

3 Sheets—Sheet 1.

SHEDDING MECHANISM FOR LOOMS.

Patented May 19, 1891.

Fig. 1.

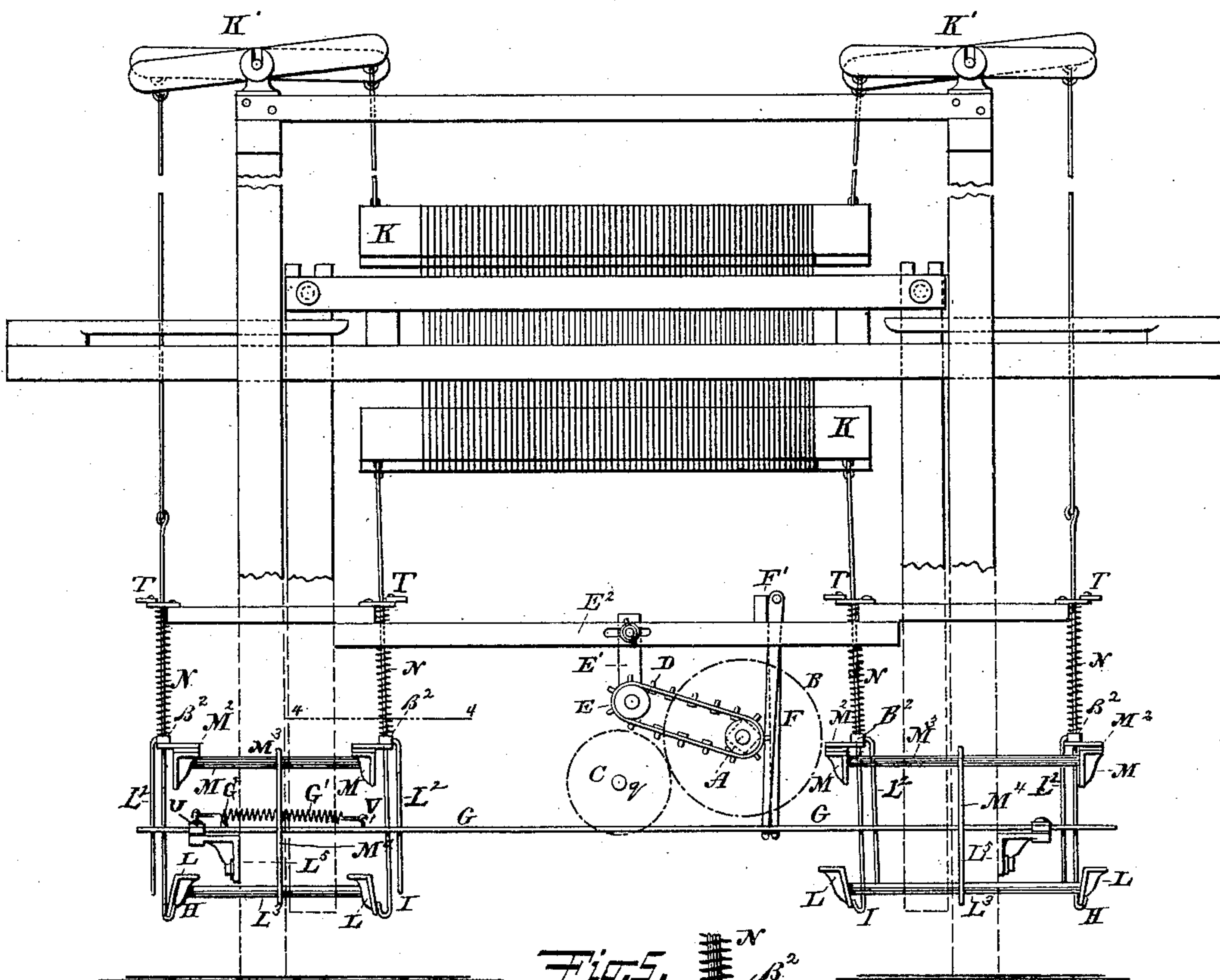


Fig. 4.

