No. 649,378. Patented May 8, 1900.

N. W. WESTCOTT.

KNITTING MACHINE.

(Application filed July 27, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1

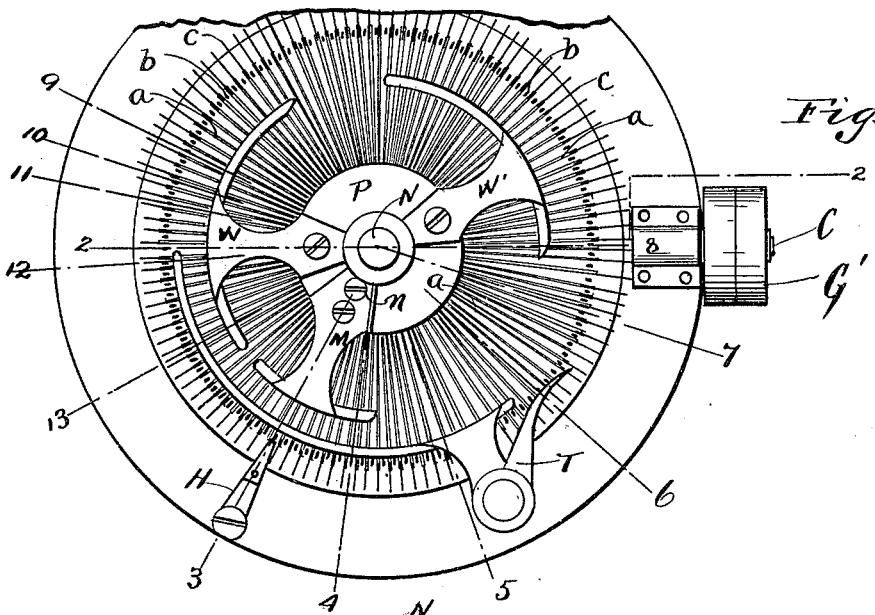
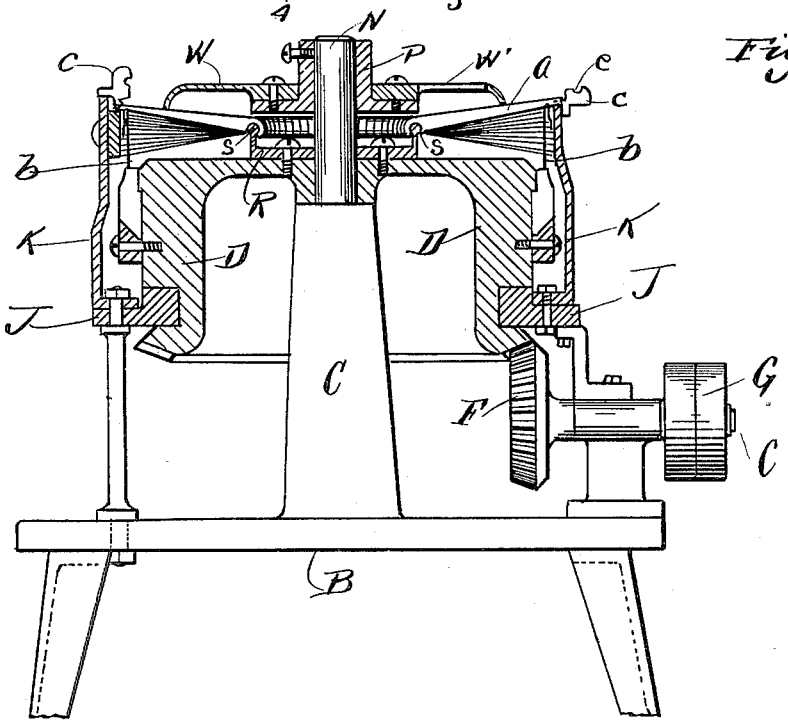


Fig. 2.



Witnesses.

J. M. Goff

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Fig. 3.

