(No Model.) 2 Sheets—Sheet 1.

L. N. D. WILLIAMS.

KNITTING MACHINE.

No. 503,921. Patented Aug. 22, 1893.

FIG. 1

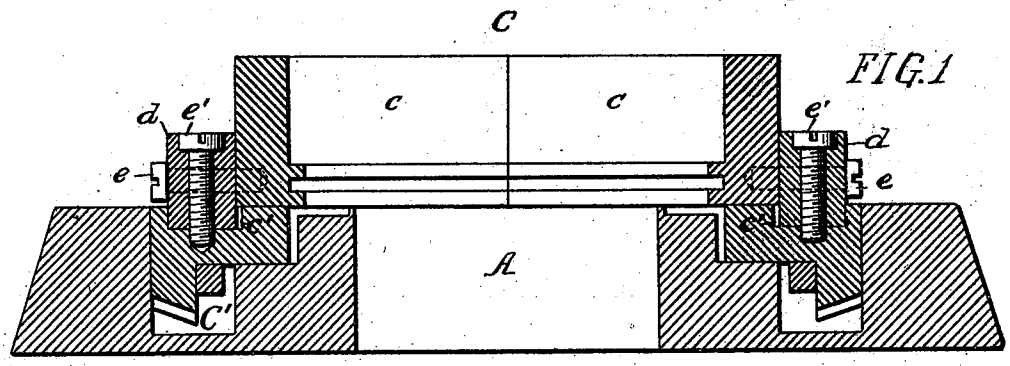
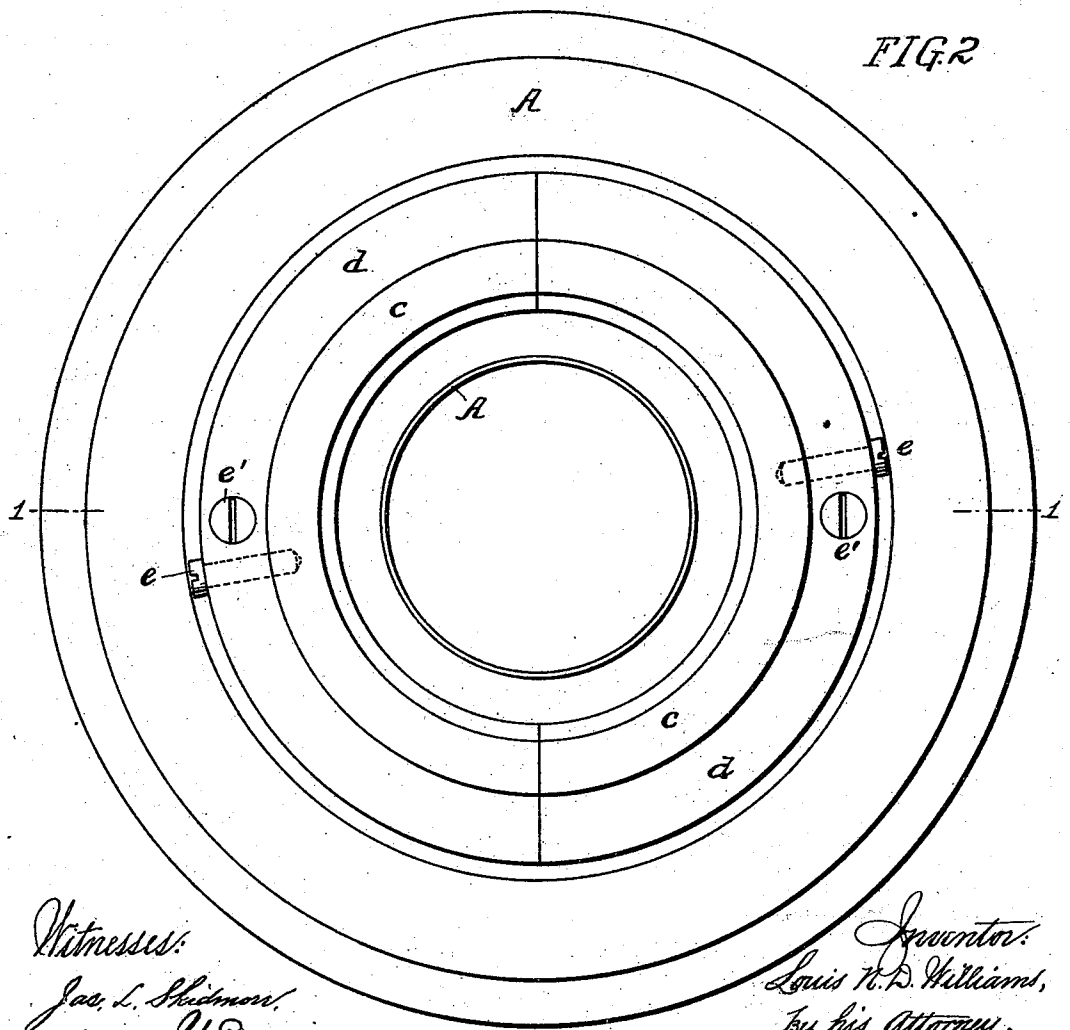


FIG. 2



Witnesses:
Jas. L. Skidmore,
Harry U. Davis.

