

M. FISCHER.
JACQUARD MECHANISM FOR LACE MACHINES.

(Application filed June 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

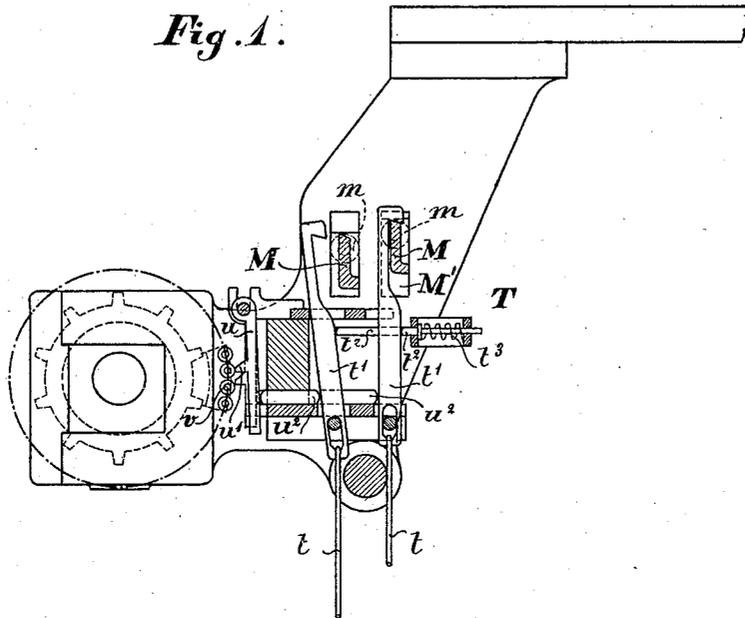
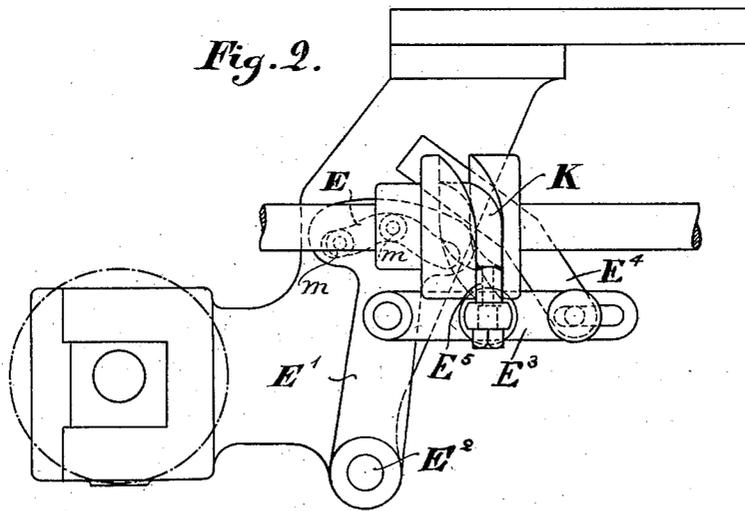


Fig. 2.



