

(No Model.)

3 Sheets—Sheet 1.

G. PAVIA.
JACQUARD MECHANISM FOR LOOMS.

No. 541,879.

Patented July 2, 1895.

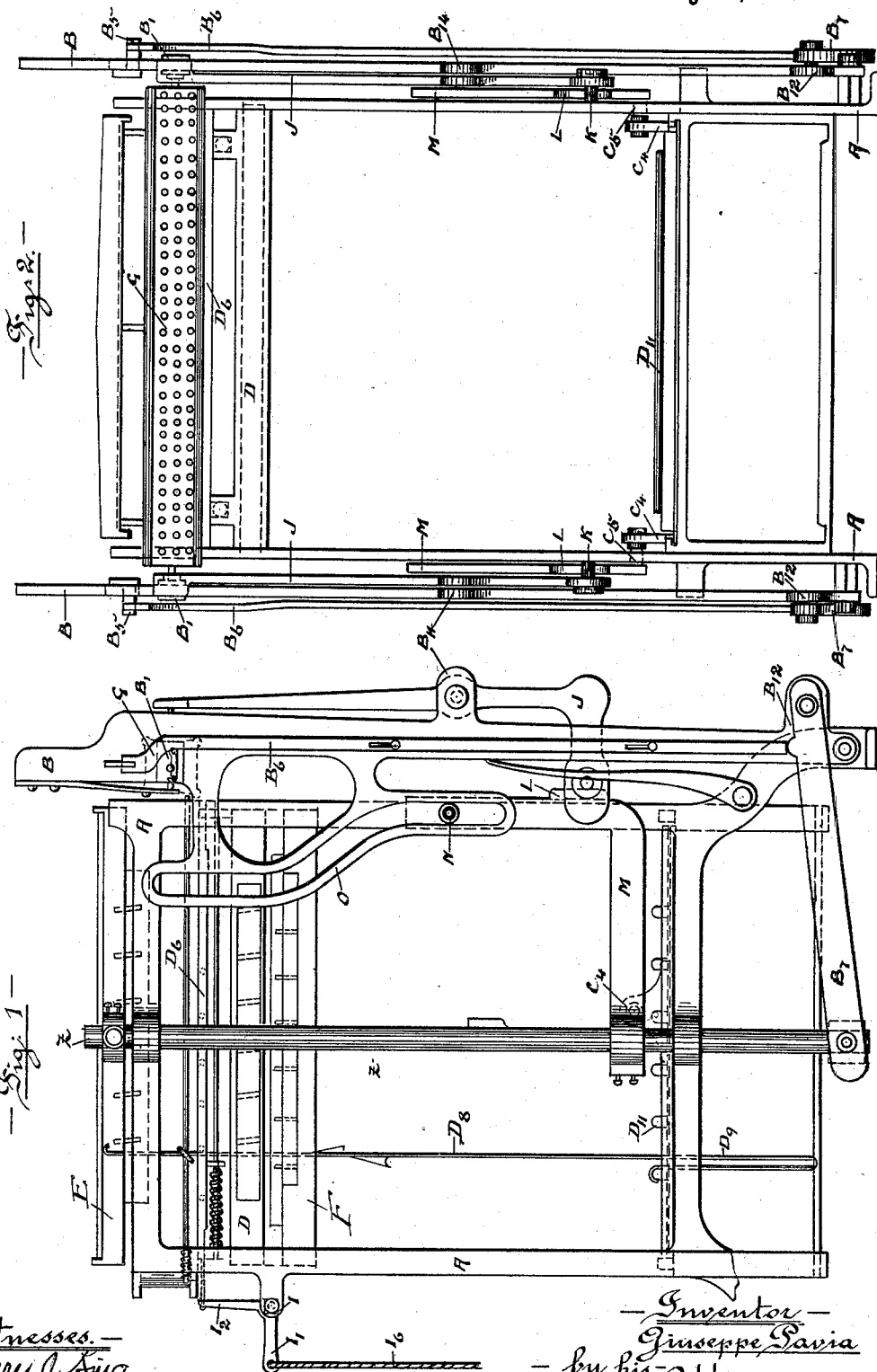


Fig. 2.

Fig. 1.

Witnesses.
Henry J. King
John R. R. R.

Inventor
Giuseppe Pavia
by his Attorneys
Treschow & Co.

