

(No Model.)

2 Sheets—Sheet 1.

J. BYFIELD.

CIRCULAR KNITTING MACHINE.

No. 359,556.

Patented Mar. 15, 1887.

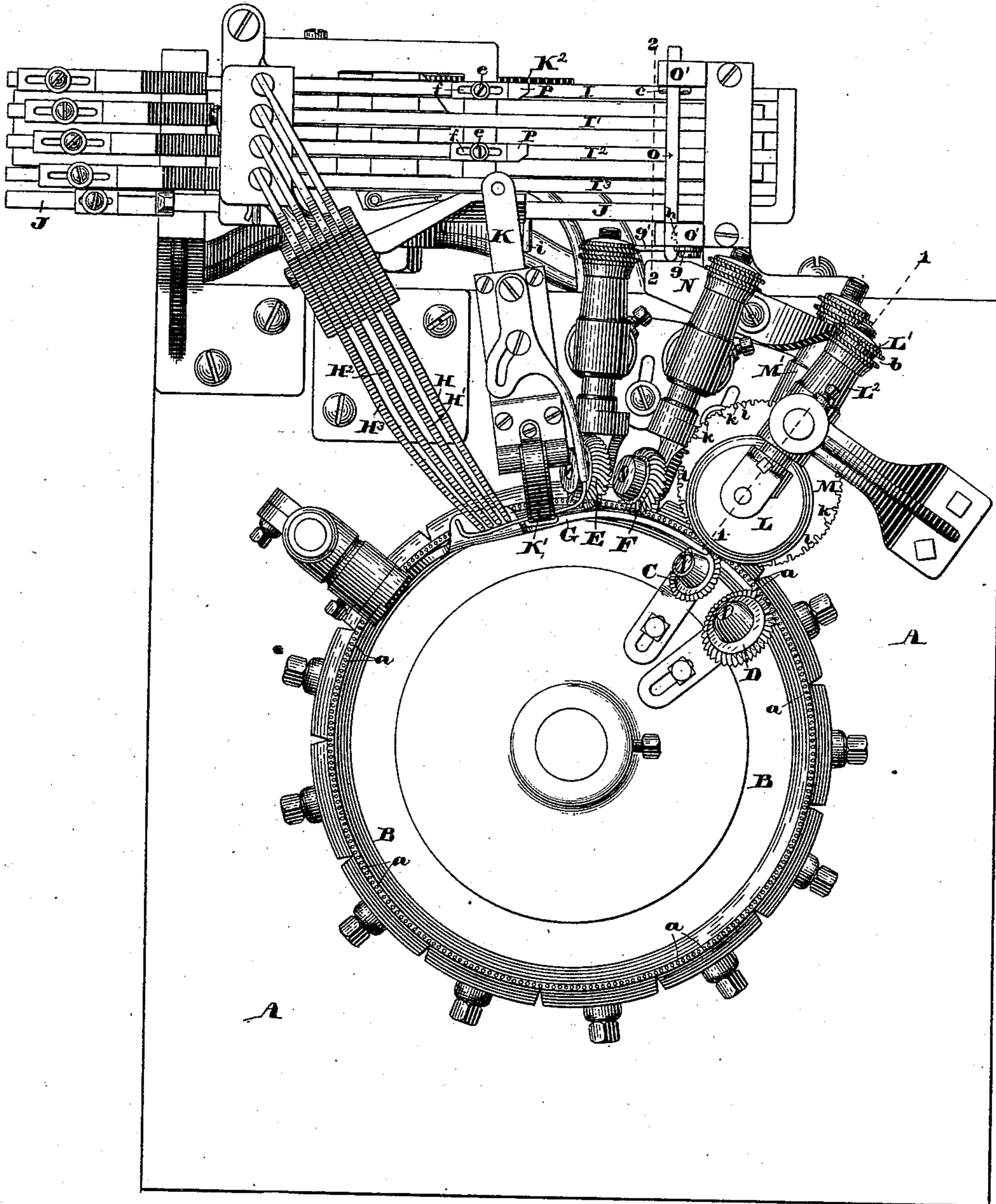


Fig. 1.