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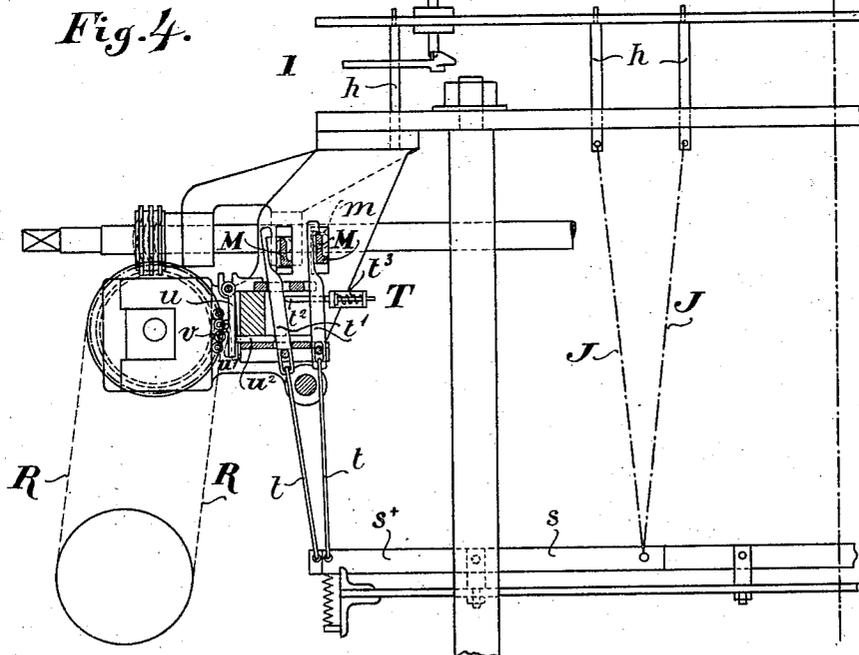
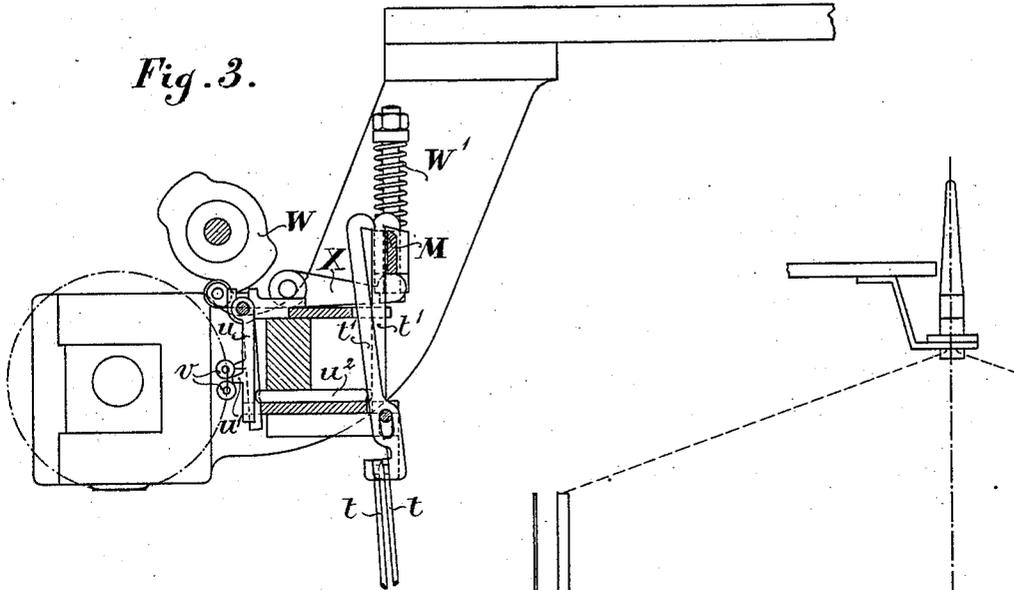
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2 Sheets—Sheet 2.



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A. M. Bourke

Inventor:
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UNITED STATES PATENT OFFICE.

MAX FISCHER, OF LANGERFELD, NEAR BARMEN, GERMANY, ASSIGNOR TO THE FIRM OF ALB. AND E. HENKELS, OF LANGERFELD, NEAR BARMEN, GERMANY.

JACQUARD MECHANISM FOR LACE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 687,372, dated November 26, 1901.

Application filed June 13, 1899. Serial No. 720,346. (No model.)

To all whom it may concern:

Be it known that I, MAX FISCHER, engineer, a subject of the King of Prussia, Emperor of Germany, residing at Langerfeld, near Barmen, Rhine Province, Kingdom of Prussia, German Empire, have invented a new and useful Improved Jacquard Mechanism for Lace-Machines, of which the following is a specification.

10 The present invention relates to improvements in lace making or braiding machines of the kind as described in the United States Patent No. 613,380, of November 1, 1898, and relates more particularly to improvements in the device for actuating the appliances where-
15 by the movement of the bobbins is controlled so as to produce the desired design or pattern. In the machines of this class there are two circular guideways crossing each other at suc-
20 cessive points, bobbins traveling in opposite direction therein, continuously-operating driving mechanisms propelling the bobbins, and means for disengaging or freeing certain of the bobbins from the driving mechanisms,
25 so that while the crossing of the thread of the remaining bobbins proceeds the threads of these particular spools are not crossed. The crossings are in such a way automatic-
30 ally varied from time to time to produce the desired pattern or change in the grouping or crossing of the threads. The means for ar-
35 resting the bobbins described in the above-named patent consist in plates movable in vertical direction and located below the disks which drive the spindles of the bobbins. The
40 plates when they are raised disengage the spindle from the disk and bring it to rest in a sort of resting-place. The said spindles remain at rest as long as the plates are not lowered. The lowering of the plates does not
45 only free the stopped spindle, but also forces it to reengage with the driving-disk. The plates are raised by means of springs and lowered by means of pulls. All the stems of
50 these plates have two pulls connected with two levers arranged side by side and independent of each other. Each of these levers is connected by a wire to an elbow-lever, which is actuated by the rollers of the endless jacquard-chain. One of these levers serves

to form the grouping of the stoppages of the bobbins relatively to its right-hand neighbor and the other lever relatively to its left-hand neighbor.

