

(No Model.)

6 Sheets—Sheet 1.

R. HARTLEY.
JACQUARD MECHANISM FOR LOOMS FOR WEAVING CHENILLE WEBS.
No. 470,427.

Patented Mar. 8, 1892.

Fig. 1.

Fig. 2.

WITNESSES:
L. Douville,
P. H. Ayer

INVENTOR
Richard Hartley
BY *John D. Wetherill*
ATTORNEY.

(No Model.)

6 Sheets—Sheet 2.

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fig. 4. fig. 5.

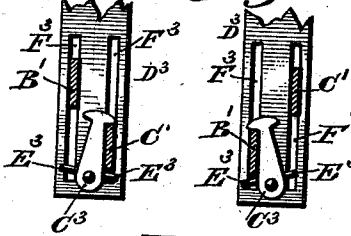
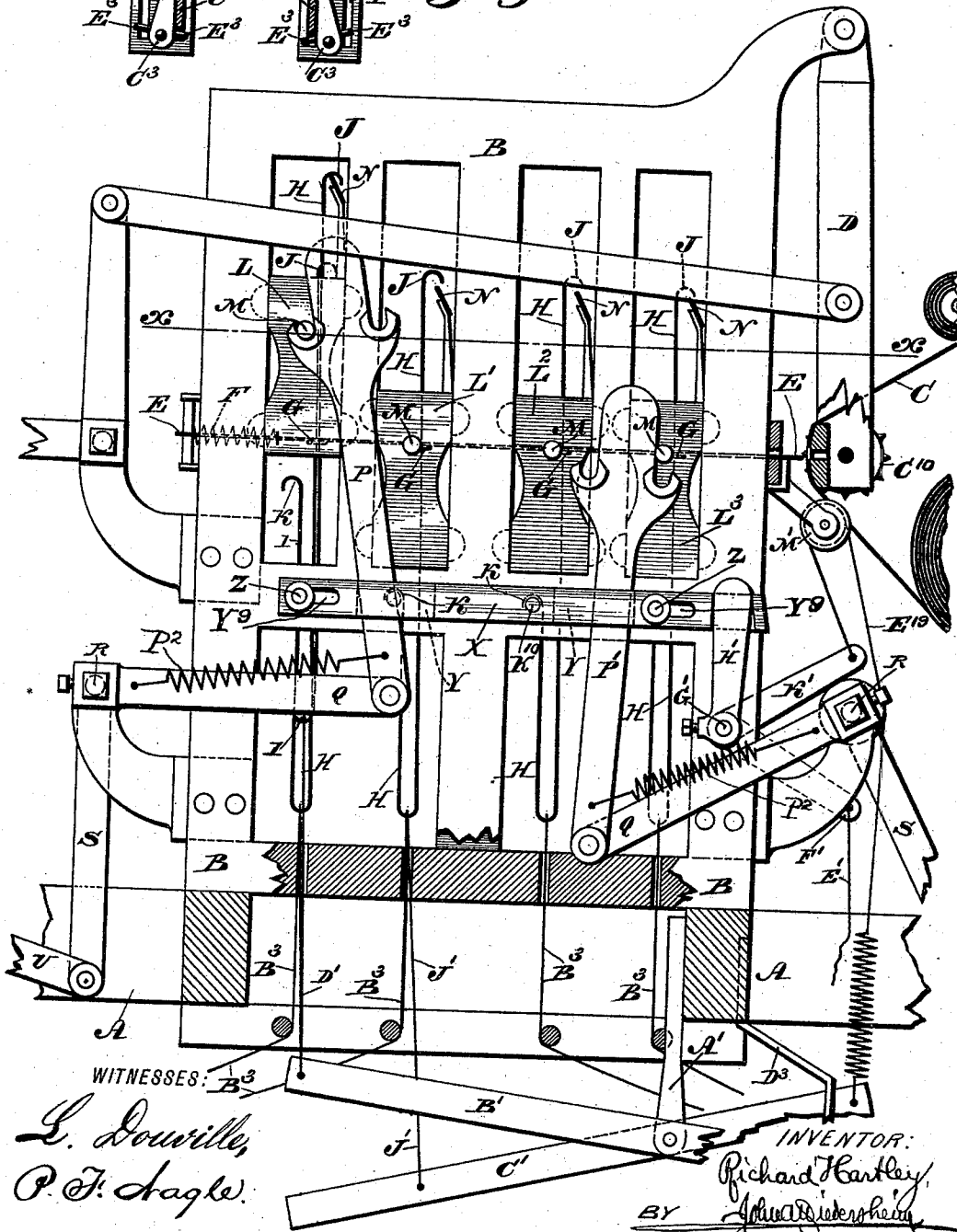


fig. 3.



