

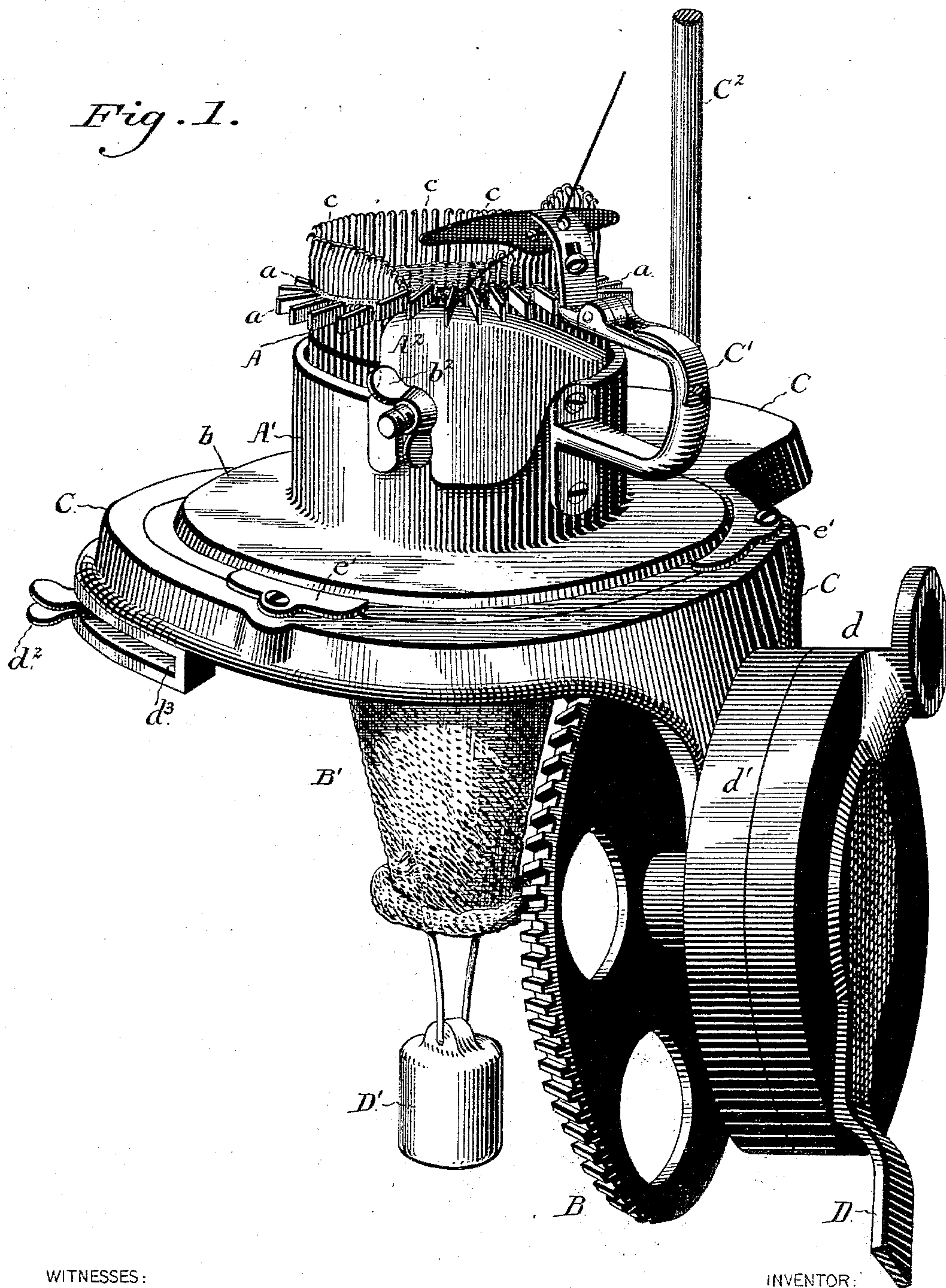
(No Model.)

2 Sheets—Sheet 1.

G. E. ELLIS.
KNITTING MACHINE.

No. 412,324.

