

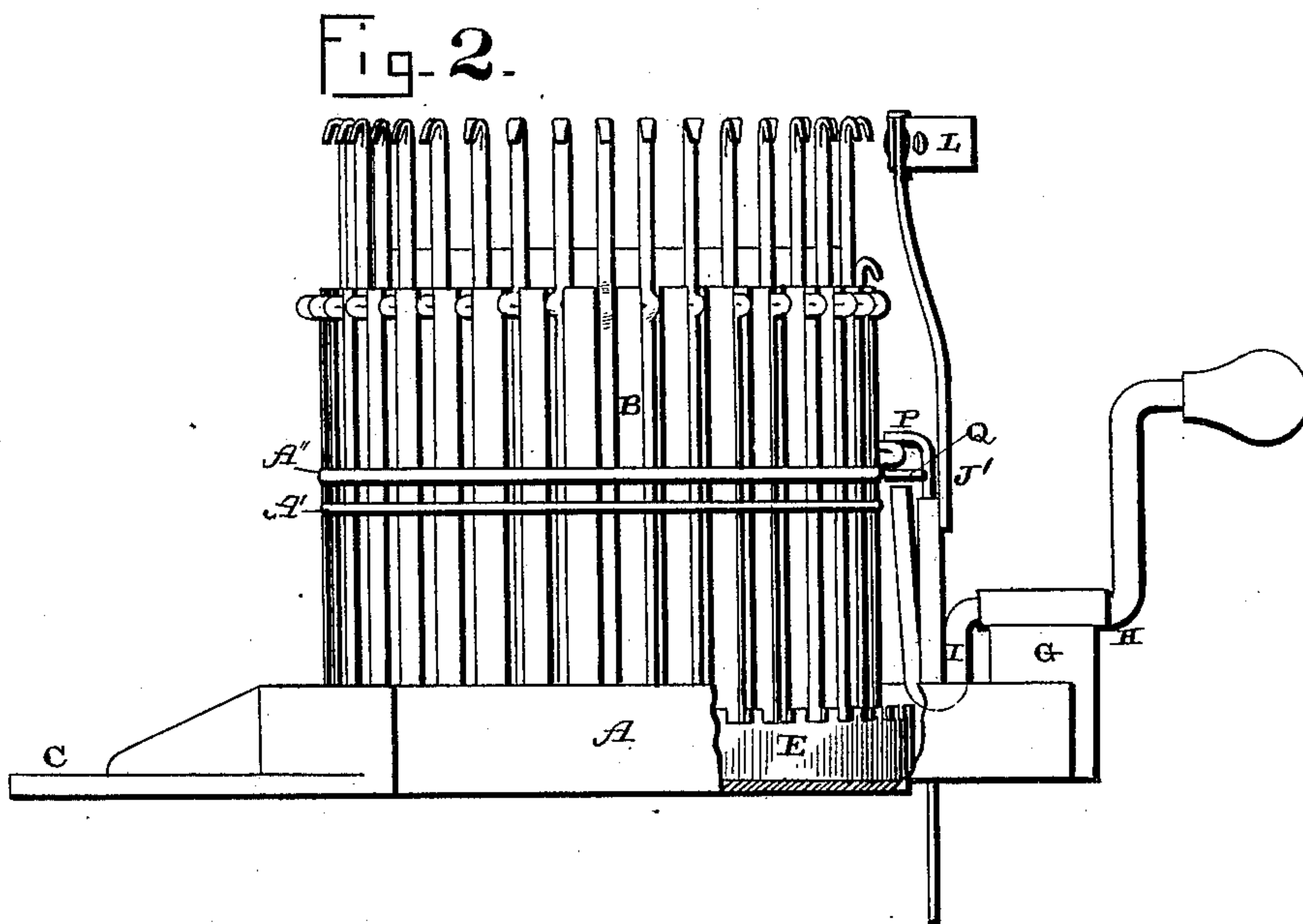
