

E. E. KILBOURN.
PROCESS OF KNITTING.
APPLICATION FILED MAR. 21, 1910.

963,227.

Patented July 5, 1910.

3 SHEETS—SHEET 1.

FIG. 1.

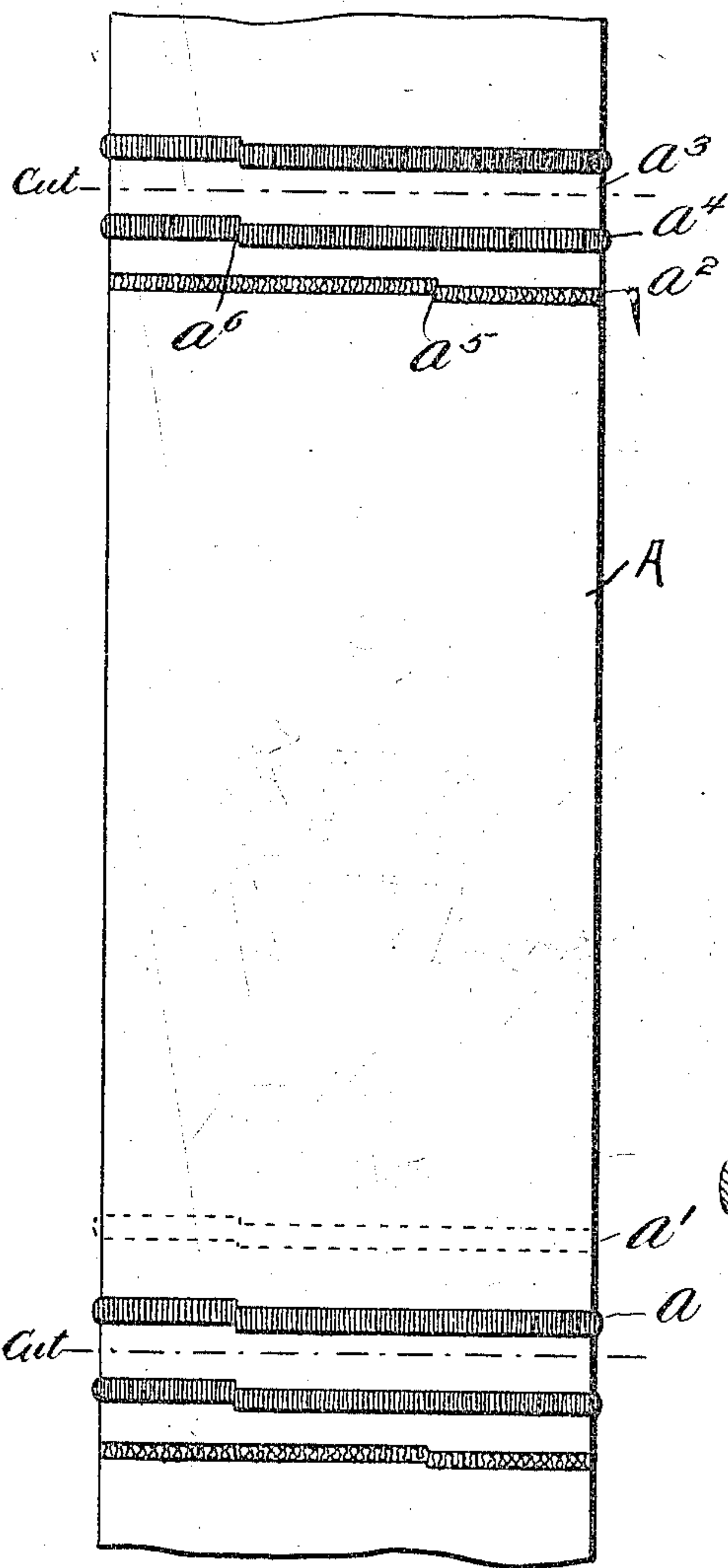


FIG. 2.

