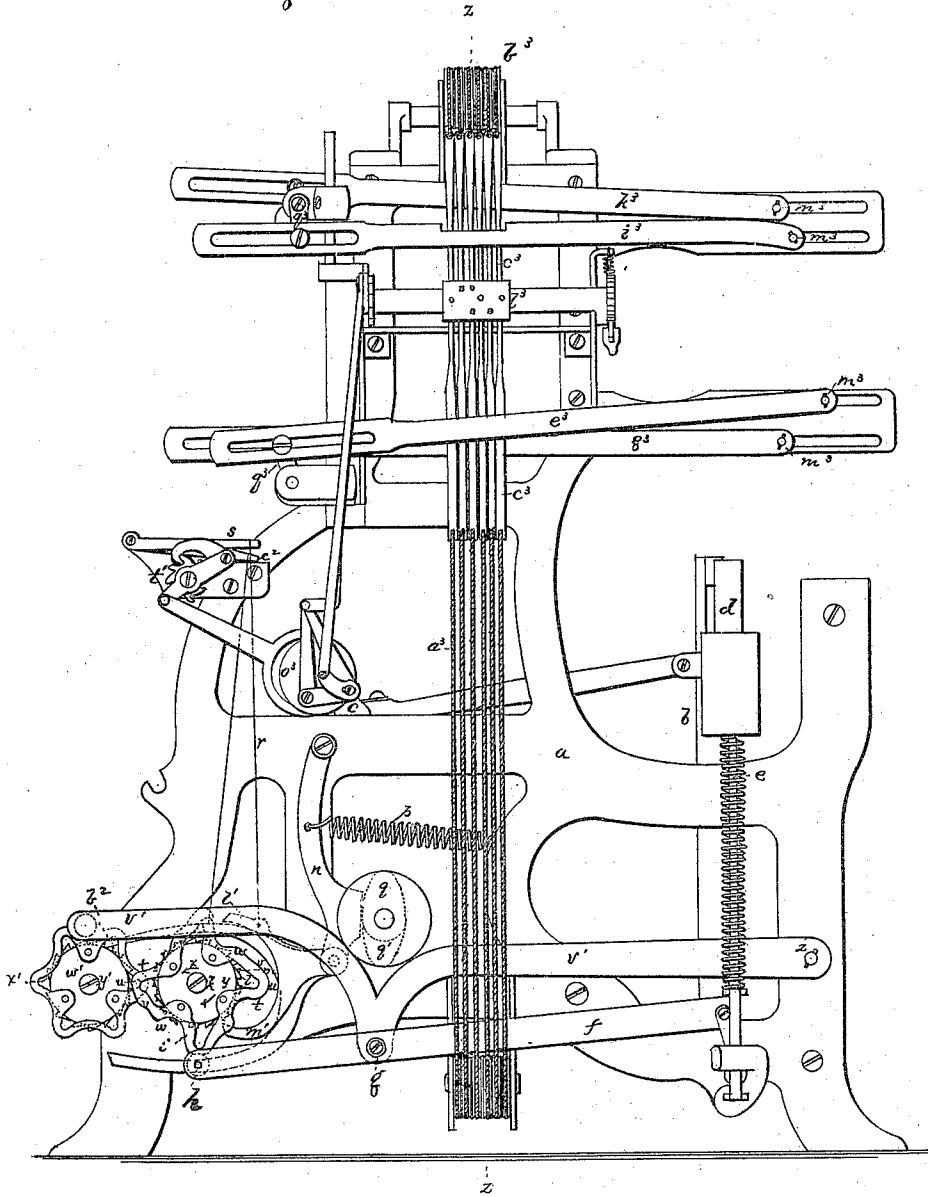


G. CROMPTON.
LOOM.

No. 172,710.

Patented Jan. 25, 1876.

Fig. 1.



