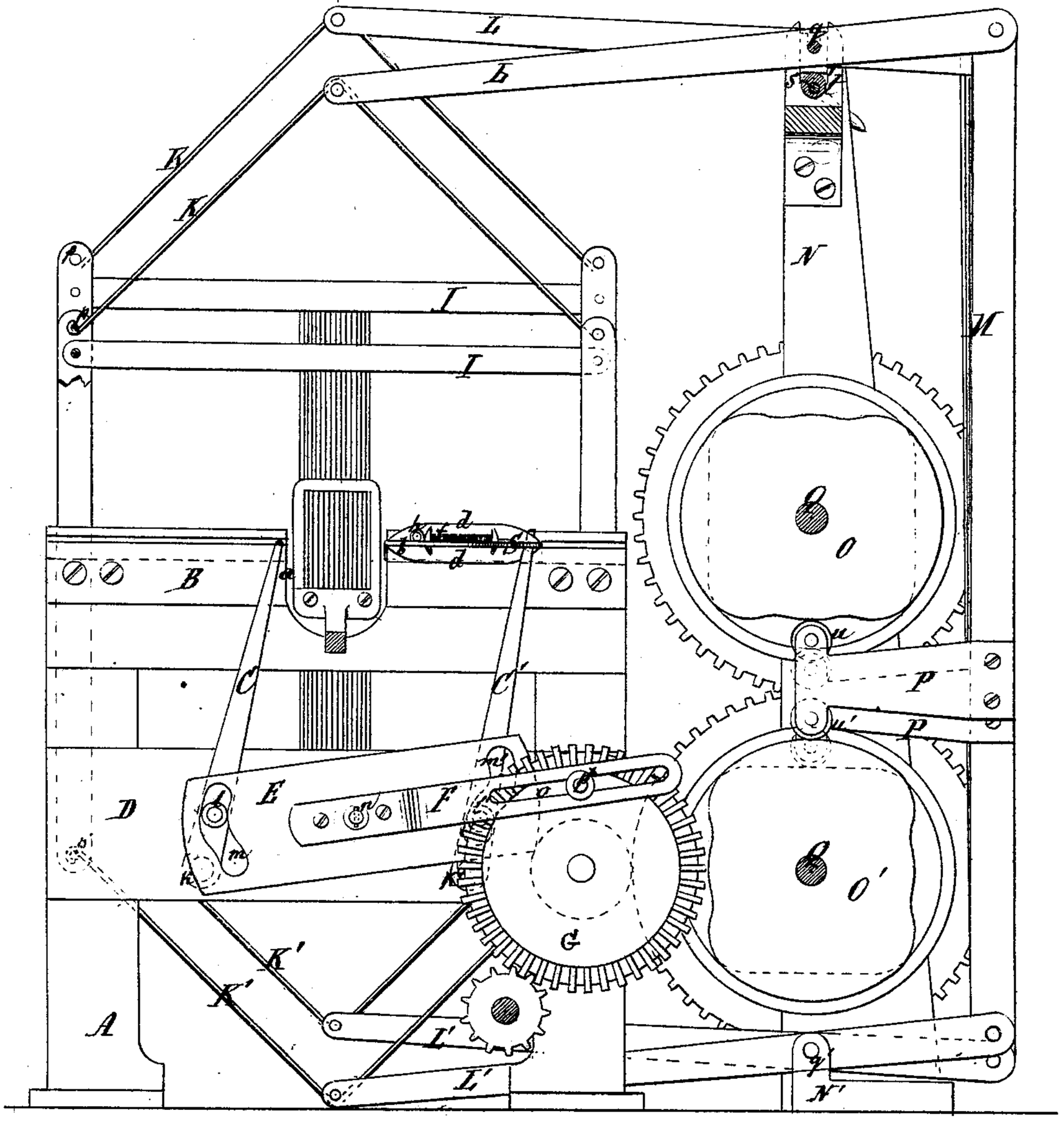
3 Sheets--Sheet 1.

ROBERT MUELLER.

Improvement in Looms.

No. 126,319. Fig. 1. Patented April 30, 1872.



