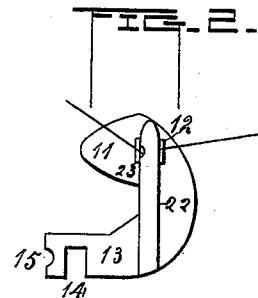
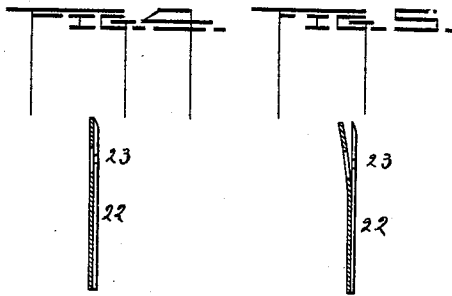
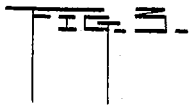
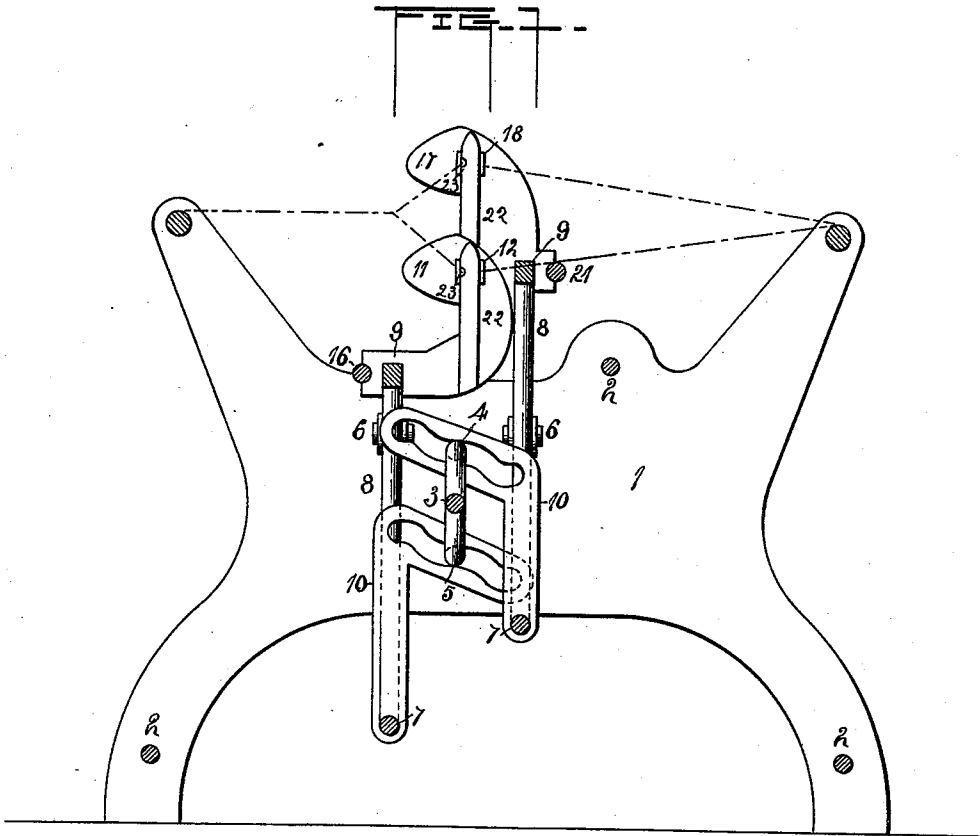


(No Model.)

E. G. JOHANSON.
LOOM.

No. 521,656.

Patented June 19, 1894.



Witnesses
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UNITED STATES PATENT OFFICE.

EMIL G. JOHANSON, OF ROCKFORD, ILLINOIS, ASSIGNOR TO CHARLES
ALSTROM AND OLOF HAGENSON, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 521,656, dated June 19, 1894.

Application filed December 7, 1893; Serial No. 493,051. (No model.)

To all whom it may concern:

Be it known that I, EMIL G. JOHANSON, a subject of the King of Sweden and Norway, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Looms, of which the following is a specification.

The object of this invention is to construct a loom in which two series of fingers constituting the heddles are secured to vertically movable frames actuated by suitable mechanism, each of the fingers having a hooked upper end and a perforation, a spring bar secured to one side thereof overlying the perforation and provided with a notch located over the perforation, in which notches the warp threads rest.

In the accompanying drawings, Figure 1, is a lengthwise vertical section through the loom. Figs. 2, 3, 4 and 5 are representations of the fingers for holding the warp.

