

B. Arnold. Darning Mach.

N^o 86,121.

Patented Jan. 26, 1869.

Fig. 8.

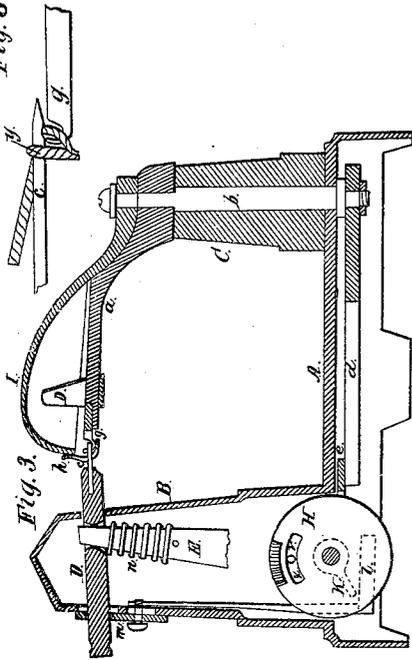


Fig. 3.

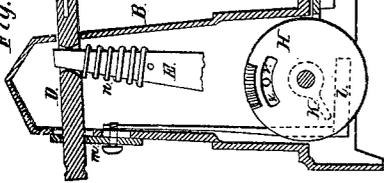


Fig. 1.

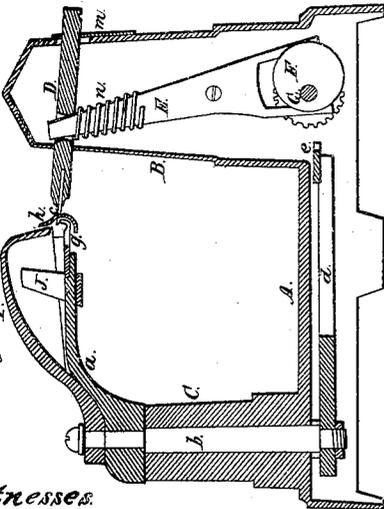


Fig. 5.

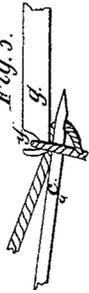


Fig. 4.

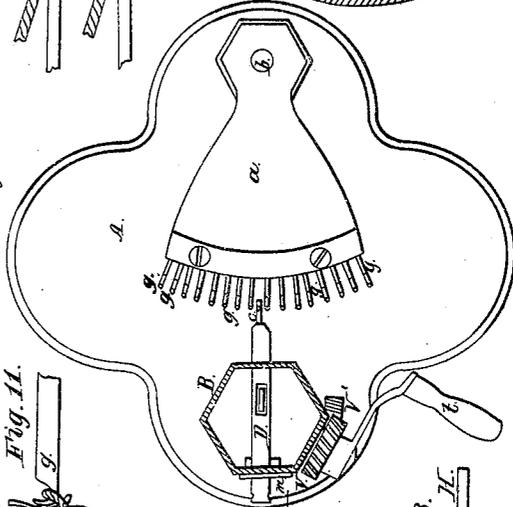


Fig. 10.

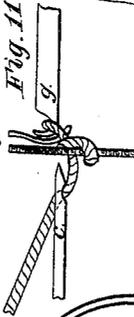


Fig. 9.



Fig. 12.

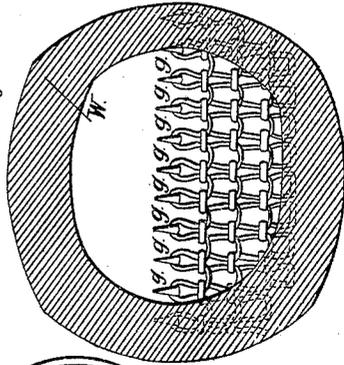


Fig. 2.

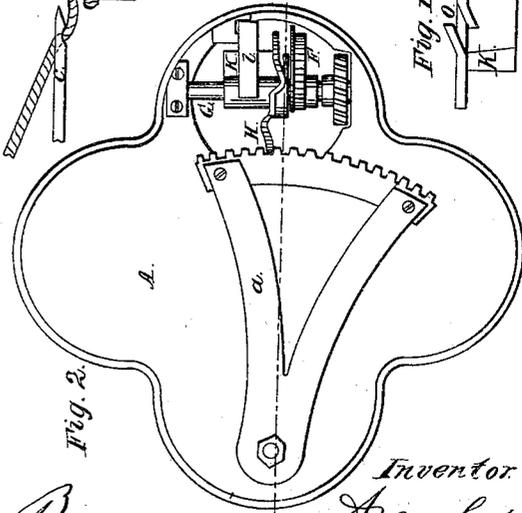
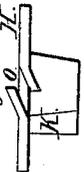


Fig. 13.



Witnesses
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BENJAMIN ARNOLD, OF EAST GREENWICH, RHODE ISLAND.

IMPROVEMENT IN MACHINE FOR MENDING STOCKINGS.

Specification forming part of Letters Patent No. **86,121**, dated January 26, 1869.

To all whom it may concern:

Be it known that I, BENJAMIN ARNOLD, of East Greenwich, in the county of Kent and State of Rhode Island, have invented a new and useful Machine for Mending Stockings and other Fabrics; and I do hereby declare the following to be a full and correct description of the construction and operation thereof, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon, the same letters denoting similar parts in all the figures.

