

No. 659,364.

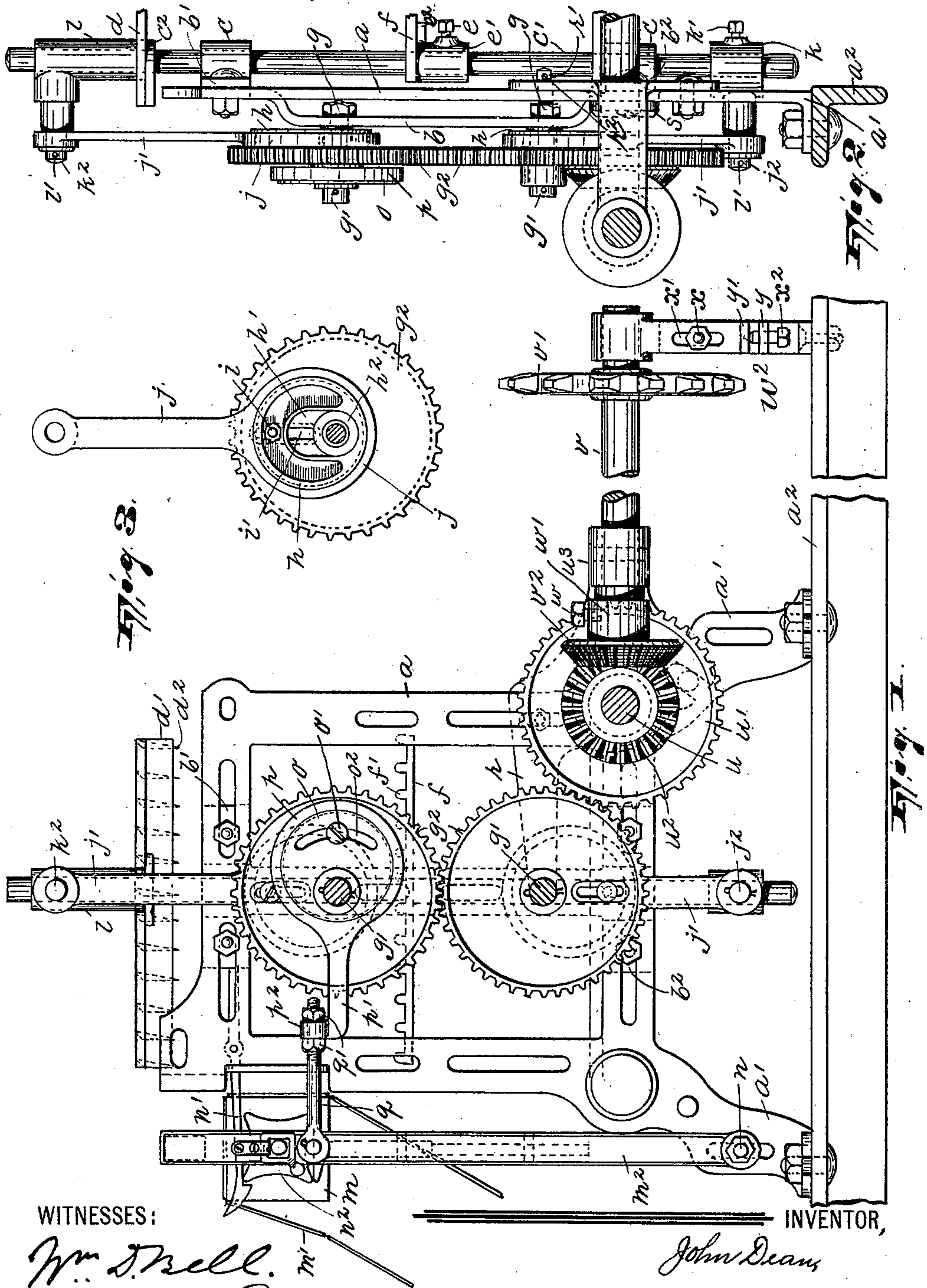
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JACQUARD MECHANISM FOR LOOMS.

(Application filed July 28, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 659,364, dated October 9, 1900.

