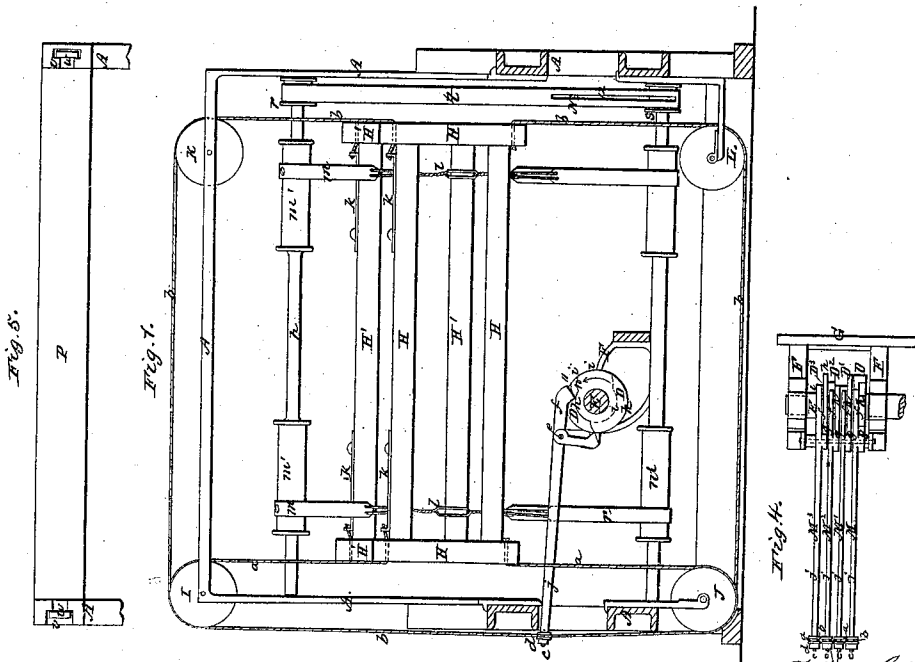
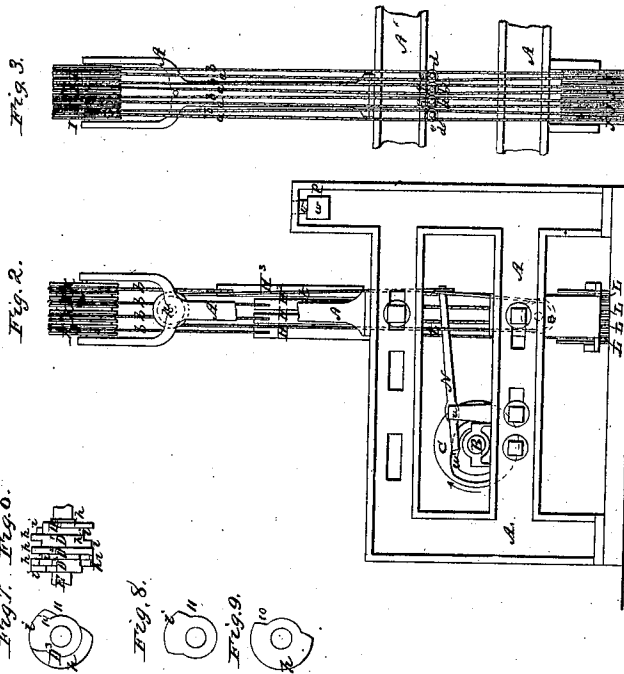


T. Stibbs.
Loon.

N^o 36,178.

Patented Aug. 12, 1862.



Witnesses.
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In witness Thomas Little
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UNITED STATES PATENT OFFICE.

THOMAS STIBBS, OF WOOSTER, OHIO.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 36,178, dated August 12, 1862.

To all whom it may concern:

Be it known that I, THOMAS STIBBS, of Wooster, in the county of Wayne and State of Ohio, have invented a new and useful Improvement in Looms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a loom taken immediately in rear of the harness-motion, parallel with the leaves of the harness, and exhibiting a back view of the harness. Fig. 2 is a side view of the loom, having a portion of the frame broken away to expose the harness-motion, and having all of the other moving parts of the loom omitted. Fig. 3 is a view of the harness-motion taken at the opposite side of the loom to that shown in Fig. 3. Fig. 4 is a top view of the cams and levers by which the harness is operated. Fig. 5 is a top view of the breast-beam. Fig. 6 is a side view of the harness-cams. Fig. 7 is a front view of one of the cams. Figs. 8 and 9 are views of two portions of the cams separated.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a certain novel arrangement of bands, pulleys, levers, and cams, in combination with the treadle-frames, whereby the operation of the harness for plain or fancy weaving is rendered very easy and free from any jarring motion, and great facility is afforded for its adjustment whenever that is necessary.

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

A A is the ordinary framing of the loom, and B is the shaft, commonly known as the "cam-shaft" or "harness-shaft," occupying the usual position parallel with the front and back of the loom. On this shaft I place the cam C, for operating the selvedge-heddles when the harness-motion is of such character as to require those heddles to be operated separately; but I place the cams D D' D² D³ for working the other heddles on a horizontal shaft, E, which is arranged in front of and at right angles to the said shaft E and parallel with the sides of the loom, in bearings in brackets F F, attached to a bar, G, which is secured to the front and back rails of the loom-framing.

This shaft is driven by bevel-gearing from the shaft B.