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No. 126,319. Patented April 30, 1872.

Fig: 2.

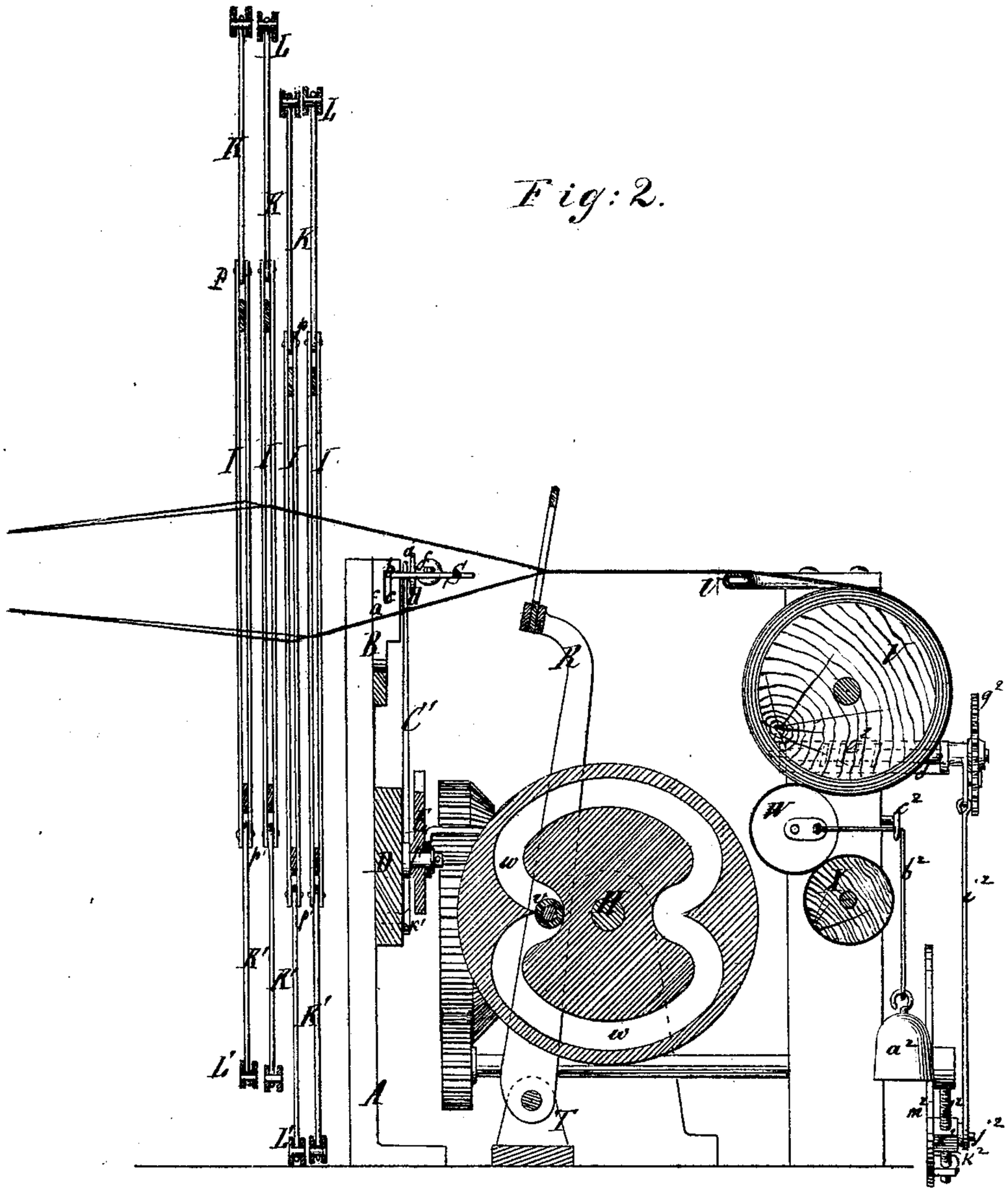

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Fig: 3.

