

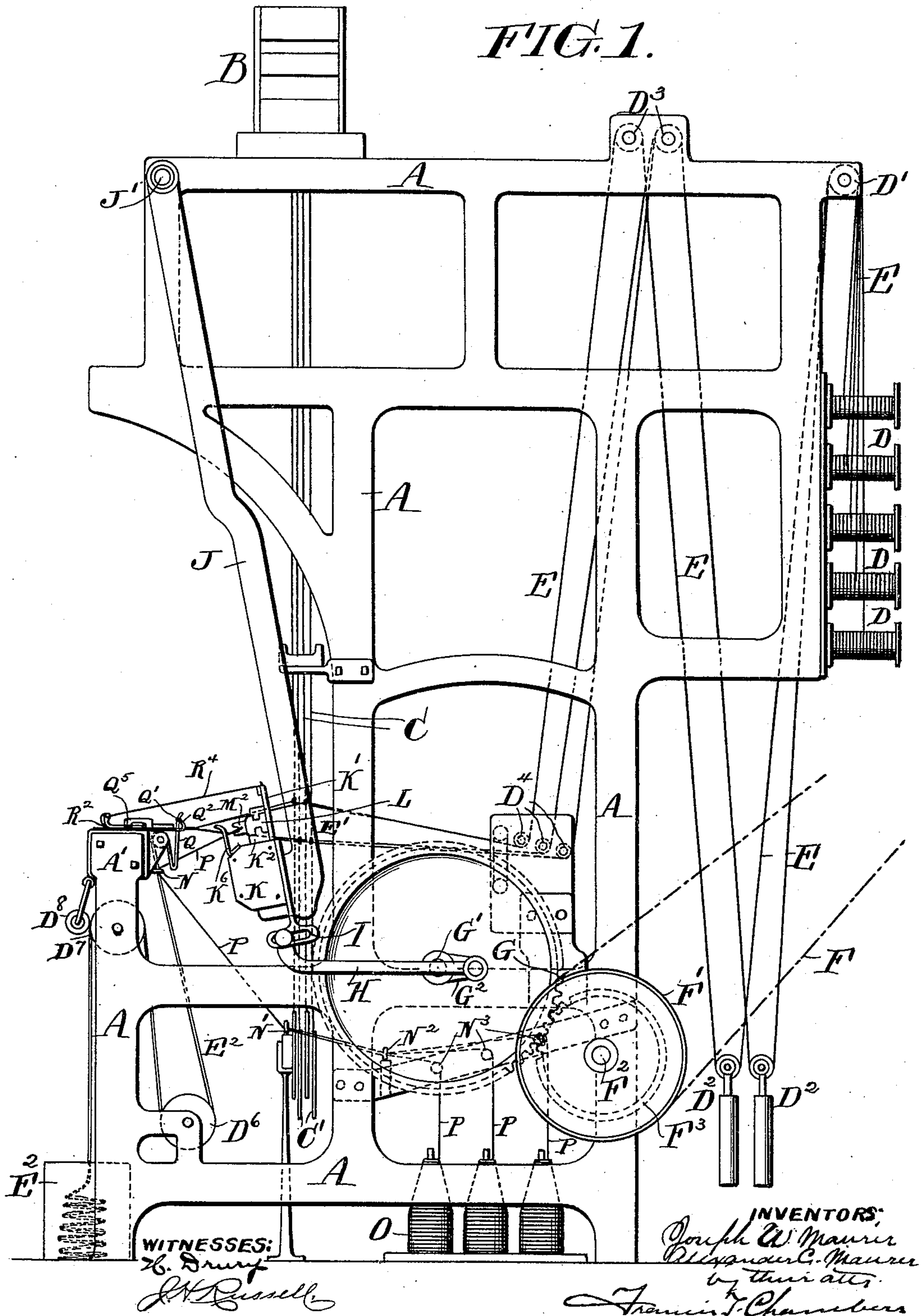
(No Model.)