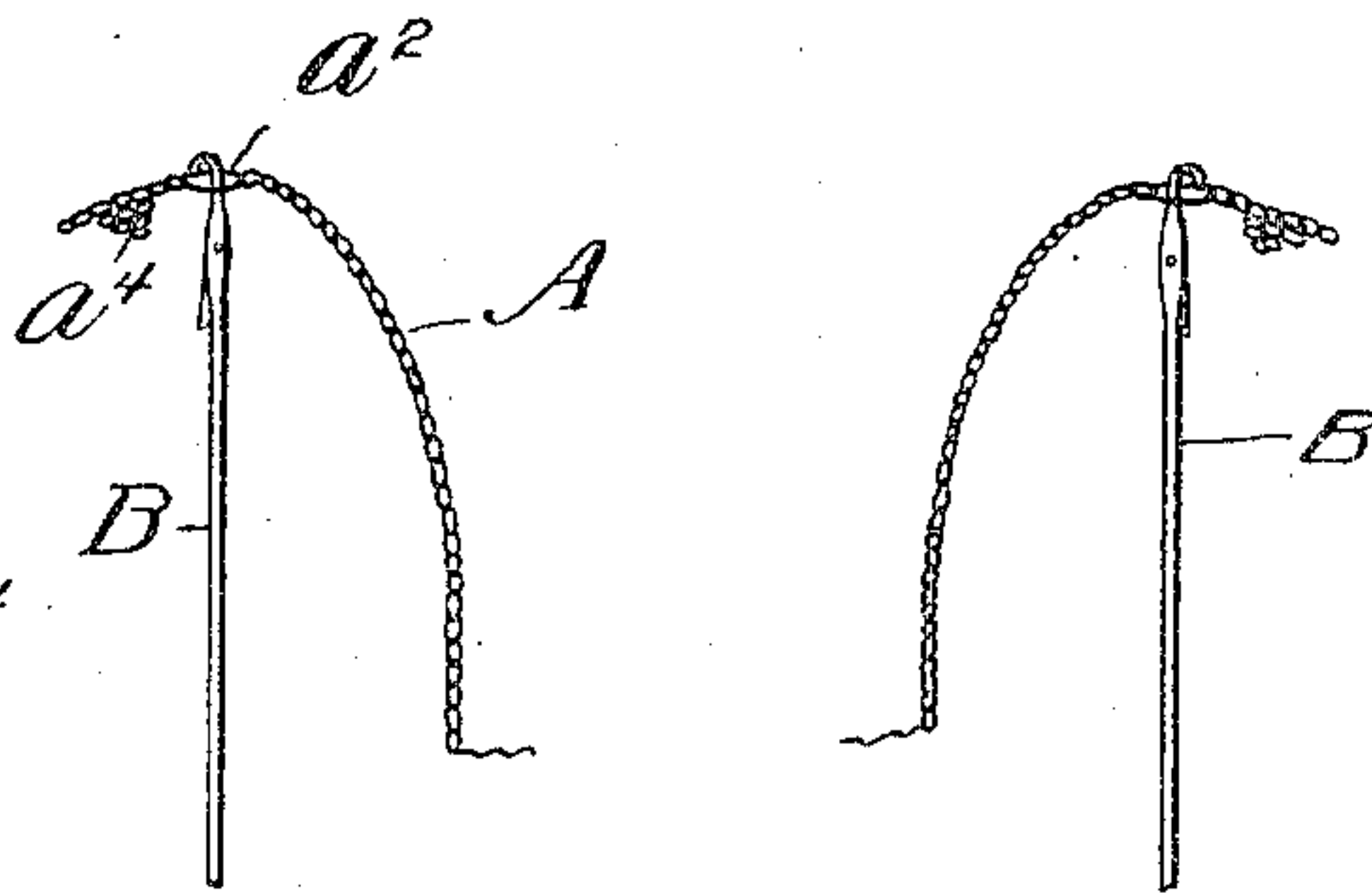
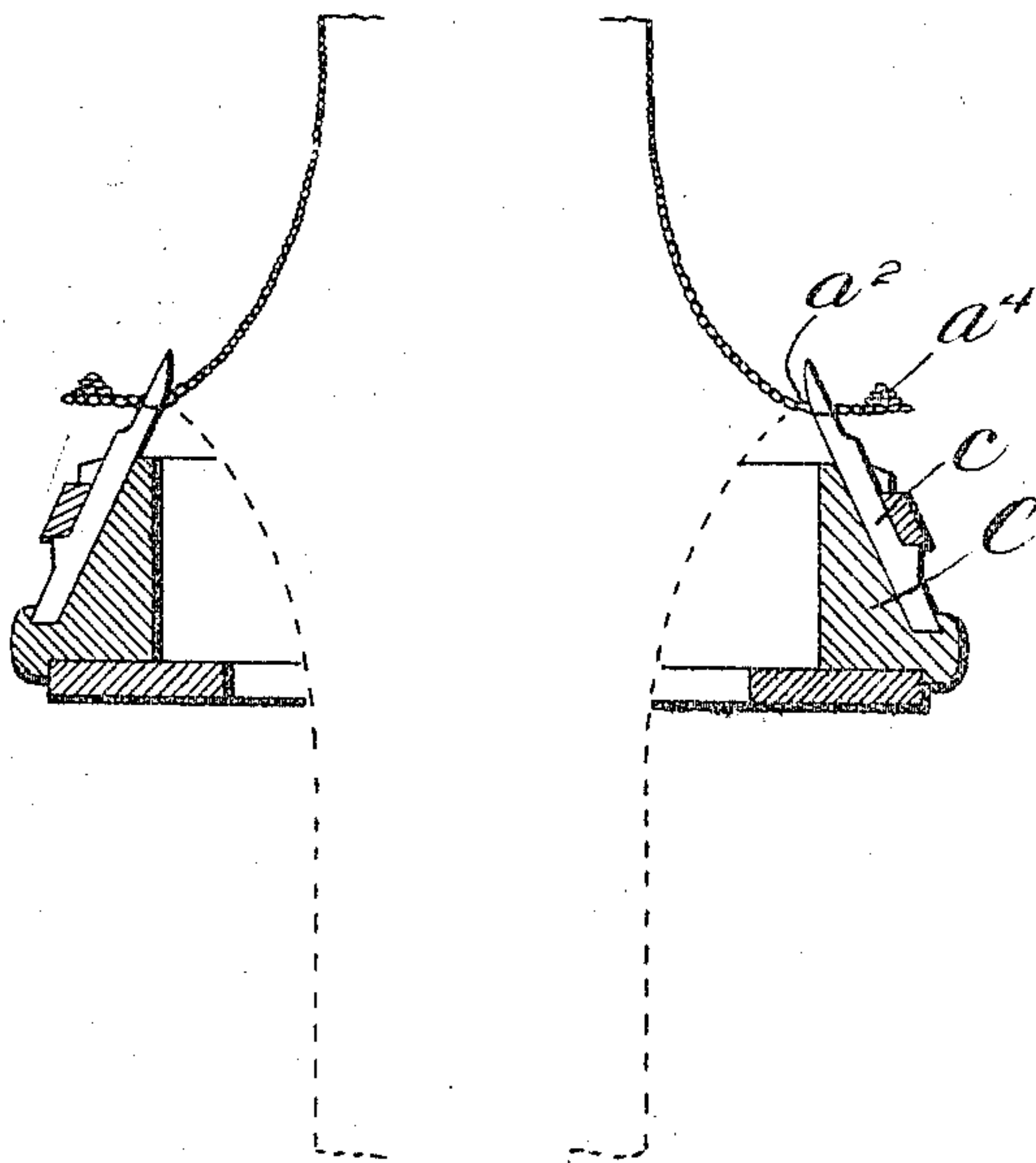