WITNESSES:

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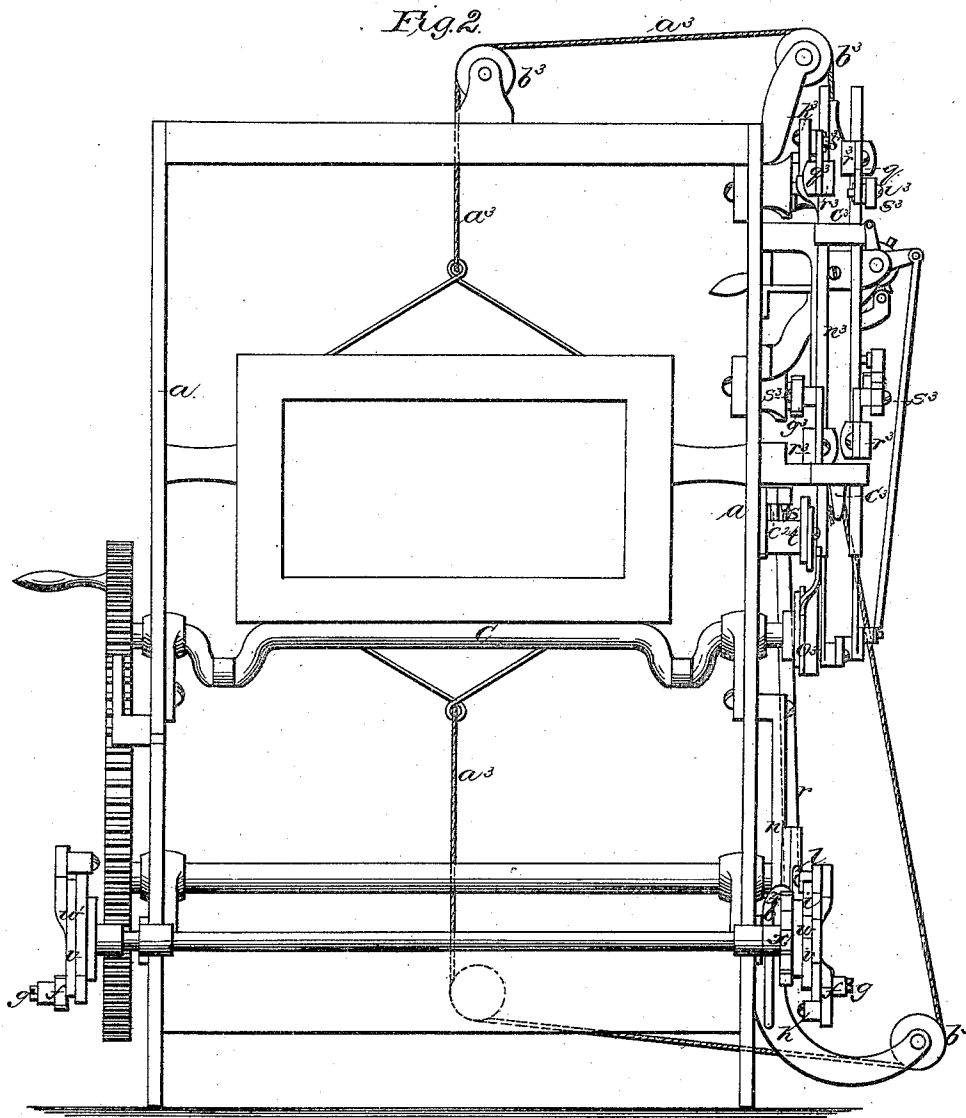
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