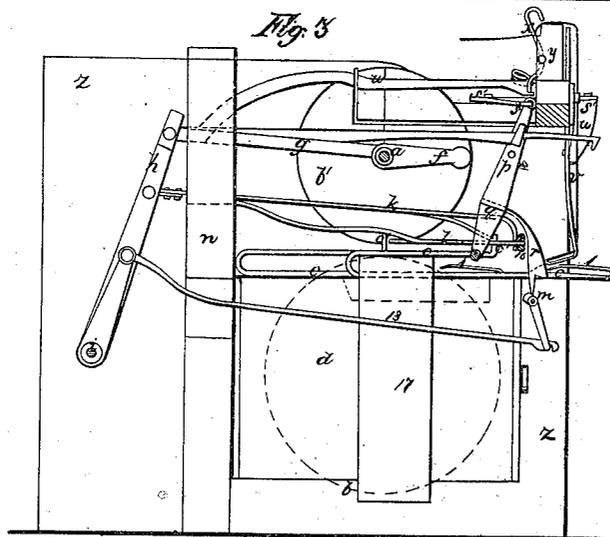
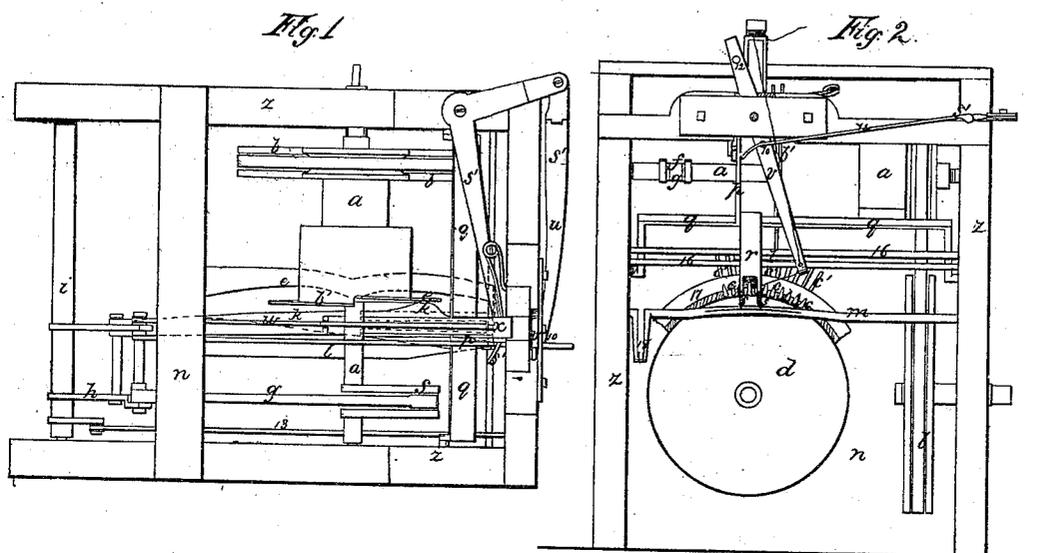


J. HOLLEN.  
KNITTING MACHINE.

No. 7.509.

Patented July 16, 1850.



# UNITED STATES PATENT OFFICE.

JOSEPH HOLLEN, OF WHITE TOWNSHIP, CAMBRIA COUNTY, PENNSYLVANIA.

## KNITTING-MACHINE.

Specification forming part of Letters Patent No. 7,509, dated July 16, 1850; Reissued April 10, 1866, No. 2,225.

*To all whom it may concern:*

Be it known that I, JOSEPH HOLLEN, of White township, in the county of Cambria and State of Pennsylvania, have invented an Improved Knitting-Machine, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, of which—

Figure 1 is a top plan; Fig. 2 a front elevation; Fig. 3 a side view with the side frame removed; Fig. 4 a separate view of the needle; Fig. 5 is a separate view of the slide (*l*) and bar (*l'*).

The advantages possessed by my improved knitting machine over those which have hitherto been used, consist in its greater simplicity, in its ability to do work finer with coarser and stronger needles, its small liability to get out of order, its easy management, its regular and uniform motions, and its small cost, and greater durability.

There is a main crank shaft (*a*) placed across the machine, and having proper bearings in the frame thereof; its location is above the needles, to be hereafter described, and at right angles to them; this shaft receives its motion from a driving wheel (*b*) which is turned by any power, and communicates its motion through a band and pulley or otherwise, to the shaft, through which the power is transmitted to all other parts of the machine. On the shaft (*a*) there is an inclined disk, formed like the single turn of a screw thread, which serves to move the needles laterally in a manner about to be described. The needles (*c*) are made of precisely the same form as those used in ordinary stocking looms; but instead of fastening their shanks to permanent bars, they are extended back for some distance, and then turned over into a long loop, the extreme end of which (*c'*) is turned upward directly under the center of shaft (*a*) (a separate view of this needle is shown in Fig. 4); the needles thus formed are ranged parallel with each other, either in a straight line, or around a cylinder; this latter plan I have adopted in my drawing and description; the other will be perfectly obvious to any competent machinist. The cylinder (*d*), for holding the needles, is placed at right angles

