H. A. Oesterle.

Netting Mach.

No. 51,744. Patented Dec. 26, 1865.

Fig. 1.

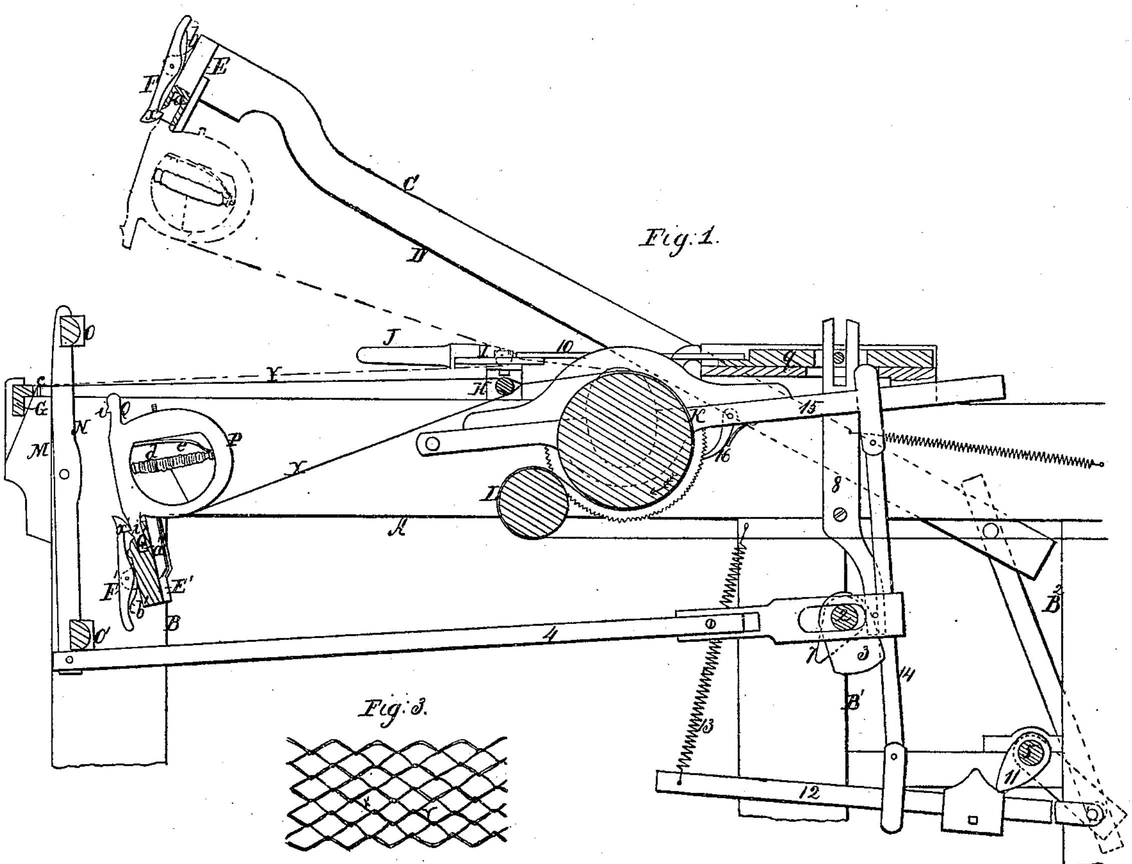
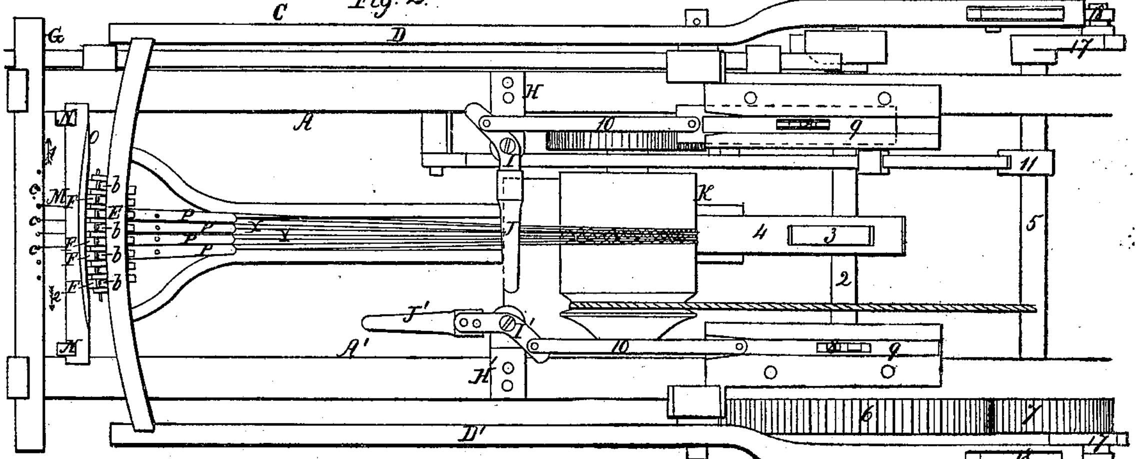


