5 Sheets—Sheet 1.

G. CROMPTON.

FANCY LOOM.

No. 51,928. Patented Jan. 9, 1866.

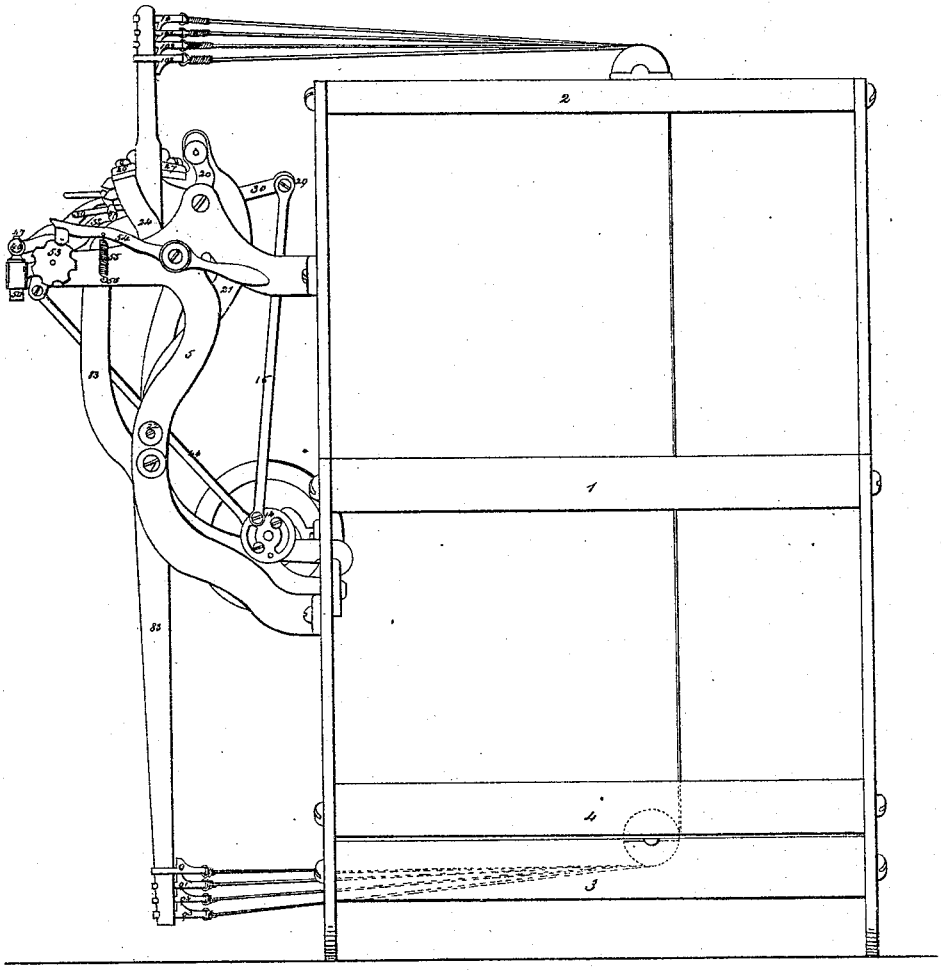

FIG. 1.

Witnesses.

Wm. Taggert

H. M. Rice

Inventor.

Geo. Crompton.

