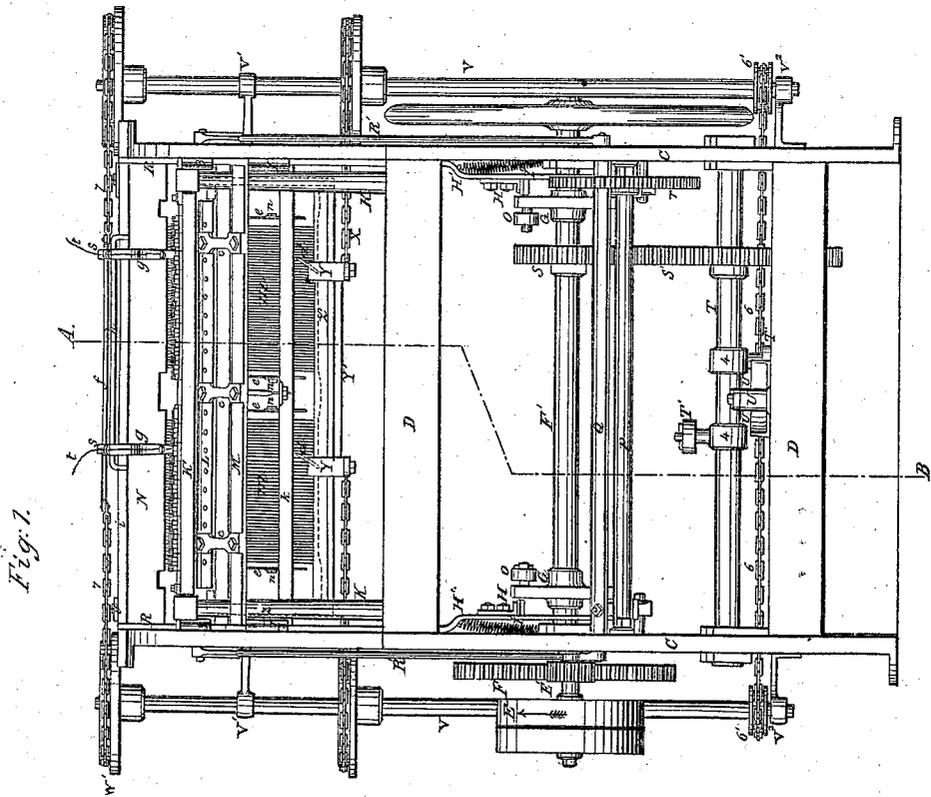
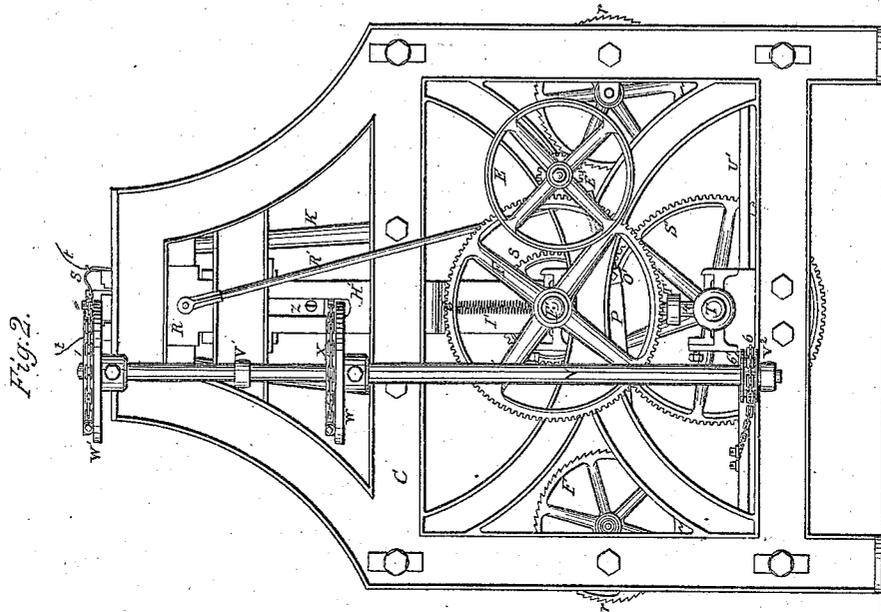


J. Pezner. Knitting Mach.

N^o. 8,172.

Patented Jun 24, 1851.



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Fig. 4.

