No. 710,826. Patented Oct. 7, 1902.

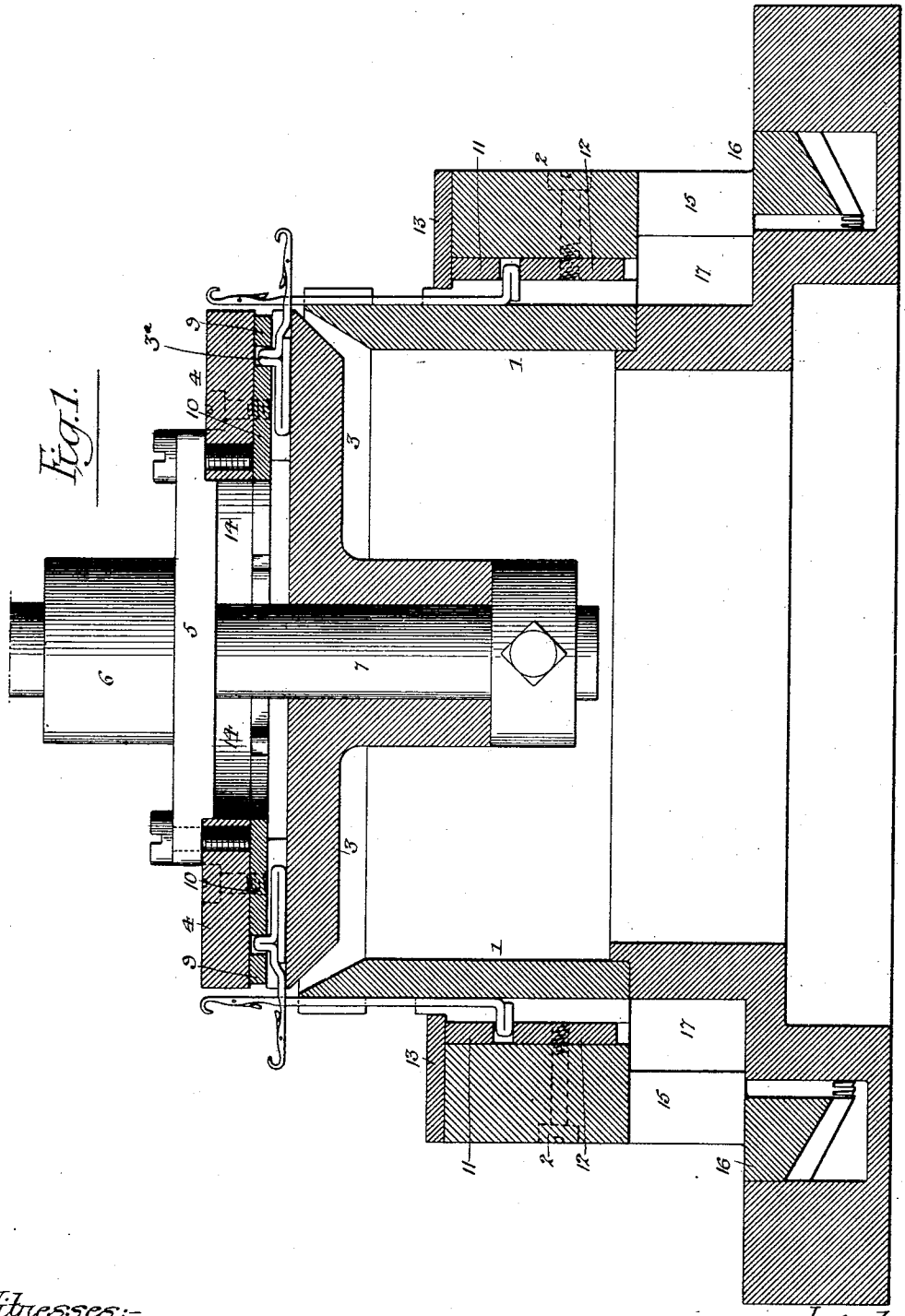
L. N. D. WILLIAMS.

CIRCULAR KNITTING MACHINE.