FIG. 3.



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3 SHEETS—SHEET 2.

FIG. 4.

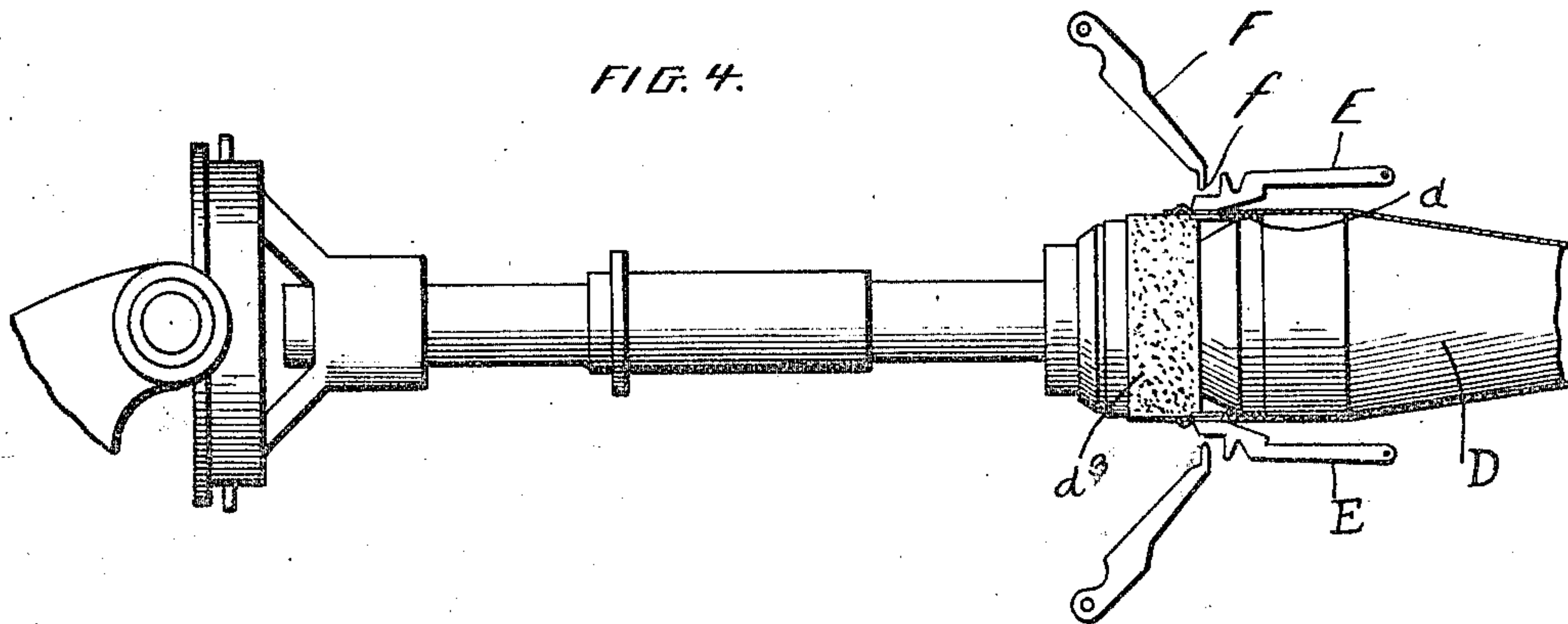


FIG. 5.

