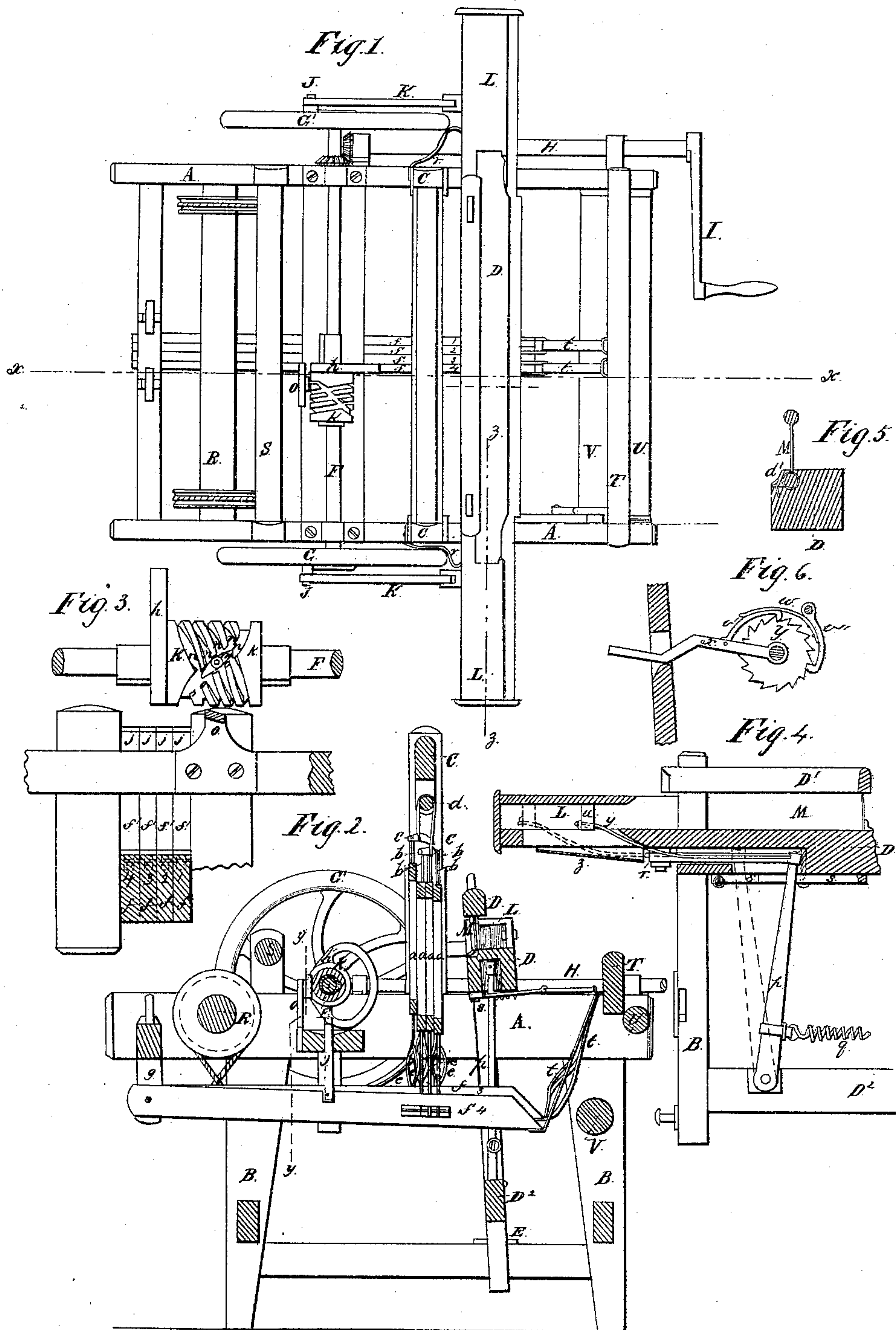


S.C. Mendenhall.
Hand Loom.

N^o 49,044.

Patented Aug. 29, 1865.



