

UNITED STATES PATENT OFFICE.

HUGO GALLINOWSKY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE LITHOSITE MANUFACTURING COMPANY, OF SAME PLACE.

METHOD OF AND APPARATUS FOR MAKING ELECTRICAL-INSULATION CONDUITS.

SPECIFICATION forming part of Letters Patent No. 609,094, dated August 16, 1898.

Application filed November 15, 1897. Serial No. 658,606. (No model.)

To all whom it may concern:

Be it known that I, HUGO GALLINOWSKY, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Methods of and Apparatus for Making Electrical-Insulation Conduits, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a view illustrating my improved method of and apparatus for making electrical-insulation conduits. Fig. 2 is a detail view of a portion of the head and tail stocks of a lathe, with the mandrel upon which the conduit is formed in position. Fig. 3 is a longitudinal sectional view through my improved conduit, and Fig. 4 is an enlarged cross-sectional view of the same.

This invention relates to a new and useful improvement in methods of and apparatus for making electrical-insulation conduits, the object being to make a conduit which will be light, strong, and an effective insulator.

The invention consists, generally stated, in a method, hereinafter described, of making electrical conduits, which consists in winding a fibrous material, preferably treated with a cementitious substance, on a suitable mandrel, by which said conduit is given its shape, then hanging or suspending said mandrel by one end, so that the conduit will slip off by its own gravity, which polishes the interior thereof, giving the said interior a certain grain or fiber and preserving its shape, so that when said conduit has passed from its mandrel it will harden in the shape desired.

Another feature of the invention resides in the apparatus for carrying this method into effect, which consists in the combination of a supply of fibrous material, a trough containing a cementitious substance in which said fibrous material is immersed, means for removing the surplusage of cementitious material, and a mandrel upon which said fibrous material so treated is wound, said mandrel having at one end a centering device and a hook or eye by which the mandrel is suspended after the conduit is wound thereon.

Other features of invention reside in the construction, arrangement, and combination of the several parts, all as will hereinafter be described, and afterward pointed out in the claims.

In the drawings, A indicates the floor, and B the ceiling, of a room, and C the joists under the ceiling, said joists C being preferably provided with suitable pegs, nails, or other supporting devices *c*, from which the mandrels are suspended when conduits are hung up to dry and which by their own gravity slip from said mandrels.

D indicates a reel, preferably supported from the joists C, which reel carries a supply of fibrous material E, which is preferably in the form of burlap, or other fibrous material may be used, if desired.

F indicates a trough or box arranged on the floor A and carrying a roller G under which the fibrous material passes, and in so doing is immersed in a cementitious substance of a character to be hereinafter described. After becoming saturated with the cementitious material in box F the fibrous material E passes between two rollers H and H', which remove the surplus cementitious material, as is well understood.

I indicates a suitable table or support, upon whose ends are arranged a head-stock J and a tail-stock K. Head-stock J has attached to it a crank *j* by which said head-stock may be turned.

L indicates a mandrel, on one end of which is arranged an eye or hook *l*, said eye or hook being formed with a centering device *l'* to co-operate with the tail-stock K. The other end of mandrel L carries a suitable locking-plate *l''*, by which it engages the revoluble head-stock J, locking the mandrel to said head-stock, so that said mandrel may be rotated. The fibrous material after being saturated with the cementitious substance in trough F passes between rollers H and H' and is wound on mandrel L, said mandrel being given as many turns as it is desired to apply thicknesses of the fibrous material. When a sufficient number of thicknesses have been wound on the mandrel, the fibrous material E is severed and the mandrel again turned and painted with the cementitious substance in box F. The ends of the fibrous material

are now trimmed by a suitable knife, the mandrel being turned at the same time.