Inventor:
Louis N. D. Williams,
by his Attorney,
Jno. E. Parker

(No Model.) 2 Sheets—Sheet 2.

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KNITTING MACHINE.

No. 503,921. Patented Aug. 22, 1893.

FIG. 3

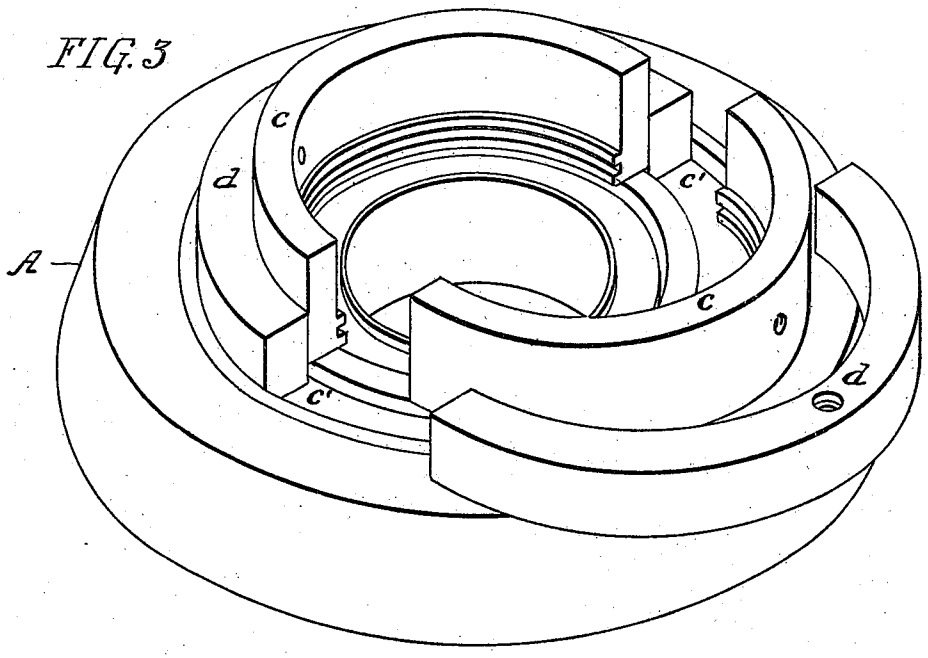


FIG. 4

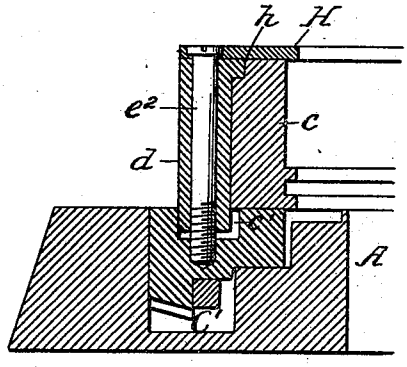
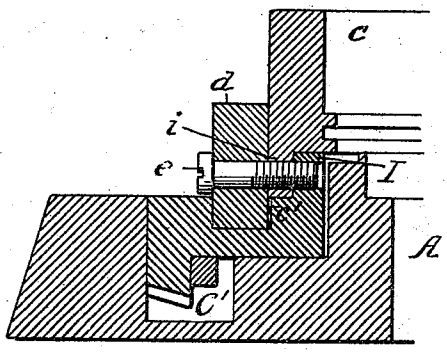


FIG. 5



Witnesses:
Jas. L. Skidmore.
Harry V. Davis

Inventor
Louis N. D. Williams,
by his Attorney,
Thos. Parker

UNITED STATES PATENT OFFICE.

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

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 503,921, dated August 22, 1893.

Application filed May 5, 1893. Serial No. 473,068. (No model.)

To all whom it may concern.

Be it known that I, LOUIS N. D. WILLIAMS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain improvements in knitting machines in which the cams are secured to or formed on removable segments, its main object being to provide means for securing the segments in position in such manner that they will be firmly held in position or may be readily removed to gain access to the needles on any portion of the needle cylinder when it becomes necessary to make examinations or repairs.