WITNESSES:
L. Douville,
P. J. Hagle.

INVENTOR:
Richard Hartley,
BY *John D. Sweeney,*
Attorney.

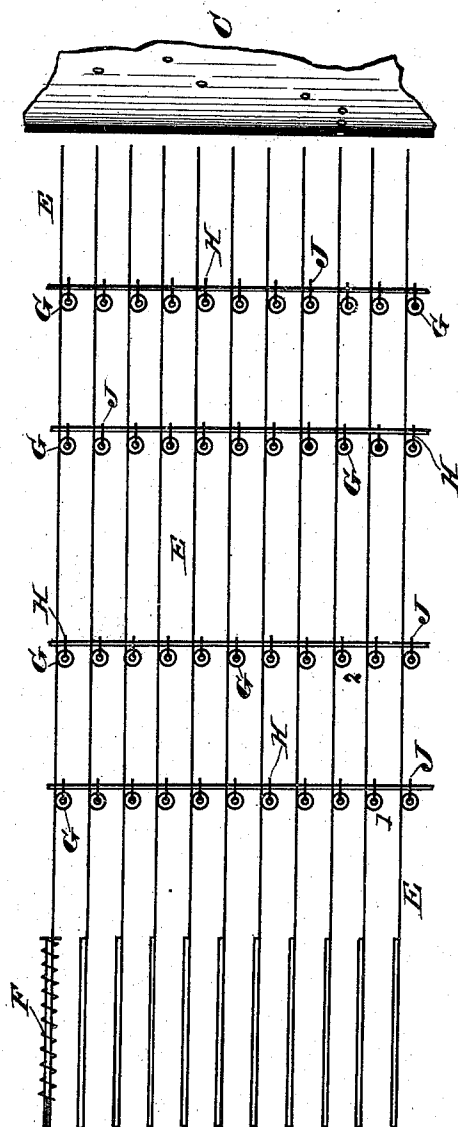
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Fig. 6.



WITNESSES:

L. Douville,
P. H. DagW.

INVENTOR

Richard Hartley
By John D. Dierckx

ATTORNEY.

(No Model.)

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R. HARTLEY.
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fig. 7.

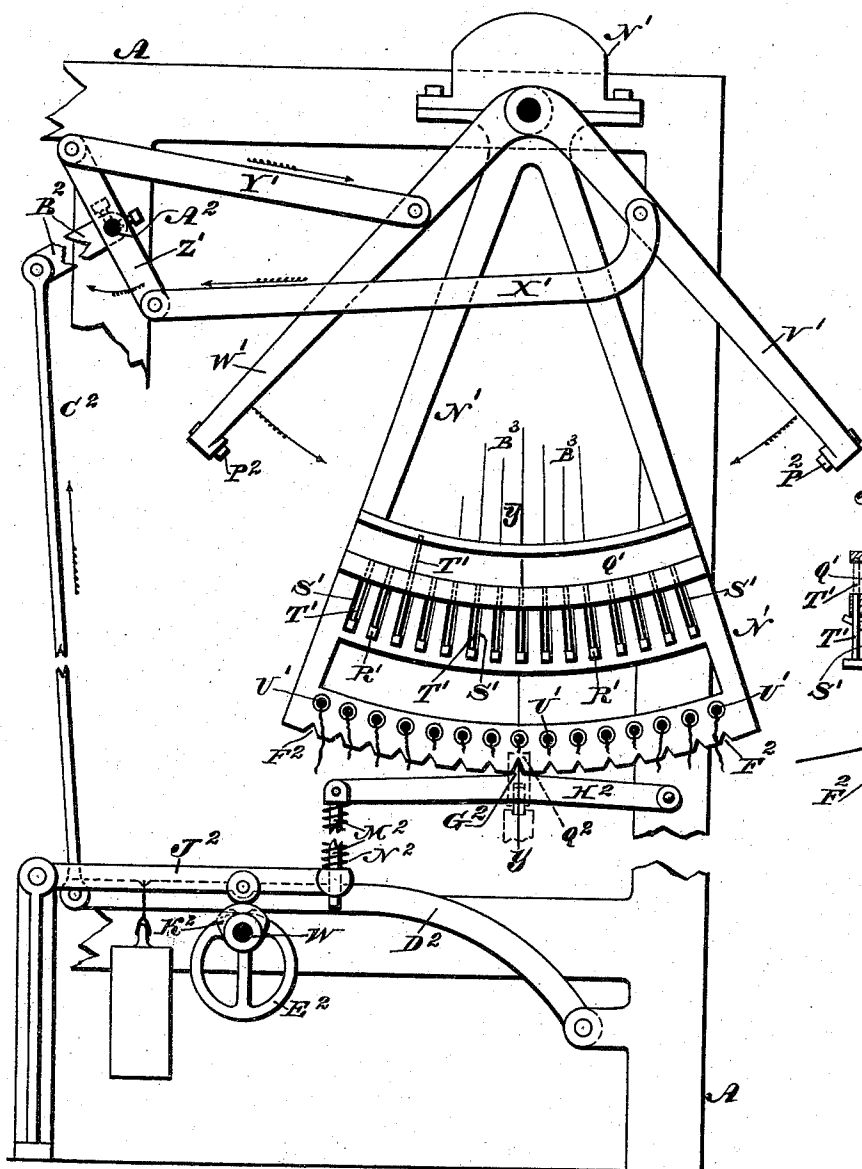
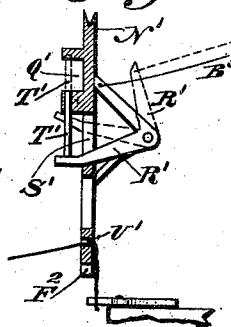


