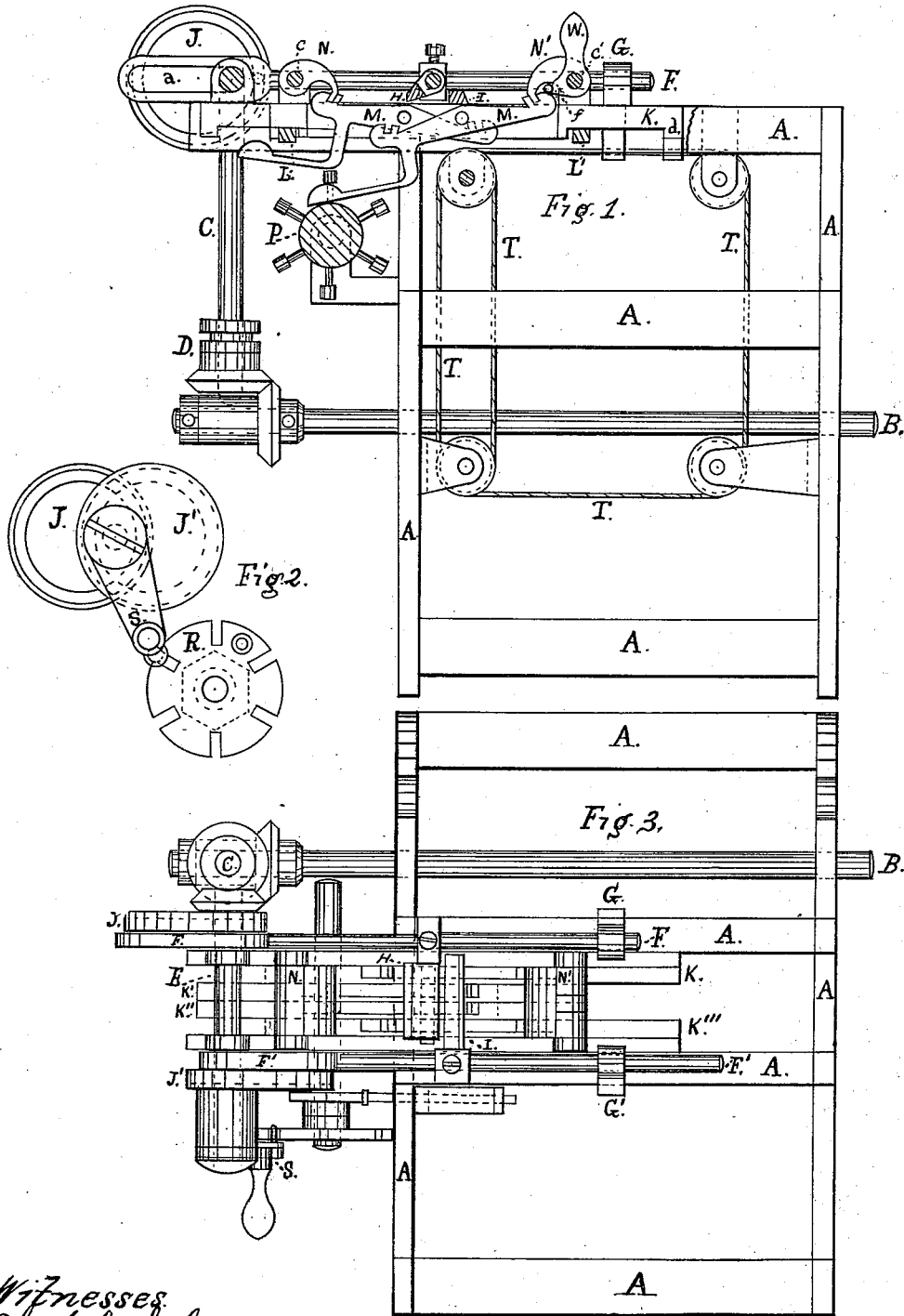


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HARNESSES-MOTIONS FOR LOOMS.

No. 193,782.

Patented July 31, 1877.



