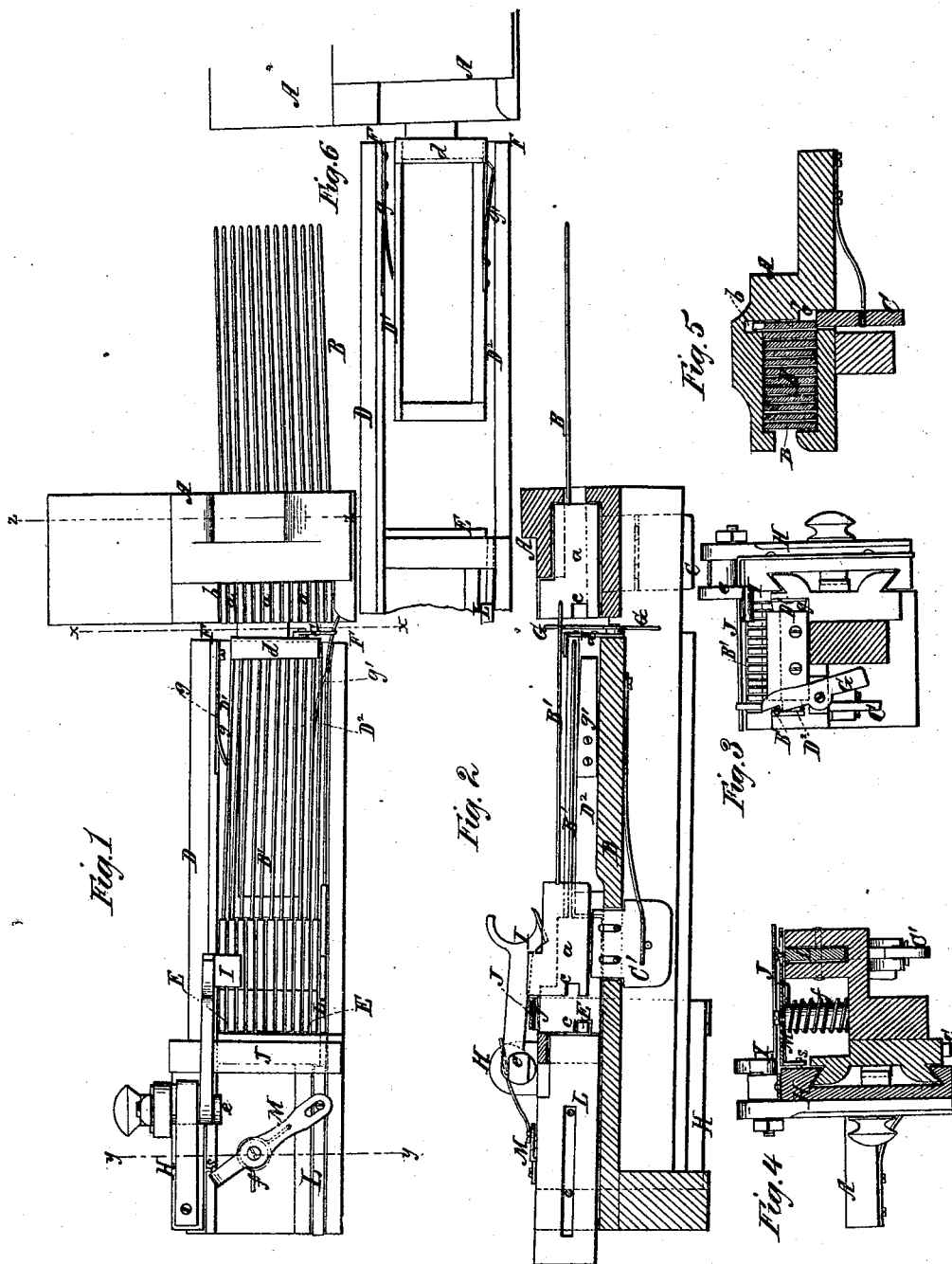


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Loom for Weaving Piled Fabrics.

No. 159,847.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN LOOMS FOR WEAVING PILED FABRICS.