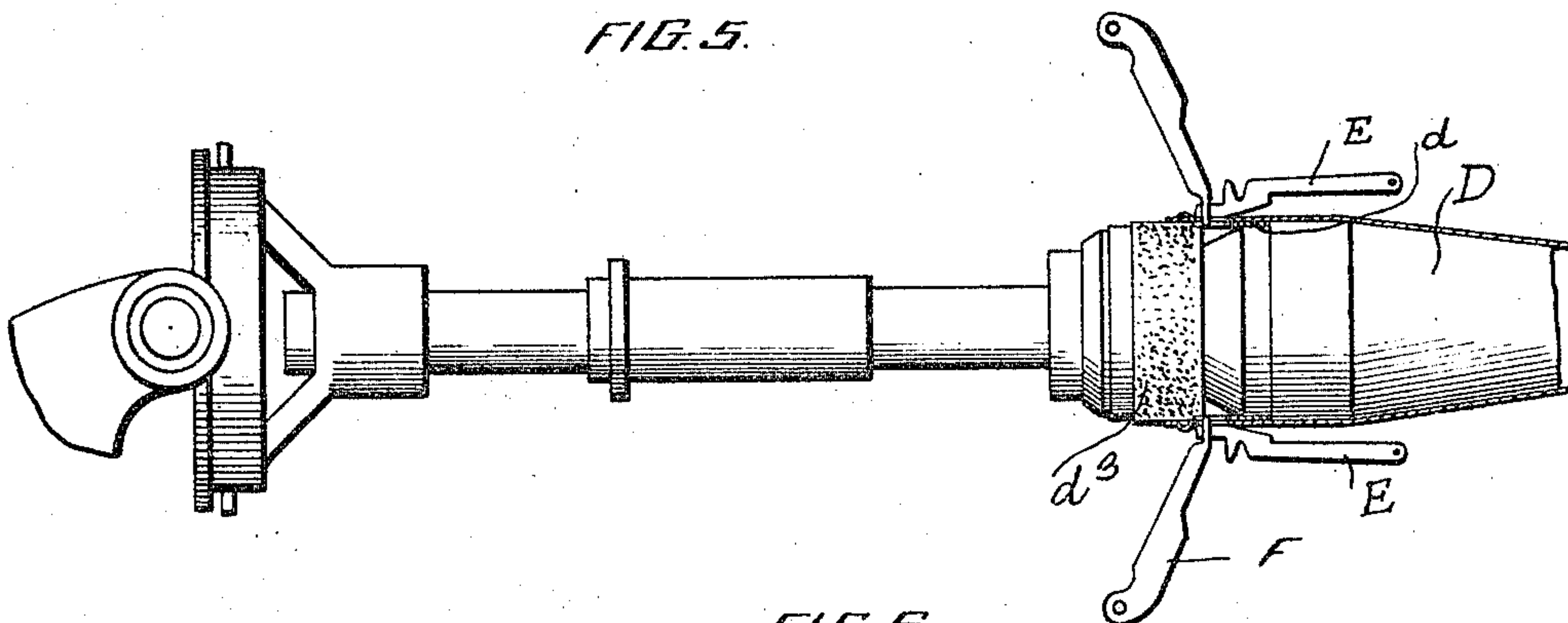
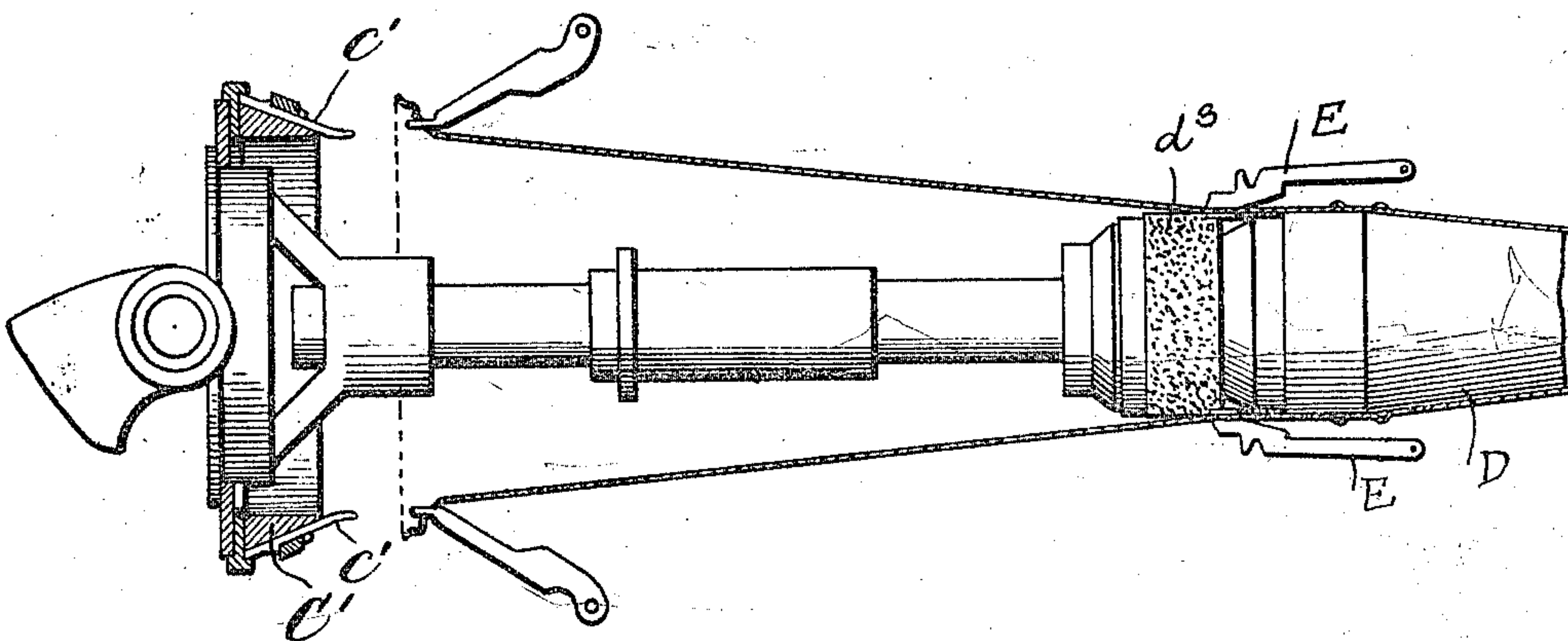


FIG. 6.



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3 SHEETS—SHEET 3.

FIG. 7.

