

(No Model.)

2 Sheets—Sheet 1.

M. BOAS.  
CIRCULAR KNITTING MACHINE.

No. 453,059.

Patented May 26, 1891.

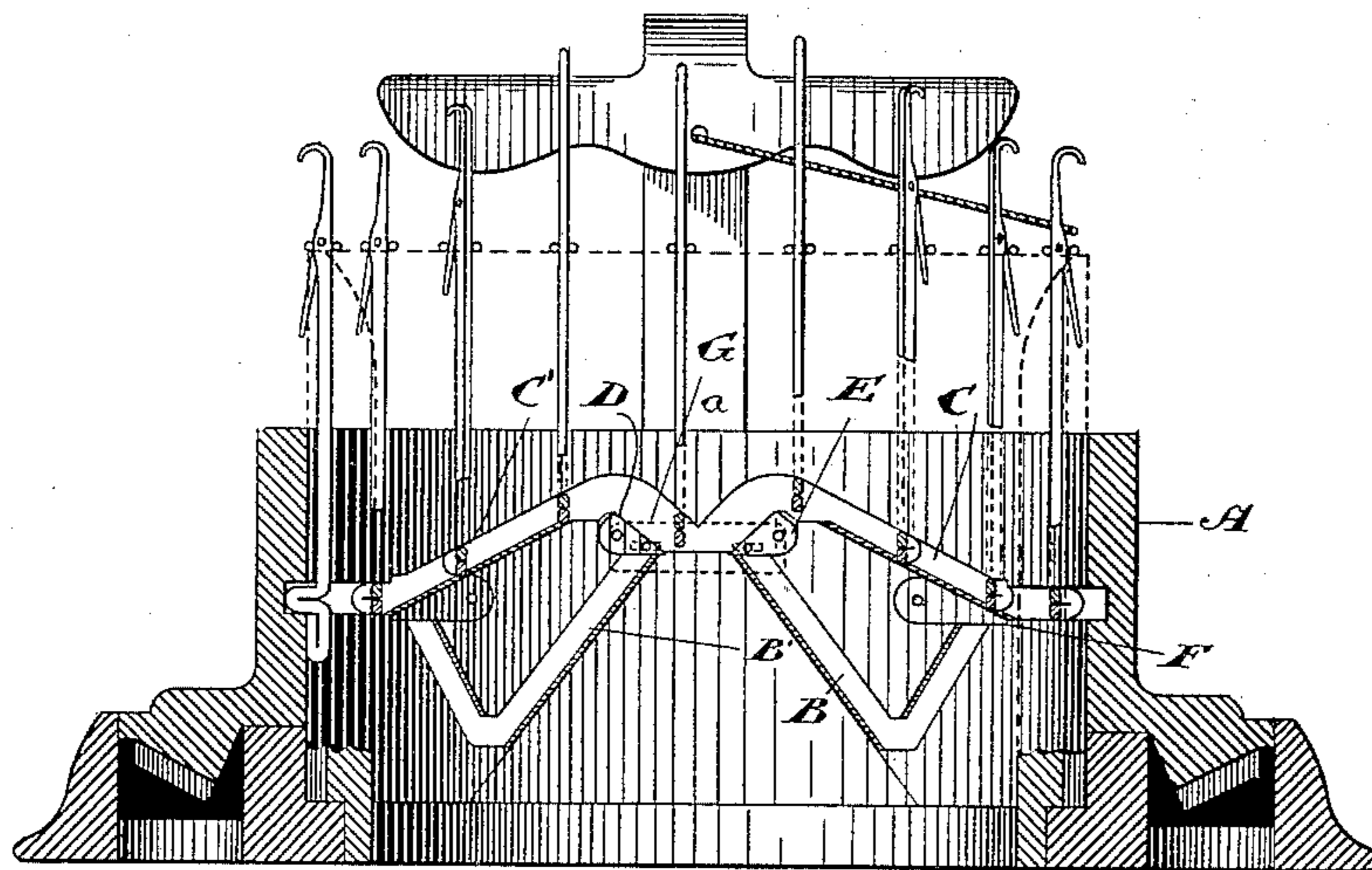


Fig. 1

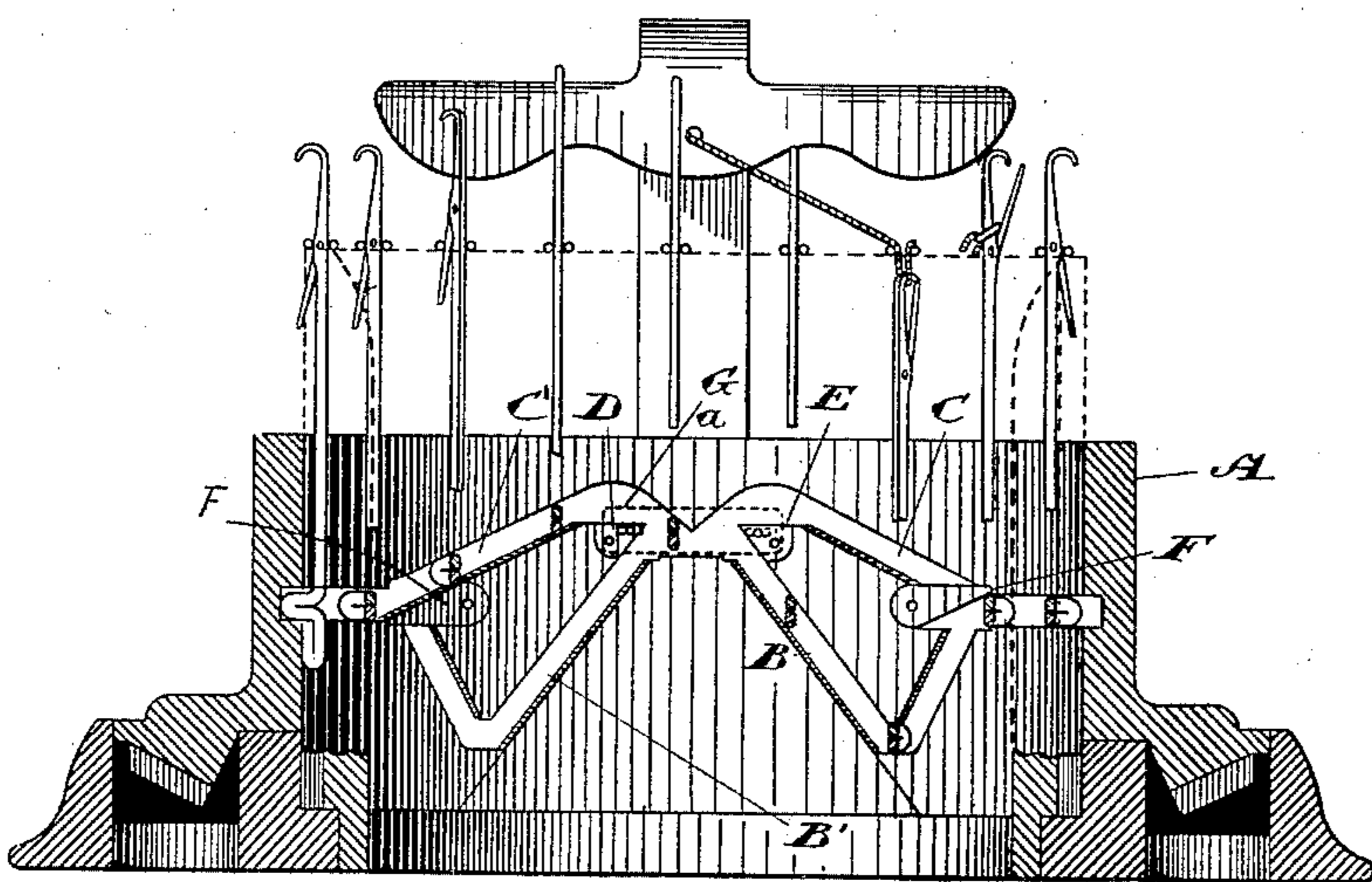


Fig. 2

Witnesses

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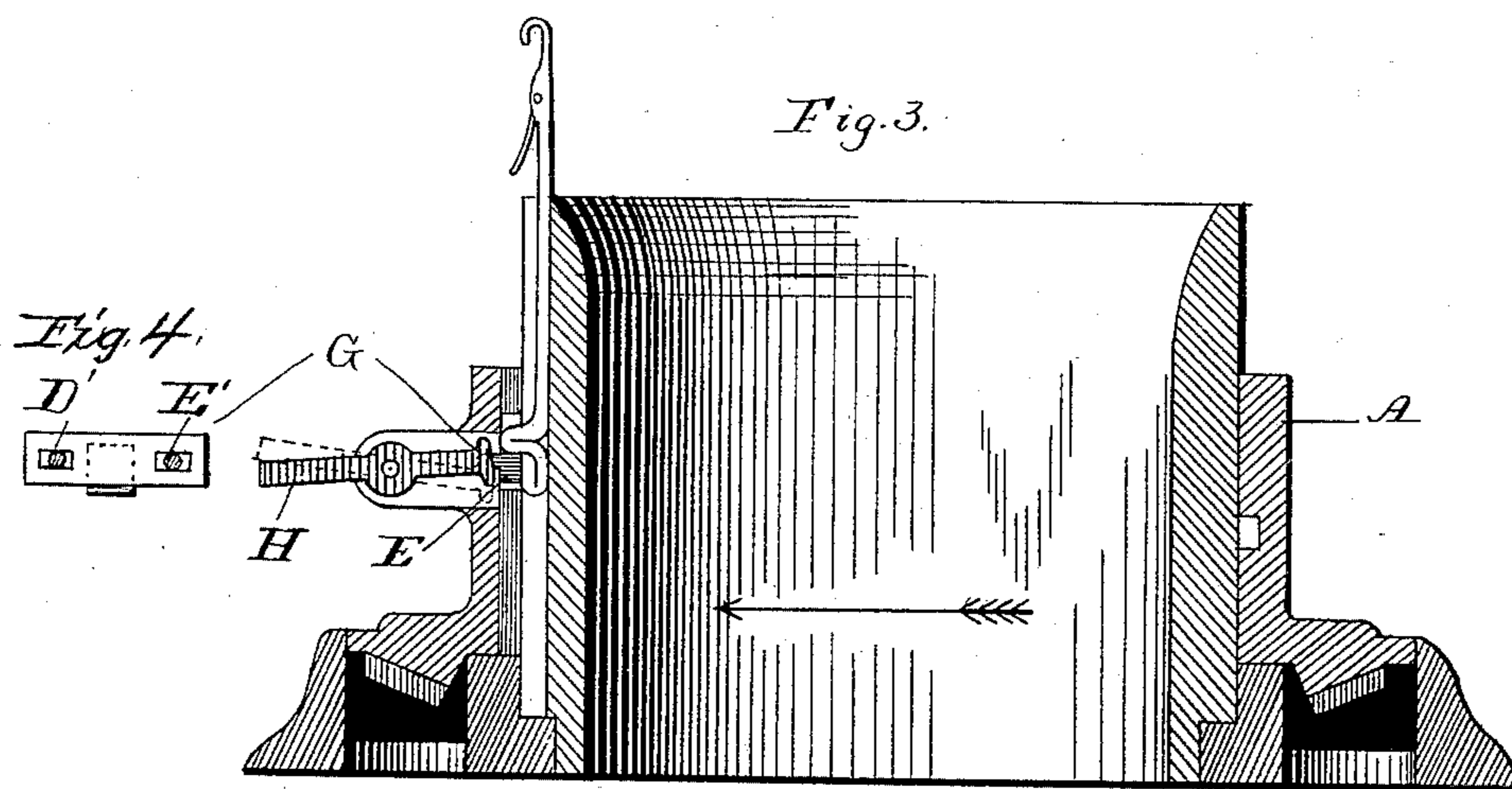
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Witnesses

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# UNITED STATES PATENT OFFICE.

MORITZ BOAS, OF ST. HYACINTHE, CANADA.

## CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 453,059, dated May 26, 1891.

Application filed October 9, 1889. Serial No. 326,457. (No model.) Patented in Switzerland November 23, 1889, No. 1,703; in