(No Model.)

L. N. D. WILLIAMS.

CAM RING FOR KNITTING MACHINES.

No. 561,039. Patented May 26, 1896.

FIG. 1.

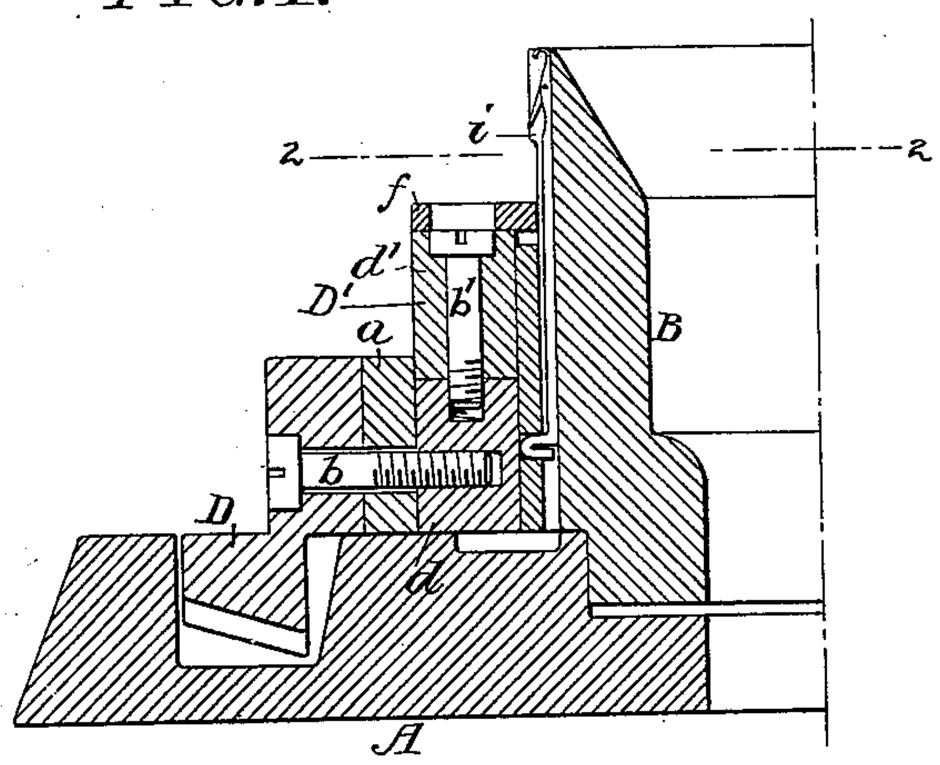


FIG. 4.

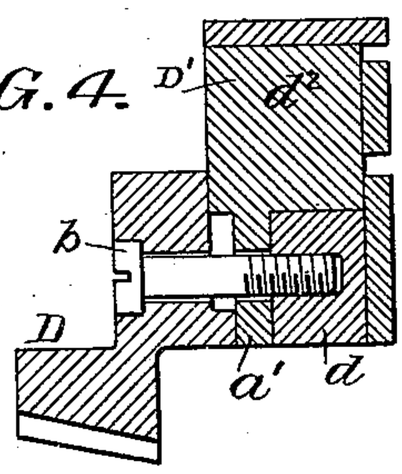


FIG. 2.