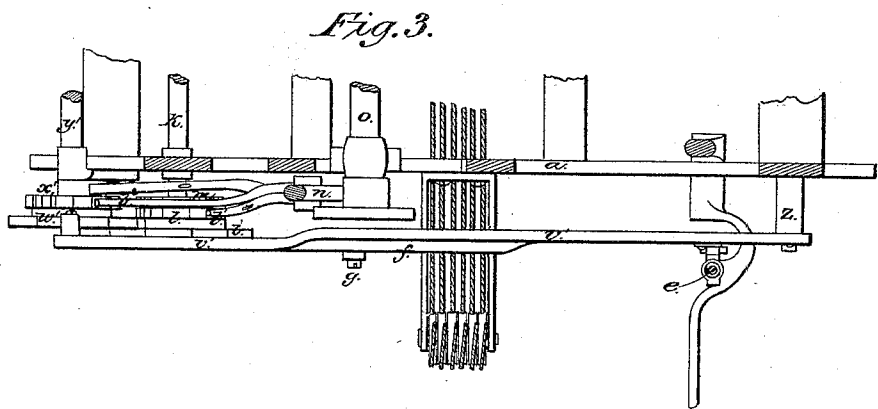
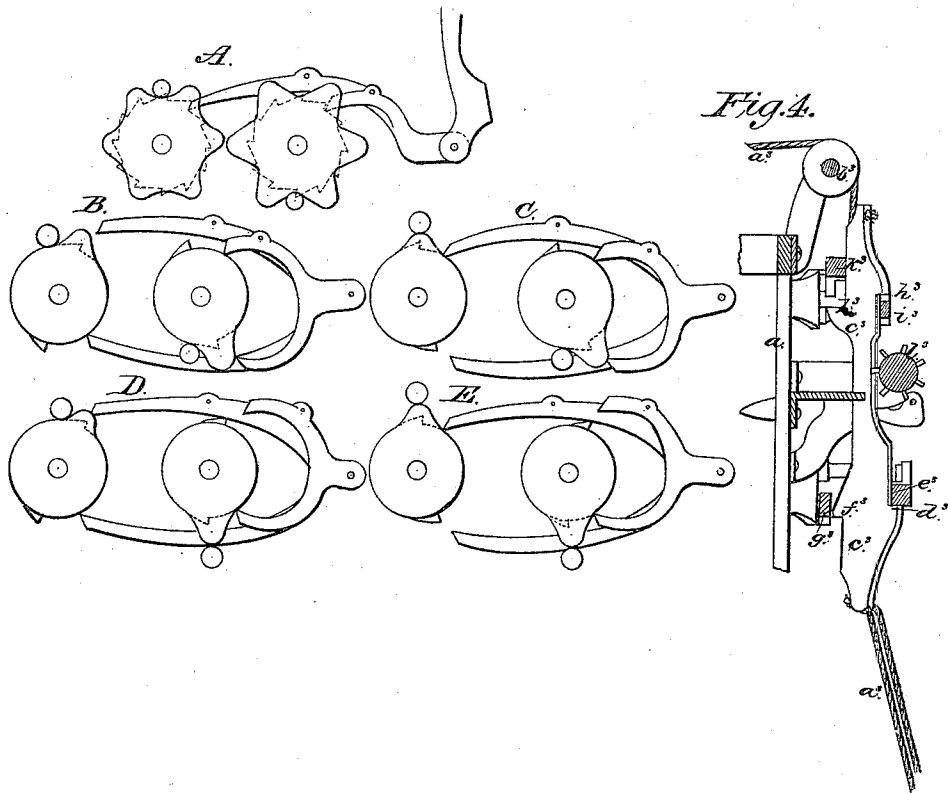
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UNITED STATES PATENT OFFICE.

