(No Model.)

W. H. SAWYER.

METAL TIPPED ELECTRIC CORD.

No. 324,171. Patented Aug. 11, 1885.

Fig 1

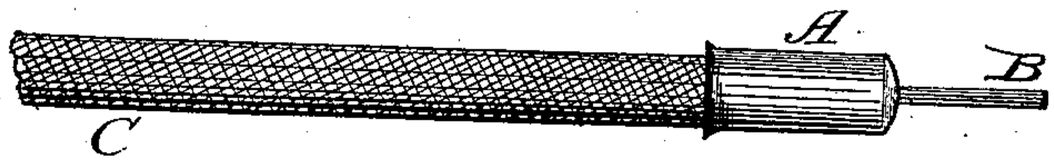


Fig. 2.

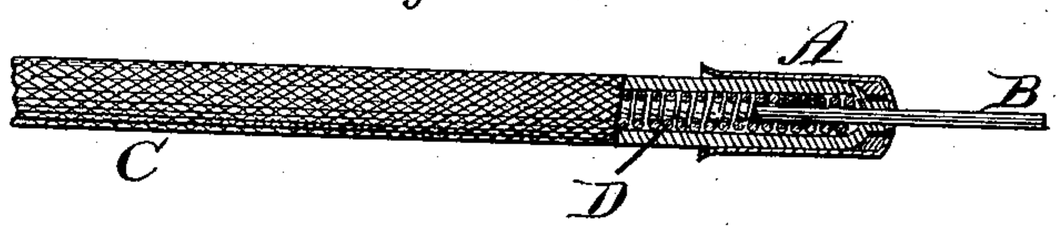


Fig. 3.

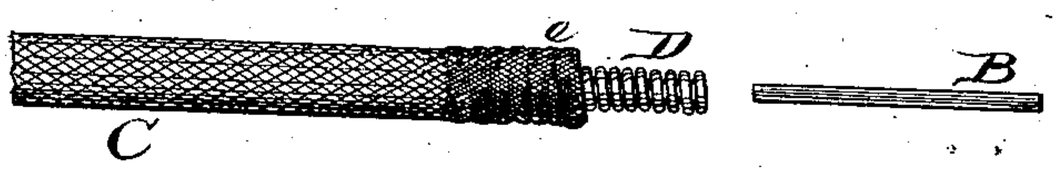


Fig. 4

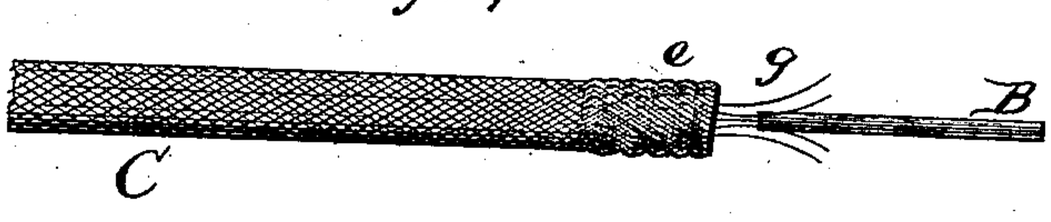


Fig. 5.

Fig. 6

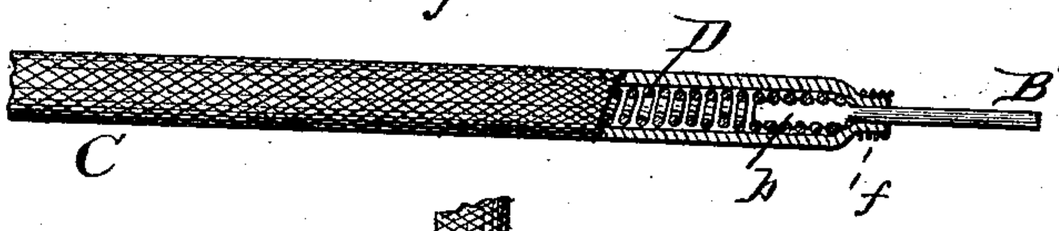
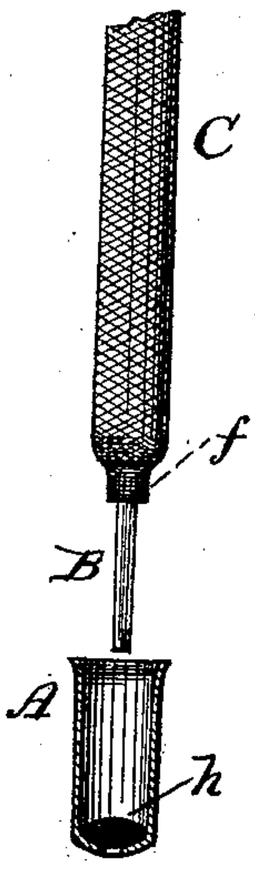


Fig. 7.



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METAL-TIPPED ELECTRIC CORD.

SPECIFICATION forming part of Letters Patent No. 324,171, dated August 11, 1885.

Application filed February 16, 1885. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SAWYER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Metal-Tipped Electric Cords; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates especially to metal-tipped telephone-cords, though flexible electric conducting-cords for other purposes may have metal tips applied to them according to my improvement.