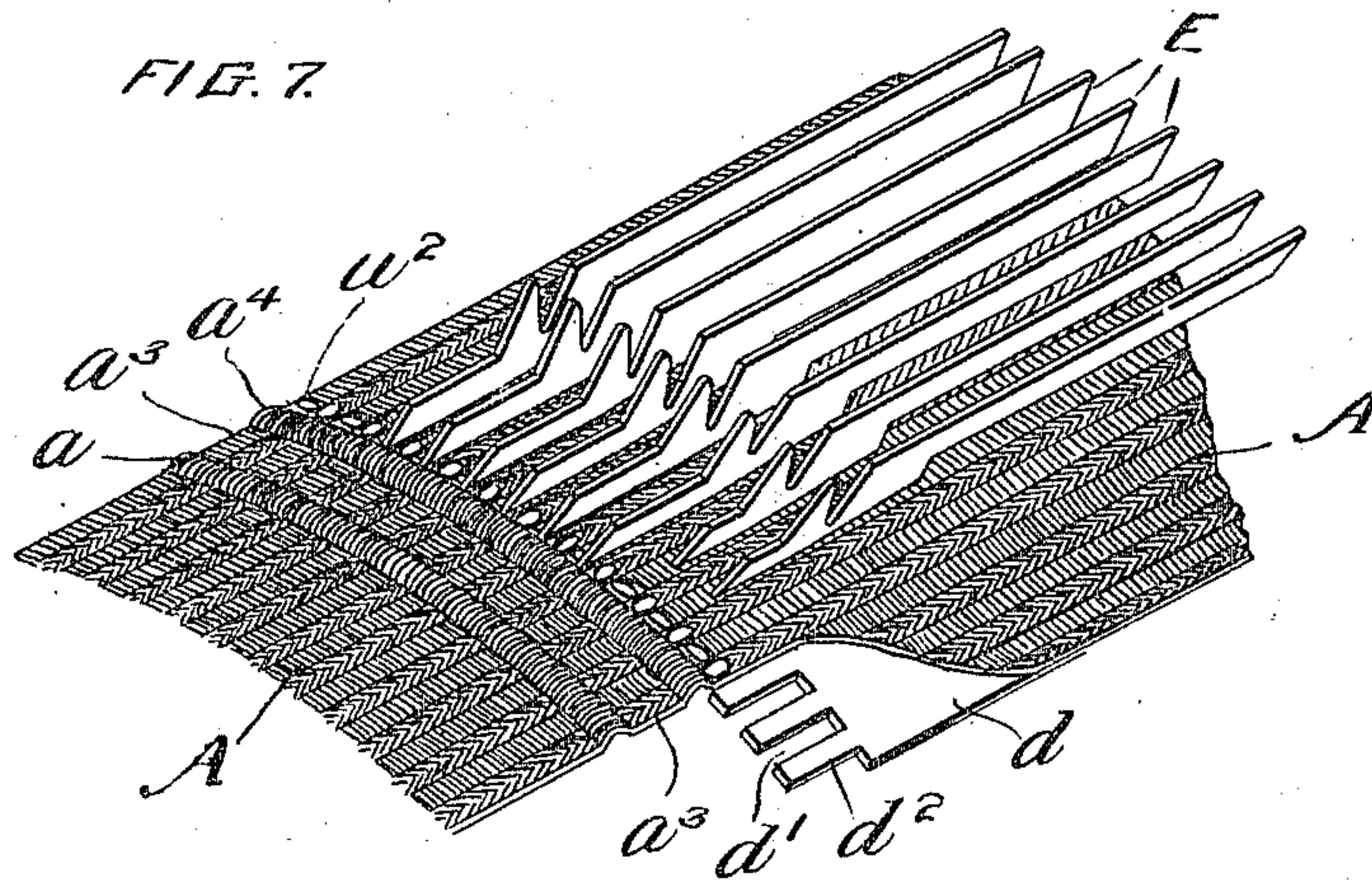


FIG. 8.