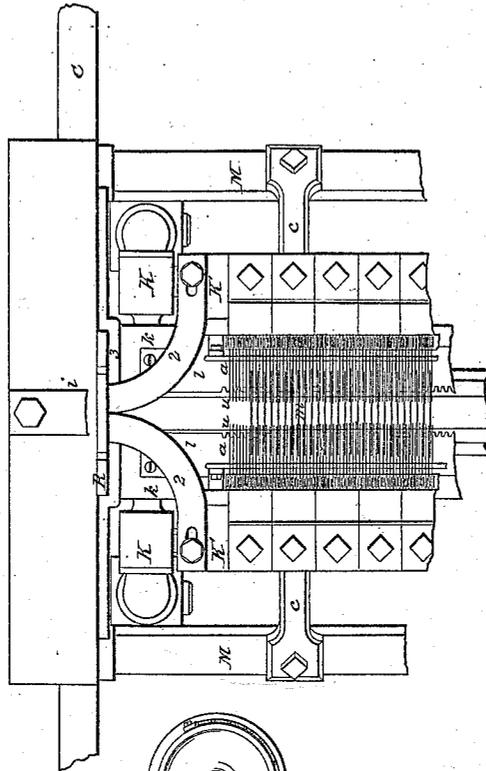
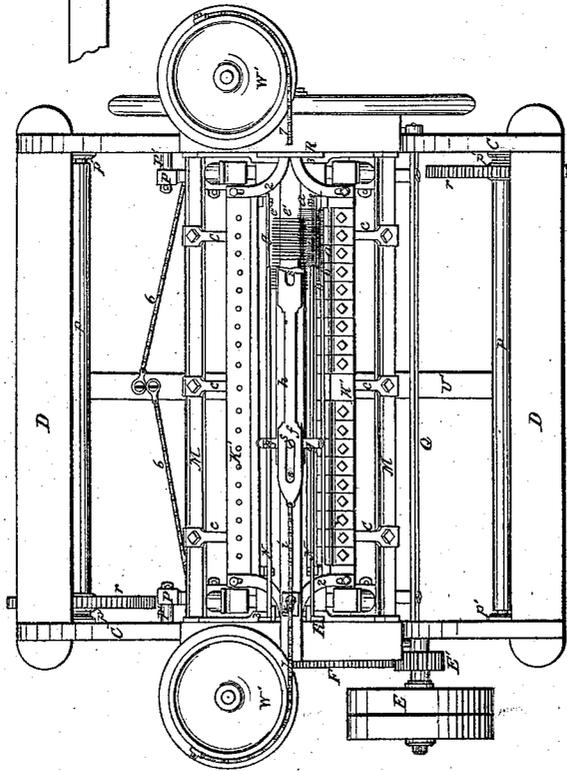


Fig. 3.



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Fig. 6.

