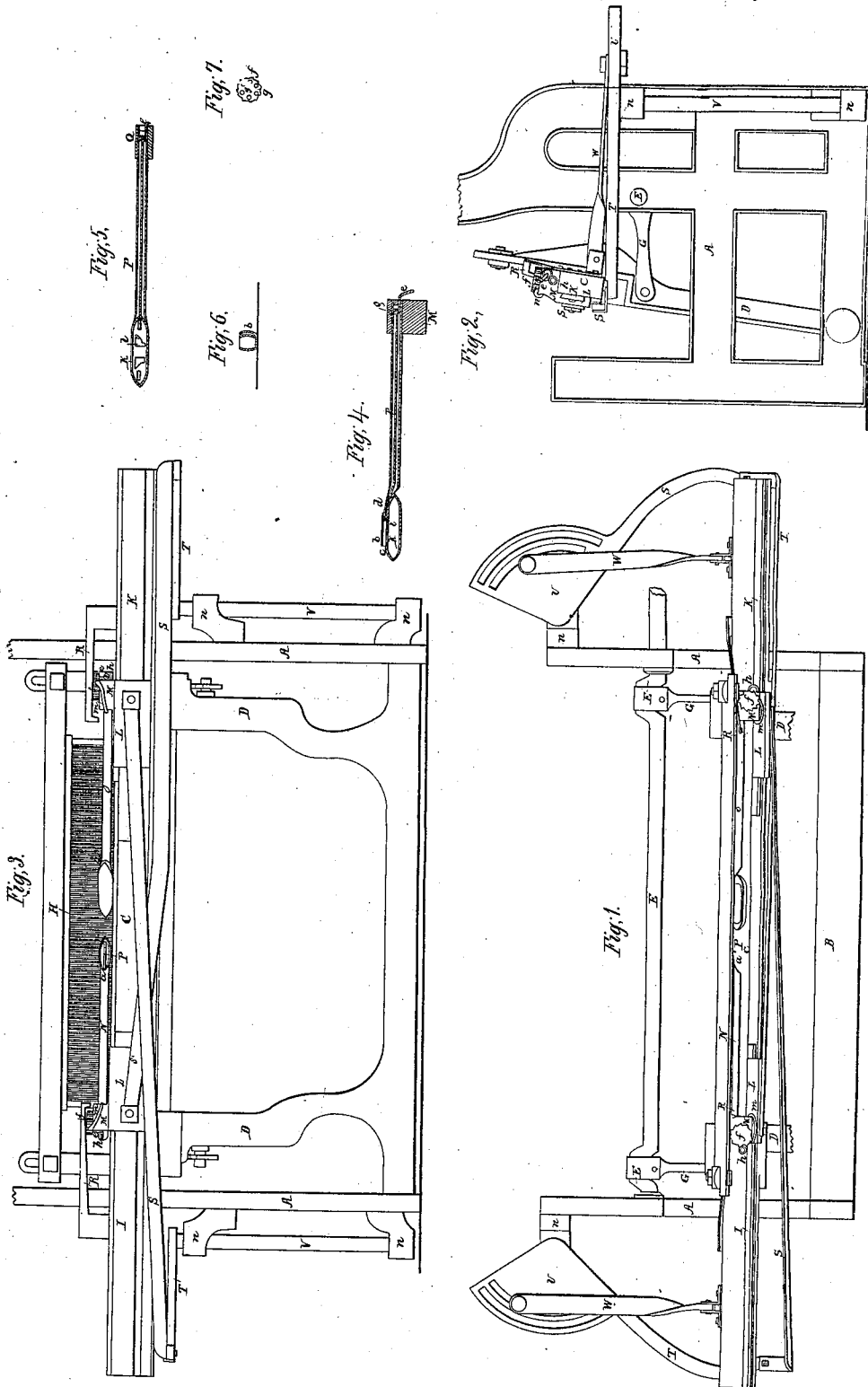


Norfolk, Standley & Marden.  
Shuttle.

Nº 5,450.

Patented Feb. 22, 1848.



# UNITED STATES PATENT OFFICE.

EDWARD L. NORFOLK AND SAMUEL S. STANDLEY, OF SALEM, AND JEREMIAH A. MARDEN,  
OF NEWBURYPORT, MASSACHUSETTS.

## LOOM.

Specification of Letters Patent No. 5,450, dated February 22, 1848.

Be it known that we, EDWARD L. NORFOLK and SAMUEL S. STANDLEY, of Salem, and JEREMIAH A. MARDEN, of Newburyport, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machinery for Actuating the Shuttle of a Loom for Weaving; and we do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of said drawings Figure 1 exhibits a top view of the frame and lay of a loom having our improvement applied to it. Fig. 2, is a side elevation of the same. Fig. 3, is a front elevation of the lay and machinery thereto attached for operating the shuttle. Fig. 4 is a horizontal and longitudinal section of the shuttle and one of the arms, by which it is moved, Fig. 5, is a vertical and longitudinal section of the said shuttle and arm. Fig. 6 is a central and transverse section of the shuttle. Fig. 7 is a view of the underside of one of the ratchet wheels of one of the carriages of the shuttle arms.

In said drawings A, denotes the frame of the loom, B, the breast beam, C, the race beam of the lay; D, D, the swords of the lay; E, the crank shaft of the lay; F, F, the bell cranks thereof; G, G, the connecting rods of the crank shaft and lay.

H is the reed through which the warps pass the whole of the above being arranged and made to operate as in the common power loom.

