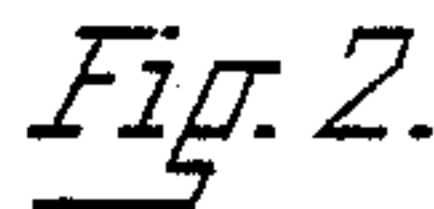
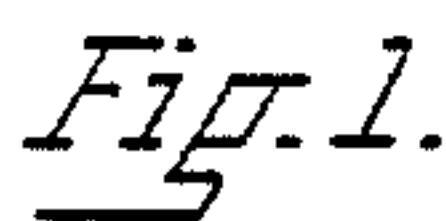


(No Model.)  
G. W. STAFFORD & S. D. BARRETT.  
SHEDDING MECHANISM FOR LOOMS.

No. 420,118.

Patented Jan. 28, 1890.



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Inventors'

By *Ther*

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# UNITED STATES PATENT OFFICE.

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## SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 420,118, dated January 28, 1890.

Application filed March 21, 1888. Serial No. 266,011. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE W. STAFFORD and SAMUEL D. BARRETT, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Shedding Mechanism for Looms; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a modification of the "dobby" or shedding mechanism for looms described in our application of September 6, 1887, that becomes necessary when perforated cards are substituted for pin-bars in constructing a pattern-chain for the purpose of controlling the operation of the heddle-frames.

In many cases it is found of great advantage to use perforated-card chains for the purpose of governing the operations of the heddle-frames in looms instead of pin-bars, as described in the application above referred to. This is especially the case when the pattern to be woven calls for a large number of changes, requiring a corresponding number of cards, as the cards carry much less weight and are easier and cheaper to make.

Figure 1 shows a vertical section of the dobbie and pattern-card operating mechanism constructed in accordance with our present invention. Fig. 2 is a front elevation of the upper part of the dobbie and the overhanging frame or cradle that holds the slack or surplus of the card-pattern chain.

The main portion of the dobbie, which includes the harness-operating levers C, jack-levers J, lifters  $r r'$ , eveners or depressors  $t t'$ , and latches  $s s'$ , with their supporting and connecting parts, are substantially the same and operate in substantially the same manner as the corresponding parts shown in the aforesaid application; but instead of having a pattern-cylinder with pin-bars located in the main body of the dobbie, the back and front frames of the dobbie are extended up and furnished with a perforated card-pattern

mechanism, consisting of a shaft  $b$ , held in bearings in the top of the frame, and having two vertical arms  $i$  attached to it, in the lower ends of which bearings are made to receive the journals of the pattern-cylinder  $a$ . This shaft  $b$  receives a rocking motion by means of a horizontal arm  $k$ , attached to it, which is connected by a vertical rod  $l$  to a lever  $l'$ , carrying a roll  $l''$ , resting on a cam  $n'$ , fast on the gear  $n^2$ , which in turn engages in a gear-wheel fast on the crank-shaft of the loom. In this way the pattern-cylinder  $a$  is moved away from the bar  $e$  by a positive motion of the cam  $n'$ , the pawl  $o$  catching into the ratchet-wheel  $y$  and turning it, and swung back to the bar by a spring  $m$ , so that in case the pattern-cylinder  $a$  does not move correctly the spring  $m$  will yield and no damage will be done to the pins or cards.

A shaft  $c$ , extending across the dobbie just below pattern-cylinder  $a$ , supports a series of plate-levers  $c'$  equal in number to the sum of both the series of upper and lower latches  $s s'$  below. Each alternate plate-lever is connected by a vertical wire  $h'$ , which is hooked over its outer end to one of the lower set of latches  $s'$ , and every intermediate plate-lever is connected in the same way by a wire  $h$  to one of the upper latches  $s$ , so that when the plate-levers are free the weight of their broad ends will hold all of the latches up clear of the lifters  $r r'$ .