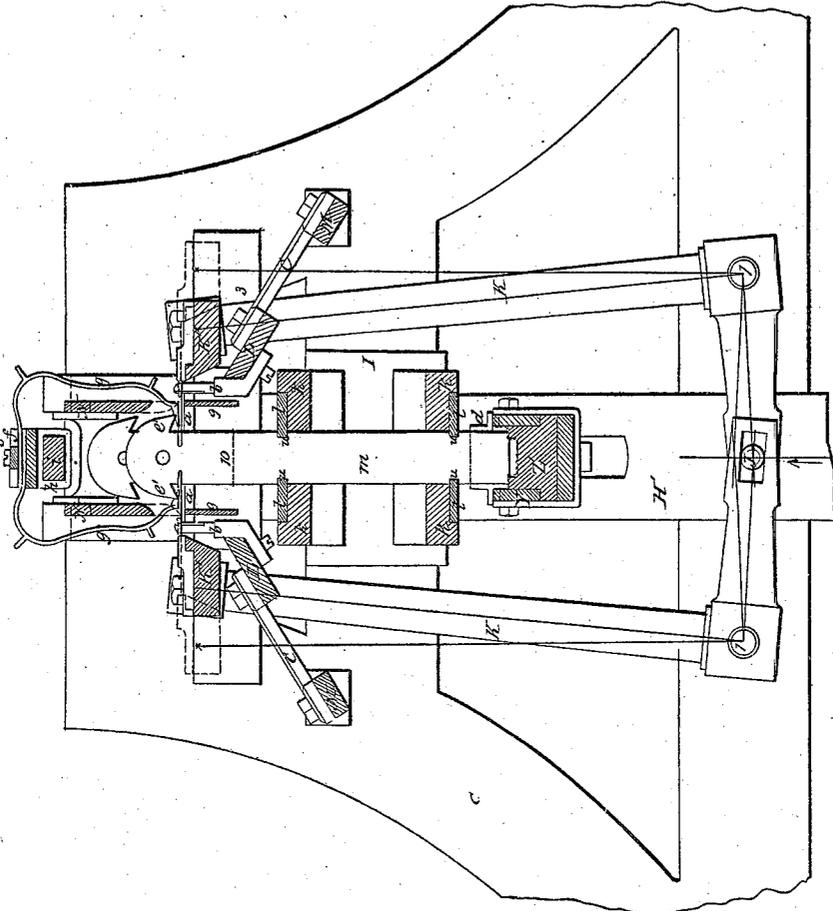
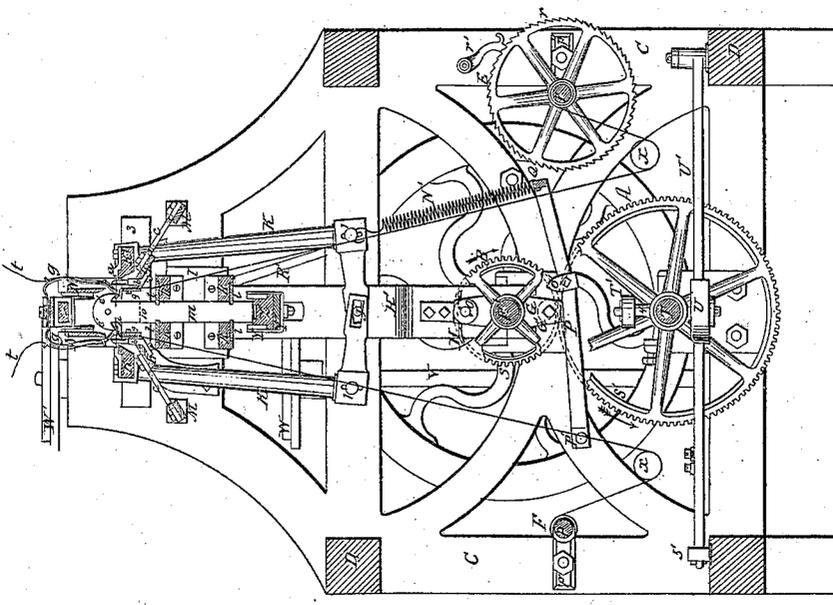


Fig. 5. Section
 thro' A-B.



UNITED STATES PATENT OFFICE.

JOHN PEPPER, OF PORTSMOUTH, NEW HAMPSHIRE, ASSIGNOR TO CRANE, PEPPER & CRANE.

KNITTING-MACHINE.

Specification of Letters Patent No. 8,172, dated June 24, 1851.

To all whom it may concern:

Be it known that I, JOHN PEPPER, of Portsmouth, in the county of Rockingham and State of New Hampshire, have invented certain new and useful Improvements in a Machine for Knitting Hosiery, called the Double-Acting Knitting-Machine; and I do hereby declare that the following is a full description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, of which:

Figure 1, is a front elevation showing the frame, and most of the working parts. Fig. 2, is an elevation of one end showing the frame, pulleys, gearing, etc. Fig. 3, is a top view. Fig. 4 a section of a top view. Fig. 5, is a view through the line A B of Fig. 1. Fig. 6, is a section through the same line.

Similar marks of reference refer to like parts in all the drawings.

C C ends of the frame, D D girts, E pulley by which the machine may be driven, fastened to the pinion E', both of which turn on a stud fastened to the end of the frame. The pinion E' drives the wheel F upon the main shaft F', which turns in appropriate boxes fastened to the ends C C. Fastened to the main shaft are two levers G G, with studs in them, upon which the rollers G' G' (one of which is represented by dotted line in Fig. 5) turn, which raise the lifting pieces H H fastened to the slides H' H' and raise them. The upper ends of the same traverse in the stands I I, fastened to the ends C C. The lower ends fork onto the shaft F', and are drawn down by the special springs I' I', which are fastened to the slides and to the caps of the box in which the main shaft turns. There are studs J J in each of those slides, that work in the slots in the short arms of the bent levers K K, the fulcra of these levers being the studs 1 1, fastened in the end, C C. The ends of the long arms of the levers K K are perforated, to receive the ends of the needle bars K' K', which are made to vibrate, and throw the loops off of the needles *a a* by the action of the studs J J operating the levers K K. There are some circular pieces 2, 2 fastened to the ends of the needle bars, which hold them in their proper position, and traverse on the stands 3 3. The needles *a a* are made in the usual form of needles used in knitting machines, with a barb, and groove to receive

it, and mounted in the usual manner by casting lead or composition around the shanks of several of them forming blocks, and then screwing the blocks thus formed onto the needle bar.

