M. MARSHALL.

COMPOUND KNITTING LOOM.

No. 9,621, Patented Mar. 15, 1853.

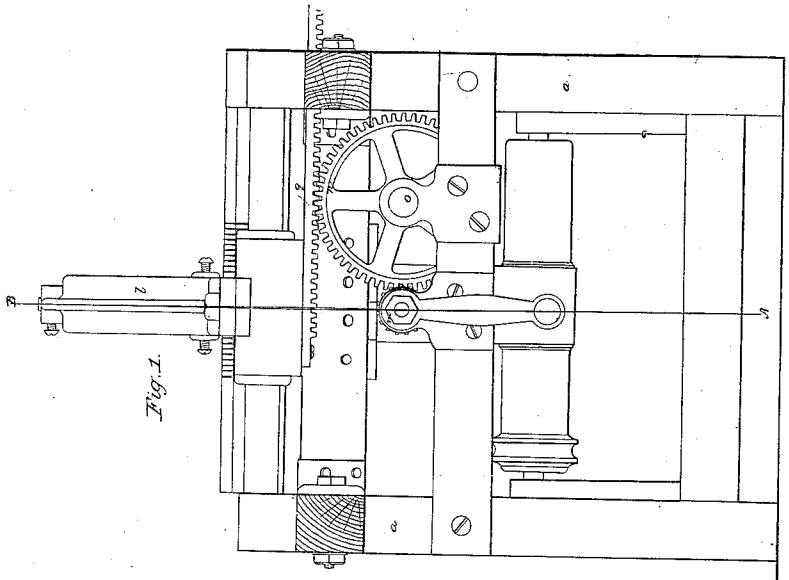

Fig. 1.

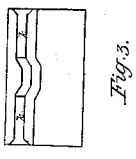

Fig. 3.

Fig. 2.

UNITED STATES PATENT OFFICE.

MOSES MARSHALL, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO M. MARSHALL, W. ALDRICH, AND L. B. TYNG.

KNITTING-MACHINE.

Specification forming part of Letters Patent No. 9,621, dated March 15, 1853; Reissued October 25, 1864, No. 1,801.

To all whom it may concern:

Be it known that I, MOSES MARSHALL, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Knitting-Looms, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements.

Figure 1 is an end view of my improved loom. Fig. 2 is a central vertical section of the same taken in the plane of the line A B Fig. 1. Fig. 3 is a detail view which will be hereinafter referred to.

In making the plain and ribbed or fancy fabrics which have hitherto been manufactured, either on hand or power looms it has been necessary to use separate machines for different kinds of work.

The peculiar feature of my improvements consists in introducing into a loom for knitting plain work a peculiar arrangement by which either plain or any kind of ribbed work can be made in the same loom. This apparatus consists of an additional set of needles working on the opposite side of the needle rest, at an angle with the first set, the needles on one side (in plain work) having no beards and taking the place of jacks in ordinary looms, so as to hold the yarn for the bearded needle on the other side to take the needles, on each side instead of drawing the yarn in ordinary looms, all at once, operate one after the other, a movement which is so performed as to give just the requisite quantity of yarn to the bearded needle. Fancy ribbed work is made in my improved loom, by removing part of the bearded needles on one side in some particular order according to the number of ribs which are to be made, and substituting needles without beards in their stead.

a a a a in the drawings represent the framework of the machine.

c, *c*, &c., *d*, *d*, &c., are the two sets of needles placed at an angle to each other, one set on each side of the stationary needle rests *e e*, *f f*. These needles are inserted in the sockets of the bent arms or levers *g g*, &c., which turn on a fulcrum at *h* and move in the guides *j*, *j*, *j'*, *j'*. Motion is imparted to each set of needles by which they are raised and lowered, one at a time, instead of dropping by their own weight or by springs, through the arms *g*, *g*, the ends of which are acted upon by the traversing boxes *i*, *i*, in each of which is a cam shaped groove *k*, *k* as shown in detail in Fig. 3. These boxes are attached to the curved arm *l l* which extends across the machine and has a traversing or reciprocating motion imparted to it by means of the pinion *m*, which works in the teeth of the gear wheel *n*, on the shaft *o* of which is the gear wheel *p*, the teeth of which and also those of the wheel *n* work the racks *q*, *q*, placed one under each of the boxes *i*, *i*. In the center of the arm *l l* and moving with it is placed the feeder *r r* through which the yarn is carried from the yarn beam to the needles. To the arm *l l* are also attached the rotary depressers *s*, *s* for pressing the beard of the needle as will be hereinafter explained, and so placed in their sockets or rests *t*, *t* as to be adjustable.

In knitting plain work, the bearded needles on one side are removed and needles without beards inserted in their place, these latter needles taking the place of jacks in ordinary looms and serving to hold the yarn, fed along by the feeder *r r*, for each bearded needle on the other side to take, the yarn being drawn and held by each needle separately, the needles being raised up and down by the needle arms *g*, *g*, &c., and cam boxes *i*, *i*, as hereinbefore explained. The fabric, as fast as it is made is drawn down between the needle rests *e e*, *f f*, which are a sufficient distance apart to admit the cloth and hold it while the loops are being drawn, by means of the roll *u*, which has a rotary take up motion imparted to it in any of the various ways commonly practised.

In making ribbed fabrics both sets of needles are bearded, one needle taking the yarn and drawing it to one side of the needle rest and the opposite needle taking the yarn and drawing it to the other side, the loops or stitches being drawn alternately on each side as the cam boxes are passing from one side of the machine to the other. Each

needle on taking the yarn a second time, carries the said yarn down through the loop first made which is loosened by its needle rising, and so on continuously, the beard of the needle being depressed at the right time, so as to pass down through this loop and form the stitch, by means of the rotary depressers *s*, *s*, which traverse with the arm *l l*. In making fancy ribbed fabrics, for instance, two ribs on one side and one on the other, every other needle of one set is removed and a needle without a beard inserted in its place; in "three ribbed" work there are two plain needles to one bearded needle, and so on till all the bearded needles of one set are removed and plain ones inserted in their stead, which will produce plain work as hereinabove described.

The rotary motion of the pinion *m* may be changed into a reciprocating rotary motion, by which the cam boxes will be made to traverse forward and back, in any of the ways commonly practised for changing a continuous rotary motion into a reciprocating rectilinear motion.

I am aware that knitting looms have been constructed in which one set of needles has had a positive motion, all at once, but not singly, but the jacks or other contrivances which held the yarn, either dropped by their own weight or by the aid of springs, so that the jacks, in case any fibers or other obstruction got between them were prevented from dropping, which necessarily produced an imperfect fabric. In my loom, it will be seen that each needle in both sets, has a positive motion both up and down, being raised and lowered through the needle arms which are both raised and lowered by the action of the cam shaped grooves in the traversing cam boxes.

Having thus described my improvements in knitting looms, I shall state my claims as follows.

What I claim as my invention and desire to have secured to me by Letters Patent is—

1. I claim connecting the rotary depressers and the feeder which carries the thread, with the arm which connects the reciprocating cam boxes, substantially as above described.

2. Dividing the plates which support the needles and cast the stitches, at the angle of intersection of the two sets of needles, so that the fabric knit will or may pass between them.

3. I claim forming the stitches alternately on each side of the needle rests, by two sets of needles placed at an angle to each other and operating, one needle at a time, substantially as above set forth.

MOSES MARSHALL.

Witnesses:
JOSEPH GAVETT,
ROBERT L. HARRIS.

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