

No. 640.364.

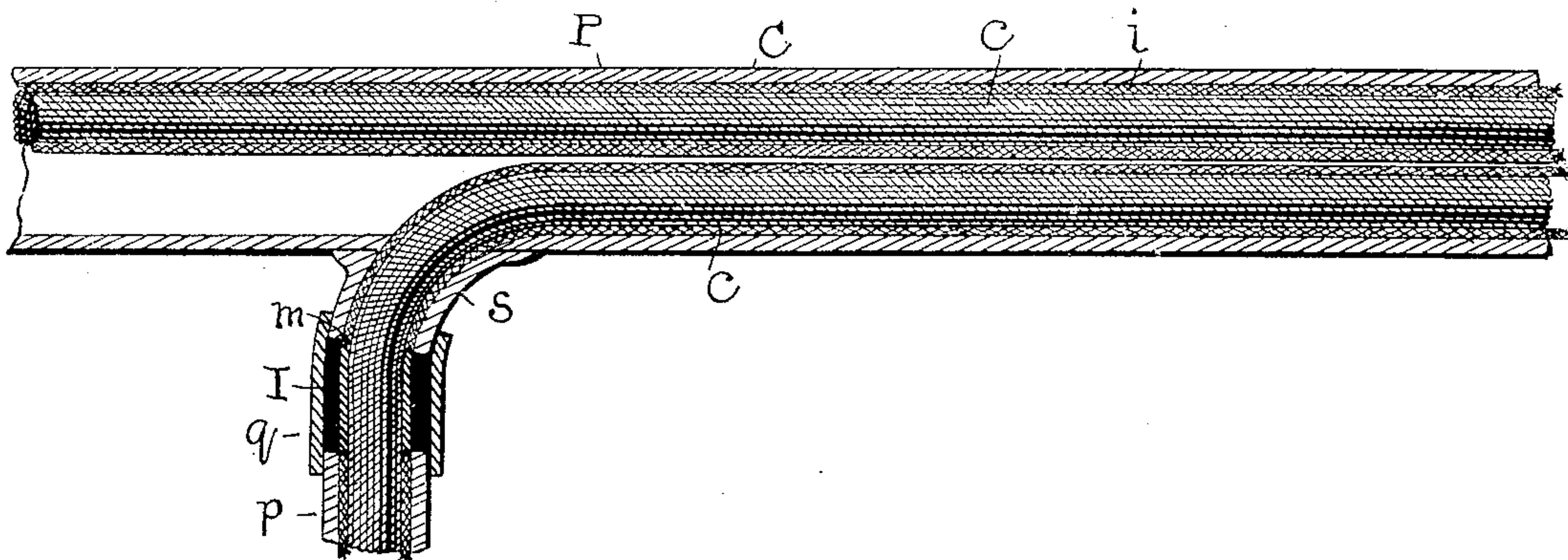
Patented Jan. 2. 1900.

W. L. CANDEE.

TERMINAL FOR ELECTRIC CABLES.

(Application filed Feb. 17, 1899. Renewed Nov. 10, 1899.)

(No Model.)



WITNESSES:

Norris A. Clark.

Anna M. Donlevy.

INVENTOR.

Willard L. Candee

BY

W. O. Vanis
his ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLARD L. CANDEE, OF NEW YORK, N. Y.

TERMINAL FOR ELECTRIC CABLES.

SPECIFICATION forming part of Letters Patent No. 640,364, dated January 2, 1900.

Application filed February 17, 1899. Renewed November 10, 1899. Serial No. 736,538. (No model.)

To all whom it may concern:

Be it known that I, WILLARD L. CANDEE, of the city of New York, (Brooklyn,) county of Kings, State of New York, have invented certain new and useful Improvements in Terminals for Electric Cables, of which the following is a specification.

My invention relates to cables composed of a number of electric conductors individually insulated from one another by a braid of fibrous substance or by a wrapping of paper or other like material constituting an insulating material possessing strong features of merit, but susceptible to attack or injury from moist air. A series of such insulated conductors are usually incased air-tight in an impermeable sheath or tube, such as lead pipe, the insulation is thoroughly dried, and there is a continually-varying degree of pressure within the tube or pipe as compared with atmospheric pressure. In the process of transporting and of laying such cables in position great care must be exercised to prevent the exposure of the ends of the cable to air and moisture, which is readily taken up by the fibrous covering and will follow along the conductors by capillary action, aided by variations with respect to atmospheric pressure. The result of this is to impair or destroy the insulation to a greater or less extent, according to the amount of moisture absorbed. Where this occurs it is a source of trouble and expense, frequently necessitating cutting out and replacing defective portions. To avoid this difficulty in a measure and to supply a portable terminal, it has been proposed to cover the end of the cable with a metallic cap; but this is serviceable only during transportation, since the cap must be removed when the cable is laid to expose the ends of the several wires to be united, as to an adjacent section. During this latter operation the ends of the wires are necessarily exposed, and if the ground be moist or if the atmosphere is charged with moisture the damage will be as great as if no metallic cap had been employed.