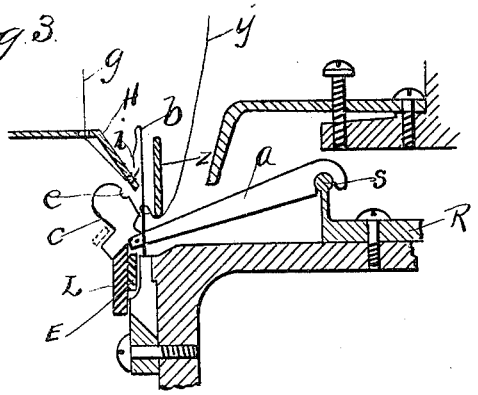

Fig. 6.

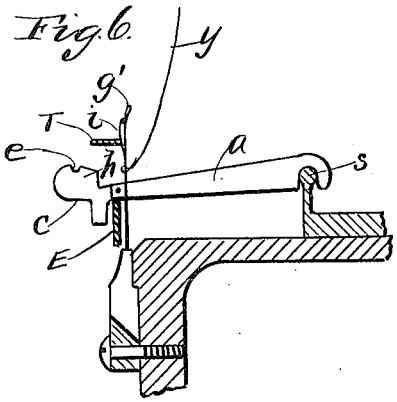

Fig. 4.

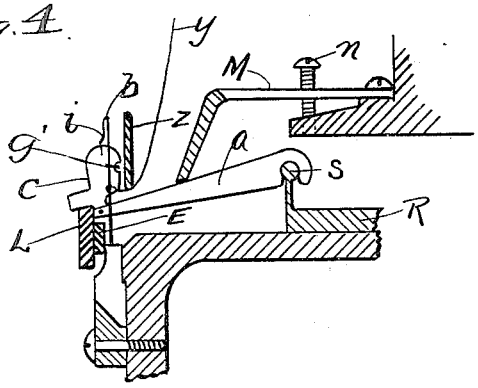

Fig. 7.

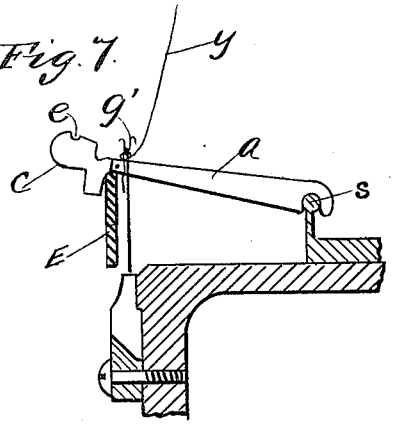

Fig. 5.

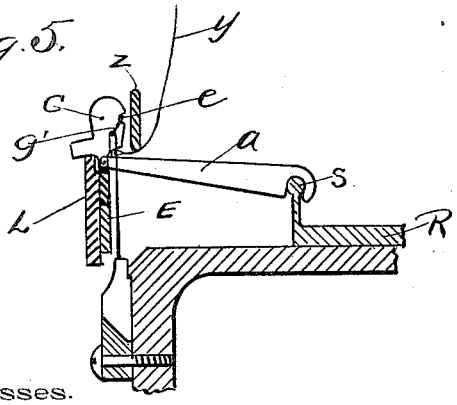

Fig. 8.

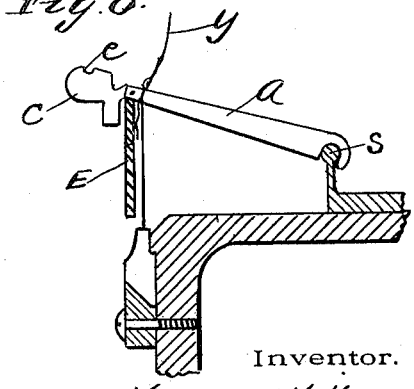

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Fig 9.

