

(No Model.)

W. T. ROWLETT.  
NEEDLE FOR USE IN KNITTING MACHINES.

No. 597,488.

Patented Jan. 18, 1898.

Fig. 1.

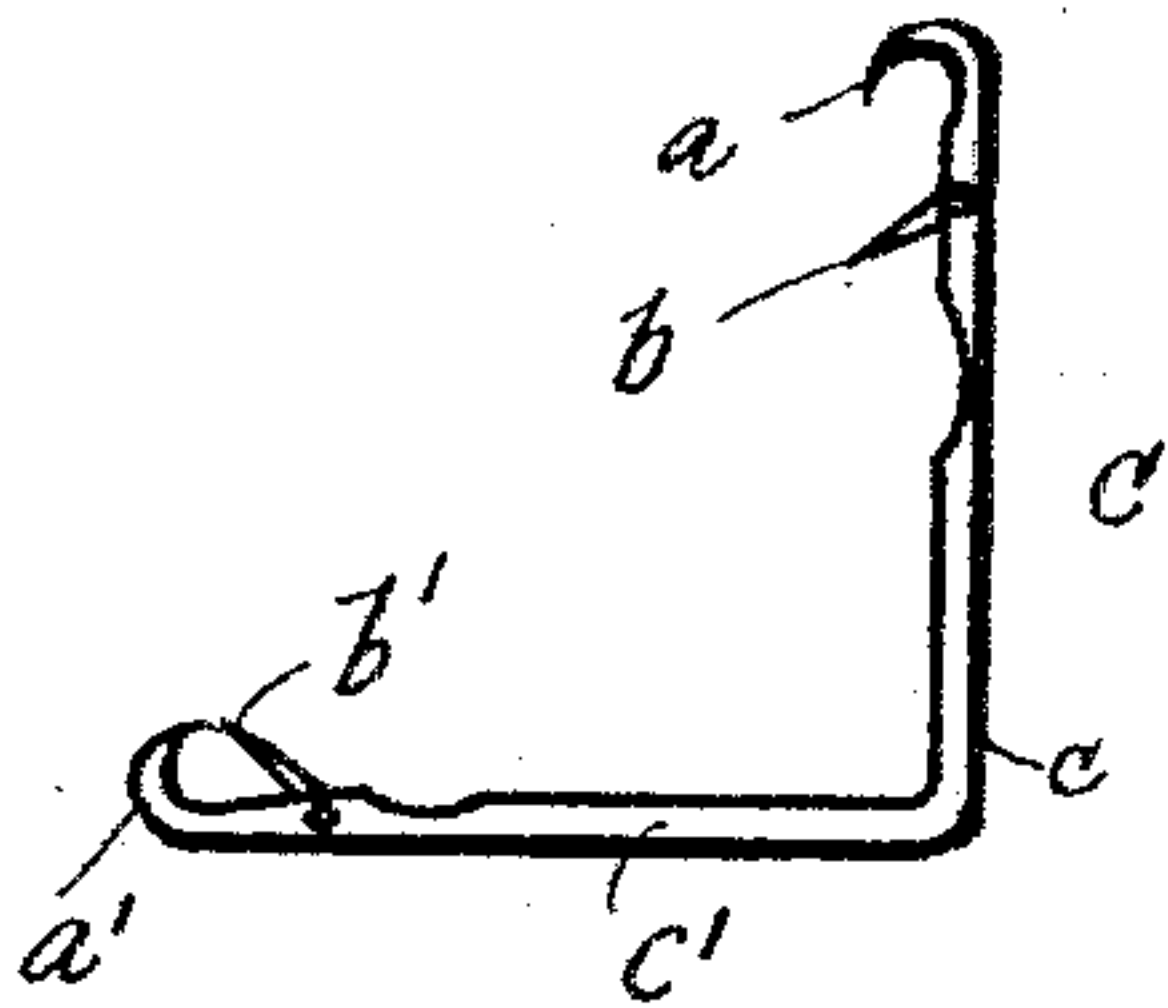


Fig. 2.

