No. 709,841. Patented Sept. 23, 1902.

# L. N. D. WILLIAMS.

## KNITTING MACHINE.

(Application filed May 20, 1902.)

(No Model.) 2 Sheets—Sheet 1.

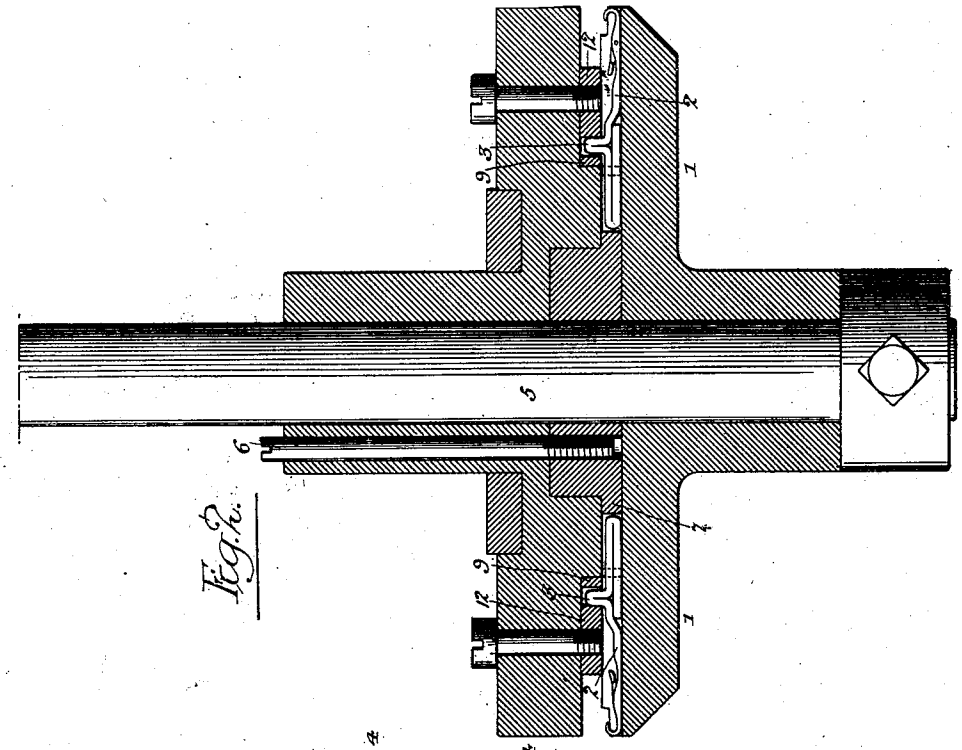


Fig. 2.

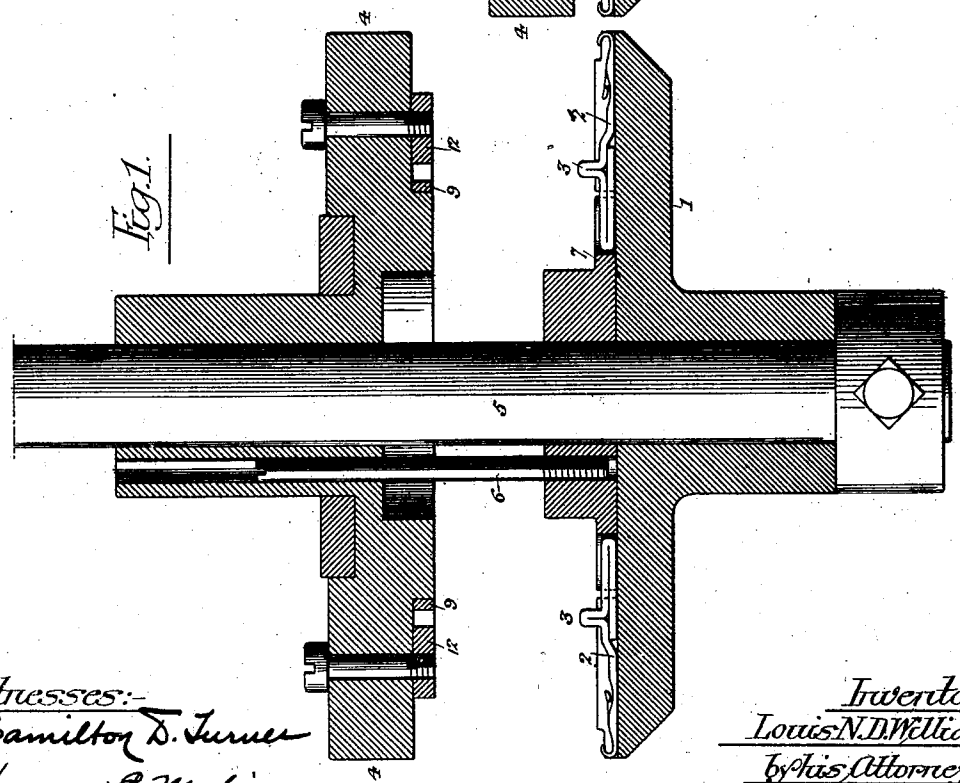


Fig. 1.

Witnesses:-
Hamilton D. Turner
Herman C. Metcalfe.