The combs *b b* are made of a series of metal teeth mounted by casting lead or composition around the shanks of the teeth to hold them firmly; these are fastened to the comb bars L L which bars are fastened to the permanent bars M M, by the crossbars C C C. The ends of the permanent bars are fastened to the ends C C. The teeth of the combs *b b* stand between the needles *a a*, and hold the fabric knit so that when the needles are drawn back by the levers above described the teeth of the combs holding the knit fabric, the needles are drawn out of the old loops, the pressers N N pressing the barbs of the needles into the grooves, while the loops are being drawn over, so as to slip off of the ends or heads of the needles.

The rollers O O turn upon studs in the levers G G (heretofore described) and act upon the knobs O' O' and depress the presser levers P P which have their fulcra upon the studs P' P'. The ends of these levers are fastened to the presser bar Q, which is connected to the presser slides R R, by the rods R' R'. The presser slides are fastened to the pressers N N and traverse in the stands 3 3, and I I. The pressers are raised by the special springs N' N', which are fastened to the presser bar and to the studs 1 1. By the apparatus described the rollers O O depress the pressers, and press the barbs of the needles into the grooves, so that the old loops slip over, at the same time that the rollers G G, draw out the needles. When the needles return, by the action of the springs I' I', the stop bars 9 9 stop the fabric knit so that the needles slip forward through the new loops (which now become old) to receive the yarn from the carrying needles *g g* to form new loops.

The wheel S upon the shaft F' drives the wheel S' upon the bottom shaft T, which has the arms 4 4 fastened to it with the rollers T' T' upon them that act upon the wedges U U on the lever U' and vibrate it. The fulcrum of the lever U' is a stud in the girt D. The end of the lever traverses in the roller 5' that rolls upon the opposite girt. Attached to the lever U' are two chains 6 6. The opposite ends of these chains

are fastened to the two grooved pulleys 6' 6' upon the vertical shafts V V to turn them in the stands V' V', and V² V² fastened to the ends C C. Upon each of the shafts V V are two pulleys W W'. The pulleys W W' 5 have the slur chains X X fastened to them. The opposite ends of the chains are fastened to the slur boxes Y Y, which traverse upon the falling bar Z', which is supported by the hangers z z, represented in part by dotted lines. The slur boxes Y Y are connected together by the bar Y', to which they are fastened; and the slurs d d turn upon pivots in the boxes, (hence they are called tilting or vibrating slurs,) when acted upon by the half jacks e e e e (as they pass under them,) which are parallel to the sinkers to be hereafter described.

The groove in the falling bar is cut deeper as shown by the dotted lines in Fig. 1, than it is under the sinkers. The lower ends of the slurs shown by dotted lines extend into the groove in the falling bar, so as to catch under the ends of the sinkers to raise them so that the carrying needles g g can pass under the projections of the sinkers e' e' and deliver the yarn to the knitting needles, a a. The groove in the falling bar under the sinkers is not deep enough to allow the slurs to turn, and they are held from falling too far by the pins 5 5.

The pulleys W' W' upon the shafts V V have the chains 7 7 fastened to them. The opposite ends of these chains are fastened to the slipping slide f, which has two slots 8 8 in it for the heads of the screws s s which fasten the carrying needles g g to the traversing slide h, the ends of which are bent down and perforated so that the top bar i passes through them, upon which the slide h traverses; which top bar i is fastened to the ends C C.

The sinker frames k k are fastened to the stands I I. To the top and bottom of these frames the sinker guide plates l l are fastened and the notches u u in them fit the edges of the sinkers m m and the half jacks e e e e, all of which traverse freely in the guides. The sinkers m m are made in form represented in the drawing, and are sufficiently heavy to draw the amount of yarn from the supply, that is necessary to form the loops as they drop after being raised by the slurs d d. The sinkers are made thin above the line 10 so that the projection will drop freely between the needles a a; also that the needles may pass freely between the sinkers.

The stops v v fastened to the top of the top bar i prevents the traversing slide h from going farther than it is carried by the slipping slide f.

The half jacks e e e e are made in the form of a sinker below the line 10 and have the stoppers n n n n fastened to them, which

allows them to drop low enough to turn the slurs d d.

There are two rollers p p upon which the fabric knit is wound as represented by the red lines Fig. 5. The pivots of the rollers p p turn in the slides p' p' fastened to the ends C C. Upon the ends of the rollers p p are ratchet wheels r r which are held by the pawls r' r'. As the fabrics are knit they are drawn down by the weight rollers a a which lay on the fabrics.