3 Sheets—Sheet 1.

J. W. & A. C. MAURER.  
LOOM.

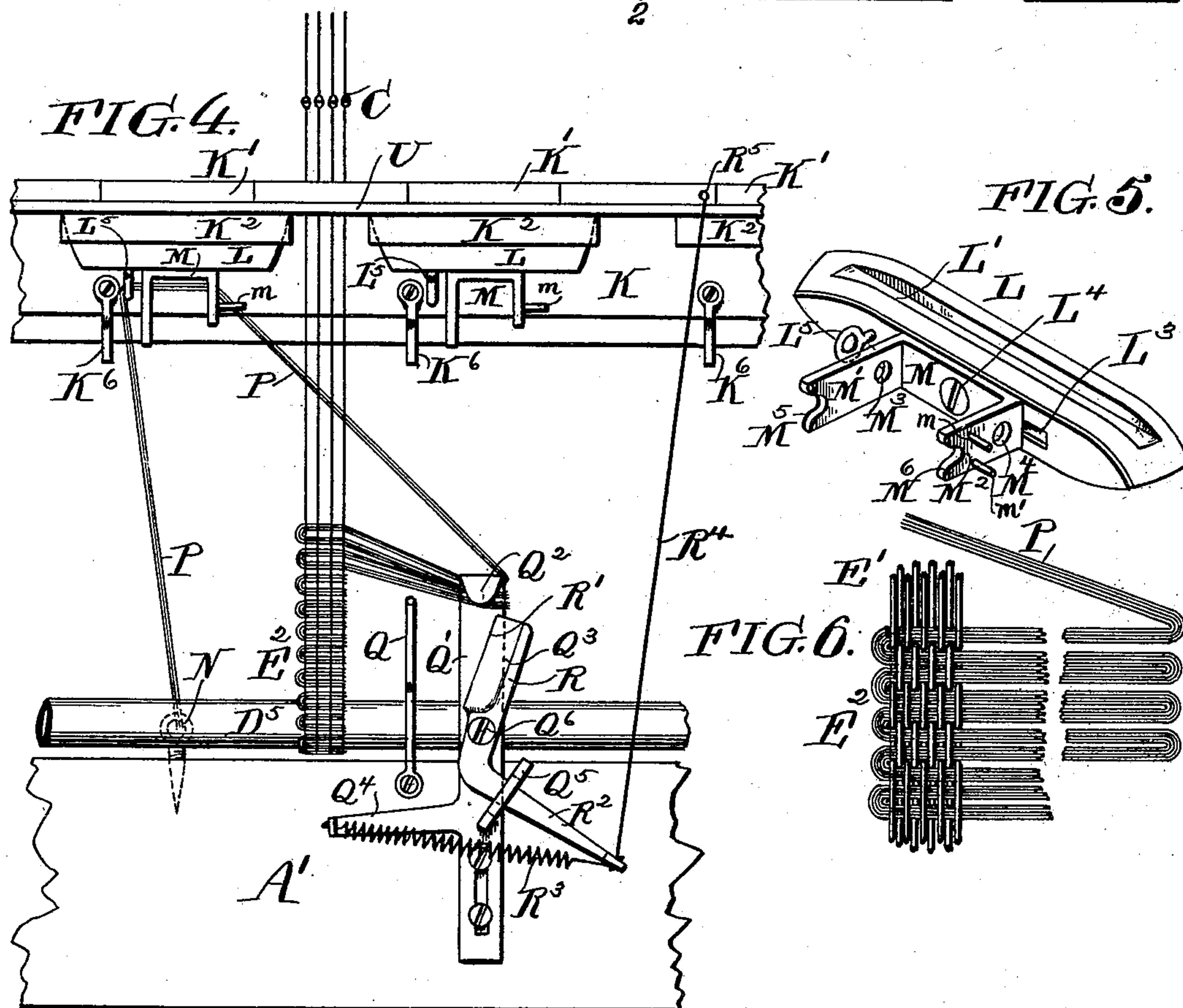