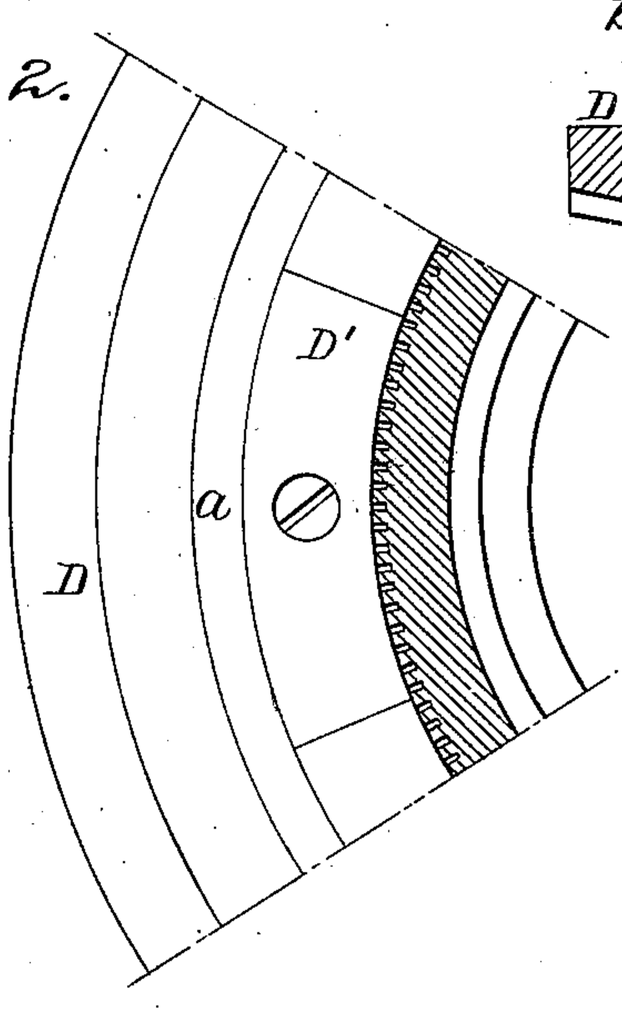
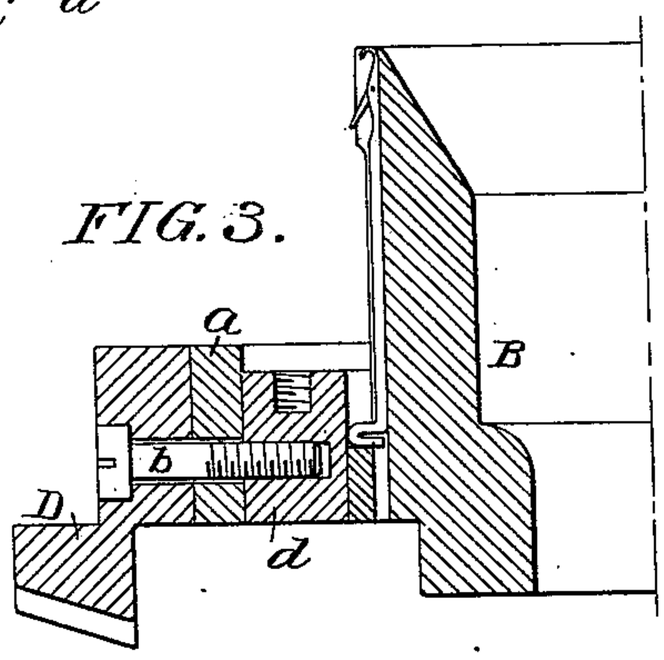


FIG. 3.



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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.

CAM-RING FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 561,039, dated May 26, 1896.

Application filed March 27, 1896. Serial No. 585,120. (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 Cam-Rings for Knitting-Machines, of which the following is a specification.

My invention consists in certain improvements in the cam-rings for knitting-machines for which I obtained Letters Patent No. 503,920, dated August 22, 1893, the object of my present invention being to permit access to the needles without the necessity of laterally removing the segments having the cams upon which the bits of the needles are supported. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a transverse sectional view of part of a knitting-machine cylinder, cam-ring, driving-wheel, and bed-plate, illustrating my present invention. Fig. 2 is a sectional plan view of the same on the line 2 2, Fig. 1, with the plate which surmounts the cam-segments removed. Fig. 3 is a view similar to Fig. 1, but illustrating part of the cam-ring removed for gaining access to the needles; and Fig. 4 is a sectional view illustrating a modification of the invention.

