L. N. D. WILLIAMS.

KNITTING MACHINE NEEDLE.

APPLICATION FILED SEPT. 19, 1911.

1,015,109.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

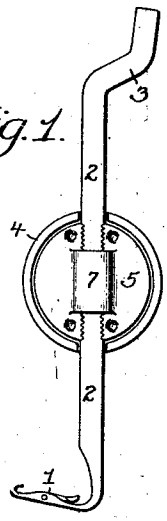


Fig. 2.

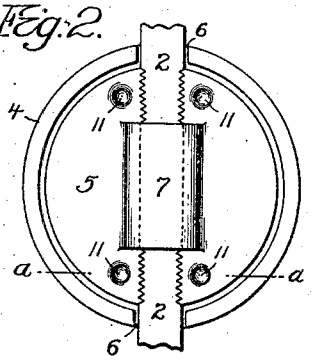


Fig. 4.

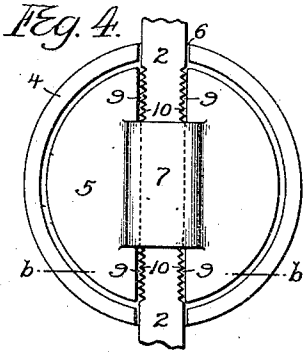


Fig. 3.

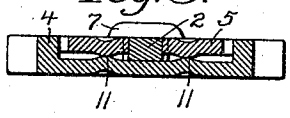


Fig. 5.

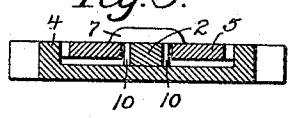


Fig. 6.

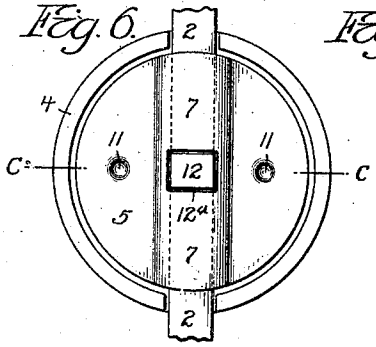


Fig. 7.

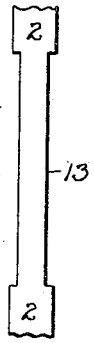


Fig. 8.

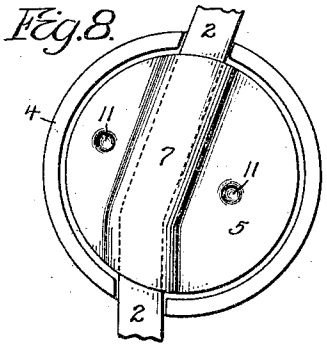


Fig. 12.

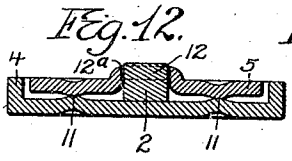


Fig. 9.

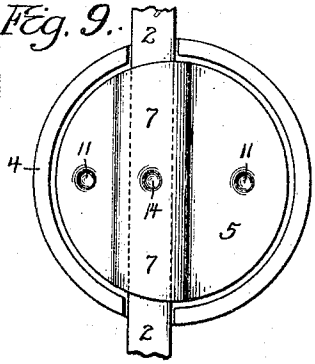


Fig. 10.

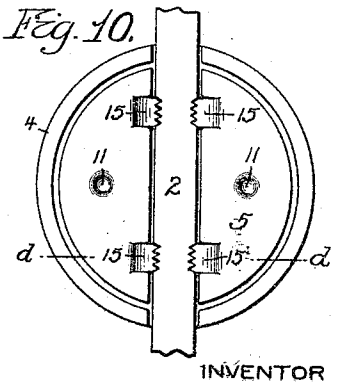
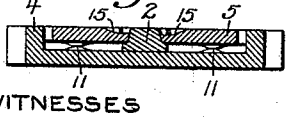


Fig. 13.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 11.

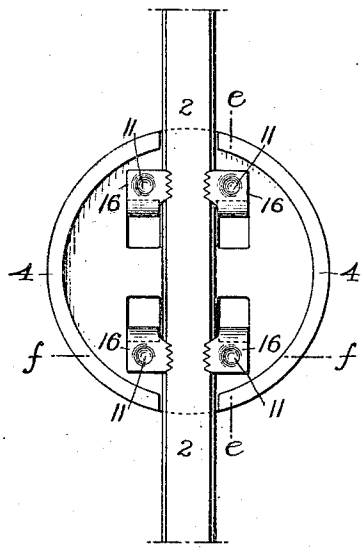


Fig. 14.