Witnesses:

E. E. Chandler.
Walter E. Lombard

Inventor:
John Byfield,
by N. C. Lombard
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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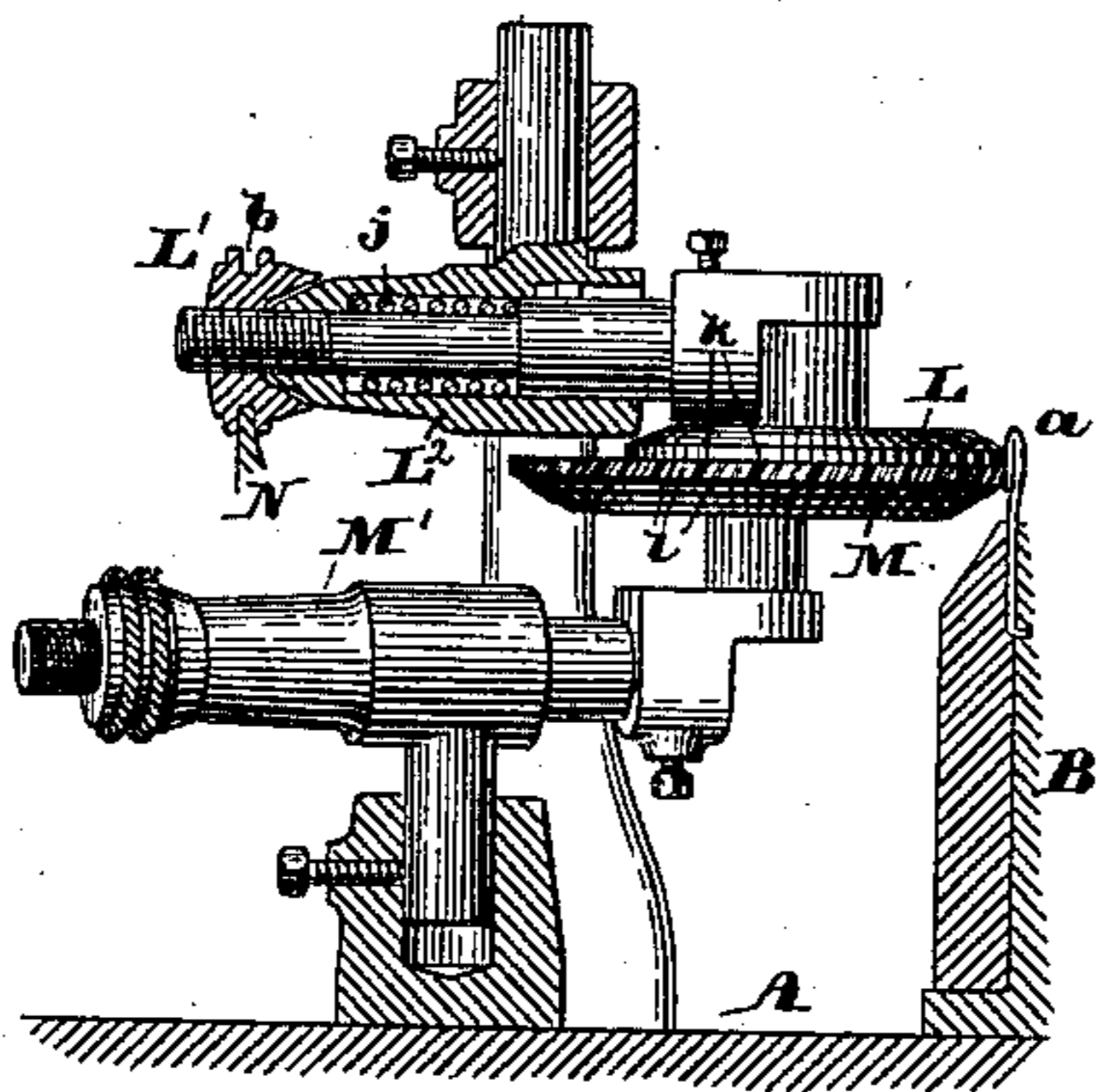


Fig:2.

