R. Lightbown.

Loom.

No. 6,832. Patented Oct. 30, 1849.

Fig. 3.

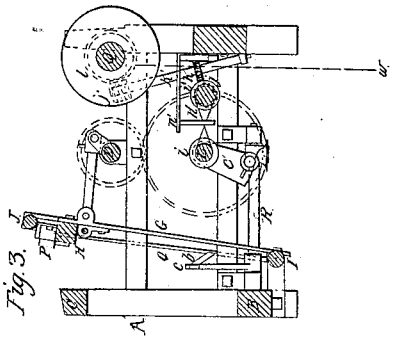


Fig. 6

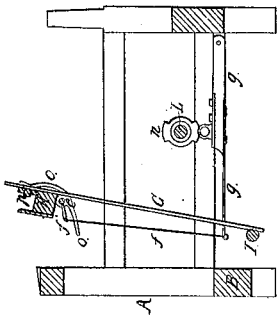


Fig. 5

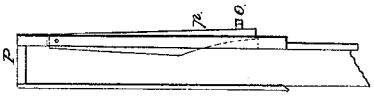


Fig. 2.

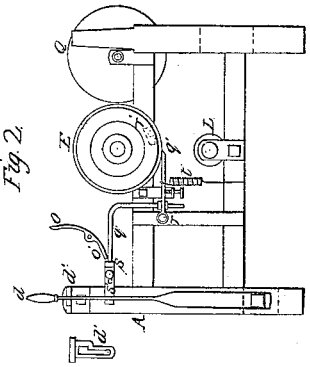


Fig. 1.

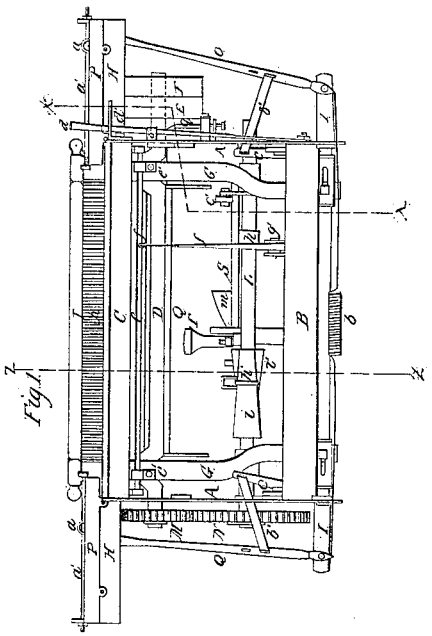
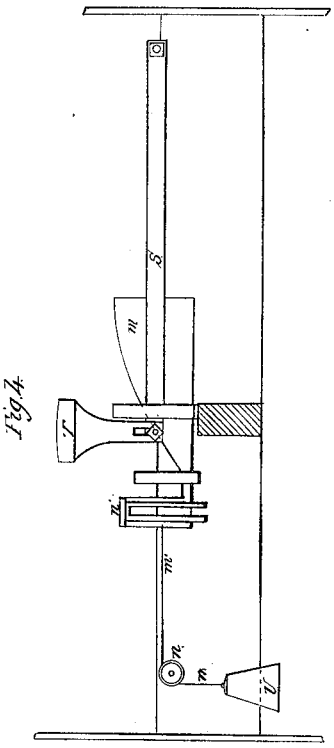


Fig. 4.



UNITED STATES PATENT OFFICE.

ROGER LIGHTBOWN, OF EATON, NEW YORK.

POWER-LOOM.

Specification of Letters Patent No. 6,832, dated October 30, 1849.

To all whom it may concern:

Be it known that I, ROGER LIGHTBOWN, of Eaton, of the county of Madison and State of New York, have invented several new and useful Improvements on the Common Power-Loom; and I do hereby declare that the following is a full, clear, and accurate description thereof, reference being had to the annexed drawings, making a part of this specification, of which—

Figure 1 is a perspective front view of the loom, Fig. 2 is a side view, Fig. 3 is a section cut transversely and vertically on the line, *z*, *z*, of Fig. 1, Fig. 4 is a detached view of the pad-lever and connected regulating parts. Fig. 5 is an enlarged top view of the shuttle box and a shuttle fender connected therewith. Fig. 6 is a sectional detached view of certain parts, cut on the line, *x*, *x*, Fig. 1.

Similar letters refer to the same parts.