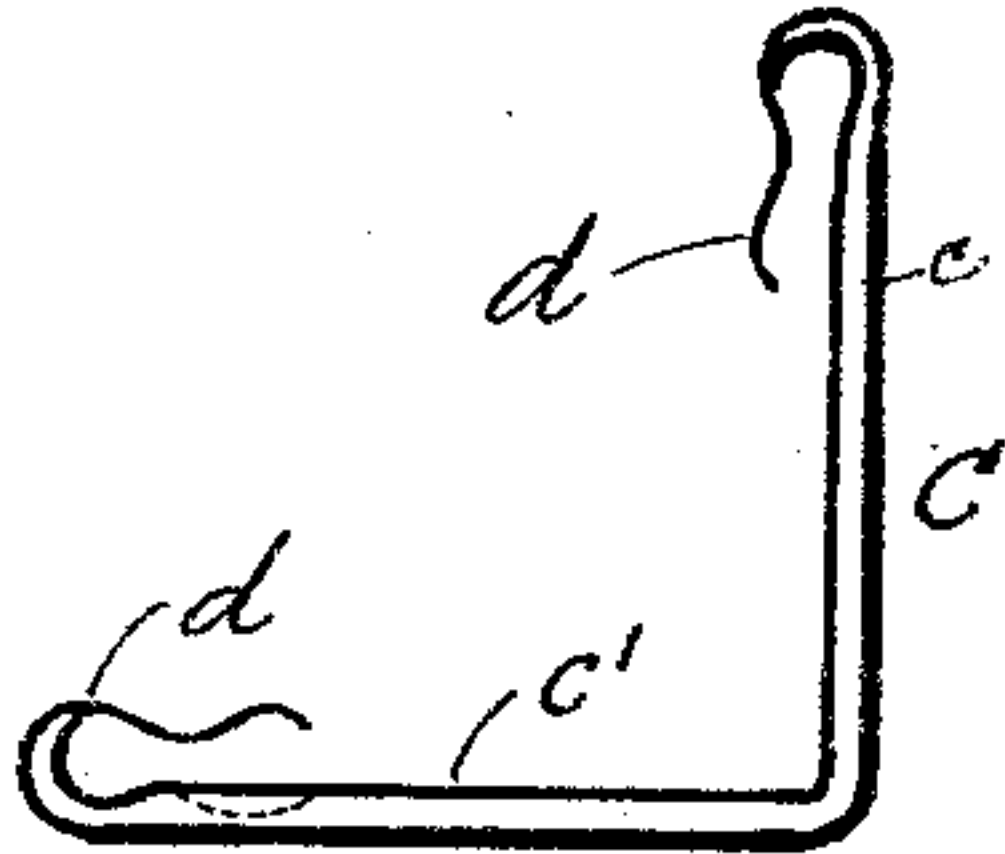


Fig. 3.

