

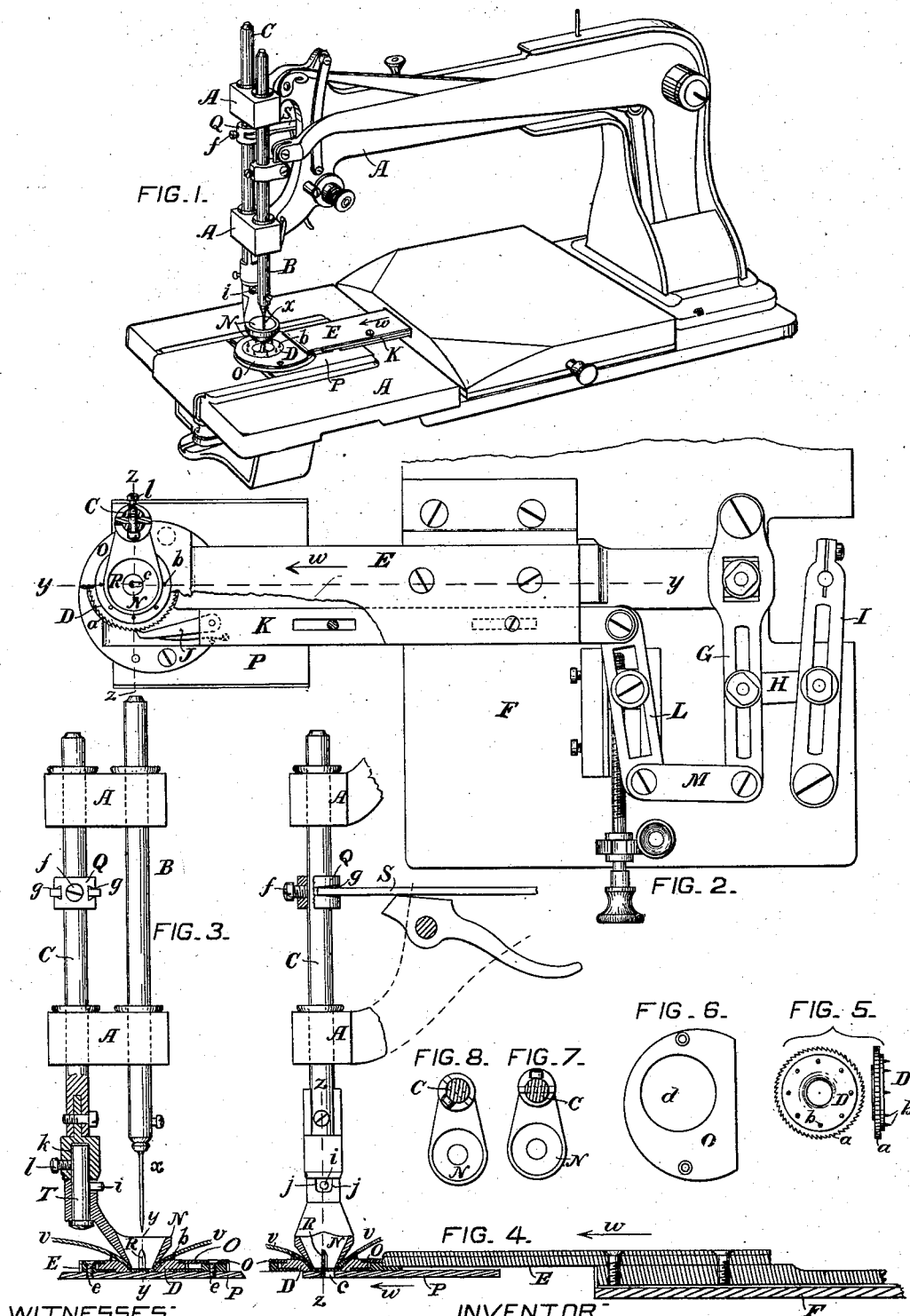
(No Model.)

H. L. PHELPS.

EYELET HOLE ATTACHMENT FOR SEWING MACHINES.

No. 261,563.