fig. 8.



WITNESSES:

L. Douville,
O. H. Hagel.

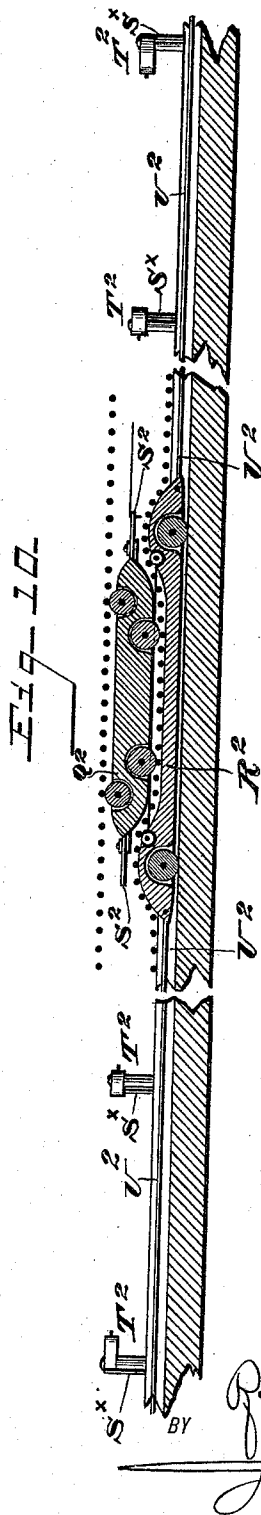
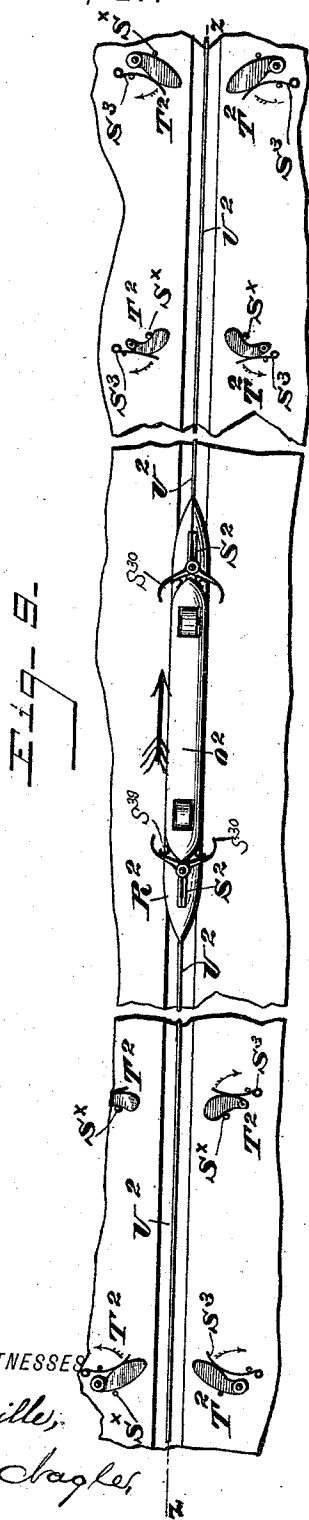
INVENTOR
Richard Hartley,
BY *John A. Diederichsen*
ATTORNEY.

(No Model.)

6 Sheets—Sheet 5.

R. HARTLEY.
JACQUARD MECHANISM FOR LOOMS FOR WEAVING CHENILLE WEBS.
No. 470,427.

Patented Mar. 8, 1892.



WITNESSES
L. Douville,
P. F. Chapler

INVENTOR
Richard Hartley
BY
Attorney

(No Model.)