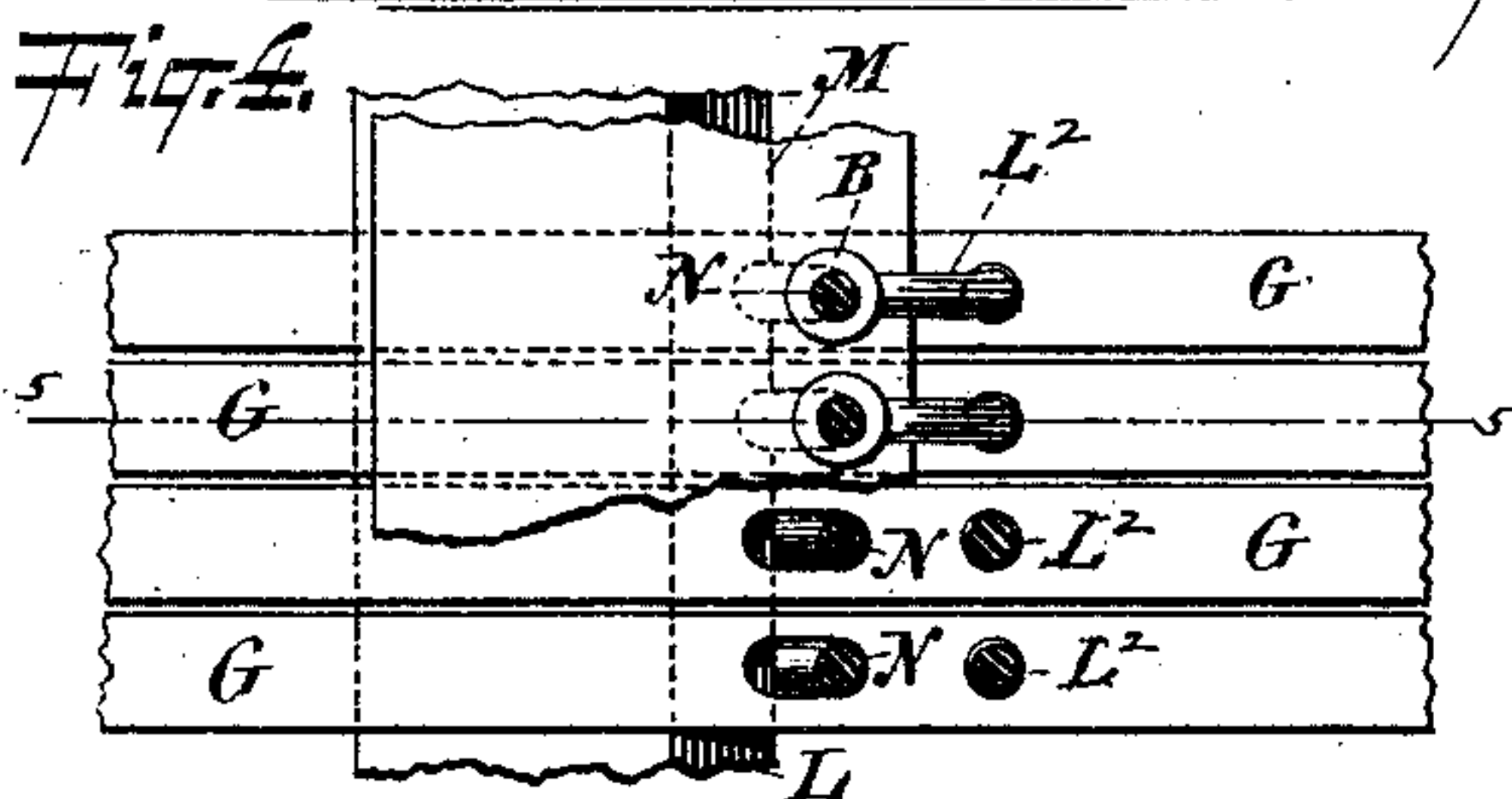


Fig. 5.

