(No Model.) 2 Sheets—Sheet 1.

G. E. NYE.

KNITTING MACHINE.

No. 253,752. Patented Feb. 14, 1882.

Fig. 1.

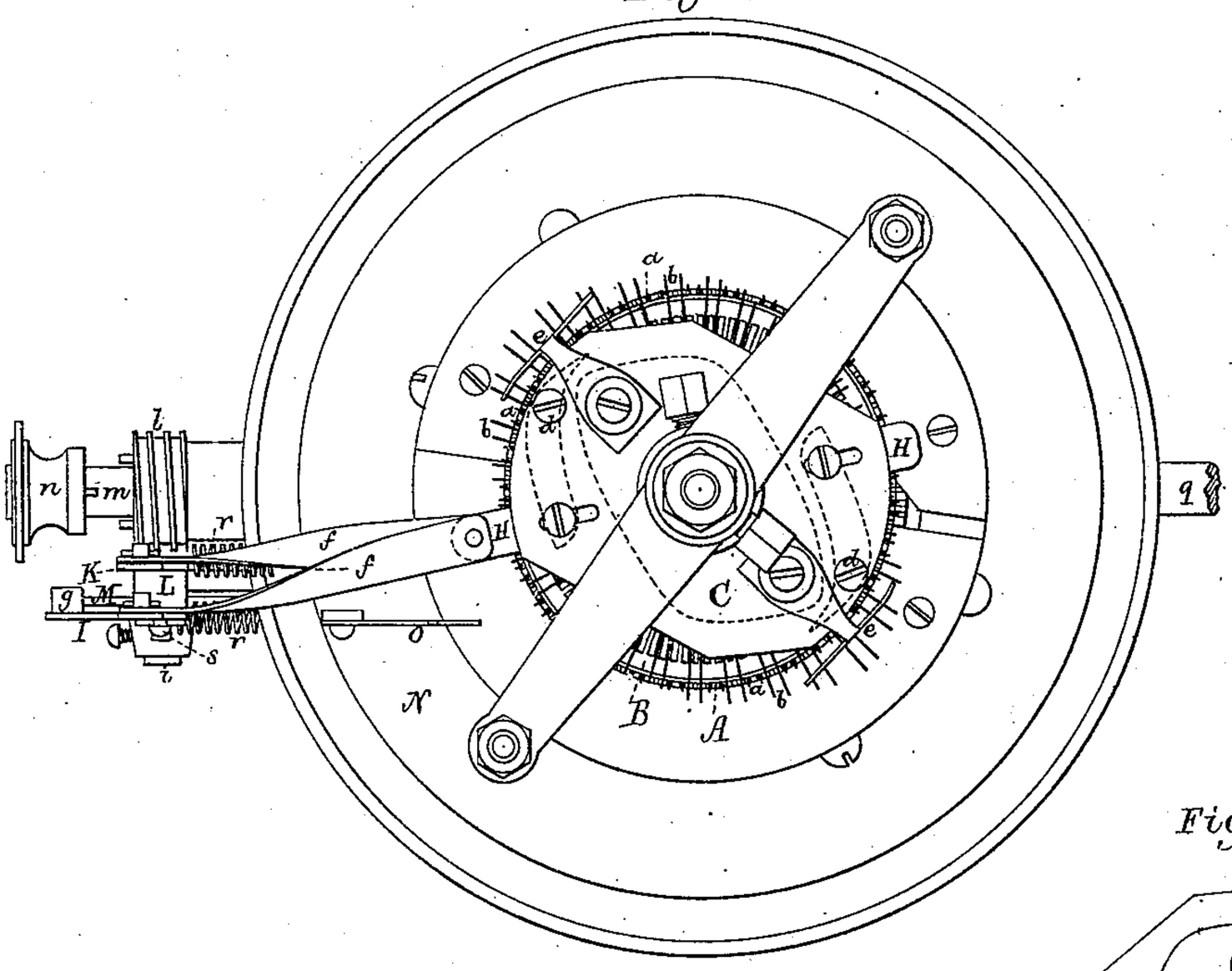

Fig. 2.