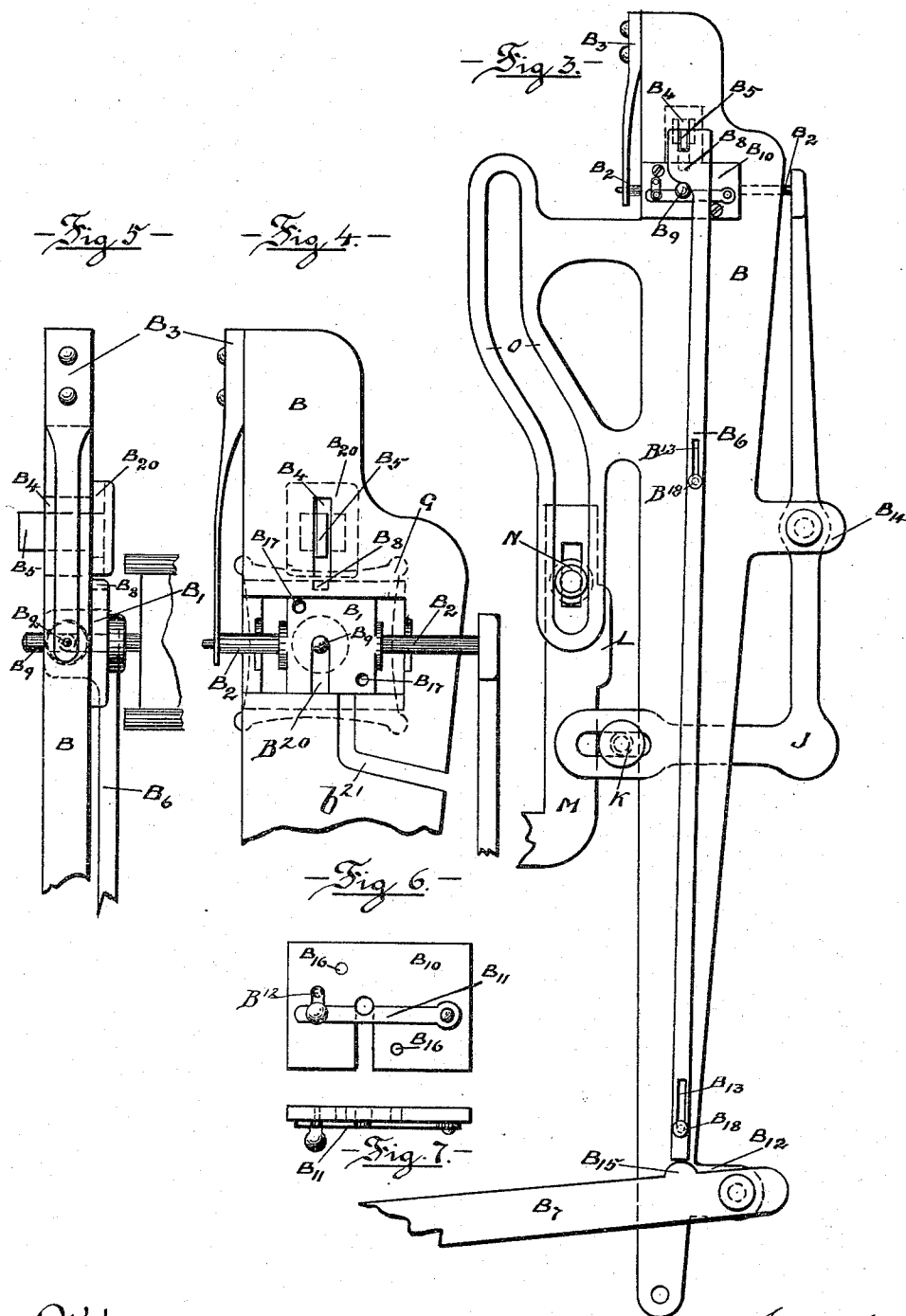
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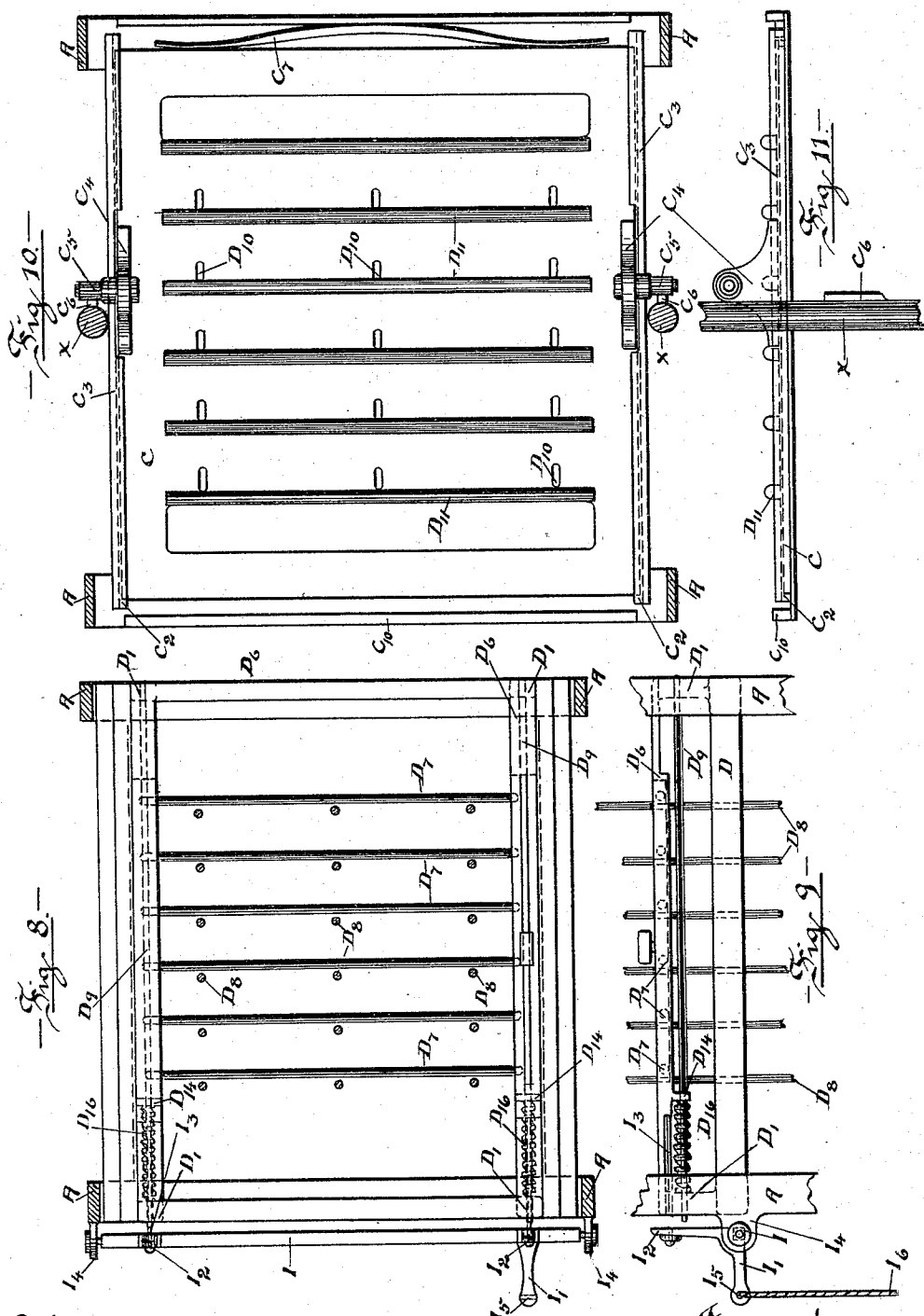
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Witnesses—