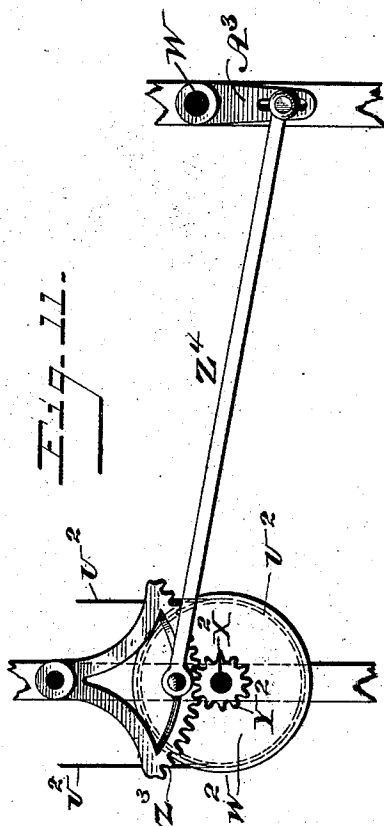
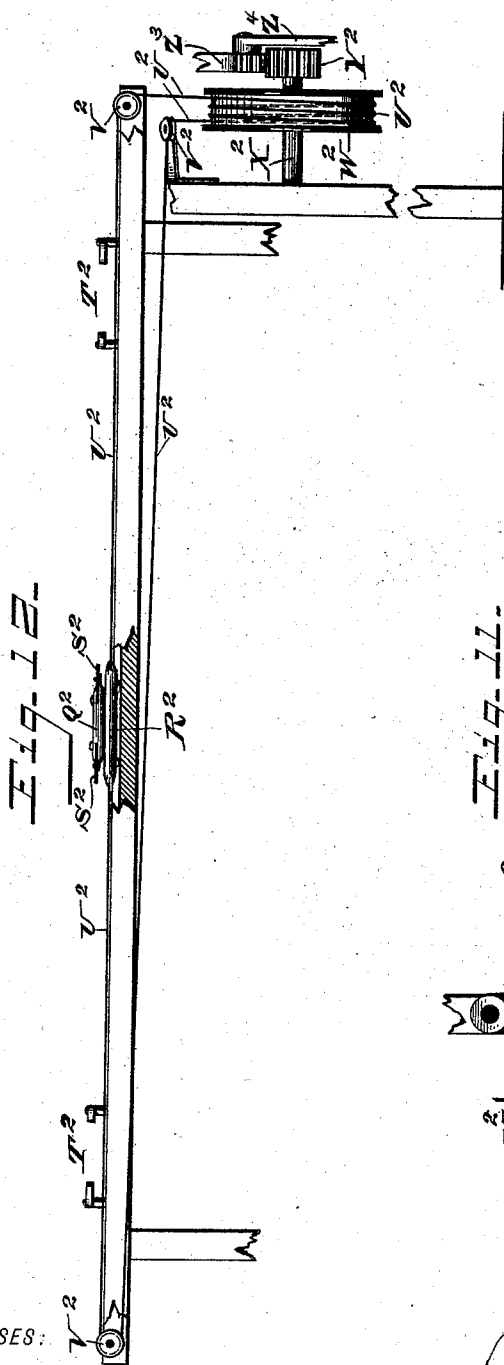
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R. HARTLEY.

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Patented Mar. 8, 1892.



WITNESSES:

L. Douville,
P. H. Bagley

INVENTOR
Richard Hartley
BY
James W. H. H.
ATTORNEY.

UNITED STATES PATENT OFFICE.

RICHARD HARTLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF FIVE-EIGHTHS TO HENRY FOULDS AND ALBERT FOULDS, OF SAME PLACE.

JACQUARD MECHANISM FOR LOOMS FOR WEAVING CHENILLE WEBS.

SPECIFICATION forming part of Letters Patent No. 470,427, dated March 8, 1892.

Application filed April 25, 1890. Serial No. 349,538. (No model.)

To all whom it may concern:

Be it known that I, RICHARD HARTLEY, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Jacquard Mechanism for Looms for Weaving Chenille Webs, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in looms of the class adapted for weaving webs for the production of chenille, and has for its object the providing of mechanism whereby the movement of a single needle of the Jacquard mechanism controls the delivery or feed of more than one bobbin of the filling-thread, so that the number of colors that can be employed in weaving chenille or other fabrics is not limited by the number of needles.

It consists of the construction and different combinations of parts herein set forth.