Specification forming part of Letters Patent No. 159,847, dated February 16, 1875; application filed January 19, 1875.

CASE B.

To all whom it may concern:

Be it known that I, STEPHEN SANFORD, of Amsterdam, county of Montgomery and State of New York, have invented a new and useful Improvement in Looms for Weaving Pile Fabrics; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a top view, Fig. 2 a vertical longitudinal section, Fig. 3 a vertical cross-section in the lines *xx* of Fig. 1, Fig. 4 also a cross-section in *yy* of Fig. 1, of my compound wire-holding box and its wires and attachments; and Fig. 5, a cross-section in the line *zz* of Fig. 1. Fig. 6 is a top view of the wire-receiver.

The object of my invention is to avoid in looms for weaving pile fabrics, the necessity of vibrating the bar which receives the respective wires from the piled fabric, and carries the same to the point of insertion, and thus save the time required to make the motions and much of the expense of the machinery required for operating said bar.

The nature of my invention consists, first, in effecting the adjustment of the wires from the point of withdrawal from the fabric woven to the point of insertion into the open shed thereof, with an auxiliary stationary wire-holder, by filling said holder with laterally-movable wires and withdrawing a wire from the shed alongside the said series of wires, so that said wire, by pressing upon the series of wires, causes all of the wires to move laterally, and one of the wires of the series to move into position for being pushed into the open shed, and so on until the operation is stopped.

My invention consists, second, in the combination of the following parts, viz: A stationary wire receiver and holder supplied with a series of wires, an ordinary stationary wire box or holder, which supports the heads of the wires which are in the fabric woven, a withdrawing latch or hook or nipper, and a wire pushing or inserting bar.

By the foregoing main features of my invention the withdrawn wire is carried out into its appropriate place in the receiver, and caused

in its movement to press laterally upon the wires in the first-mentioned receiver and holder, and a wire moved thereby in line with the passage it is to take when inserted into the open shed. The said wire receiver and holder, and the withdrawing catch or latch and pusher may be either constructed in accordance with the style of wire-head and wire-holder which is capable of withdrawing a wire singly and inserting a wire singly without lifting the wires, or the wire boxes might be made with lifters, which raise the respective wires of the respective holders in positions for being caught by the latch or pushed by the pusher, and the first-mentioned box being provided, if desirable and necessary, with an auxiliary pusher, for the purpose of starting the wire in the box preparatory to its being raised, and with a hook or other suitable device for adjusting the points of the wires to the proper position for insertion into the open shed preparatory to the action of the main pusher upon the wires, as will be presently described.

It consists, third, in a stationary supply-wire receiver and holder, constructed with one or more grooves and an intermediate space for wires, said groove or grooves being at a point or points in line with the place or places where the wire is withdrawn from and inserted into the fabric.

It consists, fourth, in the combination, with the supply-wire box, of a holding-down ledge and a spring, whereby the points of the wires are kept in proper position after the wires are received into said box or holder, and during the operation of forcing them to the side, where they are inserted into the fabric.

It consists, fifth, in the combination of a spring with the supply-wire box and the groove thereof, along which the wire passes for being inserted, whereby the point of the wire is held up while being moved by the pusher, and the head of the wire is allowed to move the required distance without obstruction.

It consists, sixth, in the combination of a hook or other suitable device with the wire box for directing the point of the wire which is ready to be inserted to a position for entering the open shed prior to the action of the main pusher upon the wire.

It consists, seventh, in a notch formed in the end of the head of the wires, in combination with a ridge or projecting tongue on the stationary supply wire-box, whereby the wire heads are guided and held down in proper position while moved laterally to the point of insertion.

It consists, eighth, in an auxiliary pusher for starting the wire far enough to allow the hook to take hold of the point of the wire to be directed into the shed.

A represents an ordinary wire box or holder for supporting the heads *a* of the wires B which are in the fabric woven. The box and its wires, as shown, are constructed on a plan which renders necessary the use of a slide, C, for lifting each of the wires separately at the point *b* of withdrawal of the wires, so that the withdrawing-latch may take hold of the head thereof.