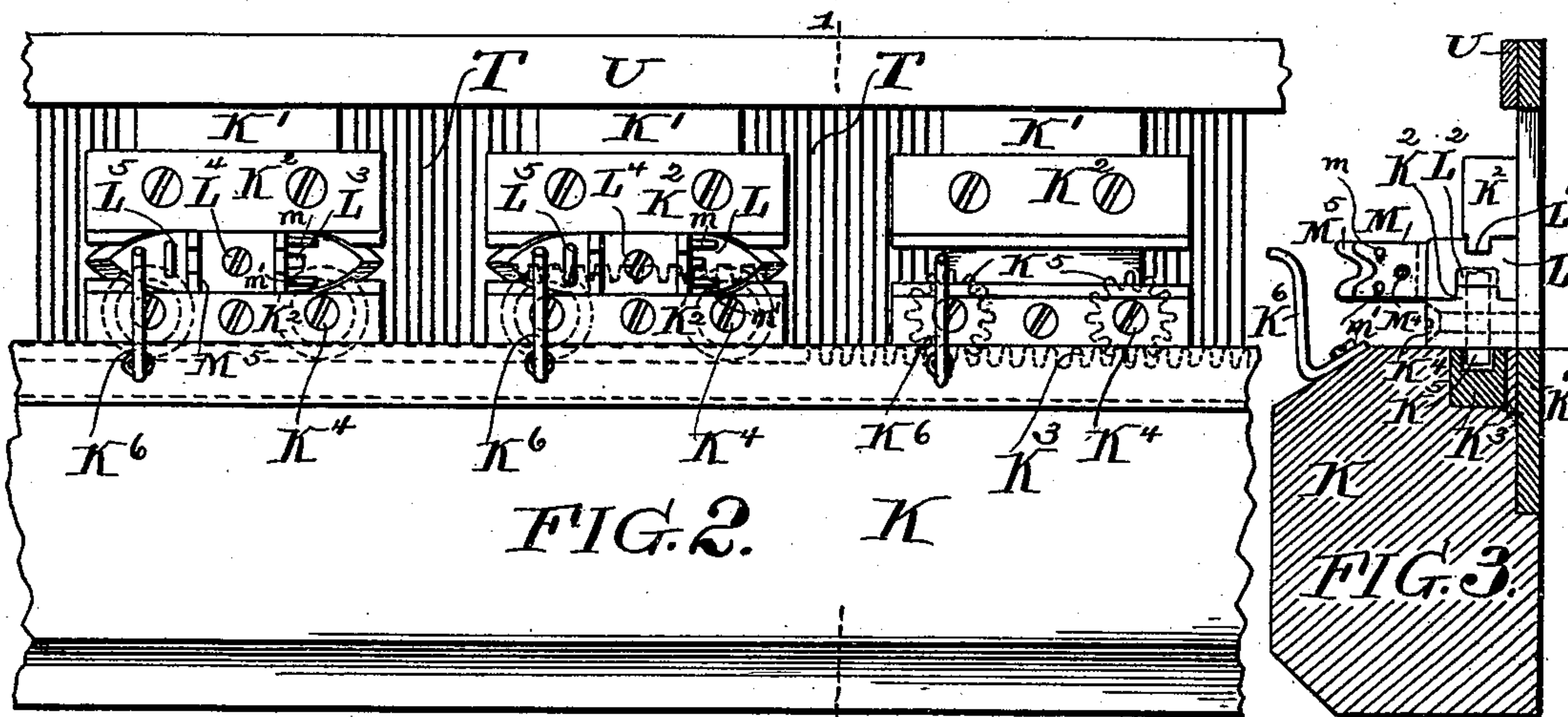
No. 488,569.