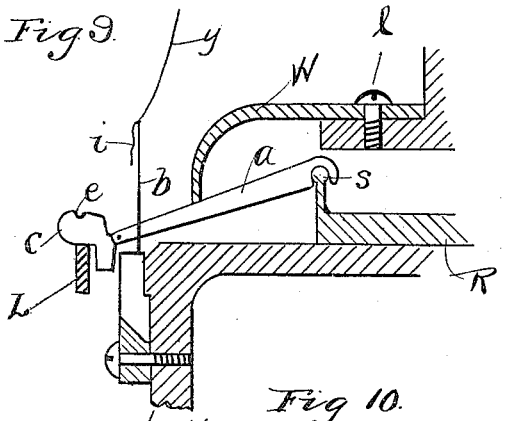


Fig 10.

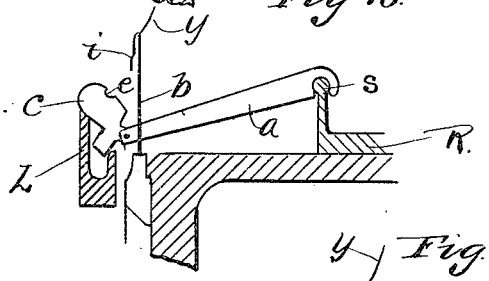


Fig 11.

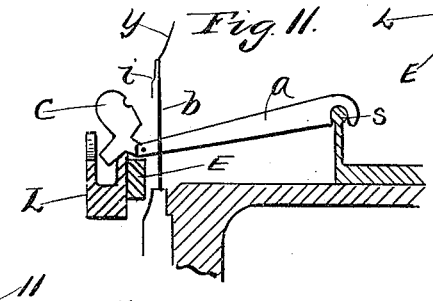


Fig 12.

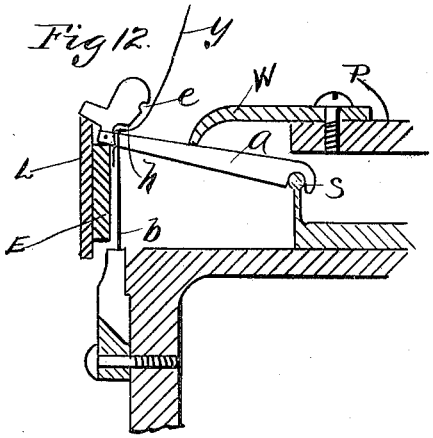


Fig 13.

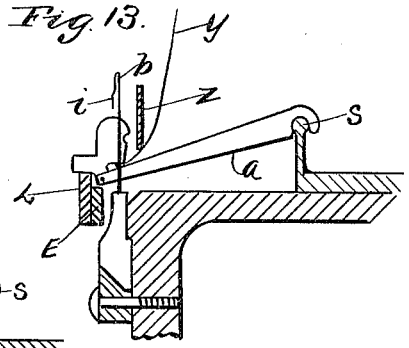


Fig 14

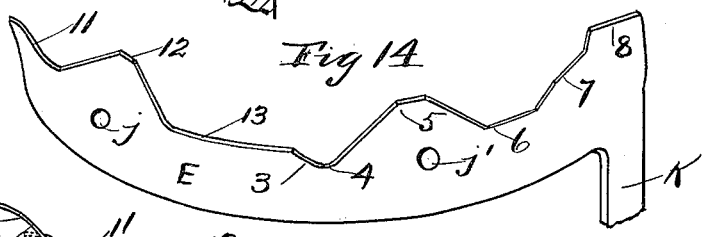


Fig 15

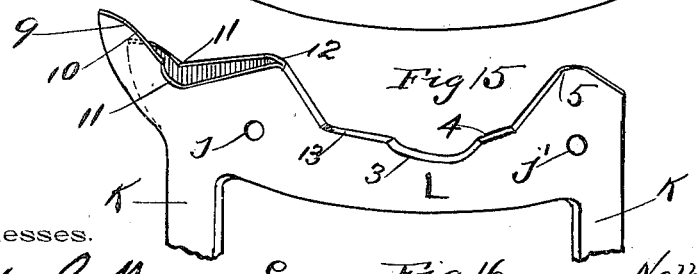
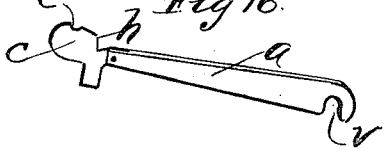


Fig 16.