Application filed July 28, 1899. Serial No. 725,368. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN DEAN, a subject of the Queen of Great Britain, residing in 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.

15 This invention relates to shedding mechanism for looms, and it has reference to and involves an improved construction of that particular form of such mechanism generally known as "jacquard apparatus."

20 In the form of jacquard apparatus at present in use the grids or sets of lifting-knives for the hooks to which the loom-harness is connected are elevated by levers that are suitably fulcrumed in the frame of the apparatus. From the same medium the rotary cylinder which carries the pattern-chain (whereby through needles connected to the aforementioned hooks the shed is initially controlled and from which the pattern is determined) is also actuated so as to effect a feeding of the pattern-cards successively into position relatively to the needles and so as to press them against said needles. The levers referred to are themselves vibrated from some suitable moving portion of the loom through connecting-rods. This means for and manner of operating the grids and the card-cylinder are objectionable, for the one effects and the other involves a more or less constant intermittent jarring as the levers rise and fall and the parts they operate are moved. Such a jarring not only produces considerable noise and acts necessarily to unduly wear the parts of the machine, but tends at times to disturb the operative engagement of some of the hooks with the rising grids, thus producing a defective pattern and necessitating a "picking-back" to remedy the damage done in the cloth. It has been proposed, furthermore, to employ eccentrically-disposed studs or stub-shafts for imparting motion to the grids and card-cylin-

der; but since said shafts are situated at a somewhat remote distance from the axis about which they rotate the objections referred to are no better overcome than where levers are used for actuating the grids and card-cylinder. In order to overcome the objections above referred to, I propose to operate the grid or grids and the card-cylinder by means of eccentrics to which a uniform rotary movement is imparted initially from a revolving part of the loom, thus effecting a constantly even action in the jacquard-machine, as hereinafter set forth in the claims.

In the accompanying drawings, wherein corresponding letters of reference indicate like parts, Figure 1 is a view in side elevation of my improved jacquard mechanism. Fig. 2 is a rear view of that particular portion of a jacquard mechanism which includes my improvements, a certain sprocket-wheel, a portion of the shaft which carries it, and a support for said shaft being removed. Fig. 3 is a detail view of a portion of the actuating mechanism for the upper grid. Fig. 4 is a view similar to Fig. 1, but somewhat reduced in size and showing a revolving shaft of the loom and operative connection between the same and the jacquard mechanism; and Fig. 5 is a detail view of a portion of my improved jacquard mechanism, showing a certain adjustable bracket which carries a shaft and gearing forming part of the operative connection between the above-mentioned revoluble loom-shaft and the jacquard mechanism.

*a* in the accompanying drawings designates one of the side frames of the frame proper of the jacquard, the same being of substantially-rectangular shape, having supporting-legs *a'*, which are bolted to a sustaining-rail *a''*, and being provided with a vertically-extending outwardly-projecting rib *b*.

*b'* and *b''* are two bearing-blocks, which are bolted the one above the other in the upper and lower portions of the side frame *a*, each of said bearing-blocks having an enlargement *c*, in which works a vertically-disposed reciprocating shaft *c'*. Near its upper end the shaft *c'* carries, loosely arranged thereon, a surrounding projection *c''*, the same being adapted to support the adjacent end of the grid, said grid consisting of an end strip *d*,



from which projects downwardly another and integral strip  $d'$ , in which latter the ends of the knives  $d^2$  are set. The strip  $d$  is provided with a recess which receives the shaft  $c'$ , said recess being somewhat narrower than the projection  $c^2$ , which therefore constitutes a shelf or rest for said strip. Beneath the projections  $c^2$  there is adjustably arranged on the shaft  $c'$ , by means of a set-screw  $e$ , carried thereby, a collar  $e'$ , constituting a rest for the lower grid  $f$ , said grid being slotted in the usual manner to form ribs  $f'$ , corresponding to the knives  $d^2$ . The grid has a recess in its edge, the same as the strip  $d$  of the upper grid, and the collar is provided with a projection  $e^2$ , that constitutes an additional support.

