2 Sheets—Sheet 1.

B. ARNOLD.

MACHINE FOR MENDING STOCKINGS.

No. 93,394. Patented Aug. 10, 1869.

Fig. 1.

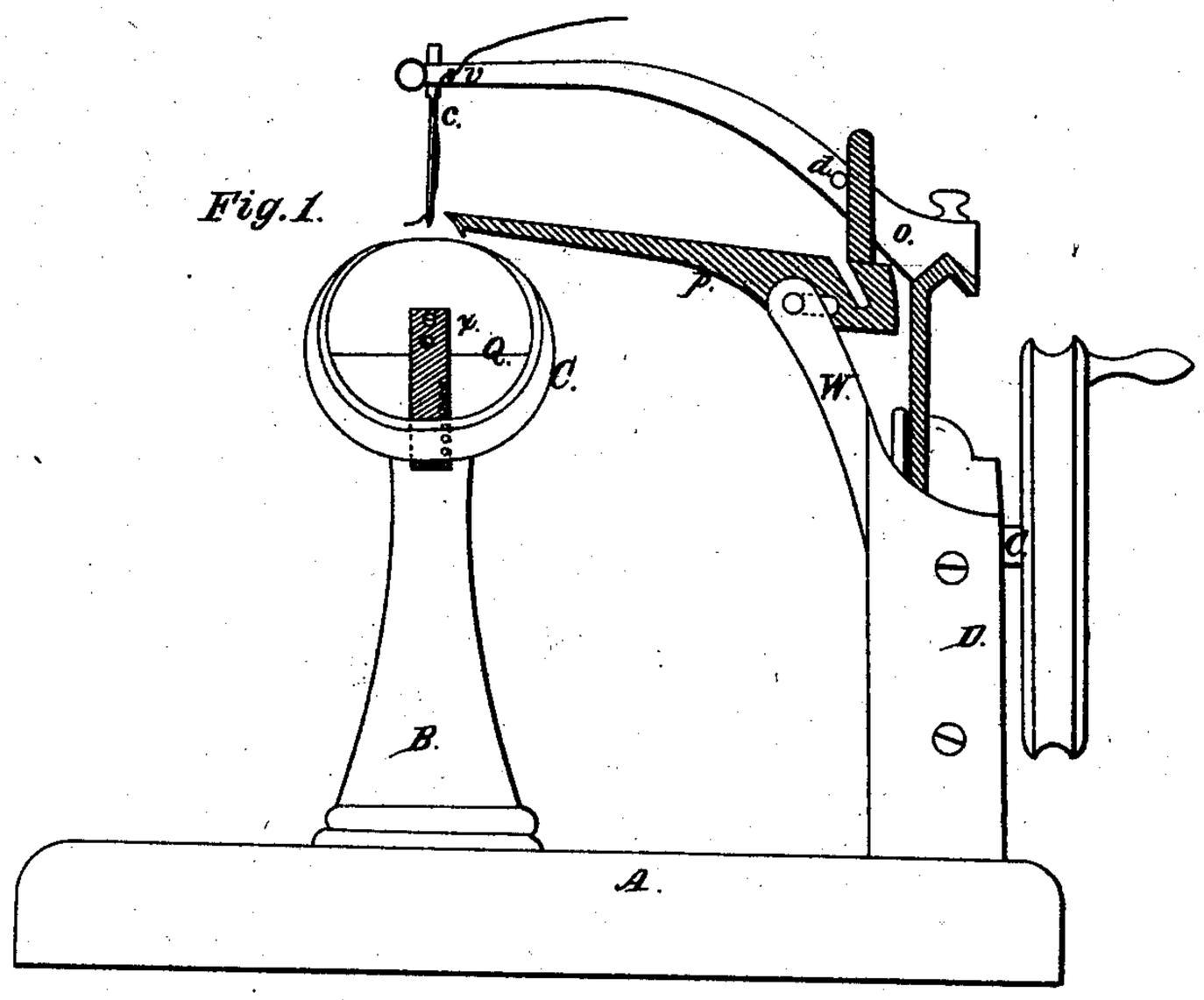
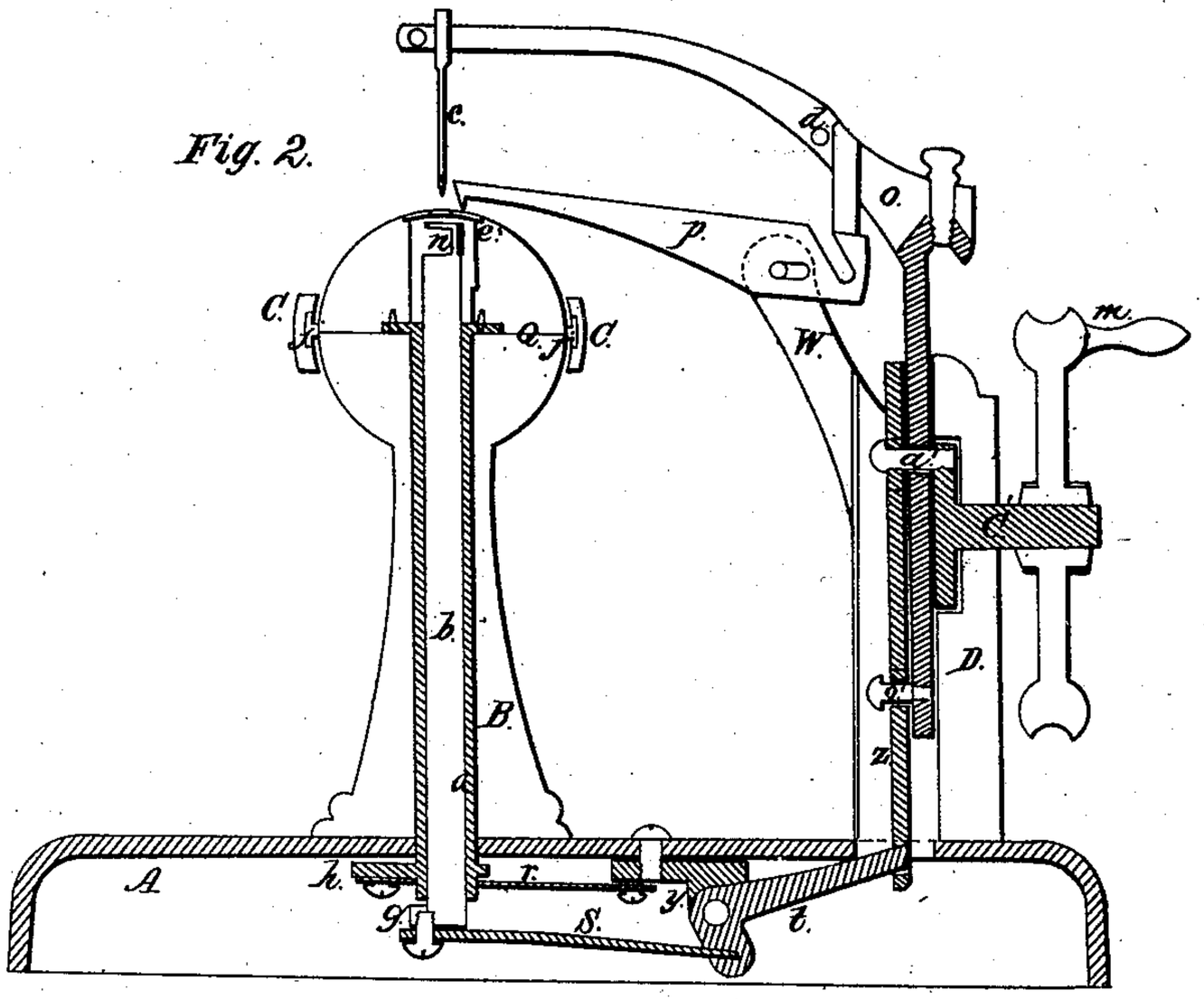


