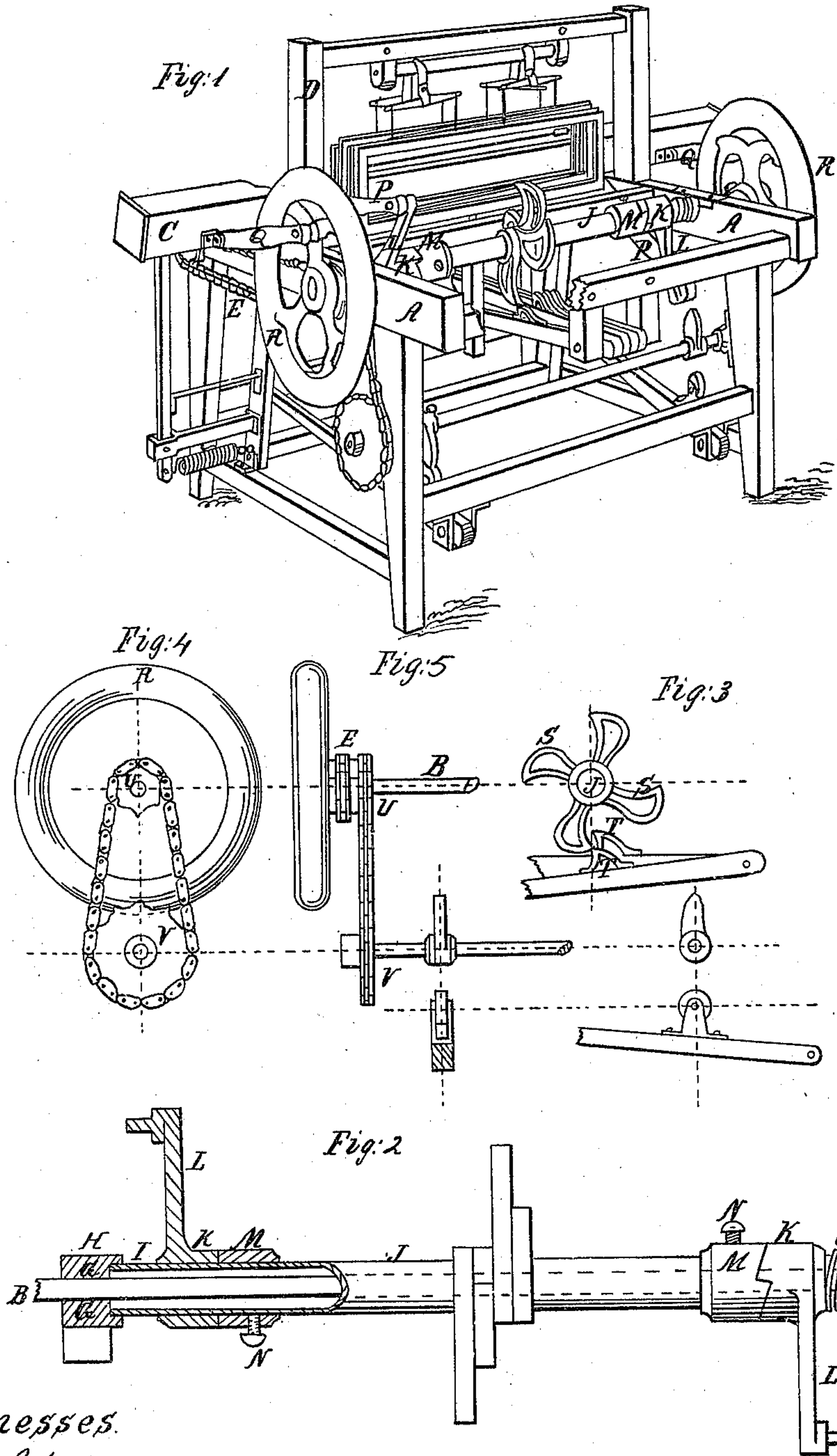


# J. L. Branson. Loom.

N<sup>o</sup> 97,158.

Patented Nov. 23, 1869.



