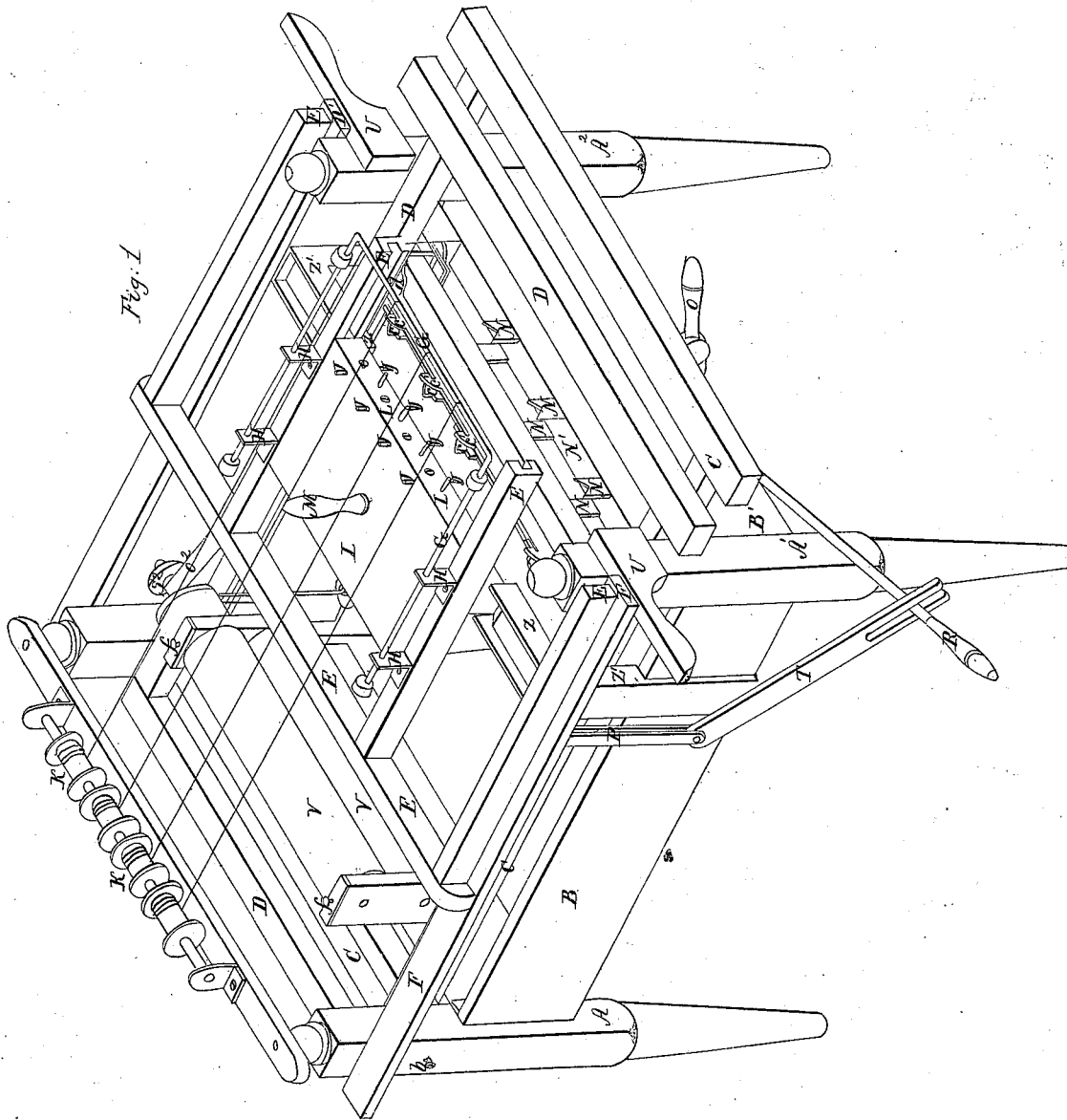


*P. Moulton.*  
*Netting Mach.*

*Sheet 1-2. Sheets.*

*N<sup>o</sup> 4,707.*

*Patented Aug. 22, 1846.*

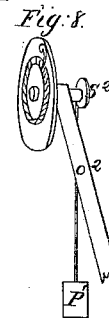
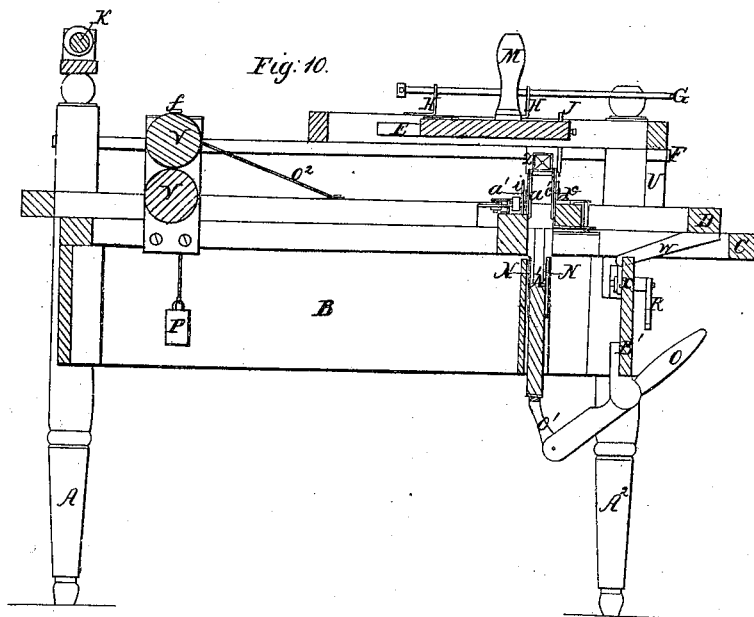
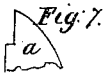
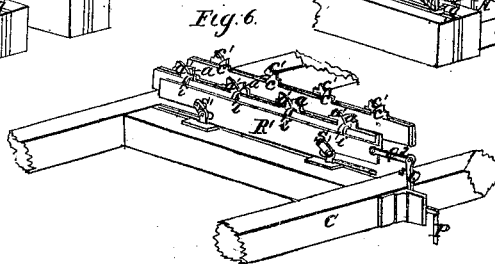
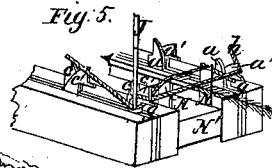
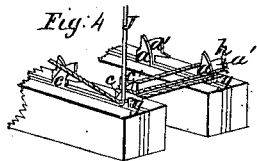
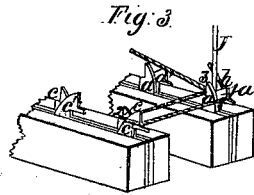
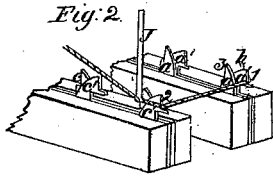


*P. Moulton.*  
*Netting Mach.*

Sheet 2-2 Sheets.

N<sup>o</sup> 707.

*Patented Aug. 22, 1846.*



# UNITED STATES PATENT OFFICE.

PETER MOULTON, OF NEW ROCHELLE, NEW YORK.

## NETTING-MACHINE.

Specification of Letters Patent No. 4,707, dated August 22, 1846.

*To all whom it may concern:*

Be it known that I, PETER MOULTON, of New Rochelle, in the county of Westchester and State of New York, have invented a new and useful Improvement in Machinery for Tying Weavers' or Bowline Knots, Applicable to the Weaving of Fish-Nets or Other Similar Fabric Requiring Such Knots, and that the following is a full, clear, and exact description of the principle or character thereof which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an isometrical view of the machine complete; Fig. 2, an enlarged view of what I denominate "check plates," which are composed of series of projections on which the loops are formed for making the knot, the cord in this figure being shown partly wound around said projections as it is in the first movement of the finger or carrier of the cord of which the knots are formed; Fig. 3, the second movement of the finger, showing the cords further wound on; and Figs. 4 and 5, the next two steps toward the completion of the knot, the last representing it ready formed for running the cross cord which is represented in this figure as put through the bight of the loop. Fig. 6 is a view of the opposite side of the "check plates," showing the holding down hooks there situated. Fig. 7 represents the two different shapes of plates in the adjoining series.

In the attempts heretofore made to manufacture nets by machinery, it has been necessary to make a square knot, and the thread or cord to be manufactured into a net was passed through loops so small that it only admitted of a wire as a conductor; this necessarily limited the quantity of cord passed through to what was used at each series of knots, and the knots are found to slip when brought into use, but by my arrangement these difficulties are obviated and a perfect bowline knot formed, while at the same time the loops can be made large enough to throw a shuttle through them filled with cord wound on a bobbin.

