

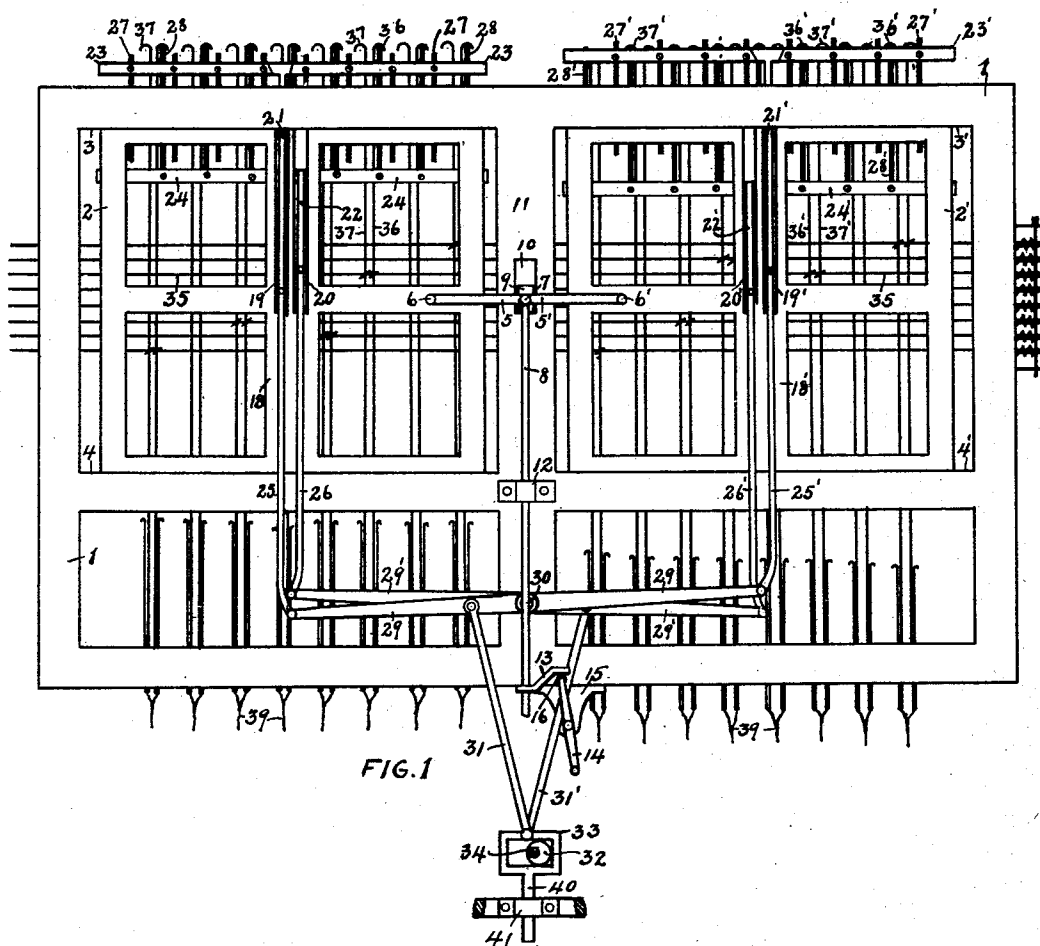
(No Model.)

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E. W. FRANCE & J. BUCKLER.
JACQUARD MECHANISM FOR LOOMS.

No. 570,703.

Patented Nov. 3, 1896.



WITNESSES:

