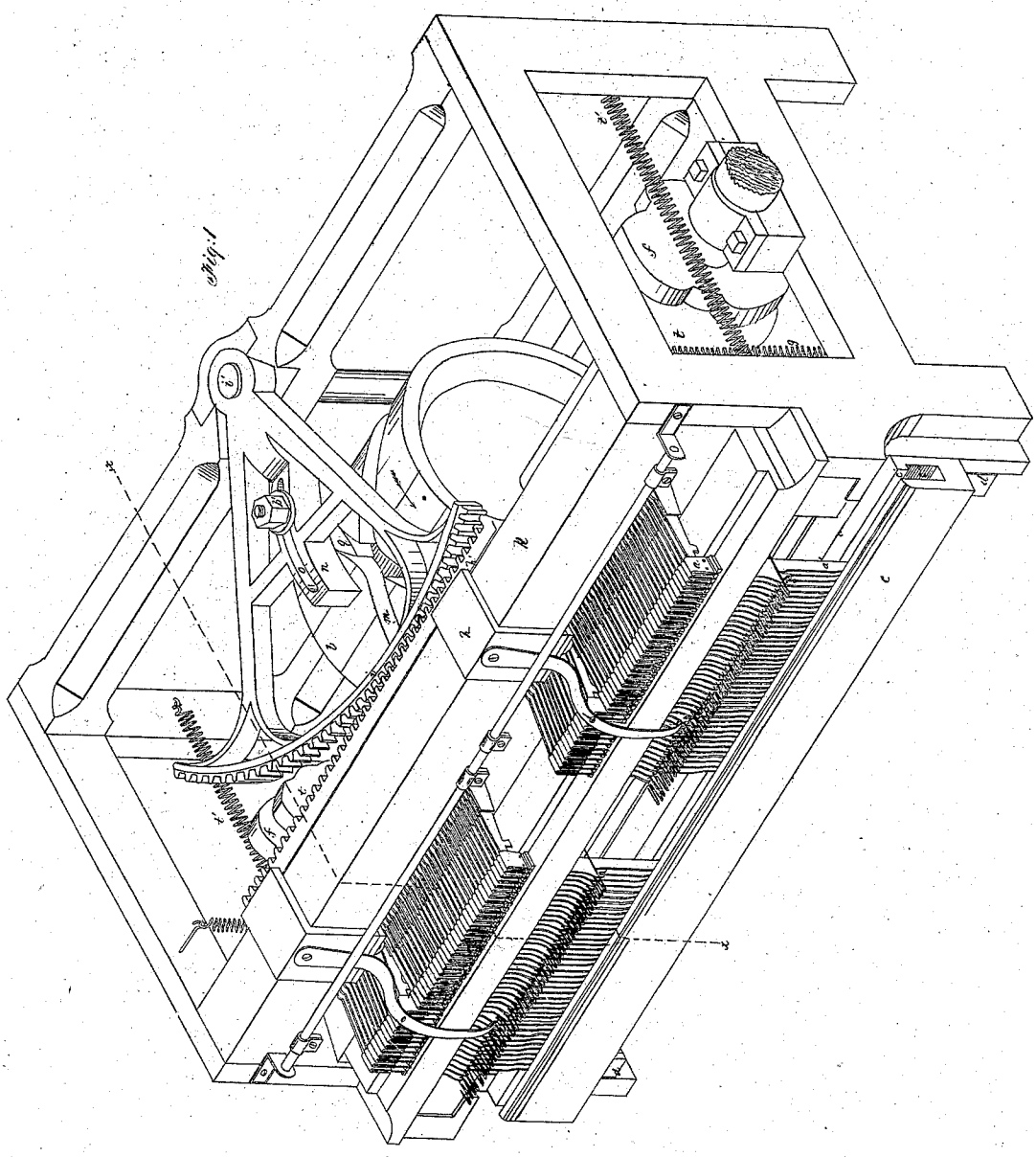
2 Sheets—Sheet 1.

