L. J. MASTERSON.

Shuttle-Box Motions for Looms.

No. 209,907. Patented Nov. 12, 1878.

Fig. 1.

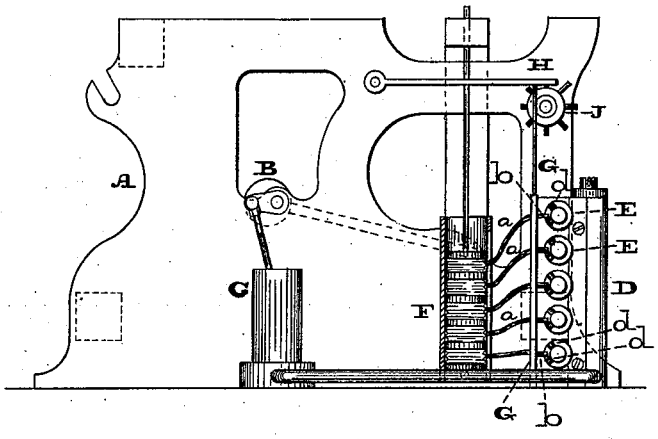


Fig. 2.

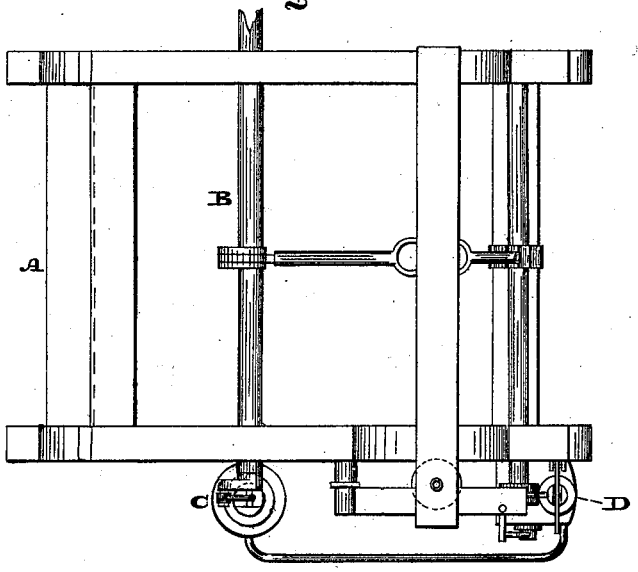
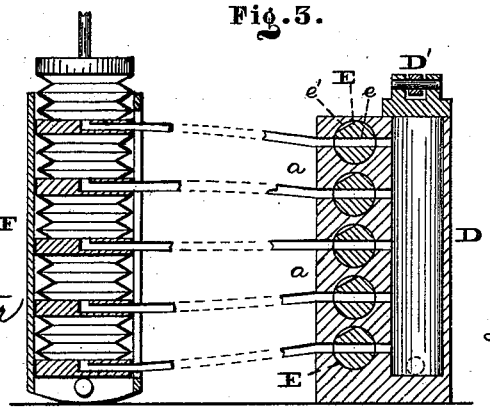


Fig. 3.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SHUTTLE-BOX MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. **209,907**, dated November 12, 1878; application filed July 18, 1878.

To all whom it may concern:

Be it known that I, LEVI J. MASTERSON, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Shuttle-Box Motions for Looms, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side view, partly sectional, of the apparatus embodying my invention. Fig. 2 is a top or plan view thereof. Fig. 3 is a vertical section of a detached portion enlarged.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in lifting drop or rotary boxes by means of compressed air or other fluid distributed into a series of cells or chambers by means of forcing or suction mechanism operating with suitable valves controlled by the chain, and opening and discharging at any given point required upon the pins of, or other devices employed with, the chain.

Referring to the drawings, A represents the frame of a loom, which may be of usual construction, and B represents the main shaft thereof. C represents an air-pump, which communicates with an air-chamber, D, adjacent to which are fitted rotary valves E, located one above the other, and each communicating with said chamber D, and also with a pipe, *a*, leading to an expansible cell or chamber of a series, F, of cells or chambers, arranged vertically, properly supported and guided, and connected to the shuttle-boxes in any desired manner.

G represents a vertically-sliding bar, whose upper end is connected to a lever or arm, H, pivoted or hinged to the frame A, said lever or arm being so disposed that it will be struck by the pins of the chain-wheel J.

To the bar G there are fitted studs *b b*, which project horizontally therefrom toward the heads or outer ends of the valves E, and engage with pins or shoulders *d* on said heads or ends, each valve having two pins or shoulders, between which enter the respective studs of the bar G. It will thus be seen that the upward movement of the bar G will move the valves in one direction and the downward movement in the opposite direction, the valves having induction-ports *e* and exhaust-ports *e'*.

The pump C and chain-wheel J are operated by the loom mechanism or mechanism independent thereof. In this case I have shown the pump operated by a crank on the main shaft B and the chain-wheel J operated by a pawl attached to the lay, taking into a ratchet on the shaft to which the chain-wheel is attached.

The chamber D will be provided with a safety-valve, D', for evident purposes.

Each cell, by its expansion or contraction by means of the air introduced or removed therefrom, operates the shuttle-boxes, raising or lowering the same the distance equal to the height of one box, and by expanding or contracting a number of the cells the shuttle-boxes will be raised or lowered a distance equal to the height of the corresponding number of shuttle-boxes. The shoulders or pins *d* are so arranged in respect to the pins *b* on the rod G that by raising the rod G a certain distance but one valve is opened. By raising the rod higher two valves are opened, and so on in proportion as the rod is raised.

The operation is as follows: When the chain-wheel J rotates its differential pins lift the lever H, which, in turn, lifts the bar G, whose studs successively, according to the nature of the pins of the chain-wheel, come in contact with the upper pins or shoulders *d* of the valves E, and rotate and open the latter, so that the air from the chamber D passes through the ports *e* and the cells or chambers F, which are expanded and elevated, and as the boxes are connected to said cells or chambers said boxes are lifted, the object whereof is evident.

When the bar G descends the studs strike lower pins or shoulders of the valves E, and rotate and close the valves. The pipes *a* are now in communication with the exhaust-ports *e'* of the valves, and the air in the cells F escapes through the pipes *a* and exhaust-ports *e'* into the atmosphere, whereby the cells contract and their heads descend, thus causing or permitting the lowering of the boxes.

As the lay comes up to pack the filling the recoil and setting of the boxes on the lay by

my method of operation relieves the jar in packing the filling.

The cells or lifts F may be made of rubber, metal, or other suitable material.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with a series of shuttle-boxes and a fluid forcing or compressing mechanism, of intermediate devices and controlling mechanism, whereby said boxes are operated by compressed air or other fluid, substantially as described.

LEVI J. MASTERSON.

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