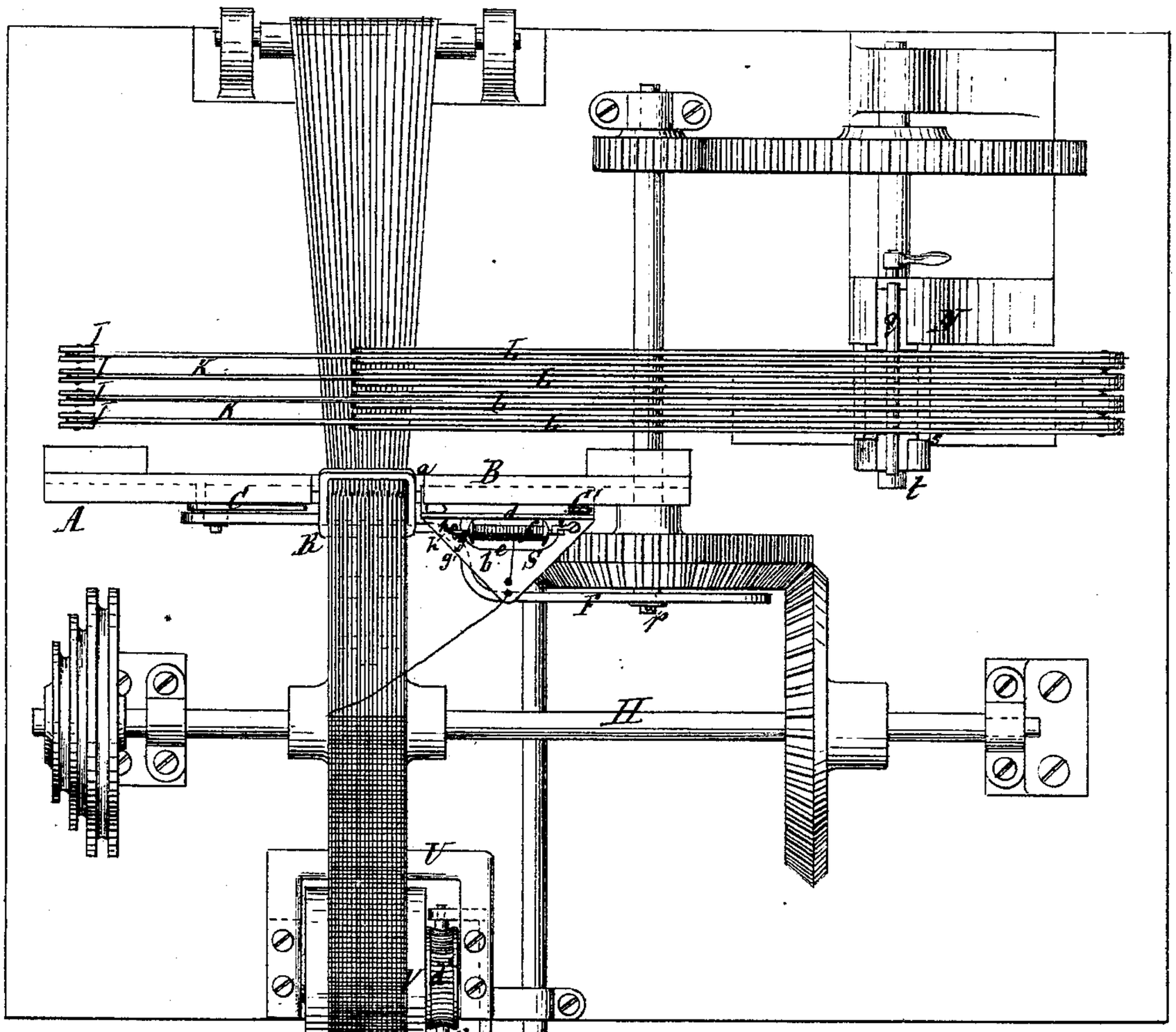


Fig: 4.