GEORGE CROMPTON, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. **172,710**, dated January 25, 1876; application filed February 19, 1875.

To all whom it may concern:

Be it known that I, GEORGE CROMPTON, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Shedding Mechanisms for 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 practice it.

My invention relates to the mechanism for actuating the drop-boxes of fancy looms, and to the arrangement of the harness mechanism of fancy looms, or looms for weaving figured fabrics.

The shuttle-boxes are operated from two tappet-shafts, preferably through the medium of a compound lever, and the part of my invention relating to the box motion consists, primarily, in combining two tappet-shafts and their tappets with the pattern-chain or cylinder, and with main and auxiliary levers; also, in the peculiar arrangement or disposition of the hooked jacks relatively to the lifters, depressors, and eveners, and to the mechanism by which they are operated.

The drawings represent a loom-frame having the mechanism embodying my improvements organized therewith.

Figure 1 shows an end view, and Fig. 2 a rear elevation, of the loom. Fig. 3 is a horizontal section on line *x x*; Fig. 4, a vertical section on the line *z z*.

a denotes the loom-frame; *b*, the lathe; *c*, the lathe-shaft; *d*, the movable boxes. Each set *d* of shuttle-boxes is supported on a rod, *e*, which rod is directly or indirectly connected with a rocker-lever, *f*, turning on a fulcrum, *g*, and having at its rear end a pin, *h*, operated upon by a tappet-wheel, *i*, on a tappet-shaft, *k*, to depress the rear end of the lever, and thereby to raise the opposite end, and with it the box-rod and boxes, the pin being kept at all times against the acting-surface of the tappet-wheel by the weight of the boxes, as is well understood.

The tappet-shaft *k* is either an oscillating or rotating shaft, as may be required, the tappets being so formed and arranged that the changes in the boxes are produced by rotative move-

ment of the shaft in either direction, the shaft bearing two ratchets, *l m*, the teeth of which are set in opposite directions, operated upon by two fingers or pawls, *l' m'*, jointed to a swinging lever, *n*, this lever being drawn toward the driving-shaft *o* by a spring, *p*, and being at each beat-up of the lay carried toward the ratchet-wheels by a cam, *q* or *q'*, on the shaft *o*.

The pawls *l' m'* are hung by a link, *r*, from a lever, *s*, resting upon the pattern cylinder or chain *t*.

When the lever *s* rests upon the surface of the cylinder, the pawl *l'* is let down upon the ratchet *l*, and when the cam *q* or *q'* presses back the lever *n* the pawl *l'* drives the tappet-wheel *i* in the direction of the arrow *x*. When a pin on the pattern-cylinder lifts the lever *s* the under pawl *m'* is carried up against the ratchet *m*, and the next rear movement of the lever *n* drives the pawl *m'* against the tooth of its ratchet *m*, and moves the tappet-wheel *i* in the direction of the arrow *y*, or opposite to the direction in which it previously moved.

The tappet is shown as constructed with one incline, *t*, on one side of each point *u*, and two inclines, *v w*, on the opposite side thereof, (each movement in either direction carrying the pin *h* over one of these inclines,) the movement of the ratchet which carries the pin over each long incline effecting the movement of the boxes from one box (opposite the race) to carry the next but one opposite thereto, and the movement carrying the pin over each short incline, bringing the box next to the one opposite the race into line with the race, so that the indicating-lever *s*, the two reverse-ratchets *l m*, and their pawls, and the reverse-tappet may be made to effect a change in the position of the shuttle-boxes, to bring any box adjacent to the box in line with the race opposite to such race, or any box next to the one in line with the race into line therewith, the tappets upon the opposite ends of the tappet-shaft being arranged with their points and depressions directly opposite each other to effect the same movement in each set of boxes, or, preferably, alternately with each other, to effect counter movements of the respective boxes.

This construction and arrangement of the

reverse tappet-wheel, and its ratchets and pawls, operated upon by the two indicating-levers of the pattern chain or cylinder, does not form the subject of my present invention, which consists, partly, in combining with such tappet wheel or wheels an auxiliary tappet-shaft, having an auxiliary tappet wheel or wheels, operating an auxiliary lever connected with the main lever, this tappet-shaft and tappet or tappets effecting changes in the position of the boxes, in connection with the tappet or tappets upon the main shaft, to increase the changes in the boxes.

The auxiliary tappet-shaft is seen at y' , its tappet at w' , and its ratchet at x' . Each tappet w' acts on the pin of a lever, v' , which swings on a stationary fulcrum, z ; but is jointed to the main lever, as seen at g , the main lever acting upon the boxes independent of the auxiliary lever, and the auxiliary lever acts upon the boxes through the main lever. Engaging with the ratchet x' is a pawl, b^2 , jointed to the lever n , and actuated by each movement of such lever toward the ratchets. The pawl is hung from an indicating-lever, c^2 , resting upon the pattern chain or cylinder.

When the cylinder lets the pawl down upon its ratchet each movement of the tappet by its pawl produces a movement of the boxes one pick up or down, accordingly as the lever-pin is moved up to or down from any point of the tappet-wheel.

This movement of the boxes, being combined with the movement thereof, produced through the main tappet and its lever, it will readily be seen that the boxes may be moved one, two, or three spaces, or from any one box to the first, second, or third box therefrom in either direction.