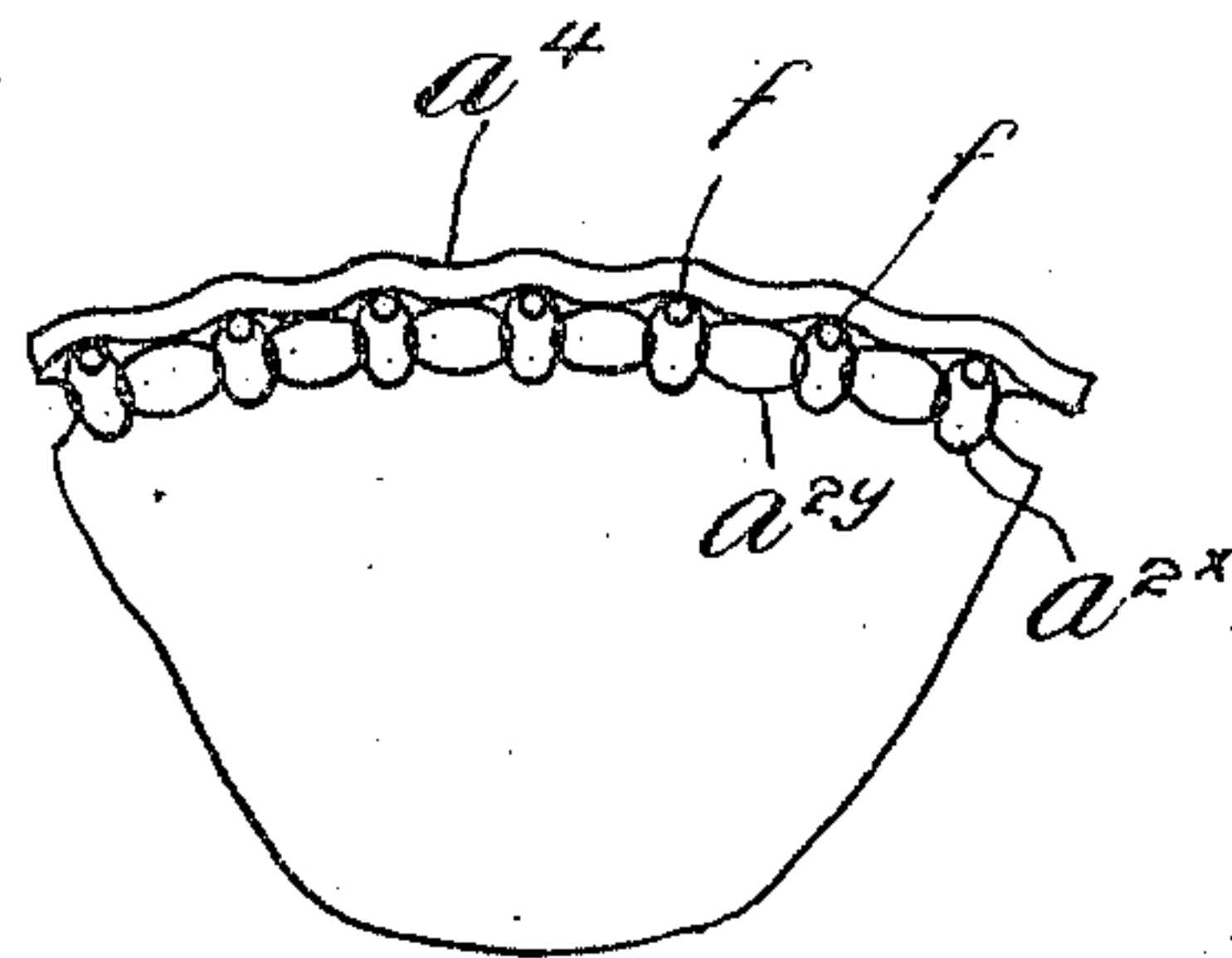
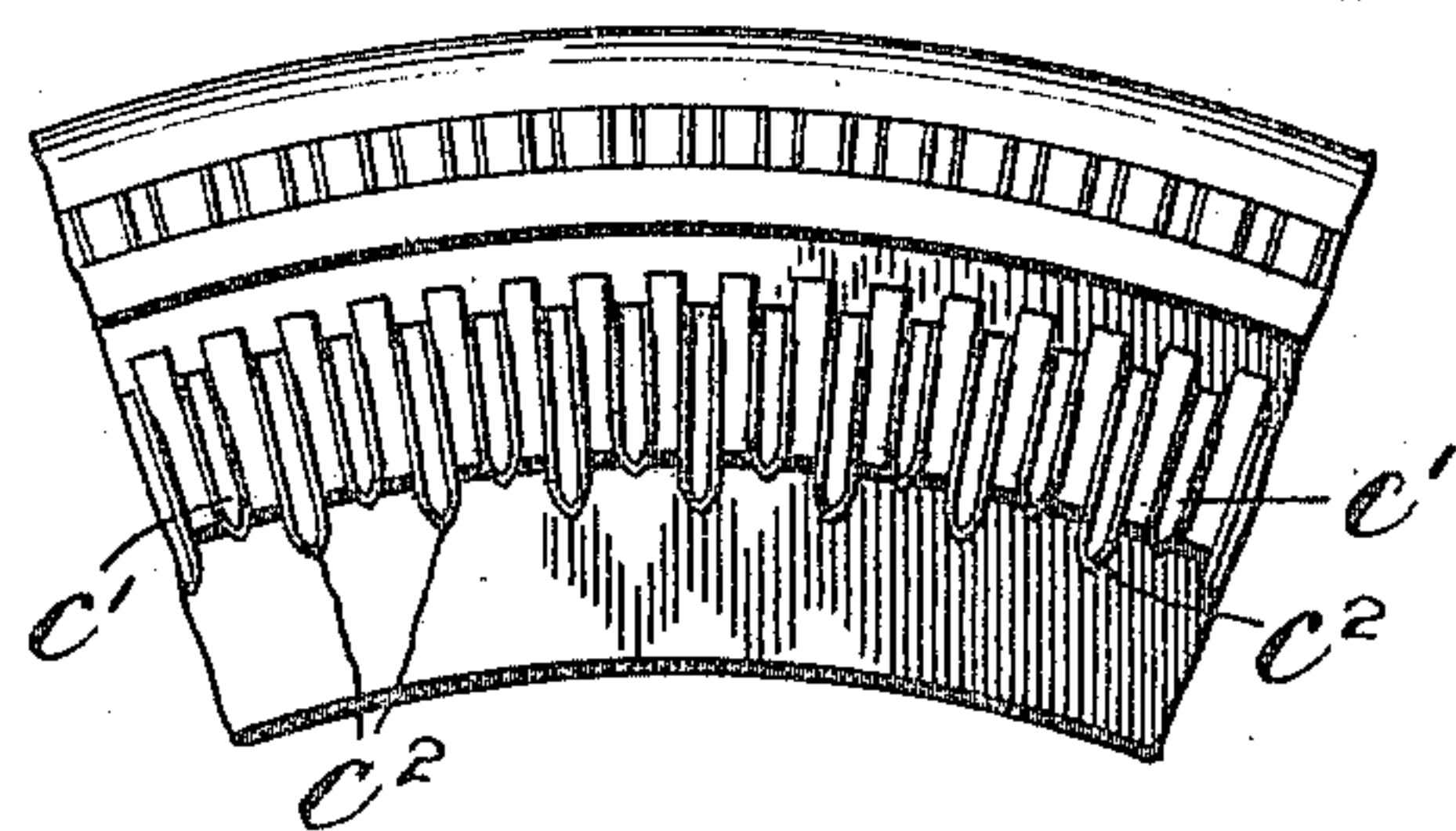