In the accompanying drawings the same letters indicate like parts.

(A, A') &c. represent the legs of a suitable oblong frame which is formed by proper

cross-pieces or rails (B, B); the posts extend above the rails and sustain some portions of the machinery to be described. On the front cross rail (B') rests the forward end of a moving frame (C) composed of two side pieces that extend back just inside of the legs to the back of the machine where they are supported on the ends of two horizontal pivots or screws (*b*) that serve as joints to allow the front of the frame (C) a motion up and down. The side pieces are connected by proper cross-ties in any ordinary way. Attached to and resting on the frame (C) is another frame (D); that slides back and forth on said frame. To two of the cross-bars of frames (C) (D) are affixed two stationary plates (*a* and *c*) at a distance of an inch apart, more or less, each of these plates has a series of projections on it standing up from the edge of the plate, one side of each of which is inclined at an angle of about 45°, the other being perpendicular with an offset in it about half way down, ((*a*), Fig. 7); beside each of the above named plates is another similar one, (*a'*) and (*c'*), these have similar projections to those on (*a*) and (*c*), but there is a notch cut into the straight or perpendicular side below the offset, which runs under the part above the offset, this is marked in Fig. 7, (*g*), (*a'*) being the body of the projection; the inclined sides on these plates are reversed from those on (*a*) and (*c*), and the plates themselves slide sideways of the frame by means of cams (*d*, *d'*) (shown in Fig. 10) which act on them as frame (D) slides back the relative position of the two plates thus placed being shown at Fig. 9.

Attached to the frame (B) are the shuttle boxes (*z*) elevated on two uprights (*z'*); these extend down below the level of the frame (C) as clearly represented in the cross section Fig. 10. Between these uprights (*z'*) slides up and down a race beam (*N'*), which is placed in a vertical plane between the two series of check plates (*a*) and (*c*); to the race beam (*N'*) are affixed on the front and back face thereof two series of upright standards (*N*), which I denominate loop plates, formed of thin sheet metal or other suitable material; these uprights (*N*) are notched on their upper end and are for a purpose described in the operation of the machine; when raised to their highest point they extend up above the projections on the check plates, as seen in Fig. 5, this is effect-

ed by means of a lever or treadle (*o*), see Fig. 1, which is connected with it underneath by the pitman (*o'*), shown in Fig. 10.

To raise the front ends of the frames (C) and (D), above described there is an inclined plane (W), attached to the under side of the front rail of frame (D), as shown at Fig. 10, against which a cam (*x*) works, placed in the stationary frame (B) and actuated by a lever (R) in front of the frame that extends out on one side horizontally. This lever passes through a slit in the end of a lever (T), placed at right angles to lever (R) on the side of the frame and is connected by means of rods (P), (Q<sup>2</sup>) and bell-crank (Q), with a movable plate (R'), more clearly shown in Fig. 6, and located behind the check plates (*a*); this plate (R') is furnished with a series of hooks on its upper edge corresponding in number with, and opposite to, the projections of the check plates; it is attached to small cranks (*s'*, *s'*) which cause it to rise in a semicircular direction and catch the cords of the warp at the point marked (*h*), Figs. 2, 3, 4 and 5, and draw them down while the fingers pass over them, as hereinafter described.

Above the frames (C) and (D), there is a frame (E) supported on two side pieces (F), the front ends of which rest on brackets (U) on the outside of, and attached to, the front posts; the other ends are jointed to the back post so as to have a lateral motion which is required by frame (E); between the inner side rails of this frame a plate (L) is made to traverse forward and back in ways or grooves cut in the sides of said rails, and from this plate there are as many fingers (J) extending down toward the plates (*a*) as there are threads used in the warp; by this arrangement the fingers can move forward and back and sideways. In short, standards H above plate (L) is fixed the U-shaped rod (G) the two legs thereof being made to slide through the standards, and the loop of the rod which is straight is parallel with the front of the frame. Affixed to the frame (C) near the rear end of the machine on two uprights which support two rollers (V) one above the other, the upper one being pressed down by set screws (*f*) in the top of the posts; on the journal of the upper roller there is a loose pulley (*s*<sup>2</sup>) with a strap (*o*<sup>2</sup>) around it, one end of which is affixed to the frame (D), (more clearly shown in Fig. 8), a counterweight (P') is attached by a cord to the same pulley, which cord is wound on to it contrary to strap (*o*<sup>2</sup>) attached to (D), so that when (D) is drawn forward it turns the pulley (*s*<sup>2</sup>), and by means of a ratchet connected with it of ordinary construction it turns the rollers (V), and when the frame (D) moves back the counterweight (P') takes up the slack.