In the accompanying drawings:—Figure 1, is a sectional elevation on the line 1—1, Fig. 2, of sufficient of a circular knitting machine to illustrate my invention. Fig. 2, is a plan view of the same. Fig. 3, is a perspective view showing one of the segments moved from position; and Figs. 4 and 5, are sectional views of modified constructions which will be referred to more specifically hereinafter.

Referring to the drawings, A represents the base of an ordinary form of circular knitting machine, of small diameter, to which is secured the needle cylinder (not shown). The base is provided as usual with a circular guide-way for a cam ring C having cams for actuating the needles of the cylinder, and provided with a bevel gear C′ which engages a driving pinion for rotating the same.

In the accompanying drawings all unnecessary portions of the machine, irrelative to the invention, have been omitted for the sake of clearness, and for further details of construction reference is had to Letters Patent of the United States numbered 421,147, granted to Robert W. Scott and Louis N. D. Williams, on the 11th day of February, 1890.

The present invention is designed more especially to provide means for securely holding the cam segments in place on machines of small diameter, such for instance as those used for knitting stocking tubes. The cam ring is preferably divided into but two segments, and to disengage the cam slot from the needle bits, a considerable extent of movement is required.

In an application for Letters Patent filed by me on the 28th day of April, 1893, Serial No. 472,178, I have described a somewhat similar manner of securing independent cam segments on machines of larger diameter, such as are used for manufacturing shirt bodies, &c. In the larger machines however, where the cam ring is divided into a comparatively large number of segments, the extent of lateral movement to disengage the cam slot from the needle bits is but little more than the length of the needle bits. In the smaller machines, however, such as this invention relates to, or where the number of segments forming the cam ring is decreased in a large or small machine, the extent of movement necessary to disengage the cam slot at the opposite ends of the segments is considerably increased, and the construction described in the above mentioned application will not permit such an extent of lateral movement. The cam ring in the present instance is divided preferably into two segments *c*, although of course, the number may be increased if necessary, and immediately in the rear of such cam ring, the body of the bevel gear C′ is provided with a continuous circular groove *c′*, in which are placed filling blocks *d* equal in number to the number of cam segments, and preferably slightly less in thickness than the width of the groove, so that the blocks will fill the space between the outer wall of the groove, and the rear wall of the cam segment. The cam segments are held in position against the filling blocks by screws *e*, and each filling block is locked in the groove by a screw *e′* passing vertically through the filling block into the body of the bevel gear C′.

To remove any single segment the screws *e*, *e′* are first removed and the filling block is lifted from the groove, leaving a clear space

for the lateral movement of the cam segment, so that its groove may be moved out of engagement with the needle bits.

In the construction shown in Fig. 4, the upper outer face of each cam segment is recessed at *h*, and the filling block is correspondingly shaped to fit therein. Extending over both the filling block and the segment is the needle guard H, and a single vertical screw e^2 passing through the needle guard and filling block to the body of the bevel gear C′, serves to hold all three parts in proper position, and in removing the cam segment it is simply necessary to loosen this single screw and raise the needle guard and filling block.

Fig. 5, illustrates a further modification, in which the body of the bevel gear C′ is provided with a vertical annular flange I recessed at its outer edge to form a seat, and each cam segment *c* has a similar flange *c′*, fitting between the flange I and the filling block and resting upon the seat formed in the flange I, forming a solid structure which may be locked in working position by a single screw *e*, as shown. In all of these constructions, the removal of the filling block from the groove C^2 will leave a clear space for the removal of the cam segment, and the latter may be moved laterally beyond the periphery of the base of the machine.

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

1. The combination in a knitting machine, of a cam ring having a number of independent segments, and having a bevel gear on which said segments are supported, there being a circular groove in the upper face of said bevel gear, and filling blocks adapted to fit within such groove and hold the segments in working position, substantially as specified.

2. The combination in a knitting machine provided with a removable cam segment, of the supporting gear having a groove in the rear of such segment, and a filling block fitting within the groove between the outer wall thereof and the rear wall of the removable segment, substantially as specified.

3. The combination in a knitting machine, of a cam ring formed of a number of removable cam segments, and having a support therefor having a circular groove in the rear of the segments, filling blocks adapted to such groove and devices for securing the cam segments and the filling blocks to such support, substantially as specified.

4. The combination in a knitting machine, of a cam ring having a removable recessed cam segment, and having a support therefor, provided with a groove in the rear of the removable segment, a filling block adapted to such groove, a projecting rim thereon adapted to a recess in the cam segment, a needle guard above the filling block and cam segment, and a securing screw passing through the needle guard and filling block to the support, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS N. D. WILLIAMS.

Witnesses:
WILLIAM BUCKLEY,
HARRY BARNARD.