Patented Dec. 27, 1892.



3 Sheets—Sheet 2.

Patented Dec. 27, 1892.



**WITNESSES:**

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J. Russell.

**INVENTORS:**

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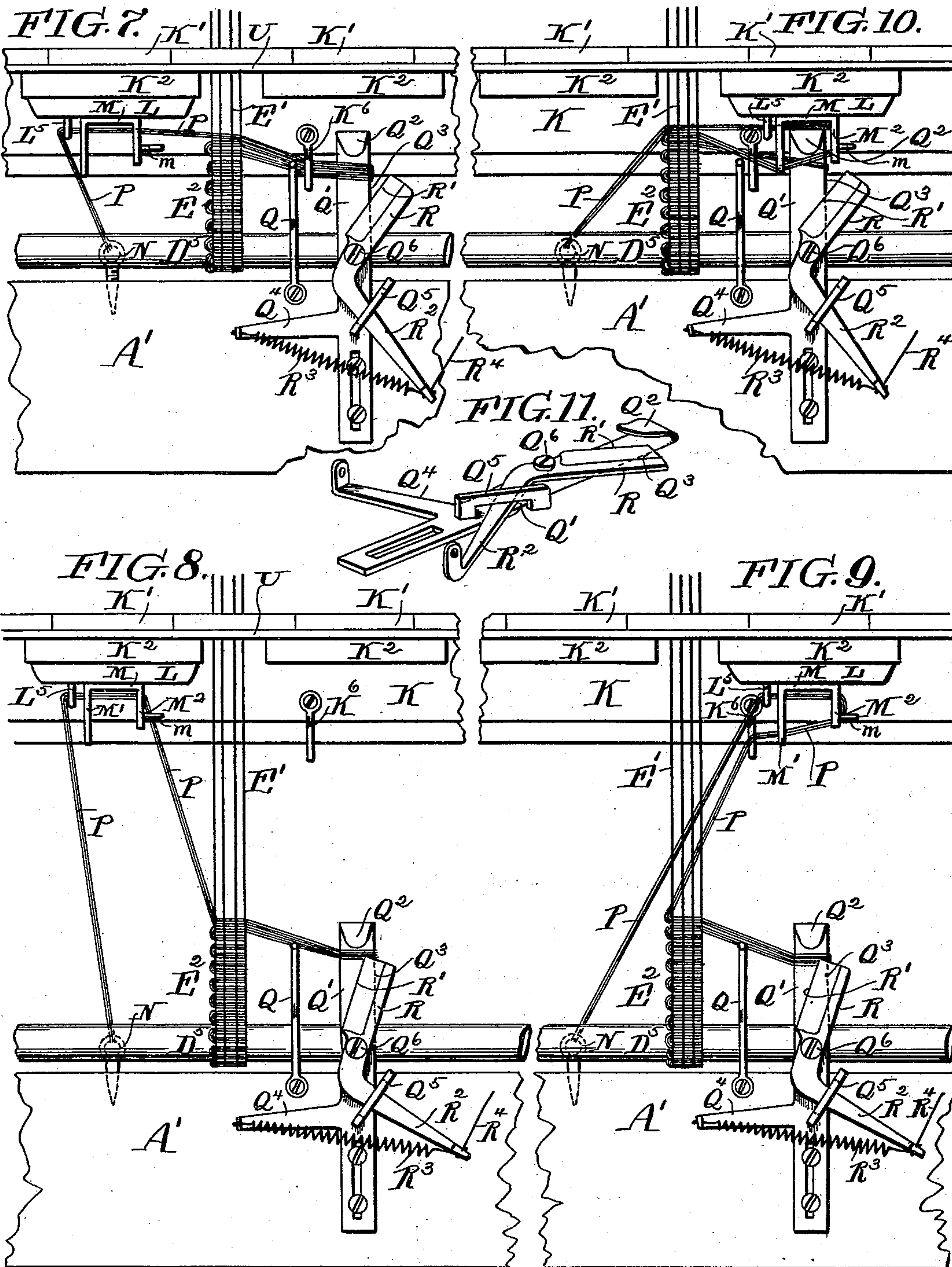
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LOOM.