In the drawings, Figure 1 represents a front view of the upper portion of a loom, showing a Jacquard attachment and thread-supplying devices embodying my invention, the frame being in part broken away and some of the parts omitted. Fig. 2 represents a top view, on an enlarged scale, of a sliding bar employed for shifting the carriage-raising levers. Fig. 3 represents in front view, partly broken away, the Jacquard attachment with my invention embodied therein on a larger scale than that shown in Fig. 1, showing the frame with the rising and falling carriages which carry the lifting-blades for the operating-hooks and mechanism for moving said carriages. Figs. 4 and 5 represent end views of the latch for the pivoted levers of the bar-shifting mechanism. Fig. 6 represents a horizontal sectional view on line *xx*, Fig. 3, on an enlarged scale. Fig. 7 represents an end view of a portion of the loom, showing the oscillating frame with the thread-carriers and operating mechanism therefor. Fig. 8 represents a sectional view on line *yy*, Fig. 7. Fig. 9 represents a plan view of a portion of the race of a loom, showing the shuttle and catches for opening and closing the jaws of the same. Fig. 10 represents a vertical longitudinal section on line *zz*, Fig. 9. Fig. 11 represents a

view in elevation of a portion of the mechanism for oscillating the drum to which the straps or cords of the shuttle-carrier are secured. Fig. 12 represents a front view, partly broken away, of the race with operating mechanism for the shuttle.

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

Referring to the drawings, A designates the frame of a loom, having secured thereon the frame B of a Jacquard attachment.

C designates the card-pattern, and D the batten, which latter is operated by the usual mechanism, consisting of levers and rods secured to the frame and connected with and operated by the driving-shaft of the loom. The devices for rotating the spur-wheel which operates the pattern-cards and also for operating the batten are also old and well known and are connected with the driving-shaft, and, forming no part *per se* of this invention, are not particularly described or shown herein, any devices that will intermittently rotate said cards being applicable—as, for instance, the mechanism shown in patent to Davis, No. 96,553, dated November 9, 1869. On horizontal supports in said frame B are the needles E, provided with the springs F, forcing them toward the card C. Each of the needles E is provided with a series or number of eyes G, through which pass the vertical stems or shanks of a series of hooks H, so as to be laterally moved by the movements of said needles, and the said hooks H are arranged in rows, each hook being formed of a piece of wire or other suitable material, having the hooked upper end J and a bent lower portion K, the latter having a hook, as shown, adapted to engage with a cross-bar K¹⁰ of the frame B to prevent the falling of the hook below its proper place in the frame. Movable located in the frame B are the carriages L L' L² L³, having the studs M on their ends and provided with the lifting-blades N, the latter adapted to engage with the ends J of the hooks H.

For the purpose of raising the carriages L L' L² L³ the following described mechanism is employed: P P' designate lifting-arms at

the front and rear of the Jacquard mechanism, having recessed projections on their sides, so as to be adapted each to engage the under side of the studs M of either of the two adjacent carriages L¹ L' or L² L³, and having their lower ends pivotally attached to the arms Q, which are rigidly secured to the rock-shafts R, the latter being suitably journaled in the frame B or arms thereof. The said rock-shafts each have at one end the depending arm S, each of the latter being pivotally connected with one limb of one of the pivoted elbow-levers T by means of a rod U. The said elbow-levers T are mounted on studs secured to the frame of the loom and are operated by means of the rising and falling rods V, which are pivotally connected therewith, each of said rods having a roller V³ at its lower end in contact with an eccentric or cam V⁴ on the driving-shaft W of the loom. The return movement of the rods V and connected parts, after having been actuated in one direction by the cams or eccentrics on the driving-shaft, is accomplished by the fall of said rods by gravity.

To shift the arms P P' so as to engage the adjacent carriages, the slotted sliding bars X on each end of the frame B are employed. The said bars are slotted vertically and longitudinally, as at Y Y, so as to permit the movement of the vertical arms P P' therein, and are also slotted horizontally and longitudinally, as at Y⁹ Y⁹, so as to allow the horizontal motion of the said bars on the bolts Z Z, which are secured to the frame B. The arms P P' have springs P² connected thereto and to the arms Q, which operate to insure shifting of the said arms P P' in lowering to bring the same under the proper studs M of the pairs of carriages.

Pivoted to a hanger A' on the under side of the frame B are the levers B' C', the said lever B' being connected at one end by a cord D' to the hook 1 of the row of hooks farthest from the card C and at its other end being connected by a spring-and-cord connection E' to an arm F', rigidly attached to a rock-shaft G', which is journaled in the frame B and has an arm H' at each end thereof engaging in recessed portions of the sliding bars X, so as to move the same when the shaft G' is rocked. The lever C' is connected at one end to the hook 2 of the next to the last row of hooks from the card C by means of a cord J' and at the other end has a spring-and-cord connection E¹⁰ with an arm K', rigidly secured to the rock-shaft G', the said cord E¹⁰ passing over a roller M' above the arm K' of the rock-shaft, so that the pulling-downward movement of the said cord will raise the arm K', and thus move the said rock-shaft in an opposite direction from that which would be imparted to it by the pulling downward of the cord E', connected with the lever B' and the arm F'.