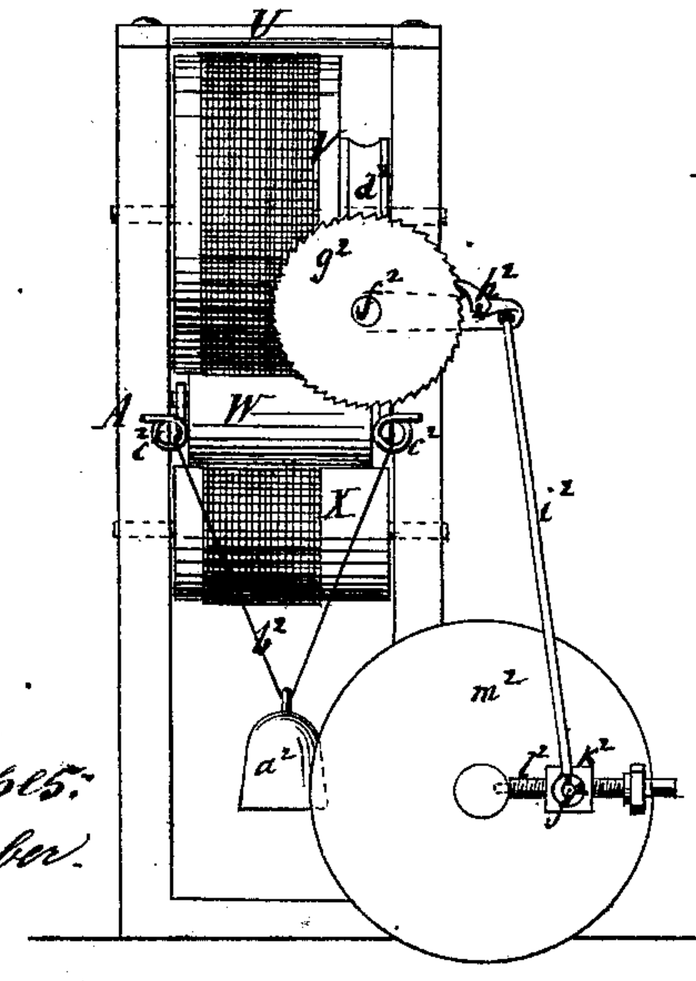


Fig: 5.

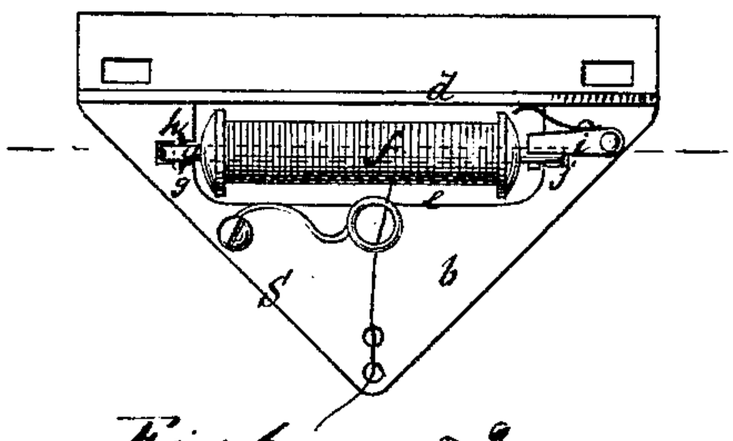
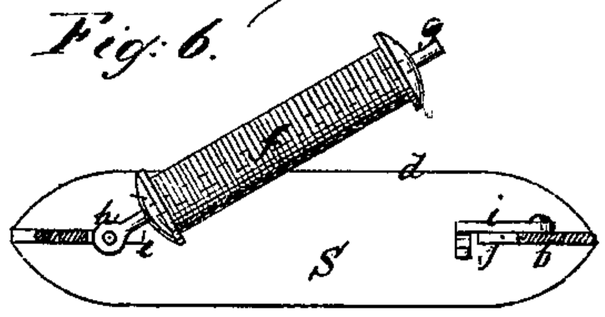


Fig: 6.



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UNITED STATES PATENT OFFICE.

ROBERT MUELLER, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND EMIL GREEFF, OF SAME PLACE.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 126,319, dated April 30, 1872.

