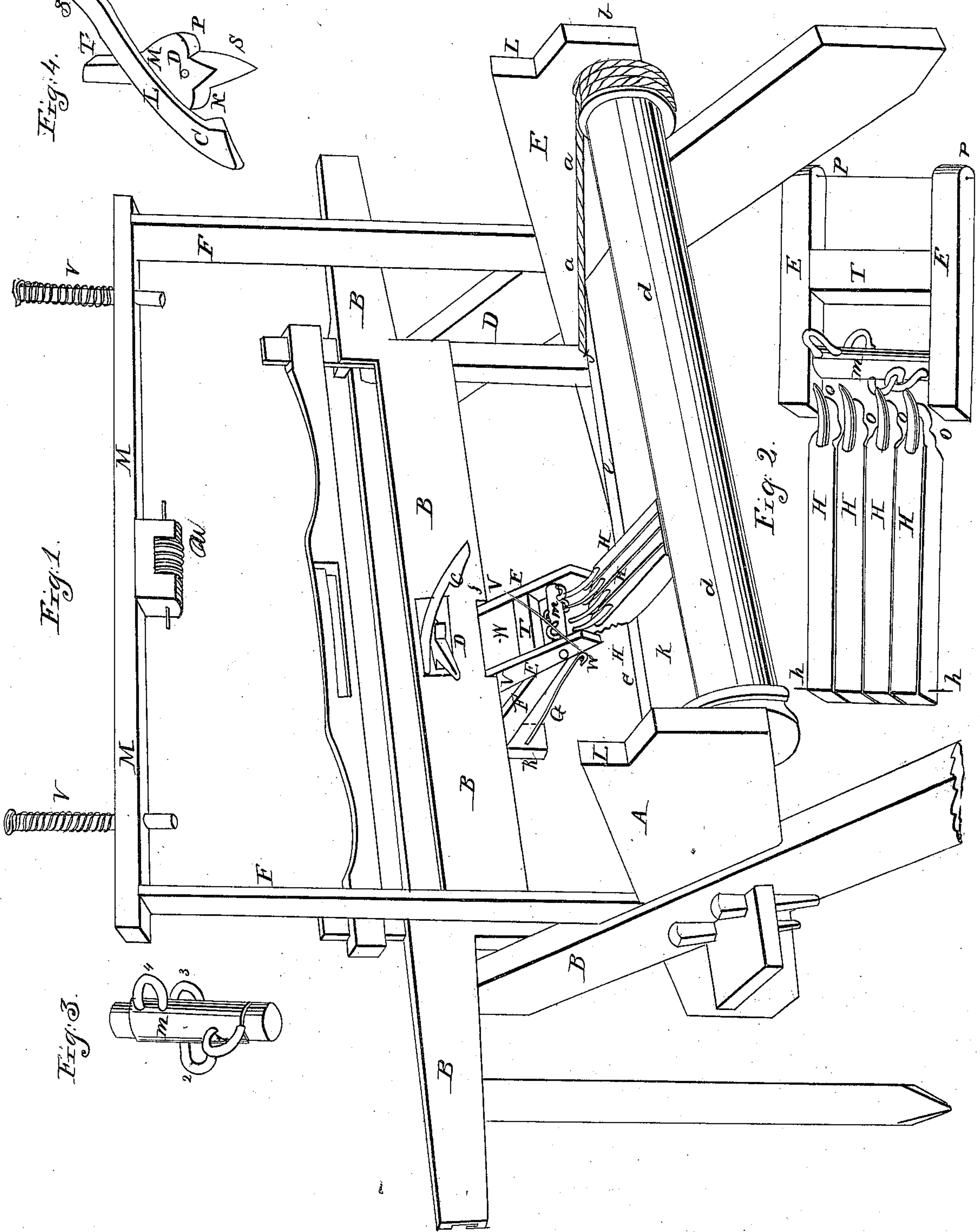
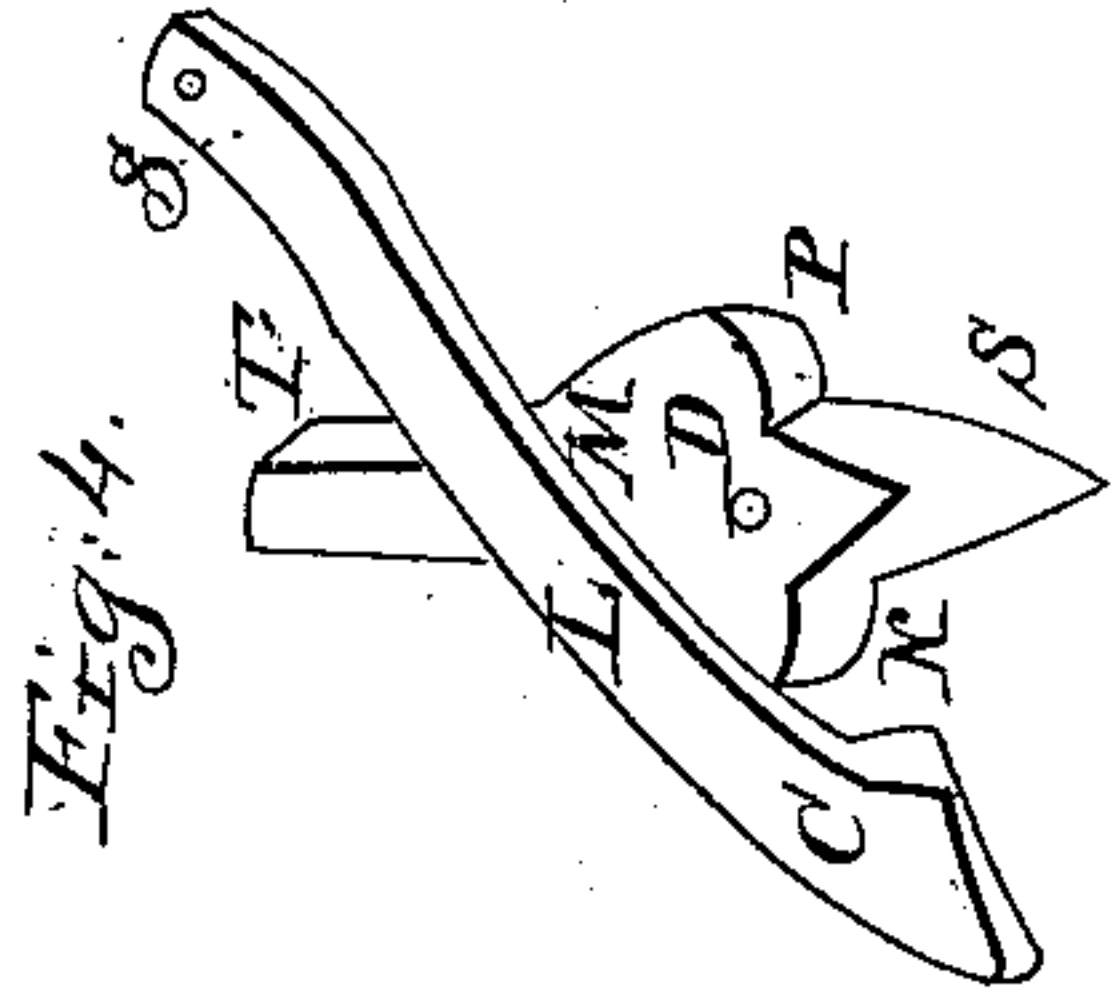


