(No Model.)

R. S. WARING.

MANDREL AND DIE FOR CABLE PRESSES.

No. 294,544. Patented Mar. 4, 1884.

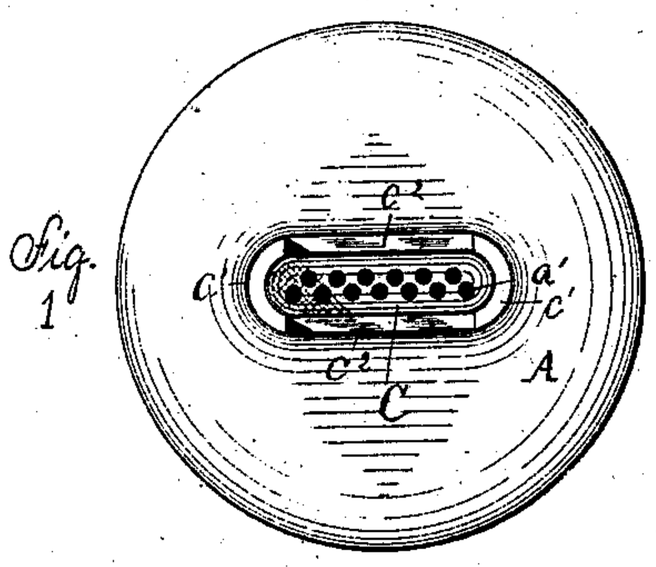

Fig. 1

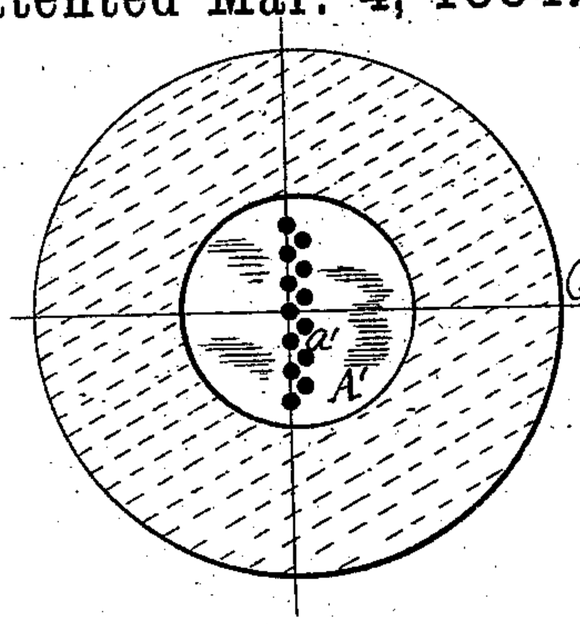

Fig. 2.

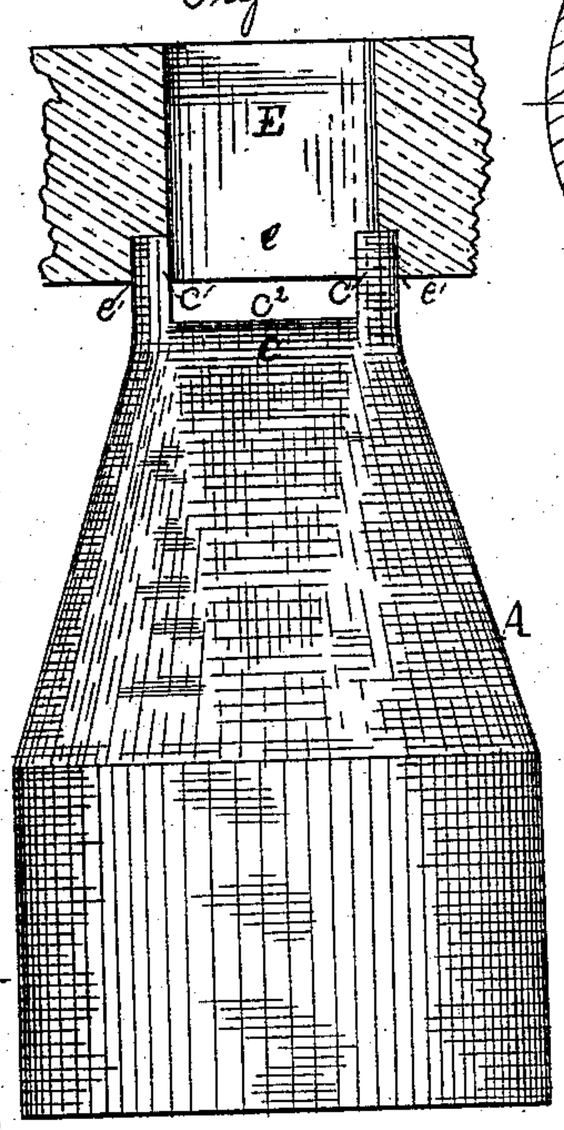

Fig. 5.