The main frame for supporting the operating mechanism of the loom consists of the side plates 1, connected by suitable cross rods 2. A driving shaft 3, is supported by the side plates constituting the main frame, having its center portion provided with two cranks 4, and 5. To the inner faces of the side plates forming the supporting frame for the operating mechanism are secured grooved faced rollers 6, four to each plate and these rollers form the guide way for two rectangular frames composed of a bottom bar 7 and end bars 8, these being of circular form, and a top bar 9, which is square. One of these frames is located in rear of the driving shaft 3, and the other in front thereof, and to the lower bar 7, of each of the frames about the center of their length are connected links 10, having cam grooves as shown at Fig. 1. As before stated the central portion of the driving shaft is provided with two cranks 4 and 5, the crank 4, entering the cam groove of the connecting link of the rear frame, and the crank 5, entering the cam groove of the connecting link of the forward frame. It is evident that if a rotary movement be imparted to the driving shaft the cranks must rotate with it by which reason of their engagement with the connecting links a vertical reciprocating movement will be imparted to the

frames supporting the connecting links, and as the cranks are set opposite each other one of the frames will move upward while the other is moving downward. The cam grooves of the connecting links standing at an angle to a horizontal plane.

At Fig. 2, I have shown a face representation of a finger for holding a warp thread made from sheet metal, and consisting of an upper hook end 11, having a perforation 12, therein, the lower end 13, extending forward provided with a square recess 14, in its lower edge and a semi-circular notch 15, in its front face. A series of these fingers is located upon the upper bar of the front vertically reciprocating frame, the recess 14, receiving the bar 9, and a circular bar 16, lies in the semi-circular notch 15, having its ends secured to the front face of the upper bar 9, thereby forming a connection between the fingers and the vertically reciprocating frame located in front of the driving shaft so that as the frame reciprocates these fingers will be carried with it.

At Fig. 3, I have shown a finger having an upper hook end 17, provided with a perforation 18, its lower end being provided with a square recess 19, and its rear edge with a semi-circular notch 20, a series of these fingers is located upon the upper bar 9 of the rear vertically reciprocating frame by the recess 19, receiving said bar and a circular rod 21, lies in the semi-circular notch 20, having its ends bolted to the rear face of the upper bar of the rear reciprocating frame forming a connection between the fingers and the frame.

In the drawings it will be noticed that the fingers are so located that the front points of the hooks 11, and 17, stand in the same transverse line and that every other finger is secured to the front frame, that is, the fingers are alternate so that every other finger will be secured to the rear frame, consequently each frame carries one-half of the fingers.

To the face of each of the fingers is secured a thin strip of metal 22, having its lower end overlying the perforations 12, and 18, of the fingers, and provided with a semi-circular notch 23, in the front face thereof, the upper end of this metallic strip being free as shown in lengthwise section at Fig. 5, and its ex-

treme upper end being beveled toward the body of the finger. The manner of threading these fingers is shown at Fig. 5, the main portion of the finger being bent laterally which will allow the plate 22, secured thereto, to stand in a vertical position allowing the thread to pass between their meeting faces until it enters the perforations and lies in the semi-circular notch 23, formed in the front face of the metallic strip 22. The main portion of the finger is then allowed to assume its normal position when the thread will move freely through the perforation of the finger, each finger being similarly supplied with the thread, and as the reciprocating frame carrying the fingers moves, a shed will be formed through which the shuttle passes during the process of weaving, and the weft is beaten up to the fell of the fabric by the front points of the hooks 11 and 17 in the vertical movement of the devices employed for shedding the warp.

I claim as my invention—

1. In a loom, a finger for supporting a warp thread made from sheet material, having a hooked upper end, and a perforation, a spring bar secured to one side thereof overlying the perforation and provided with a notch located over the perforation.

2. In a loom, the combination of two series of fingers, each series having a suitable sup-

port, the fingers provided with a hooked upper end and a perforation, a spring bar secured to one side thereof overlying the perforation and provided with a notch located over the perforation forming a guide and support for a warp thread.

3. In a loom, the combination of two series of fingers, each series having a suitable support, the fingers provided with a hooked upper end and a perforation, a spring bar secured to one side thereof overlying the perforation and provided with a notch located over the perforation, forming a guide and support for a warp thread and a shaft provided with a crank for each series by which movement is imparted thereto.

4. In a loom, the combination of two series of fingers, each series having a suitable support, the fingers provided with a hooked upper end and a perforation, a spring bar secured to one side thereof overlying the perforation and provided with a notch located over the perforation, forming a guide and support for a warp thread, the support for each series having a vertical movement, rollers forming guides for the supports and means for imparting movement to the supports.

EMIL G. JOHANSON.

Witnesses:

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