H. BURT.

KNITTING MACHINE.

No. 11,238.

Patented July 4, 1854.



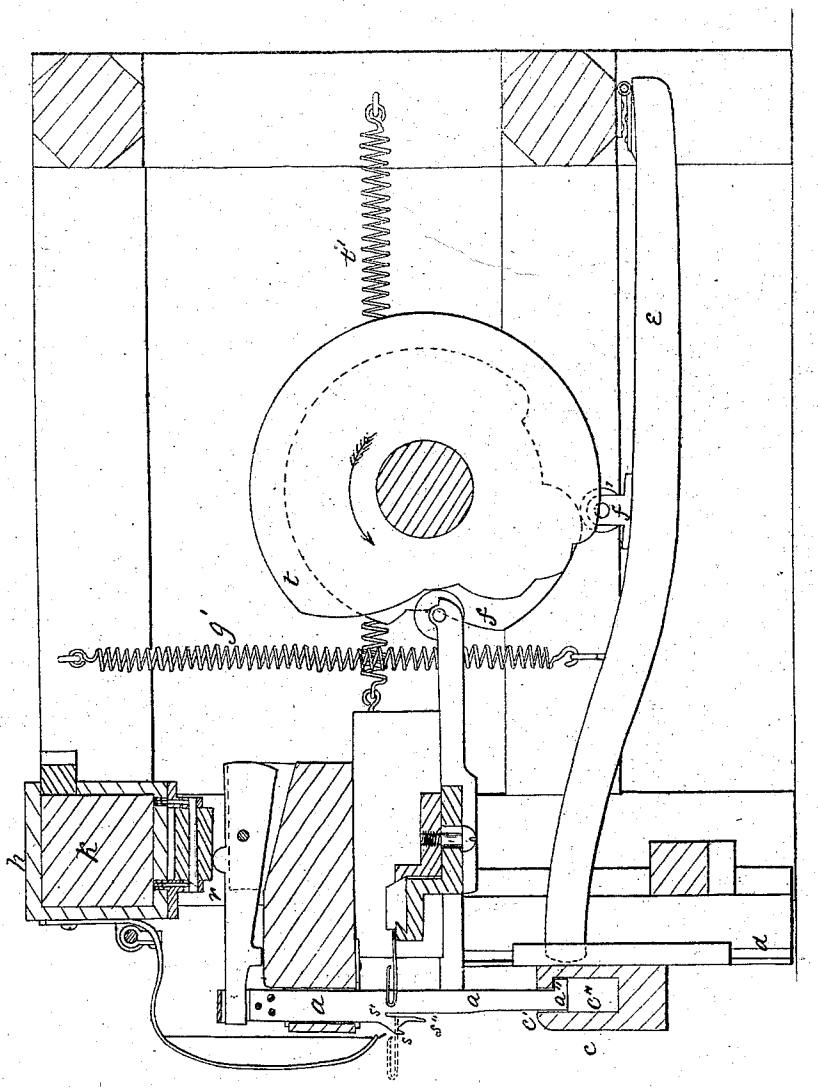
2 Sheets—Sheet 2.

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Fig. II.



UNITED STATES PATENT OFFICE.

HENRY BURT, OF NEWARK, NEW JERSEY, ASSIGNOR TO NEWARK PATENT HOSIERY CO.

KNITTING-MACHINE.

Specification of Letters Patent No. 11,238, dated July 4, 1854.

To all whom it may concern:

Be it known that I, HENRY BURT, of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Machinery for Making Looped or Netted Fabrics; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, making a part of this specification, in which—

Figure I is an isometrical view of a machine having my improvements. Fig. II is a sectional view taken on the line *x x* of Fig. I.

Similar letters refer to similar parts throughout.

My invention consists, firstly, in a new method of constructing and operating the sinkers, whereby I am enabled to greatly simplify the machine; and, secondly, in so producing the motions of the yarn carrier, that by arrangement before commencing work I effect the travel of that to the distance necessary to produce a fabric of any desired uniform width, as well as to hold the yarn carrier fixed or locked at each extent of throw, during the time required for the accomplishment of the motions of the other parts of the machine.