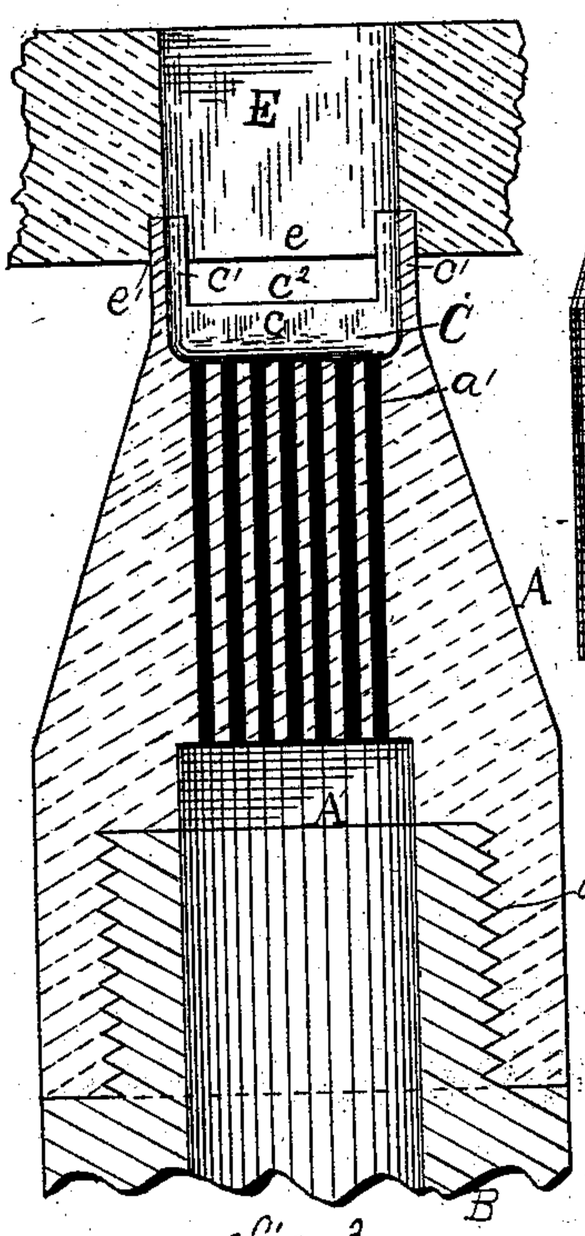

Fig. 3.

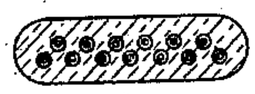

Fig. 7.

