

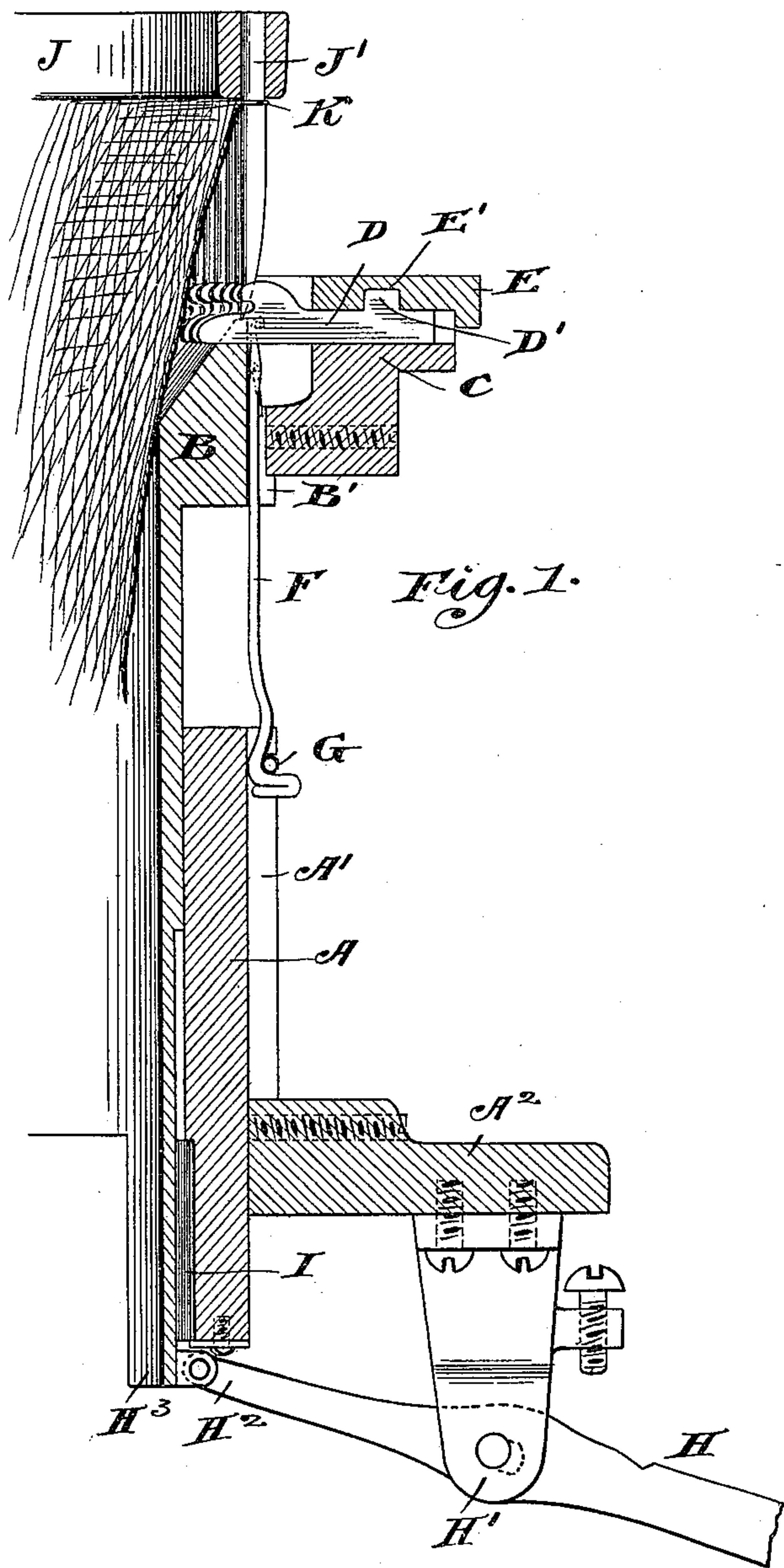
(No Model.)

2 Sheets—Sheet 1.

H. E. HARBAUGH.
KNITTING MACHINE.

No. 583,435.

Patented May 25, 1897.



Witnesses,
J. D. Mann,
Clerk of the Court.

Inventor,
Howard E. Harbaugh,
By L. H. Morrison,
Att'y.