*J. G. Henderson.*  
*Hand Loom.*

*Patented Jan. 1, 1861.*

*N<sup>o</sup> 15.*  
*31,019.*





# UNITED STATES PATENT OFFICE.

JOHN G. HENDERSON, OF PALMYRA, MISSOURI.

## HAND-LOOM.

Specification of Letters Patent No. 31,019, dated January 1, 1861.

*To all whom it may concern:*

Be it known that I, JOHN G. HENDERSON, of Palmyra, Marion county, State of Missouri, have invented a new and useful Improvement in Hand-Looms; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the entire loom from the back part. The back beam is taken off to show the machinery better. It belongs against the end of the side as seen at L, L, Fig. 1. Fig. 2 is a view of the treadles and the machinery for treading them. Fig. 3 is a view of the treader shaft. Fig. 4 is a view of the pickerstaff and driver for throwing the shuttle.

My invention consists chiefly, first, in constructing the back part of the pickerstaff, angular or raised, on the top, and the driver, of the same shape, on the bottom, so that when the shuttle does not go in the box those parts come in contact and turn the pickerstaff, directly forward, against the breast beam, forming a positive stop to the lay; secondly, connecting the beams by an endless rope, or belt, passing around the ends of the yarn and cloth beams, which are so constructed that the rope runs faster around the cloth beam than the cloth will let the cloth beam turn. It therefore has to slip. A lever is used to regulate the tension of the rope, so that when the loom is making cloth the required thickness the beating of the lay, is just sufficient to overcome the friction of the rope, and moves the cloth along as it is woven; thirdly, the shedding the web, by means of a frame, attached at one end to the body of the lay, on a journal which allows it to work back and forth, and at the other end by a journal, to guides, attached to the breast beam, on a journal, or placed on the same journal with the treadles, the frame and guides thus forming two pieces, with a joint, at each end, and a joint in the middle. When the lay is thrown back, this middle joint goes down and comes up again, as the lay comes forward. A little above this middle joint, in the end of the frame farthest from the lay, is placed a shaft, with staples in it, in a spiral form. The treadles are placed on a journal, behind, and come forward with points, that catch in those staples, and are

taken down by them. Those staples, are so arranged, that the taking down of one treadle turns said shaft partly around, throwing out another staple to catch another treadle, and so on until the last staple, completes the revolution of the shaft and throws out the first staple again.

### *Explanation of Drawings.*

The better to illustrate my improvement, I have made a drawing of an entire loom. The frame is constructed in the usual manner.

A, B, D, E, is the frame.

B, B, B, B, is the lay, constructed with swords, shuttle boxes, picker-blocks and straps &c.

K, K, is the tie that holds the frame together.

d, d, is the yarn beam.

e, e, is the cloth beam.

F, F, are uprights, and H, H, the top rail, that holds up the heddles.