5 Sheets—Sheet 2.

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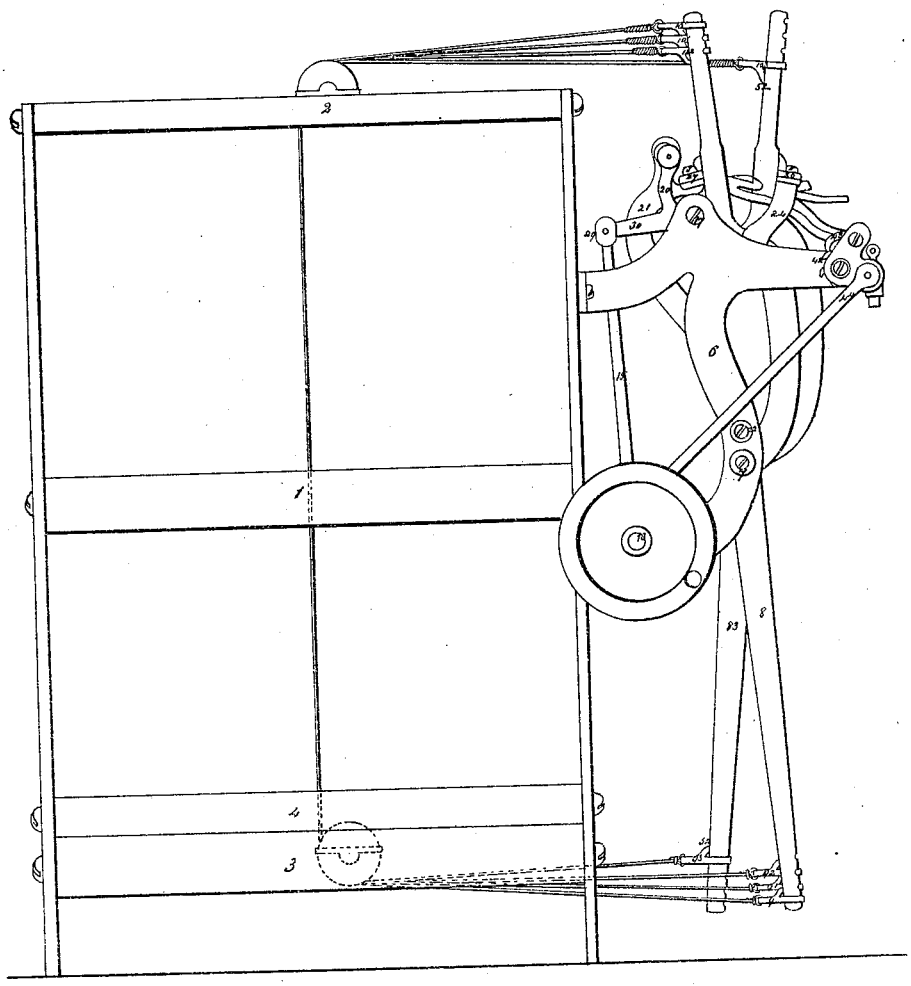

FIG. 2.

Witnesses
Wm. Eaffertz
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Inventor:
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5 Sheets—Sheet 3.

G. CROMPTON.

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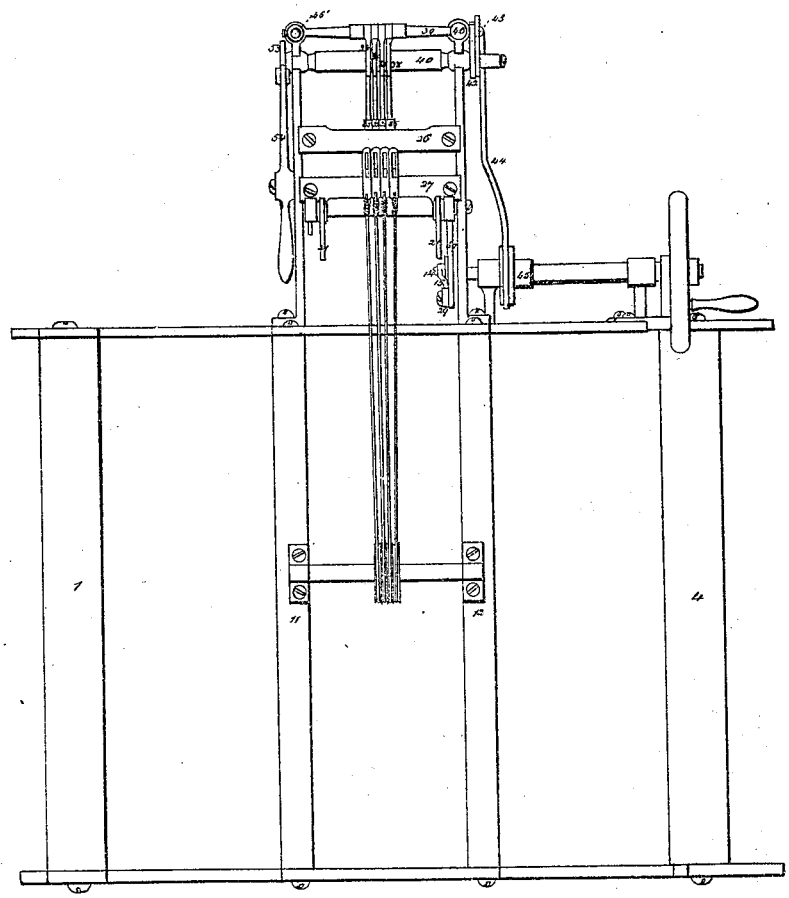

FIG. 3.

