No. 873,215. PATENTED DEC. 10, 1907.

C. W. DAVIS.

JOINT FOR METAL SHEATHED CABLES.

APPLICATION FILED MAR. 31, 1906.

FIG. 1.

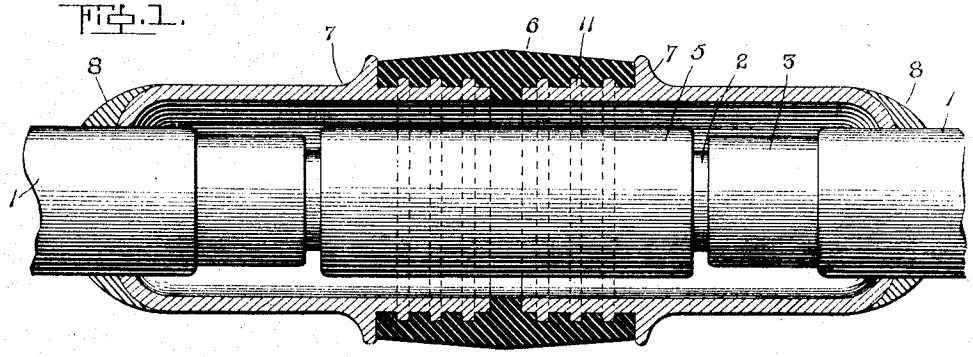


FIG. 2.

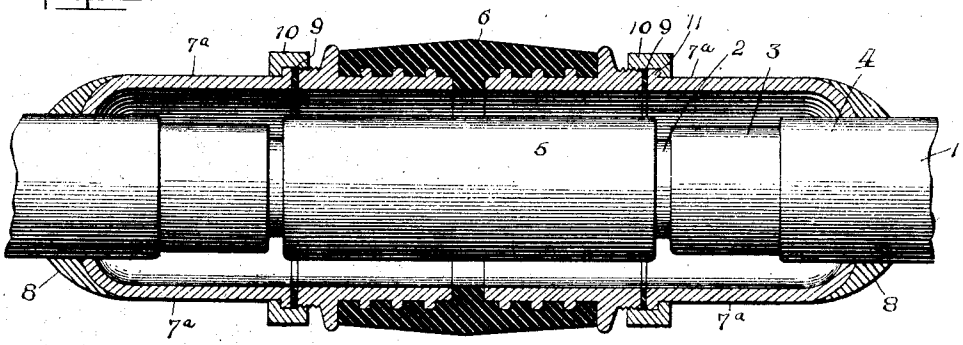
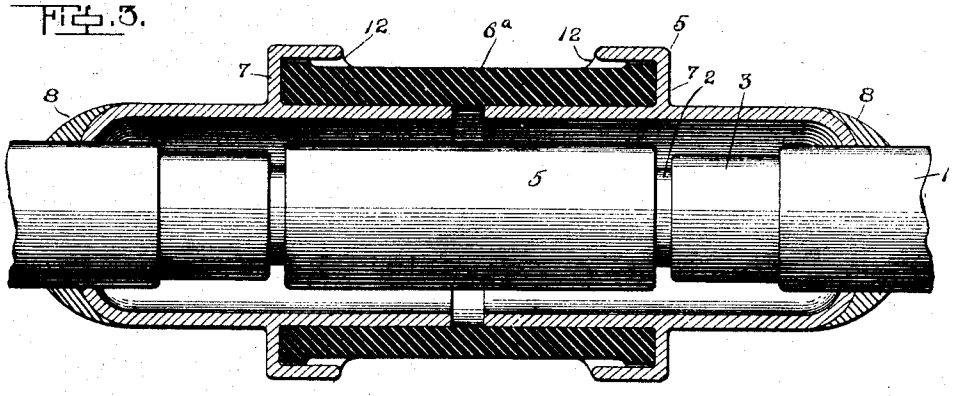


FIG. 3.



WITNESSES:

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JOINT FOR METAL-SHEATHED CABLES.

No. 873,215. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed March 31, 1906. Serial No. 309,199.

To all whom it may concern:

Be it known that I, CHARLES W. DAVIS, residing at Edgeworth, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Joints for Metal-Sheathed Cables, of which improvements the following is a specification.

My invention relates to improvements in joints for metal sheathed cables; and the object of my improvement is a joint of this character which will be non-conducting and will at the same time be tight, durable, and otherwise serviceable.

In the accompanying drawings which form part of this specification the figures show partly in elevation and partly in longitudinal section my improved cable-joint in three alternative forms.

Corresponding parts in the several figures bear the same reference numerals in each case.

A joint for a metal-sheathed cable which shall insulate adjacent sections of the sheath is most desirable; for, in service, these metallic sheaths are otherwise apt to pick up stray or lost currents, and, through faults in the cable insulation itself, to become of like potential with the included conductor; and such accidental currents flowing in the sheath tend to disintegrate and destroy the sheath both through electrolytic action and—in case the currents are at all heavy—through fusion.

In the drawings, adjacent ends of a cable, 1, are shown united by my improved joint. The cable ordinarily consists of a core, 2, which may be a single integral conductor or a plurality of independent strands coöperating to carry a single current, and thus forming a single compound conductor, or again, these strands, insulated from one another, may carry distinct and independent currents. This core 2 is contained in an insulating envelop, 3; and the whole is inclosed in a metal sheath, 4, ordinarily of lead.

My improved joint is made up, essentially of a case or shell which consists of an annulus, 6, of non-conducting material, and a pair of thimbles, 7, formed preferably of brass.