To all whom it may concern:

Be it known that I, ROBERT MUELLER, of the city, county, and State of New York, have invented a new and useful Improvement in Looms; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a transverse vertical section of my loom in the plane *x x*, Fig. 2. Fig. 2 is a longitudinal vertical section of the same in the plane *y y*, Fig. 1. Fig. 3 is a plan or top view of the same. Fig. 4 is a front view of the take-up mechanism detached. Fig. 5 is a plan, and Fig. 6 a sectional front view of the shuttle on a larger scale.

Similar letters indicate corresponding parts.

This invention relates to certain improvements in the mechanism of a loom, the parts being hereinafter described so as to need no further explanation in this part of my specification.

In the drawing, the letter A designates a frame which supports the shuttle-race B. This shuttle-race is stationary, and it is provided with an opening, *a*, through which extend the warp-threads. The shuttle S is constructed of a piece of sheet-metal, *b*, provided with flange *c*, which catches in the shuttle-race, (see Fig. 2.) On the upper and under surfaces of the body of the shuttle are formed ribs *d*, of such a height that they prevent the spool or point of the shuttle from coming in contact with the shed, said ribs being rounded off at their ends to enable them to enter the shed without being liable to catch. In the body of the shuttle is an aperture, *e*, for the reception of the spool *f;* and the quill *g*, which supports the spool, is connected to the body *b* of the shuttle by a hinge-joint, *h*, so that it can be raised, as shown in Fig. 6, for the purpose of removing or inserting the spool. When the quill is turned down its tip is locked by a spring-catch, *i*, (best seen in Fig. 6,) the body of the shuttle being provided with a mortise, *j*, for the reception of the tip of the quill, while the spring-catch is provided with a shoulder for the purpose of supporting the tip of the quill. The length of the shuttle S exceeds the width of the opening *a*, and the motion of the shuttle is produced by two levers, C C′, which are situated on opposite sides of the opening, and secured to a cross-bar, D, of the frame A by means of pivots *k k′*, (see Figs. 1 and 2.) On the levers C C′, Fig. 1, are roller-studs *l l′*, which catch in cam-slots *m m′* formed in a plate, E, which swings on a pivot, *n*, and to which a rocking motion is imparted by means of a lever, F, that is firmly secured to said cam-plate, and which is provided with an oblong slot, *o*, that catches over an eccentric wrist-pin, *p**, secured in the face of a cog-wheel G. This cog-wheel is geared with the main-shaft H of the loom, and if a revolving motion is imparted to it the cam-plate E receives an intermittent oscillating motion, whereby the levers C C′ are caused to engage alternately with holes in the body-plate of the shuttle S, the slots *m m′* in the cam-plate E being so formed that, by the action of the levers C C′, the shuttle is carried across the opening *a* in the shuttle-race alternately in one and then in the other direction. By following the motion of the levers C C′ it will be noticed that the shuttle is never released simultaneously by both levers, for at the moment one of the levers passes out of gear with the shuttle the other has already been brought in gear with the same. By this arrangement of the mechanism for driving the shuttles I am enabled to impart to the same a very rapid motion, and this object is still further facilitated by the exceeding lightness of my shuttle, which, being constructed of a simple plate of sheet-metal, is lighter than shuttles are usually constructed. The letters I I designate the heddle-frames, which are suspended by means of yokes K from levers L, while their bottom ends are secured by yokes K′ to levers L′, the rear ends of the levers L L′ being connected together by means of rods M, (see Fig. 1,) in such a manner that each heddle-frame is stretched between its levers L L′, and that said heddle-frames are moved up and down with the greatest ease, and at the same time can be forced apart, so as to get access to those in the middle, while said heddle-frames are always firmly in position, as will be presently explained. The yokes K K′ are, by preference, made of simple strands of wire, which are fastened at one end to their heddle-

