

No. 699,459.

Patented May 6, 1902.

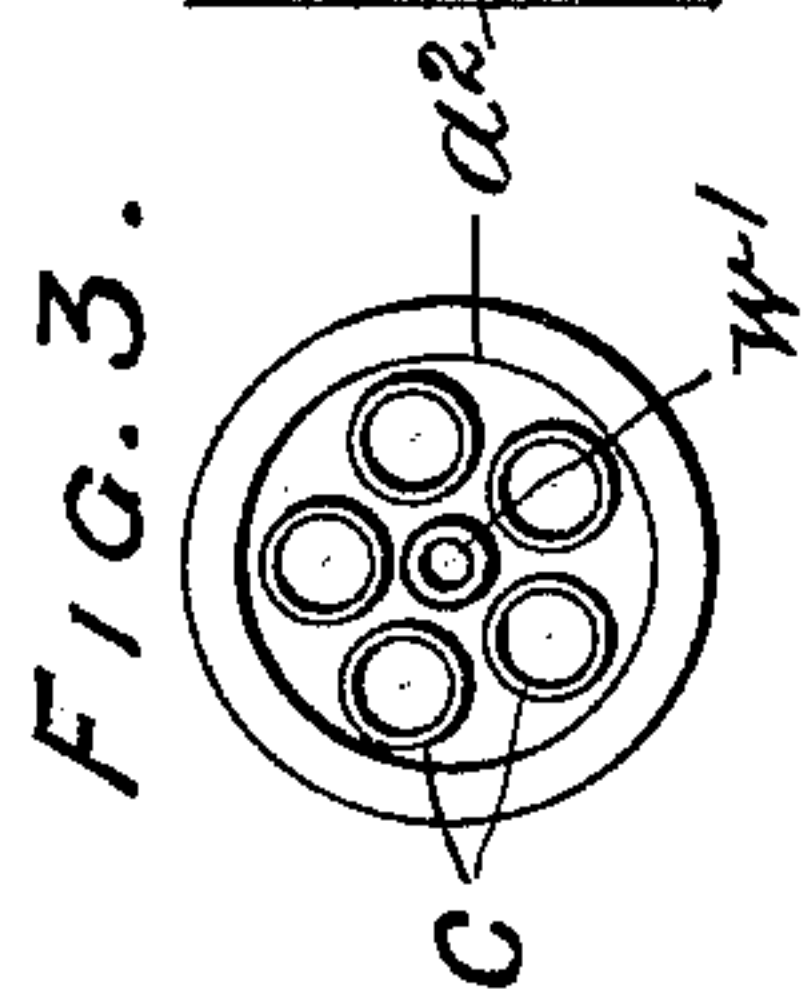
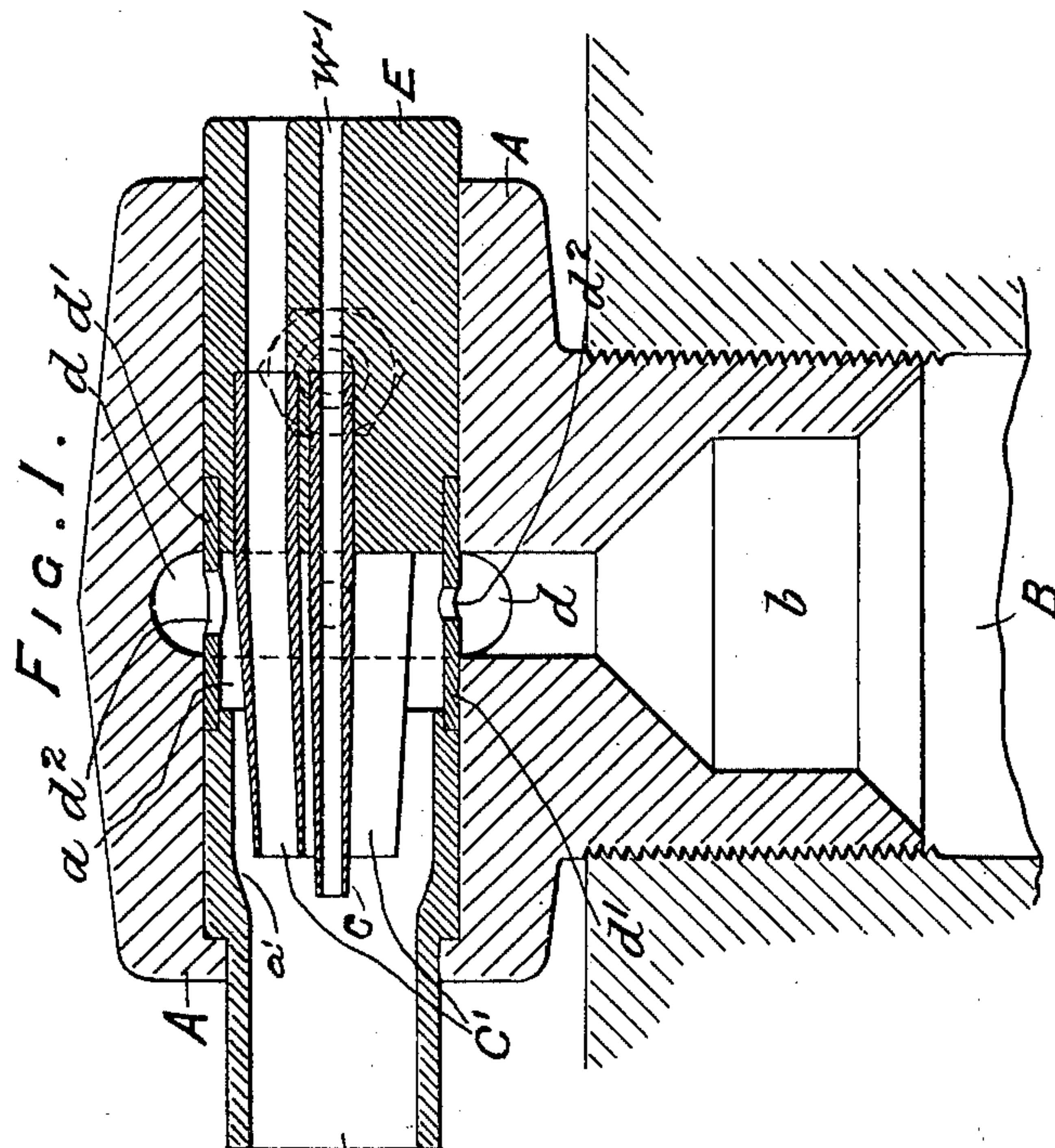
