

W. W. BURSON & J. NELSON.
KNITTING-MACHINE.

No. 170,468.

Patented Nov. 30, 1875.

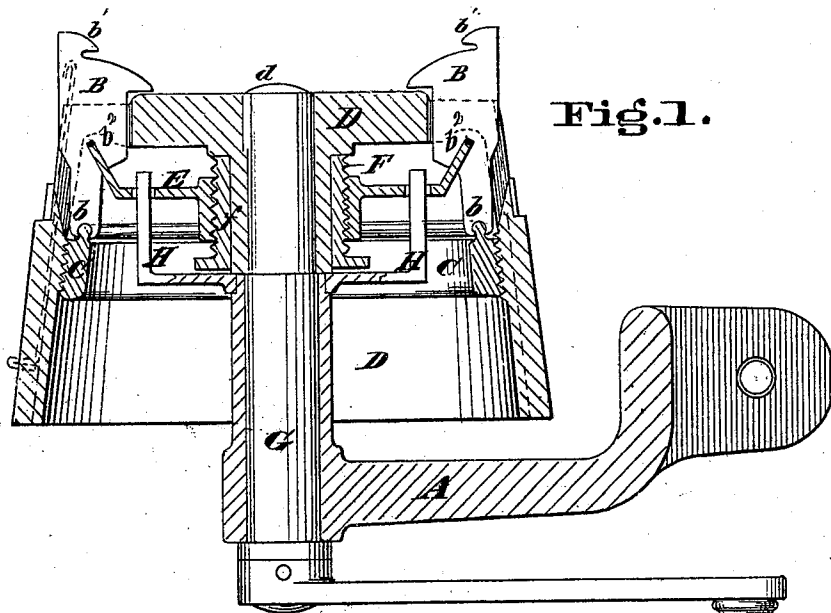


Fig. 1.

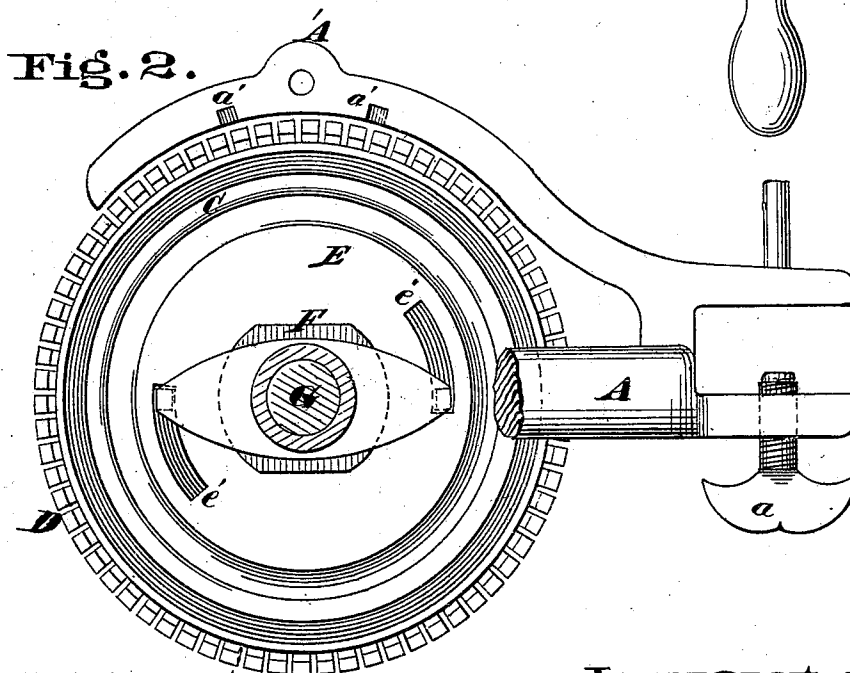


Fig. 2.

