

(No Model.)

2 Sheets—Sheet 1.

L. N. D. WILLIAMS.
RIB KNITTING MACHINE.

No. 573,743.

Patented Dec. 22, 1896.

FIG. 1.

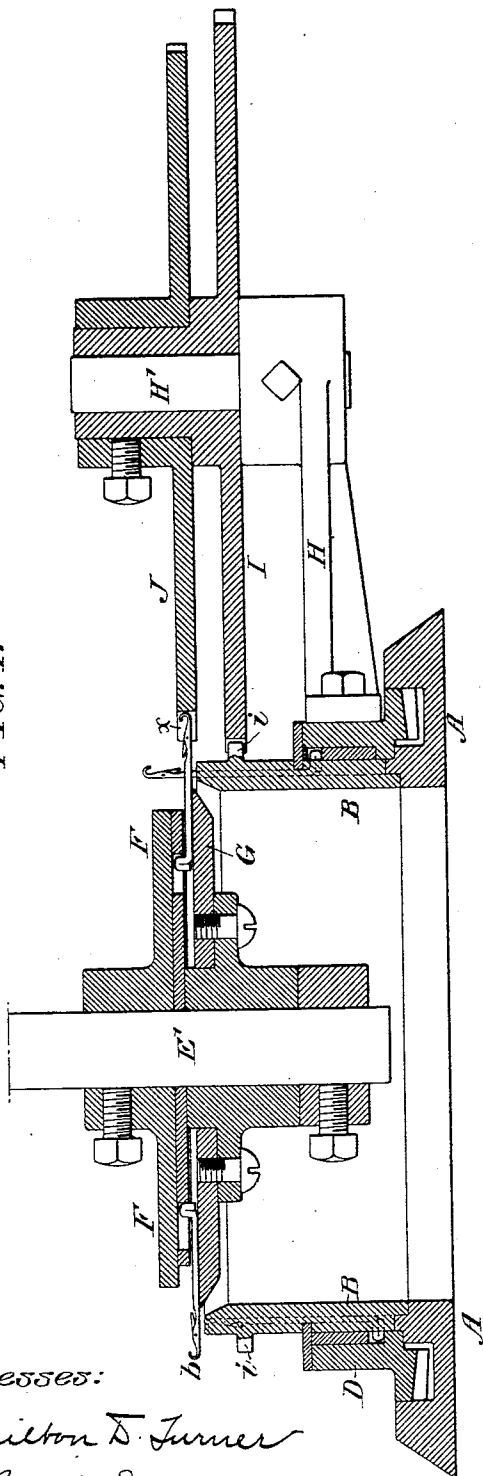
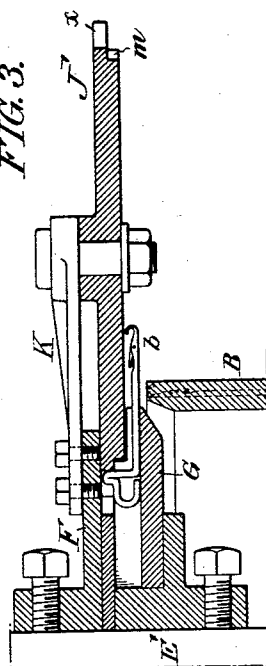


FIG. 3.



Witnesses:

Hamilton D. Turner
L. E. Beckhold

Inventor:
Louis N. D. Williams
by his Attorneys

Howson & Howson

(No Model.)