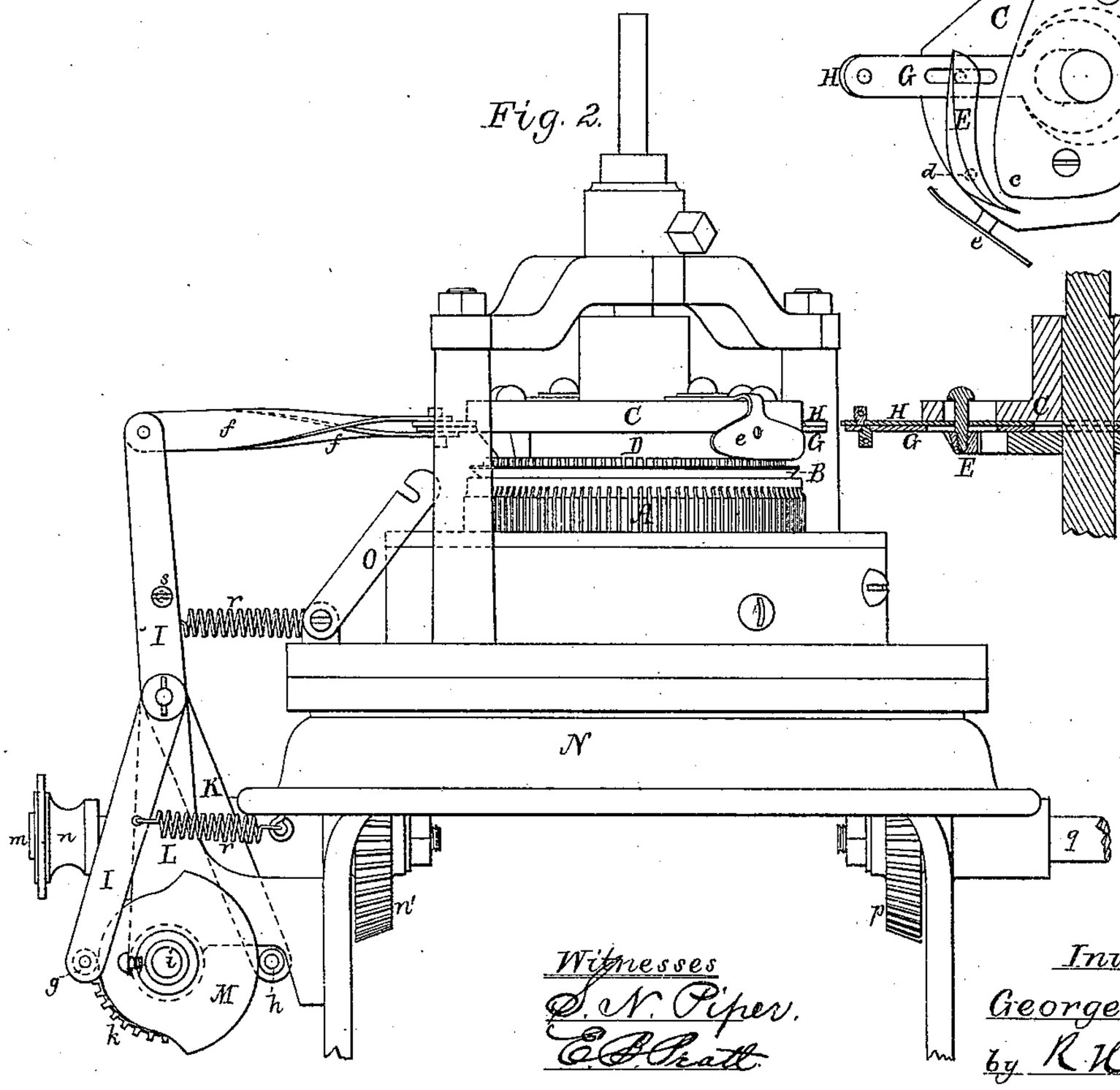

Fig. 5.

