G. CROMPTON & H. WYMAN.

SHEDDING OR HARNESS OPERATING MECHANISM FOR LOOMS.

No. 191,317. Patented May 29, 1877.

Fig. 1.

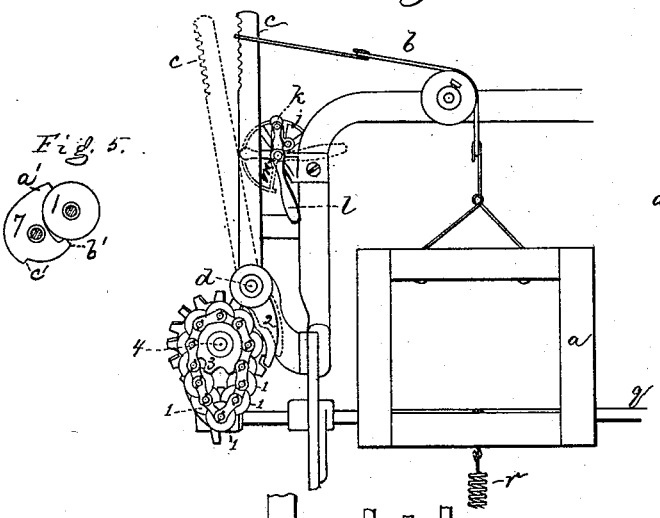


Fig. 5.

Fig. 6.

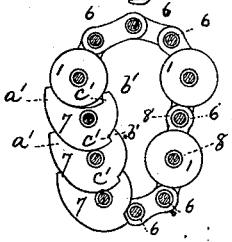


Fig. 4.

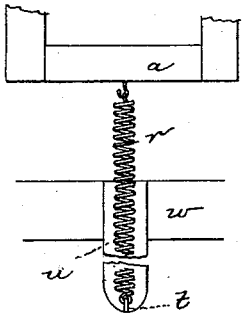


Fig. 2.

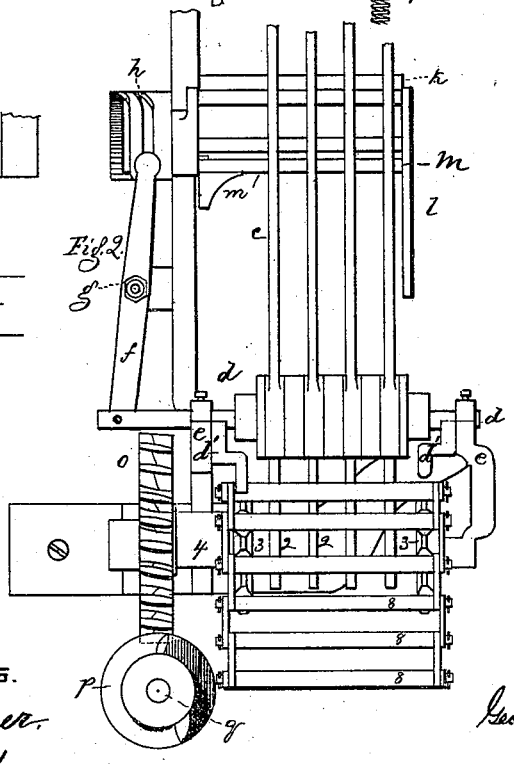
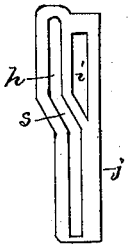


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE CROMPTON AND HORACE WYMAN, OF WORCESTER, MASS.

IMPROVEMENT IN SHEDDING OR HARNESS-OPERATING MECHANISMS FOR LOOMS.

Specification forming part of Letters Patent No. **191,317**, dated May 29, 1877; application filed February 27, 1877.

To all whom it may concern:

Be it known that we, GEORGE CROMPTON and HORACE WYMAN, both of the city and county of Worcester, in the State of Massachusetts, have invented an Improvement in Looms, of which the following is a specification:

This invention has reference to the shedding or harness mechanism of fancy-looms; and consists in the combination, with harness-levers, connected with harness-frames, and operated in one direction by springs or equivalents, of a pattern chain or surface, substantially as described, arranged to act directly on the harness-levers; also, in connection with the parts just above mentioned, an independent lifting-arm to move the harness-levers all into one plane, whereby the connected harness-frames may be lifted to even the warps, as hereinafter described; also, in the combination, with the harness-levers and pattern mechanism, of devices to change the position of the harness-levers longitudinally with reference to the protuberances of the pattern-chain, whereby the same levers may be moved by different protuberances, arranged in the same line to vary the pattern; also, in a pattern-surface composed of elevators and dwellers, to lift the harness-frames and retain them elevated, and provided with spaces to permit the frames to be lowered at the proper time, as hereinafter set forth.

Figure 1 represents a front view, and Fig. 2 an end view, of sufficient portions of a loom to illustrate our invention, but the elevators and dwellers are omitted. Fig. 3 represents the lever-shifter laid out in detail. Fig. 4 represents part of a harness-frame, showing the spring to pull it down when not positively lifted by its lever. Fig. 5 represents in detail a dweller and a riser composing the pattern, and Fig. 6 a section through the pattern-surface.

The frame of the loom may be of any usual construction. The harness-frames *a*, provided with suitable heddles, are connected by cording *b* with the upper ends of notched levers *c*, pivoted on a shaft, *d*, supported in bearings *e*, and, in this instance, movable endwise in such bearings, the shaft being connected at one end with a lever, *f*, pivoted at *g*, and provided with a pin that enters one of two slots, *h* or *i*, in a shifter, *j*, attached to and moving with a lifting-arm, *k*, provided with a handle, *l*, the lifting-arm turning, in this instance, about a center, *m*.