My invention is not confined to this style of holder and wire head, as the wire heads may be stationary so far as any vertical movement is concerned, and be constructed in any of the known ways, and be taken hold of by any of the known withdrawing latches, hooks, or nippers.

Each of the wires B has a notch, *c*, in the end of its head for a purpose presently described.

D is an auxiliary stationary wire box having a channel, D¹, for the heads of the wire to pass through as the wires are withdrawn from the woven fabric, and a channel, D², for the wire heads to pass through as the wires are forced into the open shed. These channels are located, respectively, in line with the places of withdrawal and insertion of the wires, as it is not contemplated to move the wire over to the point of insertion by the ordinary grooved vibrating bar. This box, in order to have its grooves D¹ D² in range with the point of withdrawal of the wires from the fabric and the point of insertion of the wires into the open shed, is made with a bottom equal in width to the bottom of the holder A. This increased width of box accommodates a series of supply-wires, B', and such wires are placed in the box side by side one another, as shown, so as to occupy the whole space thus provided except enough to admit a wire which is withdrawn from the fabric woven. The grooves D¹ D² are formed by vertical cleats projecting up from the bottom of the box D. These cleats only extend from the lower end of the box A to a point where the lower ends of the wire heads terminate in order to leave a transverse passage for the wire heads entirely across the bottom of the box; and they terminate vertically below points where the wires are inserted into the wire heads, so that the wires may lie above the cleats. The head-board of the box has a cleat or tongue, E, extending from it into the box D, and this cleat enters the notches *c* of the wire heads, and thereby acts as a guide to the wire heads as the wires are moved laterally in the box D. On the top of the foot-board, which terminates at both ends short of

the side-boards of the box, so as to form inlet and outlet passages for the wires, a ledge, *d*, is formed to stand above and overhang the foot-board and cleats of the groove and the points of the wires which are in the box D. This ledge does not extend across the inlet and outlet passages in the foot-board, nor over the grooves D¹ D², and therefore the wire heads are not obstructed by it in passing into and from the box D. In the groove D¹ a spring, *g*, is placed. This spring is fastened by its lower end to the side board of the box D, and bears with its other or upper end against the side of the cleat of groove D¹, and thus stands diagonally across the groove D¹. By using this spring the wire heads are permitted to pass through the groove D¹ of the box, and the wires, when fully in the box D, have their points pressed by the spring laterally under the ledge, so that one wire cannot get over or upon another. The points of the wires, by being thus pressed to one side, leave an oblique space below the head of the last-withdrawn wire and the side of the box D for the entrance into the box of another wire when it is withdrawn. In the groove D² a similar spring, *g'*, is placed, but its rear end is attached to the cleat of the groove D², and its front end bears against the side of the box D. This spring holds up and supports the end of the wire which is to be pushed into the open shed, and thus prevents it from falling down in the groove, and, by its elasticity, yields for the passage by it of the head of the wire. The free end of the spring might be bent in form of a V, so as to again cross the groove diagonally, as illustrated by dotted line, and thus facilitate any back movements of the wires, or prevent their catching against the spring when they are being moved backward by hand for any purpose. Between the foot-board of the box D and the head of box A a free space, F, is left, and in this space a hook, G, is arranged for the purpose of forcing out laterally the point of the wire which is to be forced into the open shed, and giving it a proper direction toward the shed. This hook may be attached to the box D, or to any other suitable part of the loom, and is to be operated by a suitable connection of the loom-motion.

I contemplate the use of reciprocating ratchet-bars, or a worm, as an equivalent of the hook for the purpose of moving the points of the wires laterally. The ratchet-bars would be placed directly under the wires, and one would move to the right, while the other would move to the left, and thus the point of one wire will always be kept in position for being forced out laterally. The worm would operate very well, as the wires would rest in the spirals thereof, and be moved sidewise as the worm revolves.

H is a reciprocating slide, dovetailed upon the box D, and carrying a withdrawing-hook, I, and a pushing-bar, J, as shown in the drawings. The hook is arranged on a plane a little higher than the heads of the wires in the

box A, as it passes over the same when it moves forward to withdraw a wire from the fabric woven. The pusher is on a plane a little higher than the heads of the wires in the box D, as it passes over said heads while the wire is being withdrawn from the fabric woven. The hook is shown pivoted at *e*, and acted upon by a spring, but this is only made so for convenience of lifting up the hook by hand.