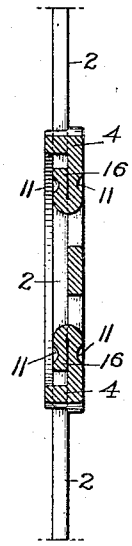
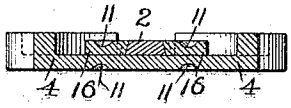


Fig. 15.



WITNESSES
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UNITED STATES PATENT OFFICE.

LOUIS N. D. WILLIAMS, OF OGONTZ, PENNSYLVANIA, ASSIGNOR TO SCOTT & WILLIAMS, INCORPORATED, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KNITTING-MACHINE NEEDLE.

1,015,109. Specification of Letters Patent. Patented Jan. 16, 1912.

Application filed September 19, 1911. Serial No. 650,125.

To all whom it may concern:

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

The object of my invention is to provide an effective pivot construction for the swinging needles employed in certain types of knitting machines, for instance in that type of machine shown in the U. S. Letters Patent of Robert W. Scott, No. 834,763, dated October 30, 1906. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a needle of the type to which my invention relates and illustrating one method of carrying out my invention; Fig. 2 is an elevation of the pivot portion of the needle on an enlarged scale; Fig. 3 is a transverse section of the same on the line *a—a*, Fig. 2; Fig. 4 is a view similar to Fig. 2, but illustrating a preceding stage in the formation of the pivot member of the needle; Fig. 5 is a transverse section of the same on the line *b—b*, Fig. 4; Figs. 6, 7, 8, 9, 10 and 11 are views similar to Fig. 2, but illustrating other embodiments of my invention; Fig. 12 is a transverse section on the line *c—c*, Fig. 6; Fig. 13 is a transverse section on the line *d—d*, Fig. 10; Fig. 14 is a longitudinal section on the line *e—e*, Fig. 11, and Fig. 15 is a transverse section on the line *f—f*, Fig. 11.

Heretofore needles such as those to which my invention relates have been provided with a segmental bend in the stem of the needle to constitute a pivot member but in making these needles it is very difficult to locate the pivot bend in accurate relation to the needle and to that end of the needle stem on which the cams act to impart movement thereto.

In carrying out my invention therefore I have provided the needle with a pivot disk which not only affords a substantial pivotal support for the needle in its bearing on the frame of the machine but which can also be accurately adjusted on the stem of the needle and can then be secured to said stem beyond risk of displacement thereon.

Referring in the first instance to Figs. 1 to 5 of the drawings, 1 represents the needle which has a bent and flattened shank 2, the latter being also bent or cranked at the upper end, as shown at 3, although this latter formation is not absolutely necessary.

The pivot disk for the needle comprises two members 4 and 5, the member 4 consisting of a cup-shaped disk with opposed slots 6 in the flange of the cup and the member 5 comprising a flat disk which can be fitted within the cupped disk 4 and has a hood 7 overlying the shank of the needle, the latter being laid upon the base of the cup-shaped disk 4 and passing through the slots 6 in the flange of said disk, as shown in Figs. 2 and 4. At each end of the hood 7 the inner disk 5 is also slotted, as shown at 9 in Fig. 4, these slots being of such width that the shank of the needle will lie freely within the same and those portions of the needle shank which are contained within these slots 9 are preferably notched or serrated on their opposite sides, as shown at 10 in Fig. 4.

For securing the pivot member to the needle shank a suitable jig is employed having means for properly positioning the needle and other means for properly positioning the cupped disk 4 in respect to the needle. These parts being thus properly positioned, the disk 5 is placed within the flange of the disk 4, the hood 7 of said disk 5 overlapping the shank of the needle and confining the same closely against the back of the disk 4. The two disks are then spot-welded together, as shown at 11 in Figs. 2 and 3, by means of a suitable form of electric welding apparatus, and in thus welding the two disks together the metal of the walls of the slots 9 will be caused to flow into the notches or serrations in the sides of the needle shank, as shown in Figs. 2 and 3, thereby firmly confining together the needle shank and its pivot member as against any movement of one in respect to the other, in any direction, the lateral flow of the metal of the slotted walls being sufficient to compensate for any slight inequalities in the width of the needle shank which are likely to occur because of inequality in the bulk of metal of which said shank is composed.