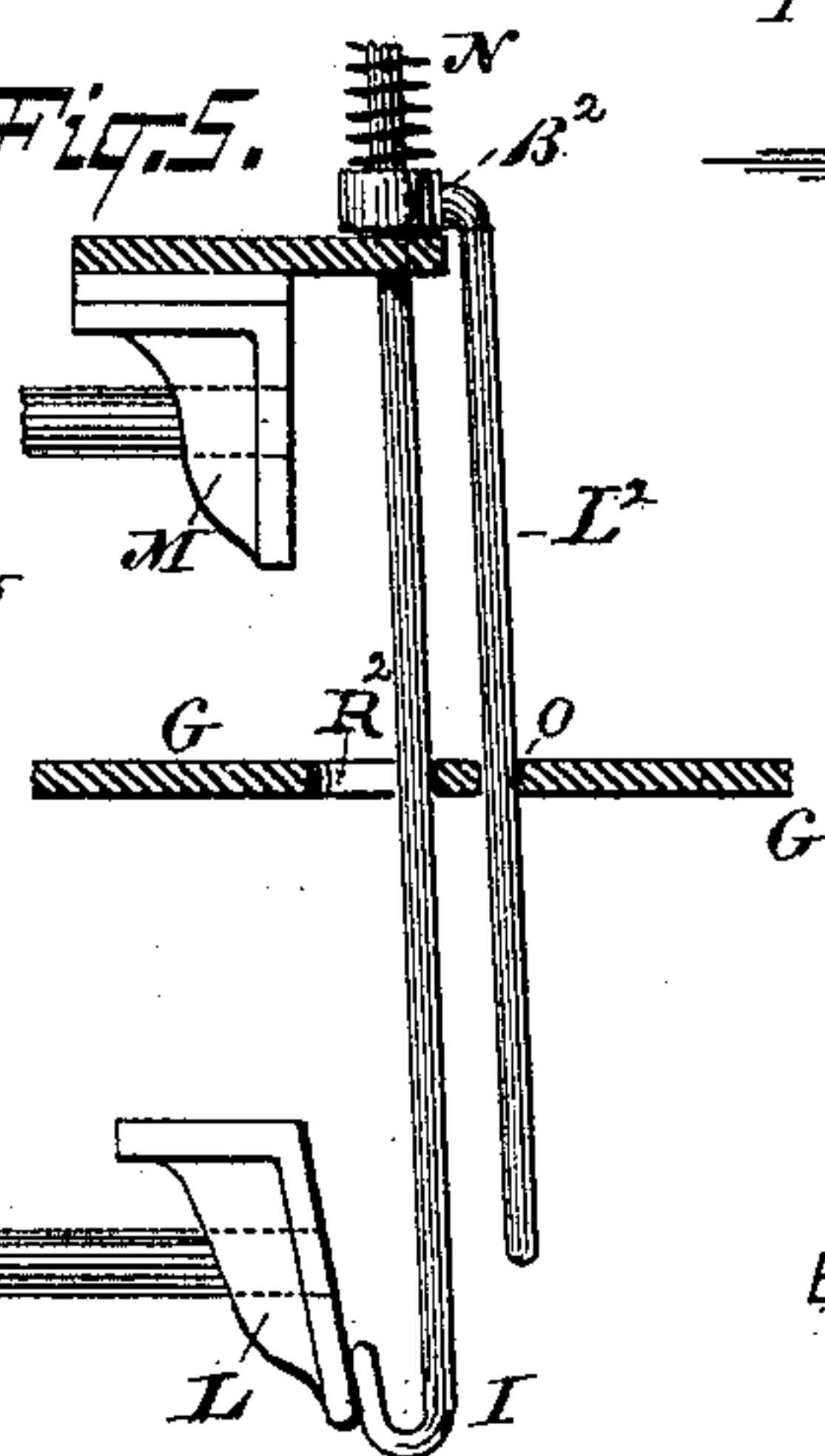
