

John Detweiler.

Power-Loom.

118114

PATENTED AUG 15 1871

Fig. 1.

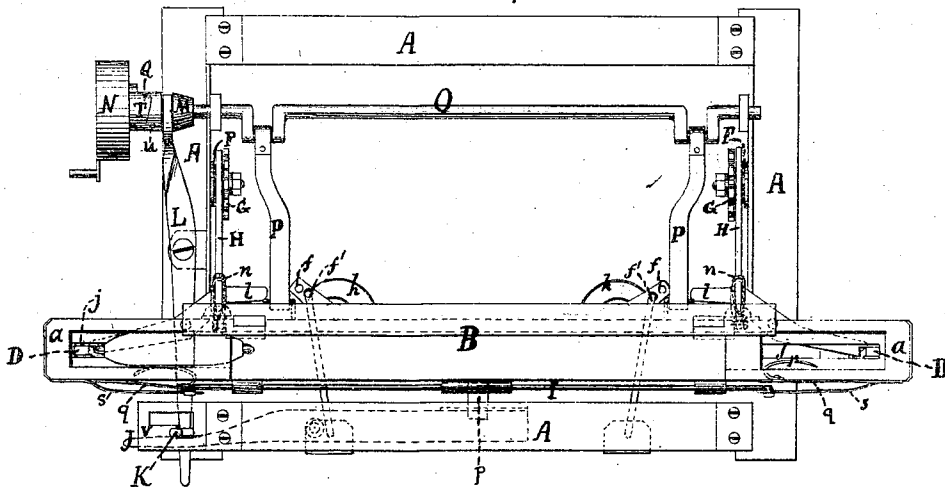
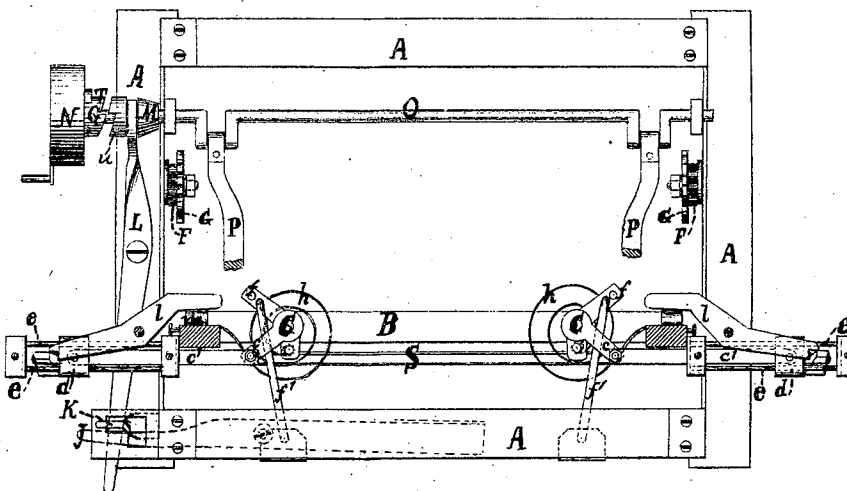


Fig. 2.



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Fig. 3.

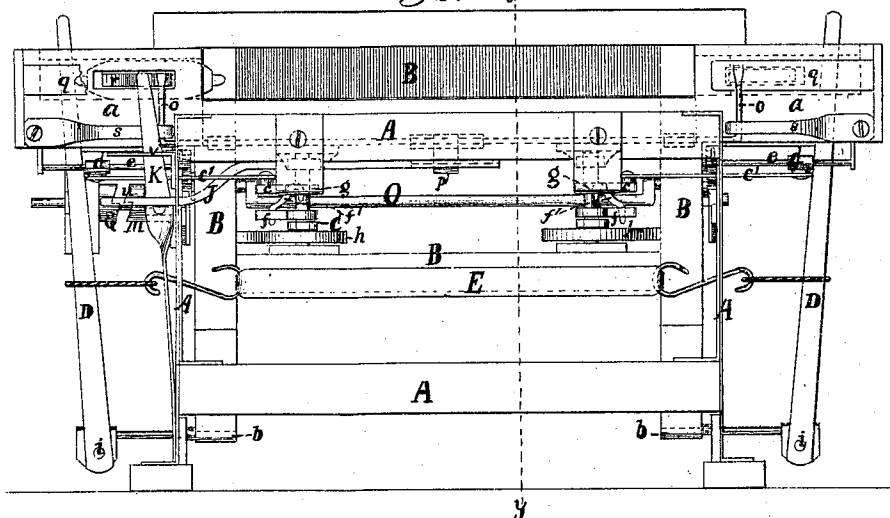


Fig. 4.