H H' H² H³ are the heddle-frames, constructed in the usual manner. One end of each of these frames has connected with it a band, *a*, which passes over a pulley, I, attached to the upper part of the loom-framing on the corresponding side of the loom, and under a pulley, J, attached to the lower part of the framing on the same side. The other end of each heddle-frame has connected with it a band, *b*, which passes upward over a pulley, K, attached to the upper part of the loom-frame, near the corresponding side of the loom, thence across to and over the opposite pulley, I, thence downward to and under the pulley J, thence across to and under a pulley, L, arranged near the bottom of the loom on the same side as K, and thence upward to the heddle-frame.

Four separate pulleys, I J K L, are provided for each heddle-frame. The pulleys K L have each a single groove, as they receive each only a single band, *b*; but the pulleys I J have each two grooves, as each has to receive two cords, *a b*. The two bands *a b* belonging to each heddle are clamped between the pulleys I J by a suitable clamping device, as a screw, *c*, and nut *d*, to the end of one of a series of levers, M M' M² M³, which are arranged one below each heddle-frame on a fulcrum-pin, *e*, secured in the brackets F F, which contain the bearings of the cam-shaft E, and the operation of the heddle-frames is produced by the action of the cams upon these levers, which, by giving the portions of the bands between the outer sides of the pulleys I J an upward or downward movement, makes the said bands give their respective heddle-frames a movement precisely the reverse.

The cams D D' D² D³ are all alike. Each one has two distinct peripheral surfaces, *h* and *i*. (Shown separately in Figs. 7 and 8, and having their relation shown in Fig. 6.) The levers M M' M² M³ are also all alike, each having three arms—viz., two arms, *f* and *g*, arranged in different planes to be operated upon by the two surfaces *h* and *i* of their respective cams, and a third arm, *j*, to which the bands *a* and *b* are connected. The step 11 on the surface *i* is properly formed and arranged to act upon the arm *f* of the lever to raise it, and so depress the arm *j* and cause it

to move both its respective bands *a b* in a direction to raise their respective heddle-frame, and the step 10 on the surface *h* is properly formed and arranged to act on the arm *g* to press it outward from the shaft *E*, and so raise the arm *j* and cause the latter to move both its respective bands in a direction to depress their respective heddle-frame. The other portions of the surfaces *h i* are so formed relatively to the steps 10 and 11 as to permit both arms *f g* of the lever to remain always in contact with the cam, which is thus made to have a positive action without the necessity of any aid from springs or weights. These several cams are respectively arranged to operate upon their respective leaves of harness in such order of succession as the goods to be woven may require.

To raise or lower either end of either of the heddle-frames it is only necessary to unscrew the clamp *c d* and draw that portion of the band *b* or *c* which is connected with that end downward or upward through the said clamp, and then to screw it up again.

When it is desired to draw in a piece, the clamps are severally unscrewed, and the portions of these several bands passing through them drawn down to raise the several leaves of harness to a convenient height for drawing in, and after this has been done they can be quickly readjusted and secured by the clamps. This saves much of the time consumed in drawing in when other harness-motions are used.

To provide for the tightening of the harness, each band *a* and *b* is attached to the upper end of its respective heddle-frame by means of a slide or buckle, *k*, by the adjustment of which the whole length of the band is tightened up. By thus tightening up at one point that operation is performed much more expeditiously than in other harness-motions.

l l are the selvage-heddles, two at each side of the loom, each connected with the opposite ends of two straps, *m* and *n*, which are attached to rollers *m' n'* on two horizontal rock-shafts, *p q*, the latter of which is arranged in fixed bearings in the framing *A*, near the bottom, and the other in fixed bearings in the said framing, near the top, of the loom. The shaft *p* has upon it a pulley, *r*; and the shaft *q* a pulley, *s*, and upon these pulleys run an endless band, *t*, the

front part of which is attached to the front end of a lever, *N*, which is arranged to work upon a fixed fulcrum, *u*, and whose rear end is received within a groove, *u'*, in the cam *C*, before mentioned, and operated upon by the said cam to produce an upward and downward movement of the said lever, by which a reciprocating movement is given to the band *t*, the lever working through a slot, 12, in the said band. The reciprocating movement of the band *t* produces an oscillating movement of the pulleys *r s*, shafts *p q*, and rollers *m n*, and so produces the necessary movement of the heddles *l l*, which, with their connecting-straps, work between the heddle-frames *H H*. The rock-shaft *p* is arranged below the pulleys *I M* and the rock-shaft *q* above the pulleys *J L*, and the said rock-shafts pass between the several cords *a b* without interfering with the operation of the main harness-motion.

To provide for the easy removal of the breast-beam *P*, the upper front portions of the side framing of the loom, between which it is placed are slotted, as shown at *v v* in Figs. 2 and 5, to allow the screw-bolts *w w*, which screw through the framing into the said beam, to pass out of the framing in an upward direction. This allows the breast-beam to be lifted out of its place when the said bolts have been turned far enough to slacken them, and obviates the necessity of taking out the bolts entirely to remove the breast-beam.

What I claim as new is—

1. The arrangement of the bands *a b* and pulleys *I J K L*, in combination with each other and with the heddle-frames of the loom, substantially as and for the purpose herein specified.

2. The arrangement of the cam-shaft *E*, cams *D D' D² D²*, and levers *M M' M² M²*, in combination with the bands *a b* and pulleys *I J K L*, substantially as herein specified.

3. The arrangement of the band *t*, lever *N*, and cam *C*, for working the rock-shafts and rollers which carry the selvage-heddles, substantially as herein specified.

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Witnesses:

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