Patented Oct. 8, 1889.



WITNESSES:

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INVENTOR:

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(No Model.)

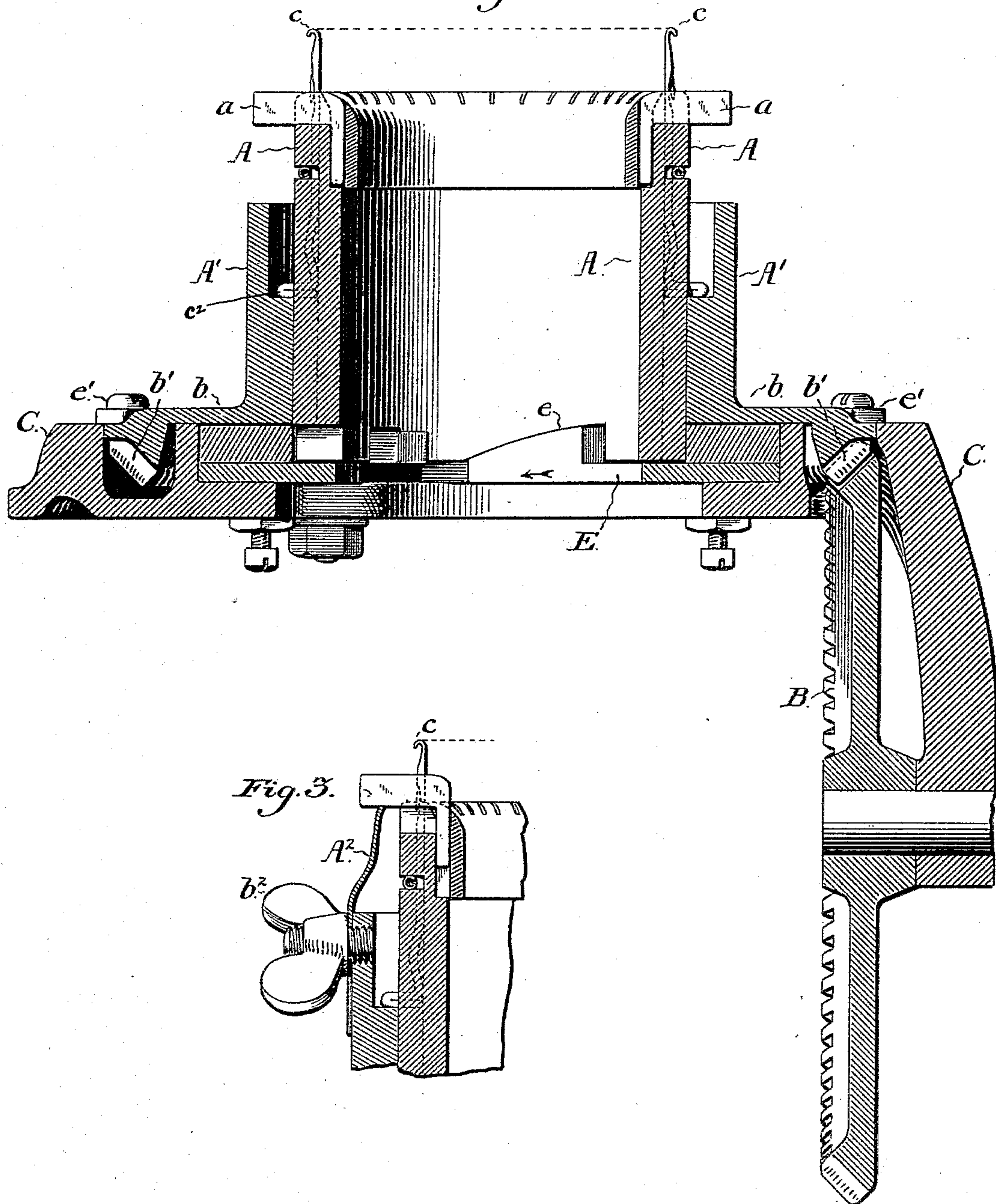
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Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE E. ELLIS, OF PHILADELPHIA, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,324, dated October 8, 1889.