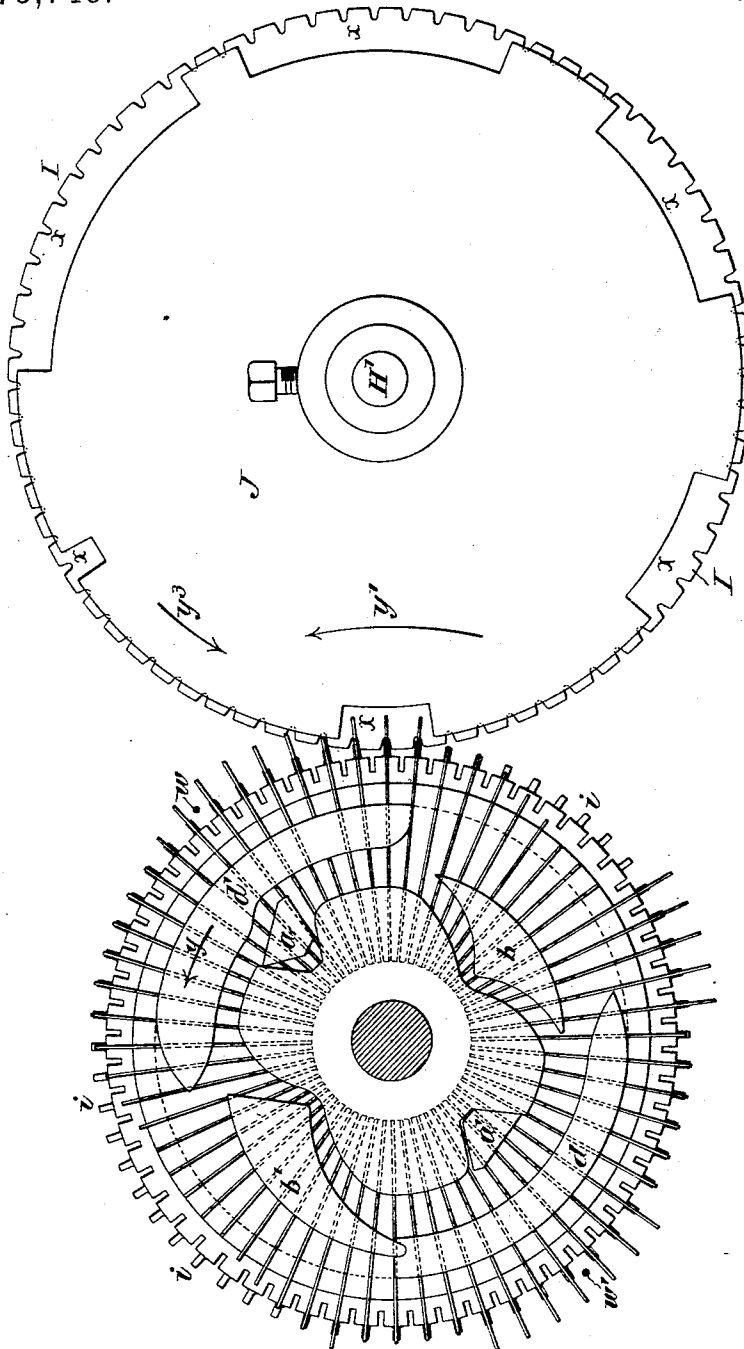
2 Sheets—Sheet 2.

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FIG. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

LOUIS N. D. WILLIAMS, OF ASHBOURNE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ROBERT W. SCOTT, OF PHILADELPHIA, PENNSYLVANIA.

RIB-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,743, dated December 22, 1896.

Application filed September 9, 1896. Serial No. 605,322. (No model.)

To all whom it may concern:

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, and a resident of Ashbourne, Montgomery county, Pennsylvania, have invented certain Improvements in Rib-Knitting Machines, of which the following is a specification.

My invention consists of certain improvements in the rib-knitting machine for which Letters Patent No. 368,429 were granted to Robert W. Scott on the 16th day of August, 1887, the object of my present invention being to so modify the construction and mounting of the notched wheel employed for acting upon the needles of said machine as to increase the range of the same to any desired extent, and thus provide for the formation of any required pattern by a proper disposal of the tuck-stitches in the fabric.

In the accompanying drawings, Figure 1 is a vertical sectional view of sufficient of a rib-knitting machine to illustrate my present invention. Fig. 2 is a plan view showing the cams of the dial cam-plate, the dial-needles, and the notched wheel for acting upon the latter, the outline of the dial cam-plate being shown by dotted lines; and Fig. 3 is a vertical sectional view illustrating a modification of the invention.

A represents part of the fixed circular bed of the machine, and B part of the vertical needle-cylinder secured to said bed and having the usual grooves for the vertical guidance of the needles *a*, which are vertically reciprocated in the ordinary manner by means of cams carried by the cam-cylinder D, the latter being rotated from the driving-shaft of the machine by appropriate gearing.

The usual circular needle-dial is represented at G, this dial having radial grooves for the reception and guidance of the dial-needles *b*, which are operated by cams on the under side of the dial cam-plate F, any of the ordinary means being employed for locking the annular dial G to the vertical needle-cylinder B, so as to prevent rotation of said dial with the cam-plate F, the latter being secured to and rotating with the central spindle F', which has operative connection with the rotating cam-cylinder D, as usual in this class of machines.

Secured to and projecting from the cam-cylinder D is a bracket H, having at the outer end a vertical spindle H', and upon this spindle is mounted, so as to be free to turn, a spur-wheel I, which is adapted to mesh with teeth *i*, projecting from the needle-cylinder B, there being by preference as many of these teeth *i* as there are needles in the dial.

