(No Model.)

W. H. REDDING.

LOOM FOR CROSS WEAVING.

No. 603,287. Patented May 3, 1898.

Fig: 1.

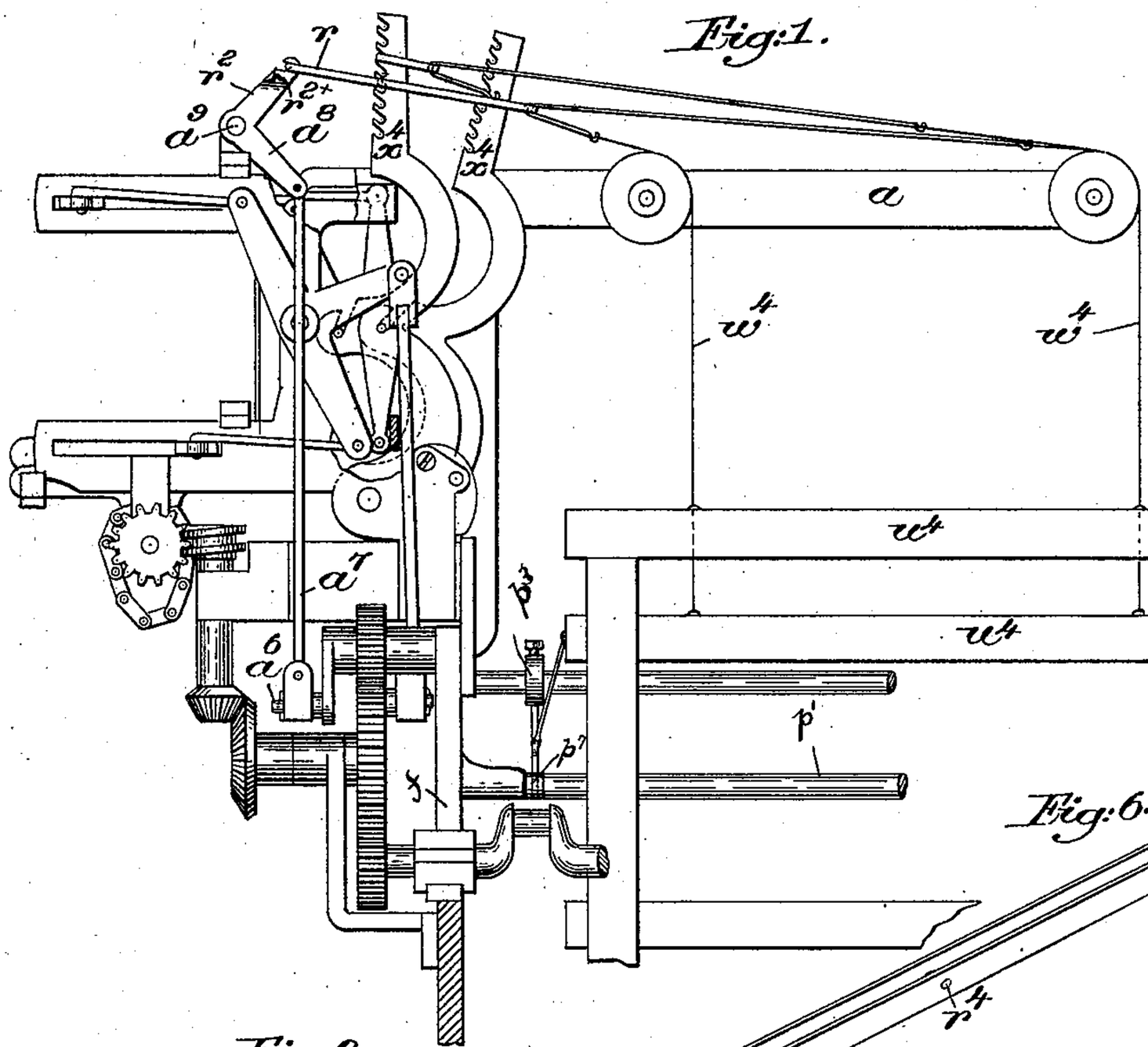

Fig: 6.

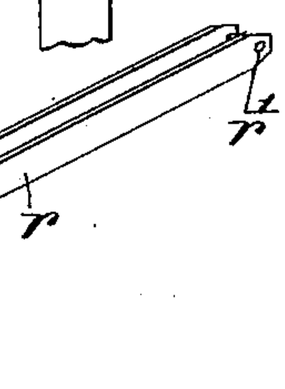

Fig: 2.