From the short end of each plate-lever  $c'$  a short arm  $g$  extends up just in front of the bar  $e$ , that holds the pins  $f$  to operate the plate-levers  $c'$ . These pins are held in holes extending through the bar  $e$ , the pins being long enough to reach through the bar and extend some distance outside. When the pattern-cylinder  $a$  is swung in, as shown in the dotted lines, the weight of the long ends of the plate-levers will cause the arm  $g$  to push the pins  $f$  in, so as to project on the cylinder side of the bar  $e$ ; but when the pattern-cylinder  $a$ , with its perforated card  $a'$ , swings out against the bar  $e$  those pins that are intended to operate their plate-levers, having no perforations in the card to receive them, are pushed through the bar  $e$  against the arms  $g$



of their respective plate-levers, and the short ends of those levers will be depressed, so as to let down the latches connected to them and allow them to be caught by the lifters  $r$   $r'$  in their outward movement.

Perforations are made in the cards  $a'$  to allow the pins that are not intended to operate to pass through, according to the pattern to be woven, as in the Jacquard principle of operating harnesses.

It is necessary to prevent a plate-lever  $c'$  from pushing in its pin  $f$  and raising its latch off of its lifter  $r'$  or  $r$  before it has accomplished its work, (which may happen when the pattern-cylinder  $a$  swings away from the bar  $e$  to allow the cards to change,) and to accomplish this we carry the outer edge  $z$  of the check-bar  $p$  down, so that when a lifter has engaged with a latch and carried it forward under the check-bar the latch cannot be raised so as to release its hook from the lifter until it has come back to place again; or, as an equivalent, a separate bar or roll placed across the frames may be substituted for the turned-down edge  $z$  of the bar  $p$ . A light frame or cradle  $D'$  is placed over the dobby to hold the rollers over which the slack of the card-chain is suspended.

It is very important, especially where a long chain of cards are required to form a pattern, that the cards should be taken from the pattern-cylinder  $a$  and delivered to it again in proper order without straining the connections between the cards, and also to secure a proper disposition of the slack of the card-chain. This is accomplished by making the lower part of the overhanging frame  $D$  in an inverted semicircular form, and placing two cylinders  $a^2$   $a^3$ , having the same size and form and number of faces as the pattern-cylinder  $a$ , at the upper ends of the circular part of the frame, with bearings in that frame. A sprocket-wheel is made fast on each back end of the journals of the cylinders  $a^2$   $a^3$  and one on one end of the cylin-

der  $a$ . The two sprocket-wheels  $e^2$   $e^3$  on the back end of the cylinders  $a^2$   $a^3$  are connected together by means of the perforated belt  $c^4$ , the openings in which are made to fit on the projections on the sprocket-wheels. The sprocket-wheel  $e^2$  on the end of the cylinder  $a^2$  is connected to a sprocket-wheel  $e^4$  on the pattern-cylinder  $a$  by means of a similar belt  $c^3$ . This arrangement, together with the projections on the cylinders, which fit into openings in the cards, insures a proper degree of tension to the pattern-chain between the cylinder  $a$  and the cylinders  $a^2$   $a^3$ , the slack of the chain between the two latter cylinders being held by the projecting wires  $c^2$ , placed at intervals in the card-chain, the ends of the wires catching on the curved frames, allowing the cards to hang down in folds between the frames.

Having thus described our improvements, what we claim as our invention is—

1. The combination, with a harness-lever, a jack-lever pivoted thereto, latches pivoted to the opposite ends of the said jack-lever, lifter-bars, and wires  $h$   $h'$ , of the weighted levers with which said wires are connected, having arms  $g$ , the pins  $f$ , and a vibrating pattern-card cylinder or prism, substantially as described.

2. The combination, with a harness-lever, a jack-lever pivoted thereto, latches pivoted to the opposite ends of the said jack-lever, lifter-bars, check-bars having depending portions adapted to hold the latches in engagement with the lifter-bars, and wires  $h$   $h'$ , of the weighted levers, with which said wires are connected, having arms  $g$ , the pins  $f$ , and a vibrating pattern-card cylinder or prism, substantially as described.

GEO. W. STAFFORD.  
SAMUEL D. BARRETT.

Witnesses:

WILLIS S. WORK,  
BENJ. ARNOLD.