Henry J. King
and
Richard

— by his —

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UNITED STATES PATENT OFFICE.

GIUSEPPE PAVIA, OF PATERSON, NEW JERSEY.

JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 541,879, dated July 2, 1895.

Application filed July 23, 1894. Serial No. 518,355. (No model.)

To all whom it may concern:

Be it known that I, GIUSEPPE PAVIA, a citizen of the Kingdom of Italy, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Jacquard Mechanism for Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The improvements claimed by me in the Jacquard mechanism relate to two sliding bearings furnished for the pattern cylinder, which are by me so constructed as to give the cylinder during the latter part of its forward reciprocation a perfect horizontal sliding movement parallel with the needles, the movement of the cylinder in many constructions heretofore having followed that of the cradle, viz: a circular movement, with the pivots of the cradle as a center thus, geometrically speaking, rendering the position of the needles that of tangents to such circles, often resulting in the missing of the holes in the pattern cards by the needles and their consequent bending. The pattern cards were furthermore subject to being punctured and otherwise damaged by the abrupt slamming of the cylinder against the needles, all of which tended to wear out the pattern cards very soon, or necessitated their being made of such heavy and thick material that they could not easily be punctured. To obviate these evils I have given the cylinder the two sliding bearings with auxiliary mechanical elements, dividing the forward reciprocation of the cradle into two separate and different movements, the first performed by the swinging cradle up to within an eighth of an inch or so from the needles, and the second performed by the horizontally sliding bearings carrying the cylinder with them thus giving an easy, elastic impression on the needles, admitting each needle horizontally with mathematical precision into its respective hole, thus preventing the bending of the needles and ultimately reducing the cost of