The most approved form of tip comprises in its general construction a metallic shell which fits upon the end of the cord, and a metallic stem or needle which has one end electrically connected to the metallic core of the cord, and projects through a hole in the outer end wall of the shell. The shell protects the covering of the cord at the point where it is most liable to wear, and the stem or needle is for insertion into the eye of a binding-post or into any other suitable clamp.

The shell and needle have been connected to a cord by various means. In one instance the needle is provided at one end with a ring or hook, which is made fast to the core of the cord, and after the needle has been inserted into and through the opening at the outer end of the shell and the end of the cord is drawn in, the shell is compressed upon the cord and creased or contracted behind the ring, to fasten shell, cord, and needle together. Such a mode of tipping cords is very expensive, involving a great deal of labor in the special construction of the needle and in the manipulation of the shell to compress and crease it. In another instance the needle or stem is headed and projected through the hole in the end wall of the shell with its head inside. A piece of soft solder is then placed in the shell behind the head, and the end of the cord is then inserted, with its core pressed against the solder. The parts being held in these positions, the shell is placed in a flame for a moment to melt the solder, which then holds the needle, shell, and cord-core together. This mode is obviously expensive on account of the time consumed and the forming of the needle or stem with a head. The electric connection of the cord-core and the needle is, moreover, liable to be defective and mechanically insecure. In still another instance the shell is screw-threaded internally, the needle is screwed into the spiral-wire core of the cord, and then the end of the cord is screwed into the shell, and must be of such diameter that its soft covering will take into the screw-thread by jamming in order to hold the shell. The head of the needle has also been threaded to engage with the shell. This style is the most expensive of all on account of the screw-threading, which requires much time and labor, and necessitates an extra thickness of the shell to receive it.

My improvement is designed to overcome the objections attending metal-tipped cords as heretofore made, and to enable the application of tips to flexible electric cords in a cheap, simple, and reliable manner. It will be readily understood from the following particular description, in connection with the accompanying drawings, in which—

Figure 1 is a side view of the end of a conducting-cord provided with a tip in accordance with my invention. Fig. 2 is a longitudinal diametric section of the same. Fig. 3 is a view of the end of the cord, with its core partly exposed and the needle ready for connection thereto. Fig. 4 is a view of the end of a cord having another kind of core, with the needle ready for connection thereto. Fig. 5 is a view of a different kind of needle, which is to be screwed into a spiral-wire core, and Fig. 6 is a sectional view showing such a needle inserted. Fig. 7 is a view showing the shell prepared to receive the needle and the end of the cord, the shell being shown in section.

The letter A indicates the shell. It can be made of very thin metal, as it is not required to be compressed, creased, or screw-threaded, and its own strength has but little to do with holding it to the cord, as will appear.

B in Figs. 2 and 3 is a needle, which is nothing more than a plain piece of wire; and

B′ in Figs. 5 and 6 is a different kind of needle, being a piece of wire having a portion, *b*, flattened, and its edges notched as a screw-thread.

C is the cord having the well-known spiral-wire core D, a part of which in Fig. 3 is bared by pressing back temporarily its fibrous or other covering, as at *c*.

In putting the parts together I insert a portion of either a screw-threaded or plain needle into the spiral core, and, preferably, solder it thereto or bind it in place by winding a piece of fine wire tightly around the core and between its turns. If a screw-needle is used, it will have its screw portion of proper size to screw snugly into the core, and may either be soldered or retain its hold by means of its engagement with the turns of the core, though I prefer to solder it. The needle being secured, I then pull up the covering over the core and bind it upon the needle near the core, as shown at *f* in Figs. 6 and 7. I then take a shell and turn it open end upward, as in Fig. 7, and drop into it a small portion of cementing-wax, as at *h*, either cold or melted. If melted it will not run through the needle-hole to any disadvantageous extent. I then pass the needle through the shell, and seizing its tip when it appears through the needle-hole, I force the shell snugly upon the end of the cord, if melted wax has been used. When the cementing-wax cools, it holds the shell firmly in place upon the cord, mixing with or penetrating the fiber if a braided or other fibrous covering is used, without injuring it, as a metal solder is liable to do. If a piece or several small pieces of the cementing-wax be dropped into the shell cold, the needle may be passed through the shell, and then the wax may be melted by applying heat to the shell while the end of the cord is being drawn into it. Glue or any ordinary adhesive substance would answer to hold the shell upon the cord; but I prefer a cement made of about equal parts of rosin and beeswax, which is hard when cold, and slightly fluent or viscous when warmed. The contraction of the shell by the cooling also causes it to bind upon the cord, which should be of a size to fit the shell tightly.

If the cord should have a core composed of several fine wires, as shown at *g* in Fig. 4, I simply lay them about the needle and bind them thereto with thread or fine wire, preferably the latter, and cement the shell upon the cord.

Having now described my invention, I claim—

A flexible electric conductor having a non-conducting covering and a metallic stem or needle projecting endwise beyond the same, the covering being surrounded immediately adjacent to the stem or needle by a metallic shell secured to the said covering by a non-metallic cement, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. SAWYER.

Witnesses:

GILMAN E. JOPP,

W. A. HATHAWAY.