

J. HOLLEN.  
KNITTING MACHINE.

No. 105,454.

Patented July 19, 1870.

Fig. 1.

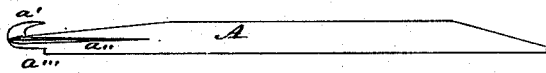


Fig. 2.

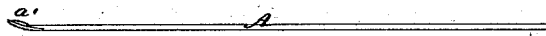


Fig. 3.

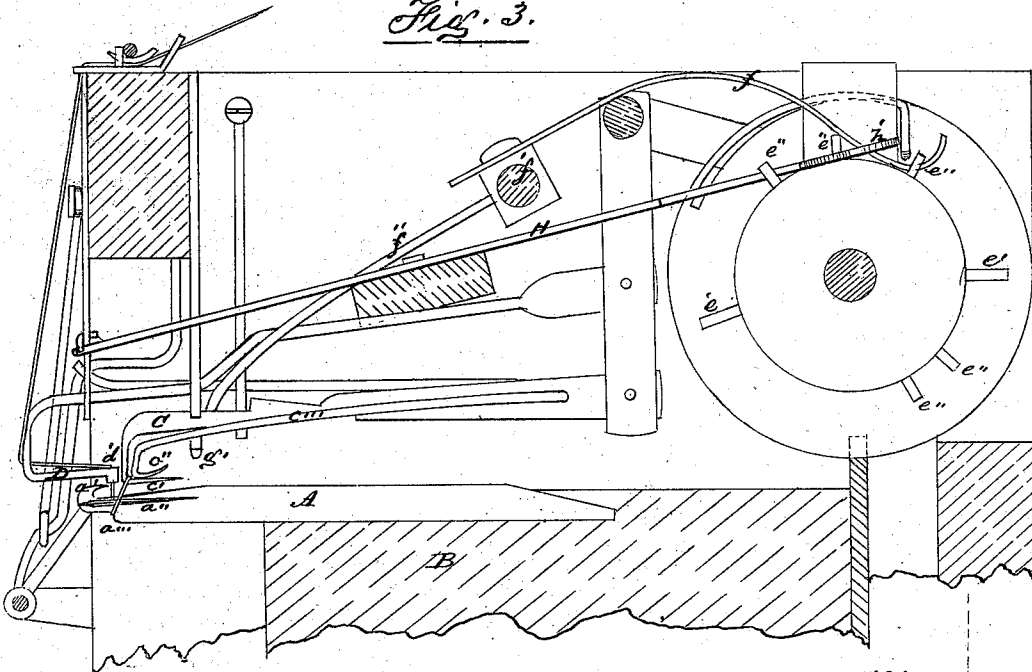


Fig. 4.

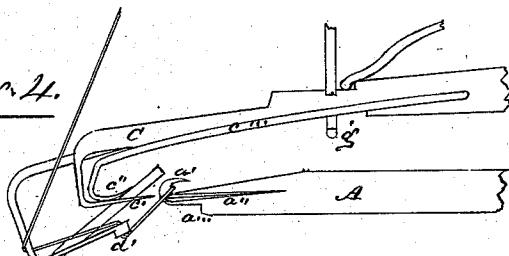
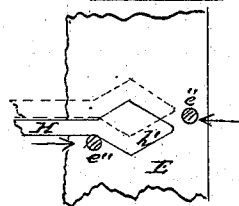


Fig. 5.



Witnesses:

John Campbell  
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Inventor:

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# United States Patent Office.

JOSEPH HOLLEN, OF FOSTORIA, PENNSYLVANIA.

Letters Patent No. 105,454, dated July 19, 1870.

## IMPROVEMENT IN KNITTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same

I, JOSEPH HOLLEN, of Fostoria, in the county of Blair and State of Pennsylvania, have invented certain Improvements in Rotary Knitting-Machines, of which the following is a specification.

### *Nature and Objects of the Invention.*

My improvements relate to that class of rotary knitting-machines in which the needles are rigidly fixed parallel with each other and with the axis of the rotary cylinder around which they are secured; and

The first part of my invention relates to the construction of the said needles. Each needle is made with a groove along in one side from the outer end of the needle backward, so that the pointed arm of the stitch-lifter will the more certainly enter the stitch on the needle; and the same side beveled to the outer edge of the hooked end of the needle, so as to cause the said arm of the lifter, on its return forward with the stitch, to slide down with more certainty on the same side of the needle; and also with a shoulder, offset, or projection, on its under-side edge, so as to more certainly keep the stitch from being drawn backward or inward too far, on the shank of the needle, by the backward or inward movement of the said lifter.