Patented July 25, 1882.



WITNESSES:

John R. Rapperty
James T. Goodfellow.

INVENTOR:

Herbert L. Phelps.
by Austin F. Park,
attorney.

UNITED STATES PATENT OFFICE.

HERBERT L. PHELPS, OF NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO THE NATIONAL MACHINE COMPANY, OF TROY, N. Y.

EYELET-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 261,563, dated July 25, 1882.

Application filed April 6, 1880. (No model.)

To all whom it may concern:

Be it known that I, HERBERT L. PHELPS, of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Eyelet-Hole Attachments for Sewing Machines, of which the following is a specification.

My invention relates to eyelet-stitching attachments for sewing-machines in which the needle reciprocates in one vertical plane, and in which attachments the fabric having the eyelet-hole therein is presented to the needle and stitch-forming devices of the sewing machine by a feed-ring which reciprocates horizontally, and thereby moves the fabric to and fro to cause the formation of the over-edge stitches, and also rotates intermittingly, and thereby turns the fabric step by step to cause the spacing of the over-edge stitches around the eyelet-hole.

The principal objects of my improvements are to provide means for centering, holding, and keeping the eyelet-hole work in accurate engagement with the feed-ring during its to-and-fro movements and step-by-step rotary motion while the work is being subjected to the puncturing and pulling action of the sewing devices and threads in the operation of binding the eyelet-hole with the series of over-edge stitches; for retaining the feed-ring in proper position and engagement with its driving devices while applying the eyelet-hole work to and disengaging it from the feed-ring, and for adjusting the position of a ring-like vibrative presser, and limiting the movements of the same in relation to the reciprocating feed-ring. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of one of my improved eyelet-stitching attachments applied to and combined with a sewing-machine. Fig. 2 is a plan on a larger scale of the same attachment, some parts being broken away. Fig. 3 is a vertical section of the same at the line *z z* in Figs. 2 and 4, and elevation of the presser-bar and needle-bar of the sewing-machine. Fig. 4 is a vertical section of a portion of the same attachment at the line *y y* in Figs. 2 and 3, and elevation and partial section of some parts of the sewing-machine. Fig. 5 rep-

resents the feed-ring detached in plan and end views. Fig. 6 is a plan of a detached part of the same attachment, and Figs. 7 and 8 are plans of the vibrative ring-like presser adjusted with its center at different distances from the axis of the presser-bar.

Like letters refer to similar parts in the different figures.

A is the bracket-arm, B the needle-bar, and C the presser-bar, of a sewing-machine heretofore in use.

D is the feed-ring, having a ratchet-toothed rim, *a*, and projecting teeth or points *b* to engage with the button-hole work, and journaled to revolve in a carrier, E, which is mounted to slide to and fro in or on ways or guides on a bed-plate, F, which is fastened to the stationary portion of the sewing-machine. The carrier E is connected by a lever, G, adjustable link H, and lever I with the driving mechanism of the sewing-machine in such manner that just before one descent of the needle *x* through the feed-ring D the carrier, with the feed-ring, is moved in one direction, (indicated by the arrow *w*,) and is moved in the opposite direction a like distance just before the next descent of the needle, and so on repeatedly to form the over-edge stitches. The feed-ring is turned a step at each movement of the feed-ring carrier E in one direction only, to space the over-edge stitches, by means of a driving-pawl, J, engaging with the ratchet-rim *a* of the feed-ring, and pivoted to a slide, K, which is connected with the feed-ring carrier E by the levers G L and link M.