Fig. 2.



Witnesses.

Frank H. Arnold

Horace M. Foster

Inventor.

Benjamin Arnold.

2 Sheets—Sheet 2.

B. ARNOLD.

MACHINE FOR MENDING STOCKINGS.

No. 93,394. Patented Aug. 10, 1869.

Fig. 3.

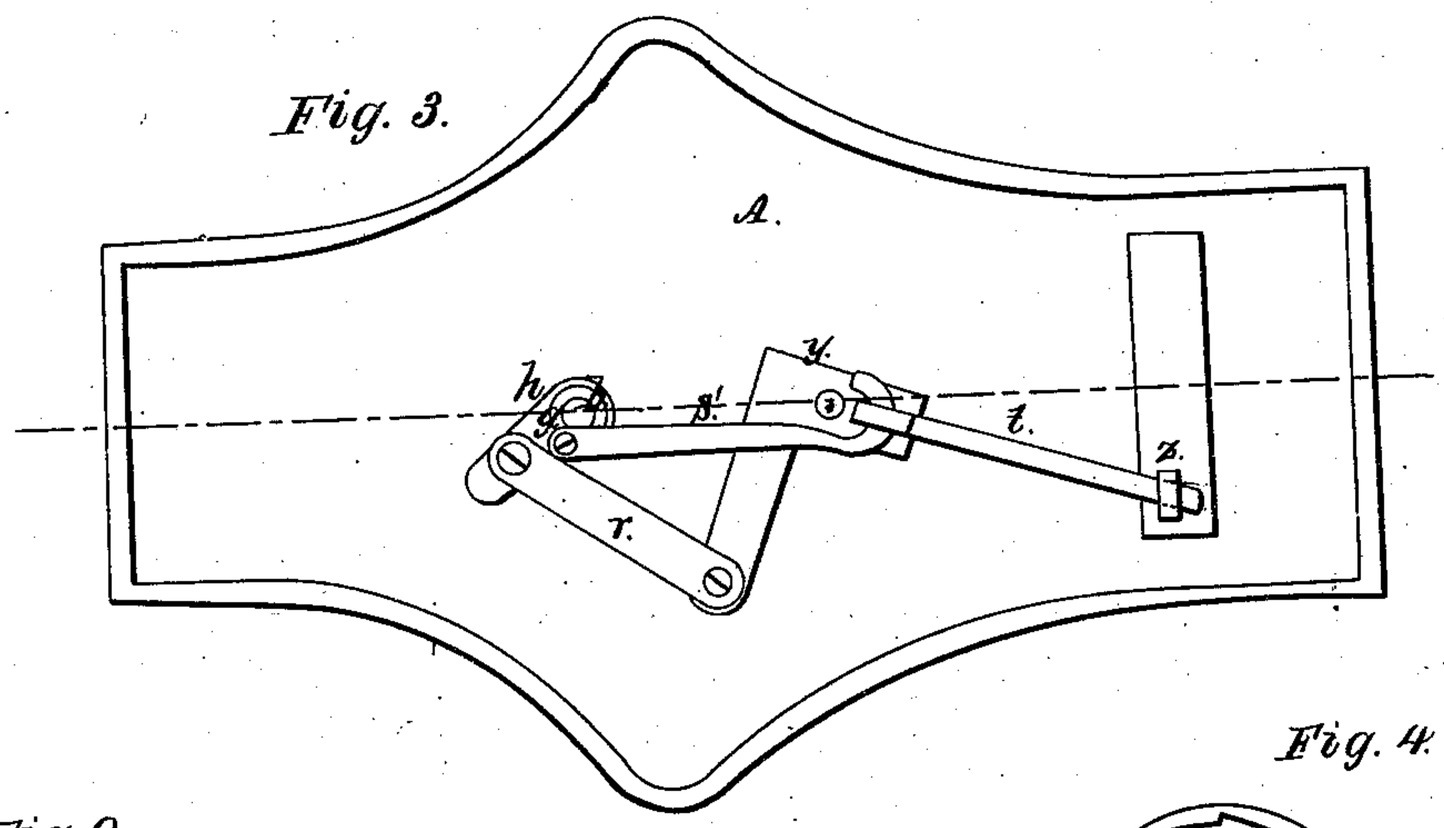


Fig. 4.

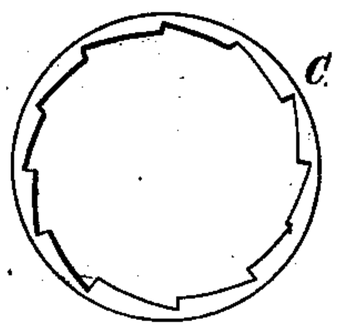


Fig. 9.

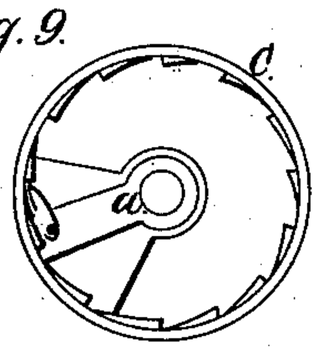


Fig. 7.

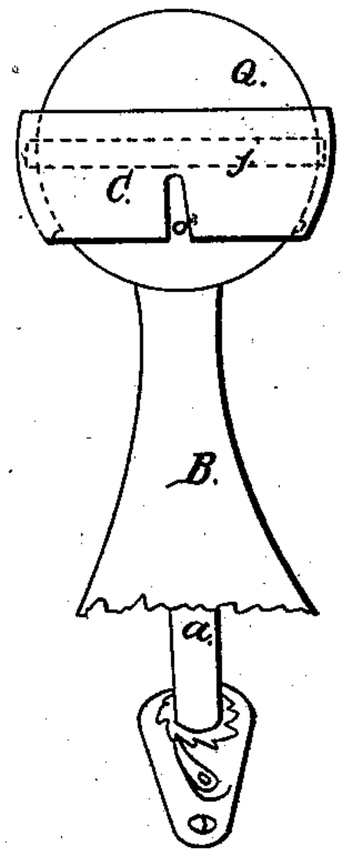


Fig. 5.