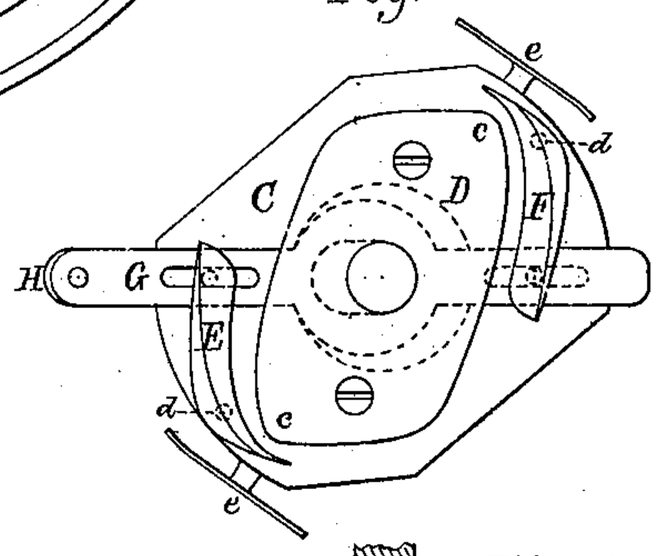

Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

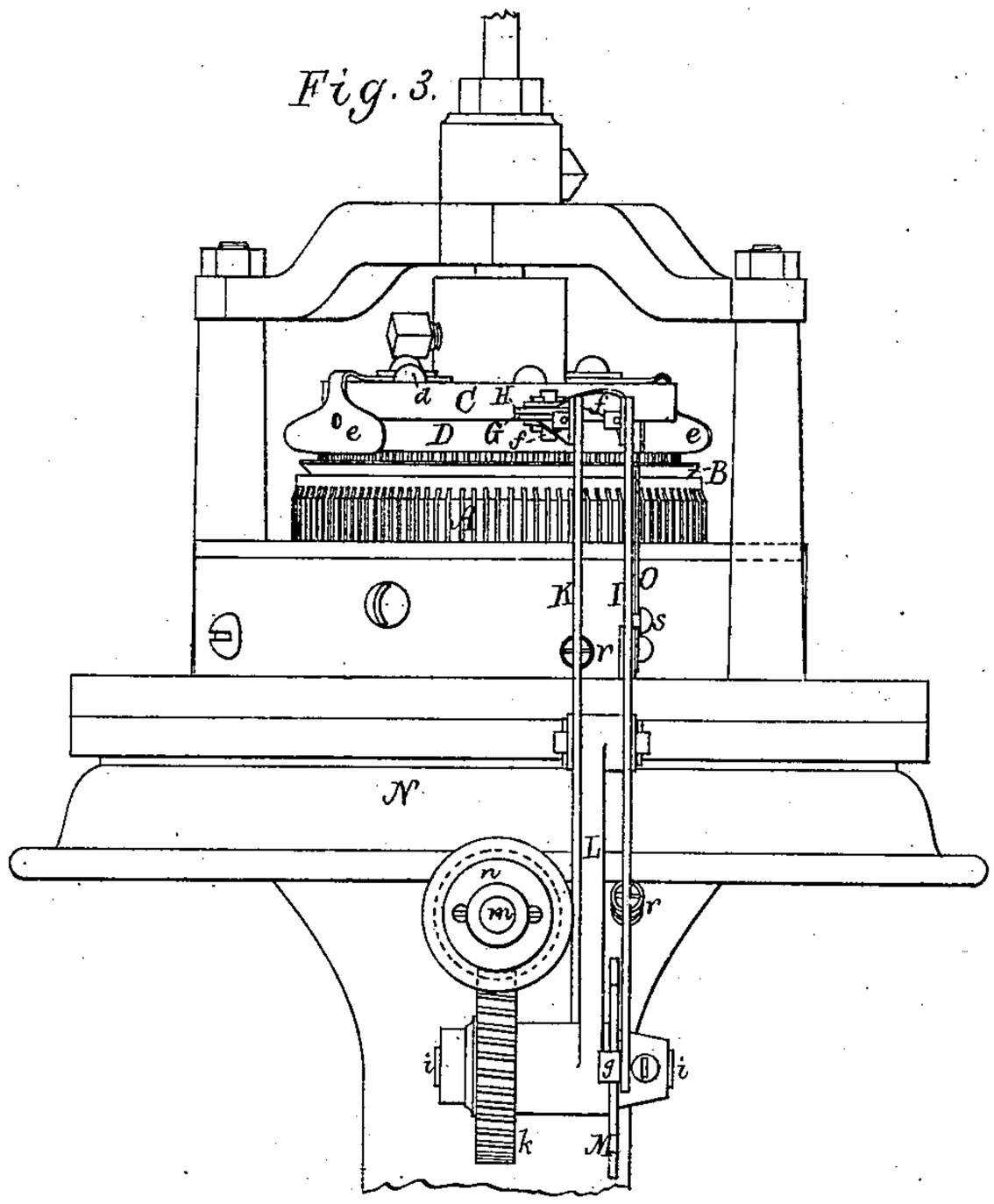
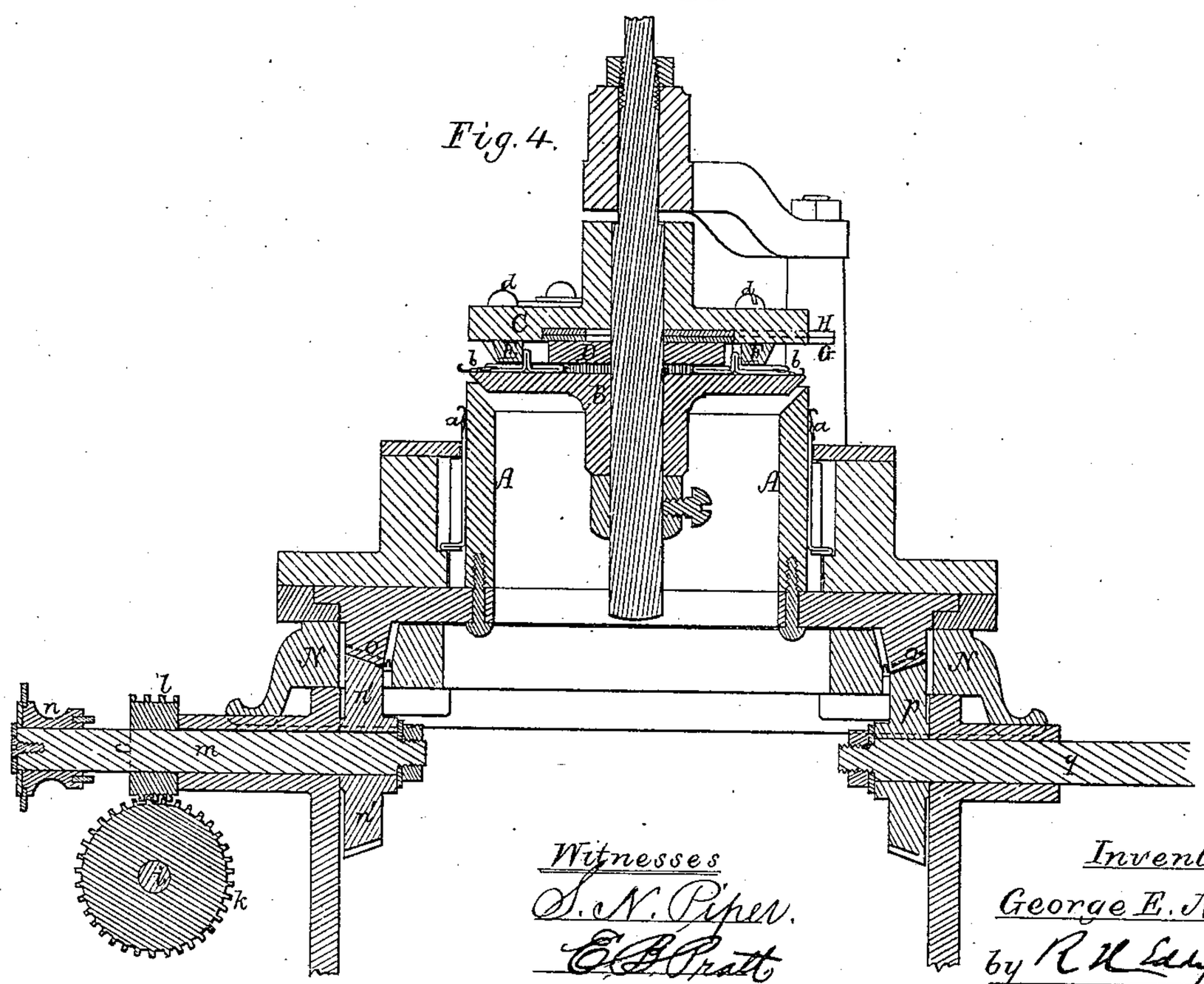


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE E. NYE, OF BRISTOL, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND HIRAM P. BALLOU, OF NEEDHAM, MASSACHUSETTS.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,752, dated February 14, 1882.

Application filed November 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. NYE, of Bristol, of the county of Bucks and State of Pennsylvania, have invented a new and useful Improvement in Rib-Knitting Machines of the Circular Class; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a front elevation, Fig. 3 a side view, and Fig. 4 a vertical section, of a machine embodying my invention. Fig. 5 is an under side view of the dial-needles' operative cams and their supporter. Fig. 6 is hereinafter described.