Witnesses.

Wm. M. Lafferty

H. M. Rice.

Inventor.

Geo. Crompton

5 Sheets—Sheet 4.

G. CROMPTON.

FANCY LOOM.

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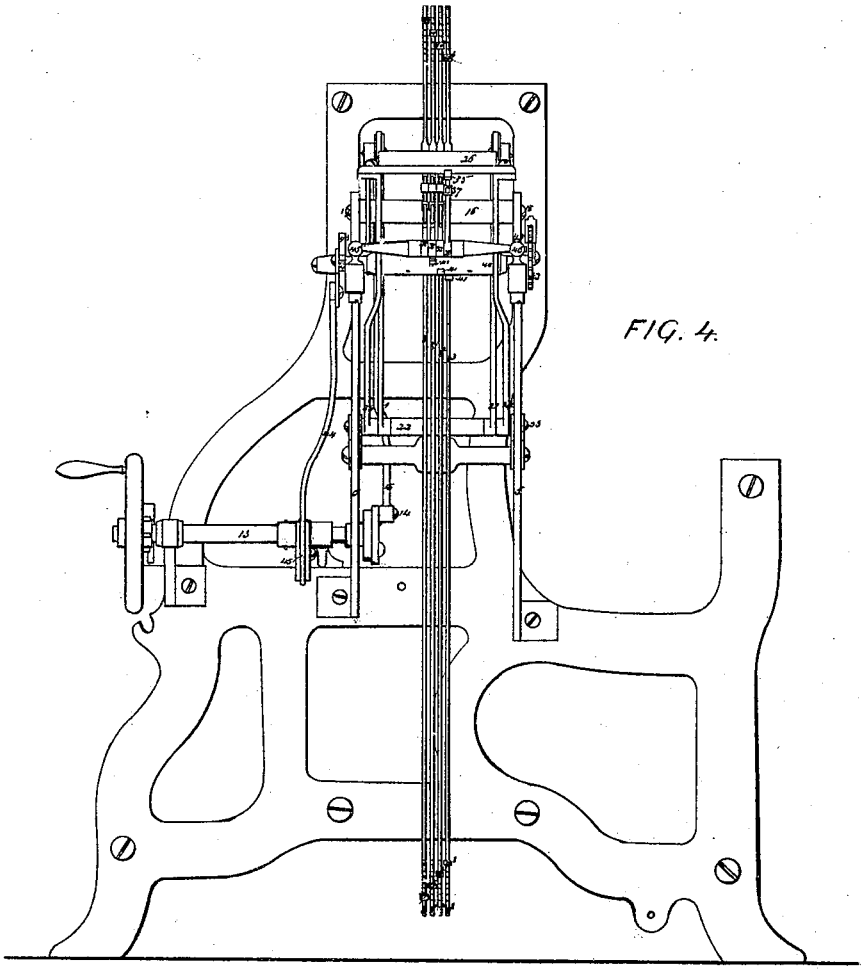

FIG. 4.

Witnesses.
Wm. Easterly
H. M. Rice

Inventor.
Geo. Crompton

5 Sheets—Sheet 5.

G. CROMPTON.

FANCY LOOM.

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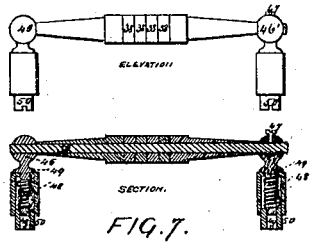

FIG. 7.

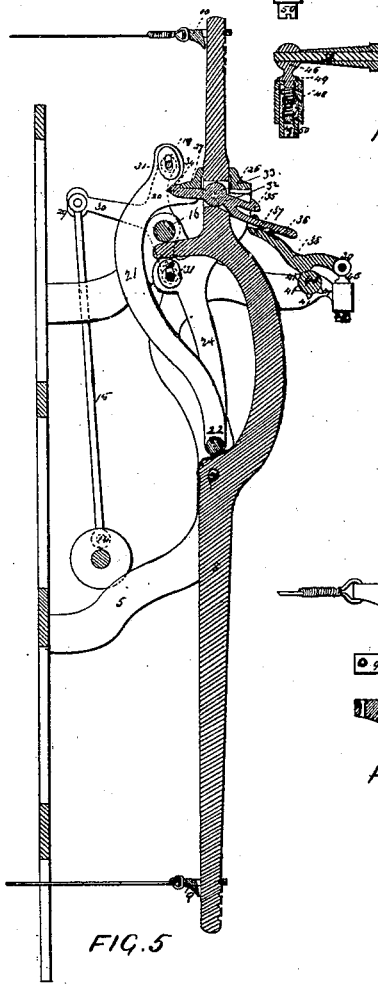

FIG. 5

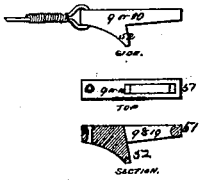

FIG. 6.