to, and directly below shaft (*a*); on the surface of this cylinder the needles are arranged in a parallel row, and are properly confined with the projection (*c'*) standing out radially from the cylinder, directly under the shaft (*a*) forming a series of teeth, into which the thread of screw (*b'*), above named, works, to turn cylinder (*d*), moving it the breadth of a needle at each revolution, which completes a single stitch. The crank (*f*) on shaft (*a*) is connected by a pitman (*g*) with an arm (*h*) on a shaft (*i*); to this same arm there is a connecting rod that extends forward to the vertical arm (*p*) of a rock shaft (*q*) with which it is connected by a long slot or notch, so as to act on the shaft during a portion of its motion, and there leave it in a state of rest, thus alternating it back and forth, and leaving it at the end of each motion, where it is held by a spring in either position; to this rock shaft (*q*) a jack (*r*) projects forward over the end of the cylinder (*d*) and to this two sinkers (*s*) are permanently attached; and it will be perceived that they can be placed at any convenient distance apart, as they have only one needle to act on at a time, which is thrust forward from the line for that purpose between said sinkers, while the stitch is being formed; the space between the sinkers is occupied by the presser, by which the point of the needle is brought down to pass under the stitch; the considerable space between the sinkers admits great latitude in the position of the needle, and avoids accidents when a needle becomes bent, or does not run true. To thrust the needles forward and return them to their places, I employ a forked lever (*k*), one prong of the fork of which is behind the projection (*c'*) on the needle, and forces it forward; the other is in front, and on the return of the lever draws the needle back; this lever is moved back and forth by lever (*h*), and is guided so as to take forward the proper needle by an oblong opening in a plate (*l*), which is jointed to a bar (*n*) in the frame, behind the shaft (*a*), and is moved laterally into position by the cam (*e*), so as to take up each succeeding needle as the cylinder revolves. The cylinder and needles having a constant motion given to them by the worm cam (*e*) it is necessary for the bar (*k*) to move with them and shift suddenly at the end of the stroke of one needle, so as to throw forward the next.

This is done by the cam (*e*) acting between two projections one on the bar (*k*) at (*k'*) and the other on the bar (*l'*) attached to the slide (*l*) at its end. Thus the slide (*l*) moves with the needles till a turn of the cam is completed, and then suddenly shifts back to cause the bar (*k*) to take forward another needle, (see Fig. 5).

The thread-bearer (*v*) is a vertical arm vibrating in front of the jack, with its lower end bent inward, so as to pass under the sinkers; this thread-bearer has a considerable range of action to compensate for any irregularities, and is moved by a bent lever (*s'*) connected by one arm with the arm (*p*) of the rock shaft (*q*), and having its other arm coupled with (*v*) by a connecting rod (*w*) either above or below its fulcrum, according to the direction it is desired to move the thread bearer in. A rod (*w*), also jointed to the lever (*h*) when projected forward strikes the tail of a small spring-vice (*x*) through which the thread is passed, and releases the thread; allowing a sufficient quantity to pass for each stitch, and by closing when the rod (*w*) is withdrawn, prevents more thread from passing. (*y*) is the center in which the jaw of the vice (*x*) works. (*z*) is the frame of the machine. (*m*) is a bent bar which is worked by the rod (*13*) which is jointed to the lever (*p*), and serves to hold the stocking to the cylinder, while the needle is thrown forward and draw the cloth down at the proper time to pull the loop off the end of the needle. The wires (*16*) form a guide for the ends of the pieces (*l*) to rest on. There is a depression in the cylinder (*d*) under the piece of leather (*17*) that holds the needles in place, which allows of the needles being taken out for cleaning, repairing, &c.

The operation is as follows: Supposing a part of a stocking completed, and the last stitches remaining on the needles, and the thread leading from a bobbin through the vice (*x*) down the thread-bearer (*v*), and through the holes in its lower end to the stitch last formed, as shown by a red line Fig. 2. Upon giving motion to the machine, one of the needles is projected forward, leaving its last stitch on the shank beyond the point of the needle, at the same time the thread is laid across it by the thread bearer (*v*); the jack (*r*) then moves downward, and presses or sinks the thread down on the needle, and the needle being then withdrawn, the thread passes into the loop of the needle (*1*), and after this the point comes in con-

tact with the presser between the sinkers, and is bent downward till it enters the groove, and then passes through the stitch previously formed, carrying the thread with it. As the thread is laid over the needle the vice opens, and lets pass a sufficient quantity to make the stitch. The following revolution causes the next needle to be presented, and the stitches are then formed in succession. To knit back in the opposite direction the motion of the machine is reversed, and the pin (*10*) is changed to the hole (*12*).

This form of knitting machine can be adapted to any variety of plain knitting work, and by continuing the needles entirely around the cylinder, a piece of work may be made without a seam. By the projection of the needles, one at a time, and dispensing with the sinkers used in other machines, closer knitting can be done with an equal sized thread; and the extreme nicety in the fitting of the several parts required for fine work in other machines, is not required in this; and the working parts can therefore be made stouter and more durable, and consequently are less liable to get out of repair.

Having thus fully described my improved knitting machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The projecting and withdrawing the needles separately and singly, with their arrangement as described, by which I am enabled to knit closer work with stouter needles, substantially as described; and secondly in combination therewith.

2. I claim the combination of the jack, the sinkers and depressers, substantially as described.

3. I claim the thread-bearer (*v*), having an extended sidewise motion to and fro, at each stitch, by which it lays the thread across the needle at each stitch, and returns with it to be ready for the next stitch.

4. I claim the spring vice for regulating the supply of thread to the needle opened by the rod (*w*) substantially as described.

5. I claim the particular arrangement and combination of the several parts of the machine, by which their various motions are derived from a single crank and screw thread substantially as described.

JOSEPH HOLLEN.

Witnesses:

EDWARD EVERETT,  
WM. GREENOUGH.