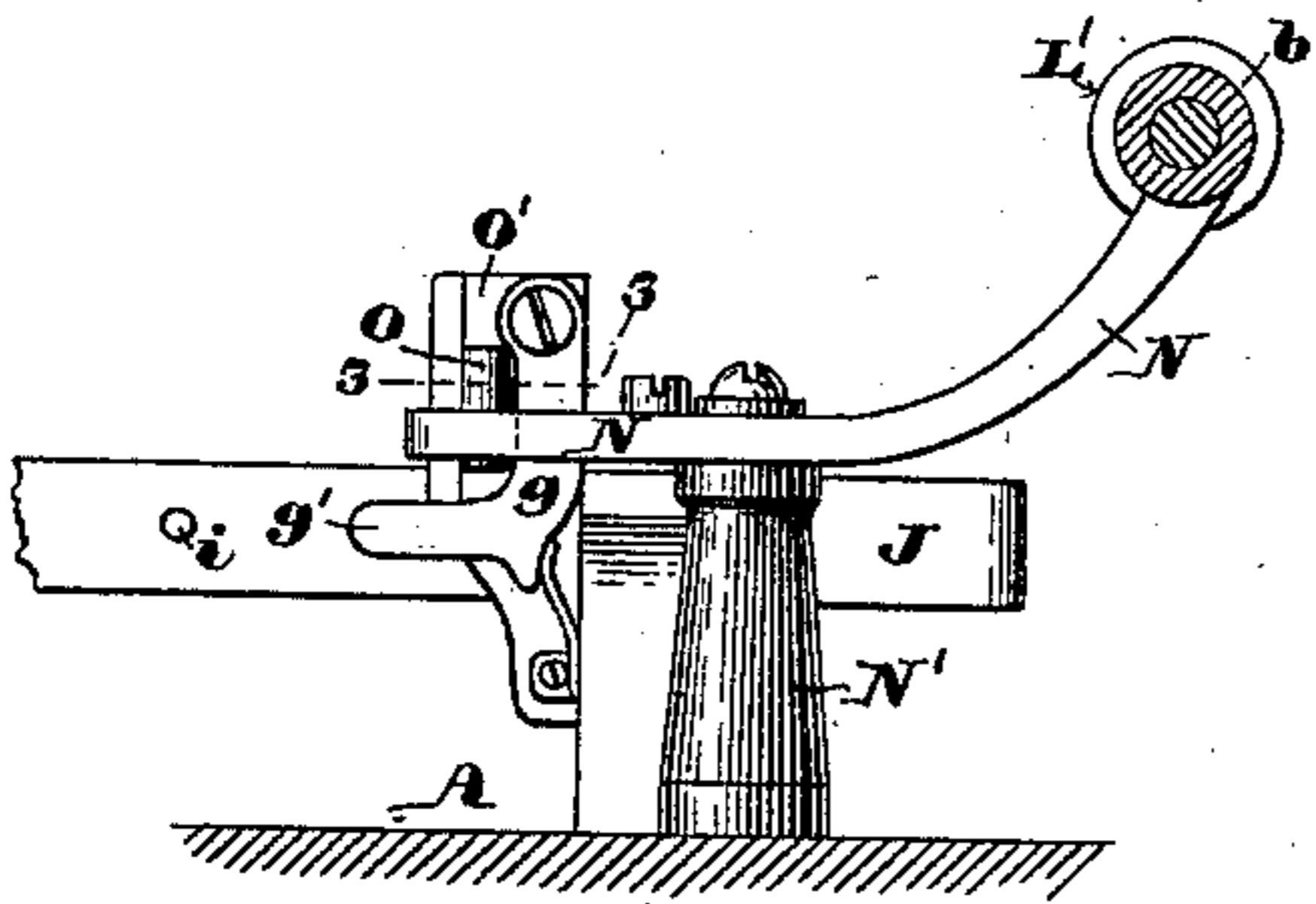


Fig. 5.