Witnesses.  
John J. Malsted  
J. F. Beale

Inventor  
Jess. L. Branson



# United States Patent Office.

JESSE L. BRANSON, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 97,158, dated November 23, 1869.

## IMPROVEMENT IN LOOM.

The Schedule referred to in these Letters Patent and making part of the same

*To all whom it may concern:*

Be it known that I, JESSE L. BRANSON, of Pittsburg, Pennsylvania, have invented certain Improvements in Looms; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

My improvements are adapted both for hand and power-loom; and consist in the employment of a hollow cam-shaft or sleeve, within which the main shaft revolves, each of these shafts having its own independent bearings or supports, and each having movements independent of the other; also, in a novel construction of journal-box, adapted for such bearings; also, in a peculiar arrangement of the lever-clutches which actuate the cams, so that one lever shall, as the lay moves back, cause the depression of the heddle, and the lever, as it moves forward, shall relieve it of such depression; also, in the combination, with such clutch-levers, of adjustable clutches, so that the shed may, at option, be kept open a greater or less period of time, as may be required for different kinds of work, and, lastly, in the employment of chains, in connection with sprocket-wheels on the main shaft and on the tappet-shaft, to impart positive motions to the latter, in the proper direction and at the proper periods, without the use of a series of cog-wheels, and avoiding the friction and loss of power incident thereto.

In the drawings—

Figure 1 represents a perspective view of a hand-loom embodying my improvement.

Figure 2 is a view of the main shaft and the cam-shaft or sleeve, the latter partly in section, showing, also, the box and its double bearings, the clutches and clutch-levers, and the treadle-cams.

Figure 3 is a side view of a treadle-cam, and the treadles and treadle-lifts.

Figures 4 and 5 are views in detail of the sprocket-wheel and chain-connection between the main shaft and the tappet-shaft, and of the latter in relation to the lever which actuates the picker-staves.

A represents the loom-frame.

B, the main shaft.

C, the lay.

D, the upright frame which supports the harness.

Without describing those parts common to looms in general, I shall now describe those parts which constitute my present improvements, and their relation to the other parts.

The main shaft B (which is driven by means of the chain E, actuating a sprocket-wheel on said shaft,) is supported in bearings G, (see fig. 2,) in the boxes H, the same boxes each having, also, a larger bearing, I, but concentric with H, to receive and sustain the

hollow shaft or sleeve J, which carries the clutches and cams, the latter being permanently affixed to the sleeve. The bore of this sleeve is considerably greater than the diameter of the shaft B, so that there is never any contact or friction between them.

The part K, of the clutch, is annular, and surrounds the sleeve so that it may play freely thereon, and it is connected with an arm or lever, L, preferably cast integral with it, the outer end of the lever being pivoted to a pitman, P, whose other end is connected with and actuated by the lay, the lay itself being actuated by the pitmen Q Q, from the fly-wheels R R, placed, respectively, on the opposite ends of the main shaft.

O represents a spring upon the sleeve J, between the box H and the clutch K, and which exerts a constant pressure upon said clutch, tending to force it into connection with clutch M, a similar spring being employed for each of the clutches K.

A set-screw, N, serves to adjust the clutches M upon the sleeve in any position desired, and thereby permit such a change, as to the period when the loose clutch shall actuate it, as to keep open the shed a greater or lesser duration of time, as may be demanded by the different kinds of yarns employed, and fabric to be woven.

The clutch-levers L, I place so that they shall be on opposite sides of the shaft, one being above, while the other is beneath it, whereby, when one of the loose clutches moves backward, to give an intermittent partial revolution to the sleeve and cams, the other loose clutch is turning on its axis in the reverse direction, and is not at that stage actuating the cams. The clutch-levers thus act alternately to drive the cam-shaft, causing it to revolve a quarter-revolution at each backward and forward movement of the batten, and bringing each leaf or section of the cam successively to operate upon the treadles.