The object of the present invention is to provide mechanism for actuating said plates in such a manner that such irregularities as are apt to be present in the jacquard-chain will not affect the accurate movement of the plates and through these the motion of the bobbins; and to this end the invention consists in providing means for actuating the devices that control the motion of the bobbins and which are in turn controlled by the motion of the jacquard-chain, such means comprising actuating devices (knives) which are operated independently of the jacquard-chain and properly timed relatively to the movement of the bobbins, lifting-hooks adapted to be engaged by the knives and connected with the devices that control the motion of the bobbin, pendulum-levers actuated by the rollers of the jacquard-chain, and slides controlling the movement of the lifting-hooks according to the movement of the pendulum-levers.

A preferred construction embodying my invention is shown in the accompanying drawings, in which—

Figure 1 is a cross-section of the device by which the movement of the bobbins is controlled. Fig. 2 is a detailed view showing means for moving the operating-knives. Fig. 3 is a cross-sectional view of a modification of the construction shown in Fig. 1; and Fig. 4 is a more complete view, on a smaller scale, showing the form of the device shown in Fig. 1.

In each of the modifications shown the rollers of the jacquard-chain do not act on the actuating mechanism of the plates, but act to control the movement of the lifting-hooks, which are brought into position to be acted upon by lifting-knives and are given by the knives a movement which is transmitted to the plates.

Referring specially to Figs. 1, 2, and 4, the rollers *v* of the jacquard-chain *R* act upon the beaks *w'* of the small levers *u*, and these levers actuate slides or needles *w*², which in turn move the lifting-hooks *t'*, which are con-

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nected to the axes h of the plates through wires t , levers s s^x , and cords or pulls J . The lifting-hooks t' are moved by the slides v^2 into position to be acted upon and raised by knives M , which receive a regular alternating up-and-down movement from the machine by suitable means.

As shown in Fig. 2, for example, the knives M are mounted to slide in slots in the framing, as shown in Fig. 1, and carry antifriction-rolls m , which extend into a cam-groove E , formed in a segment-arm E' , mounted upon a pin E^2 , and the knives are thus caused to reciprocate vertically as the cam-segment oscillates. For the purpose of oscillating the cam-segment arm E' there is pivotally connected thereto a link E^3 , which is guided by an arm E^4 , attached to the machine-frame, and which carries a pin E^5 , which extends into a groove of the cam-box K , keyed on the main driving-shaft, and which groove is so shaped that as the cam-box K rotates the link E^3 and the lever E' receive a to-and-fro motion. Pushers t^2 , sliding in the frame and guided by springs t^3 , serve to return the lifting-hooks t' to their normal position out of the paths of the knives. The levers s are divided into two groups for actuating the plates and are correspondingly divided into two rows connected, respectively, with the two knives M , which during each complete revolution of the bobbin-driver are each raised and lowered once, one knife moving up as the other moves down.

Fig. 3 shows a modification of the arrangement shown in Fig. 1, in which the lifting-hooks t' are arranged in single row and only one knife M is employed, which during one revolution of the bobbin-driver is raised and lowered twice by means of a double lever X , double cam W , and spring W' . With such an arrangement the withdrawal of the lifting-hooks t' may be effected either, as above described, by means of the pushers t^2 or by the action of the springs of the said plates, the wire pulls t being for this purpose connected to one side of the lifting-hooks, as shown in Fig. 3, so that they tend to turn the lifting-hooks on

their pivots in a direction to carry the hooks away from the knife.

The motion of the knife or knives M can be readily so timed that it will always commence accurately when the bobbins are in a certain position in their guides, and as those lifting-hooks which have been actuated by one row of rolls v of the jacquard-chain are simultaneously engaged by the knife it is evident that the plates corresponding to those lifting-hooks will also be all simultaneously moved at the proper time and in a uniform manner irrespective of whether the lifting-hooks have been brought somewhat earlier or later or somewhat more or less perfectly under the action of the knives by reason of irregularities in the rollers of the jacquard-chain. R.

It will thus be seen that by my invention all irregularities in the movement of the plates, and consequently of the bobbin motion produced thereby, are effectually prevented and the working of the lace-machine rendered accurate and reliable and entirely practicable.

What I claim as my invention, and desire to secure by United States Letters Patent, is—

In a jacquard mechanism of a lace-machine wherein the pattern of the jacquard mechanism is transmitted to actuating mechanism of the devices that control the bobbin motion, the combination of the rollers of the jacquard-chain with pendulum-levers, slides, lifting-hooks and knives, said slides operating these lifting-hooks to bring the same under the action of the knives, means for disengaging the lifting-hooks from the knives, and pulls connecting the lifting-hooks with the devices that control the motion of the bobbin, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MAX FISCHER.

Witnesses:

R. E. JAHN,
OTTO KÖNIG.