Witnesses.
Edward McKnight
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UNITED STATES PATENT OFFICE.

STEPHEN C. MENDENHALL, OF RICHMOND, INDIANA.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 49,644, dated August 29, 1865.

To all whom it may concern:

Be it known that I, STEPHEN C. MENDENHALL, of Richmond, in the county of Wayne and State of Indiana, have made new and useful Improvements in Looms; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a plan or top view of the loom. Fig. 2 is a vertical section on the line $x x$, Fig. 1. Fig. 3 is a vertical partial section on the line $y y$, Fig. 2. Fig. 4 is a vertical partial section on the line $z z$, Fig. 1. Fig. 4 is a transverse section of the reed, showing its mode of attachment to the batten. Fig. 6 is a view of the take-up apparatus of the cloth-beam.

The same letters refer to corresponding parts in the different figures.

The improvements in my machine are as follows: first, in the method of securing the reed to the batten; secondly, in the method of actuating the parts which act in connection with the ratchet-wheel of the cloth-beam; thirdly, in the guide which regulates the action of the picker-block strap; fourthly, in the combination of the devices for securing the vertical motion of the treadles by the rotation of the top shaft.

A A represent the frame of the loom, which is supported on legs B, and in turn supports the harness-frame C. The lay or batten D is pivoted to a cross-bar of the frame by means of the lay-pin in the box E. The lay has a vibratory motion derived from a horizontal shaft, F, supported on the upper part of the frame A. This shaft has fly-wheels G G', and is rotated by bevel-gearing, which transmits to it the motion of the hand-crank I and shaft H. To wrists J J on the fly-wheels are pivoted pitmen K K, which, being secured to the lay, impart to it the vibratory motion described, which has the effect, on its forward motion, of driving the woof-thread into the warp. To the lay D are secured the shuttle-boxes L L and the reed M, the latter of which is fastened between the lay D and the top piece, D'. It is usual to insert the lower bar of the reed into a

groove in the batten; but it has been found difficult so to fit it as to make the requisite finish on the side presented to the shuttle, and I have therefore made a rabbet on the edge of the batten and provided a strip, d' , which fits up against the back of the reed and secures it in position with the face of the reed fitted against the shuttle-race, so that the reed is gripped between the strip d' and the shuttle-race and a space provided large enough to accommodate bars of varying sizes, the object being not to hold the reed by the bar, but by gripping the splits themselves and holding the face of the reed accurately to the edge of the race, so that the shuttle may not be interfered with in its passage. This is a provision for overcoming the difficulty arising from using reeds of different thicknesses.

R is the warp-beam, and S the warp-roller, which supports the warp at that point.

T is the breast-beam, U the cloth-roller, and V the cloth-beam on which the fabric is wound. The motion of the cloth-beam is secured by means of the pawls $v' v''$, the spring w , the ratchet-wheel Y, and the bent vibrating arm x , which latter is pivoted on the axis of the cloth-roller and between it and the frame A, and receives its motion from the lay. This is shown more particularly in Fig. 6, where the crooked arm x is shown passing through a slot in the lay-post, which latter, bearing against the elbow of the arm x , alternately raises it and allows it to drop, so that the pawl v' , which is pivoted to it, acts upon the teeth of the ratchet-wheel to rotate it. The pawl v'' is pivoted to the post of the frame and holds all the motion of the ratchet-wheel which is gained by the pawl v' . The spring w is secured to the pawl v'' and laps upon the pawl v' , and by its inward pressure forces both pawls toward the ratchet-wheel.

The harness-frames a are supported in the usual manner by cords b from the jacks c , which are suspended from the harness-roller d , and at their lower sides are connected by the cords e to the treadles f , which are pivoted to the hanger g from the frame A.

The motion of the treadles is derived from the revolution of the top shaft, F, by means of the impingement of the cam h upon the up-rights j , which are pivoted at their lower ends

to the treadles *f*, which actuate the harness. The treadles are four in number, and, as usual, govern the shedding of the warp.