Witnesses.

Wm. Capperty
H. M. Rice

Inventor.

Geo Crompton

UNITED STATES PATENT OFFICE.

GEO. CROMPTON, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN FANCY-LOOMS.

Specification forming part of Letters Patent No. **51,928**, dated January 9, 1866.

To all whom it may concern:

Be it known that I, GEORGE CROMPTON, of the city and county of Worcester, State of Massachusetts, have invented a new and useful Improvement in Fancy-Looms; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, of which—

Figure 1 is a front elevation of a loom with my improvements applied. Fig. 2 is a rear elevation; Fig. 3, a plan; Fig. 4, an end elevation. Figs. 5, 6, and 7 are detached views of the improvement.

The same letters denote like parts in all the figures.

The nature of my improvement consists of an improved apparatus for operating the heddles, and through them the warp of fancy-looms, as I will now describe.

Fig. 1 represents the front elevation of a loom; to the left is attached the apparatus which gives motion to the heddles. 1 is the breast-beam; 2 2 are the top rails; 3, the front girths, and 4 the rear girth, by which the framework is held together in the ordinary manner.

The subject of the invention being exclusively the harness-motion, no lathe, shafting, or other mechanism common to looms are represented.

Sustained at each end by the side brackets, 5 and 6, is the rod 7, which supports the four upright levers 8 $8'$ 8^2 8^3. To the upper extremities of each of these levers are attached loop-like pieces of metal 9 $9'$ 9^2 9^3, from which a series of wires lead over pulleys or sheaves on top rails, 2 2, and which wires, passing down in a vertical line, are carried under another series of sheaves, and thence attached to the lower extremities of the vertical levers by loops 9 $9'$ 9^2 9^3.

In practice the harness-frames are suspended by the wires between the upper and lower series of sheaves, and through them the warp is drawn, neither of which, however, is represented.

Fig. 1 represents the shed closed, as does also the sectional Fig. 5. 13 is a shaft which, in practice, is operated by bevel-gearing from the crank-shaft, (which operates the lathe,) to which it is contiguous. At one end of this shaft is a crank, 14, which, by a connector, 15, gives an oscillatory motion to a shaft, 16, having its bearings 17 and 18 in side brackets, 5 and 6. Keyed upon each end of this shaft, inside its bearings, are double-armed levers 20 20, the upper ends of which play in slots 19 19 of the curved arms 21 21, rising from their fulcrum at 22, which is a rod extending from one side bracket to the other, and resting in them. From this rod rise two similar arms, 24 24, to those already described, in each of which the lower ends of both double-armed levers find play in slots 25 25.

To the upper ends of the slotted levers last described is secured a bar, 26, extending from one to the other. A similar bar, 27, is secured to the upper extremities of the first-described slotted levers. When the shed is closed these bars clamp the long upright heddle-levers, which have their fulcrum at 7, somewhat like the jaws of a vise. The rotation of the crank-pin 14 on shaft 13, from its position in Fig. 1, will draw down the connecting-rod 15, connected at the other end, 29, to a horizontal arm, 30, which is attached in one casting with the double-armed lever (shown at Fig. 2, rear elevation,) and will oscillate the shaft 16, and so cause both double-armed levers thereon, by their pins 31 31 31 31, to play in the slots of the two pair of slotted levers 21 21 and 24 24, and cause them and their respective bars to open and move in opposite directions, as it is shown in Fig. 2.