The second part of my invention relates to the construction of the stitch-lifter with a spring tongue, which will allow the stitch which is being entered by the arm of the lifter to press the spring tongue upward and slip along between it and the arm of the lifter and to the bend or angle of the latter, as the said lifter passes onward far enough to let the eye of the carrier pass across between it and the point of the needle, and so, also, that, when the lifter returns with the stitch and passes downward alongside of the hooked end of the needle, the spring tongue will rise and let the arm of the stitch-lifter withdraw from the said stitch, and immediately afterward close down again upon the arm of the lifter, which then enters the stitch on the next needle; the object of this part of my invention being to dispense with the old notch heretofore used in the lifter, and afford a more reliable and effective device for the same purpose.

The third part of my invention relates to the construction of the lever which gives the necessary vibratory motions to the thread-carrier, and consists in making its rear end in the form of a rhombus or diamond-shaped, so as to produce two opposite camms, which will cause the said end of the lever to be moved to the right and left alternately by simple studs or pins fixed in the reversible driving-cylinder of the machine, and thus produce the required vibratory motions in the thread-carrier, in a more simple and accurate manner.

### *Description of the Accompanying Drawings.*

Figure 1 is a side view of one of the needles.

Figure 2 is a view of the upper edge of the same.

Figure 3 is a sectional side elevation of the upper part of the machine, having the front side of the frame thereof removed, for the purpose of showing my invention embodied.

Figure 4 is a detached portion of some of the devices shown in fig. 3, but in different relative positions.

### *General Description.*

The needles A are each made out of a flat strip of metal, and fixed edgewise or radially around on their carrying cylinder B, parallel with each other and with the axis of the said cylinder.

The hooked end *a'* is sharpened around its outer edge or beveled on one side, so as to better allow the stitch-lifter C to pass downward on that side as it moves forward on its return with the lifted stitch; and in the same side the shank of the needle has a V-groove, *a''*; which the pointed end of the arm *c'* of the lifter C traverses, and thus is more certainly caused to enter the stitch on the needle as the said lifter is moved backward or inward for the purpose.

On the inner edge of the needle there is an offset or shoulder, *a'''*, which prevents the stitch on the needle from being drawn back too far by the lifter C as the latter moves backward or inward to let the eye *d'* of the thread-carrier D pass between it and the point *a'* of the needle A.

The stitch-lifter C has a pointed inward projecting arm, *c'*, in the usual manner, but without the notch heretofore required to draw the stitch off of the needle; and, instead of said notch, it has a curved tongue, *c''*, which is caused, by its springy arm *c'''*, to press sufficiently down upon the arm *c'* of the lifter to allow the stitch to slip, under a moderate degree of pressure, between it and the arm *c'* of the lifter C, as the said arm passes inward through the stitch, until the stitch passes the tongue *c''* and is stopped by the angle of the lifter in the further onward passage of the latter, to let the thread-carrier pass across between it and the point of the needle *a'*, (see fig. 3.) The lifter now returns forward, (see fig. 4,) carrying the stitch held thereon (not shown in the figure) by the spring tongue *c''* until, in passing downward in front of the needle, the stitch requires to be released by the withdrawal of the arm *c'*. This release is permitted by the rising of the tongue *c''*, which is effected by means of a stud, *e'*, on the driving-cylinder B, which elevates an arm, *f'*, which is fixed to a shaft, *f''*, and to which latter another arm, *f'''*, is fixed, and this latter arm is thereby caused to press downward upon the lifter C; and the spring arm *c'''* of the tongue being fixed to the latter and pressed downward upon a stop, *g'*, by the arm *f'''* pressing downward upon the lifter C, the tongue *c''* is raised sufficiently to let the arm *c'* of the lifter C be freely withdrawn from the stitch; and the stud *e'* now

passing further around, lets the arm *f* return, and, consequently, the tongue *e'* again closes down upon the arm *e*, and the latter is ready to enter the stitch in the next succeeding needle.

The necessary vibratory motions are given to the thread-carrier *D* by giving to the usual vibrating lever *H* a diamond-shaped end, *h'*, a plan view of which, applied to the driving cylinder *E*, is shown in Figure 5. It will be seen that as the cylinder *E* rotates in either direction, the series of pins or studs *e'*, arranged for the purpose, will move the head *h'* right and left alternately, and, consequently, produce the vibratory motions required in the thread-carrier *D* with which it is connected in the usual manner.

*Claims.*

I claim as my invention—

1. The needle *A*, constructed substantially as hereinbefore shown and described, for the purpose set forth.

2. The spring tongue *e'*, in combination with the arm *e* of the lifter *C*, substantially as and for the purpose hereinbefore set forth.

3. The vibrating lever *H*, constructed with the diamond-shaped end *h'*, in combination with the reversible cylinder *E*, having studs *e'* suitably arranged thereon, substantially as and for the purpose hereinbefore set forth.

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Witnesses:

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