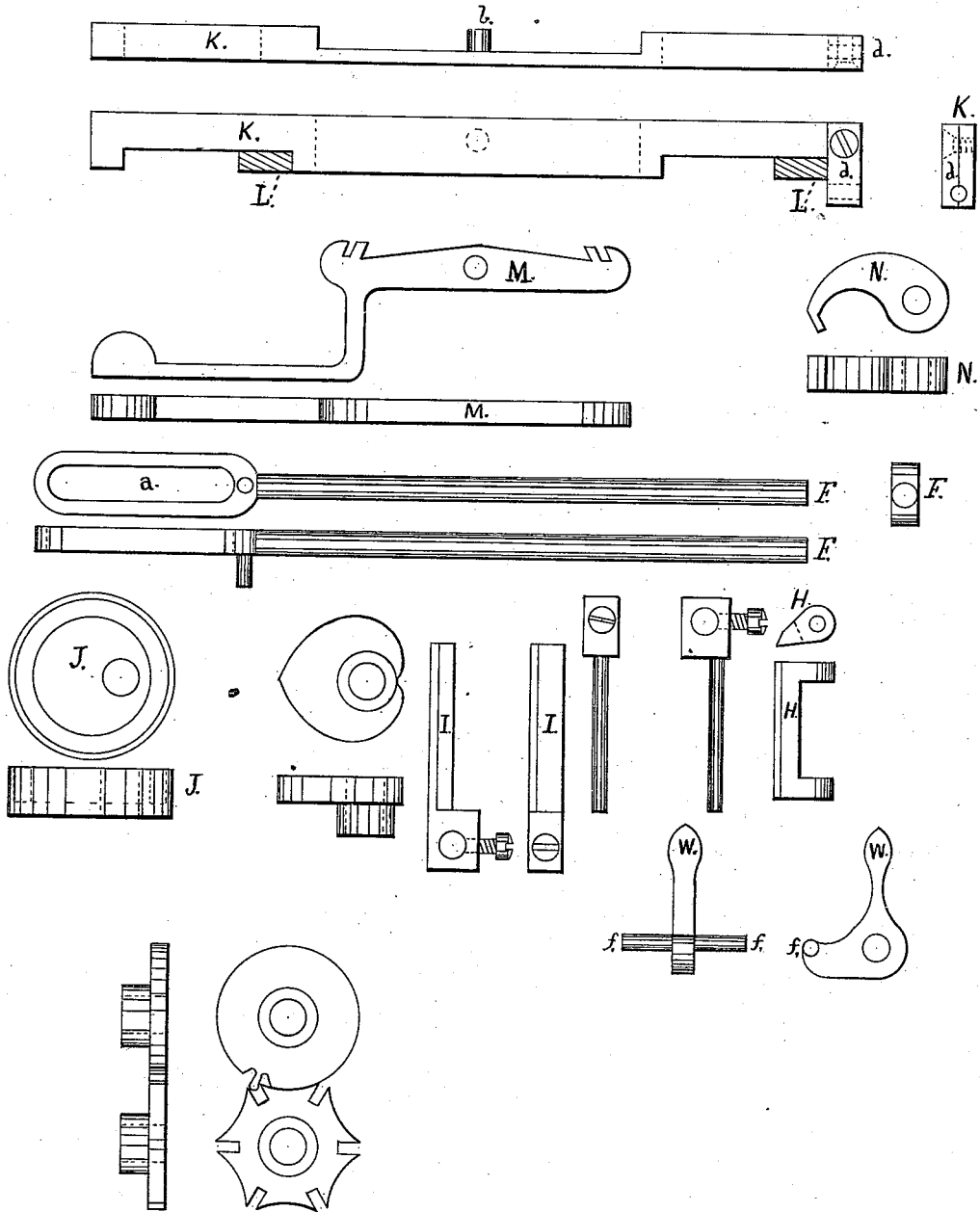
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## IMPROVEMENT IN HARNESS-MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. 193,752, dated July 31, 1877; application filed October 26, 1876.

To all whom it may concern:

Be it known that I, JOHN SHINN, of the city of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Harness-Motions for Looms, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is the construction of an open-shed harness-motion for looms in which the heddles shall be independent one from the other, and the motion capable of being disconnected from the other operating parts of the loom, to be worked by hand backward or forward, for the purpose of removing the filling from the warp in case of defective weaving, or for finding the pick, and also leveling the warp-threads when piecing them through the heddle-eyes.

The invention consists in arranging on the top of the loom a shaft, upon which is fixed two eccentric cams set with their throw to work in opposite directions, and working two sliding bars, carrying one a lifter and the other a depressor, which in turn are engaged with hooks pivoted in horizontal sliding bars. These hooks are constructed with two catches at each end, one for connecting the lifter or depressor, and the other hook or catch for holding the bar and heddles in position until relieved by the pattern device, all as will be hereinafter described.

Referring to the accompanying drawings, making a part of this specification, Figure 1 is a front elevation, showing parts of a loom with my improvements. Fig. 2 is a view of the eccentric cams, crank, and slotted wheel for operating the pattern device. Fig. 3 is a plan or top view of my improvements. The figures in Sheet 2 are parts in detail.

Similar letters of reference refer to like parts.

Previous to describing my invention and referring to the drawings, I would say that, to make the drawings plain, I have broken away parts of the framing and removed some of the parts belonging to Fig. 1 which are shown in Fig. 2; and, in order that the parts may be plainly shown, I have made a second sheet of drawings, in which the parts are shown in detail.

A represents parts of a loom-frame, and is constructed with uprights, as is usual in looms having a fancy harness-motion. B is the main driving-shaft. On one end of this shaft is a miter-wheel, which gears into a corresponding miter-wheel on a vertical or upright shaft, C. On this shaft is a clutch-box, D, by means of which the shaft C is geared and un-gearred to the main driving-shaft B. At the top of the shaft C is fastened a miter-wheel of same size as the one on shaft B. This gears into one of the same size on a shaft, E. The shaft E is set to run in bearings at the top of the loom, as shown in Fig. 3. To this shaft E are fastened two eccentric cams, J J', which set to work or give motion in opposite directions, as is shown in Fig. 2. At the top of the loom are two bars, F F'. These bars are constructed at one end with a slot, a, by which they are supported at that end on the shaft E. The other ends of these bars are made round, and are supported and slide in stands G G'. To these bars are secured a lifter, H, and depressor I. The lifter H is constructed in two pieces. (See Sheet 2.) The arm on which the lifter is fitted is made round, and upon this the lifter H is fitted loosely, and so constructed that in the closing motion of the lifter to the right, if the hooks M have been raised by setting the pattern or otherwise, the lifter H will rise over the hooks, and after passing will fall into its regular working position. It is only free to rise when not engaged in the hooks, or when moving to the right.