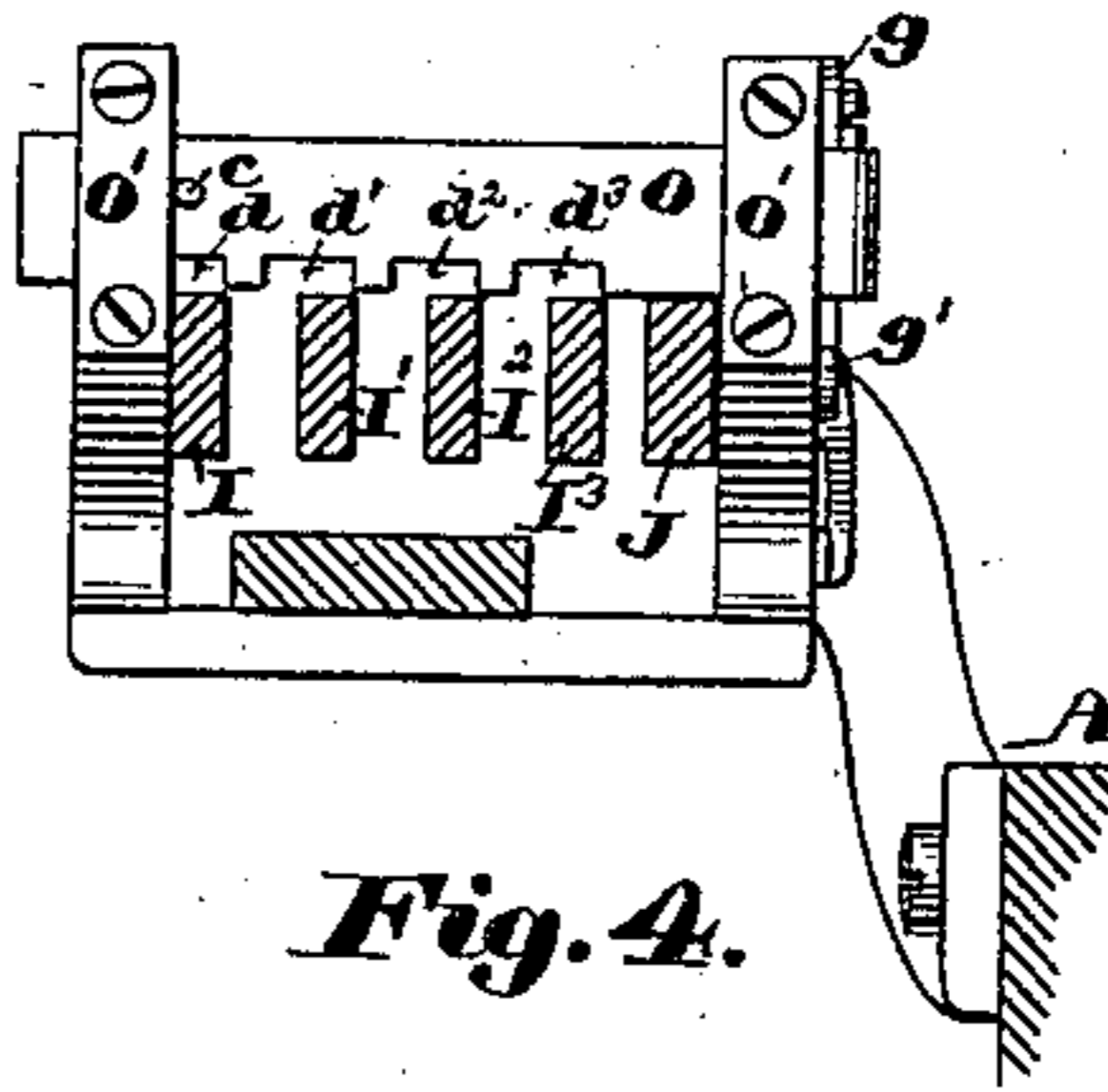


Fig. 4.

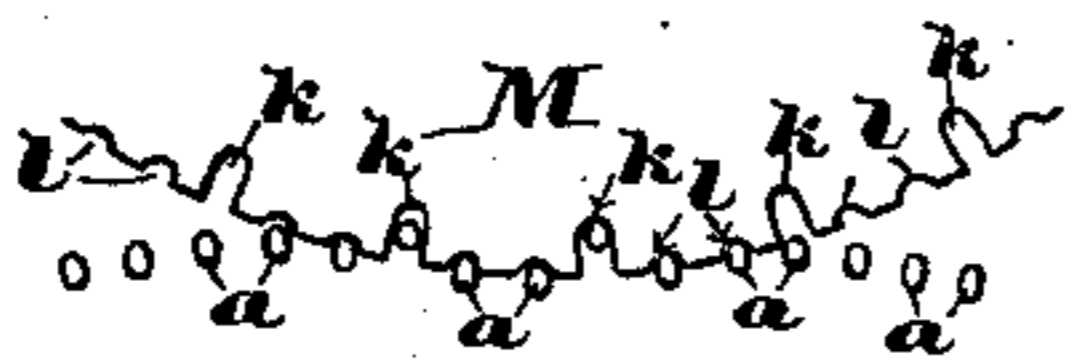


Fig. 5.