The nature of my invention consists of the following improvements on the power loom, viz: First, of an arrangement of a stop-rod in combination with a lever or click that operates on a cam on the fast pulley when the shuttle becomes accidentally entangled in the web and stopped in its passage, and instantaneously stops the driving shaft of the loom, thereby preventing smashes or breakages; secondly, of an arrangement of a spring attached to a treadle, in combination with a cam on the lower shaft of the loom, with fingers or arms on the ends of the stop-rod, and with fenders in the shuttle-boxes, whereby the velocity of the shuttle is checked as it enters the boxes, to prevent it from striking too forcibly against the peckers, while it offers no obstruction to the free passage of the shuttle when driven out of the boxes; thirdly, of the construction and arrangement of two conical pulleys in combination with a sliding wedge or inclined shoe, moved by a weight, and the pad lever, in such manner as to regulate the motion of the warp beam, as the warp is unwound therefrom, in weaving, and the size of the roll is diminished.

To enable others to understand and carry my improvements into effect, I will now describe their construction and operation.

My loom does not differ in construction from the looms in general use, except in those parts which constitute my improvements. For this reason I do not deem it necessary to represent all the working parts of a loom in the accompanying drawings, nor to describe in detail those parts which are not new and are well known. I shall therefore refer to them only so far as required to explain my improvements.

In Fig. 1, of the drawings, A, A, are the two side uprights or standards on the front of the loom; B, is the front cross-beam; C, is the breast beam; D, is the driving shaft; E, the fast and F, the loose pulley; G, G, are the two swords or swing-bars of the lay or batten; H, is the upper cross-bar of the lay, and, I, the lower cross-bar; J, is the lay cap; K, the reed; L, the lower shaft, which receives its motion from the pinion, M, on the end of the driving shaft, D, which meshes into the toothed wheel, N, on its end; O, O, are the pecker-rods; P, P, the shuttle boxes; Q, the warp beam, the upper and lower edges of which only are visible, behind the driving shaft, D, and opposite ends of which are shown in Figs. 2 and 3.

a, *a*, are the peckers, and *a'*, *a'*, their guide rods; *b*, is a coil spring on the under side of the bar, I, which operates on the rods, O, O, and draws the peckers back to their places in the shuttle boxes when they have sped the shuttle; *b'*, *b'*, are straps attached to the arms, *c*, *c*, on the side shafts, R, R, (see Fig. 3,) which work the pecker rods, O, O, the said shafts lying cross-wise of the loom on the inner side of the frame near the bottom, and are operated on by cams, *c'*, *c'*, on opposite ends of the lower shaft, L, as shown in Figs. 3, and 1.

d, is a spring bar or stop rod on the right hand side of the loom, fastened at its lower end to the front standard, A, which is ordinarily held by a notch close to the standard, but may be moved at pleasure in a guide, *d'*, (see detached top view, Fig. 2,) the object of which spring bar is to stop the motion of the loom by hand, when required, as more fully explained subsequently.

e, is a round stop rod which lies lengthwise under the lay bar, H, and rests in brackets, *e'*, *e'*, at opposite ends, on the swing-bars, G, G; *f*, is a strap or cord fastened at one end to the short arm, *f'*, on the rod, *e*, and at the other end to a spring, *g*, connected with a treadle, *g'*, that is operated by a cam, *h*, on the shaft, L, as shown in Fig. 6.

i, is a conical pulley formed on one end of the shaft, L, which gives motion by a crossed band, *h'*, to another conical pulley,

i', lying in the same plane back of it and in a reversed position, as shown in Figs. 1 and 3. On the small end or axis of the pulley, i', is an endless screw, j, which works into a small cog wheel, k, on an inclined spindle, k', on the upper end of which is another endless screw, j', which works into a small cog wheel l, on the end of the warp-beam, Q, which thus receives its motion. m, is a sliding wedge or shoe which lies under and lifts the long pad lever, S, and keeps the pad, T, bearing up against the warp roll as it is unwound, being drawn forward slowly by the weight, U, which is connected with it by the cord, m', that passes over the pulley, n, as shown in Fig. 4.

The operation of this arrangement is important in regulating the speed of the warp-beam, and is as follows:

There is a guide clutch n', which straddles the crossed band, h', as shown in Figs. 1, 4 and 3, and which is connected with the wedge, m, at its toe or point, and as the pad lever, s, is raised by the weight drawing the said wedge forward, with the gradual diminution in size of the warp roll in the process of weaving, the guide clutch, n', moves the band, h', from the base or thick part of the conical pulley, i', toward its apex or thinner part, and up on to the base of the pulley, i, thus increasing the speed of the pulley, i, gradually and concurrently with the decrease in size of the warp roll, and accelerating the motion of the warp beam accordingly, so that it sheds the warp equally fast, from first to last, just as required.