In machines of common construction the sinkers are in two sets—the one set being required to perform certain operations and the other set certain other operations, each set of operations being independent of the other, but consecutive. I use but one set of sinkers, making those of uniform construction, and operation. Between each pair of needles I place a sinker (*a*) formed like those usually employed (to fall in turn upon the yarn as it is laid upon the needles), excepting in that part of the sinker which is below the throat, or arch. This part as seen at (*a'*) Figs. I and II, I carry down to some length, turning the end at a right angle to form an elbow, or hook, as shown in Fig. II at (*a''*). These sinkers are depressed, *seriatim*, upon the yarn by jack-levers in the usual manner, to perform one of the operations, but for the purpose of effecting all of the other motions required of the sinkers, and which are to be effected simultaneously, I inclose their lower ends in a hollow bar (*c*) properly placed to receive them, and made movable in the manner to be hereinafter described. This bar has an opening along the top at (*c'*), just wide enough to admit freely the extended part of the sinkers, but immediately below, as at (*c''*), the opening is expanded to such width, as will permit the hook (*a''*), and the lower end of the sinker to play vertically with freedom. The hook is thus confined within the hollow bar, and by means of that hook the second, and simultaneous depression of the sinkers is to be effected. The depth of the groove in the bar (*c*) must be such that when the sinkers shall be in their most elevated position, the bar (*c*) being at that time at rest, and so placed that the hooks on the sinkers are at the top of the chamber (*c''*), the sinkers may then be depressed by the usual action of the jack-levers to the extent required, the lower ends moving downward within the hollow bar. The appropriate motions are given to the bar (*c*) by hanging it in vertical guides (*d*), and connecting therewith at each end of the machine a lever of the third class (*e*), the fulcrum of which is at the back of the frame as shown in Fig. II. The requisite motions are given to this lever by a cam (*f*) on the main driving shaft, Figs. I, and II, a spring (*g'*) keeping the roller (*f'*) of the lever constantly in contact with the face of the cam.

The proper action of the yarn carrier, is that it shall have reciprocating motion along the distance required by the width of the fabric, and shall rest at each end during the time necessary for the action of the needles, sinkers, &c. I effect these by attaching the yarn carrier to a collar (*h*) which collar is made to slide upon a permanent bar (*h*) of the machine, by being fixed upon a rack (*h*). This rack has a segment (*i*) meshing into it, centered at the back of the frame, as shown in Fig. I, and vibratory motion is given to it by means of a cam groove (*m*) cut in a cylinder (*l*) placed immediately below upon the main driving shaft, the groove crossing itself on one side of the cylinder as seen in Fig. I, and passing around the remainder of said cylinder near to, and parallel with each end. From a radius bar (*n*) of the segment, a pin (*p*) extends down into the cam groove (*m*), and thus as the cylinder revolves the pin following the course of the groove gives to the segment the desired reciprocating motion, and as the groove after crossing itself as before described, passes around the cylinder parallel to each end, the pin while in that part of the groove will be held at rest. That por-

tion of the radius bar (n) which is immediately over the cylinder is curved to correspond with the face of the cylinder, and the bar has a slot (o) for the purpose of adjusting the position of the pin with reference to the center (i') of the segment; it is evident that by this adjustment the throw of the yarn carrier, and consequently the width of the fabric to be produced may be determined. The curve of the bar before described is given to it in order that in whatever part of the slot the pin is placed the position of the pin with reference to the cylinder may always be the same, that is, pointing toward the center, whereby it is made to act uniformly in the cam groove. The pin is secured in the desired place by a pinch nut (p') as shown, and to facilitate its passage through the crossing parts of the groove, it may have on the lower end a traveler playing freely, being a short piece of metal fitting loosely in the groove, and sharpened at each end, as shown at (q).