After the fibrous material has been wound on the mandrel a straight tube X is formed, as shown by dotted lines in Fig. 2. The fibrous material being wound on the mandrel, the mandrel is removed from between the stocks J and K, and a short section of a tube Y is slipped over one end of the tube X, as shown in Fig. 3. This section Y is of the same material, but is firm and hard, having been previously made and hardened and cut in short sections for placing on the ends of the green tubes X. The mandrel is now hung up by its eye or hook *l* on the pins *c*, and gravity asserting itself causes the green conduit to slip down off of the mandrel, centering devices M being placed immediately thereunder to receive the green conduit and to support it in a vertical position after it leaves the mandrel. The hardened collar Y forms a hard base for the green conduit and prevents the same from becoming bent over or marred in this action. The centering devices M are preferably arranged on a base-plate *m*, so that they may be removed when a conduit is received thereon and other centering devices substituted in their place to receive other green conduits which may be suspended from the hooks or pins *c*. The conduits are left on the centering devices M until they are sufficiently hard to be handled without danger of mashing them or destroying their contour. When the conduits are slipping from the mandrels, the fibrous material is given a grain, and at the same time the interior of the conduit is polished, so as to make it smooth and even.

In addition to the collar Y acting as a firm support for the green conduit it also acts as a joining-collar when the conduits are laid in position end to end, making a tight joint, with the end of the adjacent conduit introduced thereinto. In laying the conduits end to end I prefer to use cementitious material on the end of the conduit introduced into the collar Y, so as to make a tight joint between the two.

The composition of the cementitious material in box F, to be used in connection with making my conduit, consists of the following ingredients: I take of liquid chlorid of magnesium a suitable quantity which is of the consistency of 30° Baumé. After ascertaining the percentage of calcium chlorid therein I add an equal amount of oxalic acid to neutralize the said calcium chlorid. This is to prevent sweating in the conduit by the slacking of the lime. To every pint of chlorid of magnesium I then add one and one-half pounds of oxid of magnesium, and in order to quicken the process of drying I may add a quantity of sal-ammoniac with the oxid of magnesium equal to about five per cent. thereof.

The filler used in connection with this cementitious mass may be any of the following ingredients, introduced in proportions of about one to one—that is, fifty per cent. of

filler to fifty per cent. of the mass composed of chlorid of magnesium and oxid of magnesium, as before described: graphite, powdered talc, slate-dust, pyrites, powdered mica, or other suitable material. I prefer in the selection of this filler to use one which is of itself a non-conductor of electricity. This mass is thoroughly mixed in the box F and the fibrous material immersed therein and saturated therewith, as before described.

After the fibrous material has been wound on the mandrel and given the shape desired and before the mandrel is hung up, as before described, I may, if desired, immerse the green conduit in a bath of chlorid of zinc to close the pores thereof. This immersion can also take place after the conduit has become hardened.

I am aware that the proportion of the ingredients and the ingredients themselves in my improved cementitious substance may be changed and that the construction and arrangement of the apparatus for carrying my improved method into practice may be modified to suit different conditions without in the least departing from the nature and principle of my invention.

Having thus described my method and apparatus, what I claim, and desire to secure by Letters Patent, is—

1. The herein-described method of making conduit-pipe, which consists in wholly submerging fibrous material in a bath of oxy-chlorid cement, thus saturating said material from both sides, winding said fibrous material so treated on a mandrel, and then removing the mandrel before the cement completely sets, by suspending the same by one end so that the mandrel will slip out, substantially as described.

2. The herein-described method of making electrical-insulation conduits, the same consisting in winding a fibrous material treated with an insulation cementitious substance on a suitable mandrel, placing a hardened collar on one end of said green conduit, then suspending said mandrel, so that the green conduit will slip off of the same by gravity, the hardened collar on the end of the green conduit acting as a base or support, and preventing the end of the green conduit from becoming upset or marred, substantially as described.

3. The herein-described apparatus for making conduits, the same comprising suitable stocks, and a mandrel having a hook or eye formed on one end with a centering device beyond said hook or eye, and a locking device at the other end of said mandrel, substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 9th day of November, 1897.

HUGO GALLINOWSKY.

Witnesses:

HUGH K. WAGNER,
F. R. CORNWALL.