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UNITED STATES PATENT OFFICE.

NATHANIEL W. WESTCOTT, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO JAMES M. GOFF, OF SAME PLACE.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,378, dated May 8, 1900.

Application filed July 27, 1899. Serial No. 725,262. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. WESTCOTT, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Knitting-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to rotary knitting-machines or those used to produce tubular work; and it consists in providing improved devices for forming the loops on the needles and for throwing off the old loops without the use of the toothed wheels which are commonly used in these machines. It is fully explained and illustrated in this specification and the accompanying drawings.

Figure 1 represents a top view of the machine with the improvements attached. Fig. 2 shows a vertical section taken down through the center of the machine on line 2 2 in Fig. 1. Fig. 3 represents the row of needles with the loop-forming devices in elevation with the feed-guide. Fig. 4 shows the position of the parts in forming the loops. Fig. 5 represents the new stitch carried up to the top of the needle. Fig. 6 represents the bar and plate as having fallen back to allow the presser to close the barbs of the needles. Fig. 7 represents the bar casting off the old stitch. Fig. 8 shows the old stitch cast off and the new stitch in the end of the needle. Fig. 9 shows the cast-off bar down again. Figs. 10, 11, and 12 represent the bar and plate as rising to catch over the new row of stitches to draw them down. Fig. 13 represents the bar and plate as having drawn down the last row of stitches to begin a new row, as in Fig. 3. Fig. 14 represents one of the cam-plates in elevation. Fig. 15 is a like representation of the other cam-plate. Fig. 16 represents one of the bars with its plate that form the loops or stitches and cast them off.

In the drawings, B represents the table on which the working parts of the machine are held.

C is a standard that projects up from the center of the table and has a stud N made fast in its upper end on which the head D turns, with its lower edge clasped on the edge of a circular plate J, held stationary on stands attached to the table B. The head D has bevel-gear teeth on its lower edge that engage with the teeth of a bevel-gear F, fast on the inner end of a short shaft C, with driving-pulleys G on its outer end to operate the machine. A circle of hooked needles *b b* are held vertically on the periphery of the head D, and a series of horizontal thin bars *a a* have notches *v* made in the lower edges of their inner ends (see Fig. 16) by which they are held on the round edge *s* of the vertical flange of the plate R, which is made fast to the top of the head D. The bars *a* are arranged to have their outer ends lie between the needles *b*, in the circle, one bar between each two needles. (See Fig. 1.) Each bar *a* has a peculiar-shaped plate or dog *c* (see Fig. 16) riveted to its outer end, so as to be free to turn on the rivet. The bars *a* are only hooked onto the round edge of the plate R, but the plate P above them prevents them from rising and getting off of the edge *s*.

Two cam-plates E and L, (shown in Figs. 14 and 15, respectively,) which have projections and depressions on their upper edges, give the proper motions to the bars *a* and plate *c* in forming the loops and in casting them off of the needles. These cam-plates E and L, Figs. 14 and 15, are held by means of extensions K on their lower edges, which reach down and are secured to the plate J. (See Fig. 2.) The cam-plate E is placed next to the needles and operates the bars *a*, raising and letting them down as required. It is seen in section without the cam-plate L in Figs. 6, 7, and 8. The other cam-plate L, Fig. 15, is placed on the outside of the cam-plate E in position, so that the holes *j j* and *j' j'* will correspond, and small bolts are put through these holes to secure the outer cam-plate.

