(No Model.) 2 Sheets—Sheet 1.

A. K. CHALMERS.

JACQUARD MECHANISM FOR LOOMS.

No. 585,082. Patented June 22, 1897.

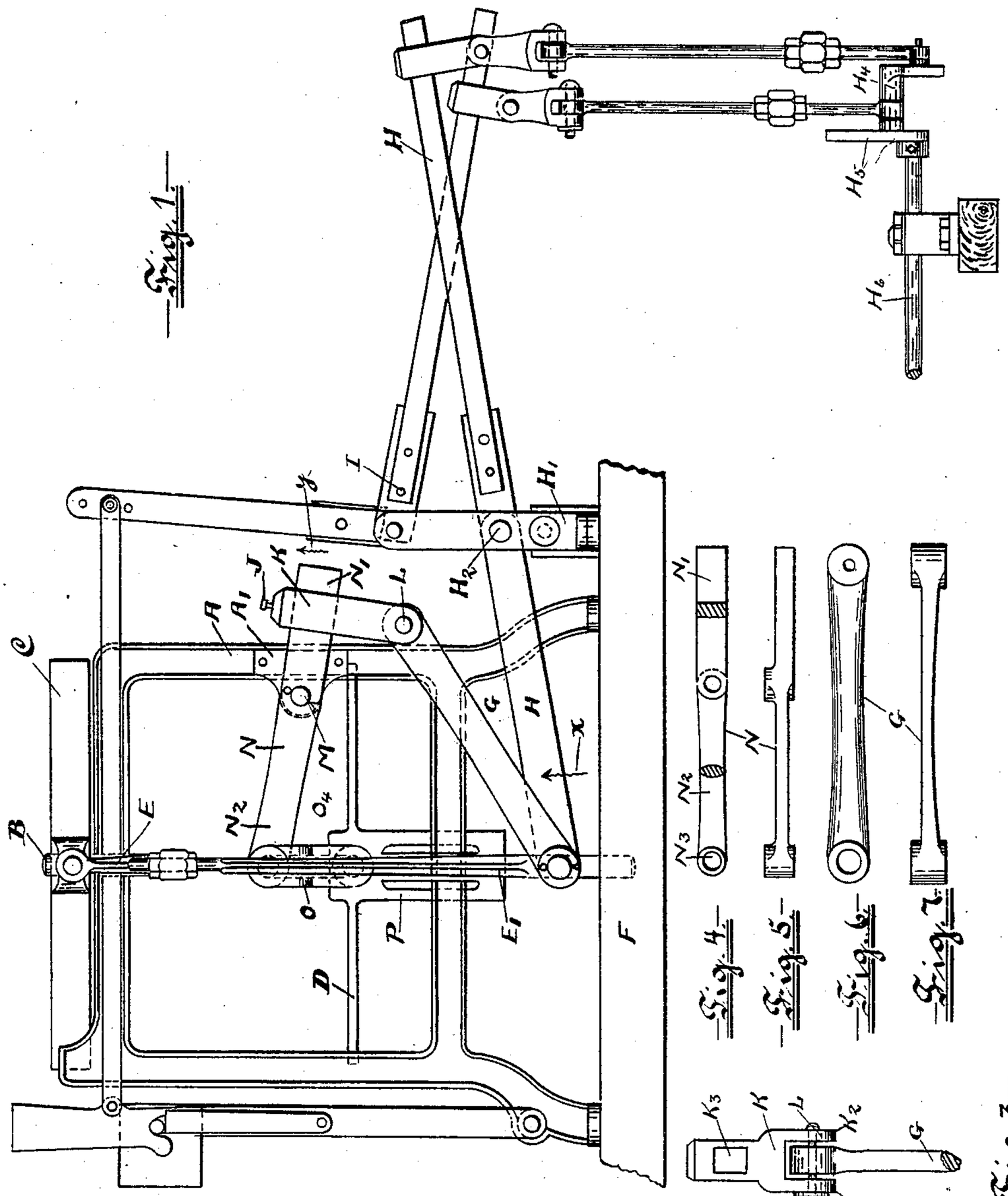

Fig. 1.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 3.