Inventor:
Louis N. D. Williams
by his Attorneys;
Howson & Howson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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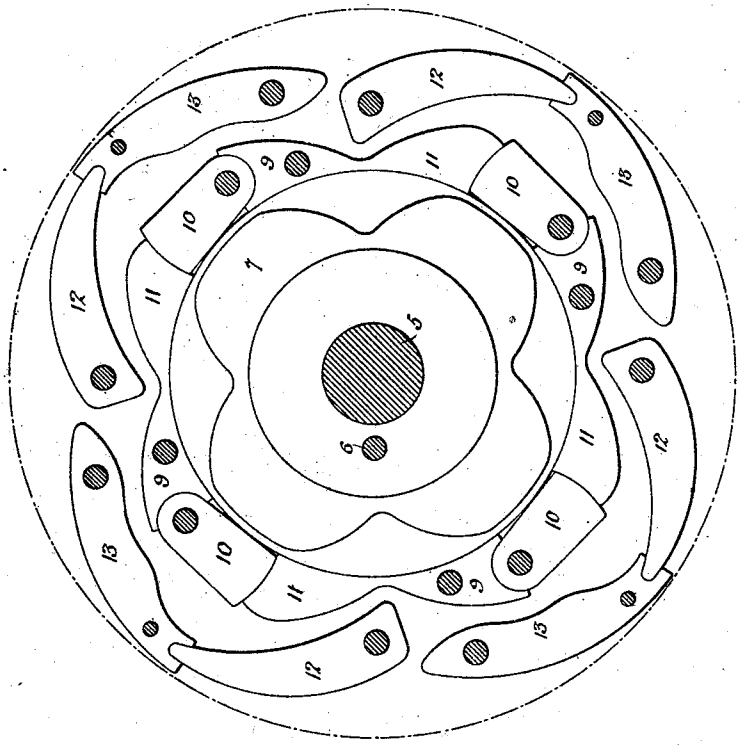
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(No Model.) 2 Sheets—Sheet 2.

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.

## KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,841, dated September 23, 1902.

Application filed May 20, 1902. Serial No. 108,187. (No model.)

*To all whom it may concern:*

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

My invention relates to that class of knitting-machines in which the needle-operating cams are secured to or formed on removable cam-carriers or segments thereof, the object of my invention being to provide means whereby the needles of the needle-carrier, if deranged during or after the removal of the cam-carrier or segment thereof, may be readily restored to their proper position, so as not to interfere with the replacing of said cam-carrier or segment. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 represents a sectional view of the needle-dial and dial cam-carrier of a rib-knitting machine with my invention applied thereto, the dial cam-carrier being shown in the elevated position in order to permit inspection, removal, or repairing of its cams. Fig. 2 is a similar view showing the dial cam-carrier in operative relation with the dial and its needles, and Fig. 3 is a plan view showing the cams of the dial cam-carrier and that element of the machine which constitutes the subject of my invention in operative relation therewith.

In the operation of knitting-machines it is desirable to obtain access to all portions of the needle-carrier in which the needles reciprocate, and this has led to the construction of machines with cam-carriers which can be moved bodily or, in some cases, in segments, so as to permit such access to the needle-carrier; but the objection to this class of machines is that during the time that the cam-carrier or segment thereof is being removed or afterward the needles in the corresponding portion of the needle-carrier are liable to become deranged to such an extent as to prevent the restoration of the cam-carrier or segment thereof, because of the fact that the butts of the needles are not in line with the grooved cam-path which normally receives the same. With the view of overcoming this objection I provide the needle-carrier with a templet having a conformation substantially similar to that of the inner or lower portion of the cam which acts upon the butts of the needles, this templet being intended to serve as a stop for the inner ends of the needle-shanks or other available portion of the needle, so that when all of the needles are in contact therewith their butts will be in proper position to register with the cam-path of the cam-carrier and will not therefore interfere with the ready readjustment of the cam-carrier or segment thereof after it has been removed from the machine or so adjusted thereon as to permit access to its cams.

In the drawings I have illustrated my invention as applied to a needle-dial, such as is employed in a rib-knitting machine; but it will be evident that my invention is not limited to such use, but can be employed in connection with the needle-cylinder or other needle-carrier of the machine with like advantage.

In the drawings, 1 represents the needle-dial; 2, the needles of the same having projecting butts 3, and 4 represents the dial cam-plate which has the needle-actuating cams secured to the under face of the same, this dial cam-plate being movable vertically on the central post or stem 5, which supports the dial, a pin 6, parallel with said stem, serving to prevent any rotative movement of the dial cam-plate on the stem, while permitting free vertical movement of the same.

The templet is represented at 7, said templet being secured to the upper face of the dial and having an outer conformation substantially similar to that of the inner cams of the dial cam-plate, each set of cams comprising in the present instance a fixed projecting cam 9, a swinging projecting cam 10, an inner guard-cam 11, an outer draw-in cam 12, and an outer guard-cam 13.

When the inner ends of the stems of the needles are in contact with the outer face of the templet and the swinging cams 10 are retracted, the butts 3 of the needles will properly register with the cam-path presented by the cams. Hence the dial cam-plate can be dropped down onto the dial without any inter-

ference arising from the projecting butts of the needles.

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

1. The combination of the needle-carrier and cam-carrier of a knitting-machine, with a templet whereby the needles may be adjusted to such position that their butts will register with the cam-path of the cam-carrier or segment thereof which normally receives said butts, substantially as specified.

2. The combination of the needle-carrier and cam-carrier of a knitting-machine, with a templet serving by contact with the ends of the needle-stems, to so adjust the latter that their butts are in register with the cam-path of the cam-carrier or segment thereof, 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:
ROY RAUDENBUSH,
JOS. H. KLEIN.