To make clear the motions of the devices in the operation of knitting, the positions in section of each part are shown in succession in Figs. 3 to 13, and the same are indicated by corresponding figures in Fig. 1 and on the cam-plates E and L in Figs. 14 and 15. I begin with Fig. 3, where the yarn *y*, fed into

the machine through the feeder H, is laid on the needles *b* just below the barb *i*. In Fig. 4 the rise on the cam-plate L has tipped the plate *c* over and caught the yarn *g* in the notch *e* and made a loop of it around the needle, the old loop being held down out of the way by the depressor *z*. At this point the length of the new loops and the consequent closeness or looseness of the knitting are determined by the regulator M, which consists of a flange attached to the top plate P at its inner end, and a screw *n* is put through a hole in the plate M and screwed into the plate P, by which the plate M can be drawn down so as to bear on the bars *a* and hold them more or less down, while the cam-plate L throws the plate *c* over against the yarn, for the lower the bar *a* is held the farther over the plate will be pushed, more yarn will be drawn in, and the longer the loop *g'* will be. In Fig. 5 the cam-plate E has raised the bars up and cam-plate L has also held the plate *c* upright and carried the new loop *g'* up into the upper end of the needle *b*. In Fig. 6 a decline in the two cam-plates has allowed the bar *a* to sink and the plate *c* to lie over horizontally to be out of the way and allow the barb-presser T to press in the barbs *i* of the needles; but as the bar *a* and its plate moved down, as shown in Figs. 5 and 6, the chin *h* of the plate *c*, Fig. 6, caught onto the former row of loops and drew it below the point of the barbs before the plate turned over out of the way. In Figs. 7 and 8, cam-plate L having terminated, cam-plate E is represented as pushing the former loops onto the barbs and over the ends of the needles onto the new loops that were there. In Fig. 9 the bar *a* and its plate are clear down and the needles have come around to the first end of the cam-plate L. Fig. 10 represents the plate *c* only as being raised by the cam-plate, which is made double at that point (see Fig. 15) to bear under the plate *c* in two places, and in Fig. 11 the cam-plate E again begins to raise the bar *a*, and in Fig. 12 the bar *a* is raised well up and the plate *c* tipped over, so as to catch the chin *h* on the new row of stitches and with the help of the stationary depressor *z* draw down the web, as in Fig. 13.

As shown in Figs. 13 and 3 the plate *c* is allowed to fall back to allow the feeder to again lay the yarn on the needles for another row of stitches.

Two stationary guard-plates W and W' (see Figs. 1 and 2) are attached to the top plate P, which is made fast to the stud N by means of a set-screw *l* in its hub. These guard-plates W W' keep the bars *a* from rising while the needles are passing around from the end of the cam-plate E to the first end of the cam-plate L.

As the movements of the parts for making the loops and casting them off, as described, take up but part of the space of the circle of needles, these parts can be duplicated on the other side of the machine and double the quantity of work turned off, especially on large machines for making body-garments.

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

1. In a knitting-machine the combination of a set of needles, a stationary barb-pressing cam, a series of bars arranged alternately with said needles, small plates movably joined to the outer ends of said bars, and means for tipping the plates to form loops on the needles and for raising the bars to cast the loops off, substantially as described.

2. In a knitting-machine the combination of a set of needles, a stationary barb-presser, a series of bars alternating with said needles and having plates movably pivoted to their outer ends adapted to pass between the needles, a yarn-guide, a cam-plate shaped to raise said bars and plates to form loops on the needles and allow said plates to fall back and out of the path of the presser, and then raise said bars, and cast off the previous row of loops, substantially as described.

3. In a knitting-machine the combination of a set of needles, a stationary barb-presser, a series of bars alternating with the needles and having plates movably riveted to their ends, means for raising said bars and plates to form loops on said needles, an adjustable plate held over said bars to limit the height that the bars shall be raised while forming the loops to determine their length, substantially as described.

4. In a knitting-machine the combination of a set of needles, a stationary barb-presser, a series of bars alternating with the needles and having plates movably pivoted to their ends, a cam-plate to operate said bars, and a cam-plate to operate the plates to form the loops, said cam-plates operating at times simultaneously and at other times independently, to raise the bars and plates to form loops on the needles and to cast them off, substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of July, A. D. 1899.

NATHANIEL W. WESTCOTT.

In presence of—

BENJ. ARNOLD,

M. E. CLEVELAND.