Witnesses —

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(No Model.)

2 Sheets—Sheet 2.

A. K. CHALMERS.

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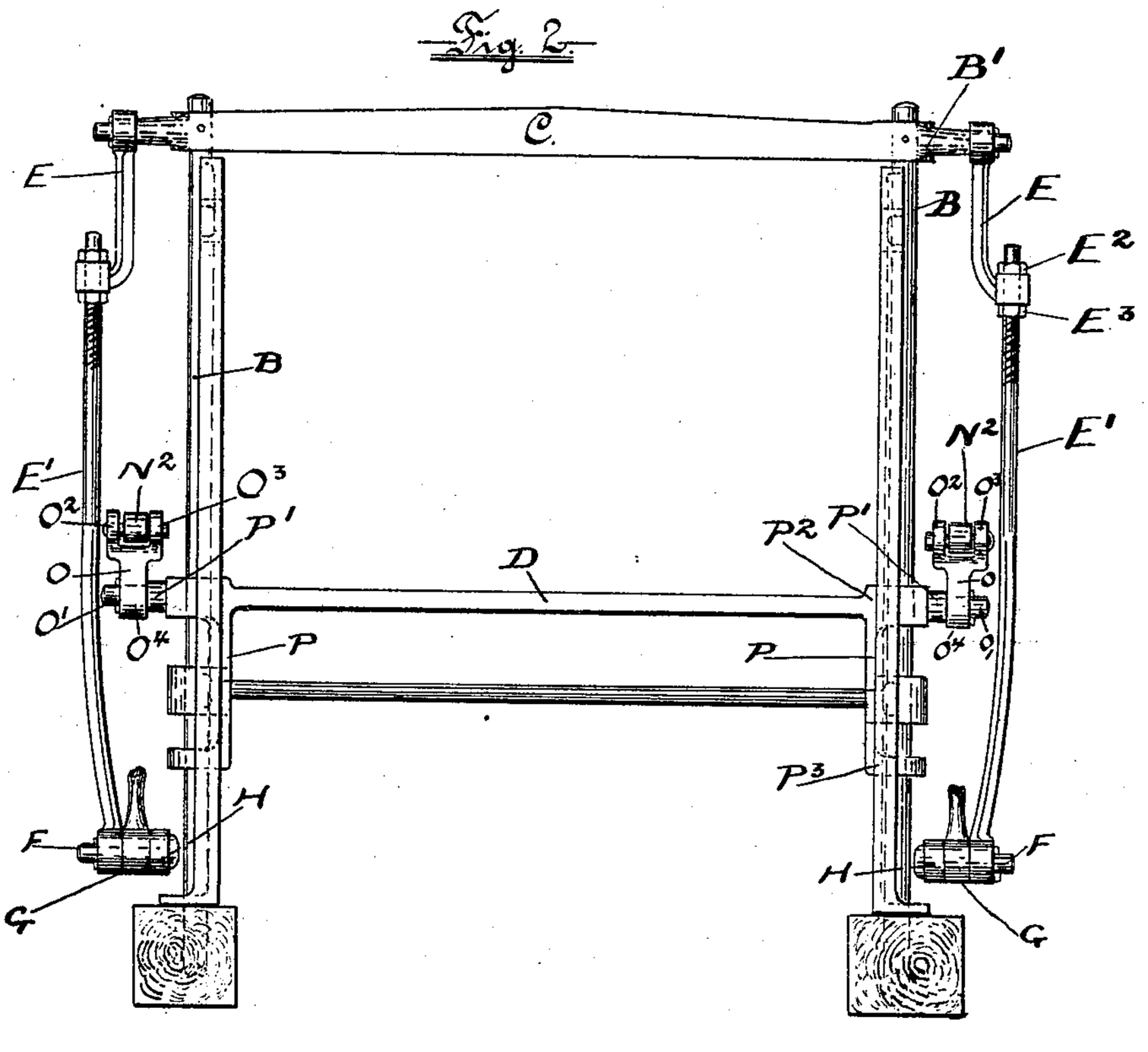
Fig. 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER K. CHALMERS, OF PATERSON, NEW JERSEY, ASSIGNOR TO JAMES JACKSON & SONS, OF SAME PLACE.

JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 585,082, dated June 22, 1897.

Application filed January 21, 1897. Serial No. 620,023. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER K. CHALMERS, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Jacquard Mechanisms 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 part of this specification.

My invention relates to improvements in the means for moving the upper and lower grates in a Jacquard mechanism to and from each other. The benefits gained by these improvements will be found to relate to durability and expense. By reason of a limited number of elements used in these my improved means for elevating and lowering the grates in the jacquard there will naturally follow a decrease in the expense consequent on this simplified construction.

In describing my invention I will refer to the accompanying drawings, where like letters of reference indicate corresponding parts in the different views, and in which—

Figure 1 shows a side view of a Jacquard mechanism with my improved elements attached, with all the inner working parts—such as the hooks, needles, &c.—omitted, as they form no part of and are not related to my improvement in any way. Fig. 2 shows an end view of the jacquard, with the guide-bars B of the upper grate and the elements that elevate said upper grate, and also the guide P, attached to the lower grate, to which are attached some of my improved elements. Fig. 3 is an end view of the knuckle-joint K and one of the levers G, connecting it with the grate-elevating lever H, shown in the side view in Fig. 1. Fig. 4 is a side view of the lever N, connecting the two knuckle-joints K and O. Fig. 5 is a top view of Fig. 4; Fig. 6, a side view of the lever G, connecting the knuckle-joint K and the grate-elevating lever-joint with each other; and Fig. 7 is a top view of Fig. 6.

As the two sides of a Jacquard mechanism are perfectly symmetrical as far as the grate elevating and lowering means are concerned, only one side need be described except in the hereunto-attached claims, where for the complete working combination's sake the double means will be enumerated.

A indicates one of the side frames in a Jacquard mechanism; C, the upper grate; D, the lower grate. B is the guiding-bar, attached firmly to the upper grate in the arm B′ and is otherwise guided in the apertures for that purpose provided in the frame A. E is a connecting-rod attached at one end to a pin B^{10} in the upper-grate arm B′ and at its other end furnished with a screw-cut hole screw-cut so as to receive the upper similarly-screw-cut part of the connecting-rod E′, whose lower part is attached to a bolt or pin F, which in addition to connecting-rod E′ supports the link G and attaches them both to the grate-elevating lever H, consequently also supporting this latter.

The two connecting-rods E and E′, the rod E′ being secured to rod E by lock-nuts E^2 and E^3, thus form the element that raises and lowers the upper grate C when said elevating-lever H, which has its fulcrum H^2 in two standards, of which H′ is one, is given the necessary motion by means of connecting-rod H^3, connecting lever H with the eccentric arm H^4, which with the eccentric arm H^5 gives, (arm H^4 being secured to arm H^5 and arm H^5 secured to shaft H^6,) when shaft H^6 is revolved, the requisite movement to their respective motion-levers H and I.

The movement of the lower cradle D, I shall now describe, commencing at a point common to both cradles—viz., the pin F, which, as previously described, carries the connecting-rod E′, having attached at its other end E, which, attached to the upper-cradle arms B′, thus elevates and lowers the said upper cradle. Pivoted on this said pin F is a lever-arm G, whose other end is pivoted on a pin L between the two prongs K′ and K^2 of a knuckle-joint K. Pivoted to a bearing A′, secured to the main frame A by means of a pin M, secured in said support or bearing, is a fulcrumed lever N, one arm N′ of which is rectangular-shaped and fits in the similarly rectangular aperture K^3 in the knuckle-joint K. The other arm N^2