The cam *h* is attached to the cam-grooved cylinder *K*, and with it has a longitudinal movement on the shaft *F*, while it is prevented from rotating thereon by a feather on the shaft. The cylinder *K* has a number of grooves on its surface, which on one part of its periphery are at right angles to its axis, and at another portion, as seen in Fig. 3, are spiral, so that they run into each other, the outer grooves connecting by means of a cross-groove, so that the swivel or switch *m*, which traverses therein, may pass from one to the other, making the course of the four grooves, and on arriving at the end, by partial rotation on its axis, be deflected into the cross-groove which it is represented as occupying in Fig. 3, and crossing in its passage the two intermediate or middle grooves of the cylinder. The object of this longitudinal motion is to bring the cam *h* in contact with one or another of the uprights *j* consecutively, or in any required succession within certain limits. The motion is obtained by the traversing of the swivel *m* in the grooves *n* of the grooved cylinder *K*. This swivel moves on its pivot so as to accommodate itself to the course of the grooves in the grooved cylinder, but is otherwise immovable, and the grooved cylinder, by rotation, is pushed longitudinally by impingement upon the swivel which is supported by the standard *o* from the cross-bar of the frame, through which the uprights on the treadle are protruded.

It is not believed to be necessary to explain in detail the modes of operating the grooved cylinder so as to produce different styles of weaving by the changes of the warp. The feature of novelty in this part of my loom consists in the mode of actuating the treadles by the rotation of the grooved cylinder through the intervention of the pivoted uprights on the treadles. The uprights *j* are pivoted or hinged to the treadles *f* so that they may be enabled to move vertically as the treadles are depressed by the action of the cam *h*, for were they firmly attached to the treadles they would describe curves and fail in proper presentation to the cam.

On the cross-bar *D*², connecting the legs of the lay *D*, are pivoted the picker-staffs *p p*, whose duty is to throw the shuttle. They are connected by a spring, *q*, which gives to each an inward tendency. On the under side of the lay are two spring-triggers, *s s*, one for each picker-staff, and their object is to retain it when it is drawn back to the position shown in red

lines in Fig. 4 ready to be released for its effective stroke.

The picker-staff is retracted by means of the strap *r*, which connects the head of the picker-staff with the harness-frame, so that the motion of the lay as it retreats from the harness-frame will draw back the picker until it is caught by the trigger *s* underneath the lay.

The pickers are released in the proper succession and time by means of the two trigger-straps *t t*, which are respectively attached to the triggers, and by bifurcation to the four treadles, the bifurcated end of one of them passing to treadles 1 and 3 and that of the other to the treadles 2 and 4, so that whatever may be the motions of the hand-crank, backward or forward, every motion of the pickers is made effective, and two consecutive blows are not delivered from one end of the lay.

The picker-block *u*, which is brought into immediate contact with the shuttle by the action of the picker-staff, is operated by the strap *y*, which attaches it to the head of the picker-staff, and the return motion of the block *u*, which places it out of the way of the incoming shuttle, is obtained by the thrust of the stiff strap *y*, guided by the plate *z*, which keeps it straight. The strap *y* is made of stiff leather, rolled and pressed, so as to give the requisite rigidity to enable it on the return motion of the picker to thrust back the picker-block, assisted by the plate *z*, which is attached to the under side of the shuttle-box in such a manner as to inclose the strap *y* and form a trough or guide to prevent its deflection under the thrust of the picker.

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

1. The described arrangement for securing the reed in the lay, consisting of the rabbet in the latter and the adjustable strip by which the face of the reed is fitted against the edge of the shuttle-race.

2. The combination of the ratchet-wheel *Y*, the pawls *v' v''*, and the spring *w*, arranged as and for the purpose described.

3. The guide-plate *z* on the under side of the shuttle-boxes, and forming a support for the strap *y* when it is brought into action to thrust back the picker-block to its place.

4. The combination of the cam *h*, the pivoted uprights *j*, and the treadles *f*, as and for the purpose described.

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Witnesses:

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