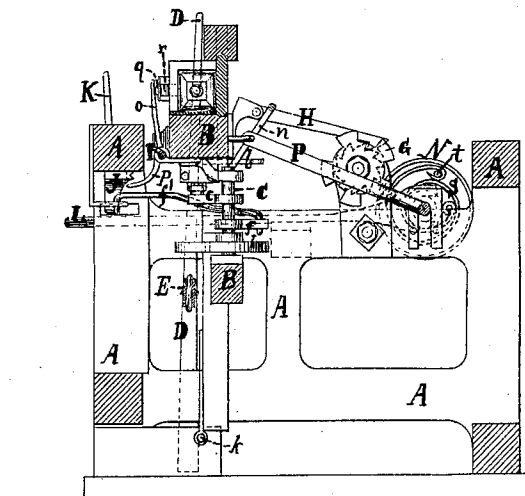
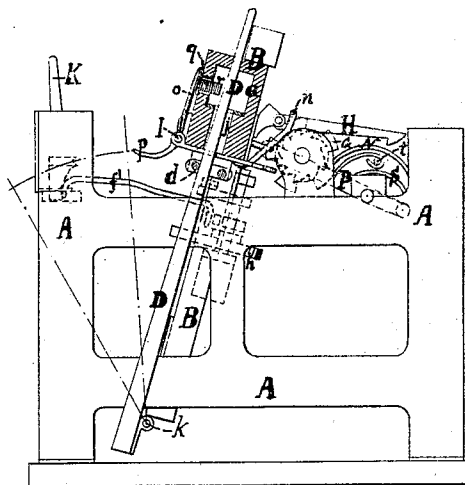


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN DETWEILER, OF WEST LIBERTY, OHIO.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 118,114, dated August 15, 1871; antedated August 11, 1871.

To all whom it may concern:

Be it known that I, JOHN DETWEILER, of West Liberty, in the county of Logan and in the State of Ohio, have invented a certain new and useful Improvement in Shuttle-Movement for Looms; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, in which—

Figure 1 is a top view. Fig. 2 is a horizontal section with the sley-board off. Fig. 3 is a front view. Fig. 4 is a vertical section through the line *y y* in Fig. 3, and Fig. 5 is an end view with section through the sley-bar.

The nature of my invention consists in the construction and operation of the several parts attached to a loom for the purpose of throwing the shuttle to and fro, as will be hereinafter more fully described.

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

A is the frame of an ordinary loom. B is the sley-board, with shuttle-boxes *a a*, and is of the usual construction, having a forward and backward motion on its bearings at *b b*, Fig. 3. Between the sley-board and its cross-tie (which serve as bearings) there extend the perpendicular shafts C. Each shaft has an arm, *c*, Figs. 2, 3, and 4, firmly fixed to it and at right angles. Attached to the outer end of each arm *c* is a rod, *c'*. The bolt securing rod *c'* to arm *c* serves as a bearing on which the rod *c'* may freely turn to accommodate itself to driving the slides *d*, which slide back and forth on the rods *e* secured to the under side of the sley-board, as shown in Fig. 3. The shafts C have each an arm, *f*, fixed to it, and a rod, *f'*, connected with the outer end of the arm *f*, extends to a bearing, *g*, on the frame A, Fig. 4. Each shaft C has one end of a coil spring, *h*, attached to it, and the other end of the spring *h* is secured to the sley-board B, as shown in Figs. 2, 3, and 4. The picker-staffs D have their bearings at *i*, (see Fig. 3,) and extend up between the bars *e* of the slide *d* and through the slot *j* in the bottom of the shuttle-boxes *a*, above the top of said boxes. The bearings *i*, Fig. 3, are the bearings on which the staffs D turn when throwing the shuttle, while the bearing *k* in Fig. 5 is the bearing on which the staff D turns to accommodate itself to the forward and backward motion