England November 28, 1889, No. 19,160; in France December 20, 1889, No. 202,729; in Austria-Hungary March 24, 1890, No. 53,026 and No. 11,249, and in Belgium January 20, 1890, No. 88,607.

*To all whom it may concern:*

Be it known that I, MORITZ BOAS, manufacturer, of the city of St. Hyacinthe, in the electoral district of St. Hyacinthe, in the Province of Quebec, Canada, have invented a certain new and useful Improvement in Circular-Knitting Machines, of which the following is a specification, and which has been patented in Great Britain, No. 19,160, November 28, 1889; in France, No. 202,729, December 20, 1889; in Belgium, No. 88,607, January 20, 1890; in Austria-Hungary, No. 53,026 and No. 11,249, March 24, 1890, and in Switzerland, No. 1,703, November 23, 1889.

The object of the invention is to design a simple device in which any number of needles in a reversible knitting-machine may be instantly thrown in or out of action without being handled or stopping the machine; and it consists, essentially, of a right and a left hand guiding-gate located one at each of the junctions of the knitting and non-knitting needle cam-grooves in such a manner that by the movement of the said guiding-gates the needles are directed into the non-knitting cam-groove, which holds them clear of the yarn so that they cannot knit, or into the knitting-needle cam-groove, which brings them into action and causes them to knit.