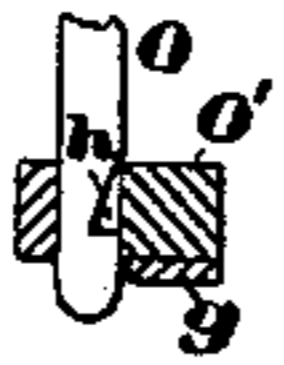


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN BYFIELD, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE BYFIELD MANUFACTURING COMPANY, OF SAME PLACE.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 359,556, dated March 15, 1887.

Application filed November 30, 1885. Serial No. 184,249. (No model.)

To all whom it may concern:

Be it known that I, JOHN BYFIELD, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Circular-Knitting Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of circular-knitting machines in which barbed or spring needles are used, and in which two or more yarns of different colors are or may be used for knitting striped goods, and it is an improvement upon the inventions described in the Letters Patent Nos. 311,172 and 311,173, granted to me January 27, 1885; and it consists in certain attachments to said machines, whereby they are adapted to knitting plain stripes, a combination of plain and broken stripes, or dotted work, at the pleasure of the operator, all of which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Figure 1 of the drawings is a plan of a machine embodying my invention. Fig. 2 is a vertical section of a portion of the machine, the cutting plane being through the center of the star-box for carrying the ordinary "presser-wheel," on line 1 1 on Fig. 1, and showing the ordinary and tuck presser-wheels and the star-box for the tuck presser-wheel in elevation. Fig. 3 is a vertical section through a portion of the bed and the star-box of the ordinary presser-wheel, and showing the devices for locking the ordinary presser-wheel in a retracted position and releasing the same in elevation. Fig. 4 is a transverse vertical section on line 2 2 on Fig. 1, looking toward the right hand of said Fig. 1. Fig. 5 is a diagram illustrating the action of the special presser-wheel upon the needles; and Fig. 6 is a section on line 3 3 on Fig. 3, but showing a portion of the lever-operating bar in plan.

In the drawings, A is the bed of the machine; B, the needle-cylinder; C, the "landing-wheel;" D, the "knocking-over wheel;" E, the "stitch-wheel;" F, the "dividing-wheel;" G, the "push-back;" H, H', H², and

H³, the yarn-guiding levers; I, I', I², and I³, the reciprocating bars for operating and controlling the yarn-guiding levers; J, the bar for controlling the operations of the yarn severing and holding devices; K, the bar that carries the yarn-severing knife, and K' the clamping-jaw for holding the end of the severed yarn, all of the above being constructed, arranged, and operating substantially as described in said Letters Patent No. 311,173, it being understood that the bars I, I', I², and I³ may be operated and controlled in their movements by a pattern-chain, as described in said Letters Patent No. 311,172, by the scroll-pattern wheel and its accessories, as described in the Letters Patent No. 311,173, before cited, or by a pattern-cylinder of well-known construction, a portion of which is shown at K², Fig. 1.

The yarn-guides and the yarn severing and holding devices may be operated and controlled as described in either of the above-cited Letters Patent, and as the manner of operating and controlling the movements of the reciprocating bars, the yarn-guides, and the yarn severing and holding devices forms no part of my present invention, it need not be further described here.

The machine constructed as so far described is adapted to knit a succession of plain stripes of two to four colors; but the object of my present invention is to vary the work by knitting plain stripes alternating with broken stripes or rows of dots, or a series of rows of dots or dashes of one color in a plain field of another color; and to this end I use, in combination with the ordinary presser-wheel, L, a so-called "tuck presser-wheel," M, mounted upon a suitable star-box, M', in a position beneath the wheel L, with its upper face in close proximity to the under face of said wheel L, and provide means for automatically retracting the wheel L from contact with the needles, locking it in said retracted position, and releasing it again to cause it to come in contact with and act upon said needles, as will now be described.

The adjusting thumb-nut L' on the star-box L² has formed in its circumference a groove,

6, with which one end of the lever N, fulcrumed upon the post N', engages, the opposite end of which lever is pressed by the spring *j* against the inner end of the bar O, located just above the bars I, I', I², I³, and J, and fitted to slide in bearings O' O', as shown in Figs. 1 and 4.

