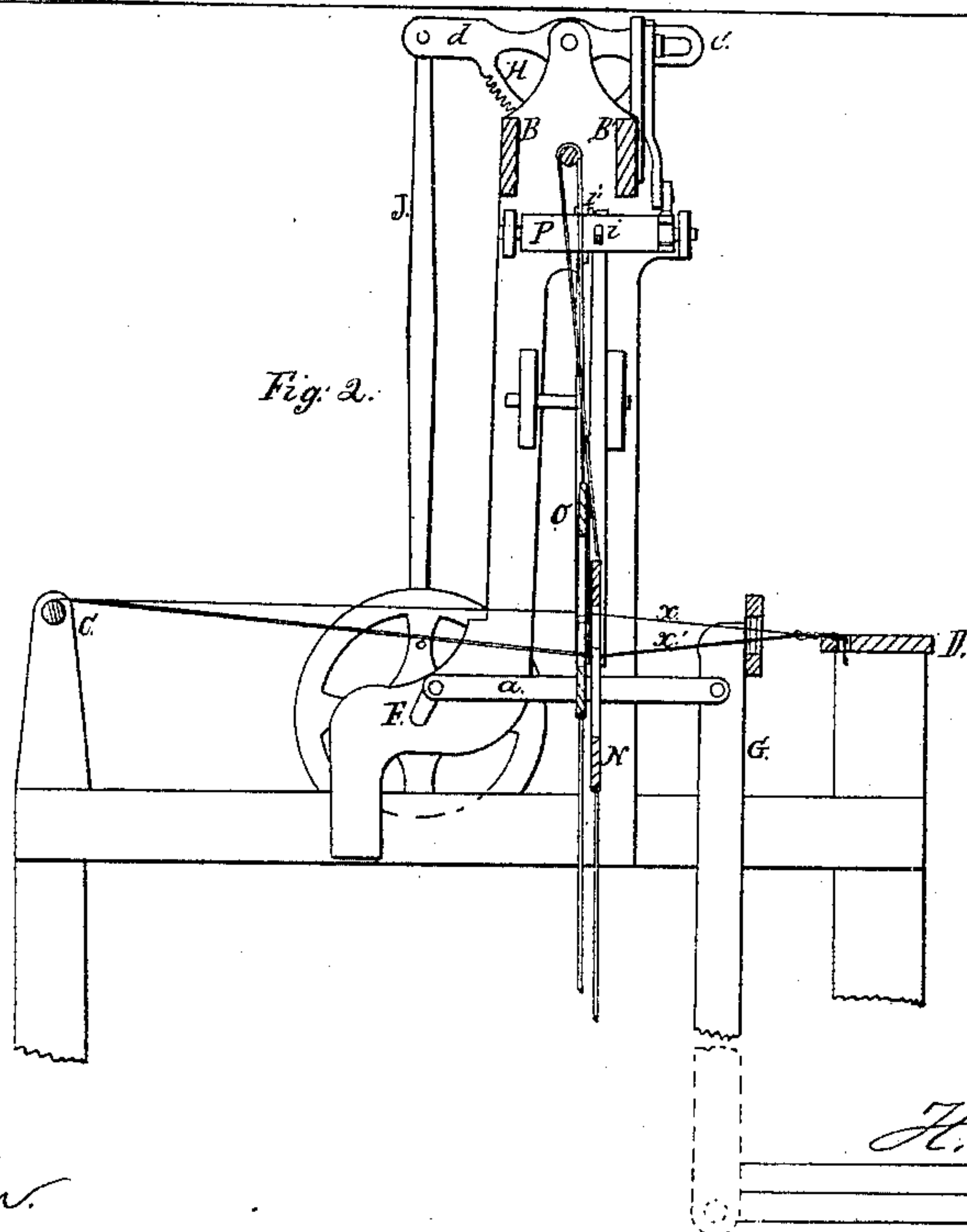


No. 50,990.



Witnesses:  
Wm. Albert Steel,  
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Inventor:  
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By his Attorney.

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# UNITED STATES PATENT OFFICE.

CONRAD RODER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
M. LANDENBERGER, OF SAME PLACE.

## IMPROVEMENT IN LOOMS FOR CROSS-WEAVING.

Specification forming part of Letters Patent No. 50,990, dated November 14, 1865.

*To all whom it may concern:*

Be it known that I, CONRAD RODER, of Philadelphia, Pennsylvania, have invented an Improvement in Looms; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain heddle-frames having eye-pointed thread-guides for carrying the warp-threads, the said frames being operated in the manner described hereinafter, so as to produce ornamental fabrics.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a front elevation, partly in section, of sufficient of a loom to illustrate my improvement; and Fig. 2, a section on the line 1 2, Fig. 1, looking in the direction of the arrow.