It is not intended that the wire heads in box A shall lift the latch or hook, although they may be made to do so if deemed desirable.

L is an auxiliary pusher, which slides through an opening in the head-board of the box D directly in line with the groove D². This pusher is connected with a spring-slotted rock-bar, M, which is made to engage periodically, by its free end, with a pin, *s*, of the reciprocating slide H. This bar is pivoted to an extension of the box D, and around the pivot a spring, *f*, is placed, for readjusting the auxiliary pusher after said pusher has moved the wire in range with it a short distance in the box, in order to clear the head thereof from the main pusher, and to adjust the point to a position for its being directed into the open shed.

The wires of the box D are, as shown, constructed to be raised by a lifting-slide, C¹, in front of the main pusher; but this is not always necessary, as the main pusher, the box, hook, and wires may be constructed to operate without requiring this elevation of the wire to take place without departing from the invention I claim. In applying the boxes A and D to a loom, sufficient inclination upward is given to the rear end of the box D to permit the shuttle-box—if a rigid one—to pass under and clear the same. The shuttle-box is also shaped to accommodate itself to the stationary wire box D. A slight lateral deflection from a straight line may also be given to the box D, as it is extended back from the box A, in order to facilitate the entrance of the wire into the open shed. And to further insure the proper entrance of the wire into the open shed it is guided and directed by a guide set between the fabric and the box A, the flexibility and great length of the wire admitting of this; all of which things, however, are not parts of my invention, but simply necessary adjustments and adjuncts in the use thereof on a loom.

The operation of the mechanism, as shown, is as follows: The reciprocating slide, with its latch or hook, moves forward over the highest part of the wire heads in box A, the slide C lifts the shoulder of a wire head behind the hook or latch, the hook or latch takes hold of the wire, and the slide moving back carries the head and wire into the box D and places its head upon the guide rib or tongue E. The pressure of the spring *g*, as the wire is passed

along, forces the points of wire under the ledge *d*, and the pressure of the wire head against the series of wire heads in box D causes all the wires to move transversely in the box D, and the last of the series of wires is thereby moved in range with the auxiliary pusher and the groove D², and the moment the last wire is so adjusted the auxiliary pusher moves forward and starts the wire forward far enough to clear the main pusher. This accomplished, the lifter C raises this wire above the main pusher. At this movement the hook G forces the point of the wire outward for proper entrance into a guide to the open shed, and, this done, the main pusher takes hold of the wire head and forces it completely into the open shed. As the wire passes through the box D it is held up by the spring *g'*, and its head deflects said spring *g'* and passes by it. Thus the operation proceeds until the loom is stopped.

What I claim is—

1. A stationary wire-box, D, in combination with a series of wires arranged side by side therein, as described, whereby each wire, as it is withdrawn from the woven fabric, places a wire in position for insertion into the open shed, as specified.

2. The combination of the following parts in a wire-motion of a loom for weaving pile fabrics, viz., the stationary wire-box D, supplied with wires B', a stationary box, A, which supports the heads of the wires in the fabric woven, a withdrawing-hook, I, and a wire-pusher, J, substantially as and for the purpose described.

3. The stationary receiver and holder D, constructed with one or more grooves, D¹ D², and a bed for wires, B', operating as set forth, substantially in the manner and for the purpose described.

4. The combination of the holding-down ledge *d* and spring *g* with wire-box D, substantially as described.

5. The combination of the spring *g'* with wire-box D, provided with the groove D², substantially as described.

6. The combination of the device G for directing the end of the wire toward the open shed with the wire-box D, substantially as and for the purpose set forth.

7. The rib or tongue on the head of the box D, in combination with the wires B B', having the notches in their heads, substantially as and for the purpose described.

8. In combination with a main pusher, J, the auxiliary pusher L for starting the wire, the two operating together, substantially as described.

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Witnesses:

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