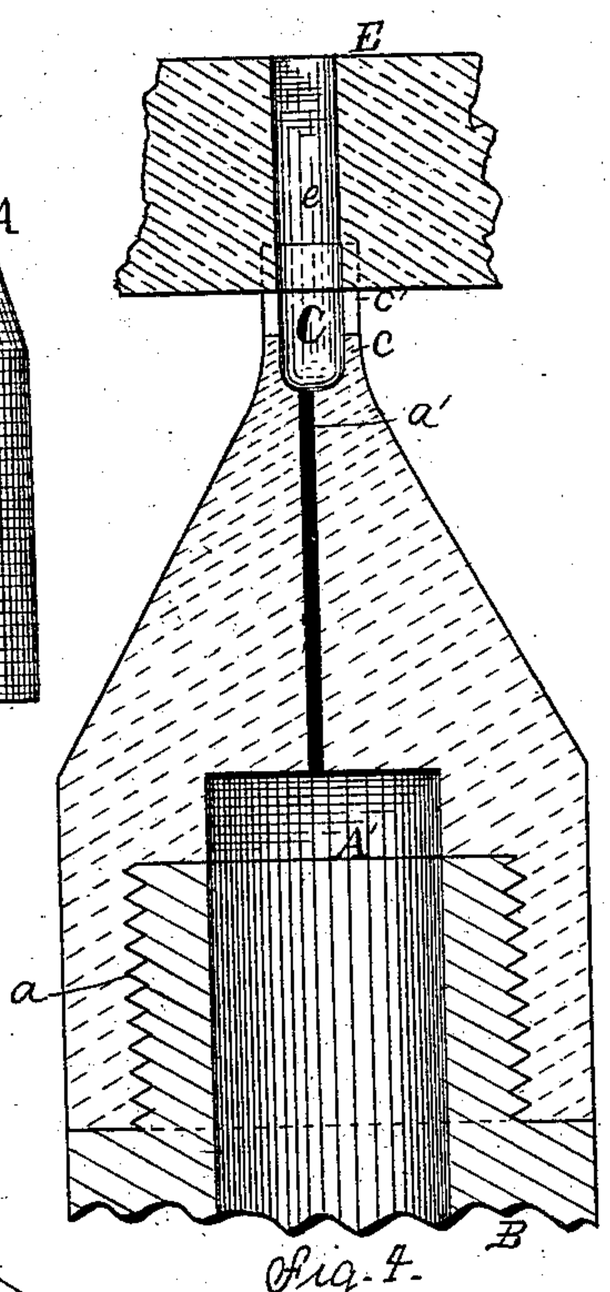

Fig. 4.

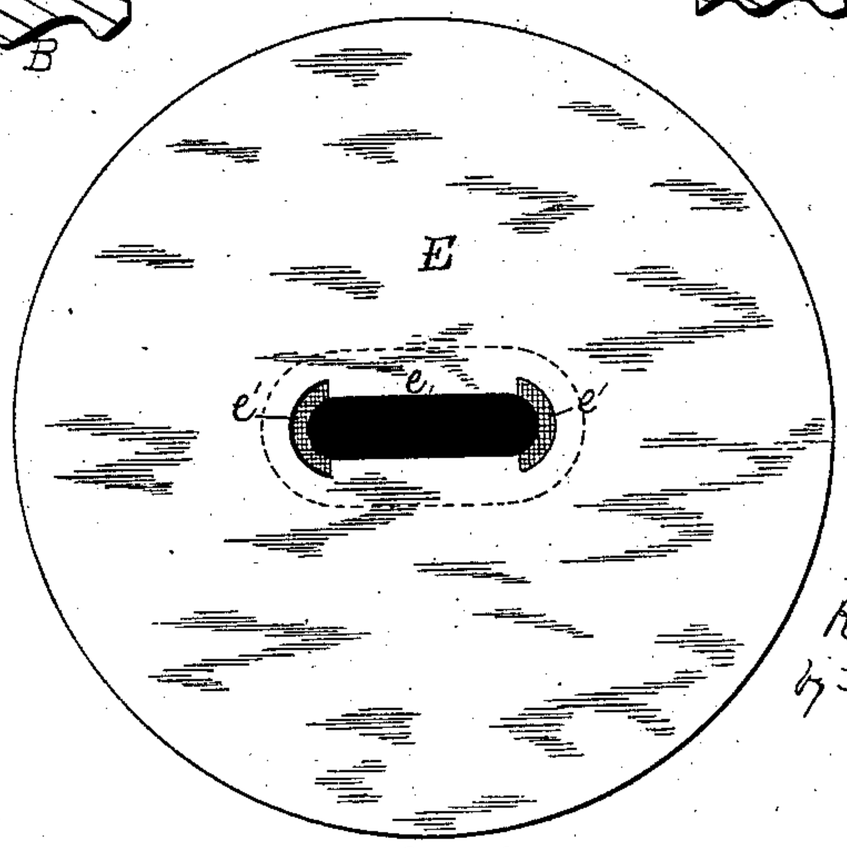

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD S. WARING, OF PITTSBURG, PENNSYLVANIA.

MANDREL AND DIE FOR CABLE-PRESSES.

SPECIFICATION forming part of Letters Patent No. 294,544, dated March 4, 1884.

Application filed August 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, RICHARD S. WARING, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Mandrels and Dies for Cable-Presses; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is an end view of my improved mandrel, looking upon the point. Fig. 2 is a transverse sectional view. Figs. 3 and 4 are longitudinal sectional views of the mandrel and die, taken in the planes of the lines *y y* and *z z*, respectively, of Fig. 2. Fig. 5 is a view in side elevation of the mandrel, with a sectional view of the die. Fig. 6 is a plan view of the die, and Fig. 7 is a sectional view of one form of cable made by my improved mandrel.