N is a ring-like presser fitting into the feed-ring D, and mounted to be vibrated on a pivot-stem on the presser-bar C, by and with the reciprocating feed-ring, to keep the fabric *v*, Figs. 3 and 4, in engagement with the feed-ring, all essentially the same as in a certain eyelet-hole attachment for sewing-machines made by George M. Morris prior to my invention, and described in United States Patent No. 227,640, dated May 18, 1880. When that prior attachment is in use the part of the eyelet-hole work or fabric which is within the circular opening through the feed-ring is supported by and pressed down hard upon and moved to and fro in direct contact with the usual stationary perforated needle-plate of the sewing-machine,

while the feed-ring is reciprocated by its carrier, and the consequent adhesion and friction of the reciprocating fabric against the stationary needle-plate tends to loosen the engagement of the feed-ring with the fabric and to
 5 displace the fabric laterally on the feed-ring, and thereby prevent the formation of the series of over-edge stitches in a true circle around the eyelet-hole in the fabric. To overcome that
 10 defect I firmly fasten to the feed-ring carrier E a plate, P, directly under and parallel to the feed-ring D, and having an oblong aperture, c, through which the needle x of the sewing-machine reciprocates, and which oblong needle-
 15 hole is arranged lengthwise with the direction in which the feed-ring carrier is moved to and fro, so that the work-supporting plate P moves to and fro with the feed-ring D, and thus prevents all reciprocating rubbing movement of
 20 the fabric upon its supporting-plate, and thereby prevents all tendency to displace the fabric on the feed-ring by reason of its reciprocating movements.

To provide means for conveniently and accurately centering the eyelet-hole work on the
 25 feed-ring D, and to further prevent lateral displacement of that work on the feed-ring as the two are reciprocated together with the work-supporting plate P, and are also turned together
 30 step by step on that plate, I firmly secure to the reciprocating plate P a round pin or stud, R, corresponding in size to the eyelet-hole to be worked, and concentric with the feed-ring D, and having in the side next to the needle-
 35 hole c a recess which is a continuation of that needle-hole, so that upon merely placing the fabric with its eyelet-hole upon the centering-pin R and releasing the spring-actuated presser D upon the fabric, and thereby engaging the
 40 latter with the feed-ring and pressing the inner part of the fabric against the plate P, the eyelet-hole is properly centered in respect to the feed-ring by the centering-pin, which also helps to prevent lateral displacement of the fabric on
 45 the feed-ring as the latter reciprocates the fabric intermittently and rotates the same step by step in the stitching operation. For very small eyelet-holes the pin R is preferably pointed, as shown in Figs. 3 and 4, to puncture the fabric
 50 for the eyelet-hole.

To cover and protect the ratchet-rim a of the feed-ring D, and prevent the latter from being displaced in putting the eyelet-hole work upon and disengaging it from the feed-ring, I provide a cap-plate, O, Fig. 6, having therein a
 55 circular aperture, d, and fitting upon and around the rim of the feed-ring, and fastened by screws e, Fig. 3, or by other suitable means, to the reciprocating carrier E of the feed-ring,
 60 so as to permit the free rotation of the feed-ring, protect its ratchet-rim from contact with the eyelet-hole work, and prevent the feed-ring from being pushed or pulled out of its journal-seat in the reciprocating carrier E, however
 65 much the feed-ring shall be pushed or pulled upward or laterally in the operation of placing

the eyelet-hole work upon and removing it from the feed-ring.

The presser-bar C is cylindrical and works through corresponding sockets in the bracket-
 70 arm A of the sewing-machine, and is prevented from turning in its sockets by a hub, Q, fastened to the presser-bar by a set-screw, f, Fig. 4, and having in its opposite sides slots
 75 g g, in which fit the forked end of a downward-pressing plate-spring, S, fastened to the bracket-arm of the sewing-machine, so that upon loosening the set-screw f the presser-bar C can be turned and adjusted concentrically about
 80 its axis, the same as in some sewing-machines made before my invention.

In fastening the eyelet-hole attachment upon the sewing-machine it is difficult to set the attachment so that the center of the feed-ring shall coincide with the center of the circular ring-
 85 like foot of the presser N, carried by the presser-bar, and the adjustment of the feed-ring by its carrier and the devices shown in Fig. 2 to properly present and feed eyelet-holes of greatly-
 90 different diameters to the needle of the sewing-machine places the feed-ring with its center at different distances from the axial line of the cylindrical presser-bar. I therefore mount the
 ring-like presser N upon a pivot-stem, T, Fig. 3, which I secure to the cylindrical presser-bar
 95 C, with the pivot-stem somewhat eccentric to the presser-bar, as indicated in Fig. 3, so that by the use of the set-screw f the presser-bar C, with the eccentric pivot-stem T of the vibrative presser, can be turned and set so as to
 100 thereby adjust the presser N with the center of its circular foot at different distances from the presser-bar C, as represented in Figs. 7 and 8, and thus easily adjust the vibrative ring-like presser to fit properly in the reciprocating
 105 feed-ring.