Application filed March 30, 1889. Serial No. 305,456. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. ELLIS, of the city of Philadelphia and State of Pennsylvania, have invented a certain new and useful
5 Improvement in Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

10 The object of my invention is to provide an improved attachment to knitting-machines, whereby by a simple adjustment the length of stitch may be changed in the knitting of a fabric—as, for instance, in knitting imitation
15 ribbed stockings—without removing the knit fabric from the machine, or even necessarily stopping the operation of the machine, as in a stocking an imitation ribbed leg may be knitted and the stitch then changed to a short-
20 er or plain stitch for the knitting of the foot without interrupting the knitting operation.

My improvement has relation to knitting-machines using latched needles for knitting hosiery and other knit fabrics, and applies
25 either to cylindrical knitting-machines—such as, for instance, the Branson machine—or to straight-knitting machines.

In the description of my invention I will describe it as applied to a cylindrical ma-
30 chine.

My invention consists in a needle cylinder or carrier having vertical slots and a series of sinkers or L-shaped pieces of metal mounted therein at intervals and operated in the said
35 slots by means of a cam, the L-shaped projections usually extending out beyond the line of the outer surface of the needle cylinder or carrier. The function of these sinkers is, when raised, as hereinafter described,
40 to elongate the thread forming the stitch, and thus change the stitch from a plain one to one resembling in appearance a rib-stitch. By dropping the sinker-raising cam on the cam-carrier by means of a thumb-screw or
45 other suitable means the machine can be caused to return to knitting with short stitches, thereby enabling me to produce a fabric having therein knit stitches resembling rib stitches or plain stitches, which are
50 introduced at will.

I will now describe my invention, so that others skilled in the art to which it appertains may make and use the same, reference

being had to the accompanying drawings, forming part of this specification. 55

In the accompanying drawings similar letters of reference refer to similar parts throughout.

Figure 1 is a perspective view of a cylindrical knitting-machine with my invention applied thereto. Fig. 2 is a cross-sectional view of the said machine, having my invention applied thereto. Fig. 3 is a detail view showing the sinker as applied to a section of cylinder in combination with needles, the
60 sinker being raised as in the act of forming the stitch, which in the fabric will resemble a rib-stitch in appearance. 65

A represents the needle-cylinder, and A' the outer rotary cam cylinder or casing. 70
b is a horizontal circular plate attached to and supporting the cam cylinder or casing A'.

On the under side of the plate b are cogs b', as shown in Fig. 2, which fit into and are
75 turned by the cog-wheel B.

C represents the casing or main casting of the knitting-frame.

c c represent the knitting-needles, placed in vertical slots provided for the purpose in
80 the needle carrier or cylinder A, and moved up and down in the said cylinder A by means of cam shaped recesses provided on the inner side of the casing A', into which projec-
85 tions c², on or near the lower end of the needle, fit, as in an ordinary cylindrical knitter.

a represents my improved sinkers or L-shaped pieces of metal, mounted at desired intervals around the top of the cylinder A in vertical slots, the horizontal projections of
90 said sinkers extending outward.

A² is a suitable cam-shaped piece of metal attached adjustably to the outer part of the casing A' by means of thumb-nut b², working on screw b³. 95

C' is a support or guide attached to the outer part of the rotary casing A' to act as a guide in feeding the yarn to the needles c c.

C² is an upright support for an additional guide, (not shown,) through which the yarn
100 is fed to the machine from above.

d² are fingers adapted to move horizontally in the slot d³ and attached to the horizontal rotary plate E, upon which the cylinder A rests. 105

e are cam-shaped projections on the plate

E, fitting into recesses of a like shape in the bottom of the cylinder A, and serving, when the plate E is rotated in the direction indicated by the arrow in Fig. 2, to elevate the cylinder A, and when turned in the reverse direction to lower the cylinder to its normal level.

D represents a hand-crank (shown in part broken away) for rotating the cog-wheel B.

