

UNITED STATES PATENT OFFICE.

WILLIAM P. KIRKPATRICK, OF ARROWSMITH, ILLINOIS.

LOOM.

SPECIFICATION forming part of Letters Patent No. 622,810, dated April 11, 1899.

Application filed April 12, 1898. Serial No. 677,347. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. KIRKPATRICK, a citizen of the United States, residing at Arrowsmith, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in looms; and the object is to simplify the construction of the means for operating the picker-sticks by which the shuttle is impelled or driven through the shed.

With these ends in view the invention consists in the combination, with the vibrating lay-beam and the heddles forming a part of the harness, of the picker-sticks operating in the shuttle-boxes, a vibrating shaft or stem situated between the picker-sticks and having loose connections therewith, a cross arm or rod carried by the vibrating shaft or stem, and push-rods suspended from the heddles and connected with the cross arm or rod and lying in the path of a bar on the lay-beam swords to be acted on alternately thereby for rocking the upright shaft or stem to pull on the cords or connections with the picker-sticks, all as will be hereinafter more fully described and claimed.

The present invention is more particularly designed as an improvement on the shuttle-driving mechanism disclosed by prior United States Letters Patent No. 586,904, granted to me July 20, 1897, by which I dispense with the relatively-complex means for operating the picker-sticks and substitute therefor the simple construction and arrangement of parts outlined above.

To enable others to understand the invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a view, partly in perspective, with certain portions of a loom shown sufficient for others to understand the operation of the working elements. Fig. 2 is a vertical sectional elevation through the lay-beam and the harness of a loom with my improvements in operative relation thereto.

Like numerals of reference denote like parts in each of the figures of the drawings.

1 designates a part of the lay-beam which is carried by the upright swinging swords 2. The heddles of the loom-harness are indicated at 3 and 4 in the drawings, the shuttle-boxes at 5 6, and the picker-sticks at 7 and 8. A part of the loom-frame is also shown by the drawings, the same being indicated at 8'. All of these parts or elements are similar to the devices disclosed by my prior patent, to which reference has been made and which are similar to carpet-looms of ordinary pattern.

In embodying my improvements in the loom I provide a fixed cross-rail 10 on the loom-frame at a suitable point in rear of the harness, and this rail is suitably fixed to the loom-frame. In this rail 10 is stepped or otherwise mounted so as to rock or turn freely a vertical shaft or stem 11, which at its upper end is provided with an angular rod 12, the free end of which terminates in a loop or eye 13.

The picker-sticks for driving the shuttle from one shuttle-box to the other are arranged in horizontal positions at the opposite sides of the loom-frame, the rear ends of the picker-sticks being pivoted at 13^a, while the front ends thereof are adapted to play or vibrate in the shuttle-boxes, as more fully described in my prior patent, to which reference has been made. The picker-sticks and the vibrating shaft or stem are operatively connected together by means of suitable loose connections, such as the cords or ropes 14 15, one of which, 14, extends from the loop of the armed stem to the picker-stick 7, while the other cord 15 extends from the arm of the shaft to the other picker-stick 8.

17 designates a cross-rod which is arranged in a horizontal position below the arm of the shaft or stem, and this rod is rigidly attached at its middle to the shaft or stem to rock or turn therewith. To one end of the cross-rod is loosely connected a pusher-bar 18, to which is connected a suspension rod or cord 19, the upper end of which is connected or attached to the bottom of one heddle-frame. To the opposite end of the cross-rod is attached another pusher-bar 20, which in like manner is suspended by a cord or rod 21, attached to the other heddle-frame.

On the swinging swords which carry the lay-beam is rigidly secured a horizontal rail or batten 22, which is adapted to travel with

the swords and beam, so as to impinge or abut against the free end of the push-bar, which may be presented to the batten by the reciprocating play of the heddle-frames. It is well
 5 known that as one heddle-frame moves down the other heddle-frame is raised, and as the push-bars are suspended from the heddle-frames they play to reciprocate therewith, whereby the push-bars are presented alter-
 10 nately to the batten or rail 22 on the lay-swords by the action of the heddle-frames.

In operation one heddle-frame 4 is raised to lift its push-bar 20 out of the path of the batten 22, while the other heddle-frame 3 is low-
 15 ered to place its push-rod 18 in the path of the batten or rail 22, which as the lay-beam makes its swing toward the harness to beat the weft acts against the push-bar 18 to impel it endwise, and thus turn the cross-rod, which in
 20 turn operates to rock the shaft or stem for the purpose of pulling on one cord 14 to impel the picker-stick 7 in a direction to forcibly throw the shuttle from one shuttle-box to the other and through the shed, the other picker-
 25 stick 8 being moved by a spring 23 to the outer end of its shuttle-box. As the harness shifts to change the position of the heddles the push-bar 18 is raised out of the path of the batten or rail 22 and the other push-bar
 30 20 is lowered into the path of the batten or rail, so that on the next beat or swing of the lay-beam the batten 22 will act against the push-rod 20 to impel it endwise and actuate the cross-rod to turn or rock the shaft 11 in a
 35 reverse direction, thus pulling on the cord 15 to impel the picker-stick 8 against the shuttle and throw it back through the shed, the other picker-stick 7 being returned by its spring 24 to the outer end of its shuttle-box.

40 From the foregoing description it will be seen that the picker-sticks are actuated alternately to impel the shuttle from one box to the other, that the shuttle-driving devices are controlled automatically by the shifting
 45 positions of the heddles, and that the power to actuate the shuttle-drivers is obtained from

the swinging lay-beam. The parts are timed to act in unison, and the entire mechanism is automatic and positive in its action.

It is evident that changes in the form and 50 proportion of parts may be made without departing from the spirit of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is— 55

1. In a shuttle-driving mechanism for looms, the combination of a lay-beam, spring-pressed pivoted picker-sticks, a vibratory shaft arranged intermediately of said picker-sticks, flexible connections between said picker- 60 sticks and shaft, and pusher-bars connected to, and adapted to actuate or vibrate said shaft and to be alternately actuated by said lay-beam, substantially as set forth.

2. In a shuttle-driving mechanism for looms, 65 the combination of a harness, a lay-beam, spring-pressed pivoted picker-sticks, a vibratory shaft arranged intermediately of said picker-sticks, flexible connections between said picker-sticks and shaft, pusher-bars con- 70 nected to, and actuating, said vibratory shaft, and the heddles connected to said pusher-bars, substantially as set forth.

3. In a shuttle-driving mechanism for looms, the combination of the spring-pressed pivoted 75 picker-sticks, the heddles, a lay-beam having the batten or rail, a vibratory shaft having an arm and arranged intermediately of said picker-sticks, flexible connections between said picker-sticks and said arm of said shaft, 80 the pusher-bars suspended from said heddles and connected to a cross-bar fixed to said shaft, and adapted to be alternately actuated by said batten or rail of said lay-beam, substantially as set forth. 85

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM P. KIRKPATRICK.

Witnesses:

R. S. KRUM,
 D. A. TAYLOR.