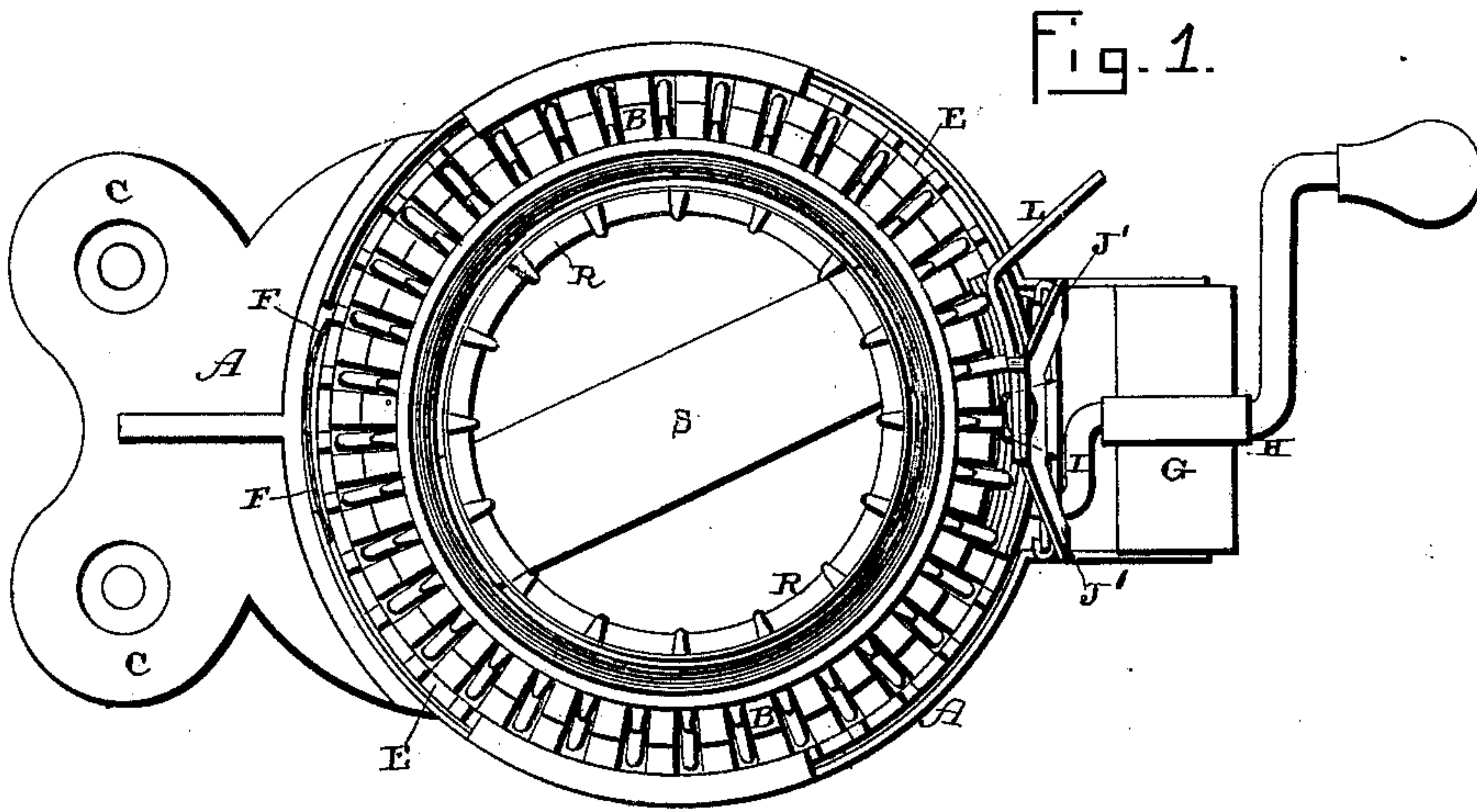
(No Model.)