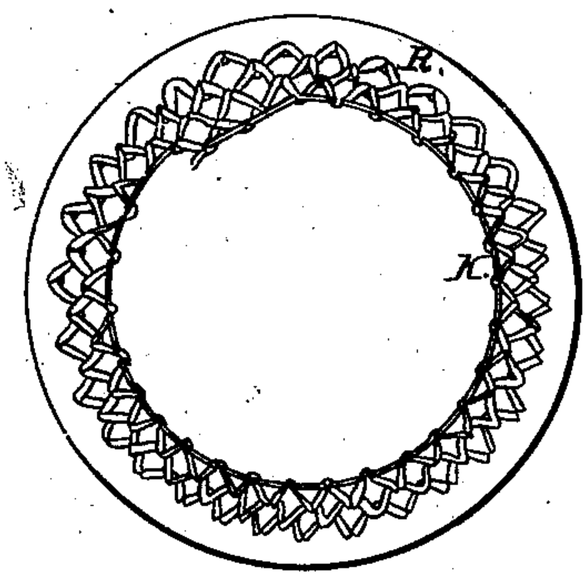


Fig. 8.

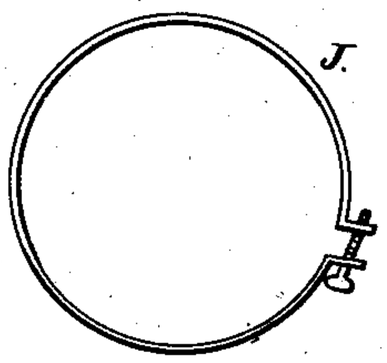


Fig. 6.

Witnesses.

Frank H Arnold

Horace N Foster

Inventor.

Benjamin Arnold

UNITED STATES PATENT OFFICE.

BENJAMIN ARNOLD, OF EAST GREENWICH, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR MENDING STOCKINGS.

Specification forming part of Letters Patent No. **93,394**, dated August 10, 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 certain new and useful Improvements in Machines for Mending Stockings and other Fabrics; and I do hereby declare the following to be a full and correct description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters and numbers of reference marked thereon, similar letters and numbers being used in all the figures to denote the same part.

In these drawings, Figure 1 is a side elevation of the machine. Fig. 2 shows a vertical longitudinal section taken in the direction of the red line, Fig. 3. Fig. 3 is a view taken from the under side of the machine. Fig. 4 shows the under side of band C. Fig. 5 shows how the rows of stitches are joined together. Fig. 6 is a top view of the looper. Fig. 8 is a ring for holding the work. Figs. 7 and 9 show other forms of some of the parts.

The nature of my invention consists in mending or filling up a hole in a stocking or other fabric by making a row or successive rows of stitches around the opening, filling the space to the center, and joining these rows together, so as to form a piece of webbing, filling the opening, and attaching to the fabric by the first row of stitches, which are taken in the border or edge of the fabric around the opening.

The construction is as follows: A is a table or platform, to which is secured the standard D, that holds the driving-shaft C′. On the inner end of this shaft is put a crank, *a′*, or its equivalent, which gives motion to a sliding arm, O, which moves up and down in slides on the standard D, and which has its outer end fitted to hold an ordinary sewing-machine needle, *c*, with the eye near the point. Another standard, B, is placed on the platform, under the outer end of the arm O, and holds a spherical block, Q, on its upper end. This block is divided near its middle horizontally, so that the upper half may move on the lower half, a tube, *a*, attached to the upper half, extending down through the standard B, serving to hold it in place and to move it. A rod, *b*, is put in the center of this tube *a*, and has on its upper end a looper to catch the thread or yarn in the needle *c*, and an arm, *g*, is fastened to the lower end of the rod to move it by. Another arm, *h*, is fastened to the lower end of the tube *a*. (See Fig. 3.)

j is a ring attached by two pivots to the lower part of the block, so as to swing freely from a horizontal to a nearly perpendicular position. On the outside of this ring is a band, C, in which an annular recess is made to hold the ring *j*. The band moves around the block and holds the article to be worked upon. It is moved in a circular direction on the ring by the plate *x*, attached to the upper part of the block, the edge of the plate catching like a pawl in the notches on the lower edge of the band C. (See Fig. 4.) The band is moved from an inclined position to a horizontal one gradually by means of notches in the edge of the plate *x*, (or a separate plate may be used,) in which the lower edge of the band runs, and this edge being formed in a sort of spiral shape, gains one notch at each revolution of the band *x*, so that as it revolves it gradually approaches a horizontal position.