Secured to the ends of the upper portion of the frame of the loom are oscillating frames

N', one only being shown, each being of the form of a segment and having in one of its sides a curved groove Q'. Each of the elbow-levers R', which are pivoted to the frames N', has a limb passing through a slot S' in said frame and engaging a pin T', which latter is adapted to be projected into the groove Q' or be withdrawn from the same, according as the said elbow-lever R is operated by means of a cord B³, which is attached thereto and to one of the hooks H.

In the lower part of the frames N' are openings U', through which are passed the threads of the filling. On the pivotal support or connection of each of the frames N' are mounted the arms or levers V' W', which are operated, respectively, by the pivoted arms X' Y', attached to the arms of a lever Z', the latter being rigidly secured to a rock-shaft A², which is oscillated by means of the arm B², rigidly secured thereto at one end. A rod C² pivotally connects the arm B² with a weighted pivoted lever D², which is raised by an eccentric E² on the driving-shaft W of the loom.

To keep the frames N' in fixed position during delivery or feed of the thread, the under side of each of the same has notches or recesses, as at F², to receive a wedge-shaped projection G² on a pivoted lever H², which latter is raised or lowered by means of a lever J², operated by an eccentric K² on the driving-shaft W at each rotation of the said driving-shaft. A spring connection consisting of a rod M², secured to either of the levers H² or J² and adapted to work in a slot in the other arm, and an expansion-spring N², surrounding the rod M², is provided to insure a yielding contact of the projection G² with the under side of the frame N', so as to prevent a binding of said parts.

In the ends of the arms V' W' are studs P², adapted to enter the groove Q and come in contact with a pin T', projected therein, so as to aid said arms V' and W' in moving the frame N' the proper distance to bring the required color in reach of the shuttle Q².

The shuttle Q² is provided with spring-jaws S² at each end thereof, the said jaws consisting of pivoted levers having the projecting arms S³⁰ at the inner ends thereof, the said jaws being adapted to clasp and to retain while closed the end of the filling-thread within the same. Said jaws, as shown, are constructed of two parts or levers pivoted together and to the shuttle-body and bent outward at the rear to provide for opening the biting ends and inclose springs S³⁹ for normally holding said jaws closed. I do not limit myself to the precise construction shown, as many forms of jaws might be employed.

For opening the jaws so that one pair of them may release the thread which has been passed through the shed and the other grasp the thread to be passed through, two pairs of spring-actuated catches T² are located at each end of the loom, the said catches bearing against the jaws, so that when the shuttle has

left the shed the thread which has become filling is dropped from one of the pairs of jaws and the other pair of jaws is ready to receive the new color or filling-thread. The jaws yield as the shuttle enters the shed, so that the pair of jaws which has come in contact with the new thread will retain the same and carry it through the shed. The shuttle moving in the direction of the arrow, Fig. 9, the pairs of jaws S^2 to the left will travel over with its thread until the first pair of catches T^2 on the right-hand side of the loom is reached by such pair, the said catches opening the said jaws, and thereby setting free the thread carried thereby. The parts are so timed that the above first-named jaws release the thread carried thereby just before the second set of jaws to the right grasps a thread. The opening and closing of said jaws is attained by the catches T^2 , which are so arranged that when the jaws to the left on the shuttle are on the outside of the outermost catches T^2 to the left of the loom as the shuttle moves to the right the said jaws will press the catches at the left-hand end of the loom backward against the tension of the adjacent springs S^3 , and said jaws will pass over and not be affected by said left-hand catches and will continue closed until the first pair of right-hand catches T^2 is reached, when said jaws will be opened. The reverse is true of the right-hand jaws. To offer a resistance to turning or pressing down the catches in one direction, studs S^x are supplied, against which the catches are always caused to normally bear by springs S^3 .

The shuttle-carrier R^2 is operated by means of a cord or chain U^2 , the said cord being passed around the pulleys V^2 at the sides of the loom and having its ends secured to an oscillating drum W^2 , which is mounted on the shaft X^2 , the latter carrying a pinion Y^2 , operated by a segmental rack Z^3 , which meshes therewith, the said rack being oscillated by a rod Z^4 and a crank-arm A^3 , attached to the driving-shaft W of the loom.

The pattern-card C has a row of openings on one of its edges to receive the spurs of a wheel C^{10} on its frame or batten, which moves the said pattern-card C an opening at every other pick, said operation of wheel C^{10} being accomplished by any suitable ratchet-and-pawl or analogous mechanism. (Not shown, as it forms no part of my present invention.) Adjacent to the said outer row of openings are two inner rows, which are adapted to control the movement of the first and second needles, and thereby the hooks 1 and 2, to which the levers B' and C' are connected. Other openings are formed in the card corresponding to the remaining needles to be actuated.