2 Sheets—Sheet 1.

J. E. GEARHART.
CIRCULAR KNITTING MACHINE.

No. 424,877.

Patented Apr. 1, 1890.



Witnesses:

E. P. Ellis,
L. J. Magier

Inventor:

J. E. Gearhart,
per J. A. Lehmann, atty

2 Sheets—Sheet 2.

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Fig. 3.

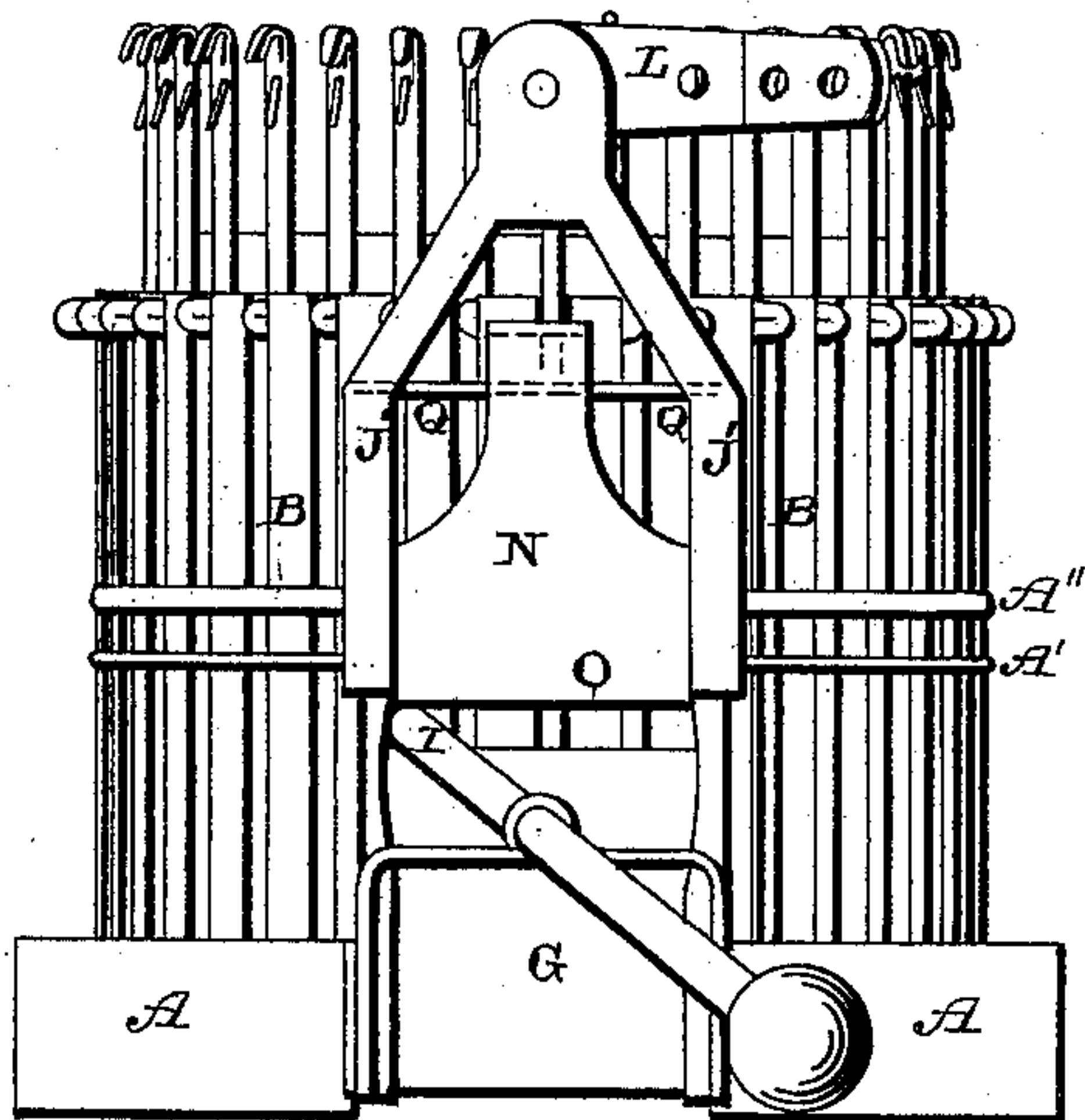


Fig-4-

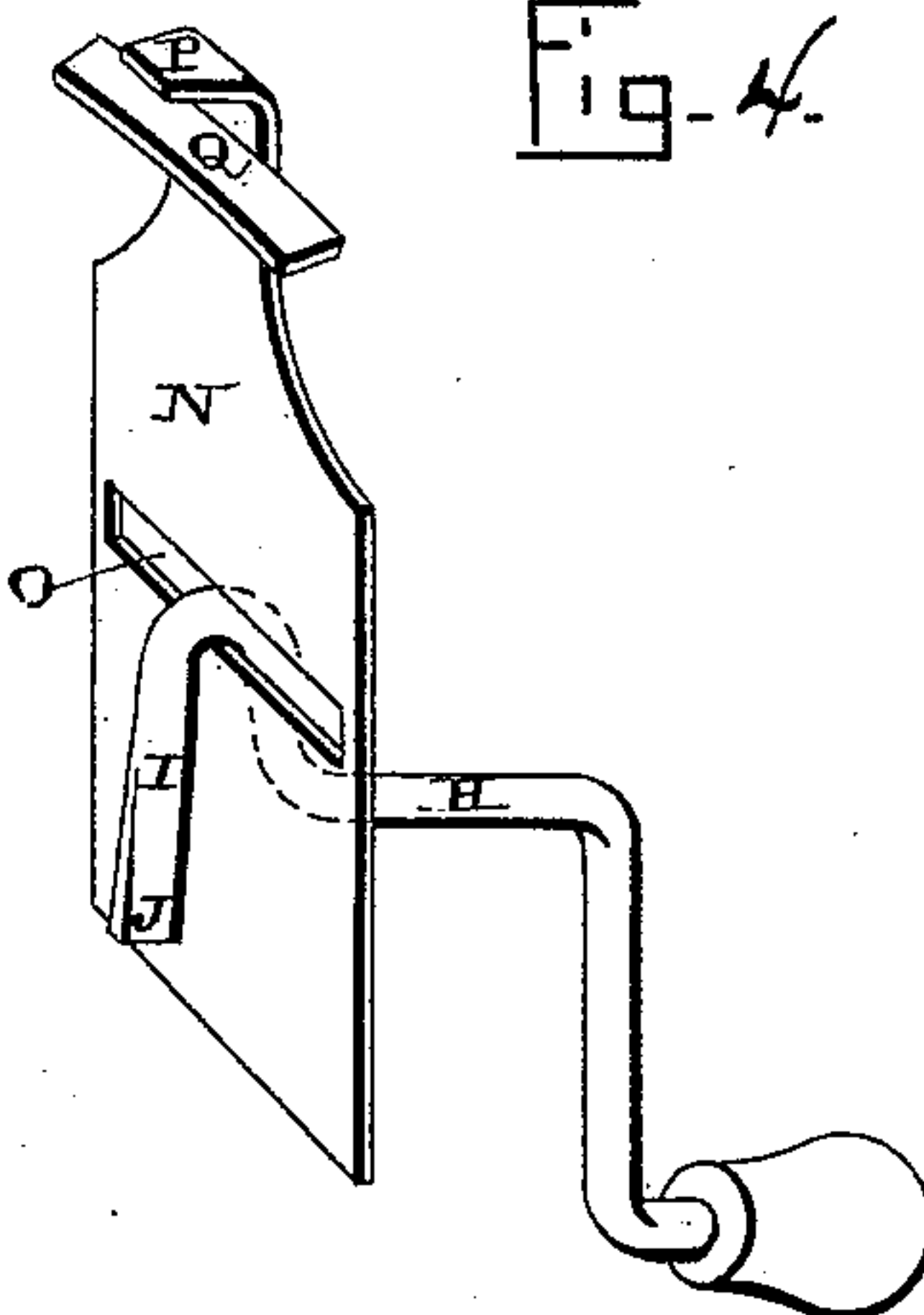


Fig. 5.