K K' K'' K''' are horizontal sliding bars supported on two fixed bars, L L'. (Shown in section.) M represents the double hook-jacks, having a hole in the center, upon which they are pivoted on a stud, b, in the sliding bars K K', &c. N N' are the retaining hooks, which are arranged on shafts c c' in series, one for each end of the hooks M.

W is a handle of a lever, to which is connected, under the hooks N', a bar, f f'. This lever is placed on the same shaft, c', as the hooks N', and should be placed in the center of the series. The form is plainly shown on Sheet 2. P is the pattern-roller with movable screws. In practice I prefer to use the well-known roller-chain. R is a slotted wheel, fixed on the pattern-roller shaft. On the same

shaft back of this wheel is a six-sided plate-wheel. (Shown by dotted lines, Fig. 2.) This plate-wheel is to hold the roller in position in the same manner as in the Jacquard machines. T represents the cords to which the heddles are connected. These cords, one for each heddle-frame, are operated on four pulleys, and the cord for each heddle is one continuous piece. The cords of each heddle-frame are double on the left set of pulleys. (Shown on the left of Fig. 1.) The object is that the two vertical cords on the right of the pulleys will move in the same direction when moving up or down. The cords T may be connected to the sliding bars K by a clip, *d*, (shown in detail on Sheet 2,) or they may be fastened to the ends of the bars K by binding or wrapping with a fine cord.

The method of fastening the heddle-frames to the cords T is fully set forth in a Patent No. 137,252, granted to me March 25, 1873.

It is a well-known fact that eccentric grooved cams, as shown in the drawings, will not give a regular reciprocating motion, but will give a quicker movement when working at the extreme of the throw than when working near the shaft, and in order to give a regular movement I propose to use the well-known heart-shaped eccentric cam, as shown on Sheet 2.

In place of the slotted wheel R and six-sided plate-wheel shown in Fig. 2, I propose to operate the pattern device by the well-known "star-wheel," as is shown on Sheet 2. The use of the star-wheel for operating a pattern device on power-looms is old and well known, (see Patent No. 7,137, 1850,) therefore no further description of the same is here required.

The operation of my improvements is as follows: Motion is communicated by the shafts B and C to shaft E, which gives motion to the cams J J', and they, in turn, give the bars F F' a reciprocating motion. These bars carry the lifter H and depressor I. The hooks M are operated by the movable screws in the pattern-roller P, and when the hooks M are raised by a screw, the hook will be caught by the lifter H, and, when dropped, (a screw being left out,) the hook will be caught by the depressor I, and by them the hooks M will be moved right and left, and as they are forced under the retaining-hooks N they will remain in that position, holding the sliding bars K until changed by the pattern device P. The sliding bars K, as before described, are fastened to the cords T, and they to the heddle-frames. The heddles will be raised or

lowered as controlled by the pattern device, and held open until operated upon for a change, as before described.

In case of an error by the wrong filling having been woven in the cloth, or by reason of a float, shire, or other defect having occurred, thereby necessitating the removal of the filling, it may be done in the following manner: The clutch-box D on shaft C is uncoupled, which disconnects the harness-motion from the other operating parts of the loom, and the shaft E, by means of the crank S, is turned in a direction opposite to that in which it was turning when the filling was put in. The filling may then be removed, thread after thread, in the same order as put in, until the error is reached and corrected. This same arrangement for working the heddles by hand may be used as a pick-finder, it being understood that the shaft E can be turned in either direction, back or forward.

When it is desirable to even the heddles for piecing broken warp-threads, it may be done by moving the handle W to the right, and all the retaining-hooks N' in that series will be raised and disconnected from the jacks M, and all the heddles that are down will partly spring up, owing to the strain on the warp-threads, and by pressing against the ends of the bars K at the right they will be raised to a level with those retained by the hooks N on the left. After piecing the ends, the loom will be ready for starting without adjusting any of the parts.

I claim—

1. A shaft arranged horizontally at the top of the loom, and having fixed to it two eccentric cams, set with their throw to work in opposite directions, each being adapted to work a sliding bar, one carrying a lifter, and the other a depressor, in combination with a series of horizontal sliding bars, upon which are pivoted double-hooked jacks controlled by a pattern device, and by which means the heddles may be moved in either direction, up or down, and held in that position by retaining-hooks N and N', until relieved by the pattern device, as above described.

2. In combination with a series of pivoted hooks or jacks, constructed with two catches or hooks at each end, and controlled by a pattern device, the two series of retaining-hooks N and N', as shown and described.

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