In the offset rib  $b$  is secured, by means of nuts  $g$ , a pair of studs  $g'$ , upon each of which is journaled a gear-wheel  $g^2$ . Upon the inside or rear face of each of these gear-wheels is adjustably secured an eccentric  $h$ , as clearly shown in Fig. 3, said eccentric being provided with a slot  $h'$ , which receives a hub or annular boss  $h^2$  of the gear-wheel, and with an adjusting-bolt  $i$ , which penetrates a radial slot  $i'$  in the gear-wheel. It will be seen that by means of the adjustment that may be thus effected in the eccentrics relatively to the gear-wheels the throw of the eccentrics may be varied. Each eccentric is surrounded by an eccentric-strap  $j$ , said eccentric-strap including as an integral portion thereof an arm  $j'$ . The contacting surfaces of each eccentric and strap may be grooved or flanged, as shown in dotted lines in the drawings, in order to maintain the strap in position.

The arm  $j'$  of the lower eccentric-strap is penetrated at its free end by and pivotally connected to a pin  $j^2$ , which projects from a collar  $k$ , that is adjustably secured on the shaft  $c'$  by means of a set-screw  $k'$ , and the arm  $j'$  of the upper eccentric-strap is pivotally connected to a corresponding pin  $k^2$  of a sleeve  $l$ , which is penetrated by and freely movable upon the shaft  $c'$  and which forms an upwardly-extending and integral projection of the rest for the upper grid. The arms  $j'$  may be kept on the pins  $j^2$   $k^2$  by means of cotter-pins  $l'$  or in any other desired manner.

$m$  designates the square cylinder, over which extends and which actuates the pattern-chain  $m'$ , said cylinder being of any well-known and desirable construction and being journaled in the upper ends of a pair of levers  $m^2$ , said levers being fulcrumed at their lower ends in the frame of the jacquard-machine upon bolts  $n$ . The card-cylinder is rotated by means of the usual hook or nogger  $n'$ , which is loosely pivoted in the frame of the machine and which engages the turn-block  $n^2$  on the end of the cylinder as the levers  $m^2$  carry the cylinder outward. The levers  $m^2$  are vibrated by means of an eccentric  $o$ , which is secured upon the outer face of the upper gear-wheel  $g^2$ , being penetrated by the stud  $g'$  by means of a screw  $o'$ , said screw being set in an arc-shaped slot

$o^2$  in the eccentric, so that the latter may be adjusted about its center of rotation. The connection between the lever  $m^2$  and the eccentric consists of an eccentric-strap  $p$ , including an arm  $p'$ , whose free end  $p^2$  is bent upwardly and is penetrated by a pitman  $q$ , said pitman being adjustably connected to the upwardly-extending portion  $p^2$  of the arm  $p'$  by means of nuts  $q'$ , which it carries, and being pivotally connected to the lever. It should be remarked that the mechanism for operating the two grids and the card-cylinder should preferably be duplicated, one such mechanism being of course disposed at each end of the machine, so as to effect evenness in the movements of the parts.

$r$  designates a bracket which is fulcrumed in the rib  $b$  upon a reduced extension  $r'$  of the lower stud  $g'$ , being kept in position on said projection by a cotter-pin  $r^2$ . Said bracket is provided with an annular outwardly-extending boss  $s$ , which penetrates a slot  $s'$  in the side frame  $a$  of the machine, and the bracket is rendered adjustable about its fulcrum at  $r'$  by means of bolts  $s^2$ , the one of which is secured in the side frame and is received by a slot  $t$  in the bracket and the other of which penetrates slots  $t'$   $t^2$  of the side frame and bracket, respectively. In the boss of the bracket is journaled one end of a shaft  $u$ , upon which shaft is fixed a gear-wheel  $u'$  and outside of said gear-wheel a bevel-gear  $u^2$ . It should be remarked that the bracket  $r$  and the gear-wheel  $u'$  are duplicated. As it has been before mentioned, the mechanism for directly actuating the grids and the card-cylinder are duplicated, the two gears being connected by the shaft  $u$ . One of these brackets  $r$  is provided at its free end with an integral sleeve  $u^3$ , and in this sleeve is journaled a shaft  $v$ , said shaft carrying a sprocket-wheel  $v'$  and at its end adjoining the bevel-gear  $u'$  another bevel-gear  $v^2$ , which meshes with the bevel-gear  $u'$ . The bevel-gear  $v^2$  is secured upon the shaft  $v$  by means of a set-screw  $w$ , which penetrates an integral sleeve  $w'$  of said bevel-gear. The outer end of the shaft is supported in a two-part standard  $w^2$ . Said standard is rendered adjustable by means of a bolt  $x$ , which is secured in one of its parts and which penetrates a slot  $x'$  in the other, the adjustment being effected by a set-screw  $x^2$  working in a projection  $y$  on one of said parts and bearing against a corresponding projection  $y'$  on the other of said parts. It will be seen that by providing the brackets  $r$ , which support the shaft  $u$  and the gears  $u'$ , said shaft may be adjusted up or down so as to tighten or loosen the chain  $z$ , hereinafter referred to, without disturbing the operative connection between the bevel-gears and the gears  $u'$  and  $g^2$ . A rotary motion is imparted to the shaft  $v$  by means of a chain  $z$ , which passes over the sprocket-wheel  $v'$  and also over another sprocket-wheel  $z'$  on a suitable revolving shaft  $z^2$  of the loom.