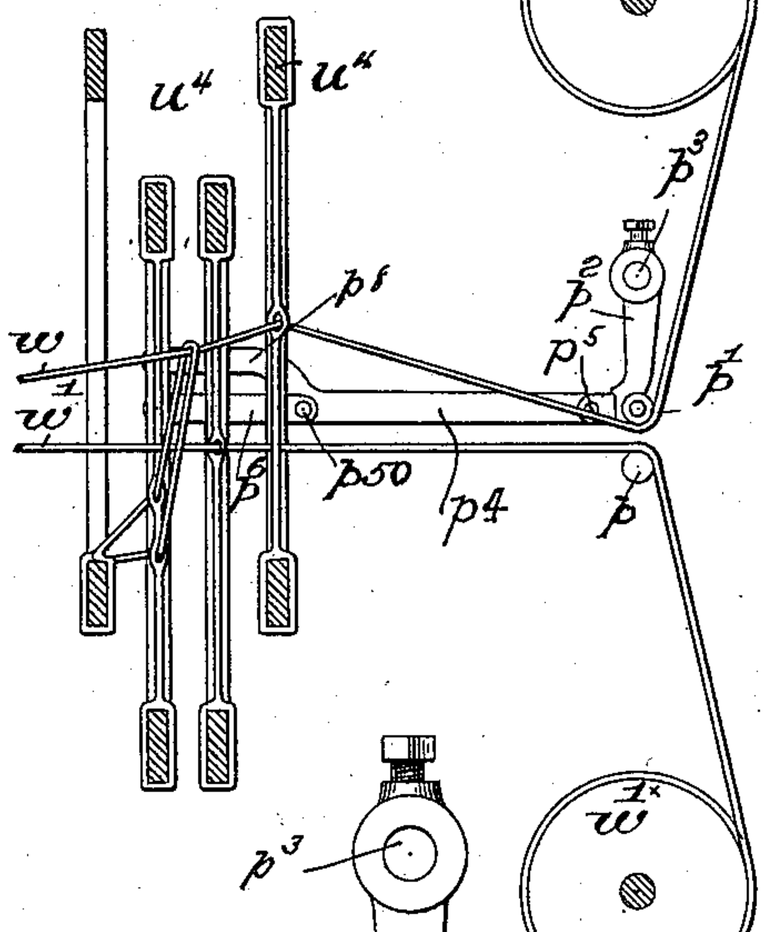

Fig: 3.

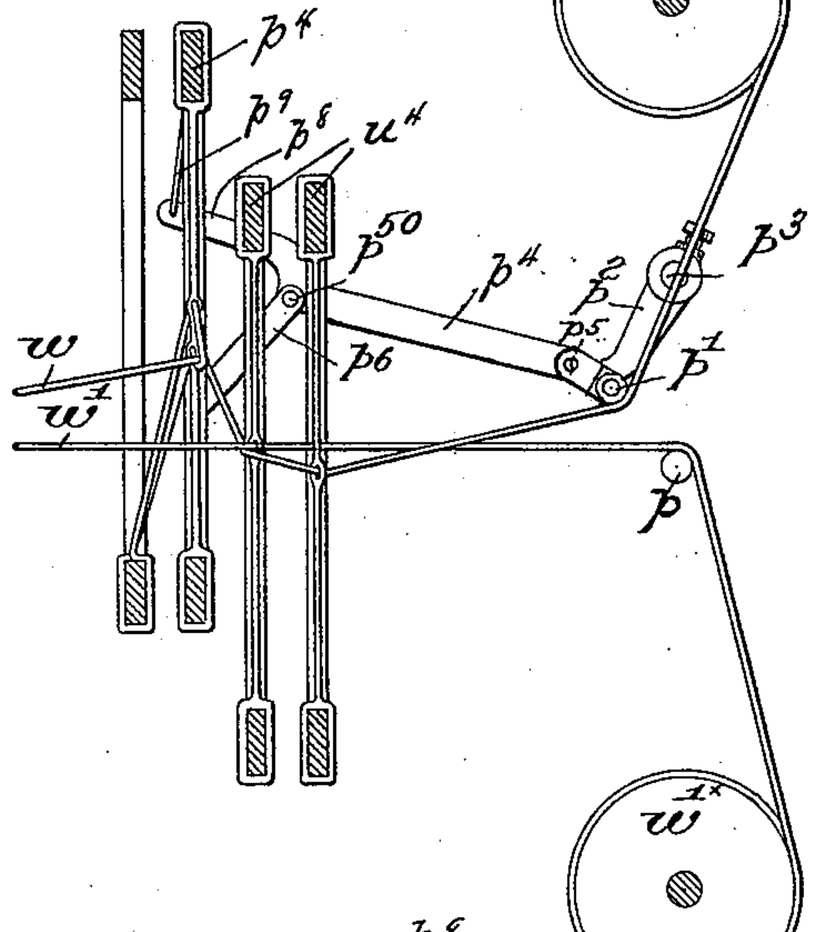

Fig: 4.

