

(No Model.)

R. S. WARING.
MANDREL FOR CABLE PRESSES.

No. 294,540.

Patented Mar. 4, 1884.

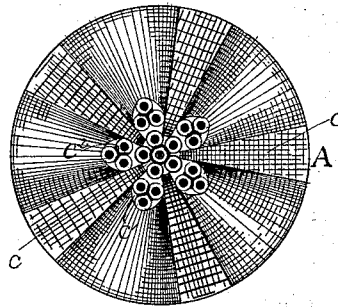


Fig. 1.

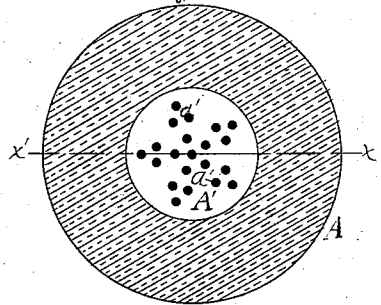


Fig. 2.

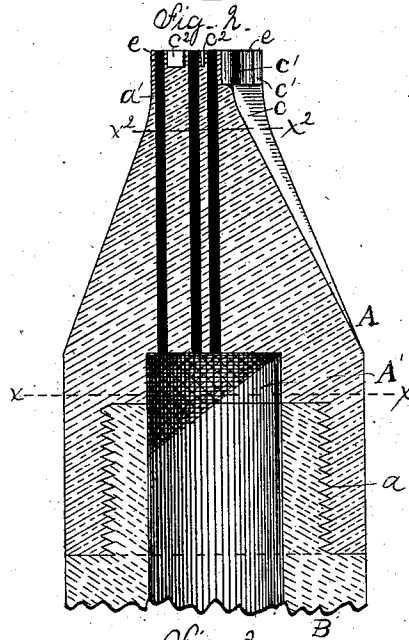


Fig. 3.

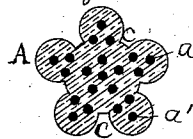


Fig. 4.

Witnesses—
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UNITED STATES PATENT OFFICE.

RICHARD S. WARING, OF PITTSBURG, PENNSYLVANIA.

MANDREL FOR CABLE-PRESSES.

SPECIFICATION forming part of Letters Patent No. 294,540, 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 and State of Pennsylvania, have invented or discovered a new and useful Improvement in Mandrels 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 or nipples. Fig. 2 is a transverse sectional view taken in the plane of the line $x x$, Fig. 3, and looking toward the point of the mandrel. Fig. 3 is a longitudinal sectional view, the plane of section being indicated by the line $x' x'$, Fig. 2; and Fig. 4 is a transverse sectional view taken in the plane of the line $x'' x''$, Fig. 3.

My invention relates to mandrels for cable-presses designed for making cables having a circular arrangement of wires; and, in general terms, it consists of a tapering body of metal having wire-passages therethrough, such passages being arranged in groups in circular order around a central group, with grooves extending longitudinally on the tapered surface between groups of wire-passages terminating at the point of the mandrel in nipples or tubes, as hereinafter more fully described and claimed.

In the drawings, A represents a tapering body, of iron, steel, or other suitable metal, having at its larger end or base a threaded socket, a , for making attachment to the threaded end of the core-bar B of the press, the tubular passage of which registers with the socket-chamber A' in the mandrel-body. Extending from chamber A' to the point or smaller end of the mandrel-body are made a series of passages, a' , which are arranged in different groups, one such group occupying the central or axial part of the mandrel, and others composed of three passages, each occurring at intervals in circular order around the central group. On the exterior tapered surface of the mandrel-body, in lines between the groups of passages forming the outer circle, are made grooves c . These grooves increase in depth toward the point where they emerge