of the sley-board. By means of the rubber band E, which is suitably connected to the picker-staffs D, the necessary power to throw the shuttle from one shuttle-box to the other is provided. On the under side of the sley-board the trigger *l* is secured, and by spring *m* is put into position to catch the picker-staffs D, as shown in Fig. 2. In order to alternately operate the triggers *l* there is provided for each trigger a ratchet-wheel, F. These ratchet-wheels have each ten teeth, and are made fast to flange-wheels G, which have five flanges each, and revolve on the same shaft, as shown in Figs. 2 and 4, attached to the frame. To operate each ratchet-wheel F there is provided a ratchet-hook, H, secured to the sley-board, as shown in Figs. 1, 4, and 5. A rubber band, *n*, serves as a spring to hold the hook H in position. A rod, I, suitably secured to and extending along the front of the sley-board from shuttle-box to shuttle-box, with its ends *o* bent up at right angles, as shown in Fig. 3, by means of its finger *p* operating upon lever J, which operates levers K and L, disengages the clutch *u* from the clutch of the drum N, to which the power is applied to the machine, when the shuttle lodges on the sley-board without being thrown into a shuttle-box, as intended; but as long as the shuttle is thrown from one box into the other, as intended, the stop-rod finger *p* will be depressed by the spring *q*, which has a piece, *r*, projecting through the slot in the side of the shuttle-box, which is forced out from the box by the shuttle, as shown in Fig. 4, and the spring *q* forcing the ends *o* of the rod I out from the sley-board will depress the end of the finger *p* so low that it will pass under lever J when the sley-board is moved forward, as shown in Fig. 4. Springs *s*, in Figs. 1 and 3, elevate the finger *p* by pressing on the ends of the rod I, should the shuttle miss being thrown into the shuttle-box. The shaft O is provided with two cranks connected to the two driving-arms or rods P, attached to and driving the sley-board. (See Fig. 1.) The drum or pulley N on the end of shaft O has a spring, S, coiled around the shaft O and in pulley N, with one of its ends attached to a pin, *t*, (see Fig. 4,) and its other end to a collar, T, with a clutch Q. This clutch Q is intended to lock with the clutch *u* of the collar M when the loom is in operation. Collar M is provided with a key-seat, into which a key on the shaft O fits.

My improvement having been constructed as above set forth and properly attached to a loom, the positions shown in Figs. 1 and 4 are assumed by taking the upper part or handle of spring-lever K and forcing it from the position shown in Fig. 3 up toward the loom so as to catch on the catch *v*, as shown in Fig. 1, thereby turning the lever J in position shown in dotted lines in Fig. 1, ready to act the instant that the shuttle fails to pass into the shuttle-box *a*; also forcing the lever L so as to slide and secure the collar M up to the pulley N so as to lock clutch *u* and Q. A belt passing over the pulley N communicates the power which is to operate the apparatus. The collars having been brought together, the power, as it passes from the pulley N, is prevented from being imparted to collar M and shaft O too suddenly by the power first passing through the coiled spring S. The shaft O as it revolves transmits through its cranks the power to the rods P, which then pull backward the sley-board B to which they are attached. As the sley-board B moves backward one side of the machine is operated as follows: As the sley-board moves from the position shown in Fig. 4 to the position shown in Fig. 5, the arm *f*, by reason of its connection with rod *f'*, is held so that the shaft C is made to rotate one-quarter of its circumference, thereby causing the arm *c* to move a distance equal to that traveled by arm *f*. The arm *c* as it moves draws back the slide *d* with rod *c'* so as to give full and unobstructed room for the motion of the picker-staff D. The shaft C as it revolves, as described, also coils the spring *h*. As the sley-board moves back the trigger *l* that secures the picker-staff D in the shuttle-box *a* ready to throw the shuttle is carried against one of the flanges on the flange-wheel G, and, with its spring *m*, is pressed back, so that it (trigger *l*) is drawn from the picker-staff D, and the staff D is sprung by the contraction of the rubber band or spring E, and the shuttle is struck or thrown by the picker-staff D along the sley-board into the shuttle-box on the opposite end of the sley-board. The picker-staff D, just before it has finished its stroke, strikes the slide *d*, which, from its connection through rod *c'*, arm *c*, and shaft C, with coiled spring *h*, yields gradually to the sudden impact of the picker-staff D, and so prevents it from breaking.