On the ends of the stop-rod, e, as shown in Fig. 6, are slender arms or fingers, o, o, projecting upward, the ends of which lie against fenders, p, p, which are let into slots in the back of the shuttle boxes, P, P, in which they move on a pivot at their ends, as seen in enlarged top view, Fig. 5. When the cam, h, depresses the treadle, g', and the spring, g, the cord, f, draws down the arm, f, and turning thus the stop rod, e, presses the fingers, o, o, against the fenders, p, p; at the moment when the shuttle enters the box, so that the said fenders obstruct the passage of the shuttle and prevent it from striking with too much force against the peckers; and at the moment when the shuttle is driven out of the box by the peckers, the cam, h, having passed and no longer acting on the treadle, g', the spring, g, the cord, f, the arm, f', and the fingers, o, o, the fenders, p, p, are relieved of pressure and allow the shuttle to fly out of the box freely.

On the stop rod, e, on the end at the right hand side of the loom, is an arm or chisel, o', which projects forward on the under side from the base of the finger, o; immediately under it is a crooked rod, q, which is connected by an adjusting screw on one end, to a lever, q', that moves on a pivot or stud, r, fastened to the side of the loom frame, which lever, q', extends under the fast pulley, E, its point coming directly below the center of the driving shaft, D, operating as a click or key upon a ratchet tooth or cam, r', (indicated by dotted lines in Fig. 2,) which is fastened on the inner face of the fast pulley. On the upper end of the crooked rod, q, is a square head, s, which screws on and admits of being adjusted, and which presents a shoulder to the point of the chisel, o', when it is depressed, in the manner to be explained, as follows:

The rod, q, with its head, s, is nicely adjusted under the chisel, o', so that when the lay swings forward in weaving, a slight pressure outward of either of the fingers o, by the shuttle, when in either box, bearing against the fender, p, lifts the point of the said chisel just sufficiently to allow it to clear the head, s; but if the shuttle by an accident of common occurrence becomes entangled in the web and stopped in its passage, its failure to reach the box and press out the finger, o, lets the point of the chisel, o', bring up against the shoulder of the head, s, as the lay comes up, and bear the rod, q, forward, thus raising the point of the lever or click, q', and bringing it against the cam, r', thereby instantly stopping the fast pulley, E, and cutting off the motion from the loom; which is a self-acting operation that effectually prevents smashes or breakages of the web.

Attached to the under side of the click, q', is a coil spring, t, fastened at the lower end to the frame of the loom, which is not powerful enough to resist the action of the chisel, o', when it operates in raising the click, but sufficiently strong to draw the click down and away from the cam, r', the moment the chisel is disengaged from the head, s.

Connected with the head, s, by a screw, is a latch, s', which extends forward and locks or catches on the spring-bar, d; and if this bar be moved, as it may be at pleasure, from a notch in the guide, d', in which it rests ordinarily close up against the side standard, A, (see Figs. 1 and 2,) the latch, s', is drawn forward and with it the rod, q, by which movement the click, q', is raised until its point comes in contact with the cam, r', and produces the same effect, by stopping the fast pulley and the driving shaft, as the self acting operation of the chisel, o', previously described.

Having fully described the construction and operation of my improvements in power looms, what I claim and desire to secure by Letters Patent, is—

1. The cam, r', on the first pulley, E, in combination with the lever or click, q', the

crooked rod, q, the coil spring, t, the catch, s', and the lever, d, constructed and arranged in the manner substantially as described, for the purpose of arresting the motion of the loom at pleasure as herein set forth.

2. I claim the mode of stopping the action of the loom instantaneously by a self acting operation, when the shuttle gets caught in the raceway of the lathe, by means of the chisel, o', on the rod e, catching against the head S, on the crooked rod q, and projecting the click or brake q', against the cam r', on the fast pulley E, in the manner substantially as herein described.

3. I claim the combination of the vibrating lever or treadle, g', and the connected spring, g, with the cord or rod, f, the vibrating fingers, o, o, on the rod e, and the fenders p, p, for the purpose of arresting the momentum of the shuttle as it enters the boxes, the cam h, on the shaft L, operating and giving motion to the fingers, in the manner substantially as described.

ROGER LIGHTBOWN.

Witnesses:
H. M. KENT,
JAMES SHAW.