

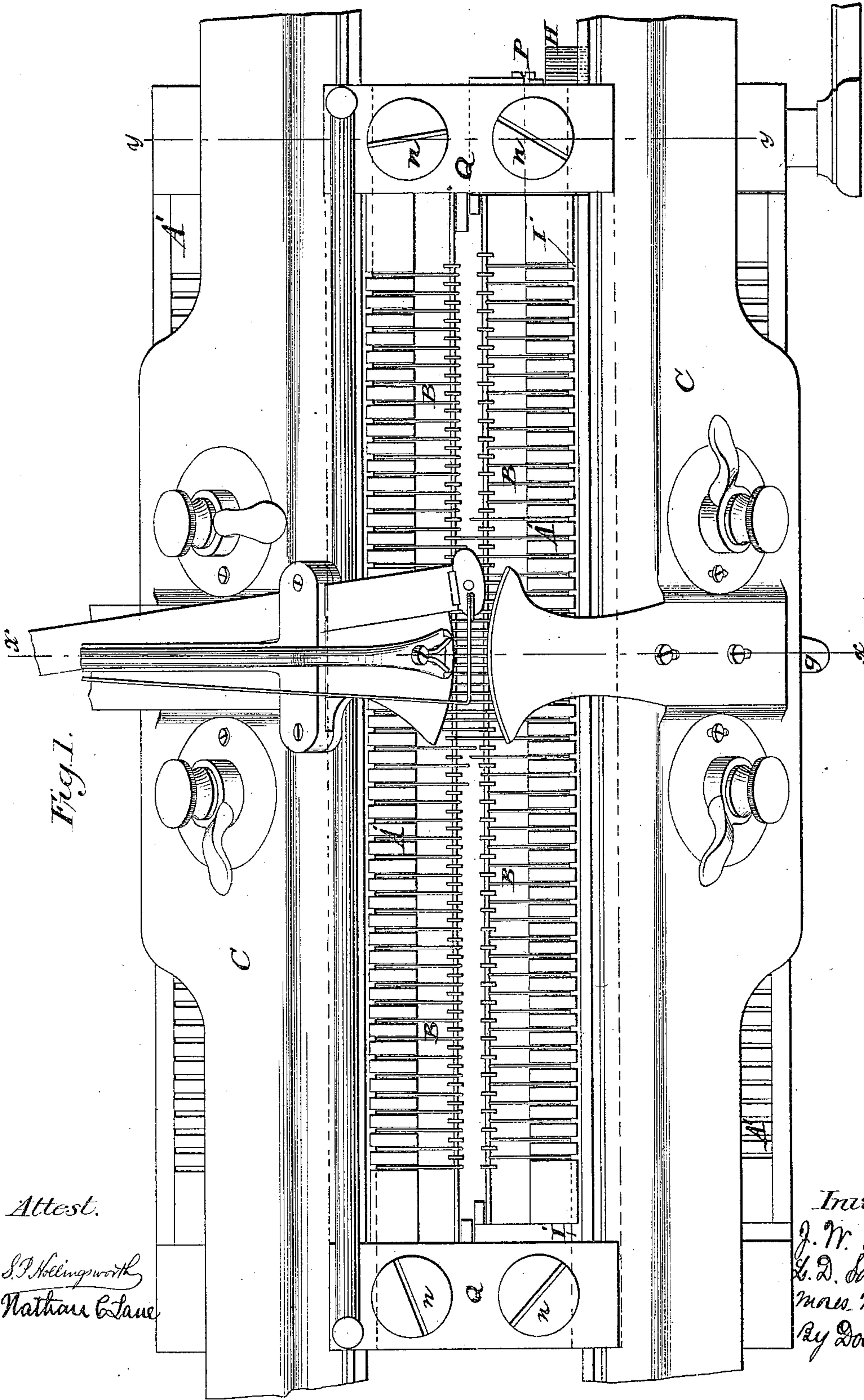
(Model.)

2 Sheets—Sheet 1.

J. W. RIST, L. D. SANBORN & M. MARSHALL.  
KNITTING MACHINE.

No. 248,795.

Patented Oct. 25, 1881.



Attest.

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*By Dodger & Co.*  
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(Model.)