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# UNITED STATES PATENT OFFICE.

JOSEPH W. MAURER AND ALEXANDER C. MAURER, OF PHILADELPHIA,  
PENNSYLVANIA, ASSIGNORS TO F. W. MAURER & SONS, OF SAME  
PLACE.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 488,569, dated December 27, 1892.

Application filed September 3, 1892. Serial No. 444,938. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH W. MAURER and ALEXANDER C. MAURER, both of the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Looms, of which the following is a true and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to the construction of looms adapted for weaving fringes, and the object of our invention is to provide a loom of this character so constructed as to weave the fringe rapidly, and adapted to make a large number of fringes at the same time.

The nature of our invention will be best understood as described in connection with the drawings in which it is illustrated, and in which—

Figure 1 is a side elevation of a loom embodying our improvements. Fig. 2 a front elevation of a part of the lay beam shown on an enlarged scale. Fig. 3, is a cross-section through the lay beam taken on the line 1—2 of Fig. 2. Fig. 4 is a plan view showing a portion of the lay beam and of the frame of the machine in front of the lay beam with the attached parts. Fig. 5 is a perspective view of one of the shuttles. Fig. 6 is a view illustrating the construction of a fringe such as our machine is adapted to make. Figs. 7, 8, 9, and 10 are views showing the operative parts of the loom, to which our invention particularly relates, in different operative positions, and Fig. 11 a perspective view of the hook and cutter which form a part of our invention.

A is the frame of the loom, the part situated immediately in front of the lay beam being indicated by the letter A.

B indicates the Jacquard apparatus; C the heddles; D warp beams or spools; D' D<sup>3</sup> D<sup>4</sup> D<sup>5</sup> D<sup>6</sup> and D<sup>7</sup> guide rods pulleys or rolls for the warp threads and the finished fabric.

D<sup>2</sup> are weighted tension pulleys for preserving a proper tension on the warp threads.

E indicates the warp threads; E' that portion of the warps in which the shed is formed by the action of the heddles; E<sup>2</sup> the finished fabric.

F indicates a driving belt acting on a pul-

ley F' secured to a shaft F<sup>2</sup> on which is also secured a gear wheel F<sup>3</sup> which engages a gear G and through it drives the shaft G', to which is or are attached a crank or cranks G<sup>2</sup>. To this crank or cranks is connected the rod H, the other end of which is adjustably attached to a projection or projections I secured to the lay beam K.

To the lay beam K are secured the lay swords J which in the construction shown, are pivotally connected at J' at the top of the frame. From the lay beam K a series of shuttle guides K' extend upwardly with space between them through which pass a series of warps E'. The shuttle guides are provided with extensions K<sup>2</sup> formed so as to grasp and hold the shuttle; the lower projection having secured under it on pins K<sup>4</sup> gear wheels K<sup>5</sup> adapted to engage a rack which is formed on the under side of each shuttle, and also to engage a rack K<sup>3</sup> which moves in a groove on the top of the lay beam. In front of each shuttle guide K', the tops of which should be, as shown, united together by a bar U, I secure a finger K<sup>6</sup>; the position of the finger being such that it will come between the group of warps on the left-hand side and the hook which will be hereinafter described, the end of the finger being curved substantially as indicated in Fig. 3 for a purpose which will also be hereinafter described.