In Fig. 5 one of the upright levers 8 is represented in longitudinal section, taken through its edge. It will be seen that a mortise is made through this lever for the purpose of introducing a small lever, 32, and sustaining it upon a pin, 33. At each end of lever 32 is a hook, 34 and 35, and from the outer end extends a branch, 36, passing through a mortise or cored slot, 37, in another small lever, 38, resting at 39. This last-named lever or finger lies on the periphery of the cylinder 40, the gravity of the double hook 32 preponderating, in conjunction with lever 38, through the medium of the mortise 37, as described. The inner hook, 34, is engaged with bar 27, and the outer hook, 35, is below the range of the bar 26. By the movement of the crank-pin 14 on shaft 13 one-half a revolution would cause the pair of slotted

levers 21 21, and the bar 27 thereon, to move toward the center of the loom, and the bar on the other pair of slotted levers to move in the opposite direction.

When the levers 32 are in their normal position the hooks 34 will be so elevated as to catch on the bar 27. Now, as the bar is moved inward it takes with it all the levers which are not lowered from it by the action of the pins 41 of the pattern-cylinder on the levers 38, throwing the lower ends of the upright levers, with which the levers 32 just drawn in are connected, outward, and lowering the leaves of harness with which they are connected. While the bar 27 is moved inward the bar 26 is moved outward, and in so doing engages with the hooks 35 of the levers 32, which are elevated through the action of the pins 41 on the arms 38, and in drawing them back throw outward the upper ends of the remaining upright levers, raising their leaves of harness and perfecting the shed.

The outer edges of the bars 26 and 27 act as lifter and depressor when making the shed. The inner edges of them operate as eveners to bring all the upright levers to a common vertical line for a new distribution of the hooks by the cylinder. This cylinder is in practice where a greater variety of changes are desired than can be obtained from a cylinder, or an endless chain of lags into which pins are inserted, as in the Dobby and Witch looms. When the shed is closed the chain or cylinder is moved, by a catch-wheel, 42, and catch 43, through the means of the connecting-rod 44 and eccentric 45 on shaft 13. The wheel 53 has depressions in which rest the roller in lever 54, to which a spring, 55, is attached and secured at 56 to check its momentum and hold it in place during the intermission of motion, at which time the rows of projections uppermost on the chain or cylinder distribute the hooks to form the shed, each row of projections varying the pattern as required, as is usual in looms of this class, as represented in Figs. 1, 4, and 3. The pins in the cylinder or chain being screwed into the lag, they, in practice, occasionally become loose and unscrewed, and being then longer from the surface of the cylinder or lag, in raising the double hook engage it with the elevating-bar 26; but as it can raise it no higher than the base of the hook without striking the lower side of the bar, the pin must break. To overcome this objection the rod 39 which extends between and is sustained at each end by 46 46′, and secured at 46′ by set-screw 47 and retains the levers 38 38 38 which lie upon the cylinder or chain, is in such cases raised up. The bearings of the rod being kept down by spiral springs 48 48, through which bolts 49 49 or stems pass, and the springs being compressed and retained by nuts 50 50, when the rod 39 is raised by a long pin, the springs 48 48 are contracted, and after the passage of the pin again expanded, and bring the bearings 46 46 down and retain them upon their seats, as shown in Fig. 7.

The loops 9 9′ 9^2 9^3 10 10′ 10^2 10^3, attached to the lower and upper extremities of the long upright heddle-levers, are shown at Fig. 5 enlarged in section, and also top and side views. These loops are so slotted as to snugly fit the extremities of the heddle-levers, and are slightly rounded at the end of the slot 51 to fit any of the series of notches on the levers, and the spur 52, bearing upon the inner edge of the lever, prevents it from falling off the lower end and from dropping down on the upper end of the levers. As before stated, the vertical heddle-levers are slotted or cored out through their edges for the introduction of the double hooks, the advantage being a bearing on each side for the pin 33 on which to sustain the hook and to rivet the pin, thereby insuring more free and independent action of the hooks in their distribution upon the lifter and depressor, when operated by the chain, than the simple riveting of the hooks upon the side of the lever.

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

1. The construction of the vertical heddle-levers having slots or mortises with pins passing through them for the support of the double hooks, as described.

2. The construction of the loop with its spur-like branch attached to the extremities of the vertical levers, as described.

3. The construction and combination of the two pairs of oscillating levers 21 21 and 24 24, and their respective bars 27 and 26, forming the lifter, depressor, and eveners, with the double hooks and pattern cylinder or chain, as described.

4. So constructing the bearings of the rod 39 that it may be raised and return again to its original position, substantially as and for the purpose set forth.

GEO. CROMPTON.

Witnesses:
H. M. RICE,
GEO. E. DUNLAP.