The present invention is an improvement upon the cable-terminal shown and described in United States Letters Patent No. 428,745, dated May 27, 1890, granted to me, where the invention consists in surrounding the several

wires of the cable for a certain distance from the end of the section with a waterproof substance or compound, so as to fill the interior of the protecting sheath or casing, the waterproof material acting as a plug or dam to prevent the passage of air and moisture.

The object of my present improvement is to more perfectly secure the result sought to be attained by the improvement described in said Letters Patent and to provide for protecting a single large stranded conductor that is tapped or led off from a cable.

My improved cable-terminal consists of a length or section of conductor composed of a series of bare strands electrically united and covered with a form of insulating material of a fibrous nature, like cotton, paper, or similar material, having strong features of merit, but susceptible to attack by air or moisture, so that damp air or water may follow along through the insulation or between the insulation and the exterior of the stranded conductor. I apply a band or section of soft metal having a comparatively low fusing-point, such as tin, which enters between the strands of the conductors, so as to fill the space or spaces, while it projects upon the outside of the conductor to a slight extent. Upon the outside of this band of soft metal I place a substantially coextensive section of impervious insulating material—such as okonite, rubber, gutta-percha, or some similar material—making an air-tight junction with the metal section described. This insulating material projects sufficiently to make an air and water tight junction with an impervious pipe section or casing, and the ends of the pipe-section are united to the lead pipe or equivalent covering of the insulated conductor to form an air and water tight junction.

The accompanying drawing illustrates my invention.

C is a cable, and, as shown, there are two conductors *c*, each insulated with a fibrous material or a paper or similar insulating material *i*. Each conductor *c* is composed of a series of strands, such as small copper wires, laid up close together. The fibrous insulating material *i* covers each stranded conductor, and the insulated conductors are inclosed in an impervious cover, sheathing, or pipe *P* of some flexible material, like lead. One of the con-

ductors *c* is to be led off, and for this purpose the pipe *P* is opened, and a section *s* of lead pipe is arranged to cover the branching point, the usual wipe-joint being employed. At a
 5 short distance from the described point the fibrous insulation is cut away for a space of from four to six inches, and a section of soft molten metal *m*, preferably tin, is run onto the exterior of the stranded conductor, pro-
 10 jecting slightly from the surface and entering the interstices due to the stranded nature of the conductor, forming an air and moisture proof junction. Upon the exterior of this section of soft metal *I* place a substantially
 15 coextensive band or section of impervious insulating material *I*, preferably rubber, okonite, or gutta-percha. This section projects sufficiently to make a tight junction either with the interior surface of the pipe *p* or with
 20 the interior surface of a pipe-section *q*, which may be drawn on over it. The junction between *q* and *I* must be air and water tight, and where *q* is employed the ends of *q* should be soldered or connected with a wipe-joint to
 25 the severed terminals of the lead pipe *p*. The conductor *c* may be tapped or "legged" onto a similar-cabled conductor and the same device employed to prevent access of air and moisture to the cable or to the surface of the
 30 conductor.

It will be seen that where a stranded conductor has a terminal constructed as shown and described it will be impossible for mois-

ture and air to gain access to the fibrous or similar covering of the conductor *c* within the
 35 cable.

What I claim, and desire to secure by Letters Patent, is—

1. An electrical conductor consisting of a series of strands electrically united, an insu-
 40 lating-coating therefor composed of a material susceptible to attack by air or moisture, a cover or sheathing for said conductor composed of an impervious material, a section of
 45 soft metal uniting the strands of said conductor together and projecting from the surface thereof and an impervious insulating material filling the space between the surface of said metal section and said cover or sheath-
 50 ing, substantially as described.

2. An electrical conductor consisting of a series of strands electrically united, an insu-
 55 lating-coating therefor composed of a material susceptible to attack by air or moisture, a cover or sheathing for said conductor composed of an impervious material, a section of tin uniting the strands of said conductor and projecting from the surface thereof and an impervious insulating material filling the
 60 space between the surface of the tin section and said cover or sheathing, substantially as described.

WILLARD L. CANDEE.

Witnesses:

W. B. VANSIZE,

THEODORE L. CUYLER, Jr.