

July 25, 1950

C. E. BENNETT

2,516,747

FLUID IMPREGNATED ELECTRIC CABLE

Filed Aug. 29, 1945

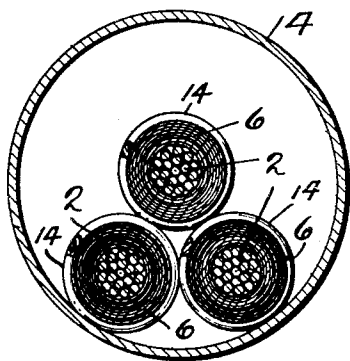


Fig. 1

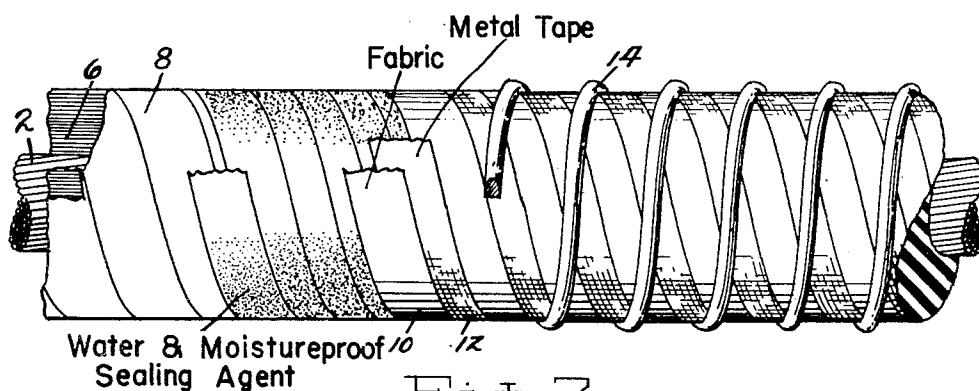


Fig. 2

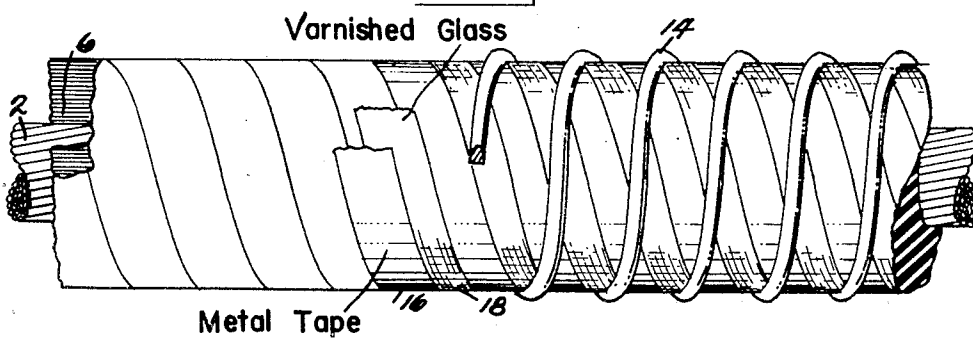


Fig. 3

Inventor
CHARLES E. BENNETT

By
James G. Bell
Attorney

UNITED STATES PATENT OFFICE

2,516,747

FLUID IMPREGNATED ELECTRIC CABLE

Charles E. Bennett, Ridgewood, N. J., assignor to
The Okonite-Callender Cable Company, Incorporated,
Paterson, N. J., a corporation of New
Jersey

Application August 29, 1945, Serial No. 613,257

2 Claims. (Cl. 174-25)

1

This invention relates to an improvement in electric cable systems and particularly to sealed cable systems wherein one or severally individually insulated conductors are enclosed in a pipe line filled with insulating fluid maintained under superatmospheric pressure.

It is customary under present practice to insulate these conductors at the factory, impregnate them with insulating fluid, and then to encase each conductor in a temporary lead sheath to retain the impregnant and to prevent the entry of moisture to the insulation in transit and while installing. This sheath adds materially to the cable cost to the customer, in time, labor and material; the sheath adds considerably to the weight of the cable thus increasing shipping costs; and finally the sheath has to be removed at the installation site involving more expense.

The present invention provides a construction wherein the temporary lead sheath is dispensed with entirely, and the expense incident to its use eliminated.

In the accompanying drawings, I have illustrated two embodiments of my invention.

Fig. 1 is a cross section through a sealed cable system of the type wherein several individually insulated conductors are enclosed in a pipe line containing insulating fluid under superatmospheric pressure.

Fig. 2 is a fragmentary part sectional elevational view of one of the conductors of the cable system of Fig. 1; and

Fig. 3 is a view similar to Fig. 2 of another embodiment of my invention.