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William J. Fisher

INVENTOR

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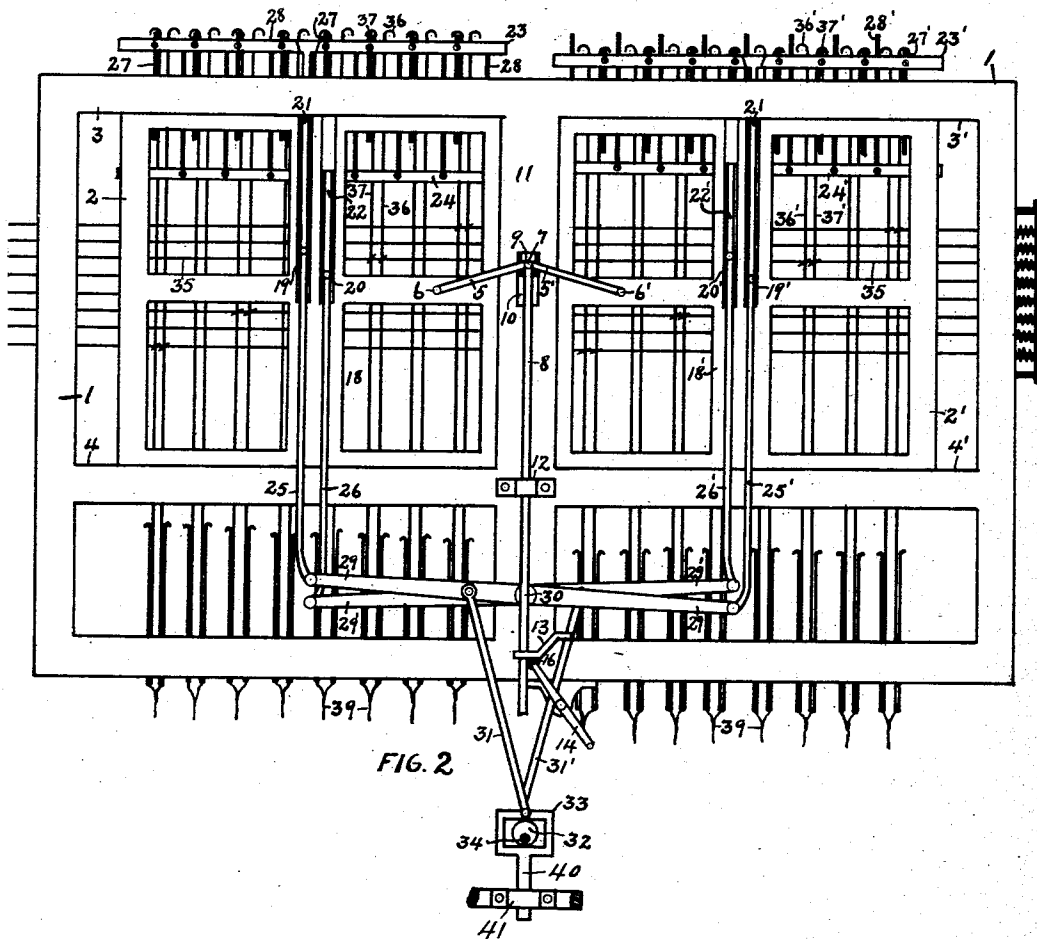
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UNITED STATES PATENT OFFICE.

EDWARD W. FRANCE AND JAMES BUCKLER, OF PHILADELPHIA,
PENNSYLVANIA.

JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 570,703, dated November 3, 1896.

Application filed January 14, 1896. Serial No. 575,500. (No model.)

To all whom it may concern:

Be it known that we, EDWARD W. FRANCE and JAMES BUCKLER, citizens of the United States, and residents of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Jacquard Mechanism for Looms, of which the following is a description.

Our invention relates more particularly to Jacquard mechanism for use in the manufacture of ingrain carpets, in which, generally, as is well understood by those skilled in the art, two lifting-boards reciprocating continuously and in opposite directions operate two sets of tail-cords which control, respectively, the two sets of warp-threads forming the ground and the two sets of warp-threads forming the figure of the fabric. This arrangement is suitable where four sets in warp and filling are operated in rotation; but when a weave is required which calls for an odd number of picks or an interior pick it will be seen that the same set of threads cannot be lifted for two or more consecutive picks because of the opposite reciprocations of the lifting-boards. To illustrate, when white and olive in the ground and scarlet and black in the figure are used in rotation the alternately-reciprocating lifting-boards and tail-cords effect the desired result; but when the picks required in the weave are white and olive and scarlet, black, and olive it will be seen that the olive threads must be lifted for two or more consecutive picks, which cannot be effected by the alternate reciprocations of the lifting-boards.

In our invention griffs are substituted for the lifting-boards and hooks for the tail-cords, two griffs reciprocating continuously and in opposite directions being provided in place of each lifting-board, and two hooks adapted, respectively, to engage adjacent bars of the reciprocating griffs in place of each tail-cord. When an even number of picks is required in the weave in rotation, as white and olive and scarlet and black, a pair of oppositely-reciprocating griffs, one in the back and one in the front set, perform the function of the lifting-boards and effect the result; but when an odd number of picks or an interior pick is required in the weave, as white and olive and

scarlet, black, and olive, necessitating two or more consecutive lifts of the olive threads, then the second pair of oppositely-reciprocating griffs are brought into engagement with their hooks and effect the desired result.

