J. Hollen.

Knitting Machine.

No. 16,
31,020.

Patented Jan. 1, 1861.

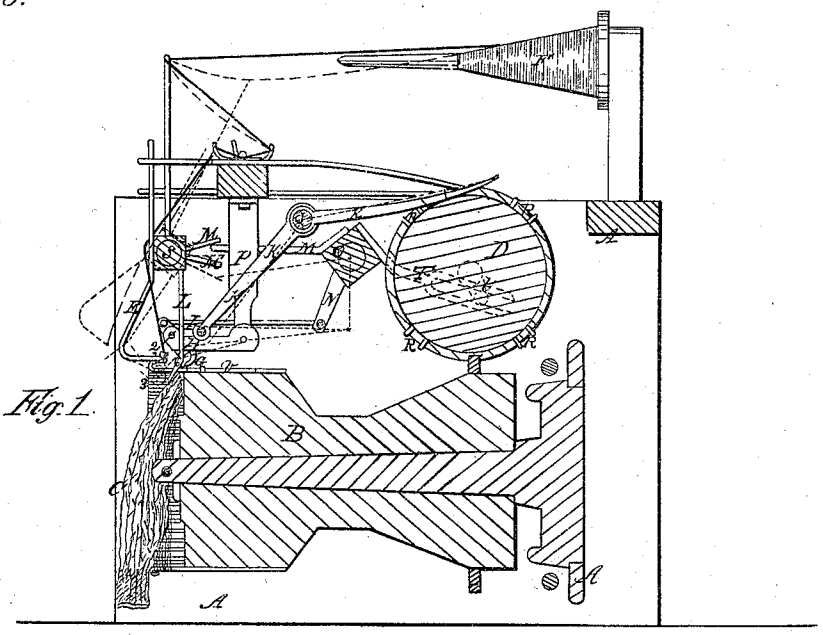


Fig. 1.

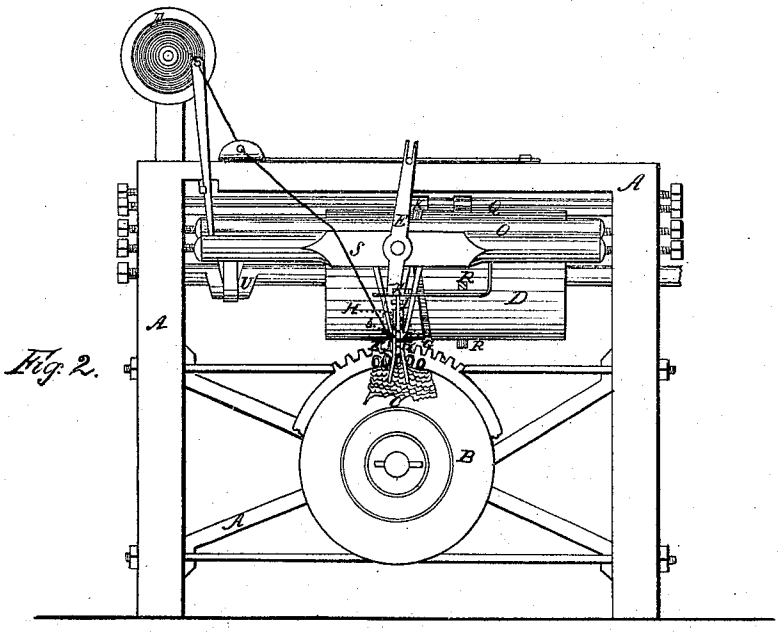
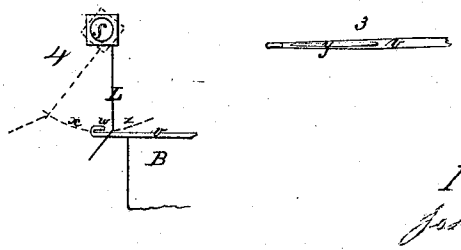


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH HOLLEN, OF FOSTORIA, PENNSYLVANIA.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **31,020**, dated January 1, 1861.

To all whom it may concern:

Be it known that I, JOSEPH HOLLEN, of Fostoria, in the county of Blair and State of Pennsylvania, have invented a new and useful Improvement in Knitting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of a rotary knitting-machine having my improvement applied thereto, and Fig. 2 a front elevation of the same.

Like letters when on the different figures indicate the same parts.

The nature of my invention consists in constructing and operating the hook which takes the stitch off of the needle that is directly beneath it, so that its point, by moving in a curve, shall enter a groove in the said needle, and beneath the stitch thereon and then rise enough to clear the hooked end of the needle its heel at this point of the hook's motion bearing upon the said needle in such a manner as to prevent its end being raised by the pull of the hook upon the stitch which is being taken off of the needle, substantially as hereinafter described, whereby the point of the hook is caused to pass under the stitch more certainly and is also more effectually prevented from striking the hooked end of the needle.