The operation is as follows: The driving-shaft W being set in motion, the batten of the pattern-card C is oscillated therefrom, so that the card is brought in contact with the needles E , all of these, except those entering openings in the said card, being forced backward

and with them their hooks, so that the latter are out of the way of the lifting-blades N of the carriages. The carriages L , L' , L^2 , and L^3 are arranged in pairs, the left-hand pair L L' being designed to operate the colors on the left hand of the loom and the right-hand pair L^2 L^3 to operate the colors on the right hand of the loom, and the left-hand carriage of each pair (or the carriages L L^2) are designed to be alternately operated by the arms P P' , while the bars X are in one position, and the right-hand carriages of each pair, or the carriages L' and L^3 , to be alternately operated by the said arms when the bars X have shifted their position. In the position of the parts shown in Fig. 3 the arms P are about to begin their descent, having raised the carriage L and by means of its blade N , the hook 1, the needle of which has entered an opening in the card C , so that the lever B' has been operated so as to draw downward upon the connection E' and the arm F' of the rock-shaft G' , thus oscillating the latter with its arm H' , and thereby shifting the bar X to the position shown. When the arms P have completed their descent, the arms P' rise and lift the carriage L^3 , so that a hook on the corresponding row is raised and draws upon a cord B^3 , thus moving an elbow-lever R' so as to project its pin T' in the groove Q' , and thus control or regulate the throw or movement of the right-hand segmental frame N' , which movement is accomplished by the action of the arms $V' W'$, operated by the arms X' , Y' , and Z' and rock-shaft A^2 , the latter being operated by the arm B^2 , rod C^2 , arm D^2 , and eccentric E^2 on the driving-shaft W . The frame N' is now in position for the shuttle to take hold of the proper color previous to its flight through the shed. When the arms P' have completed their descent, the arms P then rise and, owing to the position of the slotted bars X , raise the carriage L' , so that a hook on the row of its blade is raised according to the pattern-card, thus actuating a pin in the left-hand frame N' and regulating the movement of the latter and thereby the position of the fillings. This movement alternately of the carriages L^3 and L' is continued according to the pattern, the needle of the hook 2, the movement of which actuates the lever C' , meeting a blank in the card, so that the said needle is forced back and its hook is out of the way of the lifting-blade. When it is now desired to change the colors, the needle connected with the hook 2, operating said lever C' , enters an opening in the card, so that the hook 2 is in the way of a blade and is lifted by the raising of the carriage L' by the arms P , so that the lever C' is moved, drawing upon the connection E^{10} , and thereby raising the arm K' , thus rocking the shaft G' and arms H' , whereby the bars X are shifted to the left. When the arms P complete their descent, the arms P' rise and, engaging the carriage L^2 , lift the same and the hook of that row left in its way by its needle entering an opening in the pat-

tern-card. When the arms P' have completed their descent, the arms P, rising, engage the carriage L, being guided in the slots Y of the bars X, so that the recessed projections in their left sides are under the studs M of the said carriage. The alternate lifting and falling of the carriages L² and L will continue as long as the needle of the hook 1 contacts with a blank in the pattern-card, for when it is required to shift the bar so that the other carriages L' and L² will be operated the said needle must enter an opening in the card, whereupon the hook will be raised and the lever B' operated and rock the shaft G' and the arm H', and thereby shift the bars X, the walls of the slots of which serve as guides to direct the bearings or recessed projections on the sides of the arms P P' under the studs of the carriages. To keep either one of the levers B' C' in fixed position until the other is operated by the raising of its hook, a latch C³ is employed. The said latch is pivoted to a slotted hanger D³, secured to the frame of the attachment, and is provided with a pin E³, which projects from both sides thereof and across the slots F³, in which the ends of the levers B' and C' work. As the end of the lever in its downward motion comes in contact with the pin, it oscillates the latch, so that the head thereof is swung over the top of the lever, thus keeping it in place until the other lever descends and strikes the pin on the other side of the latch. When the latter is tilted or swung over so as to release the first lever, the end of which is moved upward and out of engagement of the said latch, the second lever is secured in place by the head of the latch.

The matter relating to the oscillating frame with the thread-carriers thereon, described in this specification and shown in the drawings, but not specifically claimed herein, is reserved, being described, shown, and claimed by me in a pending application for Letters Patent for an improvement in looms filed May 23, 1889, Serial No. 311,771.

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

1. A Jacquard attachment to a loom, having two or more rows of hooks engaged by a single row of needles, each of said hooks having mechanism, substantially as described, attached thereto for controlling the supply of a different color to the shuttle, and separate lifting devices for said rows of hooks, said parts being combined substantially as described.

2. A Jacquard attachment to a loom, having a single row of needles, two or more rows of hooks engaged by said needles, a lifting device for each row of hooks, and mechanism attached to each of said hooks for controlling the supply of a different filling to the shuttle, said parts being combined substantially as described.