In the construction and arrangement of clutches above described, (each clutch having four equidistant teeth, corresponding with the number of the cam-sections and the number of the heddles,) the two adjustable clutches are so placed on the hollow shaft, relatively to each other and to the cams, that when the batten commences to move backward, one of the loose clutches engages with its fellow tight one, and turns the cam-shaft, bringing one section of the cam on its treadle, and depressing it, thereby opening the shed for the shuttle to pass through, while the other one is turning on its shaft in a reverse direction, and is not at this stage actuating the shaft; but when the batten starts forward, it engages, at the proper time, with its fellow tight clutch, and gives the shaft another partial revolution in the same direction, which thus suddenly brings the cam off the treadle, and closes the shed.

After a cam shall have fully depressed its heddle-



lever, it remains at rest, holding the lever down and the shed open, until the batten has nearly completed its forward motion to beat up the filling.

The reason for keeping open the shed for a determinate period, and of providing means whereby the time when it shall be opened, the length of time it shall remain open, and the time at which it shall be closed, may all be varied and controlled at the will of the operator, is because some kinds of warps require to be held open longer, in order properly to beat up the filling. Others require to be held open less, so that there may be more rubbing or abrasion of the warps, to roughen them, and produce thereby a certain finish found desirable in some kinds of fabrics.

It is highly important, and especially in weaving woollen goods, that the shed should be kept open as long as possible, and then quickly closed just as the batten is about to beat up the filling. My devices, herein described, admit of accomplishing this in all cases, and also afford means for varying such period of abrupt closing of the shed to suit the particular character of the work.

By means of the set-screws N, this period may be varied as desired. One of the loose clutches performs the duty of knocking off or freeing the cam from the treadles, and the other gives all the remainder of the revolution to the cam-shaft.

The sectional cams, and also the lifts on the heddle-levers, I so construct as to insure a perfect freedom for each treadle, after it has been depressed, to rise instantly, without being checked or arrested in its effort to rise by the cam itself.

Instead of driving the picker-actuating tappet-shaft from the main shaft, by means of a train of gear-wheels, which greatly increase the friction and multiply the wear and the oiling required, or else (if but two in number) must be of very large and cumbrous size, in order to engage with each other, and must also drive the tappet-shaft in a direction the reverse of that of the main shaft, I employ a chain, passing from a sprocket-wheel, U, on the main shaft, to another sprocket-wheel, V, having double the number of teeth, and affixed to the tappet-shaft. By this means, I insure a certain and positive action of the tappets, and one revolution of the tappet-shaft to two of the main shaft, and the revolution of both shafts

in the same direction, without employing an intermediate wheel, and also avoid the wearing away of the cog-teeth, and the accumulation of dust, oil, and fibre between the teeth.

Common gas-pipe I find adapted for the making of the hollow shafts or sleeves J.

By my construction, I dispense with a great deal of mechanism hitherto employed to operate the heddles and shuttle, and simplify the loom very materially, and reduce its cost. The loom is, also, in consequence, more easily managed and kept in order, and its capacity is increased, both as to the range and character of the woven products.

The loom may be reversed in its motions, and will operate equally well, whichever way the main shaft may be revolved.

I claim—

A hollow cam-shaft, within which the main shaft revolves, each shaft having its own independent bearings or supports, and each having movements independent of the other, substantially as described.

Also, the journal-boxes H, constructed each of a single piece, provided with two concentric bearings, of different sizes, in combination with a hollow cam-shaft, within which revolves another shaft, substantially as shown and described.

Also, the arrangement of the lever-clutches K L, on opposite sides of the cam-shaft, and so that as one of the clutches moves back, it shall partially revolve the cam-shaft, and cause one of the leaves of the cam to depress a heddle, and as the other clutch moves forward, it shall, by a further movement of the shaft, relieve the heddle of such depression, substantially as set forth.

Also, in combination with the lever-clutches arranged on opposite sides of the shaft, the adjustable clutches M M, by means of which the shed may be kept open a greater or lesser period, at option.

Also, the combination of the main shaft with the reversible tappet-shaft, which impart the picker-movements, by means of a chain and sprocket-wheels upon the shafts, substantially as described.

JESSE L. BRANSON.

Witnesses:

JOHN J. HALSTED,  
J. F. BEALE.