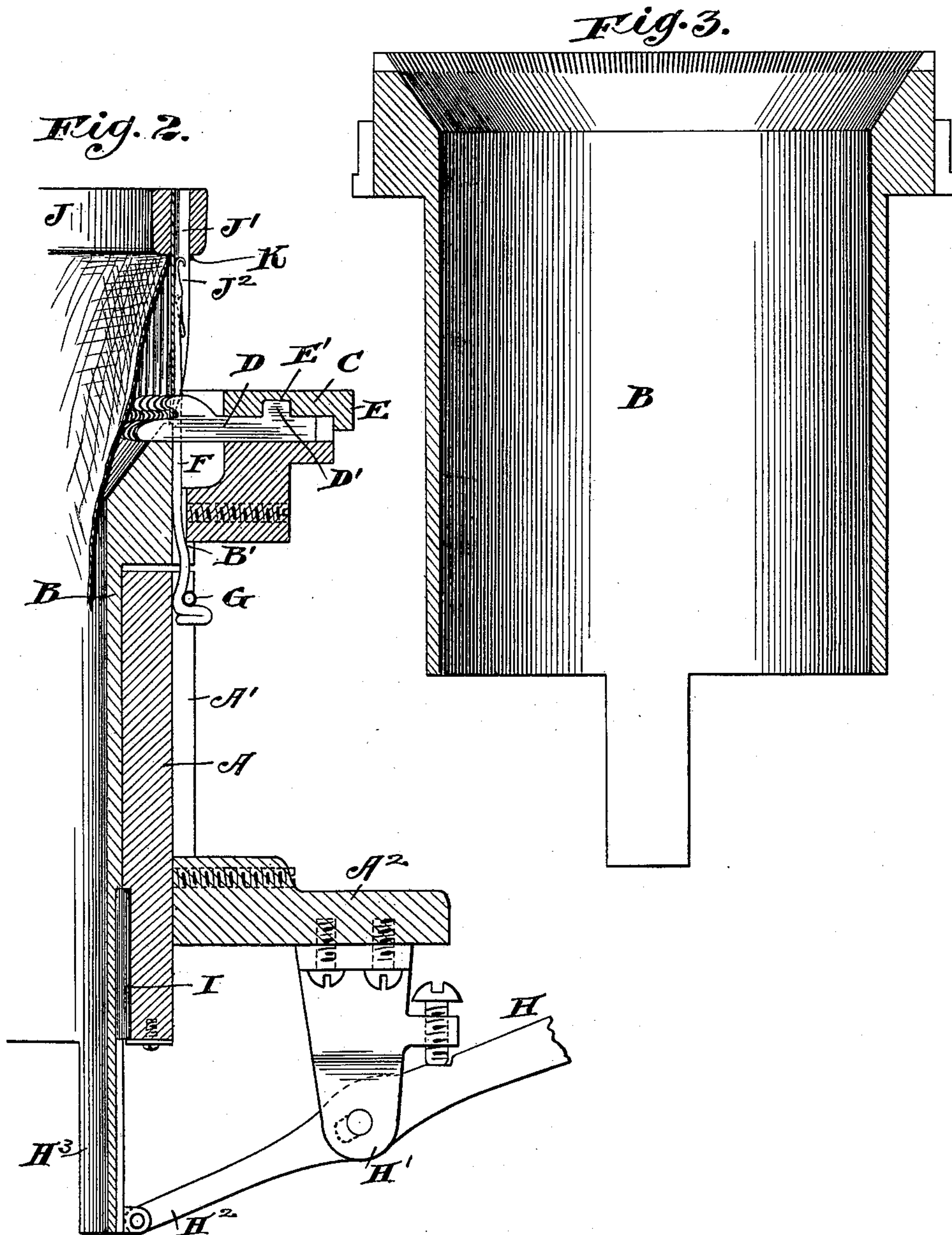
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UNITED STATES PATENT OFFICE.

HOWARD E. HARBAUGH, OF KENOSHA, WISCONSIN, ASSIGNOR TO THE
CHICAGO-ROCKFORD HOSIERY COMPANY, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,435, dated May 25, 1897.

Application filed February 3, 1896. Serial No. 577,944. (No model.)