(Application filed May 20, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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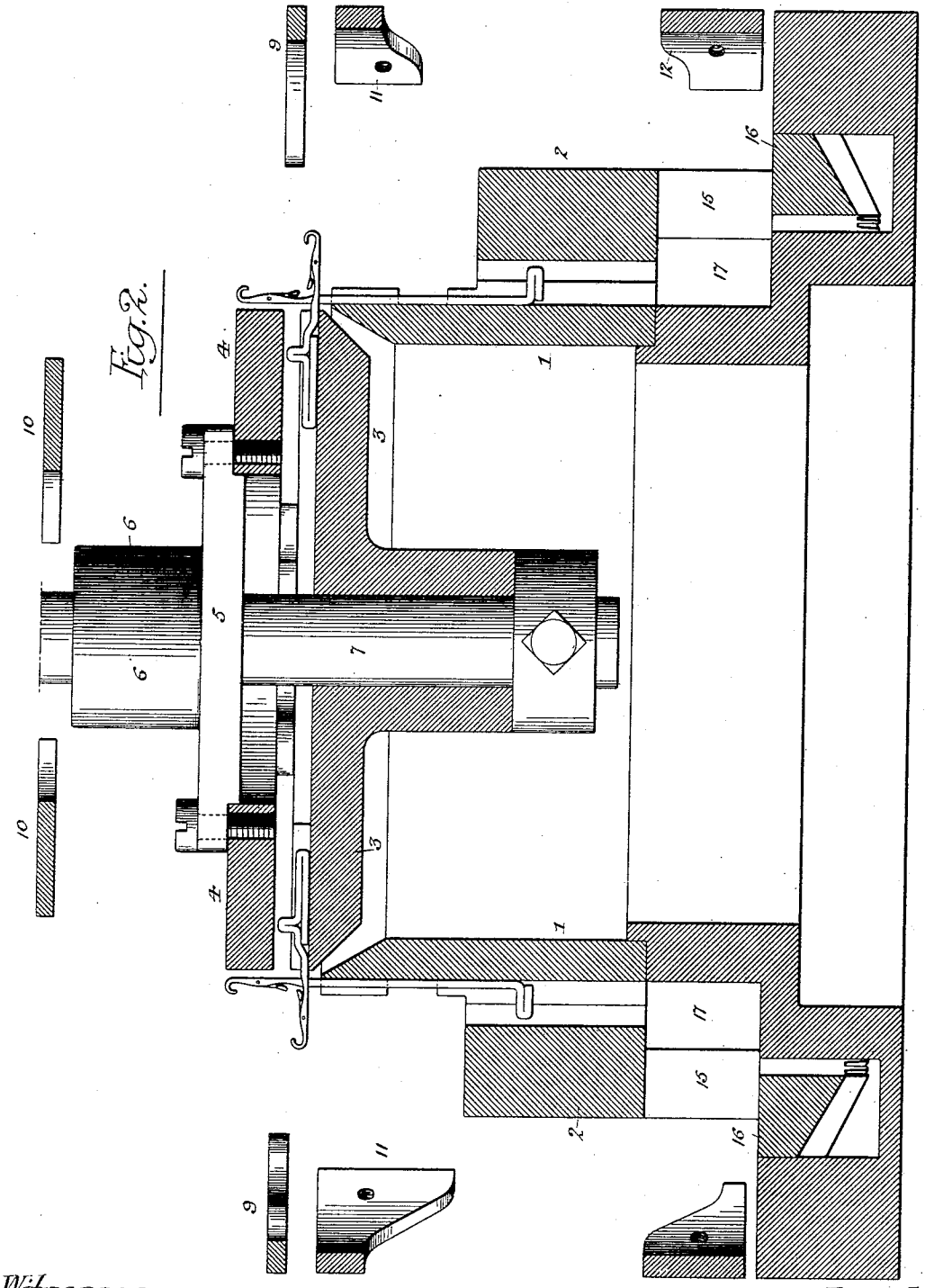
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Fig. 2.



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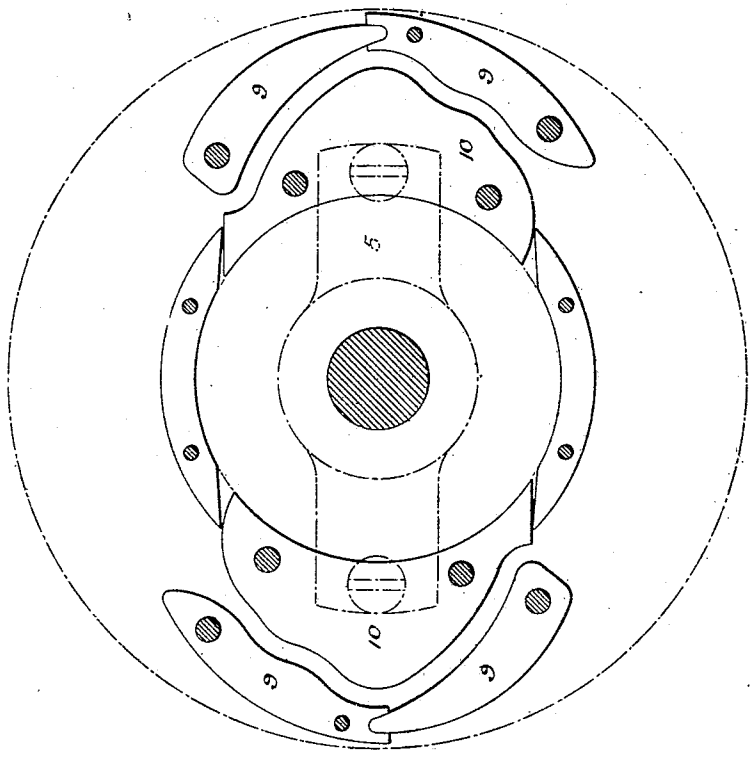
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(No Model.) 3 Sheets—Sheet 3.