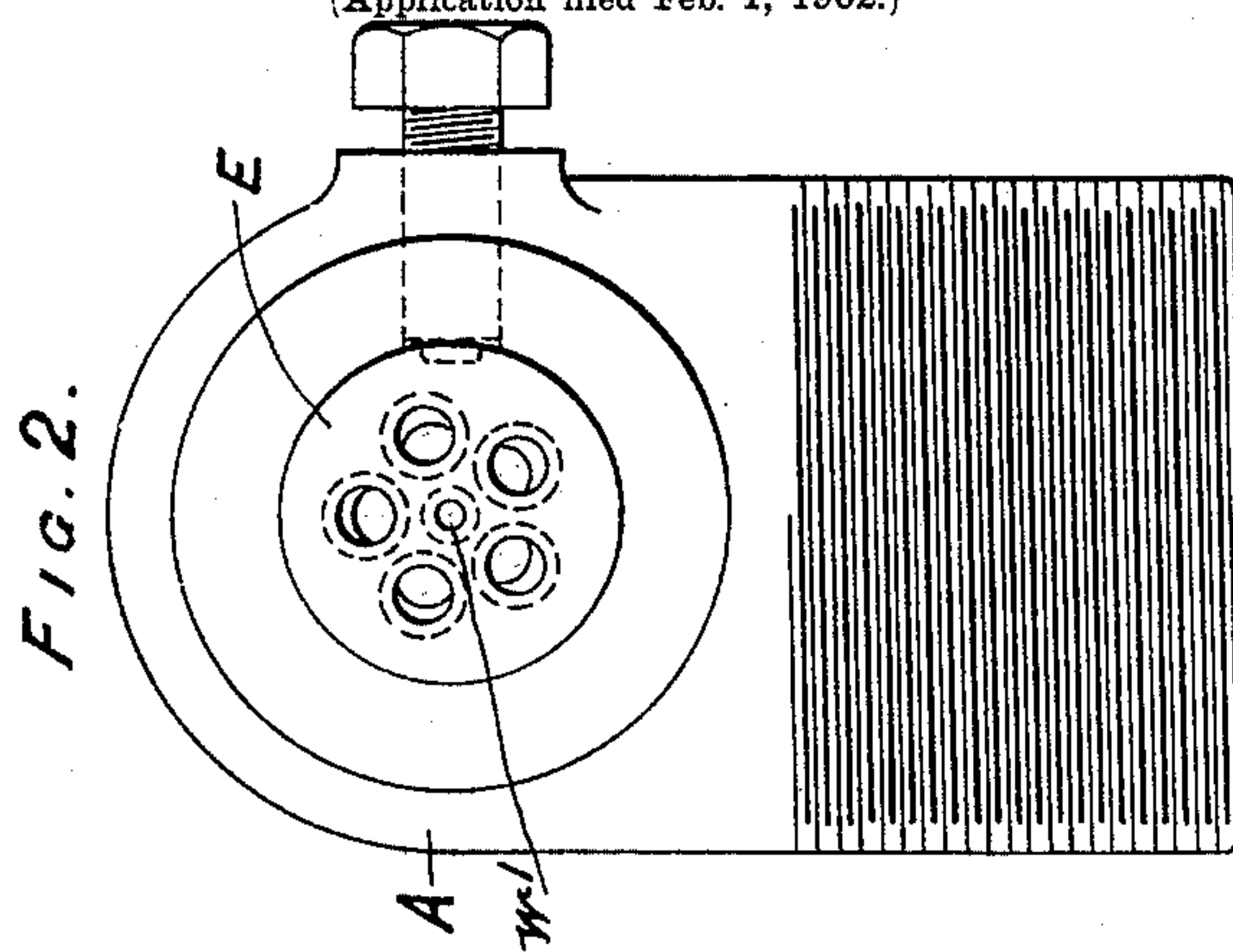
H. W. DOVER.