My invention also consists in the manner, hereinafter described, of producing the sinking and returning motions of the hook toward the needle-cylinder, whereby the stitch after it has been carried over the end of the needle is drawn downward and backward between the said needle which it has just passed over and the next succeeding one until the said hook has returned to about half-way, thereby releasing the stitch in a more perfect and easy manner.

My invention further consists in so constructing and operating the back-presser that it shall be caused to adapt itself to the increasing width of the needle as it returns along in contact with both sides of the same, as hereinafter described, whereby the stitch on the next needle is more certainly and effectually forced back to a proper position for the subsequent entrance beneath the same of the hook in its next forward movement.

In the drawings, A represents the supporting-frame of the machine; B, its rotating cylinder of needles; D, its driving-cylinder; E, its thread-carrier, and F its thread-bobbin, these parts being constructed and arranged to operate substantially as heretofore.

G represents the hook; H, the hook-carrier; I, the rod which gives the curved motions to the hook G; K, the lever which gives the sinking motion to the hook-carrier H and hook G; L, the back-presser, and M M M′ the arms whereby the outward and inward motions of the presser are effected.

The hook G is a lever of the first class, having its fulcrum in the outer end of the carrier H, its upper or power end being connected by the rod I to an arm N on the shaft O, whereby its curved motions are effected, and its lower end formed into a slender pointed stem, which is turned outward nearly to a right angle with the lever, so as to form the hook proper, as seen in Fig. 1.

The needles have each a groove made in their upper sides, substantially as seen at *y* in Fig. 3, and the hook G is so adjusted as to cause its point and heel during the forward-curve motion of the same to enter and traverse the groove in the needle *v*, which is immediately below it, so as to take up and carry the stitch off of the same without raising its outer end, the heel of the hook G bearing in the groove of the needle as the point of the said hook passes over the hooked end of the needle.

The hook-carrier H is an arm pivoted at its inner end to a stationary pendant P, while its outer end supports the hook G, and it is operated as a lever of the third class by means of the lower arm of the lever K, whose fulcrum is the rock-shaft Q, and whose upper arm rests by its own weight alternately upon the periphery of the driving-cylinder D on the line of the studs R R, which project radially therefrom, and upon the ends of these studs as the said cylinder D is rotated, thus producing sinking motions of the hook-carrier H, and with it the hook G, their rising motions being produced by the shoulders *b b* of the presser L catching under them on its return motion backward.

The back-presser L consists of a pair of arms which project downward in front of the outer end of the said uppermost needle *v* of the cylinder B from the rock-shaft S. These arms are fixed to the rock-shaft S in such relation to each other and the needle *v* that as they are moved together outward and inward by means of the arms M M M′, operating the said shaft S through the arm T, which is connected to the crank U on the cylinder D, they shall pass one on each side of and in contact with the sides of the said needle *v*. They are for this purpose so bent laterally as to be near enough to each other at the point where they encounter the end of the said needle *v* during their inward or backward motion to pass in lightly-touching contact along the same, and from this point their lower ends are bent apart sufficiently to give the said presser the forked character seen in Fig. 2, whereby it is adapted to pass in like contact along (with one arm on each side of) the gradually-increasing width or thickness of the said needle. The adaptation of this space between the arms of the said presser L to the tapering form of the needle keeps the forked end of the said presser during its curvilinear movement inward in such close contact with the two sides of the needle as to more effectually and certainly push back the stitch thereon without causing undue friction or binding of the same against the sides of the needle.

The operation of the presser L will be more clearly perceived by reference to the diagram Fig. 4, in which the curved dotted line *x* shows the rising motion of the forked end of the presser, whereby the wider part of its fork is raised from *w* to *h*, so as to correspond with the wider part of the needle *v* during its forward motion.

The thread-carrier E moves to the left or right, as the case may be, in laying the thread in the hook of the needle *v* in the usual manner just before the point of the hook G reaches the same, as seen in Fig. 2, and immediately as the hook G passes over the end of the said needle, as indicated by the blue line 2 in Fig. 1, the needle-cylinder B rotates, and thus allows the said hook to return between it and the next succeeding needle, as indicated by the blue line 3, and in this manner the whole of the described devices work together in knitting the thread of the bobbin F into the fabric C.

It will be perceived that the construction and mode of operation of the hook G and presser H, as described, will cause these parts of a knitting-machine to run lighter and smoother, to be more easily understood and kept in order by unskillful operators, and that the machine will be more simple and less costly of production than heretofore.

Having thus fully described my improved machine and shown its utility, what I claim as new therein of my invention, and desire to secure by Letters Patent, is—

1. The hook G, when the same is constructed and arranged to operate in taking up the stitch and carrying it over the end of the needle V substantially in the curved manner described.

2. Giving the said hook G the sinking and curved returning motions described for carrying down and discharging the stitch by means of the hook-carrier H, operated by the lever K, and the rod I, operated by the lever-arm N, substantially in the manner described.

3. Making the lower end of the presser L in the forked form described and causing the said fork to move in a curve along the two sides of the needle V, as described, and for the purpose specified.

JOSEPH HOLLEN.

Witnesses:
JOHN CAMPBELL,
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