$d d'$ are pulleys to operate the machine by power, when desired.

e' are keeper-plates to keep the rotary plate b in proper adjustment to the casting-frame C and to prevent it from jumping up.

D' is a weight attached to the knitted fabric B' , to draw it taut as the fabric is produced in the operation of knitting.

Without my improved device the machine as described would knit a plain-stitch fabric; but with my attachment a fabric may be knit in one operation without moving or changing any of the needles or removing the fabric from the machine, with either a plain stitch or an imitation rib-stitch. For instance, in knitting a stocking, by adjusting the machine as hereinafter described, a plain foot and lower portion of the leg may be knit in a plain stitch, and then by simple adjustment an imitation ribbed leg may be knit without necessarily stopping the operation of the machine.

I herein show and describe a particular device for raising the sinkers $a a$ in order to form the ribbed stitch, when desired. I do not, however limit myself to this particular device, as I describe it merely as a convenient form.

Without departing from the nature of my invention, other devices of a substantially-like nature may be employed for raising and lowering the sinkers.

A particular advantage in my invention is the adaptability of the machine by a simple adjustment to knit either a plain or an imitation ribbed stitch without removing or changing any of the needles or removing the knitted fabric to another machine, or even necessarily stopping the operation of the machine.

I will now describe the operation of the machine and of my improved attachment. After the thread has been properly placed in the ordinary manner the machine is then started, with the cam A^2 in depressed position. The sinkers $a a$ remain on a level with the top of the cylinder A, as shown in Fig. 2, and are thereby prevented from operating. A plain stitch and plain fabric is then knit to the length desired, as in the foot and lower part of the leg of the stocking. If it is then desired to knit an imitation ribbed leg, the cam A^2 is elevated to the position shown in Fig. 1, and set there by tightening the thumb-screw b^2 . As the cylindrical cam-casing A' is revolved by means of the gear-wheel B, operating in the cogs b' , affixed to the under

side of the plate b , the cam A^2 is revolved, and, coming under the projections of the sinkers $a a$, raises them respectively, as it passes underneath them, to the desired height above the level of the top of the cylinder A, according to the height of the cam A^2 . The raising of the sinker increases the length of the stitch, as the hook of the needle c is drawn down below the level of the top of the cylinder A at the time that the sinkers are elevated, and consequently the stitch is elongated to a length of about double the height of the sinker above the level of the top of the cylinder A. Rows of lengthened stitches are thus formed at intervals in the fabric woven, according to the number of sinkers employed, and thus is given to the fabric the appearance of a ribbed stitch. As the cam A^2 in describing its circuit passes from underneath the respective sinkers $a a$, by it previously elevated, the weight D' , attached to the end of the woven fabric B' , drawing down the fabric, has a tendency to return the sinkers $a a$ to their normal position on a level with the top of the cylinder A. The process is repeated in the same manner so long as it is desired to knit the imitation rib. When it is desired to return to a plain stitch, the cam A^2 is dropped by releasing the thumb-screw b^2 to its normal position.

I do not limit myself in the application of my invention to the particular circular machine described, but claim its application to either circular or straight knitting machines. Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the needle-carrier having vertical slots formed therein for the reception of sinkers, and a series of sinkers having portions fitting in said slots, of the cam-carrier and a cam carried thereby for moving said sinkers vertically, substantially as hereinbefore set forth and described.

2. The combination, with the needle-carrier formed with vertical slots for the reception of sinkers, as described, a series of sinkers having portions fitting in said slots, and the cam-carrier, of the cam-plate A^2 and means for clamping said plate upon the cam-carrier, substantially as hereinbefore set forth and described.

3. The combination, with the needle-carrier having vertical slots formed therein for the reception of sinkers, and a series of sinkers having portions fitting in said slots, of the cam A^2 , coming in contact with the horizontal portion of the sinkers and adapted to raise them vertically, substantially as hereinbefore set forth and described.

In witness whereof I have hereunto set my hand this 26th day of March, A. D. 1889.

GEORGE E. ELLIS.

Witnesses:

HORACE PETTIT,
W. G. GRIFFITH.