To provide means for limiting the vibrative movement of the ring-like presser N upon the pivot-stem T, and in respect to the reciprocating movement of the feed-ring D, when the
 110 said pivot-stem is arranged eccentrically upon the presser-bar C and is adjusted at any point whatever in the circle about the presser-bar, I make the pivot-stem T with a lateral lug, i, and the socket-shank of the presser N with a
 115 recess into which the lug i extends loosely between stops j j, Fig. 4, on the presser-shank, and also make the pivot-stem T adjustable concentrically about its own axis by having
 120 that stem fit so that it can be turned around in a corresponding socket, k, Fig. 3, in the presser-bar, and furnish the latter with a set-screw, l, by which the pivot T can be fastened in the socket in any desired adjusted position.
 125

In carrying out my invention any suitable known devices are to be combined with the feed-ring D and its carrier E for imparting
 from a sewing-machine to the feed-ring the proper to-and-fro movements and step-by-step
 130 rotary motion to form the over-edge stitches and to space the same around the eyelet-hole.

I am aware that an eyelet-stitching contrivance devised before my invention has had for supporting and centering the eyelet-hole work a reciprocating plate having an elongated needle-hole, and fast on the plate at one end of the needle-hole a centering-stud with a side recess in continuation of the needle-hole, but did not have combined therewith a circular reciprocating and intermittingly-rotary feed-ring and a ring-like vibrative presser for moving the eyelet-work to and fro and rotating it step by step.

I am also aware that prior to my invention an eyelet-stitching device has had a circular feed-ring rotating step by step (but having no reciprocating or to-and-fro movement) on a stationary work-support having an elongated needle-hole, and concentric with the feed-ring a centering-stud having a side recess in continuation of the needle-hole through which two needles worked, as set forth in English Patent No. 2,648 of 1856; but to bind eyelet-holes with a series of over-edge stitches such a device could not be used in connection with a common sewing-machine having one needle only reciprocating in a constant vertical plane and no other device working through the needle-hole.

What I claim as my invention is—

1. The combination, with the circular feed-ring, feed-ring carrier, ring-like presser, and means for intermittingly rotating the feed-ring and moving its carrier to and fro, substantially as described, of the work-supporting plate P, having the oblong needle-hole *c*, and secured to the feed-ring carrier, and thereby movable to and fro with the feed-ring, substantially as set forth.

2. The combination, with the circular feed-ring, feed-ring carrier, ring-like presser, and means for intermittingly rotating the feed-ring and moving its carrier to and fro, substantially as described, of the work-supporting plate P, having the oblong needle-hole *c*, and secured to the feed-ring carrier, and thereby moved to and fro with the feed-ring, and the work centering and supporting stud R, arranged on said plate P at one end of said needle-hole, substantially as set forth.

3. The combination, with the reciprocating feed-ring carrier E and feed-ring D, journaled in said carrier and having the ratchet-toothed rim and work-holding points, substantially as described, of the cap-ring O, secured to the feed-ring carrier and covering the ratchet-rim of the feed-ring, substantially as set forth, whereby the latter is protected and prevented from being displaced in putting the eyelet-hole work upon and detaching it from the feed-ring.

4. The combination, with the circular feed-ring, means for rotating and moving it to and fro, substantially as set forth, cylindrical presser-bar C, and circular ring-like presser N, mounted on said presser-bar and adapted to be vibrated by and with the feed-ring, of devices, substantially as described, for adjusting the circular presser into coincidence with said circular feed-ring at different distances from the axis of said cylindrical presser-bar, as set forth.

HERBERT L. PHELPS.

Witnesses:

W. O. BREWSTER,
WM. M. HOUSE.