The race beam of the lay has no shuttle boxes or receptacles affixed on its end, but in lieu thereof it has two long bars I, K, affixed to its front side, in line with one another as seen in Figs. 1 and 3. On each of these bars a carriage L, is arranged so as to slide freely from one end of it toward the other end of it and vice versa. From said carriage a square arm or projection M, extends over the top of the race beam and has a long tube or arm N or O, attached to it and made to project from it and over the race beam, as seen in the drawings, the two tubes or arms being made to point toward each other. The inner end of each of said tubes is beveled off and formed somewhat in the shape of a lance head as seen at *a*, in Fig. 3. It is made to enter and fit a sheath *b*, made on the side of the shuttle, and having two openings *c*, *d*, at the oppo-

site ends of it, as seen in the drawings. Each of said hollow arms N, O, carries a rod or wire P, which extends through it, and has its inner end made in the shape of a right angular hook, (as seen in Fig. 3) which is caused to rest against the lance head. The outer end of each wire P, is inserted and fixed in a cylindric rod Q, which is adapted to the tube or arm so as to easily and partially revolve therein on its axis. From the extreme outer end of said part Q, a small current arm *e*, projects toward the front of the loom, and upward toward and so as to play in contact with the under side of a ratchet wheel *f*, situated and made to turn, horizontally on the top of the arm M. The said ratchet wheel has a series of cavities *g*, *g*, &c., made at equal distances apart in its underside, and arranged in such manner that the curved end of the arm *e*, may, when the wheel is revolved, be caused to play in and out of the same successively. A spring *h* forces said curved arm up against the ratchet wheel.

R is a stationary spring pawl affixed to the lay, and arranged with respect to the ratchet wheel as seen in the drawings. There is one of said pawls to each of the ratchet wheels, and they are intended to act against the teeth of the said ratchet wheels, and partially rotate them, at or nearly at the expiration of the movement of the carriages L L, toward each other.

The hooks of the ends of the wires P, P, should be so disposed that while one of them is turned up in a vertical plane, the other should be turned down into a horizontal one. There are two cavities or holes *k*, *l*, made through the side of the shuttle, and from the interior of its sheath *b*, toward the interior of the said shuttle. They are so arranged that when the two arms N, O, have approached one another to the extent of their motion, they the said holes, shall be in direct opposition with the hooks of the wires P, P, and so that the hook which may happen to be turned down into a horizontal position, may enter the hole immediately contiguous to it, as seen in Fig. 4, it being supposed that the hole has a vertical breadth sufficient to allow of the turning of the hook into and out from it. While the said hook is so disposed in the said hole, the other hook is standing vertically in the sheath, and out of its hole, consequently, if we put

the two rods in motion so as to cause them to depart from one another, one of them will drag the shuttle away from the other and toward its end of the race beam. This being accomplished we will now suppose the arms are caused to approach one another so as to move the shuttle toward the middle part of the race beam, and to make the inner ends of the arms again enter the sheath of the shuttle. When this takes place the hook of the wire P, which previously drew the shuttle toward one end of the race beam, should be raised up into a vertical position, and out of its hole *k* or *l*, and the other hook should be turned down into a horizontal position and be made to enter its hole. It will then follow, that at the next separation of the arms N, O, the shuttle will be dragged in an opposite direction or toward the opposite end of the race beam. The holes *g*, *g*, of the ratchet wheel should be so arranged as to cause the rods P, P, to turn in the manner necessary to cause the shuttle to be alternately operated by the hooks, or dragged over the race beam in the manner described. Each ratchet wheel should have a spring retaining pawl *m*, applied to it to prevent it from being moved around by any extraneous force.

The machinery by which the carriages L, L, are made to approach toward and recede from one another is as follows: Each carriage has a long rod S, jointed to it which extends toward the opposite end of the race beam, and is jointed to one of two long curved arms T, T, projecting respectively from two horizontal sectors U, U, each of which is fixed on the top of a vertical shaft V, which is suitably sustained so as to turn in bearings *n*, *n*, applied to the loom frame. Each of said sectors has one end of a rod or bar W, jointed to it which bar is also jointed at its other end to the lay

of the loom. The said sectors being so connected with the lay, will receive a reciprocating horizontal motion from it, when it is moved forward and backward, and by means of the arms T, T, and rods S, S, the said reciprocating motion will produce the required motion of the carriages L, L. There may be various other modes adopted for moving the carriages. We do not intend to confine our invention to any particular one, but intend to make use of any one which may be convenient.

What we claim as our invention is a combination composed of the following elements or their mechanical equivalents, viz.

1. The sheath (*b*,) and its cavities (*k*, *l*,) applied to the side of the shuttle.

2. The hooked rods or arms P, P, (arranged within or upon the arms N, O,) and mechanism by which they are actuated in the manner as specified.

3. The said arms N, O, and mechanism applied to them for the purpose of causing them to approach toward and recede from one another in the manner as described; the whole of the said combination of parts being made to operate the shuttle substantially in the manner as above explained, and for the purpose of doing away with the usual pickers, picker staffs and straps, etc., such as are in common use, and which are liable to many serious objections well known to weavers, and which are entirely overcome by our improvement.

In testimony whereof we have hereto set our signatures this fifteenth day of May, A. D. 1847.

EDWARD L. NORFOLK.  
SAML. S. STANDLEY.  
JEREMIAH A. MARDEN.

Witnesses:

J. C. PERKINS,  
GEO. F. CHOATE.