FIG. 9.



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UNITED STATES PATENT OFFICE.

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PROCESS OF KNITTING.

963,227.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD E. KILBOURN, citizen of the United States, residing at New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Processes of Knitting; and I do hereby 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.

My invention consists in the novel features hereinafter described reference being had to the accompanying drawings which illustrate the manner in which my process or method is carried out, and the invention is fully disclosed in the following description and claims.

In the manufacture of circular knitted half hose, and other circular knitted goods in which a ribbed portion is united with other portions of fabric knit in plain stitch or any stitch other than rib work, it is customary to knit the rib portions or "tops" or "cuffs" as they are variously termed, either singly or in a continuous strip which is severed into individual tops or cuffs; to run on one course of the rib work upon the needles of a circular knitting machine; to ravel back the lower edge portion of the cuff or top until the course upon the needles is reached, and to knit with the machine into and from such transfer course, thus uniting the cuff or top directly to the body of the fabric. It is customary to provide these cuffs or tops with a selvage welt or welts at its outer end and with a course of loosely knit stitches adjacent to the other end to facilitate their being "run on" to a transfer ring, by which they can be transferred to the needles of a knitting machine, or directly upon the needles of the machine. It is usual to continue the knitting of the cuff or top for a considerable distance beyond the loose course of stitches, to form a marginal portion which facilitates the running on of the cuff or top, as it gives the operator something to take hold of (where the operation is performed by hand) and prevents the undue stretching of the transfer course of stitches. This marginal portion is afterward raveled back as before stated to the loose course or transfer course, and the yarn so used is wasted.

In carrying out my improved process of knitting, I first knit the ribbed top, with the usual selvage welt or welts at one end, and a transfer course adjacent to the outer end, preferably a loose course of stitches and below the transfer course, I knit a very short marginal portion, in which I form an extra welt, which is used in transferring the rib top onto a transfer ring or the needles of the knitting machine, and is then raveled out, and does not appear in the stocking as hereinafter more fully explained.

Referring to the accompanying drawings, Figure 1 is a view of a rib top or cuff provided with the extra welt. Fig. 2 is a diagrammatic view representing the manner in which the extra welt assists in running the top or cuff onto the needles of a knitting machine by hand. Fig. 3 is a similar view, illustrating the manner in which the extra welt assists in running the top or cuff on to the quills of a transfer ring. Figs. 4, 5 and 6 are diagrammatic views illustrating the manner in which the extra welt cooperates with the parts of a transferring machine, in positioning the cuff, and insuring the accurate transfer of all the stitches of the loose or transfer course. Fig. 7 is an enlarged detail view of a portion of the rib top, and portions of the transferring machine. Fig. 8 is a diagrammatic view showing the reinforcing action of the extra welt, when the alternate stitches of the transfer course are expanded and held on the transfer levers of the transferring machine. Fig. 9 is a detail plan view of part of a transfer ring which is employed in the transferring machine.

In carrying out my improved process I first knit a rib top or cuff (which may be formed singly or in a continuous fabric), one of which is illustrated in Fig. 1. The cuff or top A is provided at one end with the usual selvage welt a (or any desired number of welts as indicated at a' in dotted lines), and adjacent to the other end I provide a transfer course a^2 , which is preferably a course of loose stitches. Beyond the transfer course, and between it and the end of the cuff or top (or the line of cut indicated by dotted line a^3 , where the cuff or top is to be severed from the next adjacent cuff or top), I knit an extra or positioning welt a^4 , which is located at a definite number of

courses beyond the transfer course, and in that part of the cuff or top which is to be raveled out, and which for convenience I designate the "raveling margin". This raveling margin is made of a less number of courses than is usual where the extra welt a^4 is not employed, and there is therefore considerably less waste of material in raveling the same.

Where the transferring operation is to be performed by hand as illustrated in Figs. 2 and 3, either in connection with the needles B of the knitting machine directly, (Fig. 2) or in connection with the quills or points c , of a transfer ring C, (Fig. 3) the extra or positioning welt a^4 will afford the operator a raised surface, easily engaged by the nail of thumb or fingers, to enable the outer margin of the cuff or top to be securely held, and will also assist the operator in running on the transfer course, as the welt a^4 is throughout a definite distance from the course to be transferred.

After the top or cuff has been transferred to the needles B of the knitting machine, either directly or by the use of the transfer ring the marginal portion including the extra or positioning welt a^4 is raveled out, until the transfer course is reached, when the knitting machine is started and knits the body of the fabric upon the top or cuff.