The mechanism is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation showing the position of the parts for effecting the usual function of tail-cords and lifter-boards or for forming the shed by lifting the sets of warp-threads in regular order, and Fig. 2 is a side elevation showing the griffs shifted both horizontally and vertically to illustrate the manner of lifting the same set of warp-threads for consecutive picks.

The Jacquard frame 1 is provided with carriages 2 and 2', which are adapted to move horizontally in suitable ways 3 and 4 and 3' and 4' of the Jacquard frame. This horizontal movement of the carriages is effected by means of a toggle having its links 5 and 5' pivoted to the carriages at 6 and 6', while its knee 7 is pivoted to a vertically-movable rod 8. A block 9, which is free to move in the guideway 10 of the frame-column 11, receives the pivot which connects the rod 8 with the toggle-knee, which block 9 and the keeper 12 guide the rod in vertical movement. An inclined arm 13 is secured to the rod 8, and a rock-lever 14, journaled in the bracket 15 and provided with a roller 16, engages the arm 13 and at the desired interval is operated to elevate the rod and move the carriages to the position shown in Fig. 2. The arm 13 may be operated by the ordinary jack and box chain.

The carriages 2 and 2' have the central columns 18 and 18', provided, respectively, with the vertical guideways 19 and 20 and 19' and 20', in which the standards 21 and 22 and 21' and 22' reciprocate. These standards are respectively secured to the griffs 23 and 24 and 23' and 24', which they reciprocate, and are operated by the rods 25 and 26 and 25' and 26', to which they are respectively pivoted. Levers 29 and 29' are journaled on an arbor 30, supported by the frame-column 11, the lever 29 having its ends pivoted to the rods 25 and 25' and the lever 29' having its ends pivoted to the rods 26 and 26'. These levers

are rocked simultaneously in opposite directions by the rods 31 and 31', pivoted to them as shown, the said rods being also pivoted to a frame 33, which is guided in vertical movement by a depending part 40, which plays in a keeper 41, secured to the loom-frame. An eccentric 32, fixed on a shaft 34, journaled in any suitable manner, turns in the frame 33, and, through the mechanism described, rocks the levers 29 and 29' simultaneously and in opposite directions, it being evident that the griffs 23 and 23' and also 24 and 24' will in like manner be caused to reciprocate simultaneously and in opposite directions. Each of the needles, as 35, controls four hooks, as 36 and 37 and 36' and 37', the hooks being arranged in pairs, as shown, each pair moving as a single hook and controlling a single neck-cord 39, the hooks of each pair being turned in opposite directions.

The needles are operated in the usual manner—by pattern-cards. The movement of each needle operates the hooks with which it is connected in a manner similar to that of the two tail-cords operated by each needle in weaving two-ply ingrain carpet, where a needle that is thrust back by a pattern-card causes one of the tail-cords which it controls to engage with the rising lifter-board, thus lifting the desired threads, say, in the figure, while the threads in the ground, controlled by the other of the two cords, remain down, since the lifter-board controlling the ground-threads is descending. This effects the exchange of the warp-threads which forms the design and binds the two fabrics together, for two-ply ingrain carpet is produced by the double-cloth system, and when the warp-threads forming the ground do not exchange with those forming the figure each set works on the plain weave. In the tie-up each of the two lifter-boards controls one of the two sets of warp-threads, as the front lifter-board the ground and the back lifter-board the figure. The foregoing operation is fully explained in the work by E. A. Posselt, entitled "The Jacquard Machine," and exemplified in the Knowles ingrain-carpet loom. These principles are embodied in the operation of our mechanism, which is designed to supplement them by providing means for lifting the same set of warp-threads successively when desired.