To all whom it may concern:

Be it known that I, HOWARD E. HARBAUGH, a citizen of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

The object of my invention is to so construct and arrange the needle-cylinders of circular-knitting machines that the upper portions thereof and the sinker-slide beds and sinker-slides supported thereby may be elevated sufficiently to leave the points of their needles adapted to enter the lower ends of the quills of a quilled transfer-ring preparatory to having transferred to said needles a course of stitches received by the quills of the transfer-ring from the needles of a machine from which the transfer is being made; and it consists, essentially, of a stationary base-cylinder, a crown-cylinder adapted to slide telescopically therein and provided at its upper end with a sinker-slide bed furnished with sinker-slides, a series of needles, and a band or spring holding the needles by their lower ends into connection with the base-cylinder, when combined substantially as hereinafter set forth.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section through one side of a circular-knitting machine embodying my improvements and a quilled transfer-ring, showing the upper portion of the needle-cylinder, the sinker-slide bed, and its sinker-slides elevated sufficiently to leave the points of the machine-needles in position to enter the lower ends of the quills of the transfer-ring, which are represented as resting thereon in proper position to receive the points of the needles as the upper portion of the needle-cylinder descends to its normal position. Fig. 2 is a like view of the same, showing the upper portion of the needle-cylinder in working position and the machine-needles in the quills of the transfer-ring ready to receive therefrom the stitches of the fabric to be transferred thereto. Fig. 3 is a central vertical section of the upper portion of the needle-cylinder detached from the machine.

A is a base-cylinder having a series of vertical radial needle-grooves A' therein corre-

sponding in number with the number of needles in the machine and supported by any suitable frame A².

B is a crown-cylinder having a series of vertical radial needle-grooves B' therein corresponding in number and registering with the needle-grooves A' in the base-cylinder A and adapted to slide telescopically therein.

C is a sinker-slide bed and is rigidly connected with the upper portion of the crown-cylinder B.

D are sinker-slides operative on the slide-bed C.

E is a sinker-cam ring having a sinker-slide groove E' therein engaging with the lugs D' on the sinker-slides D.

F are needles.

G is a spring or band, (here shown as being formed of spirally-coiled wire,) encircling the entire series of needles F of the machine and holding them into connection with the needle-grooves A' in the base-cylinder A, whence they project upward into the corresponding needle-grooves B' in the crown-cylinder B.

H is a lever mounted on the fulcrum-lug H', projecting from the frame A², and hinged at the end of its short arm H² to the lug H³ on the crown-cylinder B.

I is a pin which prevents the crown-cylinder B from rotating in the base-cylinder A, while permitting it to freely slide vertically therein.

J is a transfer-ring provided with quills J', corresponding in number with the needles F of the machine, to which transfer is to be made, cut away longitudinally, Fig. 2, so as to form in each of them a recess J² of suitable dimensions to admit therein one of the needles F of the machine.

Supposing the number of needles F of the machine, the number of quills J' in the transfer-ring J, and the number of stitches K in one course of the fabric to be transferred to be the same—say one hundred in each case—each quill J' of the transfer-ring J is inserted through one of the hundred stitches K preparatory to transferring the same. The lever H, Fig. 1, is depressed until the crown-cylinder B and the parts C D E are elevated to the positions shown in Fig. 1 preparatory to having the transfer-ring J placed thereon,

which may be properly done by placing the free ends of the series of quills K thereof between the adjacent sinker-slides D of the machine and upon the upper end of the crown-cylinder B, as clearly shown in Fig. 1, when the lever H is released, and the latter descends to the position shown in Fig. 2, and all the parts of the machine and transfer-ring then assume the positions there shown. The stitches K, Fig. 2, are next slid downward over the ends of the needles F, when the transfer-ring J is lifted, and the quills J' thereof are thereby withdrawn from the stitches K, and they are left upon the needles F ready to be further added to by knitting.

I claim—

In a knitting-machine, in combination, a base-cylinder, a crown-cylinder, each having

a series of vertical radial needle-grooves therein corresponding in number and registering with the grooves in the other and furnished with needles, a sinker-slide bed provided with sinker-slides and rigidly connected with the upper portion of the crown-cylinder, means for holding the needles, by their lower ends, into connection with the base-cylinder, and means for elevating the crown-cylinder preparatory to placing a quilled transfer-ring in position, on the machine, to receive the machine-needles, as the crown-cylinder descends to its normal position, substantially as and for the purpose specified.

HOWARD E. HARBAUGH.

Witnesses:

WILLIS W. COOPER,
G. H. CURTIS.