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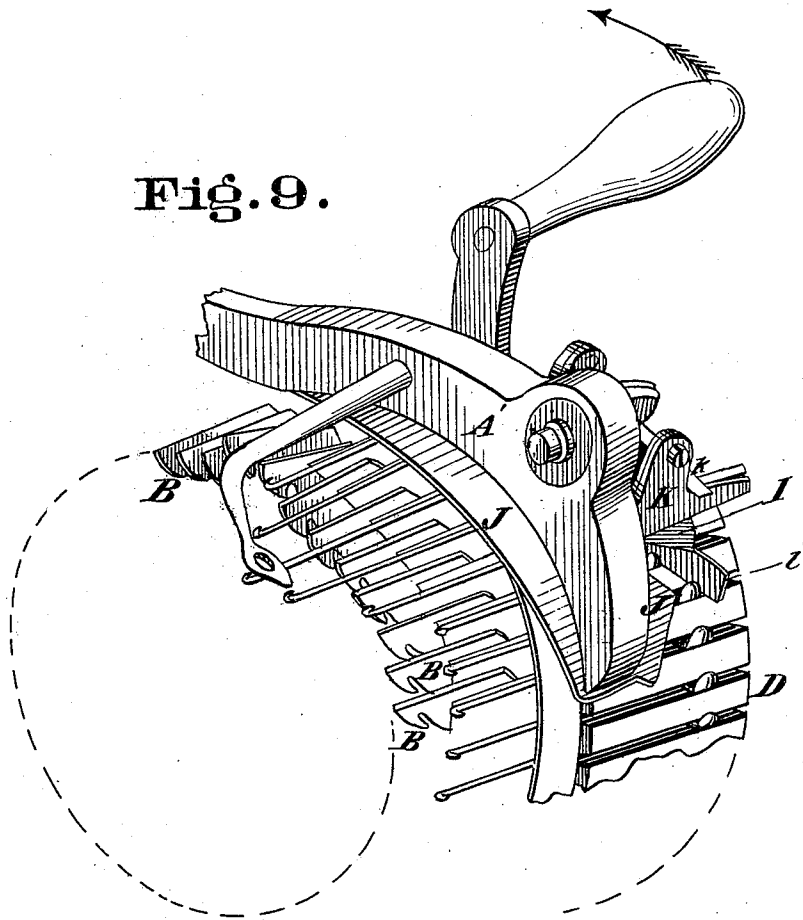
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Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM W. BURSON AND JOHN NELSON, OF ROCKFORD, ILL., ASSIGNORS
OF ONE-THIRD THEIR RIGHT TO RALPH EMERSON AND WILLIAM A.
TALCOTT, OF SAME PLACE.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **170,468**, dated November 30, 1875; application filed
June 19, 1874.

To all whom it may concern:

Be it known that we, WILLIAM W. BURSON and JOHN NELSON, of Rockford, in the county of Winnebago and State of Illinois, have invented certain Improvements in Knitting-Machines, of which the following is a specification:

Our invention relates to knitting-machines; and consists, first, in a series of springs or hooks, or their equivalents, arranged between the needles, and operating successively for the purpose of pressing the yarn down close upon the needles, and holding it from being carried forward or back by the needles, thus causing the loop to be shed when the needles are drawn back, and also doing away with a weight or tension-rollers on the fabric, the said springs or hooks being so arranged as to have a swinging motion, and being actuated by a suitable cam; second, in a strip of metal with an oblique flange at each end, so arranged upon a pivot that the one flange may form, in conjunction with a fixed piece, a groove-cam for the operation of the needles, while the other flange is raised out of reach of the needles, the piece being so constructed that, by simply tipping it, the opposite flange may be brought into operation, as will be hereinafter more fully described.

Figure 1 is a longitudinal section through the middle of the machine. Fig. 2 is an end view of the same with the frame A, Fig. 1, cut away. Fig. 3 shows the tip-cam as seen from above. Fig. 4 is the same as seen from the back end of the machine. Fig. 5 shows the catches for holding the tip-cam in position. Fig. 6 is a section through the cam which actuates the hooks, and shows the screw for adjusting the same. Fig. 7 is a side view of the same. Fig. 8 shows the hook which presses and holds the yarn upon the needles. Fig. 9 is a perspective view of a portion of the top of the machine.