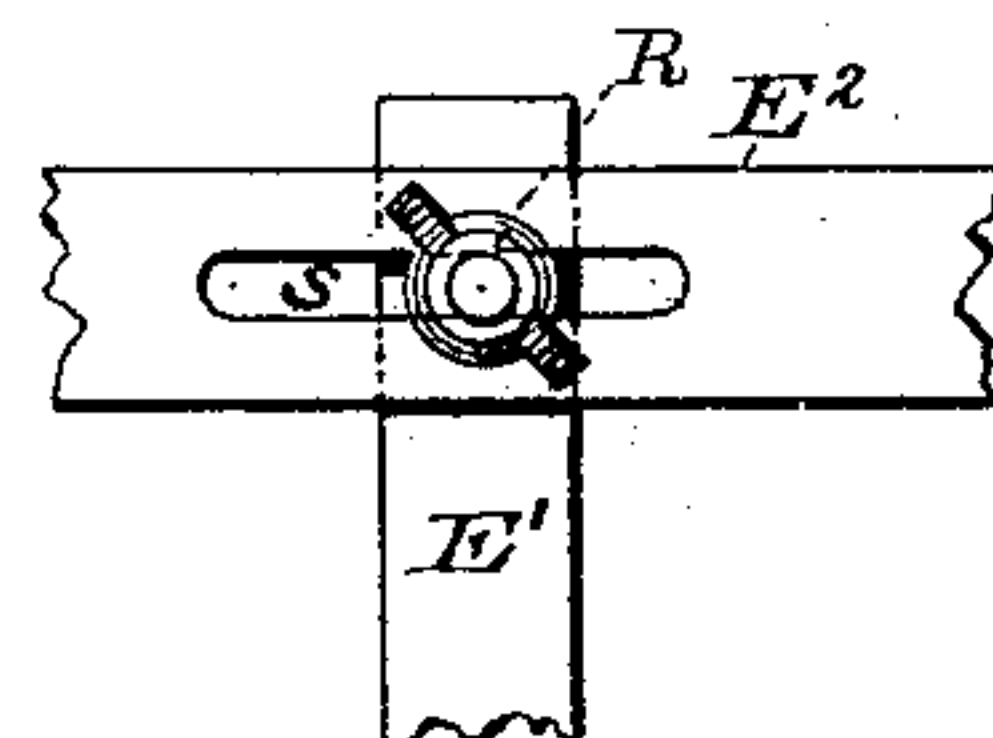