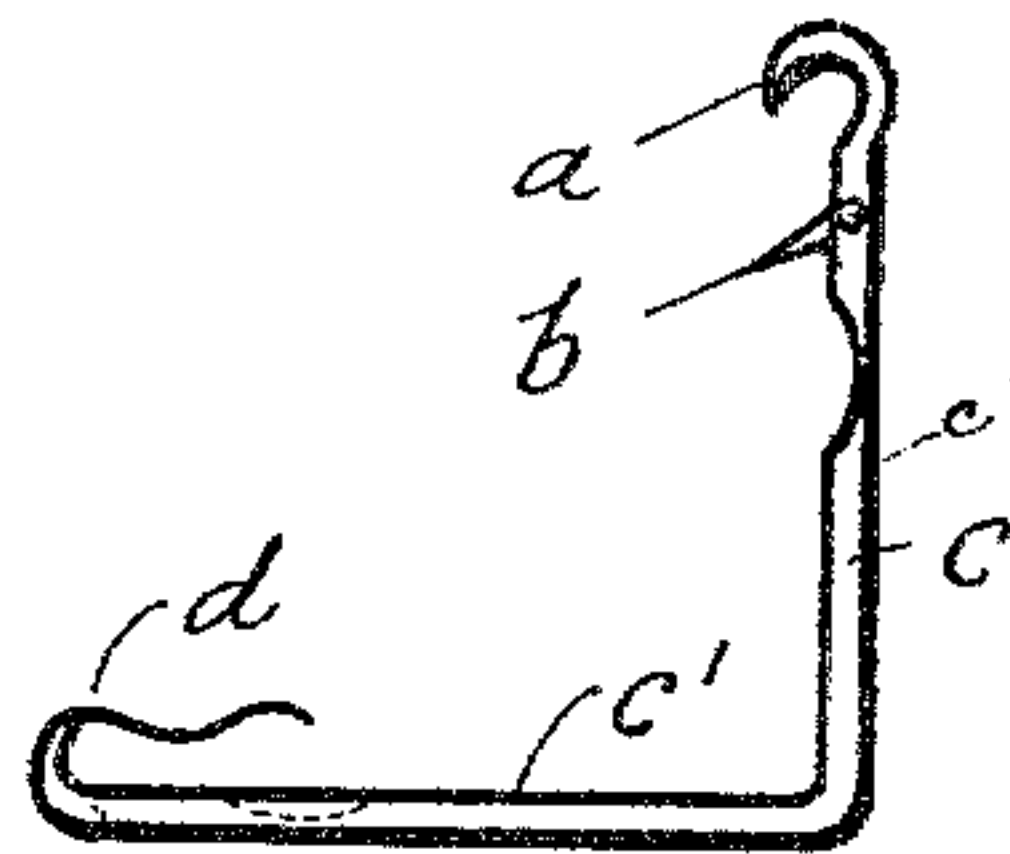


Fig. 1<sup>a</sup>.