partially within the circle of the central group of passages. Their purpose is to provide passages for flow of lead past the outer groups of passages to the inner parts of the mandrel-passages, or to the cable made thereby. The mandrel, at and near the point, is given a lobed form by these grooves, (see Fig. 4,) each such lobe including or carrying one of the three passage groups which together form the outer or surrounding circle. At the point of the mandrel the several wire-passages a' terminate in nipples or tubular extensions e , which are formed by cutting grooves c' in the metal between the separate passages of each group, and also cutting channels or narrow passages c'' across the end connecting the grooves c' between the openings to the separate passages. The inclosing-walls of the wire-passages are thus reduced to comparatively thin and light body; and to secure adequate strength to withstand the pressure required in work, the channels c'' are made shallow or of less depth—say about one-half the depth of the grooves c' . Greatest working pressure of lead upon the nipple-surfaces is toward the center of each group, and by making the end channels, c'' , shallow a web or body of metal is secured in the center of each group, between its passages, which assists materially in sustaining the pressure of lead. Lead flowing along the grooves c , under pressure thereon, within the cylinder of the press, is applied directly to the outer surfaces of all the nipples contained in the outer circle of groups, and is also delivered or directed into the grooves c' and channels c'' between all the nipples or passages both in the inner and outer groups. Provision is thus made for securing an adequate supply of lead between all the nipples, which, uniting around the nipples under pressure, passes off from each, forming continuous unbroken walls of covering for each and all the wires of the cable.

So far as I am aware, it is new with me to provide for grouping wires in circular order in this class of cables. By means of this provision I am enabled to bring the wires into close proximity in the cable and secure the continuous unbroken body or walls of covering requisite to successful use for electrical purposes. These features of construction and advantage are very useful in practice, because

it enables me to cover a large number of wires with a comparatively small amount of lead, and also to combine the same into a single compound cable of comparatively light weight and small sectional area.

It will be observed that the passages composing the circle of the central groups correspond in number to the groups forming the outer or surrounding circle, and that they are in the same radial lines as the outer groups. This feature of arrangement is designed with reference to carrying the exterior grooves, *c*, well into the inner circle of passages, and thereby conduct lead-supply into the central group of passages.

The cable may be given any desired form of exterior, such form being imparted to it, as heretofore practiced in the art, by the shape of the die-opening employed. I prefer a form in cross-section substantially similar to the section of mandrel shown in Fig. 4; but I make no claim herein to such a cable or to a cable of other form containing the peculiar grouping of wires herein described, as the same will be included in the subject-matter of other applications. Also, in another application I have described and claimed a mandrel embracing substantially the features of construction contained in one of the outer groups of passages, and therefore I make no claim herein to the same individually considered, my present invention having reference more particularly to the features of construction by which I am enabled to group a number of such parts or elements into one mandrel with successful results in making compound cables therewith.

I claim herein as my invention—

1. A mandrel, *A*, for a cable-press, having groups of tubular nipples thereon, such groups being arranged in circular order around a central group, and having grooves *c* in its side, such grooves extending longitudinally be-

tween successive groups of nipples, substantially as set forth.

2. A mandrel, *A*, for a cable-press, having wire-passages therethrough, terminating at the point in separate groups of nipples, such groups being arranged in circular order around a central group, the outer circle of groups being divided one from another by grooves cut radially between them, such grooves being extended in depth at the point of the mandrel to or within its central group of nipples, substantially as set forth.

3. A mandrel, *A*, having wire-passages therethrough, such passages terminating at the point in separate groups arranged in circular order around some central group, with grooves *c*, separating the groups of the outer circle, smaller grooves *c'* between the individual passages of each group, and channels *c''*, connecting the grooves *c'* across the ends between passages, substantially as set forth.

4. A mandrel for a cable-press, having passages therethrough, terminating at the point in separate tubular nipples, such nipples being arranged in groups of three around some central group, with surface-grooves on the mandrel extending to its point between the outer groups of nipples, substantially as set forth.

5. A mandrel for a cable-press, having wire-passages therethrough, terminating at the point in separate groups of nipples, such groups being arranged in circular order around and in the radial lines of the nipples of a central group, with surface-grooves on the mandrel, dividing the several outer groups one from another, and extending in depth within the circle of nipples of the inner group, substantially as set forth.

In testimony whereof I have hereunto set my hand.

RICHARD S. WARING.

Witnesses:

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