Where the rib top or cuff is run on or transferred by means of a transferring machine, the guiding and positioning devices thereof, usually termed "registering bits" are made to engage the extra positioning welt, and thus draw the cuff or top into such position that the stitches of the transfer course will be taken by the transfer levers, and when the transfer levers are opened out to expand the web, and aline the stitches of the transfer course with the points of a transfer ring (or the needles of a knitting machine,) the extra welt a^4 will prevent the undue stretching of the transfer course, as the edge of the welt toward the transfer course of stitches is in the nature of a selvage, and the fabric cannot be raveled from that direction.

In Figs. 4 to 9 inclusive, I have selected for purposes of illustration a transferring machine such as is illustrated, described and claimed in the application of E. E. Kilbourn, Wm. E. Smith and I. W. Kilbourn, filed in the U. S. Patent Office Jan. 29, 1909, Serial No. 474,953. As this machine forms no part of my present invention, I will only refer in detail to such parts of it as are necessary to enable my invention to be understood. Thus, D represents the mandrel of the topping or transferring machine, which is provided with a metal ring d having a plurality of slits or apertures d' therein, forming a series of projections d^2 , which lie beneath the alternate stitches of the transfer

course, as clearly shown in Fig. 7. The mandrel is also provided with a brush portion d^3 . E, E represent a circular series of longitudinal registering bits, which lie in the grooves between adjacent wales of the fabric and guide the same to keep it from twisting. These bits E, E are moved into engagement with the extra or positioning welt a^4 (see Figs. 4 and 7) in the operation of the transfer machine, thus pushing the stitches of the loose course a^2 into an exact and predetermined relation with the points of the transfer levers F and clamping the fabric between the bits E, E and the projections d^2 of the mandrel so that the points of the transfer levers may enter between the bits E, E and pass down through the alternate stitches of the transfer course and into the recesses d' in the mandrel ring D (see Figs. 5 and 7). The transfer levers are then operated as indicated in Fig. 6 to expand the web, and bring the stitches of the loose course in position to be placed upon the points of a transfer ring C' and in this figure it will be seen how the positioning welt a^4 takes the strain of the transfer levers upon its selvage edge, and prevents the undue stretching, or the possibility of raveling, of the loose course.

Fig. 8 also illustrates the manner in which the extra welt acts in conjunction with the transfer levers. In this figure the points of the transfer levers are illustrated at f , and engage the alternate stitches a^{2x} , the strain on the fabric being communicated to the extra welt a^4 . It will also be seen by reference to this figure that the extra welt acts to support the intermediate and alternate stitches a^{2y} not engaged by the transfer levers, and holds them in a definite relation with the stitches a^{2x} so that all the stitches of the transfer course can be accurately and simultaneously placed on the points c' , c^2 of the transfer ring C', which (as shown in Fig. 9) has alternating points c' in one circle to receive the stitches a^{2x} , and the intermediate points c^2 in a circle of slightly less diameter, to receive the stitches a^{2y} . The top or cuff is transferred from the ring C' to a circular knitting machine, the marginal portion including the extra or positioning welt is raveled out, and the body of the fabric is knit into and from the transfer course a^2 as previously described. In knitting the rib top or cuff, it is preferable to have the "jog" in the loose course of stitches (indicated at a^5 , Fig. 1) at a different point in the circle of the fabric from the jog in the extra or positioning welt (indicated at a^6).

What I claim and desire to secure by Letters Patent is:—

1. The herein described process of knitting articles provided with a rib top or cuff, which consists in forming a rib top or cuff having a selvage edge at one end, and a

transfer course adjacent to the other end, and knitting a positioning welt on said top or cuff at a predetermined distance from the transfer course, and on the side of the same opposite the selvage edge, transferring the transfer course by means of said positioning welt, to the needles of a knitting machine, raveling out the original portion of said cuff or top and said positioning welt, back 10 to the transfer course, and knitting the body of the fabric into and from said transfer course.

2. The herein described process of knitting an article provided with a rib top or cuff, which consists in forming a rib top or cuff, having a selvage edge at one end and a transfer course adjacent to the other end, and knitting thereon a positioning welt at a predetermined distance from the transfer 20 course on the side thereof opposite to the selvage edge, engaging the said positioning welt and drawing the fabric into position to permit the stitches of the transfer course to be engaged by transferring means, engaging 25 certain stitches of the transfer course, and expanding the web to bring all the stitches of the transfer course into position to be transferred, transferring the stitches of the transfer course to the needles of a knitting 30 machine, raveling out marginal portions of the cuff or top including the said position-

ing welt, and knitting the body of the fabric into and from said transfer course.

3. The herein described process of knitting articles provided with a rib top or cuff, which consists in forming a rib top or cuff, 35 knitting thereon a marginal portion below the transfer course, and knitting in said marginal portion a positioning welt at a predetermined distance from the transfer 40 course, engaging the said positioning welt and drawing the top or cuff into position to permit alternate stitches of the transfer course to be engaged, and holding the top or cuff in that position, engaging the alter- 45 nate stitches of the transfer course, and expanding the transfer course, against the positioning welt, said welt acting to hold in position the intermediate alternate stitches, transferring all the stitches of the transfer 50 course to a knitting machine, raveling out the marginal portion of the top or cuff and said positioning welt, and knitting the body of the fabric into and from said transfer 55 course.

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

EDWARD E. KILBOURN.

Witnesses:

SAM F. WUBI,
JOHN ERICKSON.