APPARATUS FOR INSULATING OR COVERING STRANDS AND FORMING THE
SAME INTO CABLES.

(No Model.)

(Application filed Feb. 1, 1902.)

2 Sheets—Sheet 1.



WITNESSES :

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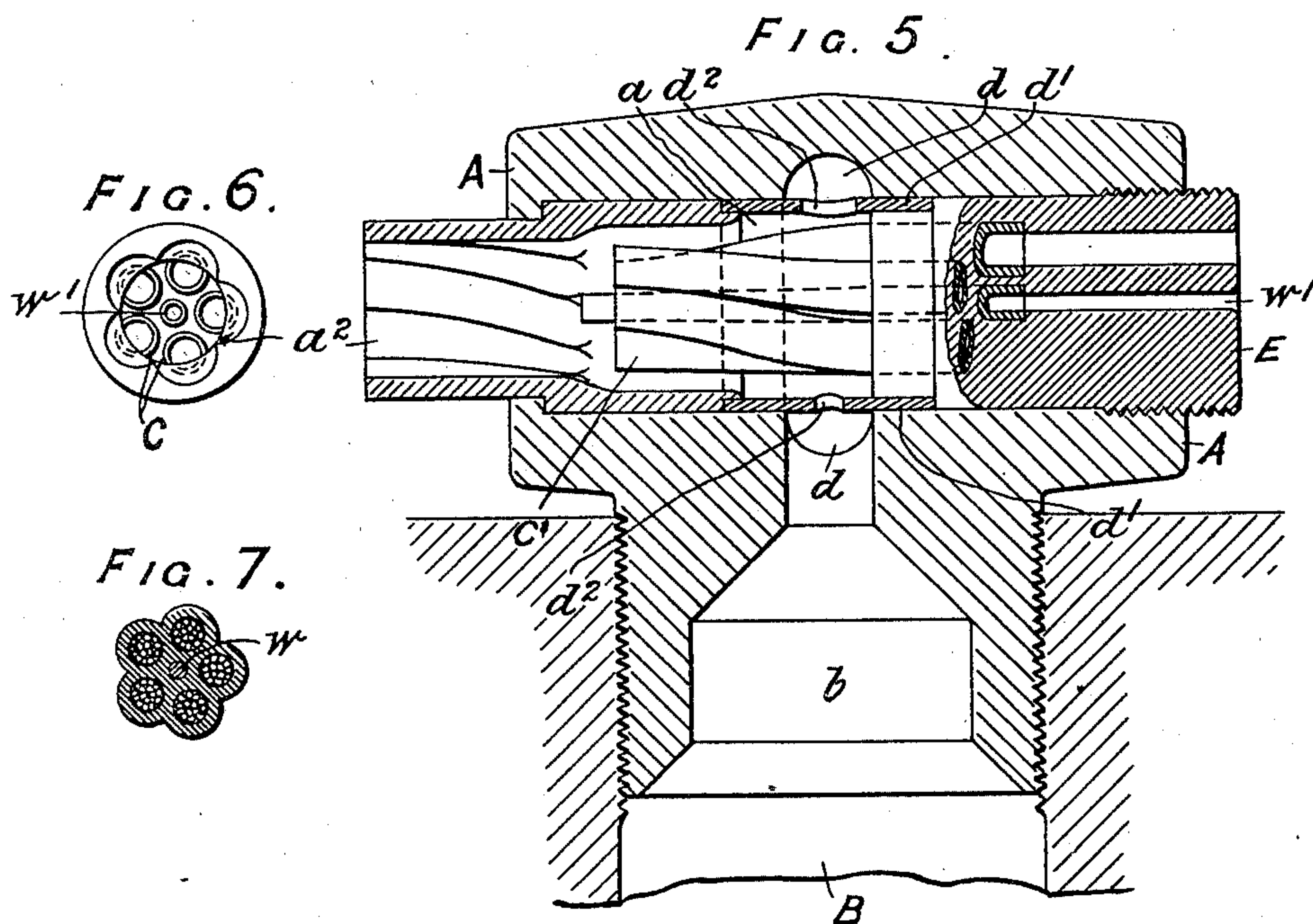
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UNITED STATES PATENT OFFICE.

HORACE WALTER DOVER, OF NORTHAMPTON, ENGLAND.

APPARATUS FOR INSULATING OR COVERING STRANDS AND FORMING SAME INTO CABLES.

SPECIFICATION forming part of Letters Patent No. 699,459, dated May 6, 1902.

Application filed February 1, 1902. Serial No. 92,227. (No model.)

To all whom it may concern:

Be it known that I, HORACE WALTER DOVER, managing director of Dover, Limited, a subject of the King of Great Britain, residing at Park road, St. James End, Northampton, England, have invented an Improved Apparatus for Insulating or Covering Strands and Forming the Same into a Cable, of which the following is a specification.

10 This invention relates to the manufacture of electric cables; and it consists of apparatus for covering with celluloid, xylonite, or similar material the conductors (whether plain or stranded wires) and also wire or fibrous
15 cords surrounding the conductor and forming the whole into a cable at one operation.

The invention will be described with reference to the accompanying drawings, forming part of this specification, wherein—

20 Figure 1 is a longitudinal sectional view, and Figs. 2 and 3 are end views, of a tool for covering and incorporating in cable form a central stranded conductor surrounded by wire or fibrous cords to impart the tensile
25 strength required for a submarine cable, as shown in Fig. 4. Figs. 5 and 6 show a modification, and Fig. 7 shows a cross-section, of the cable.