A represents part of the bed-plate of the machine, and B part of the vertical needle-cylinder secured thereto and having external grooves for the reception and guidance of the needles, as usual. Mounted on the bed is an annular bevel-wheel D, to which are secured the segments D′, carrying the cams whereby the needles of the cylinder B are actuated, these segments being backed by removable filling-blocks *a* and both segments and filling-blocks being secured to the bevel-wheel D by means of bolts *b*. In the patented machine each of the cam-carrying segments was in one piece, and when it was desired to gain access to the needles the bolt securing the segment was withdrawn, the filling-piece *a*, corresponding to said segment, removed, and the segment withdrawn laterally until its cams were free from the bits of the needles, the segment being then removed vertically in order that free access to the needles might be permitted. In reapplying the cam-carrying segment difficulty was frequently experienced in adjusting the needles so as to cause them to again properly enter the cam-groove. Hence in the present construction I make each cam-carrying segment in two parts—namely, the upper part *d′* and the lower part *d*, the latter being secured to the bevel-wheel D by the bolt *b* and the upper portion *d′* of the segment being secured to the lower portion *d* by a vertical bolt *b′*. In case it is desired to inspect the needles the upper half *d′* of any segment can be readily withdrawn without disturbing the lower half and without disarranging the needles or disengaging their bits from the cams of said lower portion of the segment, the latter being capable of radial withdrawal in the same manner as the segment of the patented machine, however, if such withdrawal is necessary. By this means proper inspection and repairs can in almost all cases be effected in a very short time, as there is nothing to prevent the ready removal or the equally ready replacement of the upper portion *d′* of the cam-segment. Further than this, the removal and replacing of the upper portion of the cam-segment can be effected with slight vertical movement of the same. Hence there need be but little space between the needle-confining ring *f* and the shouldered portion *i* at the top of the needle-cylinder.

It is preferable to provide the upper portions *d′* of the segments with the upper cams of the needle-cam race and the lower portions *d* of the segments with the lower cams of said needle-cam race, although this is not absolutely essential, as part of the upper cams may, if desired, be secured to the lower portions of the segments.

In the modified construction shown in Fig. 4 the upper section d^2 of the cam-segment is made in one piece with the filling-block *a′* and the vertical bolt *b′* is dispensed with, both the upper section of the cam-segment and the filling-block being released on the removal of the bolt *b*. When they are withdrawn, the lower section *d* of the cam-segment is not radially confined, but there is very little chance of its being accidentally displaced, and even

if it is it can be readily readjusted after first lifting the needles, so that its cams can pass beneath the bits of the same.

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

1. The combination of the needle-cylinder and its needles, with the surrounding cam structure consisting of cam-carrying segments each composed of upper and lower portions detachably secured together, whereby the upper portion can be removed in order to permit inspection of the needles, an outer drive-wheel and means for securing the cam-carrying segments to said drive-wheel, substantially as specified.

2. The combination of the needle-cylinder and its needles, a surrounding cam structure composed of cam-carrying segments each comprising upper and lower portions secured together, an annular drive-wheel, filling-blocks or segments interposed between said drive-wheel and the lower portions of the cam-segments, and means for securing said segments to said drive-wheel, substantially as specified.

3. The combination of the needle-cylinder and its needles, a surrounding cam structure composed of cam-carrying segments, each composed of upper and lower portions, an outer drive-wheel, vertical bolts securing said portions of the cam-segment together, and other bolts securing the lower portion of each segment to the drive-wheel, substantially as specified.

4. The combination of the needle-cylinder and its needles, a surrounding cam structure composed of cam-carrying segments, each composed of upper and lower portions, an outer drive-wheel, vertical bolts securing said portions of the cam-segment together, other bolts securing the lower portion of each segment to the drive-wheel, and filling-blocks interposed between said drive-wheel and cam-segments, substantially as specified.

5. The combination of the needle-cylinder and its needles, a surrounding cam structure composed of cam-carrying segments, each composed of upper and lower portions, an outer drive-wheel, vertical bolts securing said portions of the cam-segment together, other bolts securing the lower portion of each segment to the drive-wheel, and filling-blocks interposed between said drive-wheel and cam-segments and having a bearing against the outer face of both the upper and lower portions of each cam-segment, substantially as specified.

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,
FRANK E. BECHTOLD.