The operation will be as follows: Let the main shaft be turned, in the direction indicated by the arrows, until the segment (i) has reached the extreme of its throw in one direction—the pin (p) will then be in that part of the cam groove which is parallel to one of the ends of the cylinder. If now the motion of the shaft be continued until the cam groove has so far advanced that it is about to give a returning throw to the pin, the other parts of the machine will have taken the following positions: A yarn carrier of usual construction attached to the collar (h) will be at one end of the set of needles ready to deposit a yarn upon the needles, the sinkers will all have been raised by the action of the bar (c) to their highest place, and that bar will have been depressed again by the appropriate action of the cam (f) to such distance as will permit the sinkers to be thrown down to their lowest place. A regular continuous motion being now given to the main shaft, the pin will by the angular direction of the cam groove be moved toward the reverse side. The yarn carrier is thus moved onward depositing a thread upon the needles behind their beards in the usual manner of knitting machines. A roller (r) upon the under side of the collar (h) effects the depressing of the sinkers in turn as the yarn is deposited under each just behind the hooked point (s) of the sinker, which part draws the yarn down between the needles to the desired extent, being that of the length of the loop. When the pin in the cam groove has passed quite to the side, the yarn carrier will have passed to the full extent of its throw, and the sinkers will have been all depressed upon the yarn, the yarn carrier will then be at rest, and held fixed in that position, inasmuch as the straight portion of the cam groove is now passing along the pin (p). The needles now begin to retreat as usual in knitting machines, effected in this however by an appropriate cam (t), on the main shaft, and spring (t'). The needles retreat to such distance that the new laid loop, still held by the hooks (s), is brought just within the point of the beard. A presser bar of common construction, and operation, but not shown herein by reason of avoiding unnecessary complicity, now comes down in the usual manner to press the points of the beards into the grooves upon each usually styled the "eyes." The needles recede still farther, as usual, and the web previously formed being held in the throat, or arch of the sinker (s'), Fig. II, the continued recession of the needles brings the old loop upon the top of the beard, the new loop being still within the beard. The presser bar having now accomplished its purpose is withdrawn as usual, and the sinkers are now to be raised to their highest position in order that the point (s'') of the front of the arch may be above the cloth or web. So soon as this has been accomplished the needles retreat still farther, as usual, and bringing the web against the straight part of the sinkers draw the old loop resting upon the upper side of the beard over, and then hold the web only by the new loops which at this time are within the beards, and at the forward end of the needles. The sinkers are now to be thrown down again in order that the cloth may be held in place by the arch or throat (s') while the needles are moving forward again to bring the new loops out of the beards, and upon the single portion or shank of the needle as common in knitting machines, so that a new thread may be laid upon the shanks as before described, when the sinkers shall have been raised a second time. The first raising of the sinkers is effected by an appropriately timed depression on the face of the cam (f) which permits the spring (g) to raise the hollow bar (c), and by it pressing up the sinkers by their lower ends. The first time that the sinkers were depressed it was described as being necessarily *seriatim*. The second time, they are required to act together, and here the hooks on the lower ends come into play as by the action of the cam (f), at the proper time the bar (c) is depressed until the part (c') coming down upon those hooks draws the sinkers with it down to the distance required. The second raising of the sinkers is effected as the first, the lever merely falling into another depression on the face of the cam, and as soon as it has been accomplished the cam again depresses the bar (c) to its initial position that the sinkers may be again depressed by the slur-cock, or roller as before described. Several yarn carriers may be affixed to the rack bar

(h') at suitable distances from each other, and each having its set of needles, and sinkers, one hollow bar sufficing to operate the sinkers of all the sets, and thus several webs may be netted at one and the same time.

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

1. The hollow bar (o) or its equivalent in combination with the extended ends of the sinkers, for the purposes described.

2. I claim the radius bar (n) constructed and operating as described, in combination with the cylinder (l) and the collar (h) for the purposes substantially as set forth herein.

HENRY BURT.

Witnesses:
S. M. MAYNARD,
JAMES L. ROBERTS.