In that form of needle shown in Figs. 6 and 12 the shank of the needle has a lug 12 formed thereon which enters a slot 12^a in the hood 7 of the disk 5, this construction

serving to properly position the needle shank and disk before the welding together of the disks 4 and 5.

If desired, the shank of the needle may be reduced in width, as shown at 13, in Fig. 7, in that portion which is fitted to the hood of the disk 5, the side walls of the hood bearing against the sides of this reduced portion of the needle shank and the ends of the hood bearing against the shoulders at the ends of the reduced portion, so as to accurately position the disk 5 upon the needle shank preparatory to the welding of the disks together, or the proper positioning of the needle shank and disk 5 may be effected by forming one portion of the hood 7 at an angle in respect to the other portion and by bending the shank of the needle to conform to the hood thus formed, as shown in Fig. 8, or the hood may be spot-welded to the shank of the needle, as shown at 14 in Fig. 9, the objection to welding the shank of the needle to the disk 5, however, being that the heat of the welding operation affects the temper of the needle shank.

Instead of providing the hood on the disk 5 as previously described, said disk may consist of separate halves, as shown in Fig. 10, the confinement of the needle shank to the pivot member being effected by displacing the metal of each half of the disk at one or more points 15 and causing the metal thus displaced to overlap beveled notches formed in the sides of the needle shank, as shown in Fig. 13.

In the needle constructed in accordance with my invention perfect uniformity and rotundity of the pivot member will be presented, and when the disks constituting said pivot member are secured together and to the needle shank, the latter will be rigidly secured to the pivot member, and the various parts will bear the proper accurate relation to one another necessary to the proper functioning of the needles in machines of fine gage. The smoothness and uniform rotundity of the cupped disk are qualities which are difficult, if not impossible, to secure in a punched washer.

The disk 5 is preferably made of softer metal than the cupped disk 4 so as to facilitate the displacement of the metal for the formation of the hood 7, which is preferably slightly less in depth than the thickness of the needle shank so that the latter will be firmly clamped to the back of the disk 4 when the two disks have been properly secured together.

The disk 5 fits loosely within the cupped disk 4 but is fitted snugly to the needle shank so that the position of the disk 5 within the cupped disk 4 is dependent wholly upon the position which the needle shank occupies in the positioning jig in respect to said cupped disk 4, the latter being positioned by separate means so that any variation in the width or thickness of the needle shank will not affect the proper localization of the cupped disk thereon.

While I prefer to unite the two disks 4 and 5 by means of an electric weld because of the rapidity and cheapness with which the operation can be effected and because of the facility which it affords for restricting the weld to certain limited parts of the area of the disk, said disks may, if desired, be secured together by soldering or brazing.

In that embodiment of my invention illustrated in Figs. 11, 14 and 15, the washer 5 is omitted, the needle shank 2 having beveled notches at each side which are engaged by the lateral spreading of webs 16 struck up from and folded back upon the back web of the cupped disk 4, as shown in Fig. 14, the lateral spreading of these webs 16 being effected either by the operation of spot-welding them to the back web of the disk 4, as shown in Fig. 15, or by simple pressure upon them after the manner of the webs 15 in Fig. 10.

I claim:

1. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk secured within the cupped disk, and engaging the shank of the needle.

2. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk secured within said cupped disk and having a portion overlying the shank of the needle so as to press the same against the back of the cupped disk.

3. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk secured within said cupped disk, and having a portion overlying the shank of the needle so as to press the same against the base of the cupped disk, and also having a portion engaging the shank of the needle to prevent longitudinal movement of the same in respect to the pivot member.

4. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk engaging the shank of the needle and located within said cupped disk, the two disks being connected together by spot-welding whereby the temper of the needle shank is not destroyed by the heat of the welding operation.

5. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk secured within said cupped disk and having a hood for the reception of the needle shank which is confined between the two disks.

6. A knitting machine needle having a pivot member consisting of a cupped disk, and a second disk secured within said cupped disk and having a hood for the re-

ception of the needle shank which is confined between the two disks, said second disk also having beyond the hood a portion displaced into engagement with a notched or serrated portion of the needle shank.

7. A knitting machine needle comprising a disk secured to the needle shank, a cupped disk carrying said first named disk, and means for securing the latter to said cupped disk, said means being independent of those whereby the disk is secured to the needle shank.

8. A knitting machine needle having a cupped disk secured to the needle shank and constituting a pivot member therefor, the outer face of the side of the cup constituting the bearing surface for the pivot member.

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

LOUIS N. D. WILLIAMS.

Witnesses:

KATE A. BEADLE,

HAMILTON D. TURNER.