In operating the machine the cords are

brought from spools (K) at the back of the frame, over and around the front part of rod (G), and thence back to the fingers (J) passing through eyes therein from whence the cords extend back to the rollers or a portion of net that is between said rollers. The first motion of the fingers is forward as represented in Fig. 2, which carries the warp (*h*) from the point marked (1) in the back check plates (*a'*) to the notch in the front check plates *a'*, which is done by sliding forward the plate (L) between the two rails of the traverse frame (E). The next movement of the fingers which carries the warp to the notch in the check plates (*c*) (where the finger (J) is represented in Fig. 2) is produced by pushing the handle (M) to the left, this slides the traverse frame (E), and with it the plate (L) and the fingers as above described.

The next movement is produced by pushing the handle (M) back, which slides back the plate (L), carrying the fingers that conduct the warp to the notch in the check plates marked (*a*), in the back set of check plates, as represented in Fig. 3, in which the finger (J), is seen at the point (3).

The next movement is represented in Fig. 4. The handle (M) is carried to the right, which slides the traverse frame (E), and carries with it the plate and fingers (J) conducting the warp to the notch (*g*); but before the warp passes through the notch (*g*) as represented in Fig. 4, the check plates with the frames (C) and (D) to which they are attached, are raised sufficiently to bring the notch (*g*) up to the level of the lower end of the fingers (J), (through which the warp passes) and are there held by a cam marked (X), Fig. 10, under the frame (C) which is acted on by the lever (R), and at the same time the hooks *i*, *i*, *i*, *i*, as above described and shown in Fig. 6 are operated on by levers (R) and (T), and lay hold of the warp at the point marked (*h*) in Figs. 3, 4 and 5, and hold it down lower than the points of the fingers (J), which now pass over it as the plate (L) and traverse frame (E) are moved to the right. The plate (L) is now brought forward as before described, and as represented in Fig. 4 by which means the warp is brought forward into the notches (*g*, *g'*) in the check plates (*a'*) and (*c'*). At this period of the operation the set of perpendicular loop plates marked (N) in Fig. 1 and Fig. 5, are raised by the lever (O), to the position in which they are represented in Fig. 5, each notch in the loop plates catching that portion of the warp which passes through the notches (*g*), and pressing it up and holding it until the weft is passed through by a shuttle, the direction of which is represented by the arrow in Fig. 5. The loop plates (N) are next depressed by the lever (O), and the frame (D) (Fig. 1) is

shoved back carrying the front rows of check plates ( $c'$ ,  $c$ ) nearly back to the back rows ( $a'$ ,  $a$ ).

5 The warp which has been carried around the check plates ( $a'$ ,  $a$ ) and ( $c'$ ,  $c$ ), and through the notches ( $g$ ) in the check plates ( $a'$ ) and ( $c'$ ) is relaxed and cast off by the check plates ( $a'$ ,  $c'$ ); those which have the notch ( $g$ ), being moved to the left by means  
10 of inclined slides ( $a$ ), one of which is represented near the front check plates ( $c'$ ,  $c$ ), Fig. 1, while all the check plates descend with the frames (C) and (D), the inclined plane or wedge under the front cross rail of  
15 (D) which slides on the cross rail ( $B'$   $B'$ ), Fig. 1, allows the frames (C) and (D) to descend when the frame (D) is shoved back. While the operator shoves back the frame (D) with one hand he draws forward the  
20 bar (G) with the other and takes up or tightens the warp (which was made slack or loose by being cast off from the check

plates) and completes the knots, with the exception that they require to be drawn tight after the net is removed from the machine. 25 The frame (D) is next drawn forward which moves the rollers (V, V), Fig. 1, and (B) sufficiently to take up the net the length of one mesh, it being passed between the rollers above named. 30

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

The combination of the fingers (J) check-plates, loop-plates (N), and hooks ( $i$ ), constructed, arranged, and operated as above 35 described, for the purpose of forming the loops in the warp, and for tying weavers or bowline knots, in the manner set forth, and for the purpose described.

PETER MOULTON.

Witnesses:

STEPHEN WATERMAN,  
J. J. GRENOUGH.