Fig: 5.

Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM H. REDDING, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

LOOM FOR CROSS-WEAVING.

SPECIFICATION forming part of Letters Patent No. 603,287, dated May 3, 1898.

Application filed May 15, 1896. Serial No. 591,606. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. REDDING, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Looms for Cross-Weaving, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to looms of the type shown and described in United States Letters Patent No. 488,497, dated December 20, 1892, and employed in cross-weaving or leno-work. In looms of this class the warp-threads are usually divided, those which are to be carried in usual manner through the loom being drawn from a separate beam from those which are to be crossed. These latter threads when drawn from the beam have been passed over a guide or whip roll, made movable and connected with some moving part of the loom to cause it to be vibrated in required manner to give out and take up the warp-threads, as may be necessary to enable said threads to be crossed yet be always maintained under suitable tension.

One object of my present invention is to provide improved means for vibrating the guide referred to or an equivalent guide and for holding the same in position under the tension of the warp-threads drawn thereover.

In the said Patent No. 488,497 one of the harness-frames there shown is arranged to be moved by the usual harness-lever and also by an auxiliary harness-moving mechanism arranged beyond the harness-lever and shown as a rock-shaft provided with a wheel b^5; but this auxiliary mechanism is connected with its harness-frame only through the medium of the harness-lever for that frame, so that the said harness-lever is not only moved at such times as it is to move its frame, but is also moved by the auxiliary mechanism when the latter governs the movements of the said harness-frame, said harness-lever at such times as the frame is moved by the auxiliary mechanism performing no function except that of a medium of connection between the auxiliary mechanism and the frame. To improve this arrangement, my present invention comprehends connecting the auxiliary harness-moving mechanism with any harness-frame to be moved thereby in a manner which will enable said frame to be moved by said auxiliary mechanism without moving the harness-lever for that frame, at the same time permitting such harness-frame to be moved by its harness-lever without moving the auxiliary mechanism, all as will be hereinafter set forth.

In the drawings, Figure 1, in front elevation, shows a sufficient portion of a loom embodying my invention to enable said invention to be understood; Figs. 2 and 3, cross-sectional diagrams showing the parts in different positions; Figs. 4 and 5, side elevation and top or edge view, respectively, of the actuating-levers to be described; and Fig. 6, a detail perspective of the preferred form of connecting means between the harness-lever, the auxiliary harness-moving mechanism, and the harness-frame.

Referring to the drawings, in the embodiment of my invention there shown the frame a, the harness levers or actuators x^4, the straps w^4, harness-frame u^4, the rock-shaft a^9, its lever a^8, and actuating connection a^7, connected with the crank a^6, are and may be of usual construction—such, for instance, as that shown and described in United States Letters Patent No. 488,497, issued December 20, 1892. The warp-threads are shown as divided into groups $w\,w'$, the threads w being drawn from a suitably-located beam $w^\times$, shown as mounted in an elevated position on the loom-frame, the threads w' being shown as drawn from a separate beam $w'^\times$, mounted also in the loom-frame, but beneath the beam $w^\times$. One set of threads, as w', are drawn in usual manner over the guide or whip roll p, mounted in suitable, it may be fixed, bearings in the loom-frame, thence through the eyes of the heddle in the desired harness-frame of the loom. The other set of threads, as w, which are the threads to be crossed, are drawn from the beam $w^\times$ down and about the guide or whip roll p' and thence to and through the eyes in the heddles of the necessary harness-frame u^4.

In accordance with my invention the guide or whip roll p' is made to vibrate herein by mounting the same in the free ends of the

depending arms p^2, fast on the shaft p^3, journaled in the frame, and to the lower end of which I have jointed at p^5 one end of a toggle-lever p^4, jointed at p^{50} to its coöperating toggle-lever p^6, the latter at its opposite end being jointed at p^7 to a fixed support, as the frame f.

The lever p^4 is shown as provided with an arm p^8, which extends beyond the joint p^{50} and is connected by a link p^9 with that one of the harness-frames w^4 which governs or coöperates in governing the crossing of the thread w', thereby constituting one form of means connected with a moving part of the loom for vibrating the whip roll or guide p' through the medium of the toggle-lever described.

When the harness-frame to which the link p^9 is connected is raised, it will operate to buckle the toggle-levers, as shown in Fig. 3, to thereby draw the guide p' toward the harness to give out sufficient length of threads w to enable the same to be properly crossed, as shown in said figure. When the said harness-frame is dropped to its position, Fig. 2, the toggle-levers are restored to their normal position, as there shown, said levers then holding said guide in fixed position.