While the parts just described are operating as set forth those on the opposite side are worked in exactly the same manner, except that the trigger *l* on that side, instead of striking a flange on the flange-wheel G, and so disengaging the picker-staff D, is allowed to enter a space between two of the flanges on the wheel G. As shown in Fig. 5, the trigger *l* is left set with staff D, and the shuttle pressing up against said staff. As the shuttle enters the shuttle-box the projection is forced out, Figs. 1 and 4, and pushes the ends *o* of the rod I and spring *s* out from the sley-board B, and lowers the outer end of finger *p*, as shown in Fig. 4, so as to be carried below the lever J when the sley-board is moved forward to the position shown in Fig. 4.

The sley-board having fallen back, as repre-

sented in Fig. 5, the forward movement begins, and the side first described above operates as follows: The rod *f'*, resisting the advance of the end of the arm *f* with which it is connected, causes the shaft C, as the sley-board moves forward, to make one-quarter turn, and the slide *d*, through means of the rod *c'* and arms *c*, is pressed along the parallel bars *e* against the picker-staff D, which is thereby thrust back to the end of the slot *j* until the trigger *l* catches the picker-staff D, as shown in Figs. 1 and 2, and the rubber band or spring E is drawn to the proper tension. Just before this is fully accomplished the ratchet-hook H is drawn forward by the sley-board from the position shown in Fig. 5 to the position shown in Fig. 4, and, as it moves forward, hooks into one of the ten teeth on the ratchet-wheel F, which turns the flange-wheel G so as to make it assume the position shown in Fig. 5, ready to permit the trigger *l* on this side of the machine to pass into a space between two of the flanges on wheel G, when this side moves back with the sley-board.

The opposite side of the apparatus operates in the same manner while the sley-board is making this forward movement, except that the picker-staff D is already set or caught by the trigger *l*, and does not move with the slide *d*; and also the ratchet-hook H on this side of the machine, and at the same instant that the other hook H is operating, hooks on one of the teeth of wheel F so as to turn the flange-wheel G from the position shown in Fig. 5 to the position in Fig. 4, and thus present a flange of wheel G, ready to set off the trigger *l* and discharge the picker-staff D when the sley-board comes backward as the side first described above did. These movements are alternately executed by the opposite sides of the machine, and thus performing the function of my improvement in throwing the shuttle.

Should the shuttle be detained on the sley-board between the shuttle-boxes by any means the spring *q* will remain flush with the sides of the boxes *a*, as shown in Fig. 5, and the springs *s* will press both ends *o* of the rod I flat against the sides of the boxes *a*, the flange *p* will be elevated, as shown in Fig. 5, and, as the sley-board moves forward, the point of the disengaged end of finger *p* will describe the curved dotted line drawn from it, as represented in Fig. 5, and strike the lever J, which is shown in dotted lines in Fig. 5. The finger *p*, thus catching against the lever J as the sley-board comes forward, presses the lever J back, and the other end of this lever J throws the upright spring-lever K off catch *v*. The spring-lever K, as it springs back, passes from the position in Fig. 1 to the position shown in Fig. 3, and throws back the end of lever L connected with it, (the lever K,) causing the opposite end of the lever L to withdraw the clutch *u* of the collar M from its engagement with clutch Q of the collar secured to pulley N by coiled spring S, thus instantly stopping the machine. The shuttle can then be properly adjusted before any damage results from the miss-throw.

Having thus fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The perpendicular shafts C, with their arms *c* and *f*, rods *c'* and *f'*, slides *d*, and parallel bars *e*, and coiled springs *h*, constructed and operating in combination with the picker-staffs D and triggers *l*, substantially in the manner and for the purposes set forth.

2. The ratchet and flange-wheels F and G, ratchet-hooks H, and springs *n*, in combination with triggers *l*, and springs *m*, and picker-staffs D, and spring E, when constructed and operating substantially in the manner and for the purposes described.

3. Pulley N, coiled spring S, and collar T, in combination with collar M and shaft O, when constructed and operating substantially in the manner and for the purposes set forth.

In testimony that I claim the above-described certain new and useful improvement in shuttle-movement for looms I have hereunto signed my name this 27th day of October, 1870.

JOHN DETWEILER.

Witnesses:

R. N. JORDAN,
F. W. DRAPER.