The above all refers to Fig. 1, and is common to all looms.

Fig. 4 represents the machinery for throwing the shuttle. M is the pickerstaff, and L the driver. The pickerstaff is placed on a pivot fastened permanently in the bottom of a mortise through the lay, as seen at D, Fig. 1, and passing through it at D, Fig. 4, which allows it to work, right and left. The pickerstraps are attached to the pickerstaff at T, Fig. 4, and attached to blocks sliding in the shuttle boxes in the usual manner.

The driver L, Fig. 4, is fastened to the breast beam, in a mortise, by a pin, passing through the hole S, Fig. 4, which allows it to play back and forth over the pickerstaff. It is constructed with a shoulder, as seen at C, Fig. 4, on the under side a proper distance back, to throw the shuttle at the proper time. When the lay goes back, the shoulder N, on the pickerstaff M, strikes against the shoulder C of the driver L, Fig. 4, throwing the point T of the pickerstaff around, and throwing the shuttle across to the other box. This turns the point S of the pickerstaff to the other side, which guides the driver to the shoulder P at the next vibration of the lay, which turns said point S, again and so on, throwing the shuttle out of one box into the other at each backward vibration of the lay. If however the shuttle fails to go into the box, the point S, of



the pickerstaff, Fig. 4, in order to prevent its being beat up and breaking threads, is made angular and raised, and the bottom of the driver at C, Fig. 4, is made of the same shape, so that when the shuttle does not hold it around those points coming together throw the pickerstaff directly forward, against the breast beam, and prevent the shuttle, from breaking the threads by being beat up by the lay.

The yarn is let off, and the cloth is taken up, by the following process: A rope *a, a*, Fig. 1, is passed around the yarn beam at *b*, Fig. 1, and around the cloth beam at *f*, Fig. 1, and spliced together in the form of an endless belt. The yarn beam *d, d*, is made larger at the end *b*, where the rope goes around, than at *d, d*, where the yarn goes around, as shown at *b*, Fig. 1, and the cloth beam is made less at *f*, where the rope goes around, than at *e, e*, where the cloth goes around. By this arrangement the rope has to run around the cloth beam faster than the cloth will let it turn. It therefore has to slip, and this slipping is made sufficiently hard to beat against in making cloth. A lever is used to regulate the tension of this rope, so that the beating of the lay is just sufficient to turn the beams and passes the web, as fast as it is woven. To make the friction greater, I wrap the rope twice around the yarn beam and three times around the cloth beam.

The shed is produced by means of the treader E, E, guides G, G, treadles H, H, H, H, and shaft M, Fig. 1. The treader E, E, Fig. 1, (and enlarged in Fig. 2,) is made of two pieces E, E, connected by the tie T, and attached to the lay B, B, B, B, Fig. 1, on a journal at V, V, which allows it to work, back and forth. The guides G, G, are attached to the lower or back part of the treader E, E, on a journal, as seen at W, Fig. 1, and also attached (to the down-right R, which is mortised into the breast beam) or placed on the same journal with the treadles H, H, H, H. Those guides cause the lower or back part of the treader E, E, to be elevated as the lay comes forward, and guides it downward as the lay goes backward, causing it to pass up and down as the lay goes back and forth.

In the back or lower end of the treader E, E, Figs. 1 and 2, the shaft M, Figs. 1, 2 and

3, is placed, on journals, so as to turn around. It has staples placed in it in a spiral form, so that when staple No. 1, Fig. 3, is on the back part of the shaft M staple No. 2 is on the bottom, staple No. 3 is on the front, and staple No. 4 on the top. The treadles H, H, H, H, Figs. 1 and 2, are placed on the rod N, N, Fig. 2, which passes through uprights, fastened permanently on the brace K, K, Fig. 1, and come forward and are attached to the heddles by strings, passing around them at O, O, O, O, Fig. 2. These points are ironed and form hooks that stand so that the staples in the shaft M, interlock with the points of the treadles. Consequently when the shaft M, passes down staple No. 1, Fig. 3, catches the first treadle and carries it down with it, at the same time turning the shaft M, partly around, which is prevented from turning back by the catch W, Fig. 1, which is made to spring up on the under side of the shaft M, and therefore holds staple No. 2 out ready to interlock with the second treadle at its next downward motion, which turns the third staple out, and the third the fourth. This completes the revolution of shaft M, and throws out staple No. 1 again, which action repeated takes down the treadles in rotation, producing the shed as required.

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

1. So constructing and combining the pickerstaff M, and driver L, that the staff will stand at right angles to the lay and operate as a stop to the lay when the shuttle fails to box substantially as described.

2. Operating the take-up and let-off motions by the beating up of the web, by means of the endless belt connecting the cloth and yarn beams substantially as described.

3. The combination of the treader E, E, guides G, G, and shaft M, Fig. 1, so arranged that the taking down of one treadle by the backward motion of the lay, turns said shaft M, partly around throwing out another staple, to take down the treadles, in the proper manner to make the required shed substantially as described.

JOHN G. HENDERSON.

Witnesses:

JACOB HICKMAN,  
THOS. E. THOMPSON.