In cases or shells for cable-joints which have heretofore been devised and which are made up in part of conducting and in part of non-conducting materials, two chief practical difficulties have been encountered; first that of making a tight and durable connection with the cable sheath; and second that due to the deterioration in service of such insulating materials as have heretofore been suitable to those old forms. The metal thimbles of my joint are capable of being secured to the cable sheath on opposite sides of the point of union of the core by the ordinary wiped joint, which has been found to be in service the most efficient connection, and these metal thimbles, separated from one another so as to break the continuity of the conductive sheath, are in turn united by the annulus of insulating material. And this insulating material is not a yielding elastic material so unserviceable but so essential in the older forms of insulating joint, but a strong unyielding and permanently efficient material, such as "electrose", "micanite" or porcelain.

The parts of my improved joint are preferably assembled in the following manner. The case or shell, comprising the metallic thimbles and the non metallic insulating annulus, will ordinarily be completed in the shop. The material of which the annulus is formed must be sufficiently tenacious; it is preferably worked in plastic state, and capable of being shaped or pressed into form; it must be such as to make sufficiently intimate contact with the bodies of the thimbles, that there may be no ingress of moisture; it should have a coefficient of expansion approximately the same as that of the metal of which the thimbles are formed; and it should be (when the shell or case is of the particular form shown in Fig. 1 or Fig. 3) of such quality as to be unaffected by the heat conveyed through the thimbles when the wiped solder joints presently to be described are being formed. I preferably employ a compound resembling the material known to the trade as "electrose", but modified to withstand high temperature without becoming plastic. Such a material, brought to a plastic condition, is molded to shape upon the pair of thimbles first brought into proper position, indicated in the drawings. That portion of the surface of the thimbles upon which the annulus is formed may be shaped to afford a more secure union; and this is indicated in the corrugations, 11, upon thimbles 7. It will be

observed from the drawings that this shell, while having great mechanical strength by virtue of the short space between adjacent ends of the pair of thimbles which form part of it, has a large "leakage surface" on its exposed outer surface. By "leakage surface" is meant the surface of insulating material separating or intervening between adjacent conductor surfaces, and over which any leakage must pass. The construction is in this respect of great practical value. Returning then to the assembling of the parts, the adjacent ends of the cable to be united are first prepared by stripping away the sheath and insulation and laying bare the core, and a case or shell composed as described is threaded upon one of the cable ends. The exposed conductor ends are then brought together and united in any preferred manner. In the drawings a sleeve, 5, which will be of metal, is shown surrounding the adjacent ends of the single integral conductor which in this case constitutes the core of the cable. This sleeve 5 is sweated to place with solder. The connections and the exposed portion of the conductors are then insulated if desired, with insulating tape or otherwise. The shell or case is then advanced until it surrounds and incloses the connection formed in the core of the cable and rests at either end upon the sheath upon either side of the point of union. The thimbles which form the ends of the case or shell are then secured to the sheath 4 by the familiar wiped solder joints, indicated at 8.

While I preferably employ a material for the annulus which will not be injuriously affected by the heat conveyed to it in the forming of the wiped joints, 8, I have in Fig. 2 shown means whereby the wiped joints may be formed without subjecting the annulus to a high temperature. Each thimble, 7^a, is made in two sections, the inner receiving the annulus 6 and the outer the wiped joint. These two sections may be separated by an interposed ring of insulation, 9, which may be a rubber gasket or other preferred substance, and the sections may be made capable of secure union, as by a clamping ring, 10, which when the sections are assembled and secured may be screwed to place.

While I prefer to employ an annulus such as I have described, which is molded to place, I have shown in Fig. 3 an alternative form in which the annulus, 6^a, is applied in solid form. Such an annulus is preferably formed of porcelain or like refractory, non-conducting material. The thimbles are shaped to receive opposite ends of this annulus and to permit the formation of an impervious cement joint, 12.

It will be understood that the joint proper, formed in the core, may be wrapped with insulating tape or otherwise insulated, and that the space within the shell or case may after the parts are assembled as described be left vacant or filled in any manner known to the art with insulating material.

I claim herein as my invention:

1. An insulated joint for a metal-sheathed cable which includes a case or shell formed of a pair of thimbles connected to the sheath on opposite sides of the point of union of the cable core and extending into proximity to one another, and an annulus of insulating material surrounding such point of union, the inner surface thereof covering the proximate ends of said thimbles and the outer surface thereof exposed for a distance greater than that which separates the thimbles, substantially as described.

2. An insulated joint for a metal-sheathed cable which includes a case or shell formed of a pair of thimbles connected to the sheath on opposite sides of the point of union of the cable core and extending into proximity to one another, the outer surfaces of said thimbles being corrugated, and an annulus of insulating material surrounding such point of union, and connecting said thimbles, covering the proximate ends of said thimbles over the corrugated surfaces thereof, and exposed outwardly over a distance greater than that which separates said thimbles, substantially as described.

3. An insulated joint for a metal-sheathed cable which includes a case or shell formed of a pair of thimbles connected to the sheath on opposite sides of the point of union of the cable core and extending into proximity to one another, and an annulus of insulating material formed upon and uniting the proximate ends of said thimbles and surrounding such point of union, and outwardly exposed over a distance greater than that which separates the thimbles, substantially as described.

4. A thimble for use in forming an insulated joint for metal-sheathed cables, such thimble being of suitable size to surround the cable adjacent to the point of union, and composed of two substantially annular portions of substantially equal diameter, a third ring of heat-insulating substance interposed between the abutting ends of the two first-named annular portions when brought into service position and serving to separate said portions from heat transmitting contact, and means for securing said two first-named annular portions to one another with the third ring portion interposed between them when in service position, substantially as described.

In testimony whereof, I have hereunto set my hand.

CHARLES W. DAVIS.

Witnesses:
CHARLES BARNETT,
BAYARD H. CHRISTY.