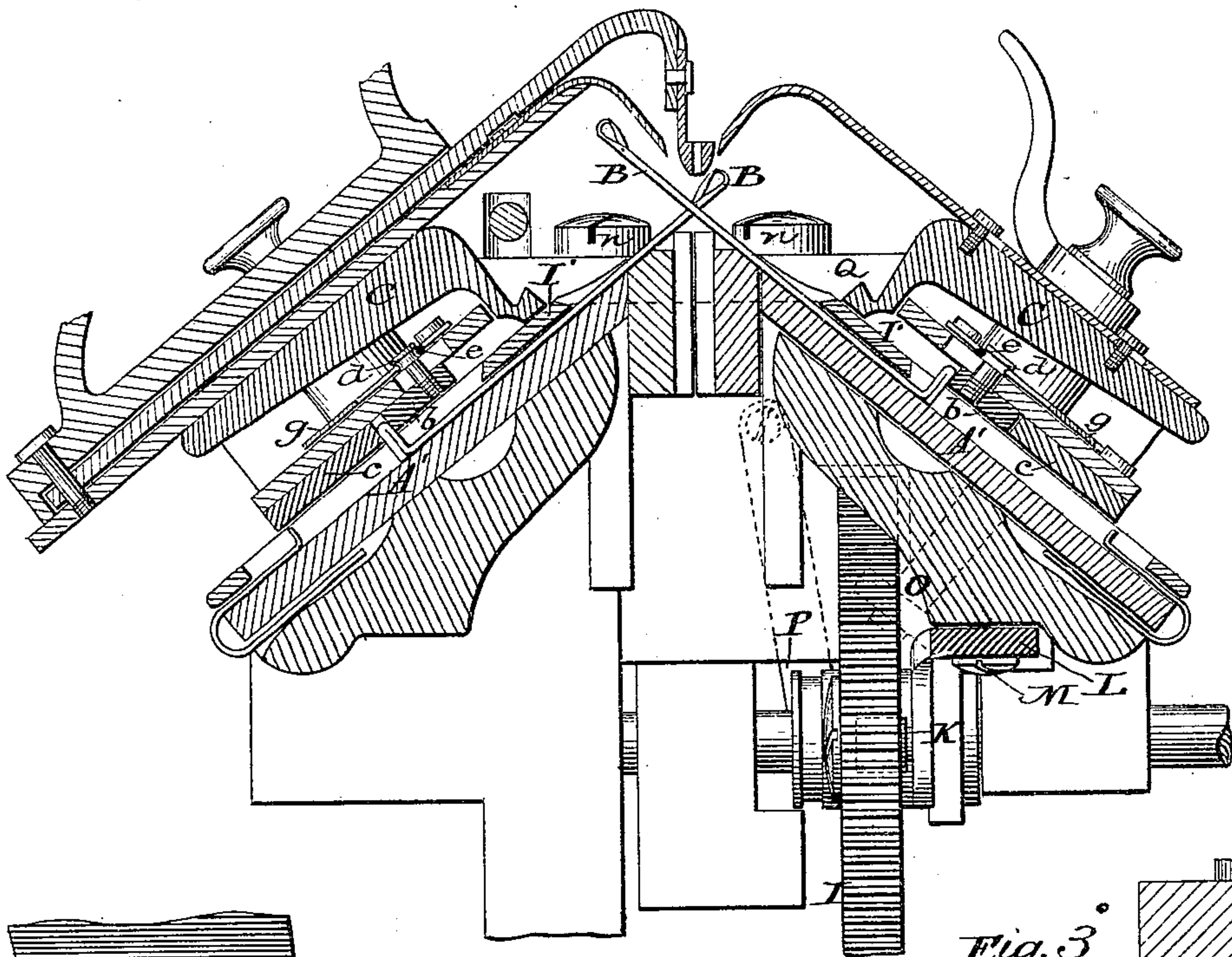
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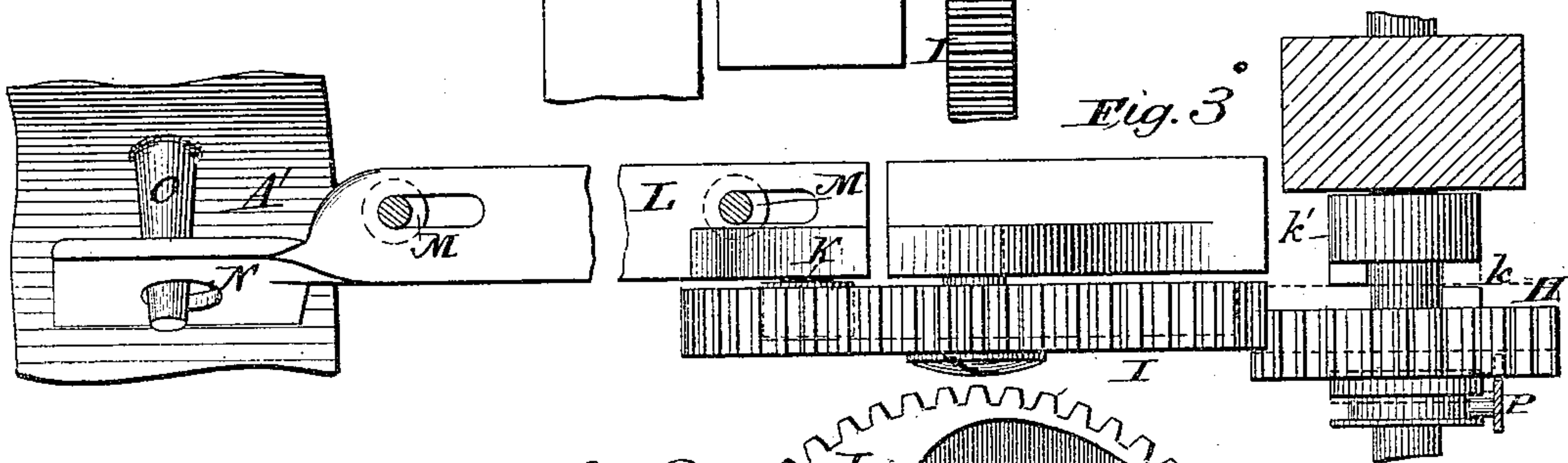