Figure 1 is a sectional view of the cam-cylinders of a circular-knitting machine, showing the guiding-gates set to direct the needles into the non-knitting-needle cam-grooves. Fig. 1 is a view showing the gates set to direct the needles into the knitting-needle cam-grooves. Fig. 2 is a vertical sectional view showing the mechanism whereby the gates are secured in adjusted position. Fig. 4 is a view of a detail.

In the drawings, A represents the cam-cylinder, in which the knitting and non-knitting needle cam-grooves are formed.

B B' represent the knitting-needle cam-grooves, and C C' the non-knitting-needle cam-grooves. There are two sets of grooves set in a reverse direction and connected at the junction *a*.

D and E represent two guiding-gates, one being a right-hand and the other a left-hand

gate, and preferably connected by a movable plate G in such a manner that the movement of the said plate shall adjust the two gates D and E simultaneously.

H, Fig. 3, is a lever or handle connected to the plate G and protruding through the cam-ring A, and it is by the means of this lever that the position of the said gates is controlled.

D' and E' are sections of two pins which protrude from the backs of the gates D and E near their points, engaging with two slots formed in the plate G to receive them. When lever H is depressed, as shown in Fig. 3, the plate G is raised and the gates D and E held in the position which is shown in Fig. 2. When the lever H is placed in the position indicated by the dotted lines, the gates D and E are changed to and held in the position which is shown in Fig. 1. When these gates D and E are set as indicated in Fig. 1 and the machine is traveling as indicated by the arrow in Fig. 3, the needle-butts are directed by the gate E into the non-knitting-needle groove C, and consequently the needles are kept out of action. When the gates D and E are adjusted into the position indicated in Fig. 2, the butts of the needles are directed by the gate E into the knitting-needle groove B. Thus the direction of the needles is instantly changed. When the gates D and E are held in the position as shown in Fig. 1 and the direction in which the machine is traveling is reversed from that indicated by the arrow, the needle-butts are directed by the gate D into the non-knitting cam-groove C', and consequently the needles are kept out of action. When the gates D and E are held in the position shown in Fig. 2 and the machine still traveling in reversed direction to that indicated by the arrow, the needle-butts are directed by the gate D into the knitting cam-groove B'. Thus the direction of the needles is changed from the non-knitting cam-groove C' into the knitting cam-groove B'. In this way the needles are put into or out of action without handling them, or if done automatically or quickly these changes may be effected without stopping the machine.

In order to reverse the machine, I first move

the gates D and E back into the position shown in Fig. 1, continuing to revolve the machine in the same direction in which it first moved until all the needles which may have entered the knitting-needle grooves B have passed the tripping-gate F. The moment that the last needle has passed this tripping-gate F the said gate closes, either by its own gravity or by the action of a spring, and the machine may be reversed, and the gates D and E, either being left in position to keep the needles in the non-knitting-needle grooves C or set so as to make the guiding-gate D act as the switch and direct the needle-butts into the knitting-groove B', the machine revolving in the direction opposite to that indicated by arrow. In this way the machine may be reversed when moving in either direction without any fear of breaking the needles or without handling them. The only point to be observed is to see that all the needles are clear of the knitting-needle grooves before the reversing takes place.

By my arrangement of guiding-cams I am able to increase or decrease the number of needles in operation without handling the needles. For instance, if I set the guiding-gate E as shown in Fig. 2 and hold it in that position only sufficiently long to permit a single needle to pass, and immediately reclose the said guiding-gate E into the position in

which it is shown in Fig. 1, the single needle thus thrown into the right-hand knitting-groove B operates. When this needle has passed the tripping-gate F, the machine may be reversed, and when this needle reaches the guiding-gate D the said guiding-gate is set into the position in which it is shown in Fig. 2, when the said needle follows down the knitting-groove B', the guiding-gate D being closed the instant that the said needle has passed it. From this it will be seen that I can knit with one needle only, or as many more needles may be added as desired; or, in other words, the machine may commence with one needle and all the needles gradually be brought into action, or the knitting may commence with all the needles and the needles gradually withdrawn from action, thus widening or narrowing the fabric.

What I claim as my invention is—

A reversible knitting-machine having knitting and non-knitting needle cam-grooves and right and left hand guiding-gates located in proximity to the junctions of said grooves, substantially as described.

Toronto, October 3, 1889.

MORITZ BOAS.

In presence of—

CHARLES C. BALDWIN,  
W. G. McMILLAN.