L is the shuttle which is grooved in its upper and lower faces so as to be engaged by the projecting ends of the projections K<sup>2</sup> on the shuttle guide. The upper groove L' is smooth, but the lower one L<sup>2</sup> is formed with a downwardly extending rack which is engaged by the spur pinions K<sup>5</sup>. On the front of the shuttle we prefer to form a groove L<sup>3</sup> so as to make the binding screw L<sup>4</sup>, which secures the thread carrier M in place, adjustable, enabling us to change the position of the thread carrier. The thread carrier consists essentially of two projecting arms M' and M<sup>2</sup> which, as shown, are secured to a base plate in turn secured to the front of the shuttle by the binding screw L<sup>4</sup>. The arms M' and M<sup>2</sup> are formed with notches M<sup>5</sup> M<sup>6</sup> in their ends, the function of which is to catch and engage a weft thread coming from the shuttle



to the fabric when the shuttle moves across from left to right. These arms are of course adapted for use with shuttles carrying an ordinary bobbin, but preferably are constructed as shown, with thread holes  $M^3 M^4$  through which one or more weft threads  $P$  are led after passing through a guide eye  $L^5$  to which they are led from spools  $O$ , of which there are one or more for each shuttle, passing over rods  $N^3$  and through guide eyes  $N^2 N' N$  to the shuttles.

$Q Q$  are fingers secured to the frame  $A'$ , one situated between each set of warp threads and the corresponding hook  $Q' Q^2$ , the shank  $Q'$  of each hook is secured to the frame  $A'$  so that its hooked end  $Q^2$  will lie in front of each guide  $K'$  and in such position that when the lay moves forward it will extend in between the arms  $M' M^2$  of the shuttle. The back  $Q^3$  of the hook shank (that is, its edge lying farthest from the set of warps to which it appertains) is preferably formed with a cutting edge which forms one blade of a pair of shears, the other blade  $R$  of which, having a cutting edge  $R'$ , is pivoted on the shank  $Q'$  at  $Q^6$ , and is provided with a backward extension  $R^2$  which is connected with a spring  $R^3$  which tends to draw back the blade  $R$ , being preferably attached to an arm  $Q^4$  extending out from the hook shank. The arm  $R^2$  is also connected with the lay as by a cord  $R^4$ , so that as the lay moves back from frame  $A'$ , the shear blade  $R$  is forced in against the hook shank.

$T T$  &c. indicate the rods secured in each opening between the shuttle guides  $K'$ .

The operation of our loom is easily followed on the drawings. A set of warp threads is led from the beams  $D$  through each set of reeds  $T$  and connected with the heddles  $C$  which form the sheds. One or more weft threads  $P$  are led from the spools  $O$  through the guides to each shuttle  $L$ , and the loom then started, the heddles of course being connected with and actuated by the jacquard  $B$ . Assuming the loom to be in the position indicated in Fig. 4 with the thread  $P$  leading from the shuttle caught under the hook  $Q^2$ ; the next motion of the loom is the forward motion of the lay beam to the position shown in Fig. 7, the rod  $T$  pressing the thread  $P$  down into the fabric, and the heddles then moving as usual to bind it in. As the lay moves forward the thread  $P$  is caught between the hook and the warp threads by the finger  $K^6$  which presses it in and, by reason of its curvature, (see Figs. 1 and 2) down, causing it to pass beneath the hook shank  $Q'$  and pushing it along said shank away from the hooked end, the shear blade  $R$  being at the time drawn back from the shank by spring  $R^3$ . The lay then moves back to the position shown in Fig. 8 and acting on shear blade  $R$  by a cord  $R^4$  causes it to move in against the back  $Q^3$  of shank  $Q'$  and cut away loops of weft thread which have been pushed down the shank to a proper distance.

The shuttles are then actuated from left to right by a convenient mechanism acting on rack  $K^3$  bringing them to the position shown in Fig. 9. The thread  $P$  leading from the shuttle is by this movement carried through the shed and over the arms  $M' M^2$  in the notches  $M^5 M^6$  of which it lies passing thence back of the finger  $K^6$  through the shed. The lay then again moves forward to the position shown in Fig. 10, the portion of thread  $P$  which lies between and over the ends of arms  $M' M^2$  being forced by said arms over the hook  $Q^2$  and the portion lying in the shed being forced into the fabric by the reeds. The lay then again moves back and the shuttles are thrown from right to left bringing the parts to the position shown in Fig. 4. The function of the finger  $Q$  is simply to push the cut loops off of the hook shank and the lug indicated at  $Q^5$  simply acts as a stop to limit the movement of the shear arm  $R$ .