the pattern cards. This improvement can be utilized on any kind of Jacquard mechanism.

My invention further relates to an improvement on the lower stationary grate whereby the same is made movable horizontally back and forth at the moment when the knives pass the hooks. This movement has the benefit of preventing the bending of the hooks which very frequently occurs and consequently saves the time spent by the operator in repairing, and in the end, wear on the hooks and knives, giving longer life to the jacquard. It also makes it possible to use the jacquard in rooms with lower ceilings than the jacquard of up to date will permit, as no emergencies will arise where new hooks will have to be inserted. Lastly I have furnished a bar-frame worked by a lever attachment for the purpose of throwing all hooks elevated in their standing position, enabling the weaver to adjust any threads out of order and which furthermore will throw the shed level. The principle on which this mechanism works as relating to the location of the needles, and their combination with their respective hooks, the movement of the upper and lower griffs toward and from each other and their relation to the upper stationary grate D is the same as covered and described in other patents and I shall therefore confine myself to describing my improvements and in so doing will refer to the accompanying drawings where like letters of reference indicate corresponding parts in the different views.

Figure 1 represents a side view of the Jacquard mechanism with one needle and its attendant hook shown for the sake of illustrating my improvement relating to wear on the knives and hooks. Fig. 2 is an end view of Fig. 1, looking at it from the end where the cradle is attached. Fig. 3 is a side view of my improved cradle, showing all the parts necessary to give it the new movement herein described. Fig. 4 is a side view of the top of cradle showing the location of the sliding bearings. Fig. 5 is an end view of the parts shown in Fig. 4. Fig. 6 is the plate which covers the opening containing the sliding bearing. Fig. 7 is a top view of the plate shown in Fig. 6. Fig. 8 is a top view of my improved

bar-frame fixed on top of the upper stationary grate. Fig. 9 is a side view of the parts shown in Fig. 8. Fig. 10 is a top view of my improved lower stationary grate. Fig. 11 is a side view of the parts shown in Fig. 10.

In Fig. 3, will be seen the cradle B, pivoted on frame A, which carries the cylinder G to and from the needles. The movement of cradle B is occasioned by the roller N, attached to the right-angled arm M connected with the upright motion bar Z and consequently following its motion, moving in cam guide O on the cradle. After completing the period of this movement toward the needles, I maintain the cradle in a fixed position allowing the cylinder during this time to come in contact with the needles by a straight horizontal movement. The mechanical elements necessary to attain such objects I shall now proceed to describe.

The ends of the cylinder shaft B⁹ rest in a set of sliding bearings B', one of which bearings is shown in the detail view in Figs. 3 and 4 and in one side of the cradle. An opening is to that end cut out in the cradle B of such a size and shape that the bearing fits snugly in it and allows it to travel back and forth regulated by the movements of the other component elements of this combination.

Bearing B' and plate B¹⁰ having slots registering with another slot cut out in cradle arm to permit the cylinder to be taken out is furnished as a consequence with an arm or bearing supporting the end of the cylinder shaft B⁹ when it passes over the slot in the cradle arm. This arm B¹¹ is pivoted on plate B¹⁰ and has a pin B¹² fitting into a corresponding hole in plate B¹⁰ said plate B¹⁰ thus covering and protecting the opening containing bearing B'. This opening is on the inside of the cradle covered by bearing B' itself lapping over the edges as indicated by the dotted lines in Fig. 4. The plate B¹⁰, which is shown in Figs. 6 and 7 separately in a front and top-view is fastened to the sliding bearing B' by means of screws passing through holes B¹⁶, screwed into screw-cut holes B¹⁷ in bearing. In the upper edge of the rear part of bearing B' overlapping the opening there is a square notch B⁸ cut out for the reception of a tongue B⁵. Said tongue being acted upon by the elevating rod B⁶, is given an up and down movement and rests in a pocket B²⁰ cast on the inside of cradle arm above the bearing B' and passes through a slot B⁴ cut out for such purpose in cradle arm and tongue B⁵ protrudes far enough on the outside to enable the upper forked end of elevating rod B⁶ to catch it and lift it in and out of the notch B⁸ in bearing B' as the occasion requires it.