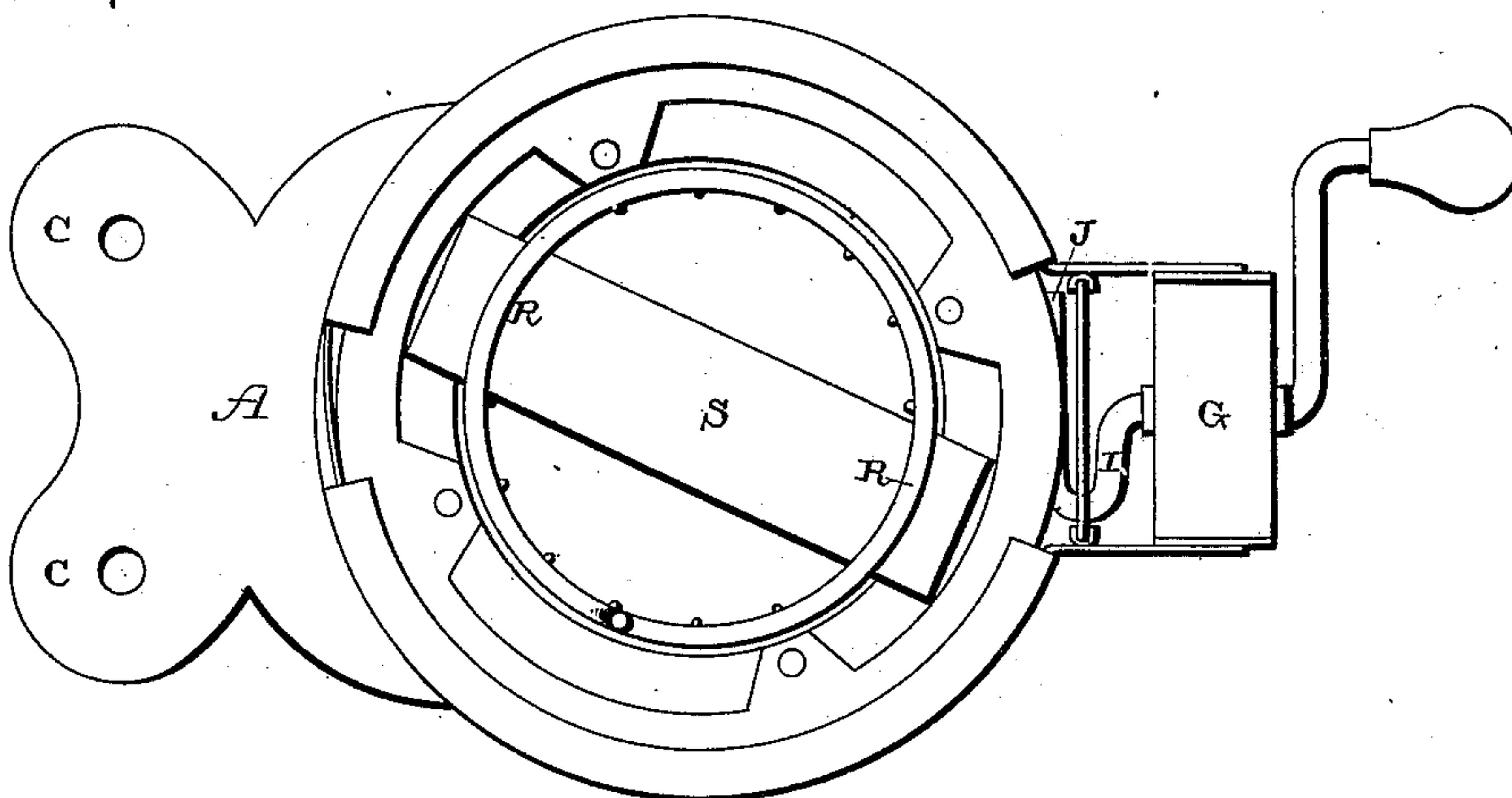