Figure 1 is a section taken down through the machine in the direction of the red line in Fig. 2. Fig. 2 shows the under side of the machine. Fig. 3 is a section taken through in the same manner as Fig. 1, but showing the other half of the machine. Fig. 4 is a top view with the part I removed. Figs. 5, 6, 7, 8, 9, and 10 show the different positions of the needle and hooks while making the loops. Fig. 11 shows how the loops pass through and bind the fabric being mended. Fig. 12 shows the position of the article on the hooks during the process of mending.

The construction is as follows: A is a platform, with an upright case, B, at one side, which contains a part of the machinery, and a standard, C, at the opposite side, holding the swinging arm *a*.

A sliding needle-bar, D, is placed in openings near the top of the case B, having a needle, *c*, in one end, very much like the needles used in most sewing-machines, having an eye near the point.

A lever, E, is pivoted to one side of the case B, its lower end being forked and extending down each side of the eccentric F, which moves it, and its upper end being inserted into a slot in the bar D.

A shaft, G, is placed across the bottom of the case B, on which are the eccentric F and feed-cam H.

The standard C has an upright shaft, *b*, passing up through its center, with the arm *a* fastened to its upper end, and the arm *d*, holding the curved rack *e*, fastened to its lower end under the platform, by which the shaft is moved.

The arm *a* has a row of hooks, *g g g*, ar-

ranged in an arc on the end toward the needle-bar, and over which is placed a cap or hood, I, to hold the stocking in position, a slotted guard-plate, *h*, fastened on the hood, coming down over the hooks *g* to keep the stocking from catching on them.

The hood I is fastened on the arm by a pivot, so as to allow it a short vibratory motion, but is held in place, so as to keep the slots in the guard-plate in front of the hooks, when not pushed one side as the needle passes around the hooks, by the spring J.

The needle-bar D has a backward-and-forward motion given to it by the eccentric F through lever E. It also has a short tilting motion over the front edge of the case B, the back opening in the case being cut down low enough to allow the back end of the bar to be depressed, so as to raise the front end with the needle. This motion is given by the projection K on cam H striking on the arm *l*, which is attached to the plate *m*, through which the bar D passes. The spring *n* throws the bar up after being pulled down.

The hooks *g g* are moved sidewise, so as to bring them in proper succession before the needle *c* by means of the cam H, in one side of which is a notch, *o*, (see Figs. 3 and 13,) the edge of this cam working in teeth on rack *e*. (See Fig. 2.) Whenever the notch *o* passes the rack it takes one tooth to the right or left, according to which direction the cam is turning. The other curves in the cam *h* (shown in Fig. 2) give the vibrating motion to the hooks *g* necessary to allow the needle to pass around them.

The cam H is loose on its shaft, and is turned by a pin, *r*, in the eccentric F, which enters into the slot X in the cam, the object of the slot being to allow the cam H to fall back a certain distance around the shaft, so as to bring its motions in proper order with regard to the eccentric when the motion of the shaft is reversed.

The operation is as follows: The stocking is drawn over the arm *a*, hood I, and standard C, so as to bring the hole to be mended just above the row of hooks *g g*, and the yarn threaded down through the eye of the needle, when, motion being given to the shaft by means of the crank *t* and gear-wheels V V',

the eccentric F will throw the needle-bar D forward by lever E and push the needle in under the hook in front of it, as in Fig. 5. Then the cam H, by the first part of its crook, (shown in Fig. 2,) moves the hooks one side by pushing the rack *e*, so as to bring the space between the hook over the needle, when the projection K on cam H, coming in contact with the arm *l*, pushes it down and depresses the back end of bar D, thereby raising the needle, as seen in Figs. 6 and 7. By this time the second part of the crook in cam H has moved the hooks back under the needle, and the straight place in the cam holds them in position, while the eccentric draws the needle back a little, so that in passing over the hook the yarn shall be caught on the under side of the needle upon the hook, (see Fig. 8;) and as the cam H moves the hooks still farther the projection K will have passed the arm *l*, and the spring *n* raising the back end of bar D, the needle will descend on the other side of the hook, as in Fig. 9, and, at the same time drawing back, will be as seen in Fig. 10.

In making the first row of loops, there being no loops on the hooks to cast off, the needle simply passes through the stocking, along the lower edge of the hole, and leaves a loop on each hook; but in all the succeeding rows the loop *y* on the hook is taken off by the lifting and drawing back of the needle. (See Figs. 5 to 10.)

Fig. 11 shows how the loops are knit through the sides *w* of the hole, so that the piece knit in to fill the hole is firmly fastened to the edge, all around the sides of it, the last row at the top being fastened by drawing one through another, or by drawing the end of the yarn through them.

Fig. 12 shows a hole partly mended, the work being drawn down as each succeeding row is knit, and when a row is knit across, the motion of the crank is reversed and another row is knit going back. When the hole to be mended is small, but few turns of the crank each way will be necessary, and as many stitches may be taken into the stocking, at the sides of the hole, as may be deemed necessary to secure the work well, as each time the needle draws out of the stocking and re-enters, it leaves a loop in front, binding the stocking to the work knit underneath.

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

1. The row of hooks *g g g g*, in combination with the guard-plate *h*, substantially as described, and for the purpose specified.

2. The arm *d* and rack *e*, in combination with the arm *a* and shaft G, substantially as and for the purpose specified.

3. The combination of the needle-bar D with the arm *l* and plate *m*, substantially as described, and for the purpose herein set forth.

4. The combination of the cam H and eccentric F, having a slip-motion between them, substantially as and for the purpose specified.

5. The hooks *g g g* and guard-plate *h*, in combination with the needle *c*, constructed and operating substantially as described, to mend a stocking or other fabric by knitting in a piece, as set forth.

BENJAMIN ARNOLD.

Witnesses:

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