In Fig. 6, the levers K K, needle bars K' K', and needles a a, are represented by black lines in a position to receive the yarn from the carrying needles g g; and by red lines as being nearly drawn out as in the act of drawing off the loops; and in the same drawing the red lines represent the pressers N N as nearly drawn down, to press the barbs of the needles into the grooves. One of the sinkers is represented as being raised by the slur. I contemplate making the sinkers of such a size and weight as may be necessary to form the loops of the yarn knit, let it be coarse or fine, and to vary the size and proportions of the other parts of the machine, as may be expedient or necessary, to facilitate its operations, and adapt it to the kind of work, for which it is intended.

Operation: To set the machine at work set the levers G G and the arms 4 4 in about the same position that they are represented in Fig. 5. Some spools of yarn should be suspended over the machine, to supply the carrying needles g g, which should be threaded as represented by the red lines t t, and the ends of the yarn drawn between the stop bars 9 9, and the combs b b. The pulley E being turned in the direction pointed by the arrow, it turns the pinion E', which turns the wheel F and main shaft F', and wheels S and S', and shaft T, rollers T' T' which act upon the wedges U U, and operate the lever U', which turns the vertical shafts V V by the chains 6 6. The vertical shafts V V turn the pulleys W W, which operate the slurs d d, by the chains X X, and raise the sinkers m, m, so that the carrying needles g, g, operated by the pulleys W' W' and chains 7 7 carry and deliver the yarn under the projections e' e' upon the sinkers, when the slur allows each sinker to drop to the falling-bar, and draw from the carrying needles g, g, the supply of yarn required to form a loop, before the succeeding sinker is allowed to descend at all, or come in contact with the yarn, so as to hinder the yarn from being drawn freely by the sinkers that the slurs have passed and permitted to fall. When the slurs and carrying needles have passed across, and delivered a supply of yarn, and the sinkers have formed loops, the rollers G' G' act under the lifting pieces H H and raise the slides H' H'; and the studs

J J which raise the short arms of the levers K K; and the long arms draw out the needle bars K' K' and needles a a. The teeth of the combs b b now hold the yarn in every
 5 space between the needles, and make a series of loops half the length, but double the number of those made by the sinkers. The loops thus formed may now be threaded with a string or wire, or fastened to the edge of a
 10 piece of cloth, so as to be drawn down between the combs b b and the stop bars 9 9, so that as the needles a a pass in the loops thus formed will be retained by the stop bars 9 9, and the needles will slip forward
 15 through the loops as they pass in between the sinkers. The needles having returned to their places as the operation proceeds, the slurs raise the sinkers, the carrying needles deliver the yarn (as heretofore described)
 20 and form a new series of loops, which are held by the sinkers so as to be drawn under the barbs of the needles as they are drawn back, and the pressers N N are drawn down (by the presser slides R R, rods R' R' presser bar Q and presser levers P P; by the
 25 action of the rollers O O upon the knobs O' O'), and press the barbs of the needles into the grooves as they are drawn back; so that the old loops held by the combs b b slip
 30 over the barbs and are drawn off, over the heads or ends of the needles. The pressers rise by the action of the springs N' N', and as the needles pass in the stop bars 9 9, retain the loops upon the needles, so that the
 35 needles slip forward through them, to receive more yarn from the carrying needles as heretofore described. The fabrics knit as represented by the red lines are drawn down by the rollers x x which lay upon them; and

are wound up by the rollers p p, which are
 40 turned occasionally by the attendant.

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

1. In a sinker to be used in machines for
 knitting, so constructed as to form the loops
 45 upon the needles used in knitting two separate fabrics, at the same time, and at one operation; and of sufficient weight to draw the requisite quantity of yarn from the supply to form the loops required. 50

2. In a slur to be used in knitting machines so constructed as to let each sinker drop to the falling bar, and draw the requisite quantity of yarn from the supply to form the loop or loops, between the needles
 55 before it allows the succeeding sinker to drop, and act upon the yarn.

3. In a falling bar so constructed that the slurs and slur boxes traverse upon it; instead of traversing a separate bar. 60

4. In the combination of the sinkers, stop bars, combs and needles that traverse so arranged as to knit two separate fabrics at the same time with one and the same set of sinkers, and slur. 65

5. I do not intend to limit myself to the precise construction described in the foregoing specification; but to use such forms of construction as will answer the purpose intended. 70

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

JOHN PEPPER.

Witnesses:

ALBERT N. HATCH,
 ALONZO HAINES.