3. In a loom, a frame with a single row of

needles, two or more rows of hooks engaged by said needles, filling-thread carriers connected with said hooks, and lifting-carriages for said hooks, operated in pairs, said parts being combined substantially as described.

4. In a loom, a frame with a single row of needles, a series of four or more rows of hooks extending transversely of the said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, thread-carriers, mechanism, substantially as described, connecting said hooks with the thread-carriers, carriages with blades, the latter adapted to engage said hooks, said carriages being in pairs, as described, and mechanism, substantially as described, for alternately operating one of the members of each of the said pairs of carriages, said parts being combined substantially as described.

5. In a loom, a pattern-card with operating-batten, a single row of needles, a series of four or more rows of hooks extending transversely of said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, an oscillating frame having thread-carriers thereon, mechanism, as described, operatively connected with said hooks and frame for regulating the movement of the said oscillating frame and carriers, lifting-carriages for said hooks, and arms for raising the carriages, as described, said parts being combined substantially as described.

6. In a loom, a single row of needles, a series of four or more rows of hooks extending transversely of said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, frames having thread-carriers thereon, mechanism, substantially as described, operatively connected with said hooks and frames for regulating the movement of said frames and carriers, lifting-carriages for said hooks, pivoted arms and other mechanism, substantially as described, connected with the driving-shaft for lifting said carriages, a slotted bar in which said pivoted arms work, and mechanism, substantially as described, connected with said bar for shifting the same, said parts being combined substantially as described.

7. The combination of a sliding needle, a hook engaged by said needle, a lifting-carriage for said hook, a pivoted lever connected at one end to said hook by a cord, a rock-shaft having an arm connected to the other end of the lever and carrying another arm, a slotted bar shifted by the oscillation of the last-mentioned arm, and mechanism, substantially as described, including a pivoted arm for raising said carriage, said pivoted arm working in a slot of said shifting-bar, substantially as and for the purpose set forth.

8. In a Jacquard attachment to a loom, the combination of a frame, a single row of needles guided thereby, a series of four or more

rows of hooks extending transversely of said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, a lifting-carriage for each of said rows, mechanism, substantially as described, operated by the driving-shaft of the loom for alternately raising two of said carriages, and mechanism, substantially as described, for shifting a portion of said raising mechanism, so that the latter will be adapted to alternately raise another two of the said carriages, substantially as described.

9. In a loom, the combination of a frame, a single row of needles working in said frame, a series of four or more rows of hooks extending transversely of said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, a lifting-carriage for each row of needles, said carriages working in said frame and each having studs on its ends, two arms, each having recessed projections on opposite sides adapted to engage the studs of either of one pair of adjacent carriages, two rock-shafts having bearings in the frame and each provided with a fixed arm to which one of the said arms is pivotally secured, and mechanism, substantially as described, connected with the said rock-shafts and the driving-shaft of the loom for alternately communicating a rocking motion to said rock-shafts and thereby an alternate rising motion to said levers, substantially as and for the purpose set forth.

10. In a loom, a frame, a single row of needles working in said frame, a series of four or more rows of hooks extending transversely of said needles and connected therewith, so as to be moved thereby, each of said needles controlling a hook in each of said rows of hooks, a lifting-carriage for each row of hooks, rising

and falling, each adapted to engage either of one pair of adjacent carriages, two rock-shafts suitably journaled and each having an arm to which one of the said levers is pivoted, mechanism, substantially as described, connected with the said rock-shafts for alternately communicating an oscillating motion to said rock-shafts and thereby a rising motion to said arms, a pivoted lever operated by the raising of a designated hook on one of said rows, a rock-shaft operated by the movement of said lever and carrying an arm, and a sliding bar actuated by the oscillation of said arm and having slots in which said rising and falling arms of the carriage-lifting mechanism work, said parts being combined substantially as described.

11. In a loom, the combination of a support with slots therein, pivoted levers having their ends working in said slots, a latch pivoted to said support, and a pin or pins projecting from said latch across said slots and adapted to be engaged by either of the levers, the said latch having a head adapted to extend across either slot and hold one of said levers in fixed position, substantially as described.

12. In a loom, an oscillating frame with thread-carriers thereon and having notches on its lower edge, a pivoted lever with a projection on its upper side adapted to fit in either of said notches, a driving-shaft with a cam thereon, a pivoted arm bearing on said cam, a pin secured to the lever and working in an opening in the arm, and a coil-spring around said pin and bearing on the said lever and arm, said parts being combined substantially as described.

RICHARD HARTLEY.

Witnesses:

JOHN A. WIEDERSHEIM,
WM. C. WIEDERSHEIM.