The nature of my invention is defined in or by the claims hereinafter set forth, its object being the production of certain changes, to be hereinafter described, in knitting the ribbed fabric, such changes being produced by the drawing-in cams and their operative mechanism, to be described.

In carrying out my invention I have combined with the push-out cams of the dial-needles of a machine for the production of circular rib-knitting two movable drawing-in cams and certain mechanism, as hereinafter explained, for operating these latter cams.

In the drawings, the vertical needles are shown at *a* and the horizontal ones at *b*. The needles of the former set are arranged in the ordinary manner in grooves in the outer periphery of a rotary cylindrical tube, A, while the horizontal needles are disposed in radial grooves within a rotary circular plate, B, usually termed the "dial." The supporter of the cam of the dial-needles is shown at C as provided with the stationary cam-plate D, formed or provided with the push-out cams *c c*. The said plate D is between two movable cams, E F, formed and arranged, as shown in Fig. 5, on the lower part of the supporter C. Each cam is pivoted to the supporter at *d*, and also to one of two slides, G H, arranged within the supporter and relatively to the cam-plate D, in manner as represented in Fig. 5, and more especially as shown in Fig. 6, which is a vertical section of the supporter and the two slides.

Opposite to each push-out cam is a yarn-guide, *e*, through a hole in which the yarn is led to the needles. The two slides G H, by means of links *f f*, are connected to the upper arms of two angular levers, I K, fulcrumed to the upper part of a stationary post, L. From the lower arms of these levers two studs, *g h*, project, and have between and against them a cam, M, formed as shown, and fixed on a short shaft, *i*, upon which is fastened a worm-gear, *k*, that engages with a worm, *l*. This worm revolves freely on a short horizontal shaft, *m*, provided with a sliding clutch, *n*, to engage the gear with or disengage it from the shaft, as occasion may require. On the inner end of the said shaft *m* is a bevel-gear, *n'*, that engages with the gear *o* of the rotary tube A, such tube being revolved by a gear, *p*, which is fixed on the driving-shaft *q* and engages with the gear *o*.

To the levers I K springs *r r* are adapted to keep the studs of the levers up to the periphery of the cam M, such springs being projected from the circular head N for supporting the knitting-machine. Furthermore, from the upper arm of one of the levers I K a stud, *s*, projects. A latch, O, pivoted to the head N and notched to receive the stud *s*, serves, when caught in the stud, to hold the lever stationary, in which case the draw-cam of the lever will be maintained in its closest position to the cam-plate D, the upper draw-cam being movable toward and from such plate while the cam M may be in revolution.

The vertical needles are to be supposed to be operated by suitable cams while the tube A may be in revolution, the number of such cams corresponding to the number of thread-guides. If now we suppose the two yarns of the two thread-guides to be of different colors—that is, one to be red and the other blue, for instance—the ribbed fabric produced may have what may be termed a "striped," "checked," or "block-work" appearance, either being produced, as may be desired. If we wish to knit the striped work, unclutch the worm from its shaft, in which case the cam M will not revolve so as to affect or move either of the levers I K. Should we desire to knit the block, we turn down the latch upon its catch-stud and thereby stop one of the levers from working, and we clutch the worm to its shaft. The machine will

then perform the block-knitting, which consists of transverse and parallel ranges of stitches, of which each range is of one color and the next one of the other of the two colors. In the striped work the ribs are of one color and the intervening spaces of the other color. The check-knitting has the appearance of the squares of a checker-board, each figure or portion of color being either square or rectangular, as may be required. To produce the check-knitting, both levers are to be acted on by the cam and the worm is to be clutched to its shaft. These changes can be effected while the machine may be in operation, there being no necessity for stopping it in order to effect either of them.

What I claim in the circular rib-knitting machine as my invention is as follows:

1. The combination of the stationary cam-plate D and the two movable cams E F and their operative mechanism, consisting of the slides G H, links *f f*, levers I K, post L, cam M, shaft *i*, worm-gear *k*, worm *l*, shaft *m*, and clutch *n*, all being applied substantially as specified.

2. The combination, with the head N, latch O, and adjustable cam, of the lever I, provided with stud *s*, and mechanism for operating said lever, substantially as specified.

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Witnesses:
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S. N. PIPER.