A and A' are the side frames of the machine, which are connected together by the cross-pieces B, B', C, D, and E. In the side frames turns the crank-shaft F for operating the lathe G by means of the rods *a* in the usual manner, the lathe carrying the usual shuttle and reed.

To one side of the frame A, near the upper end of the same, is hung a toothed segment, H, the teeth of which gear into those of a pinion, *b*, on the end of the heddle-shaft I, which turns in the opposite side frames of the machine.

At one side of the segment H is a slotted projection, *c*, and at the opposite side a projection, *d*, to which is jointed the upper end of a rod, J, the lower end of the latter being connected to a crank-wheel, K, on the end of the driving-shaft F.

To brackets on the inside of the frame A are hung levers L and M, levers L' and M' being hung to brackets on the opposite frame, and in the lower end of each lever is a recess adapted for the reception of the edge of one of two heddle-frames, N or O, the former being hung to the ends of cords *e e*, which pass around the shaft I, and the latter to the opposite ends of said cords, the levers L' and M' being maintained against the edges of the frames by springs *f*.

To the lower edge of the frame N are connected the ends of the cords *e'*, which are passed round the cross-bar E and connected at their opposite ends to the lower edge of the frame O, this arrangement of the frames in the machine being similar to that of heddle-frames in ordinary looms.

In projections on the inside of the frame A turns a square spindle, P, projections *i i'* on which bear against the upper ends of the levers L and M, and at the end of the spindle is a ratchet-wheel, to which is adapted the hooked end of a pawl, *m*, hung to one arm of a bell-crank lever, Q, the other arm of the latter passing through the slot in the projection *c* of the segment H.

From the upper side of the heddle-frame O, project (downward) a number of thread-guides, *n*, and from the under side of the frame N project (upward) a number of similar thread-guides, *n'*, one of the warp-threads, *x* or *x'*, passing through each of these guides.

As the crank-shaft F is turned the lathe is moved back and forth, a vibrating motion is imparted to the segment H, and the shaft I is rotated first in one direction and then in another, so as to alternately raise and lower each of the frames N and O. As the segment H vibrates a similar motion is imparted to the bell-crank lever Q, the pawl *m* of which gears into the teeth of the ratchet-wheel on the end of the block P and turns the latter one-fourth of a revolution at each vibration. As the projections *i i'* are brought into contact with the upper ends of the levers L and M the latter will be caused to vibrate and impart a longitudinal reciprocating motion to the frames N and O. It will be seen, however, that the projections *i* and *i'* are so arranged that when one of the levers is moved the other will remain stationary, so that the frames N and O are never moved together in the same direction.

When the machine is put in operation and the pawl *m* is thrown out of gear with the ratchet, so that the frames N and O have only a vertical reciprocating motion, the threads *x* and *x'* will be crossed vertically and the shuttle-thread will be thrown between them, as in ordinary looms, the usual woven fabric being produced. When, however, the shaft P is caused to rotate and operate the levers L M



and impart a longitudinal motion to the frames the threads  $x x'$  will be opened for the passage of the shuttle, as before; but prior to the threads being opened in the opposite direction one of the frames, N or O, is moved longitudinally a sufficient distance to carry the upper threads over the lower ones, so that the threads  $x$ , after passing up at one side of the threads  $x'$ , are carried over the latter and pass down on the opposite sides of the same, after which the shuttle-thread is passed between them, as before.

It will be apparent that the style of the fabric may be altered by increasing the length of the projections  $i i'$ , so as to move the frame sufficiently to carry each upper thread over two or more of the lower ones, and that, if desirable, a pattern-chain may be hung to the shaft P, so as to produce fabrics of more elaborate patterns. In some instances, also, two or more frames may be used in place of each of the frames N and O, so that a portion of the lower warp-threads,  $x$ , may be moved in one direction and a portion in another, the upper warp-threads being operated on in a like manner, the character of the fabric thus produced

being determined by the number of frames employed and the manner in which they are operated.

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

1. The within-described combination of a shuttle, the heddle-frame O, with its eye-pointed guides  $n$ , which carry a portion of the warp-threads, and the frame N, with its eye-pointed guides  $n'$ , which carry the remainder of the warp-threads, when both a vertical and lateral motion is imparted to each frame by the devices herein described or their equivalents, for the purpose specified.

2. The combination of the said heddle-frames, the levers L and M, and shaft P, with its projections  $i$ , the whole being arranged and operating substantially as and for the purpose herein described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CONRAD RODER.

Witnesses:

CHARLES E. FOSTER,  
JOHN WHITE.