An advantage of the invention is that when the levers p^4 and p^6 are in their normal position, Fig. 2, they lie in a direct line between the guide p' and the fixed point p^7 on the frame, so that the tension of the threads w, tending at such times to draw the guide toward the harnesses, is received directly by the said pin and the frame or support and not by the harness-frame or part to which it is connected and by which it is operated.

Referring now particularly to Fig. 1, the harness connections w^4 for that frame which is to be moved by the auxiliary mechanism instead of being connected directly with and to be moved by the harness-lever for that frame are, in accordance with one embodiment of my present invention, connected, herein shown by a pin r', with one end of a link-like connection r, shown as rigid in structure and slotted in the form of an elongated loop or made double to straddle the said harness-lever, passing beyond the latter to and connected with an arm r^2, fast on the rock-shaft a^9 of the auxiliary harness-moving mechanism, said link being connected with said arm by a pin r^3. (See Fig. 6.) Intermediate its length, however, and in position close to and at the left of the said harness-lever, Fig. 1, the link r is provided with another pin r^4, so that whenever the harness-lever passing through the link is vibrated it will engage the pin r^4 and, through the latter and the link, raise and lower the harness-frame connected with said link, the latter at such times sliding freely past and without moving the arm r^2 of the auxiliary mechanism. When, however, it is desired to move said harness-frame by the arm r^2 of the auxiliary mechanism, as for a half-and-return movement, well understood by those conversant with the art, said link slides freely past and without moving the harness-lever protruding therethrough. The pins r^3 r^4, constituting independent connections between the auxiliary harness-moving mechanism and frame, and the harness-lever and frame enable the latter to be moved by either said auxiliary mechanism or lever independently and without moving the other. The arm r^2 is shown as provided with a suitable rest $r^{2\times}$ to prevent the link r dropping below its proper position.

My invention in so far as its reference to the connection between the auxiliary moving mechanism, the harness-lever, and the frame is concerned, as well as that relating to the movable guide for the warp-threads, is not limited to the improvement herein shown, for it is evident the same may be varied without departing from the spirit and scope of my invention.

I claim—

1. In a loom, the combination with a vibrating guide and actuating means therefor, of means to at times resist vibration of the said guide, substantially as described.

2. In a loom, the combination with a vibrating warp-guide, and actuating means therefor, of connections between said guide and the loom-frame to relieve said actuating means from the tension of the warp-threads on said guide, substantially as described.

3. In a loom, the combination with the warp-guide, a stationary support and jointed levers connecting said guide and support, of means to relatively move said jointed levers to thereby vibrate said guide, substantially as described.

4. In a loom, the combination with a warp-guide, a stationary support, and toggle-levers connecting said guide and support and normally receiving the tension of the warp-threads on said guide, of means connected with a moving part of the loom to relatively move said toggle-levers to vibrate said guide, substantially as described.

5. In a loom, the combination with the harness-frames, a warp-guide, a stationary support, and toggle-levers connecting said guide and support, of a connection between said toggle-levers, and a harness-frame for moving the former by the latter, substantially as described.

6. The combination with a loom-frame, the harness-frames, the warp-beams, and the warp-guides, one of which is capable of vibration, of toggle-levers connecting said vibrating guide with said loom-frame, and connections between said toggle-levers, and a harness-frame for moving the former by the latter, substantially as described.

7. In a loom, the combination with a harness-frame, its harness-lever, and an auxiliary harness-moving mechanism, of connections between said lever and frame and between the said moving mechanism and frame, for moving the latter by either the said lever

or mechanism without necessary movement of the other, substantially as described.

8. The combination with a harness-frame, its harness-moving lever, and an auxiliary frame-moving mechanism, of a rigid connection interposed between the said frame and said lever and auxiliary mechanism, through which movement is transmitted to said frame by said lever and auxiliary mechanism, substantially as described.

9. The combination with a harness-moving lever, and the auxiliary frame-moving mechanism having an arm, of a rigid link device adapted to be engaged by either the said lever or arm, and when moved by either, having a sliding movement with relation to the other, the harness-frame and connections between the same and said rigid link device, substantially as described.

10. In a loom of the class described, the combination with a harness-actuator, a harness-frame, and harness connections engaging with the said harness-actuator, the said harness-actuator operating to transmit full-length movements to the harness-frame, of devices connected with the said harness connections, to communicate a half-and-return movement to the said harness-frame without imparting movement to said harness-actuator, substantially as described.

11. In a loom of the class described, the combination with a harness-actuator, a harness-frame, and harness connections having an elongated loop to engage with the said harness-actuator, the said harness-actuator operating to transmit full-length movements to the harness-frame, of a half-stroke lifting device engaging with the said harness connections to communicate a half-and-return movement to the said harness-frame, substantially as described.

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

WILLIAM H. REDDING.

Witnesses:

JUSTIN A. WARE,

SAMUEL B. SCHOFIELD.