Fig. 3.

Fig. 2.



Witnesses.
Wm Albert Steel.
Chas. B. Rice.

Inventor.
H. A. Oesterle By his Atty
K. Rowson,
[illegible]

UNITED STATES PATENT OFFICE.

HERMAN A. OESTERLE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MAKING NETTED OR LACE FABRICS.

Specification forming part of Letters Patent No. **51,744**, dated December 26, 1865.

To all whom it may concern:

Be it known that I, HERMAN A. OESTERLE, of Philadelphia, Pennsylvania, have invented a Machine for Making Netted or Lace Fabrics; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain mechanism, fully described hereinafter, for producing netted or lace fabrics—such, for instance, as the sashes worn by army officers.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of my improved machine for making netted or lace fabrics; Fig. 2, a plan view, and Fig. 3 a diagram illustrating one style of fabric produced by the machine.

Similar letters refer to similar parts throughout the several views.

A A′ are opposite side beams of the machine, each of the said beams being secured to the uprights B, B′, and B².

To pins projecting from the beams A is hung a frame, C, which consists of two arms, D and D′, and a curved cross-piece, E, at the under side of which are a number of recesses, *a*, and in the rear of the cross-piece are hung a series of levers, F, each of which has an inclined or rounded end and an abrupt shoulder, *x*, a portion of the face of the cross-pieces being removed to allow each of the shoulders *x* to project a short distance into the recess *a* under the circumstances described hereinafter. A flat spring, *b*, bears against and tends to force the upper end of each lever F outward.

Between the uprights B extends a curved cross-piece, F′, in which are recesses *a′*, similar to those in the cross-piece E, and in the rear of this cross-piece are hung a number of levers, F′, with inclined upper ends and abrupt shoulders *x′*, a spring, *b′*, bearing against and tending to force outward the lower ends of each of said levers.

In suitable brackets attached to the outer ends of the side beams, A A′, slides a bar, G, near the edge of which are a series of openings, *c c*, for a purpose described hereinafter.

To the side piece A is secured a bracket, H, to which is hung a horizontal lever, I, having at its end a wooden rod or beater, J, and to a bracket, H′, secured to the opposite side beam, A′, is hung a lever, I′, to which is secured a beater, J′, the latter being somewhat lower than the beater J.

Between the side pieces A turns a drum, K, in front of and below which revolves a roller, L, an intermittent rotary motion in the direction of the arrow being imparted to the drum by mechanism similar to the take-up motions of ordinary looms.

Between the side beams A and A′, near the rear end of the same, is hung a vertical frame, M, which consists of the side pieces N and N′ and the upper and lower cross-pieces, *o* and *o′*.

P P P P are shuttles, in each of which is hung a bobbin, *d*, the latter being prevented from turning too freely by the pressure of a spring, *e*. From the front edge of each shuttle project two arms, Q and Q′, the ends of the former being adapted to the recesses *a* in the cross-piece E, and the latter to the recesses *a′* in the cross-piece E′, and on the front edge of each arm Q is a projection, *i*, with an inclined edge and an abrupt shoulder, there being a similar projection, *i′*, on each of the arms Q. The arms Q′ of each of the shuttles P is inserted into one of the recesses *a²*, where it is retained by the shoulders *x* of the lever F catching the shoulder of the projection *i′*. The thread X from the bobbin *d* is then passed through an opening in the lower edge of the shuttle around the drum K, the roller L, and thence to any suitable take-up roller. Threads Y are also conducted from bobbins arranged in suitable frames at the rear of the machine through the openings *c* in the bar G to the drum K, and round the latter and the roller L in the same direction as the threads X. The different parts are then brought to the position shown in Fig. 1, when the operation of the machine will be as follows: Motion being imparted to the different parts by the mechanism illustrated, or the equivalent to the same, the frame C first descends until the cross-piece E is brought directly above the shuttles P, the arms Q′ of which now occupy a position in the recesses *a′*, while the shoulders *x′* of the levers F′ catch those of the projections *i′* on the shuttles. The lower end of the frame M now moves forward by the means herein-

