. The heat is usually applied from the compressing-tool, through the medium of the dies, from one minute to a minute and a half, during which time we keep a gentle pressure on the jaws of the tool. At the end of that time the pressure may be momentarily increased and the dies and tool then removed. The heat should not be great enough to melt or materially soften the metal except

where amalgamated, if the best results are to be obtained. The effect of the mercury seems to be (probably from its amalgamation with the other metal) to cause a very thin film of metal at the surface to melt or soften at an abnormally low temperature, so that when pressure is applied the two surfaces are readily united without softening the main body of the metal. The resultant joint is, we believe, a perfect weld between the sleeve and coverings e^2 , so that these parts are united by a solid homogeneous connection, (indicated at i .) The metal at these points j will not melt or soften in the completed joint at any lower temperature than that at which the metal compassing the sleeves and coverings will ordinarily melt or soften, the low-melting metal having been apparently substantially removed at the time of making the joint.

We do not in using the term "homogeneous" in referring to the character of the connections j wish that term to be understood in its strictest sense, as it may sometimes occur that some slight traces of the amalgam formed by the mercury or other foreign matter may be found therein. We use the term, however, to mean that, practically considered, the metal forming these connections is substantially the same as the adjacent metal.

In the modified form of joint shown in Fig. 6 a metal ring G is slipped over the insulation and under the covering e^2 , so as to form an internal die. This relieves the insulation and allows of obtaining a more effective pressure at the surfaces to be united. This figure also indicates the application of the dies and jaws of the compressing-tool.

We do not in this application claim, broadly, a metal joint formed by uniting amalgamated surfaces by heat and pressure, such a joint being claimed, broadly, in our application of even date herewith, Serial No. 728,380. We do not, however, wish to limit ourselves herein to the specific details which we have shown

and described, as the same may be varied without departing from our invention as pointed out in the following claims.

Having thus described our invention, what we claim, and desire to protect by Letters Patent, is—

1. The combination with a pair of lead-covered electrical cables, of a lead sleeve surrounding the ends thereof and homogeneously united thereto, substantially as described.

2. The herein-described joint for lead-covered cables, consisting of a sleeve fitted over the end portions of the cable-coverings and united thereto by homogeneous connecting portions formed by originally-amalgamated contacting surfaces of the sleeve and coverings, substantially as described.

3. The combination with a pair of cables having a metallic covering capable of forming an amalgam, of a sleeve surrounding the end portions of said cables and of a similar nature to their coverings, and homogeneous connections between said sleeve and coverings formed by originally-amalgamated portions thereof, substantially as described.

4. The combination of a pair of lead-covered cables, rings within the end portions of the coverings and supporting the same, and a sleeve surrounding the ends of said cables and homogeneously connected to the said coverings by originally-amalgamated contacting portions thereof.

5. The herein-described joint for lead-covered cables, comprising a sleeve surrounding the end portions of said cables and connected thereto by interior homogeneous connecting portions, substantially as described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

W. MILT. BROWN.

GEORGE H. McFEATERS.

Witnesses:

B. M. SMITH,

H. W. SMITH.