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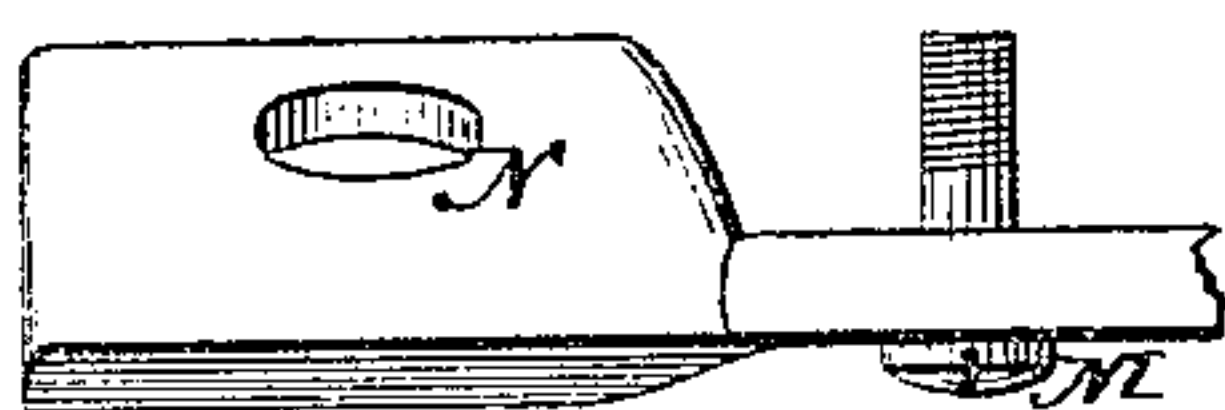
*Fig. 2.*