In operation, a rotary motion being im-



parted to the shaft  $v$  from the shaft  $z^2$  of the loom through the sprocket-wheels  $v'$  and  $z'$  and the chain  $z$ , the gear-wheels  $u'$  will be rotated and likewise the gears  $g^2$  and the eccentrics they carry, the consequence being the reciprocation of the respective grids, said reciprocations being effected alternately by a proper relative disposition of the eccentrics on the gear-wheels. At the same time the rotation of the eccentrics  $o$  will effect, through their eccentric-straps and the pitman which are connected thereto through the arms  $p'$  of said eccentric-straps, intermittent vibrations in the levers  $m^2$ , and consequently move the card-cylinder to and from the machine, at the same time, with the assistance of the nogger  $n'$ , effecting the rotation thereof. The action of the card-cylinder relatively to the action of the grids may be varied by adjusting the eccentric  $o$  about its center of rotation by means of its set-screw  $o'$ , as will be obvious. It should be remarked that the eccentrics should be of appreciable diameter—that is to say, preferably of such size that while the axes of the gears penetrate them the outer portions of their peripheries are in proximity to the peripheries of said gears. This being so, the motion will be most perfectly smooth and true, all jarring and lost motion being obviated. The advantage of this over the motion imparted from eccentrically-disposed shafts or studs will be manifest. Owing to the small diameter of such shafts or studs and to the fact that they must necessarily be disposed somewhat remotely from their axes of rotation in order to secure an adequate amount of movement of the parts driven thereby there will necessarily and obviously not be produced that even and true motion which I am able to effect in the arrangement which I have invented. It will be seen that the shafts  $c'$  not only act as a means for carrying and moving the lower grid, but as guides for the upper grid.

Although I have hereinbefore described my invention as being applied to a jacquard of the "double-lift" pattern, it will be apparent that the invention is also applicable to a jacquard of the "single-lift" pattern.

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

1. In a jacquard mechanism, the combination, with the frame, of gears journaled therein, reciprocating grids arranged in said frame, operative connecting means between said gears and the grids, brackets fulcrumed in said frame concentrically with said gears, a revoluble shaft carried by said brackets, gears carried by said shaft and intermeshing with said first-named gears, another revoluble shaft carried by one of said brackets, gearing connecting said shafts, and means for adjustably supporting the free end of said last-named shaft, substantially as described.

2. In a jacquard mechanism, the combination, with the frame, of gears journaled therein, reciprocating grids arranged in said frame, operative connecting means between said gears and the grids, brackets fulcrumed in said frame concentrically with said gears, means for adjustably securing said brackets to the frame, a revoluble shaft carried by said brackets, gears carried by said shaft and intermeshing with said first-named gears, another revoluble shaft carried by one of said brackets, bevel-gearing connecting said shafts, and means for adjustably supporting the free end of said last-named shaft, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of July, 1899.

JOHN DEAN.

Witnesses:

JOHN W. STEWARD,  
JAMES B. NEWTON.