Pivoted on a lug B¹⁴, cast on cradle is a right-angled lever J which at the end of its short and horizontal arm is furnished with a roller K which is acted upon by a projection or lug L cast on the arm M formerly alluded to.

On the outside of cradle B, as seen in Figs.

1 and 3, is an elevating rod B⁶ resting with its lower end on an arch-shaped projection B¹⁵ on a lever B⁷; which lever at one end is pivoted on a lug B¹², cast on cradle B, and at the other end suitably fixed to upright motion bar Z. The upper end of said elevating rod B⁶ is fork-shaped and in the fork rests the tongue B⁵. The rod B⁶ having the two slots B¹³ cut out in it and being secured to the side of cradle B by means of the two pins B¹⁸ so that it moves up and down the side of it, following automatically the up and down motion of upright motion bar Z, thus raises and lowers tongue B⁵. The last element in this construction is a spring B³ fixed on the cradle B in such a manner as to reciprocate the action of lever J on sliding bearing B'. The action of spring B³ and lever J is on two prongs B² protruding from the front and rear of sliding bearing B'.

The connection and working order of the above described mechanical elements are the following: When the arm M carrying roller N moving in guide O forces the cradle in toward the needles, lever B⁷ which as well as arm M is fixed on upright motion bar Z will be in its lowest position and tongue B⁵ will consequently be resting in the notch B⁸ in bearing B'. On the return movement motion bar Z will lift lever B⁷ and consequently rod B⁶ thus throwing tongue B⁵ out of notch B⁸ and the right angled lever J will at that moment by the action of lug L on roller K force bearing B' in toward the needles, and both bearings carrying cylinder G will thus perform the final movement and bring the cylinder carrying the pattern cards into contact with the needles, the action of spring B³ here coming into play by breaking the force of the movement and by sending bearings back again to receive the tongues ready to hold them in position until the next inward movement of the cradle, which was the desired object.

The movement whereby the bending of the hooks is prevented occasioned by the knives striking them in their downward movement and whereby the mutual wear on them is diminished by reason of their being enabled to pass and repass each other without coming into contact is illustrated in Figs. 10 and 11 showing the lower stationary grate and Fig. 11 a side view of same. The main features in this construction are, first, two rollers held in bearings cast on the grate which during the up and down movement of upright motion bars X are pushed away by lugs cast on said motion bars acting on the rollers, and, secondly, an auxiliary spring which reciprocates above-mentioned action, thus having the desired object as can be seen in Fig. 1, of steering hook D⁸ clear of its respective knife.

Cast on frame C are bearings C⁴ carrying rollers C⁵. Said rollers, in order to create the necessary movement on frame C, are acted upon by lugs C⁶ cast on upright motion bars X. Frame C slides in slots C³, cut out in bars

C³ running from front to rear down both sides of the frame support and having the slots C² cut out in them, which slots act as guides for the inner loose frame C, thus preventing it from moving out sidewise or being lifted up from its support, and on the cradle side of the mechanism lies a spring C⁷ between a bar of the main frame A and frame C. Opposite to this lies a bar C¹⁰ to prevent frame C from sliding out at that end. It will thus be seen, alluding to hook D⁸ in Fig. 1 that as the nether oblong U shaped part of hook D⁸ marked D⁹ in Fig. 1, and passing through oblong holes D¹⁰, is bent so as to rest on cross bars D¹¹, whenever rollers C⁵ pass lugs C⁶ on motion bars X frame C will, sliding in its grooves, be pushed away and hook D⁸ resting in before-mentioned manner with its lower bent end on frame C will be given a motion that will have the desired effect of allowing the upper part of said hook D⁸ to pass and repass its knife without coming in contact with it and frame C will, after being pushed over far enough be given a reciprocate motion to that rendered by lugs C⁶ acting on rollers C⁵, by the spring C⁷, return to its normal position until acted upon again.