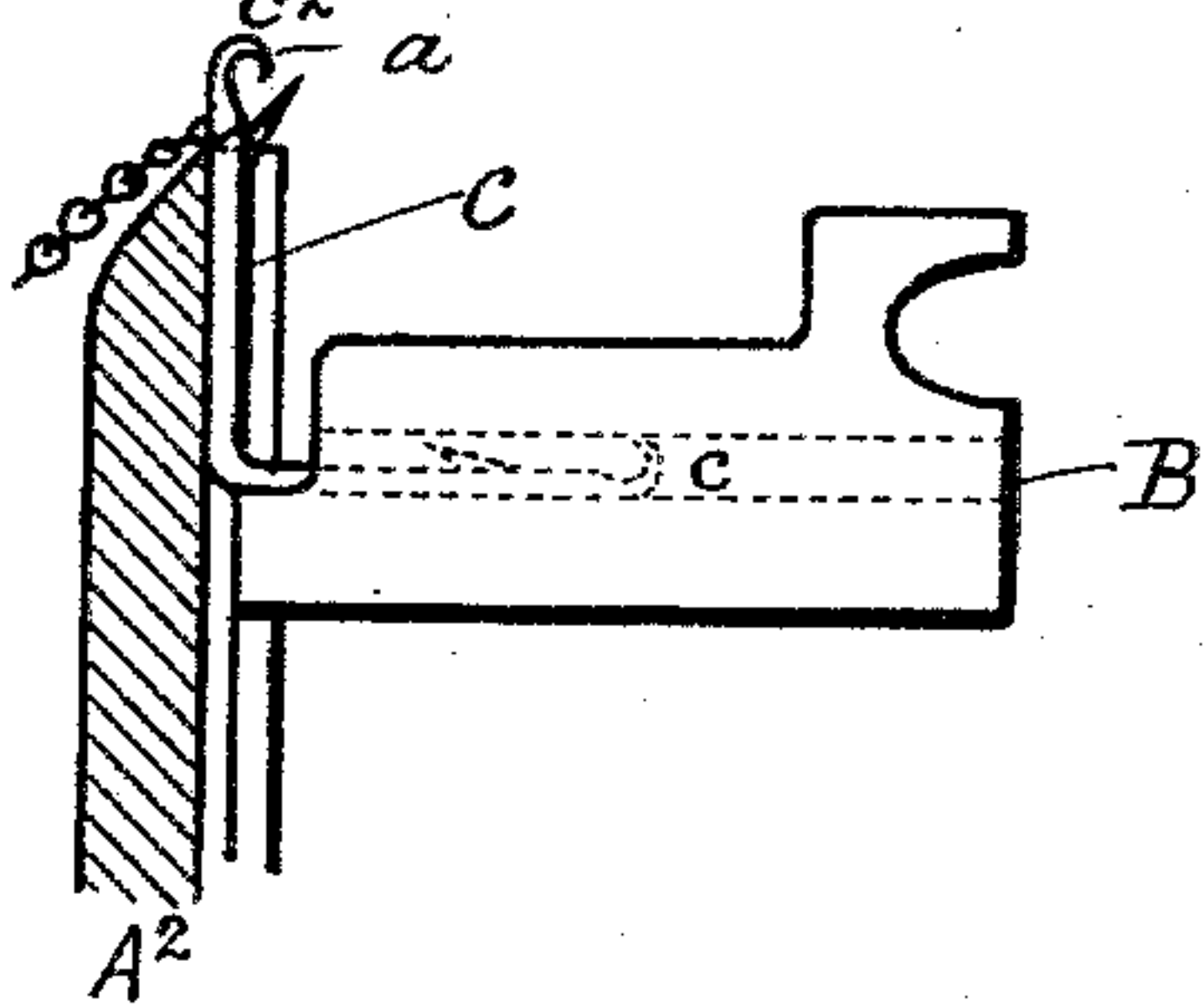


Fig. 2<sup>a</sup>.