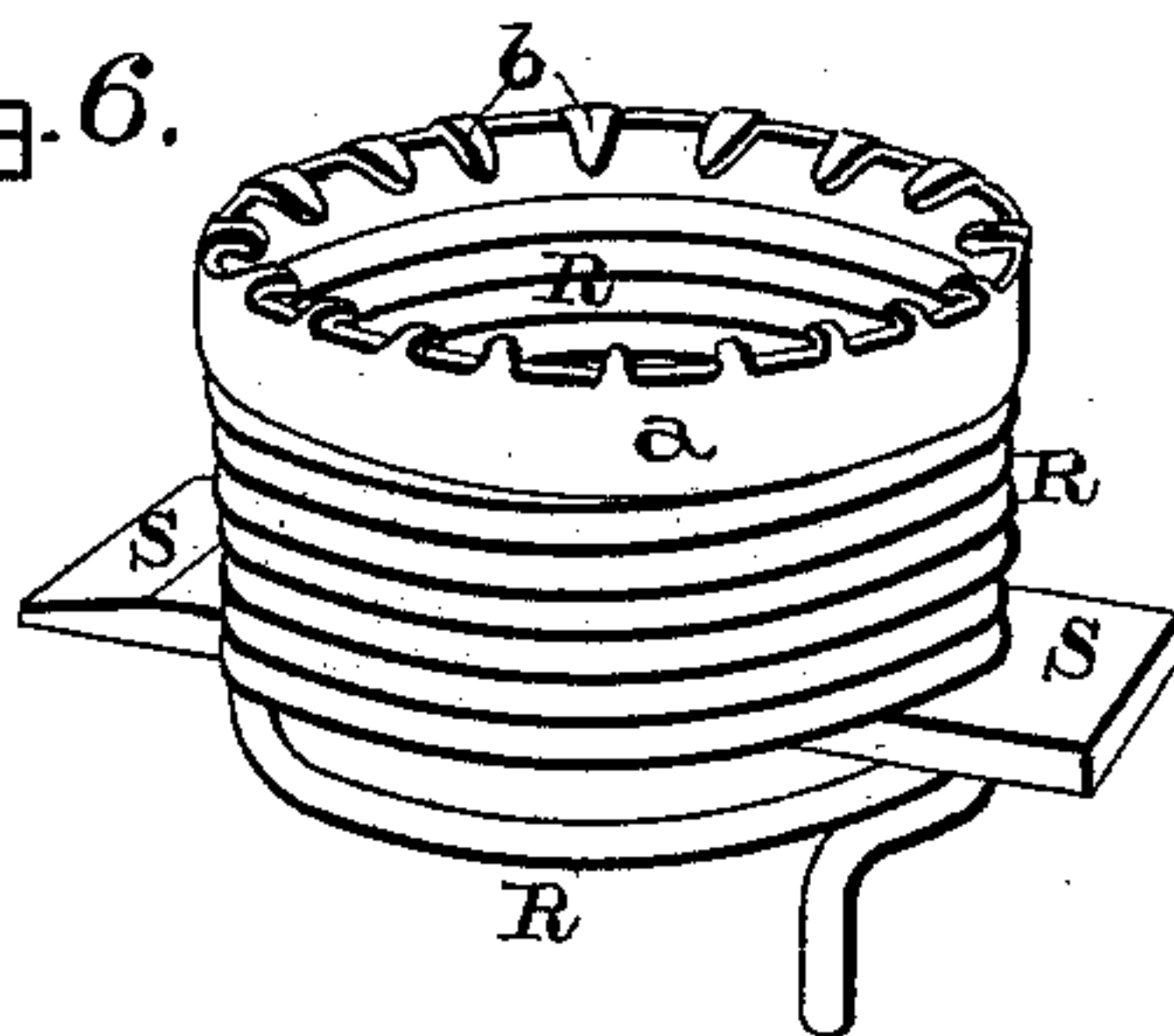