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.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 710,826, dated October 7, 1902.

Application filed May 20, 1902. Serial No. 108,186. (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 Circular-Knitting Machines, of which the following is a specification.

My invention consists of certain improvements in that class of knitting-machines in which the cams are secured to a cam-carrier which occupies a fixed position in the machine, (the term "fixed" in this connection having no reference to rotating movement,) the object of my invention being to permit of the ready removal of any of the cams for inspection or repair and the ready replacing of the same and also permit of the ready removal of the parts of a broken needle and ready inspection of and access to all parts of any of the needle-grooves. This object I attain by providing a construction which permits of the ready removal either of an inner or an outer or an upper or a lower cam without disturbing any part of the cam-carrier which carries the same.

In the accompanying drawings, Figure 1 is a vertical sectional view of sufficient of an ordinary type of rib-knitting machine to illustrate the application of my invention thereto, the cams of both cam-cylinder and dial-cam plate being shown in operative relation with the needles. Fig. 2 is a similar view showing the cams of the cam-cylinder and dial-cam plate removed, and Fig. 3 is a plan view showing the cams of the dial-cam plate.

In the operation of knitting-machines it frequently becomes necessary to remove cams from the machine for the purpose of inspection or repair and also to gain access to the needle-carrier for the purpose of removing parts of a broken needle for inspection or repair of the needle-grooves. Heretofore this has been effected by removing the cam-carrier or a segment of the same; but this is not always advisable, and my present invention therefore contemplates the removal of any one or more of the cams without disturbing the position of the cam-carrier or any part thereof.

1 represents the needle-cylinder of the machine; 2, the cam-cylinder; 3, the needle-dial, and 4 the dial-cam plate, the latter being in the form of a ring which is carried by a cross-bar 5, having a hub 6, which is secured to the central spindle 7, upon which the dial is mounted. This cross-bar may be secured to the annular dial-cam plate 4, or may be an integral part thereof, as desired. Outer or retracting cams of the dial-cam plate are shown at 9 and inner or projecting cams at 10, and in like manner upper or retracting cams of the cam-cylinder are shown at 11 and lower or projecting cams of said cylinder at 12. For convenience the cams 9 and 11 will hereinafter be termed "outer" cams and the cams 10 and 12 "inner" cams. The outer cams of the dial-cam plate can when released from connection with said plate be readily removed radially when the cylinder-needles are depressed, and the outer cams of the cylinder 2 can be readily removed vertically when the top plate 13 of said cylinder has been removed and the dial-needles are retracted, and my invention consists of a construction whereby provision is afforded for removing the inner cams of the dial-cam plate and cylinder with equal readiness.

It will be noted that the dial-cam plate 4 has a central open space 14, into which the inner cams 10 can be moved radially when released from connection with the plate and can then be withdrawn vertically from this space when moved around, so as to be free from engagement with the cross-bar 5, and in like manner the cam-cylinder 2 is supported, by means of studs or posts 15, upon the driving-ring 16, so as to provide a space 17 into which the inner cams 12 can be dropped prior to being removed radially through the spaces between the supporting-posts 15. When the cams on the dial-cam plate of the cylinder are thus removed, as shown in Fig. 2, the needles and needle-grooves, access to which is normally prevented by the cams, are fully exposed and free access to said needles or needle-grooves for purposes of inspection or repair is permitted, and a broken needle may be removed by pushing it into the space 14 even when the needle is fractured across the bend of the butt, as at 3^a in Fig. 1. The

cams are secured in place, as usual, by means of screws accessible from the top of the dial-cam plate or from the outside of the cam-cylinder, as shown, for instance, by dotted lines in Fig. 1.

For convenience I have in the claims referred to the spaces 14 and 17 as being "behind" the inner cams, such phrase being intended to apply to any space into which an inner or needle-projecting cam can be withdrawn in order to permit inspection of that portion of the grooved needle-carrier which is ordinarily covered thereby.

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

1. The combination in a circular-knitting machine, of a cam-carrier having its inner or needle-projecting cams detachably secured thereto and having a space behind said cams into which they can be withdrawn, substantially as specified.

2. The combination in a circular-knitting machine, of a cam-carrier having inner or needle-projecting cams detachably secured thereto and having a space behind said cams into which they can be withdrawn, and a support for said cam-carrier providing spaces through which the cams can be removed when thus withdrawn, 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.