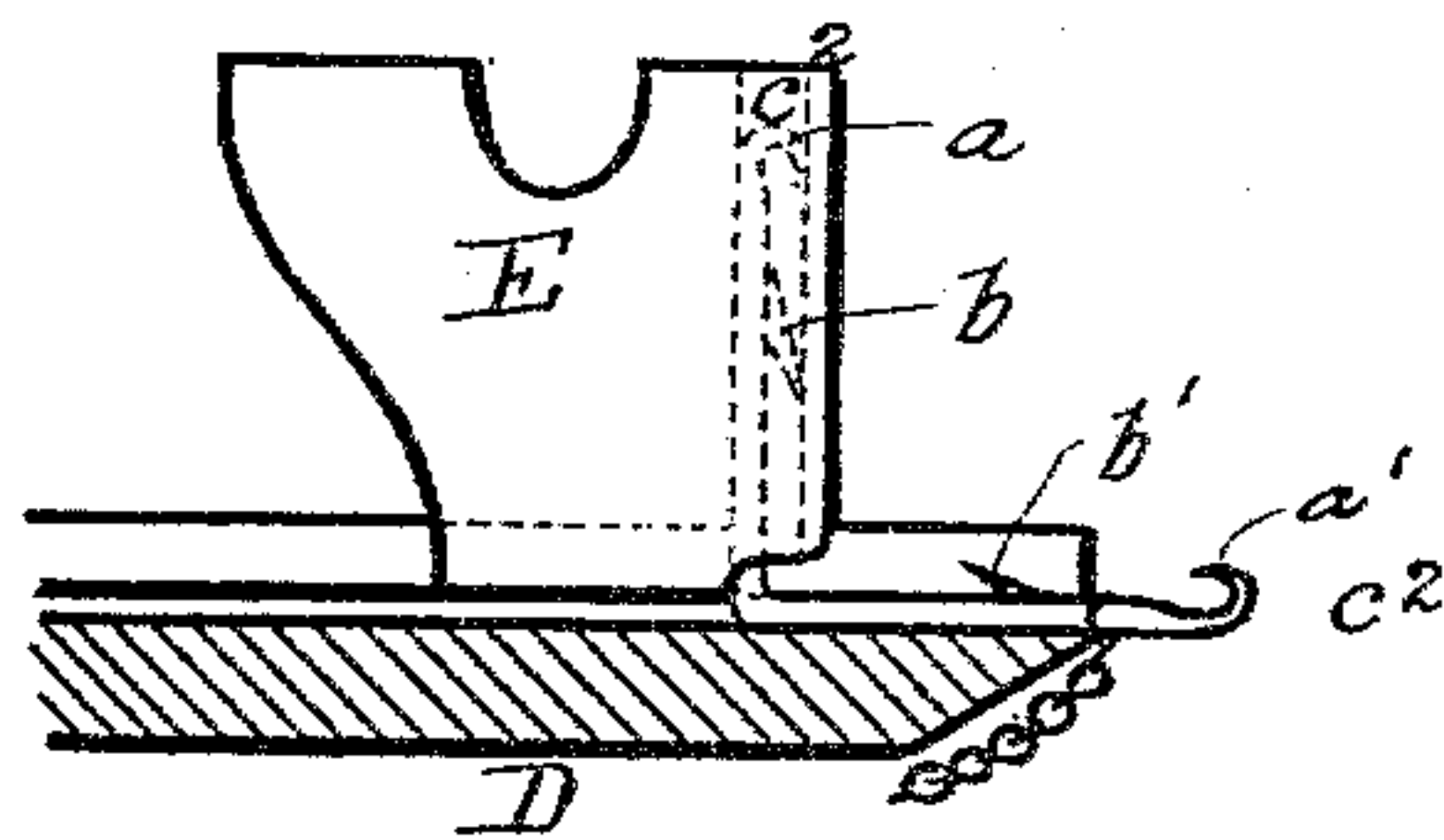


Fig. 3<sup>a</sup>.