Referring to Fig. 1, A is the die-box, screwed
30 to or otherwise connected with the steam-jacketed pressure-chamber B of a "stuffing" machine or press capable of exerting a pressure of, say, one and one-fourth tons per square inch. The chamber a of the die-box
35 is in communication with the pressure-cylinder by an orifice b and terminates in a coned portion a' , leading to an extrusion-nozzle a^2 , with parallel sides or very slightly coned, the diameter and length of the nozzle being such
40 as to insure a sufficient grip of the strands by the covering material to cause the strands to be fed through along with the covering material without tension being otherwise applied to the strands. Within the chamber a
45 project tubular guide-mandrels C C', adapted to give passage to stranded wires or cords, of which the central one is to act as the electric conductor and the outer ones to impart the necessary tensile strength to the cable.
50 The guide-mandrels are externally tapered and converge somewhat as they approach the extrusion-nozzle a^2 , so that the intervening

spaces for the passage of the insulating material will be of gradually-diminishing sectional area toward the point of emergence of the strands from the tubular guide-mandrels C, which terminate in a sharp edge, so as to enable the insulating material to be delivered from the intervening passages closely around the stranded wires or cords.

The bore of each guide-mandrel is just so much larger in diameter than the strand as to allow of the latter passing freely through it, the extrusion of the material having for effect to cause it to drag the strand along with it without liability of the material being forced back through the bore of the guide-mandrels.

In order to insure the even distribution of the material around the guide-mandrels, the orifice b preferably leads into a circumferential channel d , separated from the space a by a liner-ring d' , but communicating therewith by orifices d^2 , the liner having for effect to divert the material entering at b in opposite directions through the annular channel d , whence it passes through the orifices d^2 , which are so graduated in diameter as to insure an equal flow of material around the mandrels.

The tubular guide-mandrels are each formed of a steel tube, the several tubes being mounted in a bush E, which closes the rear end of the die-box A, the guide-mandrels C' being spaced in a circle concentrically about the central one C.

The insulating material on emerging through the spaces between the closely-juxtaposed guide-mandrels being still plastic coalesces in the form of a solid mass around and between the strands, which are thus embedded therein, so as to form a cable in which the strands are severally insulated from each other and also protected from external influences.

In Figs. 5 and 6 the outer guide-mandrels have a slight helical twist about the central guide-mandrel, so as to cause a twist to be imparted to the cable while being extruded, the nozzle a^2 being correspondingly riffled, so as to assist in imparting the desired twist and economize insulating material by giving the cable the section shown in Fig. 7.

I claim—

1. A die for the manufacture of electric cables by extrusion of plastic insulating material around and between a central conductive strand and a surrounding circle of strands, the said die comprising a cylindrical chamber closed at one end and having an extrusion-nozzle of lesser internal diameter than that of the chamber at the other end, said chamber communicating through lateral inlet-orifices with the press-cylinder for supplying the plastic material, a central tubular guide-mandrel coaxial with the extrusion-nozzle and a group of similar guide-mandrels spaced in a circle around and converging toward the central guide-mandrel, all of said guide-mandrels being of externally-tapered form, and leading into the die-chamber through the closed end thereof, to a point beyond the lateral inlet-orifices and terminating just before the commencement of the extrusion-nozzle, substantially as specified.

2. A die for the manufacture of electric cables by extrusion of plastic insulating ma-

terial around and between a central conductive strand and a surrounding circle of strands, the said die comprising a cylindrical chamber closed at one end and having an extrusion-nozzle of lesser internal diameter than that of the chamber at the other end, said chamber communicating through lateral inlet-orifices of graduated diameter with a circumferential channel in connection with the press-cylinder for supplying the plastic material, a central tubular guide-mandrel coaxial with the extrusion-nozzle and a group of similar guide-mandrels spaced in a circle around and converging toward the central guide-mandrel, all of said guide-mandrels being of externally-tapered form, and leading into the die-chamber through the closed end thereof, to a point beyond the lateral inlet-orifices and terminating just before the commencement of the extrusion-nozzle, substantially as specified.

HORACE WALTER DOVER.

Witnesses:

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J. CONWAY.