We have found it advisable in order to insure that the thread shall fall into the notch  $M^6$  of arm  $M^2$  to provide extending fingers  $m m'$  from the outside arm  $M^2$ . As shown these fingers guide and direct the thread into the notch, the lower one  $m'$  keeping it from falling down beneath the arm, and the upper one keeping it from curling up over the top of the arm.

Having now described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a loom the combination of a lay, shuttle guides  $K'$  supported on said lay on each side of the warps, a shuttle working between two of such guides, and means for actuating said shuttle, projecting-arms  $M' M^2$  extending out from the face of the shuttle and having notches  $M^5 M^6$  in their edges, a hook  $Q' Q^2$  secured to the frame of the loom to one side of the warps, said hook being so situated that its end  $Q^2$  will come between the shuttle arms  $M' M^2$  in one forward movement of the lay and engage the weft thread lying in the notches of said arms.

2. In a loom the combination of a lay, shuttle guides  $K'$  supported on said lay on each side of the warps, a shuttle working between two of such guides, and means for actuating said shuttle, projecting arms  $M' M^2$  extending out from the face of the shuttle and having notches  $M^5 M^6$  in their edges; a hook  $Q' Q^2$  secured to the frame of the loom to one side of the warps, said hook being so situated that its end  $Q^2$  will come between the shuttle arms  $M' M^2$  in one forward movement of the lay and engage the weft thread lying in the notches of said arms; and a finger  $K^6$  secured to the lay and lying between the warps and the hook  $Q' Q^2$ .

3. In a loom the combination of a lay, shuttle guides  $K'$  supported on said lay on each side of the warps, a shuttle working between two of such guides, and means for actuating said shuttles, projecting arms  $M' M^2$  extending out from the face of the shuttle and hav-



ing notches  $M^5 M^6$  in their edges, a hook  $Q'$   $Q^2$  secured to the frame of the loom to one side of the warps, said hook being so situated that its end  $Q^2$  will come between the shuttle arms  $M' M^2$  in one forward movement of the lay and engage the weft thread lying in the notches of said arms; and an intermittently-operating cutter-blade  $R$  arranged to co-act with the back of hook  $Q'$  to cut the thread thrown over said hook.

4. In a loom the combination of a lay, shuttle guides  $K'$  supported on said lay on each side of the warps; a shuttle working between two of such guides, and means for actuating said shuttle, projecting arms  $M' M^2$  extending out from the face of the shuttle and having notches  $M^5 M^6$  in their edges; a hook  $Q' Q^2$  secured to the frame of the loom to one side of the warps said hook being so situated that its end  $Q^2$  will come between the shuttle arms  $M' M^2$  in one forward movement of the lay and engage the weft thread lying in the notches of said arms; a finger  $K^6$  secured to the lay and lying between the warps and the hook; and a finger  $Q$  secured to the frame between the warps and the hook, all substantially as and for the purpose specified.

5. In a loom the combination of the lay, a series of shuttle guides  $K'$  supported on said lay and arranged at a distance apart with a series of warps passing between them; a series of shuttles supported in guides  $K'$  and means for actuating the shuttles simultaneously in the same direction arms  $M' M^2$  extending out from each shuttle and having notches  $M^5 M^6$  in their edges to engage the weft thread when the shuttle moves forward; and a series of hooks  $Q' Q^2$ , one arranged in front of each guide  $K'$  and so as to come between arms  $M' M^2$  when the lay moves forward with the shuttle in said guide.