The parts that give motion to the looper and feeding mechanism are the knee-lever *t*, with its connecting-bar S, which has one end pivoted to the arm on the lower end of the looper-rod, and the crooked lever *y*, in which the lever *t* is hung, and by which it is moved. Lever *y* is connected by the bar *r* to the arm on the tube *a*. All these parts derive their motion from a plate, *z*, hung on a pivot, *o′*, in the face of the arm O, and having the crank-pin *a′* projecting through a slot therein, which gives the plate *z* a sidewise motion, which, combined with the motion up and down, given to it by the arm O, produces a circular motion at its lower end, which is communicated to the long arm of the lever *t*, which projects through a hole in the lower end of plate *z*.

In the standard *w* a lever, *p*, is hung, having a hook on the end of it, which comes close by the needle when it is down. A slot in the lever, where it is pivoted, allows it to move forward and back, motion being given to it by the pin *d* in the arm O.

Fig. 5 shows how the rows of stitches are joined together. As the work is fed around, the stitch in a former row—that is, nearest to the needle—is drawn out and held in position for the needle to pass through it by the hook *p*.

Fig. 9 shows another way of feeding the band C around by having a ratchet made on its in-

side and an arm with a pawl to work in the ratchet on tube *a*, the arm to work in a recess cut out between the two parts of the block.

Fig. 7 shows a way of feeding the work to the needle without turning it around, but by giving it an undulatory motion, the ring *j* in this case being hung on the upper part of the block, which is moved clear around by an arm and ratchet, and carrying the ring with it, obliging the band C, which in this case cannot turn, to make an undulating or waving motion, which brings all sides of the opening in succession to the needle.

The operation is as follows: The stocking or article to be worked on is drawn on over the top of the block Q, where it is secured to the band C by the ring *j*. The plate *x* is then depressed and the band C tipped up until the needle, when it comes down, will enter the edge of the fabric near the hole to be filled. The thread or yarn is threaded through the guide *v* and down through the eye of the needle *c*. Motion being given to the wheel *m*, the crank-pin *a'* will move the arm O down and push the needle through the fabric near the edge of the hole, and as the needle rises the looper *n* turns around and enters between the thread and the needle, compressing the spring *e'*, which, when the needle rises farther, springs out and holds the loop ready for the needle to enter when it comes down again. Then it enters between the spring *e'* and looper-point. The looper turns back and leaves the loop on the needle, and is ready to turn and catch the thread when the needle rises, as before. This forms a row of chain-stitches, the band, with the article on it, being fed around by the plate *x*, moved by the arm *h*, connection, and lever *y*, and gradually raised to a horizontal position by the action of the spiral edge of the band C in the notches in the plate *x*. When the arm O has nearly reached its lowest position the pin *d* will raise the front end of the lever *p* by depressing its rear end, and push it forward by the diagonal slot at the same time; but when the arm O rises it will depress the hooked end of the lever *p* by raising the back end, and then draw it back by the diagonal slot. The hook catching a stitch in the previous row will draw it under the needle *c*, so that the needle will enter it when it comes down, and thus make it stitch through it and connect the rows together and form one piece. The outside row being taken in the edge of the fabric will join the whole together. When the needle is down the plate *x* is moved back so as to catch in a notch in the edge of the band C, and when the needle is up clear of the work the plate *x* is moved back again and carries the band C and work with it. This gives the feed for the stitches; but the feed for rows is accomplished by a notch in edge of the band C, the sides of the notch being one bent out and the other bent in, so as to take one notch higher in the side of the plate *x* at each revolution of the band, thus gradually raising it to a horizontal position.

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

1. The band C, in combination with the block Q and plate *x*, or its equivalent, substantially as described, and for the purpose set forth.

2. The hook, *p* or its equivalent, operating to catch a stitch in a row of stitches previously made and spread and hold it so that the needle shall pass through it, substantially as described, and for the purpose set forth.

3. The combination of mechanism for producing a rotary feed motion to form a row of stitches with mechanism for producing a vertical feed motion, substantially as and for the purpose set forth.

4. Mending or filling up a hole in a stocking or other fabric by making successive rows of chain-stitches around the opening, the outer row being taken in the edge of the fabric, and the rows joined together, substantially as herein set forth.

BENJAMIN ARNOLD.

Witnesses:

FRANK H. ARNOLD,

HORACE N. FOSTER.