In the position of the mechanism shown in Fig. 1 the griff-bars 28 of the griff 24 engage the hooks 36 and the griff-bars 28' of the griff 24' engage the hooks 36', and as these griffs reciprocate simultaneously in opposite directions it will readily appear that the neck-cords 39 are lifted in the same manner as with the usual form of alternately-reciprocating lifter-boards and tail-cords. When, however, it is desired to raise the same set of threads for consecutive picks, the rock-lever 14 is thrown into the position shown in Fig. 2, thus elevating the rod 8, which breaks the toggle and moves horizontally toward each other the car-

riages 2 and 2' and with them the griffs, which they carry. The griff-bars 27 of the griff 23 are now brought into position to engage the hooks 37, and the griff-bars 27' of the griff 23' are in like manner brought into position to engage the hooks 37', the same set of warp-threads being thus lifted for consecutive picks, for as the hooks of each pair, as 36 37, are connected with the same cord when the mechanism is in the position shown in Fig. 1 and the vertically-reciprocating bars of the griff 24 engage the hooks 36 the cords 39 will be lifted while the griff 23 is falling, and when the mechanism is in the position shown in Fig. 2 and the vertically-reciprocating bars of the griff 23 engage the hooks 37 the cords 39 will now be lifted while the griff 24 is falling, and in like manner the griffs 23' and 24' are caused to effect two or more consecutive lifts of the same set of cords.

It will be understood that the mechanism shown in side elevation should be duplicated on the opposite side of the machine for effecting the operation of the parts, and that various modifications and changes may be made in the details of construction without departing from the spirit of our invention.

Having described our invention, we claim as new and desire to secure by Letters Patent—

1. In a Jacquard machine, hooks and neck-cords connected therewith, a pair of griffs adapted to reciprocate vertically and in opposite directions, and also adapted to reciprocate horizontally and in opposite directions, independently of the said vertical reciprocations, and mechanism for effecting the respective reciprocations of the said griffs, substantially as shown and described.

2. In a Jacquard machine, hooks and neck-cords connected therewith, a pair of griffs adapted to reciprocate vertically and in opposite directions, a second pair of griffs adapted to reciprocate vertically and in opposite directions, in combination with means for effecting the simultaneous horizontal reciprocation of the two pairs of griffs and means for reciprocating the griffs vertically, substantially as shown and described.

3. In a Jacquard machine, in combination, hooks and neck-cords connected therewith, a pair of griffs and a carriage adapted to move horizontally, a second pair of griffs and a carriage adapted to move horizontally, and a toggle connecting the two carriages, substantially as shown and described.

4. In a Jacquard machine, in combination, two pairs of griffs adapted to reciprocate both horizontally and vertically, means for effecting their respective reciprocations, a needle and two pairs of hooks and neck-cords connected therewith, substantially as shown and described.

5. In a Jacquard machine, in combination, hooks and neck-cords connected therewith, a lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, a

second lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, and means for operating the levers simultaneously, substantially as shown and described.

6. In a Jacquard machine, in combination, hooks and neck-cords connected therewith, a lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, a second lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, and means for oscillating the said levers simultaneously and in opposite directions, substantially as shown and described.

7. In a Jacquard machine, in combination, hooks and neck-cords connected therewith, a lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, a second lever and a pair of griffs connected therewith and adapted to be reciprocated thereby, and an eccentric connected with each of said levers, substantially as shown and described.

8. In a Jacquard machine, hooks and neck-cords connected therewith, a carriage adapted to reciprocate horizontally, a pair of vertically-reciprocating griffs carried by the said carriage, and means for imparting horizontal movement to the carriage and vertical movement to the griffs, substantially as shown and described.

9. In a Jacquard machine, hooks and neck-cords connected therewith, a carriage adapt-

ed to reciprocate horizontally, and a pair of vertically-reciprocating griffs carried by the said carriage, in combination with a second carriage adapted to reciprocate horizontally, a second pair of vertically-reciprocating griffs carried by the said second carriage, and means for imparting horizontal movement to the carriage and vertical movement to the griffs, substantially as shown and described.

10. In a Jacquard machine, in combination, hooks and neck-cords connected therewith, a carriage and a pair of griffs carried by the said carriage, a second carriage and a pair of griffs carried by the said second carriage, and a toggle connecting the two carriages, substantially as shown and described.

11. In a Jacquard machine, hooks and neck-cords connected therewith, a pair of carriages, a toggle connecting the said carriages, a pair of griffs supported by each carriage, a rod connected to the knee of the said toggle, an inclined arm secured to the said rod, and a lever adapted to engage the said inclined arm and elevate the said rod, substantially as shown and described.

In testimony whereof we have hereunto set our hands, this 13th day of January, 1896, in the presence of the subscribing witnesses.

EDWARD W. FRANCE.

JAMES BUCKLER.

In presence of—

THOMAS SOVEREIGN GATES,

CHARLES N. BUTLER.