Fig. 6.



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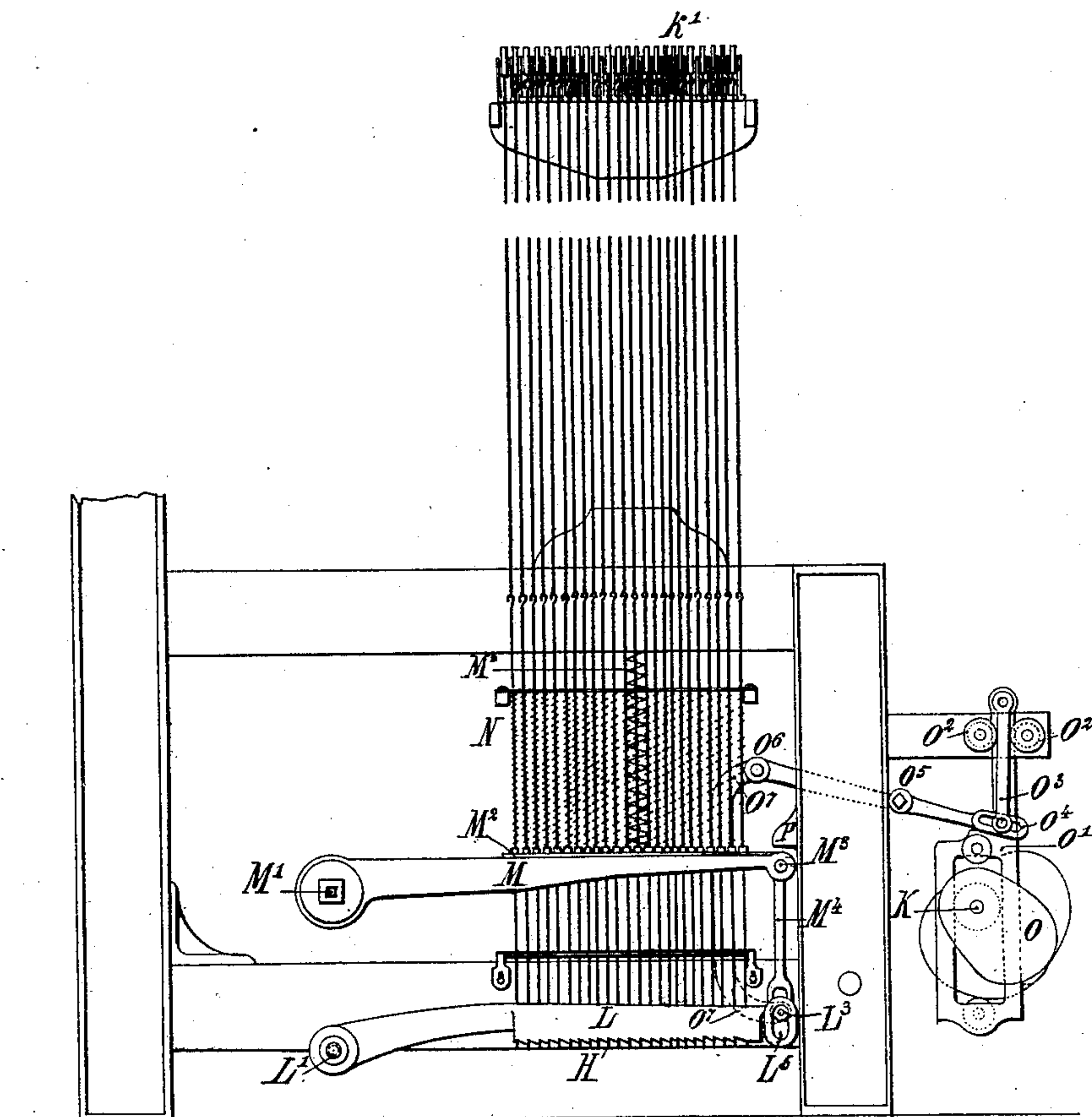
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3 Sheets—Sheet 2.

No. 452,451.

Patented May 19, 1891.

FIG. 2



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(No Model.)