frames, then drawn over or under a pivot secured in the levers L or L′, and finally hooked on pins *p p′* secured in the heddle-frames. By releasing the hooked ends of the yokes from their pins *p p′* each heddle-frame can be readily removed. The levers L have their fulcrums all on one and the same pin *q*, which is secured in a slide, *r*, fitted in a slot, *s*, in a standard, N, which rises from the frame A, but the pivot *q′*, which forms the fulcrum for the levers L′, is secured in standards N′, which are rigidly attached to the frame A. The slide *r*, which supports the fulcrum-pin *q* of the upper levers L rests upon an eccentric, *t*, and by turning this eccentric the fulcrum-pin *q* can be raised or lowered, and the yokes K K′ which support the heddle-frames can be strained or released. If it is desired to get in between the heddle-frames the yokes are released; but when the loom is in operation the yokes are strained so as to retain the heddle-frames firmly in position. The rear ends or arms of the levers L and L′ are of different length; those levers which connect with the front heddle-frames having the longest arms, and those which connect with the rear heddle-frames the shortest, so that the heddle-frames are raised and depressed more or less in proportion to their distance from their shuttle-race to produce an even shed.

The heddle motion is produced by cams O O′, which act on rollers *u u′* secured in the ends of arms P, which extend from the rods M, (see Fig. 1.) Said cams are mounted on shaft Q Q, which are geared together so that they revolve in opposite directions at a uniform velocity, and the cams are so adjusted in relation to each other that the high portions of the cams O are opposite the low portions of the corresponding cams O′, and that the rollers *u u′* are always in contact with their appropriate cams, thereby firmly retaining each heddle-frame in its respective position. The cams O O′ are all of uniform size and shape, and if the rear arms of the levers L L′ should be made of a uniform length, the heddle-frames would all be raised and depressed to the same distance; but by reducing the length of the rear arms of the levers L L′ as the same recede from the shuttle-race the throw of the heddle-frames can be easily regulated, as above stated. The cams O O′ are so arranged that they can be taken off and replaced by others of different shapes, according to the pattern to be produced. The batten R is pivoted to a standard, T, secured to the frame A, and it carries a roller-stud, *v*, which engages with a cam-groove *w*, (see Fig. 2.) This cam-groove is formed in a disk mounted on the driving-shaft H, and it is of such a shape that the batten beats up each time a new weft-thread has been thrown in by the shuttle.

The finished fabric passes over the breast-beam U, thence round a rough surface-roller, V, then partly round the tension-roller W to the take-up roller X. The tension-roller W is pressed in between the rough surface-roller V and the take-up roller X by means of a weight, a^2, which is suspended from a cord or strap, b^2, extending from the gudgeons of the tension-roller through loops c^2. (See Figs. 2 and 4.) On the shaft of the rough surface-roller V is secured a worm-wheel, d^2, (see Figs. 3 and 4,) which engages with a worm, e^2, on a shaft, f^2, which also carries a ratchet-wheel, g^2. With this ratchet-wheel engages a lever-pawl, h^2, that connects by a rod, i^2, with a pin, j^2, secured in block k^2, as shown in Fig. 4. This block is mounted on a screw, l^2, secured to a disk, m^2, which receives a revolving motion from the driving-shaft H. By turning the screw l^2 the block k^2, with its pin j^2, can be moved toward or from the center of the disk m^2, and thereby the throw of the lever-pawl h^2 can be changed, and the take-up motions can be regulated with the greatest nicety.

This loom is intended particularly for narrow goods, such as ribbons, suspenders, tapes, and similar articles, and its peculiar advantages are that it can be run at considerable speed; that it is cheap in its construction; that it can be readily adjusted for different patterns; and that it is not liable to get out of order.

What I claim as new, and desire to secure by Letters Patent, is—

1. The cam-plate E, receiving an oscillating motion by means of a lever, F, and acting on levers C C′, which engage alternately with the shuttle S, substantially in the manner herein shown and described.

2. The combination of the rods M, provided each with an arm, P, having two rollers, *u u′*, the cams O O′, graduated levers L L′, yokes K K′, and heddles I, all substantially as described.

3. The eccentric *t*, in combination with the slide *r*, levers L, yokes K, and heddles I, substantially as set forth.

4. The rough surface-roller V and roller X, both running firmly in their bearings, in combination with a loose roller, W, which is drawn in between the two fixed rollers V X by a weight, a^2, the rough surface-roller receiving its motion by a worm-wheel, d^2, worm e^2, ratchet-wheel g^2, and adjustable crank, all constructed and operating substantially in the manner shown and described.

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