Instead of having a reversible tappet upon the main tappet-shaft, a tappet having a movement in one direction may be used in connection with the auxiliary tappet, as seen in the detail at A; or the shifting of the boxes may be produced by a main and an auxiliary tappet, each made reversible, as seen at B, the relative changes in the tappets and the lever-pins being readily understood from the details B, C, D, and E, which show the different positions of the pawls, the ratchet-teeth, and the lever-pins.

In each of these modification, however, there is the same invention, in that there is employed, in connection with the main tappet-shaft, an auxiliary tappet-shaft, through which the necessary changes are produced in the positions of the shuttle-boxes.

The harness leaves or frames are shown as strung by the cords a^3 running over sheaves b to hooked jacks c^3 , each of which has a hook, f^3 , on one side to engage with the lifter g^3 , and a hook, d^3 , on its opposite side to engage with the depressor e^3 , each also having on each side a hook, h^3 , for engagement with the evener i^3 or k^3 .

The tops of the jacks c^3 are directly under the outer side of the upper sheaves, or so that the evener-hooks are always under or

over their respective evener and depressor bars or levers.

To insure the release of the jacks from the lifter after every shed is formed, or after every throw of the shuttle, I place the lower sheaves out from the frame, as seen in Fig. 2, so that the jacks are drawn over from a vertical position toward and against the depressor e^3 , or against the surface of the pattern-cylinder l^3 , by the strain of the cords between the jacks and the lower sheaves, the jacks being held nominally against or in connection with the depressor, or against the surface of the cylinder, and such of them as are to be thrown into connection with the lifter at each shed being pressed away from the depressor and over upon the lifter, after being evened, by the pins or rollers on the pattern cylinder or chain, said chain or cylinder insuring the connection of the proper jacks at the proper time with the lifter, and the outward strain of the cords insuring the connection of all jacks not thrown in by the chain or cylinder with the depressor. In connection with the oblique arrangement of the jacks, the eveners are so disposed with relation to the hook surfaces of the jacks upon which they act that, in their operation, they not only bring the hooks into line for redistribution of the jacks, but they also operate to press the lower ends of the jacks outward, or toward, or against the pattern-cylinder or the depressor, the outer evener pressing the outer sides of the jacks upwardly, and the inner evener pressing the inner sides of the jacks downwardly, and thus canting the lower ends of the jacks outward from the loom, as will be readily understood, thereby acting as auxiliaries to insure dislodgment of the hooks from the lifter.

Each evener, lifter, and depressor lever is fulcrumed at one side of the loom-frame, as seen at m^3 , Fig. 1, and the lifter and evener on one side of the jacks are jointed to a slide-rod, n^3 , connected to a crank-wheel, o^3 , and the depressor and evener on the opposite side, to a slide-rod, p^3 , connected to said crank-wheel. To permit each lever to freely rise and fall, the connection between the end of the lever and the slide-rod is effected by means of a link, q^3 , jointed to the lever, and to an ear or projection, r^3 , on the slide, the link swinging loosely with respect to the rod, and thus allowing the lever to vibrate without sliding upon the pin s^3 .

Having described my invention, I claim—

1. The combination of the main and auxiliary levers f v' with the reversible main tappet-wheel, the auxiliary tappet-wheel, the swinging lever n , its connected double pawl l' m' , and pawl for operating the auxiliary tappet-wheel and pattern-cylinder, all arranged, constructed, and adapted to operate, substantially as described.

2. The sheaves b^3 , combined with the lifter, depressor, and evener bars, and with the hooked jacks and harness-connecting cords,

and arranged as described to insure the release of the notched jacks from the lifter, as described.

3. The jacks, with upper hooks h^3 in combination with the evener-levers, they operating to throw the jacks toward the cylinder to bring the hooks into line, substantially as described.

4. The combination, with lifter, depressor, or evener-levers, of slide-rods and links q^3 , or equivalent device, substantially as described.

GEO. CROMPTON.

Witnesses:

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E. C. WEAVER.