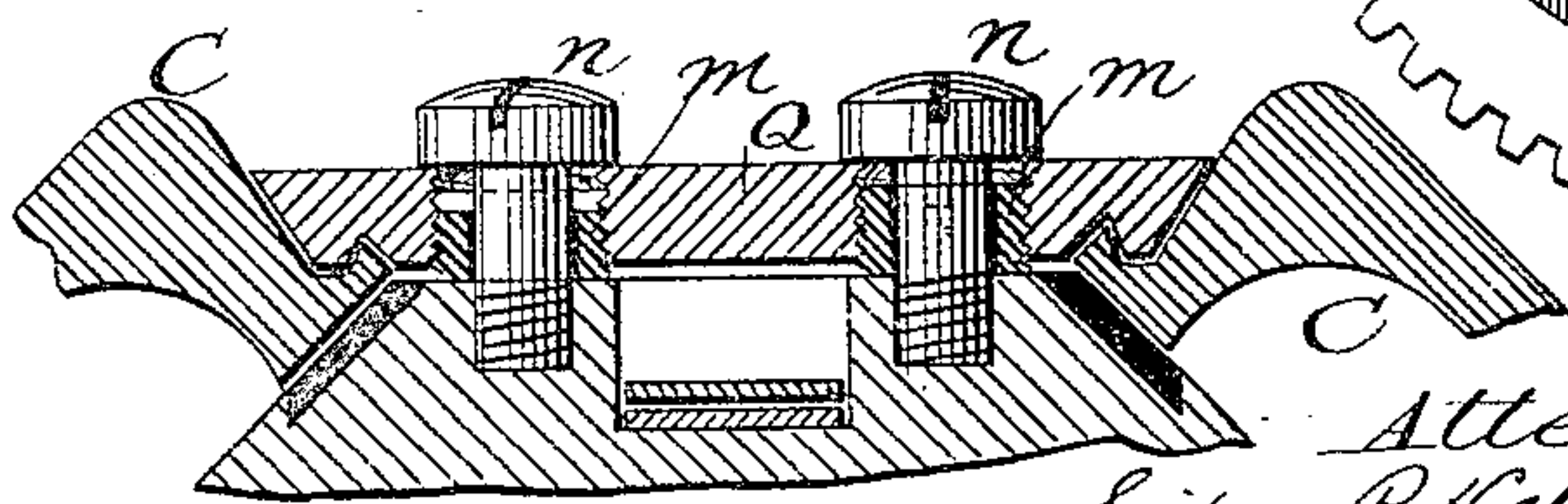
*Fig. 3.*



*Fig. 2.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

JOEL W. RIST, LORENZO D. SANBORN, AND MOSES MARSHALL, OF CHICOPEE FALLS, MASSACHUSETTS, ASSIGNORS TO THE LAMB KNITTING MACHINE MANUFACTURING COMPANY, OF SAME PLACE.

## KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 248,795, dated October 25, 1881.

Application filed May 1, 1880. (Model.)

*To all whom it may concern:*

Be it known that we, J. W. RIST, L. D. SANBORN, and MOSES MARSHALL, of Chicopee Falls, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a specification.

This invention relates to that class of straight reciprocating machines represented by the well-known Lamb knitter; and it consists in combining with the racking or reciprocating needle plate or support mechanism for moving the same automatically and continuously during the operation of the machine, said operating mechanism being adapted to be thrown into or out of action at will; also, in a peculiar combination of devices for adjusting the guide plates or caps by which the reciprocating frame is held in place.

Referring to the accompanying drawings, Figure 1 represents a top-plan view of a Lamb knitting-machine provided with our improvements; Fig. 2, a vertical cross-section of the same on the line  $x x$ , Fig. 1; Fig. 3, a bottom-plan view, illustrating the mechanism by which the racking or reciprocating motion is imparted to the needle-plate; Fig. 4, a side elevation of the same; Fig. 5, a cross-section on the line  $y y$ , Fig. 1, illustrating the construction of the adjustable cap or bearing plate.

In its general construction and mode of operation the machine represented in the drawings is the same as the well-known Lamb knitting-machine, and, being familiar to those skilled in the art, it need not be described in detail herein.

Generally speaking, the machine consists of two main plates,  $A' A'$ , arranged parallel with each other and having a downward inclination from their adjacent upper edges, said plates being provided in their upper surfaces with parallel grooves containing sliding needles  $B$ , the lower ends of which will have upright shanks acted upon by cams or locks on the longitudinal reciprocating frame  $C$ , the action of the parts being such that the needles are moved upward and downward and their upper hooks or ends caused to operate upon and interlock the threads. Each series of needles is

operated upon by its own "lock," so called, each lock consisting of three cams, two  $V$ -cams to depress the needles and an intermediate cam in the form of an inverted  $V$  to elevate the needles, as usual in this class of machines.

Inasmuch as the construction of the locks or operating-cams constitutes no part of the present invention, (it may be of any approved construction,) a detailed description of the same is deemed unnecessary herein.

The first feature of our invention relates to a racking needle-plate. The needle-supporting plate  $A'$  is mounted in guides  $I'$  on the main frame in such manner as to have a limited motion in a longitudinal direction or direction at right angles with the needles, in order to shift all the needles on one side of the main frame laterally with relation to those on the opposite side. This movement, which in itself is well known in the art, has the effect, when properly timed, of drawing the loops or stitches diagonally on one side of the fabric, producing what is commonly known as a "cross-stitch."