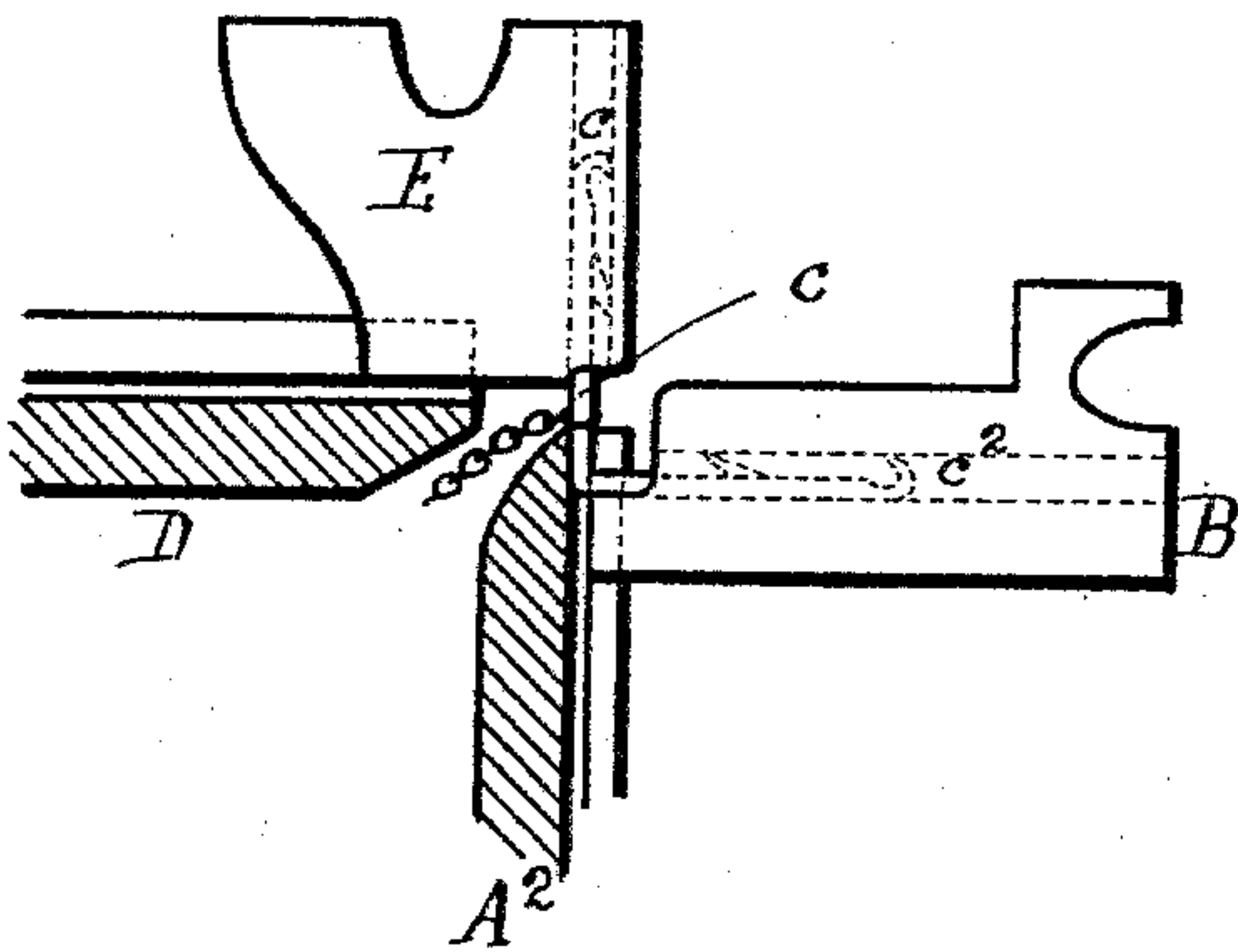
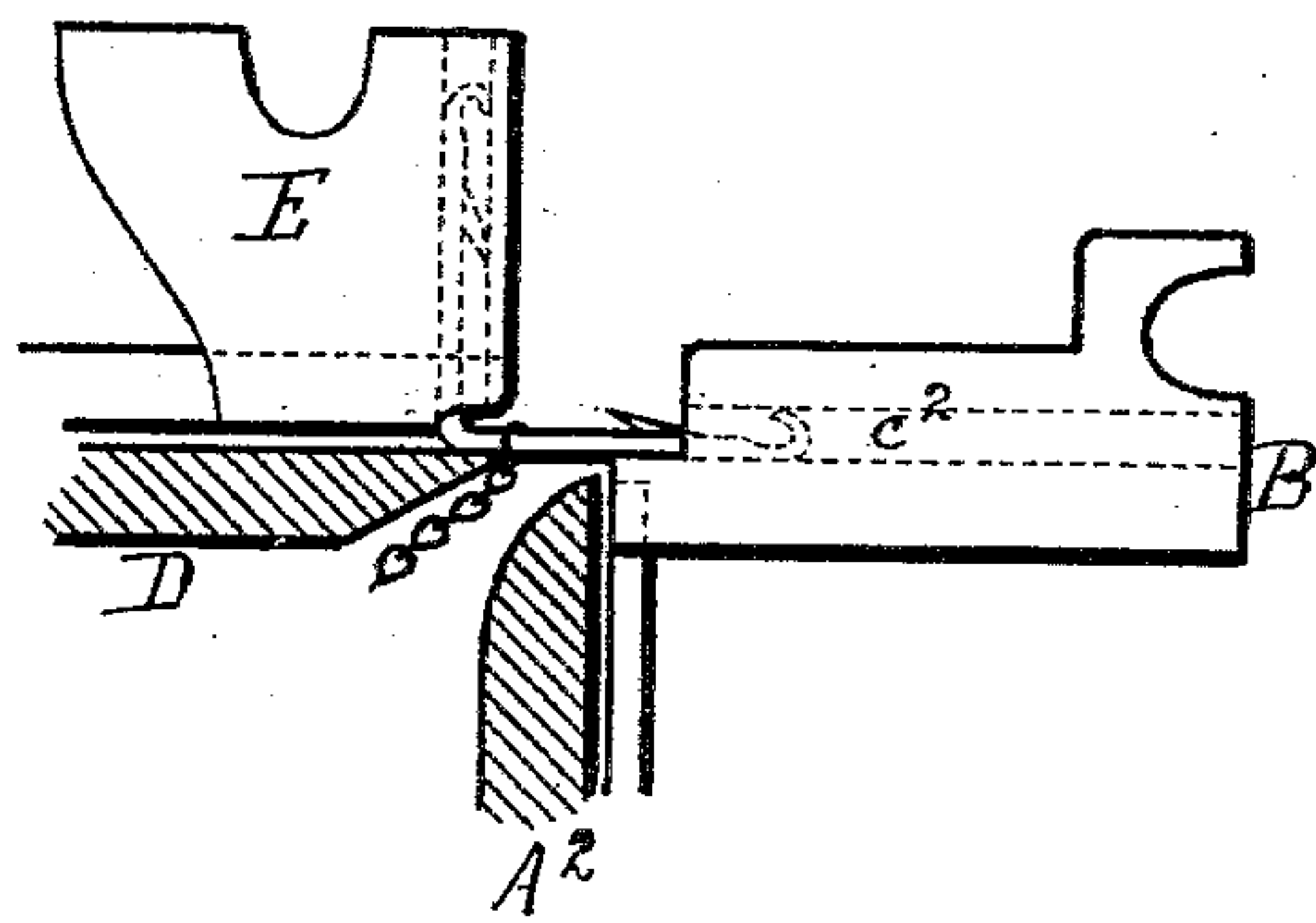


Fig. 4.