The machine is mounted on a cast-iron frame, A A', which carries at one side a clamp and set-screw, a, to clamp it to a table. The hooks B, Figs. 1, 8, and 9, are arranged in the spaces between the needles—one hook in each space. At the back end of the hook is a pair of claws,

b, which embrace a circular rail upon the upper part of the ring C, Fig. 1. This ring is screwed to the needle-frame D, as shown in Fig. 1. At b¹ is a notch or hook, which catches on the yarn. The hook B, it will be seen, thus performs three distinct offices—viz., it holds the loop down close to the needle, thus dispensing with a weight or tension-rollers on the fabric; it keeps the fabric from being carried forward by the needles when they are driven forward; and, by acting as a breast, it stops the yarn from being drawn back, thus assisting in shedding off the loop. The hooks are adjusted by screwing the ring C backward or forward. The cam to operate the hooks B is shaped like a pan with inclined sides, as shown in Figs. 6 and 7. One side is slightly bulged, as shown at e, to form the cam. The inclined sides of the cam fit into oblique slots b² in the hooks B, so that by moving the cam backward by means of the screw F the hooks are caused to press more lightly on the yarn, and vice versa. The swinging motion imparted to the hooks by means of the cam enables them to be raised at the time when the yarn is drawn back, so as to offer no resistance, and if brought down at the proper time they assist in shedding the loop over the end of the needle. At e¹ e¹ are slots to allow the cam E to adjust itself to the proper needles when the machine is reversed.

It will be seen by reference to the drawings that the needle-frame D, which is keyed to the spindle G at d, carries the hooks B and needles around with it when the crank is turned, and that the cam E, which is free to revolve on its bearing f on the needle-frame D, is held in position by the fork H, which is attached to the frame A of the machine. When the machine is reversed the needle-frame D carries the cam E with it until it (the cam) is stopped by the fork H at the other end of the slots e¹.

The tip-cam for operating the needles (shown in Figs. 3, 4, and 9) is formed of a piece, J, Figs. 3 and 9, screwed to the frame A' of the machine, and a strip of metal, I, with an oblique flange, i, at either end. This piece I is pivoted at i', so that it may be tipped one way

or the other to bring the flanges *i i* into operation, according as the machine is running backward or forward. It is held in position by the catches *K*, Figs. 5 and 9, which are pressed into notches *a' a'*, Fig. 2, by a spring, *k*. The cam-groove, formed by the pieces *I* and *J*, is shown in Fig. 3, partly in full and partly in dotted lines. Fig. 9 represents, in perspective, the relative position of the hooks and needles and of the tip-cam.

In the drawing the machine is shown as moving from the left to the right of the operator, as indicated by the arrow, and it also shows the point at which the needles are moved forward and backward, and at which the hooks *B* are raised. If the cam *I* be tipped and the movement of the machine reversed, the hooks will be raised at a point as far to the left of the loop through which the yarn is delivered to the needles as they now are to the right of that loop.

The ordinary latch-needles are employed; but it has not been thought necessary to represent the latches or the entire series of hooks and needles, as the construction and operation of the latter are well known in the art.

What we claim as new, and desire to secure by Letters Patent, is—

1. A series of swinging hooks alternating with the needles of a knitting-machine, and

operated successively for the purpose of keeping the fabric from being carried forward or back by the needles, and of pressing the loops down close to the needles and causing the same to be properly shed when the needles are drawn back.

2. The swinging hooks *B*, alternating with the needles in a knitting-machine, in combination with cam *E*, with inclined sides *e²*, to adjust the pressure of the hooks upon the yarn, the whole operating and constructed as shown and described.

3. The swinging hooks *B*, combined with cam *E*, provided with slots *e¹ e¹*, to enable the projection *e* to retain its position relatively to yarn-carrier in whatever direction the machine may be moving.

4. The swinging hooks *B*, in combination with the adjustable ring *C* and cam *E*, constructed as shown, and for the purposes described.

5. The tipping-cam *I*, when constructed and arranged as described and shown, and for the purposes specified.

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JOHN NELSON.

Witnesses:

SILAS A. BUELL,
JOHN M. BUELL.