My invention relates to mandrels or wire-holders employed in a lead-press for making lead-covered electric cables; and in general terms it consists of a mandrel having wire-passages therethrough and a guard or shield at the point combining with the die to admit lead-supply to the wires at certain points, as hereinafter more fully described and claimed.

In the drawings, A represents a tapered body of iron, steel, or other suitable metal, in the base end of which is formed a threaded socket, *a*, for making attachment to the threaded end of the tubular core-bar B of the press. A chambered recess, A′, in the base of socket *a* registers with the tubular passage in bar B, and affords a common passage for introducing the wires of the cable. In order to hold the wires at suitable intervals apart and in the desired order of arrangement or relationship to each other, separate passages *a′* are made through the body of the mandrel from the base of recess A′ to the point. These passages may be arranged in any desired order; but I prefer to arrange them in two rows, the passages constituting one row alternating in order of occurrence with those of the other row. This is done with reference to making a flattened cable, and securing compact arrangement of wires with easy access of lead to all parts of the wire-surface. At the point of the mandrel is made a recess, C, forming thereby an extended rim, *c c′*, surrounding the openings to the wire-passages. The side rims, *c*, are cut out in part, forming openings c^2, through which lead flows to and around the wires. At and near the edges the rims *c′* are extended, so as to enter correspondingly-shaped recesses *e′* in the die E. The rims *c′* fit closely in these recesses, and thereby hold the die and mandrel in fixed relationship. The inner surfaces of these rim extensions *c′* are in effect portions of the die-opening *e*, and operate as such in giving shape to the exterior surface of the cable, and they also perform the function of preventing lateral displacement of the die and mandrel, as above stated. This I consider an important feature of improvement, and insures a more uniform covering in the cable than can be secured when the mandrel and die are wholly separate, and may move laterally with relation to each other. The die E, together with that part of it formed by the rim extensions *c′*, operates in compressing the lead so as to cause it to make adhesive union around the wires, and also in shaping the exterior of the cable, substantially as the corresponding devices heretofore employed.

In operation the wires to be embodied in the cable are introduced through the passages *a′* and carried through the die E, where their ends may be united either by twisting them together, or by preference by means of a perforated button, which answers the double purpose of connecting the wire ends, and also spacing them in the same order and relationship as by the passages *a′*. As lead is forced out of the cylinder of the press, it will enter the recess C around the wires, and, filling the same, will pass outward through the die, carrying the wires along with it, completely embedding the latter in the body of metal so delivered from the press.

While I prefer, for the reasons above given, to make the rim extensions *c′* of sufficient length to enter corresponding recesses, *e′*, in the die, still I do not wish to limit my inven-

tion by this specific feature of improvement, because the mandrel may be and has been used by me with good results with the extensions c' resting on the face of the die. This is especially the case when suitable provision is made in other ways for preventing lateral displacement of the die and mandrel. In either of these cases the rims c' prevent direct flow and pressure of lead upon the wires in the direction of the rows in which they are arranged, and in this respect, also, they are of material advantage and importance, because such pressure, if it existed unrestricted, would tend injuriously to bunch the wires by deflecting them out of proper alignment.

A special feature of advantage secured by this invention is the provision made thereby for bringing the wires into close relationship, so as to make a cable of given area in cross-section to contain a comparatively large number of wires. By means of the rim $c\ c'$ the wires are suitably protected from direct flow and pressure of lead, and by omitting the nipples ordinarily employed in this class of mandrels the passages a' may be brought much closer together.

I claim herein as my invention—

1. A mandrel for a cable-press, having separate wire-passages therethrough, and a recess therein at the point, into which the passages open, substantially as set forth.

2. A mandrel for a cable-press, having wire-passages therethrough, with a rim extension at the point surrounding the ends of the passages, and openings in the sides of the rim to admit lead to the rim-inclosure, substantially as set forth.

3. The mandrel A, having separate passages a' therethrough, opening into a recess, C, in the point, such recess having openings c^2 in its side walls for admitting lead-supply to the recess, substantially as set forth.

4. The mandrel A, having separate passages a' therethrough, opening into a recess, C, at the point, such passages being arranged in one or more rows, substantially as set forth.

5. A mandrel for a cable-press, having a recess at the point, into which the wire-passages open, in combination with a die co-operative with the walls of the recess in shaping the exterior of the cable, substantially as set forth.

6. The mandrel A, having recess C and rim extensions c', in combination with die E, having recesses e' therein, adapted to receive the extensions c', substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand.

RICHARD S. WARING.

Witnesses:
R. H. WHITTLESEY,
C. L. PARKER.