after stated until the cross-piece O′ is brought against the lower ends of the lever F′, the upper ends of the latter being thus released from contact with the shuttles P, when the frame C is elevated, carrying with it the shuttles, which on the downward motion of the frame were seized by the levers F, and each of which conveys a thread, X, between the threads Y. The bar G then moves such a distance in the direction of the arrow 1, Fig. 2, that each thread Y is carried over two of the recesses *a*′, or, in other words, over two threads, when the frame C is again depressed, the shuttles and their threads X descending between the threads Y through the second space to the left of that through which they had been elevated, the arms Q′ passing into the recesses *a*′ and being retained in the same by the levers F′. The upper end of frame M then swings forward, so that the cross-piece O is brought against the upper ends of the levers F, which are thus released from contact with the shuttles, and the frame C is then elevated without the shuttles while the beater J′ is carried between the threads X and Y at right angles to the same, so as to beat up the loop just formed, while at the same time a slight motion in the direction of the arrow is imparted to the drum K, so as to take up a portion of the fabric. The bar G now moves in the direction of the arrow 2, Fig. 2, such a distance as to carry each of the threads Y over two of the shuttles P. The beater J′ then moves to the position shown in Fig. 2, and the frame C again descends, catches the shuttles P, and rises as before, after which the beater J is brought to the position shown in Fig. 2, so as to beat up the last-formed loop. As these operations are continued each of the threads X is carried round two of the threads Y, first over and then under the same, each stitch is beaten up as soon as made, and a netted or lace fabric of the character shown in Fig. 3 is thus produced.

The pattern of the fabric may be readily changed by imparting a different motion from that described to the bar G. For instance, the threads Y may be carried alternately over one and then over two of the threads X. The manner of making these changes and their effect will be so readily understood by those conversant with the art as to need no particular description. The desired rocking motion is imparted to the frame M from the shaft 2 through the medium of the cam 3 and connecting-rod 4, the shafts 2 and 5 being geared together by the cog-wheels 6 and 7, Fig. 2. The necessary movement is imparted to the beaters J and J′ from the shaft 2 through cams 7, levers 8, sliding rods 9, and connecting-rods 10. The take-up roller K is actuated by the cam 11 on the shaft 5 through the aid of the lever 12, spring 13, connecting-rod 14, lever 15, spring-pawl 16, and the ratchet-wheel on the shaft of the take-up roller, and the frame D is vibrated by cranks 17 on the shaft 5 and connecting-rods 18.

The bar G may be actuated by any suitable devices which will readily suggest themselves to those experienced in this class of machinery.

Without confining myself, however, to the precise mechanism herein described for imparting the desired motion to the several moving parts,

I claim as my invention, and desire to secure by Letters Patent—

1. The shuttles P, each carrying a spool of thread, X, in combination with the devices herein described, or the equivalents to the same, for retaining and releasing the said shuttles on one side of the system of threads Y, and with the devices described, or their equivalents for seizing the said shuttles, conveying them between the threads Y, and releasing the same, all substantially in the manner described.

2. The vibrating or reciprocating cross-bar E, its recesses *a* and spring-catch levers F, in combination with the arms Q on the shuttles, and the projection *i*, and the bar O of the rocking frame M.

3. The stationary cross-bar E′, its recesses *a*′, and spring catch-levers F′, in combination with the arms Q′ of the shuttles, and the projection *i*′, and the bar O′ of the rocking frame M.

4. One or more reciprocating or sliding bars, G, or their equivalents, for guiding and laterally moving the threads Y, in combination with the shuttles P, to which the above-described movements are imparted.

5. The beaters J and J′, arranged to operate on the threads and the loops of the same, substantially in the manner described, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

H. A. OESTERLE.

Witnesses:

HENRY HOWSON,
JOHN WHITE.