is by the hole N^3 attached to the pin O′, secured in the two prongs O^2 and O^3 of the knuckle-joint O. The lower prong O^4 of knuckle-joint O is secured to an arm P′ of a guide P, part of or firmly secured to the lower grate D. This guide P is furnished with an upper projection P^2 and a lower projection P^3, both furnished with holes through which the guide-rod B slides, giving said guide-rod a steady support. The other motion-lever I appertains to the in-and-out movement of the cradles to and from the needles, and, as it exists in just the same operative manner with just the same elements in other Jacquard mechanisms and has not been improved upon by me and forms no working part necessary to the *modus operandi* of my improvements, which relate absolutely to the grate movements, there is no necessity for describing it.

My invention and the *modus operandi* of the combined elements will thus be seen to be as follows: The upward motion of the upper grate C is transmitted direct, inasmuch as when the motion-lever H is caused to move around its fulcrum H^2 in the standard H′ in the direction of arrow-head *x* the combination of the connecting-rods E and E′ will lift the grate C by the two arms, of which B′ is one. At the same time the lower grate ought to be moved in the opposite direction, consequently downward, and doing this by means of the same movement administered by the same motion-lever H was the object of my invention. To this effect I created a fulcrum in the pin M, attached to the support A′, located between the upper and lower grates, nearest to the lower grate and attached to the part of the frame adjacent to the operating-levers. On the pin M, representing said fulcrum, I pivoted a double-armed lever N, the obvious result of this being that an upward movement of the arm N′ of lever N in the direction of arrow-head *y* would result in a downward movement on the part of N^2 and consequently be transmitted to the lower grate D, to which said lever-arm N^2 is attached, by means of the knuckle-joint O being pivoted on the pin O′ of the arm P′ on grate D, as illustrated and described, and the creation of this movement was the desired object of my invention. The connection of the different elements with each other will thus be seen to be the following: To each prong of motion-lever H there is attached by the pins F the two levers G, both of which levers at their other ends are secured by pins L between the prongs of knuckle-joints K. Passing through an aperture in said knuckle-joints are the square arms N′ of the two fulcrumed levers N. Said levers N are each pivoted in its respective support, and the other arms N^2 of the levers N are each secured between the prongs of the knuckle-joints O, and pivoted to the arms P′ of the guides P, attached to or part of the lower grate D, thus completing the combination.

It will be observed that the knuckle-joint K is secured to the arm N′ by the screw J and can be slid back and forth, and in being thus adjustable can lengthen or shorten the rise of the lower grate. This same adjustability relates also to the upper and lower connecting-rods E and E′ of the upper grate, inasmuch as the end of rod E′ being screw-cut, so as to fit the similarly screw-cut hole in rod E, it will be apparent that rod E′ can be screwed up and down in rod E and thus shorten or lengthen the rise and fall of the upper grate at the operator's will and in exact proportion to the rise and fall of the lower grate.

What I consequently claim as a new improvement in the movement administered to the grates in a Jacquard mechanism and not known or used hitherto, and for which I desire protection by Letters Patent of the United States, is—

In a Jacquard mechanism, the combination of a motion-lever with the upper and lower grates, and two guiding-bars attached to the upper grate, two guide-brackets attached to the lower grate having guide-holes guiding the respective guiding-bars; an arm attached to each guide-bracket terminating in a pin, two knuckle-joints, one attached to each pin, two fulcrumed levers, pivoted on supports secured to the main frame, one arm of said fulcrumed levers attached each to the knuckle-joints pivoted to the guide-bracket arms, two additional knuckle-joints admitting adjustably in their upper square apertures the rectangular-sectioned arms of said fulcrumed levers, two connecting-links pivoted to the second pair of knuckle-joints, their other ends pivoted to the arms of the motion-lever, as herein set forth, as illustrated and described, for the purposes as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of January, 1897.

ALEXANDER K. CHALMERS.

Witnesses:

AUGUST M. TRESCHOW,

EDWARD JACKSON.