Secured to the hub of the spur-wheel I is a disk J, which has in its periphery a series of notches *x*, the number and disposition of which will be dependent upon the desired character of the pattern to be produced. As the cam-cylinder D rotates, the disk J is carried around with the same, and is at the same time caused to rotate around its own axis by reason of the engagement of the spur-wheel I with the teeth *i* of the stationary needle-cylinder, and the periphery of the wheel is so disposed in respect to the needles of the dial that it will push inward any projected dial-needles which may be subjected to its action, the notches *x* in the periphery of the disk J, however, being such that they will permit such projected dial-needles as enter the same to remain in the projected position.

The dial cam-plate has on the under side of the same two projecting cams *a a'*, two draw-in cams *b b'*, and two guard-cams *d d'*, the projecting cams being preferably adjustable, so that when extended they will cause the dial-needles to be projected to the clearing-point or when retracted will permit said dial-needles to remain at the tuck-point.

The dial cam-plate will be provided with two thread-guides occupying the usual operative relation to the cams *a a'*, one of these guides, for instance, being located at the point *w* and the other at the point *w'*, Fig. 2. Hence if all of the dial-needles are projected by the cam *a* as the dial cam-plate rotates in the direction of the arrow *y*, Fig. 2, certain of these needles will be pushed inward by contact with the periphery of the disk J, and certain of said needles will be permitted to remain in the projected position by entering the notches *x* of the disk, said disk being carried around the dial in the direction of the arrow *y'* and being at the same time caused to rotate around its own axis in the direction of the arrow *y''*. Those needles which are pushed inward by

the peripheral portions of the disk J will come under the action of the draw-in cam *b*, and hence will occupy a different relation to the thread-guide *w'* than those needles which are permitted to remain projected by entering the notches of the disk, all of the needles being finally retracted by the draw-in cam *b'* preparatory to being again projected by the cam *a*. Provision is thus made for producing patterns in tuckwork upon the needles, and owing to the fact that the pattern-disk J is outside of the machine it can be made of any desired size and is consequently capable of producing patterns of any desired degree of elaboration, differing in this respect from the internally-located notched wheel of the Scott patent previously referred to.

By properly proportioning the number of teeth of the spur-wheel I in respect to the number of teeth of the needle-cylinder B the notches *x* of the pattern-disk J may on each successive rotation of said disk receive different needles from those received on the preceding rotation.

It is not essential to the proper carrying out of my invention that the pattern-disk and its spur-wheel should be carried by the cam-cylinder and operated by engagement with teeth on the needle-cylinder, nor that the pattern-disk should act upon the ends of the dial-needles. For instance, in Fig. 3 I have shown a construction in which a pattern-disk J' is carried by a bracket K, projecting from the dial cam-plate, and acts upon the bits of the needles *b* instead of upon the ends of the same, this pattern-disk J' having on the under side of the same teeth *m* for engagement with a shouldered portion of the needle-dial, so as to cause rotation of the pattern-disk around its own axis as it is carried around by the dial cam-plate.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of the needle-cylinder, the needle-dial, the cylinder cam-box and the dial cam-plate of a rib-knitting machine,

with an externally-located and peripherally-notched pattern-disk carried by one of the rotative elements of the machine, and combined with means whereby it is caused to turn around its own axis as it is carried around with said rotating element of the machine.

2. The combination of the needle-cylinder, the needle-dial, the cylinder cam-box and the dial cam-plate of a rib-knitting machine with an externally-located and peripherally-notched pattern-disk carried by one of the rotative elements of the machine, and constructed to act upon the ends of the dial-needles, said disk being combined with means whereby it is caused to turn around its own axis as it is carried around with said rotating element of the machine.

3. The combination of the needle-cylinder, the needle-dial, the cylinder cam-box, and the dial cam-plate of a rib-knitting machine, with an externally-located and peripherally-notched pattern-disk mounted upon and rotating with one of the rotating elements of the machine, and combined with a spur-wheel meshing with the teeth on the fixed element of the machine, whereby said pattern-disk is caused to rotate around its own axis as it is carried around with said rotating part of the machine.

4. The combination of the needle-cylinder, the needle-dial, the cylinder cam-box and the dial cam-plate of a rib-knitting machine, with an externally-located and peripherally-notched cam-disk, a spur-wheel carrying said disk, a bracket on the cam-cylinder, and a spindle on said bracket upon which the spur-wheel is mounted so as to be free to rotate, said spur-wheel being adapted to mesh with teeth upon the needle-cylinder of the machine.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:

JOS. H. KLEIN,
F. E. BECHTOLD.