Hitherto it has been customary to move the needle-plate by hand, an operation which required considerable labor and close attention, and which materially lessened the speed at which the machine could be operated. In order to overcome these difficulties, we introduce between the main shaft of the machine and the racking needle-plate a connecting mechanism which imparts the required movements from the one to the other. This mechanism is made adjustable, so that it may be thrown into or out of action at will, and is clearly represented in Figs. 3 and 4. It consists of a pinion,  $H$ , mounted on the main crank-shaft of the machine, and arranged to drive a large gear-wheel,  $I$ , attached to a bearing on the under side of the main frame. This wheel  $I$  is provided in its side face with a cam or groove,  $J$ , which receives a stud or roller,  $K$ , on the end of the sliding plate  $L$ . This plate  $L$  is provided with slots to receive screws  $M$ , by which it is held loosely in place on the under side of the main frame. At its outer end the plate  $L$  is provided with an elongated opening or slot,  $N$ , which receives a stud,  $O$ , on the under side of the reciprocating or racking needle-plate. The rotation of



the gear I imparts a reciprocation to the plate L, and the latter, acting on the stud O, reciprocates the needle-plate. Owing to the fact that the opening N is elongated the needle-plate is permitted to remain at rest during the movement of the needles. Owing to the difference in size between the wheel I and driving-pinion H the shifting of the plate is caused to take place during each alternate action of the needles, so that one line of stitches is formed with the needle-plate in one position and the next line or series formed with the plate in another position. The shape of the cam-groove and the speed at which the wheel is driven may be modified, as desired, in order to produce different stitches or figures in the fabric. The driving-pinion H is arranged to slide laterally upon the shaft, and is driven when in one position by a shoulder, *k*, on its side engaging with a correspondingly-shouldered collar, *k'*, fastened upon the shaft. By moving the pinion laterally it may be engaged with or disengaged from the driving-collar without disengaging from the wheel I. The pinion is held in position by means of a pivoted swinging spring, P, one end of which bears in a grooved hub on the side of the pinion.

It is manifest that the form and arrangement of the mechanism for imparting motion to the needle-plate may be modified, if desired, as many equivalent arrangements will readily suggest themselves to the skilled mechanic.

A second feature of the invention relates to the caps or guide-plates by which the reciprocating lock-carrying frame is secured in position upon the main frame. These plates, which are represented at Q, Figs. 1, 2, and 5, are secured across the ends of the main frame and engage at their ends over the reciprocating frame. The plates require to be accurately and closely fitted in place, and in practice much difficulty has been experienced in securing their adjustment and compensating for their wear and the wear of the reciprocating frame. Under our mode of construction each cap-plate is provided, as shown in Fig. 5, with a tubular vertical screw or collar, *m*, which may be turned downward below the surface of the cap, so as to rest upon the main frame and

sustain the cap, thereby limiting the descent of the latter and its pressure upon the main frame. Through each of these collars we insert a screw, *n*, seated in the main frame, serving to hold the cap down in place. As the parts wear away the screws or collars *m* are turned backward, and the plate thereby lowered, the screws *n* being turned at the same time downward, in order to force the plate to its place.

Having thus described my invention, what I claim is—

1. The combination of a reciprocating or racking needle-plate, a driving-gear, and intermediate mechanism adapted to permit a lost motion between the gear and plate, substantially as described and shown.

2. The combination of a driving device, a reciprocating needle-plate, and intermediate connecting mechanism containing a disconnecting device, substantially as set forth, whereby the movement of the plate may be controlled without reference to the operation of the remainder of the machine, substantially as described.

3. The combination of the wheel I, having cam-groove J, sliding bar L, having elongated opening N, and the needle-plate, having stem O, projecting through opening N, substantially as shown.

4. In combination with a main frame and reciprocating frame, cap-plate Q, screw-collars *m*, and screws, substantially as shown and described.

5. The combination of the main shaft having gear H, wheel I, having cam-groove J, clutch *k k'*, arm P, bar L, and the needle-plate, substantially as described.

6. The combination of the main and reciprocating frame, the cap-plate, screws to depress the cap, and independent screws to sustain the same, substantially as described.

JOEL W. RIST.  
LORENZO D. SANBORN.  
MOSES MARSHALL.

Witnesses:

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T. C. PAGE.