Witnesses:-  
H. K. Boulter  
C. M. Mather

Inventor:  
Wm. T. Rowlett,  
By Wm. E. Boulter,  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM TERTIUS ROWLETT, OF LEICESTER, ENGLAND.

## NEEDLE FOR USE IN KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 597,488, dated January 18, 1898.

Application filed July 27, 1896. Serial No. 600,640. (No model.) Patented in England August 15, 1895, No. 15,342, and in France April 15, 1896, No. 255,574.

*To all whom it may concern:*

Be it known that I, WILLIAM TERTIUS ROWLETT, yarn merchant, a subject of the Queen of Great Britain, residing at 34 Newarke Street, Leicester, England, have invented certain new and useful Improvements in Needles for Use in Knitting-Machines, (for which Letters Patent have been obtained in Great Britain, No. 15,342, dated August 15, 1895, and in France, No. 255,574, dated April 15, 1896,) of which the following is a specification.

This invention has reference to the application of double-ended or two-hooked needles to knitting-machines for the manufacture of ribbed fabrics.

In these machines the needles are placed and worked at an angle to each other, so that the loops are pulled over in opposite directions in the same course and form ribs on each side of the fabric.

In the more common types of circular-rib machines the needles work at right angles to each other, the cylinder-needles being vertical and the dial or rib needles horizontal, and intersect the plane of movement of each other. In such machines, when it is desired to change the knitting from one kind of rib to a different kind or from rib fabric to plain fabric, needles have to be removed from the dial and the same number of needles inserted in the cylinder, or vice versa, and the loops from the removed dial-needles placed on the inserted cylinder-needles. For instance, in making a one-and-one ribbed fabric, as in the rib-top of a sock, the needles are placed alternately in the cylinder and dial, and every alternate stitch is then pulled over in the opposite direction. Then to make the leg of a sock the rib is changed to, say, three-and-one rib, which means that three needles are placed together in the cylinder alternately with one in the dial. To arrange this, it is necessary to take out every alternate needle in the dial and insert an additional needle in the cylinder, transferring the loop from the removed dial-needle to the additionally-inserted cylinder-needle.

The present invention comprises an improved construction of needle which will admit of being slid from the dial to the cylin-

der or from the cylinder to the dial without the necessity of removing the loop therefrom.

In order to facilitate the transfer from the dial to the cylinder, or vice versa, as described, the needles are bent so that one end stands at an angle with the other.

The needles may be formed either with hooks and latches, or they may be bearded needles, or they may be furnished at one end with a hook and a latch and at the other end with a beard.

The object of the bent double-ended needle is to facilitate the change of knitting before described by simply sliding the needle out of the dial-groove into the cylinder-groove, or vice versa, without the removal of the loop. This object is found impracticable and could not be attained by a double-ended needle with a straight intermediate stem.

The accompanying drawings illustrate my invention, and also illustrate a portion of a knitting-machine with which my improved needle is used.

Figure 1 is a view of a needle having a hook and latch at each end. Fig. 2 is a view of a needle having a beard at each end. Fig. 3 is a view of a needle having a hook and latch at one end and a beard at the other. Fig. 1<sup>a</sup> is a sectional elevation of a portion of a circular-knitting machine, showing the needle just rising in the cylinder after having made the stitch. Fig. 2<sup>a</sup> is a similar view showing a part of the dial. Fig. 3<sup>a</sup> is a similar view showing the needle in the act of being transferred from the cylinder to the dial. Fig. 4<sup>a</sup> is a view similar to Fig. 3<sup>a</sup>, showing the needle in the act of being transferred from the dial to the cylinder.

The same letters indicate the same parts of the needle in each figure.

The hooks *a a'* and latches *b b'*, as also the beards *d*, are constructed and work in the ordinary manner.