The bar O has set therein the stop-pin *c*, which engages with the outer bearing, O', to limit the outward movement of said bar, and said bar has formed in its under edge four rectangular notches, *d d' d² d³*, arranged, respectively, over the bars I, I', I², and I³, as shown in Fig. 4.

P P are wedge-like cam-blocks secured to the upper edges of said bars I, I', I², or I³, one or more, by means of a screw, *e*, passing through a slot, *f*, in each of said cam-blocks and screwed into the bar I, I', I², or I³, so that said cam-block may be adjusted toward or from the bar O, as shown in Fig. 1.

One or more of the cams P may be used and may be secured to either of the bars I, I', I², or I³, according to the design to be produced, and when a bar carrying a cam-block, P, is moved toward the right of Fig. 1 the inclined cam-surface on the forward end of the cam-block engages with the side wall of the notch in the bar O corresponding to the bar being moved, and moves said bar O toward the lever N, thereby moving said lever about its fulcrum, and retracting the presser-wheel L or removing it from contact with the needles.

When the bar O has reached the limit of its movement toward the lever N, the latch *g*, pivoted to one of the bearings O', engages with a notch, *h*, cut in the vertical side of the bar O to lock it in such position, where it remains, holding the presser-wheel L in its retracted position until the next movement of the bar J toward the right hand of Fig. 1, when the pin *i*, set in the side of said bar, comes in contact with the end of the angularly-projecting arm *g'* of the latch *g* and disengages said latch from the notch *h*, when the reaction of the spring *j* in the star-box L² will move the presser-wheel L into contact with the needles again.

The presser-wheel M has formed in its edge two series of notches, which engage with the needles as the needle head or cylinder revolves, one series, *k*, being cut to such a depth that the needles received therein will not be pressed by said wheel, and, as a consequence, the stitch will not be knit, and the other series, *l*, being of much less depth, the beards will be pressed so as to spring the needle inward, just the same as if acted upon by the ordinary presser-wheel, and the stitch will be knitted.

The presser-wheel M (shown in the drawings) has the notches in its edge arranged in the order of one deep notch *k* to two shallow notches *l*, so that when the presser-wheel L is removed from contact with the needles every third stitch will be skipped or will not be

knit; but it is evident that the notches may be arranged in any other desired combination—as, one and one, two and two, three and one, or three and two—without affecting the principles of my invention.

When it is desired to knit plain stripes, it is only necessary to remove the cam-blocks P from the bars I, I', I², or I³, as the case may be, when the presser-wheel L will remain constantly in contact with the needles, all of which will have their beards pressed and be deflected from their vertical or normal position, and every stitch will be knitted, the presser-wheel M having no effect upon the needles when the wheel L is in contact with the needles.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with a revolving needle-cylinder carrying a series of bearded or spring needles arranged in a circle, a tuck presser-wheel provided in its periphery with two series of notches of different depths, and arranged to revolve constantly in contact with the needles, a plain presser-wheel located so as to press upon the needles in about the same radial line as the tuck presser-wheel, and in close proximity thereto, a series of pattern controlled and operated reciprocating bars, a pivoted lever connected at one end to the support of the plain presser-wheel, a spring arranged to press its other end toward said reciprocating bars, a notched bar arranged at right angles and in near proximity to said reciprocating bars, with one end in contact with the spring-pressed arm of said lever, and a cam-wedge formed upon or secured to one or more of said reciprocating bars in positions to act upon said notched bar when reciprocated, and thereby cause the plain presser-wheel to be moved away from contact with the needles in a direction radial to the axis of the needle-cylinder.

2. In combination with a revolving needle-cylinder and a series of bearded or spring needles mounted thereon, the tuck presser-wheel M, the plain presser-wheel L, the lever N, connected at one end with the supporting-arm of the wheel L, a series of pattern-controlled bars, a cam-block, P, on one or more of said bars, the notched bar O, arranged to act upon the lever N, a locking-latch for holding said plain presser-wheel in its retracted position, and the bar J, provided with a device for retracting said latch to release said wheel and allow it to again press upon the needles, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 21st day of November, A. D. 1885.

JOHN BYFIELD.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.