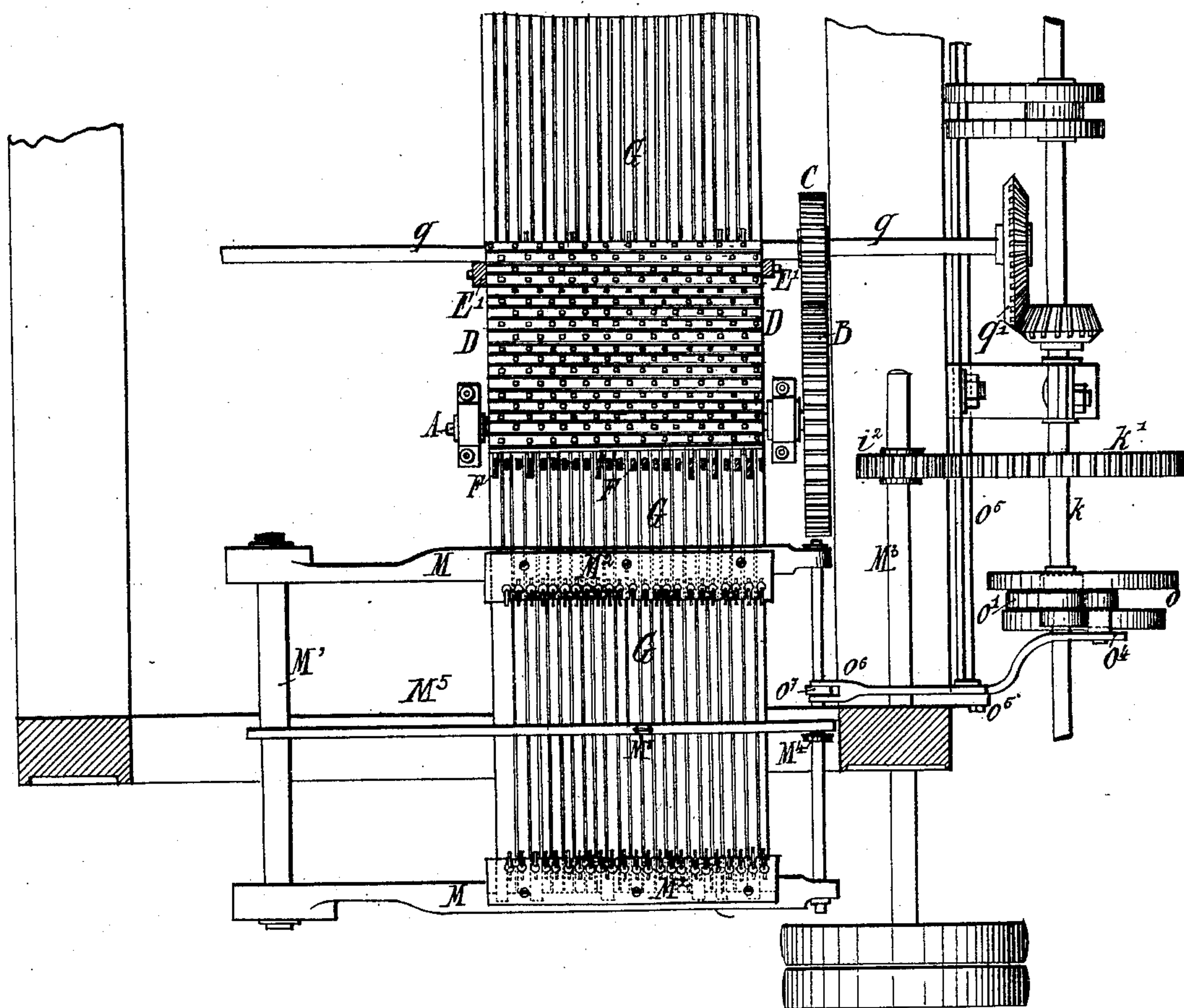
3 Sheets—Sheet 3.

A. F. DEVIGNE & J. P. DURAND.
SHEDDING MECHANISM FOR LOOMS.

No. 452,451.

Patented May 19, 1891.

FIG. 3



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UNITED STATES PATENT OFFICE.

ANTOINE FRANCOIS DEVIGNE AND JEAN PIERRE DURAND, OF LYONS,
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SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 452,451, dated May 19, 1891.

Application filed May 21, 1887. Serial No. 239,257. (No model.) Patented in France October 27, 1886, No. 179,169; in Belgium November 13, 1886, No. 75,223; in Italy November 26, 1886, XLI, 227; in England December 30, 1886, No. 17,094, and in Germany April 1, 1889, No. 46,439.