The pattern mechanism consists of a chain composed of elevators 1 and dwellers 7, (see Fig. 6,) adapted to bear against the lower ends 2 of the levers, and having spaces at 6 to permit the harness-frames to be depressed. The bars 8 of the chain engage notches in, and are moved by, toothed disks 3 on a shaft, 4, supported in stationary bearings. The shaft is provided, in this instance, with a worm-toothed pinon, *o*, engaged and moved by a worm-wheel, *p*, at the end of the usual crank-shaft *q*.

When the lower ends of the levers come opposite the spaces in the chain the harness-frames are fully depressed. When such ends are acted upon by the elevators 1, the harness-frames are elevated, and when by the dwellers 7 the frames are held up from pick to pick.

The harness-frames are each connected at bottom with spiral or other springs *r*, only partially shown in Fig. 1, but fully so in Fig. 4, such springs depressing the harness-frames and warps after they have been lifted by the levers. The springs are attached at their lower ends to a stud, *t*, on a hanger, *u*, attached to a cross-bar, *w*.

The warps may be leveled at any time by turning the lifting-arm from the position shown in full lines, Fig. 1, to that shown in dotted lines, and all the levers *c* not then held back in the position shown by dotted lines, Fig. 1, by the pattern will be moved back, and the warps will all be thrown together.

If the pin at the upper end of the lever *f* under such circumstances remains in the straight parts of the slots *h* or *i*, in which it was before it was moved, as above described, the levers will only be rocked about their axes; but if the lifting-arm is moved far enough to cause the pin to move from one to the other end of slot *h*, or to pass through the inclined portion *s* thereof, then the lever *f* will be vibrated on its axis *g*, and, acting on the shaft *d*, will shift it, together with its

full set of levers *c*, laterally far enough to place the lower ends 2 of the levers opposite a new line of protuberances, 1, running in the direction of the length of the chain or pattern-surface, and will cause such protuberances then brought into action to move the levers in accordance with their pattern, and in this way patterns composed of two or three repeats, as in checks, &c., may be made with a very short chain, and either pattern may be thrown into operation at will. We call this chain a duplex pattern-surface.

Where the pattern of the fabric is perfectly regular in its repeats, the shifter *j* may be moved automatically instead of by hand.

When the levers are being shifted their lower ends are held away from the chain by the lifting-arm.

This harness mechanism is specially designed for gingham and other similar looms, is very simple, and has but few parts. The lathe, stop-motion, and other usual parts of loom, will be of ordinary construction.

It is obvious that the shifter *j* might be operated independently of the lifting-arm, and might be made as a cam to act on the end of the shaft *d;* or the shaft might be provided with a slotted plate resembling Fig. 3, and a pin on a movable axis working in a slot like *h* might be made to shift the axis *d*.

The pattern surface or chain might be shifted laterally when the levers were moved back, and in such event the wheels or shaft carrying the chain would be connected or keyed with wheel *o*, so as to move laterally within it.

The spaces 6 in the pattern-chain permit the lever resting against them to move to positions to completely lower or sink their harness-frames. The rolls or elevators 1 next the sinkers are annular disks, mounted on the rods or bars, and when they act against the levers the harness-frames of such levers are elevated.

The dwellers, shaped substantially as shown in Figs. 5 and 6, and placed on the rods or bars, act to hold the levers in the position in which they are placed by the elevators, for any desired number of picks, their acting faces being substantially at the same distance from the center of the cylinder as the peripheries of the elevators. These dwellers, elevators, and spaces constitute a chain, as shown; but they may be so placed as to form the acting surface of a rotary cylinder.

Each dweller is shaped substantially as shown in Figs. 5 and 6, and has an extended portion, *a'*, to fit over the elevator 1, to retain the lever acted upon by it in the position in which it was placed by the elevator. Each dweller has also a projection, *b'*, to keep the part *a'* up to the adjacent elevator or dweller, and a notch, *c'*, to receive the projection *b'* when the dwellers are extended into a chain, as in Fig. 6. Guards *d'*, placed above the pattern-chain or its rods or bars, prevent the latter from moving out of the notches of the toothed disks or flanges 3 of the cylinder that move the chain.

We claim—

1. In a fancy-loom, a chain provided with elevators, dwellers, and spaces, substantially as described, adapted to indicate the pattern to be woven, substantially as set forth.

2. In a fancy-loom, a chain provided with elevators and spaces, and mounted upon a cylinder rotating in stationary bearings, and adapted to indicate the pattern to be woven, in combination with vertical levers connected with the harness-frames by cording, and with springs to depress the harness-frames, the chain being adapted to operate against the short ends of the levers, substantially as described.

3. A lifting-arm to move the vertical levers, connected by cording with the harness-frames, away from the pattern-surface, in combination with a duplex pattern-surface, and with a shifter to move the levers laterally with reference to the pattern-surface, substantially as described.

4. The crank-shaft, its worm-gear *p*, worm-toothed wheel, and pattern-surface, in combination with the short upright levers, provided with ends 2, against which said pattern-surface acts, and with harness-frames, connections *b*, and springs *r*, all substantially as described.

5. The levers *c*, shaft *d*, and lever *f*, in combination with the shifter *j* and lifting-arm *k*, substantially as described.

6. The combination, with levers, connected harness-frames, springs, and pattern-surface, of a lifting-arm to move the levers not acted upon by the pattern-surface, whereby the connected harness-frames are lifted and the warps evened, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEO. CROMPTON.
HORACE WYMAN.

Witnesses:
J. B. SYME,
J. A. WARE.