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH E. GEARHART, OF WEST DECATUR, PENNSYLVANIA.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 424,877, dated April 1, 1890.

Application filed November 13, 1889. Serial No. 330,177. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. GEARHART, of West Decatur, in the county of Clearfield and State of Pennsylvania, have invented certain new and useful Improvements in Circular-Knitting Machines; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to rotary-knitting machines; and the objects of my invention are to operate the vertically-moving slide which operates the needles by means of a crank upon the operating-shaft, and to turn the grooved cylinder provided with teeth or cogs at its lower end by means of the same operating-shaft, to operate the needles separately and together by means of a vertically-moving slide, which depresses the needles one at a time and which raises a number of them together, and to use a spiral spring for drawing the work down through the cylinder.

Figure 1 is a top view of a knitting-machine which embodies my invention. Figs. 2 and 3 are side elevations taken at right angles to each other. Fig. 4 is a detached view of the operating-shaft and the vertically-moving slide. Fig. 5 is a bottom view of the machine. Fig. 6 is a detached perspective view of the spiral spring R.

A represents the frame in which the circular revolving grooved cylinder B is placed. This frame A may be of the construction here shown, or any other that may be preferred, and is provided upon one side with the ear C, through which the screws are to be passed for the purpose of securing the machine upon any suitable base provided therefor. The cylinder B is provided on its outer surface with a longitudinal groove for each needle, in which groove it is held in the manner hereinafter described, and in which it has a free vertical movement.

Secured to the lower edge of the cylinder B is a crown-wheel E, the cogs upon the wheel being so arranged as to just correspond to the number and positions of the grooves, as shown, so that when the cylinder is moved forward one tooth a needle will be brought into the

proper position to be drawn downward by the vertical slide. In order to prevent the cylinder from being moved either forward or backward, except when operated positively by the end of the operating-shaft, a friction-spring F is used, and this spring bears against the outer edge of the crown-wheel for the purpose of preventing any unnecessary movement.

Formed as a part of the base A is the bearing G for the operating-shaft H, which is provided with a crank-handle at its outer end and crank I just inside of the bearing, and has its inner end J so shaped as to move the cylinder B forward through the crown-wheel one tooth at a time. Rising above the bearing is a vertical standard J', which has suitable guides formed upon opposite sides of its lower end and which forms a support for the pivoted thread-carrier L. Moving in the guides of the standard J' is the vertical slide or cam N, which is provided with a slot O, by means of which it is operated by the crank I, and which slide has its upper end turned horizontally inward, so as to form the projection P. Secured to the inner side of this slide N, below the projection P, is the horizontal plate Q, which is long enough to raise one or more of the needles each time the slide N moves upward. The projection P upon the upper end of the slide depresses a single needle each time that the slide N is depressed, and then as the slide is again raised the plate Q raises its set of needles. Just as the slide N is raised by the crank I to its highest position the end J of the operating-shaft moves the cylinder forward one cog, thus causing a new needle to be presented to the projection P for the purpose of being depressed. As above stated, each time that the slide N is raised it raises a set of the needles to their highest point, and each time that it is depressed one of the needles is first depressed and then returned to its position again. Pivoted upon the upper end of the support J' is the thread or yarn carrier L, which can be turned toward either the right or the left, according to the direction the cylinder is being turned. Placed inside the cylinder is a spiral spring R, which is held in position at its lower end by a cross-bar S, and which spring has attached to its upper end a circular plate a, which is provided with hooks b, for catching in the work and exerting the

necessary tension upon it. This spring serves to draw down the work as fast as it is formed, and does away with the weights and other similar devices which have heretofore been employed.

The needles are held in position in the cylinder by means of a wire or metal band A', which is passed around the cylinder, and just above it is placed a rubber or elastic band A'', as shown. The elastic band serves to allow each of the needles a slight movement at its upper end when it is raised to its highest point in the usual manner.

By depressing a single needle at a time the machine can be turned backward and operated with the same needle. Heretofore other machines have required to have a number of needles upon which to reverse the motion.

Having thus described my invention, I claim—

1. The combination of the grooved cylinder provided with a wheel upon its lower end, an operating-shaft provided with a crank for moving the slide and having its inner end so shaped as to engage with the teeth of the wheel, and the slide having the plate Q, and extending inward at its upper end, so as to raise and depress the needles, substantially as set forth.

2. In a knitting-machine, the combination of a vertically-moving slide provided with a projection at its upper end and a horizontal plate below the projection, the cylinder, the needles, mechanism for raising and lowering the slide which operates the needles, and means for revolving the cylinder, substantially as specified.

3. The combination of a revolving cylinder in a circular-knitting machine, with a spiral spring and hooks connected thereto at its upper end for engaging with the work, and a cross-bar for catching against the base of the machine, substantially as shown.

4. The combination, with the grooved cylinder, a crown-wheel applied to its lower end, and a reciprocating slide, of a single operating-shaft bent into the form of a crank, whereby the bent portion engages and operates the slide, and its inner end engages the crown-wheel for revolving the cylinder as the shaft is turned, substantially as set forth.

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

JOSEPH E. GEARHART.

Witnesses:

A. S. AMMERMAN,
JOSEPH BRESSLER.