To all whom it may concern:

Be it known that we, ANTOINE FRANCOIS DEVIGNE and JEAN PIERRE DURAND, both at present residing at Lyons, in the Republic of France, have invented a new and useful Improved Shedding Mechanism for Looms, (for which we have obtained Letters Patent in France for fifteen years, dated the 27th of October, 1886, No. 179,169; in Belgium for fifteen years, dated the 13th of November, 1886, No. 75,223; in England for fourteen years, dated the 30th of December, 1886, No. 17,094; in Italy for fifteen years, dated the 26th of November, 1886, No. 227, Vol. 41, and in Germany April 1, 1889, No. 46,439,) of which the following is a full, clear, and exact description.

This invention relates to the harness or mechanism for actuating the heddles of a power-loom in such manner that the heddles are both raised and lowered simultaneously and thus produce a thorough rising and falling shed.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a front elevation of a loom embodying our invention, the cloth-beam being removed. Fig. 2 is a side elevation of the same. Fig. 3 is a plan showing the mechanism for actuating the heddles. Fig. 4 is an enlarged horizontal section on line 4 4, Fig. 1. Fig. 5 is an enlarged vertical section on line 5 5, Fig. 4. Fig. 6 is an enlarged side view of the connection between the bracket-arm E' and cross-bar E².

The same letters of reference indicate like parts in all the figures.

The tappet or pattern-chain D runs on a shaft A, driven by spur-wheels B C from shaft G, and passes around a shaft E, hung in bracket-arms E', that are adjustably carried by cross-bars E², whereby the distance of shaft E from shaft A may be made to suit the length of the chain. This adjustment can be brought about by means of the slot s, Fig. 6, in the cross-bar E², the screw R sliding in said slot and carried by arms E' and the nut on said screw. Pendent levers F, corresponding

in number to the number of leaves of the heddles, are pivoted at their upper ends F', while their lower ends pass down through slots in horizontal slide-rods G, also corresponding in number to the heddles, so that whenever a tappet or stud of the tappet-chain comes against a lever F the corresponding rod G is slid longitudinally to the right. Each rod G is acted on by a spring G', which brings back the rods G to a fixed point, which is determined by a stud G² on the rod G and checked by the abutment U. Each rod G acts on four hooks like those used in the jacquard and acting together in pairs—that is to say, the two outside ones H being connected through rock-levers K' with the top and the two inside ones I with the bottom of the same leaf or heddle K, as shown in Fig. 1, the former for raising and the latter for lowering the heddle. Pairs of griff-levers L receive an up-and-down motion on a center L', Fig. 2, and engage with the hooks brought by the rods G into their path. Above each griff-lever is a second lever M, mounted on a rock-shaft M' and carrying a sort of comb M², said lever M serving both to guide the hooks and insure their regular spacing and alignment. The free ends of the two levers L and also of the two levers M at the same side of the loom are connected by cross-bars L³ M³, respectively, (see Fig. 2,) and to the middle of the cross-bar M³ is attached a pendent forked rod M⁴, which straddles the cross-bar L³ and forms a distance-piece between the levers L and M, and which allows the lower griff-lever to rise for a certain distance independent of the movement of the lever M, since the connecting-piece L³ between the griff-levers slides in the lower slotted or forked end of the distance-piece M⁴, the object of which is fully stated hereinafter. The griff-levers L are moved up and down for acting on the series of hooks H and I by a double cam O, acting on the friction-rollers of a slotted sliding frame O', whose upper end is guided between the rollers O². The upper end of this slide is connected by a link O³ with a lever O⁴, fixed on a cross-shaft O⁵, having at each side of the loom an arm O⁶ and connecting-rod O⁷, which takes

hold of the cross-rod L^3 , whereby the two griff-levers connected by said rod L^3 receive a regular up-and-down movement, this operation being simultaneous at both sides of the loom.

5 In their descent the griff-levers L engage those hooks which are brought into their path, and after completing their ascent those hooks which were engaged at the previous descent are released.