The upper lifting grate E is carried by the upright motion bars Z, and the lower lifting grate F is carried by the upright motion bars X, and these upright motion bars may be actuated by any suitable mechanism so as to operate the said grates alternately. The hook D⁸ which I employ is similar in construction to that shown and described by the patent to Charcot, No. 500,852, dated July 4, 1893, the said hook having a projection for engaging the grate E, another projection for engaging the projection F, and a third projection for engaging the upper stationary grate D, as well as a fourth projection for engaging with the lower stationary grate D¹¹.

My last improvement the bar frame with lever attachment is constructed in the following manner, reference being had to Fig. 8 showing said frame and lever attachment and Fig. 9 being a side view of Fig. 8. Above the stationary grate D and fastened on four square pins D⁷ fixed on said grate is a frame D⁶ which has as many bars D⁷ as there are rows of hooks D⁸ employed in the mechanism, running horizontally across the jacquard and immediately in front of each row of hooks. Said bars D⁷ are fastened in a frame work which is movable back and forth according to the action on a lever arm I⁷ and is connected with such lever by two bars I⁸ fastened appropriately to the two arms I² of said lever attachment. The frame D⁶ being thus secured to arms I², there is provided a means for giving said frame D⁶ a reactionary motion after its being pulled out by lever arm I⁷ by springs D¹⁶ coiled around bars D⁹ and lying between lugs D¹⁴ cast on frame D⁶ and the two front pins D, connecting D⁶ with the upper stationary grate D. These springs will, when frame is

pulled out, be compressed between the square pins D⁷ and the lugs D¹⁴, and will, on being allowed to resume their ordinary positions, carry frame D⁶ back with them.

The lever attachment is composed of a square bar I pivoted in two lugs I⁴ cast on frame A and lying horizontal, enabling weaver by a downward pull to manipulate same. Bar I has a single arm I⁷, having a hole I⁵ drilled in it in which is fastened a cord or chain I⁶ within reach of the weaver, who, when he wishes at any time to adjust any of his threads or otherwise examine his work, can throw his shed level by pulling such cord attached to the eye I⁵ in arm I⁷ thereby pulling out bar frame D⁶ which, by means of the bars D⁷ lying immediately in front of hooks D⁸ as above described, will pull these back from their knives on grate D and thus attain the desired object. The frame D⁶ will immediately upon the release of the weaver's hold upon cord, move back to its original position by the action of springs D¹⁶ as described.

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

1. In a Jacquard mechanism, the cradle, the pattern cylinder and the needles, the cradle being provided with openings adjacent to the ends of the pattern cylinder, in combination with a pair of sliding bearings supporting the pattern cylinder and moving in the said openings, means for vibrating the cradle and cylinder, each bearing having a prong at the front and also one at the rear, two right angled cam-operated levers acting on the prongs at one side of the bearings to give the cylinder an additional movement toward the needles, and two springs acting on the prongs at the other side of the bearings to reciprocate the movement of the angle levers, substantially as described.

2. In a Jacquard mechanism, the cradle, the pattern cylinder and the needles, the cradle being provided with openings adjacent to the ends of the pattern cylinder, in combination with a pair of sliding bearings supporting the pattern cylinder and moving in the said openings, means for vibrating the cradle and cylinder to and from the needles, the bearings for the pattern cylinder being notched at their top edges, vertically movable locking tongues sliding on said cradle and engaging the said notches, and means for moving said tongues into and out of engagement with the notches, substantially as described.

3. In a Jacquard mechanism, the cradle, the pattern cylinder and the needles, the cradle being provided with openings adjacent to the ends of the pattern cylinder, in combination with a pair of sliding bearings supporting the pattern cylinder and moving in the said openings, means for vibrating the cradle and cylinder, each bearing having a prong at the front and also one at the rear, two right angled cam-operated levers acting on the prongs

at one side of the bearings to give the cylinder an additional movement toward the needles, and two springs acting on the prongs at the other side of the bearings to reciprocate
5 the movement of the angle levers, the bearings for the cylinder being also notched at their top edges, vertically movable locking tongues sliding on said cradle and engaging said notches, two elevating rods for moving
10 said tongues into and out of engagement with the notches, the horizontal motion bars, and

two arc shaped projections thereon co-acting with the elevating rods, substantially as described.

In testimony that I claim the foregoing I 15
have hereunto set my hand this 14th day of July, 1894.

GIUSEPPE PAVIA.

Witnesses:

GILBERT C. HIGBY,
AXEL BEEKEN.