Referring to the drawings in detail, and first of all to Figs. 1 and 2:

2 designates the individually insulated conductors of a sealed cable system wherein these conductors are enclosed in a pipe line 4 filled with insulating fluid maintained under superatmospheric pressure of the order of two hundred pounds per square inch.

Each conductor 2 is insulated with paper tape 6 which in accordance with conventional practice is wound helically about the conductor, layer upon layer until the desired wall thickness has been built up.

About the paper insulation 6 I wrap a moisture- and waterproof tape 8 of aluminum or other metal foil, or a tape of paper treated to render it moisture- and waterproof. This tape is wound helically with a substantial overlap, and covered with a water- and moistureproof sealing agent such as polybutene sold commercially under the name of Vistag. The tape itself being moisture- and

2

waterproof and sealed with Vistag, it will be apparent that no moisture or water can pass through the sheath thus provided, and that the fluid insulation with which the conductor insulation is impregnated before leaving the factory cannot escape.

In installing this type of cable long lengths are drawn into the pipe line 4. It is necessary that the cable be protected against damage in this operation.

Accordingly I wrap heavy canvas tape 10 about the impervious sheath just described. The canvas tape 10 is wrapped helically and is intercalated with metal shielding tape 12. The shielding tape is imperforate.

As a further protection against damage and to facilitate drawing in of the cable I wrap metal armor wire 14 about the cable exterior. This armor is D-shaped in cross section, with its flat side in contact with the cable, and wound with a long pitch in the opposite hand to the wraps beneath it.

It will be apparent from the foregoing that my invention provides a cable construction wherein the cable conductor is finished at the factory, that is insulated and impregnated, and may be shipped and installed without danger of loss of the fluid insulation, without injury because of moisture or water, and without the necessity of removing the temporary lead sheath heretofore found necessary to protect the cable. Obviously this is a considerable advance over conventional practice.

In the construction illustrated in Fig. 3, I have provided a somewhat simpler construction than the one just described but with all of the advantages thereof.

In this embodiment of my invention I employ insulating paper tape 6 as before, and immediately about this insulation I wrap imperforate shielding metal tape 16, copper, for example, intercalated with varnished glass tape 18. A coating of a sealing agent such, for example, as the Vistag above referred to, is applied over these tapes so as thoroughly to seal the same against the entry of water or moisture.

As in the embodiment of my invention first described, D-armor 14 is applied to the cable exterior, being wound in the opposite hand to the intercalated tapes 16 and 18.

It will be appreciated that in both embodiments of my invention the necessity for a temporary lead or other sheath, with the expense incident thereto, is eliminated, yet the cable is at all times fully protected against loss of the cable

3

impregnant and against the deleterious effects of the elements.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described within the purview of my invention.

What I claim is:

1. A high tension cable installation comprising in combination a conductor, a wall of porous insulation around the conductor, an imperforate flexible sheath of water- and moisture-proof material wrapped helically about the said insulation, a permanent water and moisture-proof sealing coating for said sheath, intercalated tapes of metal and fabric wound helically over said coating, a solid metal strip wrapped in an open helix about the last mentioned tapes, a body of fluid insulating material filling the porous insulation and all spaces beneath the said sealing coating, a fluid-tight pipe enclosing the cable, the internal diameter of the pipe being large enough relative to the overall dimensions of the cable to permit the cable to be drawn into the pipe, and a body of fluid under superatmospheric pressure filling the space between the sheathed cable and the wall of the pipe.

2. A high tension cable installation comprising in combination a conductor, a wall of porous insulation around the conductor, an imperforate flexible sheath of water- and moisture-proof material wrapped helically about the said insulation,

4

a permanent water and moisture-proof sealing coating for said sheath, a metal shielding tape intercalated with a fabric tape wound helically over said coating, a solid metal strip wrapped in an open helix about the last mentioned tapes, a body of fluid insulating material filling the porous insulation and all spaces beneath the said sealing coating, a fluid-tight pipe enclosing the cable, the internal diameter of the pipe being large enough relative to the overall dimension of the cable to permit the cable to be drawn into the pipe, and a body of fluid under superatmospheric pressure filling the space between the sheathed cable and the wall of the pipe.

CHARLES E. BENNETT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,147,402	Faucett	Feb. 14, 1939
2,222,932	Bennett	Nov. 26, 1940
2,229,967	Flynn	Jan. 28, 1941
2,368,097	Bennett	Jan. 30, 1945

FOREIGN PATENTS

Number	Country	Date
147,565	Switzerland	Aug. 17, 1931
460,515	England	Jan. 26, 1937