The hook *a* and latch *b* of the needle perform the operation usually performed by the cylinder-needle of a circular-knitting machine, and the hook *a'* and latch *b'* perform the operations usually performed by the dial-needle.

The needle is bent so that the end *c* stands



at an angle with the end  $c'$ . In the drawings this angle is shown as a right angle; but such may be deviated from in certain cases, and the two ends  $c, c'$  of the needle may be the  
 5 same or of different lengths. The two ends of the needle may be made separately and be joined together at an angle instead of bent.

In Figs. 1<sup>a</sup> to 4<sup>a</sup>, inclusive, C indicates the improved needle; B, a part of a needle-holder  
 10 which works the needle; A<sup>2</sup>, part of the needle-cylinder; D, the dial, and E the dial-needle holder.

In order to produce knitted ribbed fabrics, two rows or sets of needles are used in two  
 15 needle-beds. The needles in one row form the stitches in one direction and the needles in the other row form the stitches in the opposite direction, thus producing a knitted web, both sides having the same appearance  
 20 when the number of needles in each row is equal. This web is very elastic and is therefore largely used for the ends of socks, pant-legs, shirt-sleeves, and for similar purposes. In a circular-ribbed-knitting machine, such  
 25 as illustrated, one row of needles C is arranged in the grooves of the vertical cylinder A<sup>2</sup> and work up and down in these grooves. The second row of needles is arranged in radiating grooves in the horizontal dial D, located within  
 30 the circumference of the cylinder, and work horizontally backward and forward in these radiating grooves. The two rows of needles cross or intersect each other in working and are so arranged when producing ordinary  
 35 ribbed work that a cylinder-needle is placed alternately with a dial-needle, and thus produce what is known as "one-and-one" ribbed work.

In order to change the kind of work made—  
 40 say from one-and-one rib to three-and-one—every second needle is taken out of the dial and a new needle brought into the corresponding space in the needle-cylinder, onto which the stitch is transferred from the needle which  
 45 has been taken out of the dial. The needles are thus arranged in groups of three in the needle-cylinder and single needles between these groups in the dial.

To change one-and-one ribbed work into  
 50 plain work, all the needles must be taken out of that part of the dial where plain work is required and fresh needles placed in corresponding grooves in the cylinder, onto which the stitches from the needles taken out of the  
 55 dial must be transferred. It will be found

that my bent needle with a hook and tongue at each end or a beard at one or both ends allows the above changes to be made, as one end of the needle is horizontal and the other  
 60 vertical, the horizontal half working in the dial and the vertical half in the cylinder. In effecting a change in the fabric, as before described, a dial-needle is brought forward until it leaves the dial-groove and is taken by the  
 65 corresponding needle-holder of the cylinder, which is at the same time raised sufficiently high to receive the horizontal part of the needle. The needle-holder then recedes or is lowered, drawing the vertical part of the  
 70 needle out of the dial-needle holder without losing the stitch, which remains on the shaft of the needle. The needle then works with the other cylinder-needles, forming the stitches in the opposite direction to those needles remaining in the dial. In transferring needles  
 75 from the cylinder to the dial the operations are reversed.

In transferring the needle, as before described, the loop simply slides along the stem and does not need to be removed from the  
 80 needle.

It is obvious that the double-ended bent needle is equally adapted for use in straight-bar double-bed machines of the well-known  
 85 "Lamb" type for producing ribbed fabrics and in which the needle-beds are disposed at an angle the one to the other.

I claim—

1. In knitting-machines for the manufacture of ribbed fabrics the combination with  
 90 needle-beds disposed at an angle to each other, of double-ended or two-hooked needles, the stems of which are bent at an angle to facilitate the transference of the needles from the dial to the cylinder or from one needle-bed to  
 95 another and vice versa, substantially as described.

2. The double-ended or two-hooked needle bent at an angle, substantially as described.

3. A bent or double-ended needle having  
 100 the two ends at an angle one to the other and provided at opposite ends with loop-engaging devices, such as specified.

In testimony whereof I have hereunto set my hand in the presence of the two subscrib-  
 105 ing witnesses.

WILLIAM TERTIUS ROWLETT.

Witnesses:

E. N. LEWIS,  
 J. P. WARING.