10 The hooks H and I are each provided with an extra limb L^2 , attached to a collar B^2 on the stem of the hook, the extra limb passing through a round hole o in the corresponding rod G , (more fully illustrated in Fig. 5,) while
15 the hook itself passes through a longitudinal slot R^2 in said rod, so that the rod acts on the hook (to move it in or out of the path of the griff-lever) through the medium of the extra limb L^2 , which acts as a spring-connection as
20 well as a guide, and so facilitates the disengagement of the hook from the griff-lever when the latter rises.

It will be seen that the two outer series of hooks when acted on by the descending griff-
25 levers raise the corresponding leaves of the heddles, while the inner series of hooks when so engaged lower them. When, therefore, a tappet or stud of the chain D pushes the corresponding lever F and rod G to the right,
30 the corresponding hooks of the two outer series H are brought into the paths of the outer griff-levers at the same time that the corresponding hooks of the inner series are moved out of the paths of the inner griff-levers, as
35 shown in Fig. 1, so that the corresponding leaves of the heddles will be raised; but all the rods G which have not been so moved by the tappet-chain are held in the normal position toward the left by the springs G' , so
40 that the corresponding hooks of the two outer series are thereby held out of, while the corresponding hooks of the two inner series are held in, the paths of the griff-levers, whereby the leaves of the heddles to which those hooks
45 of the inner series are connected will be drawn down.

The disengagement of the hooks from the griff-levers is effected as follows: Each griff-lever in its descent draws down a certain number of hooks, and through them the levers M ,
50 upon which the collars B^2 , which are firmly secured to the hooks, bear with a pressure due to special springs N , that are confined between these collars and a fixed abutment T .
55 The levers M rise by the tension of a spring M^* , Figs. 2 and 3, attached at its upper end to a fixed point and at its lower end to a lever-arm M^5 , fast on the rock-shaft M' , to which levers M are fixed. The levers L and M rise
60 together until the cross-bar M^3 meets a stop P , Fig. 2, whereupon the levers M are arrested, while the levers L continue to be raised still

farther, this being allowed by the slots L^5 , in which rod L^3 rests, said slots being at the ends of levers L , as in Fig. 2, the cross-bar L^3 now
65 resting in the upper part of the slot. As, however, the hooks are pressed downward by the springs N , so that their collars B^2 always bear on the levers M , they stop with the latter, and the griff-levers L continue to rise by the
70 action of the rod L^3 , which rises to the upper part of the slots and continues to rise until the hooks become disengaged from the griff-levers L , the spring action of the limbs L^2 , which
75 have been slightly flexed during the engagement of the hooks, moving the hooks quickly out of the path of the griff-levers. To limit the approach of the levers L and M while the former continue to rise, the cross-bar L^3 enters the fork of the distance-piece M^4 . By this
80 arrangement the working of each leaf of the heddles is quite independent of the others, and, moreover, the tension upon the leaves is nearly the same whether in work or at rest, a rising and falling shed being used for weaving
85 all kinds of patterns, so that their motions balance one another, and each warp-thread at all times bears only its proper proportion of strain, which is conducive to economy in the maintenance of the harness. The levers F
90 may of course be actuated by a pin-drum or other suitable means instead of a chain.

Having now described our invention, what we claim is—

In a loom-heddle-operating mechanism 95 wherein the heddles are caused to move independently but simultaneously in opposite directions, so as to produce a rising and falling shed, the combination of the heddles K with the outer set of hooks H and the inner set of
100 hooks I , respectively acting to raise and to lower corresponding heddles, as described, with the pairs of griff-levers L and levers M acting on the two sets of hooks and the spring N in the manner described, the slide-rods G ,
105 connected each to the hooks of both sets corresponding to the same leaf or heddle and pattern-tappet, pattern-actuated levers F , and mechanism, substantially as described, for operating the levers L and M , the whole com-
110 bined for operation as described, so that when the hooks of one series are in position for engagement by the griff-levers those of the other series are out of position for engagement, substantially as specified. 115

The foregoing specification of our improved loom signed by us this 25th day of April, 1887.

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