6. In a loom the combination of the lay, a series of shuttle guides  $K'$  supported on said lay and arranged at a distance apart with a series of separate warps passing between them; a series of shuttles supported in guides  $K'$  and means for actuating the shuttles simultaneously in the same direction arms  $M' M^2$  extending out from each shuttle and having notches  $M^5 M^6$  in their edges to engage the weft thread when the shuttle moves forward; a series of hooks  $Q' Q^2$  one arranged in front of each guide  $K'$  and so as to come between arms  $M' M^2$  when the lay moves forward with the shuttle in said guide; and a series of curved fingers  $K^6$  secured to the lay so as to come between each set of warps and the hook and push the weft thread under the hook shank pertaining to it as the lay moves forward.

7. In a loom the combination of the lay, a series of shuttle guides  $K'$  supported on said lay and arranged at a distance apart with a series of separate warps passing between them; a series of shuttles supported in guides  $K'$  and means for actuating the shuttles simultaneously in the same direction; arms  $M' M^2$

extending out from each shuttle and having notches  $M^5 M^6$  in their edges to engage the weft thread when the shuttle moves forward; a series of hooks  $Q' Q^2$ , one arranged in front of each guide  $K'$  and so as to come between arms  $M' M^2$  when the lay moves forward with the shuttle in said guide; a series of curved fingers  $K^6$  secured to the lay so as to come between each set of warps and the hook pertaining to it and push the weft thread under the hook shank as the lay moves forward; and a cutter-blade  $R$  pivoted on the hook shank  $Q'$  and actuated by the movement of the lay as described.

8. The shuttle  $L$  having arms  $M' M^2$  each provided with thread holes  $M^3 M^4$  and with thread notches  $M^5 M^6$  at their ends.

9. The shuttles  $L$  having arms  $M' M^2$  each provided with thread holes  $M^3 M^4$  and with thread notches  $M^5 M^6$  at their ends in combination with guide fingers  $m m'$  secured on arm  $M^2$  as and for the purpose specified.

10. In a loom the combination of a lay, a series of shuttle guides  $K'$  secured thereto; a series of shuttles moving in said guides, and means for actuating said shuttles as described; the arms  $M' M^2$  extending out from each shuttle and having holes  $M^3 M^4$  and notches  $M^5 M^6$  as described; a series of warps extending between the shuttle guides; a series of hooks  $Q' Q^2$  secured to the frame and lying in front of the shuttle guides; a series of bobbins  $O$ , one or more for each shuttle; and thread guides leading from said bobbins to the back of each set of warps and thence to the arms  $M' M^2$  of the shuttle.

11. In a loom the combination of a lay, a series of shuttle guides  $K'$  secured thereto; a series of shuttles moving in said guides; and means for actuating said shuttles as described; arms  $M' M^2$  extending out from each shuttle and having holes  $M^3 M^4$  and notches  $M^5 M^6$  as described; a series of warps extending between the shuttle guides; a series of hooks  $Q' Q^2$  secured to the frame and lying in front of the shuttle guides; a series of bobbins  $O$ , one or more for each shuttle; thread guides arranged to lead the thread from said bobbins to the back of each set of warps and thence to the arms  $M' M^2$  of the shuttle; and a series of fingers  $K^6$  secured to the lay so as to come between the hook and the set of warps pertaining to it and curved so as to throw the weft thread to the under side of the hook shank.

12. In a loom the combination of a lay, a series of shuttle guides  $K'$  secured thereto; a series of shuttles moving in said guides, and means for actuating said shuttles as described; the arms  $M' M^2$  extending out from each shuttle and having holes  $M^3 M^4$  and notches  $M^5 M^6$  as described; a series of warps extending between the shuttle guides; a series of hooks  $Q' Q^2$  secured to the frame and lying in front of the shuttle guides; a series of bobbins  $O$ , one or more for each shuttle; thread guides arranged to lead the thread from said



bobbins to the back of each set of warps and  
thence to the arms  $M' M^2$  of the shuttle; a  
series of fingers  $K^6$  secured to the lay so as to  
come between the hook and the warps and  
5 curved so as to throw the weft thread to the  
under side of the hook shank; and a cutter  
blade actuated by the lay and arranged to

co-act with the hook shank to sever the threads  
thrown over said shank.

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Witnesses:

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