(No Model.) 2 Sheets—Sheet 1.

C. B. RUMSEY.

POSITIVE SHUTTLE MOTION FOR LOOMS.

No. 280,960. Patented July 10, 1883.

Fig. 1.

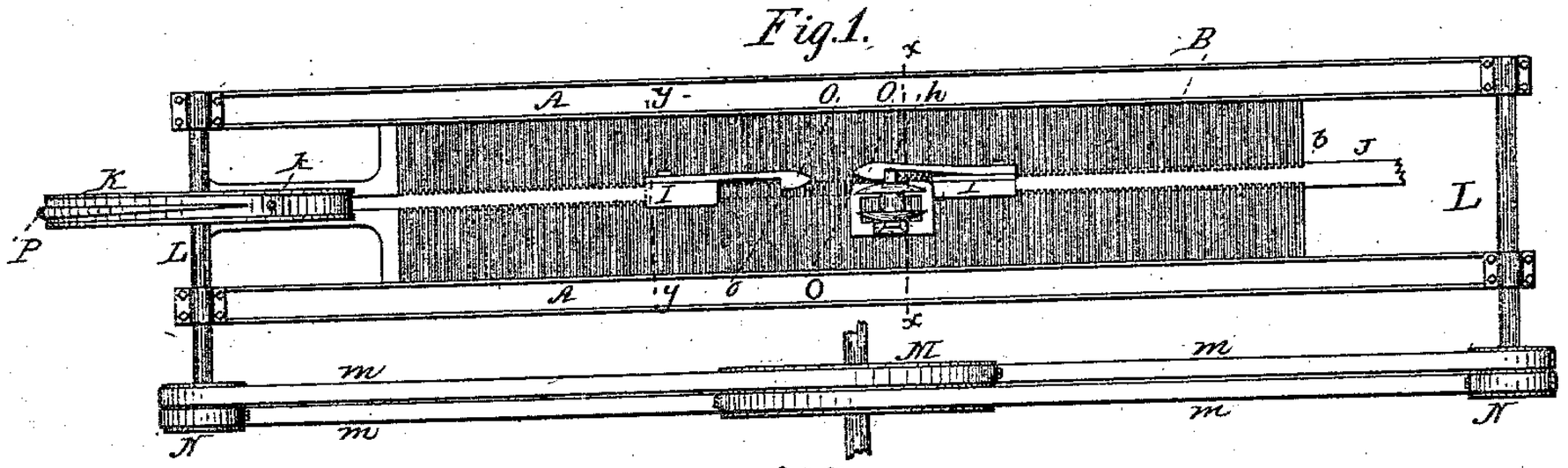

Fig. 2.

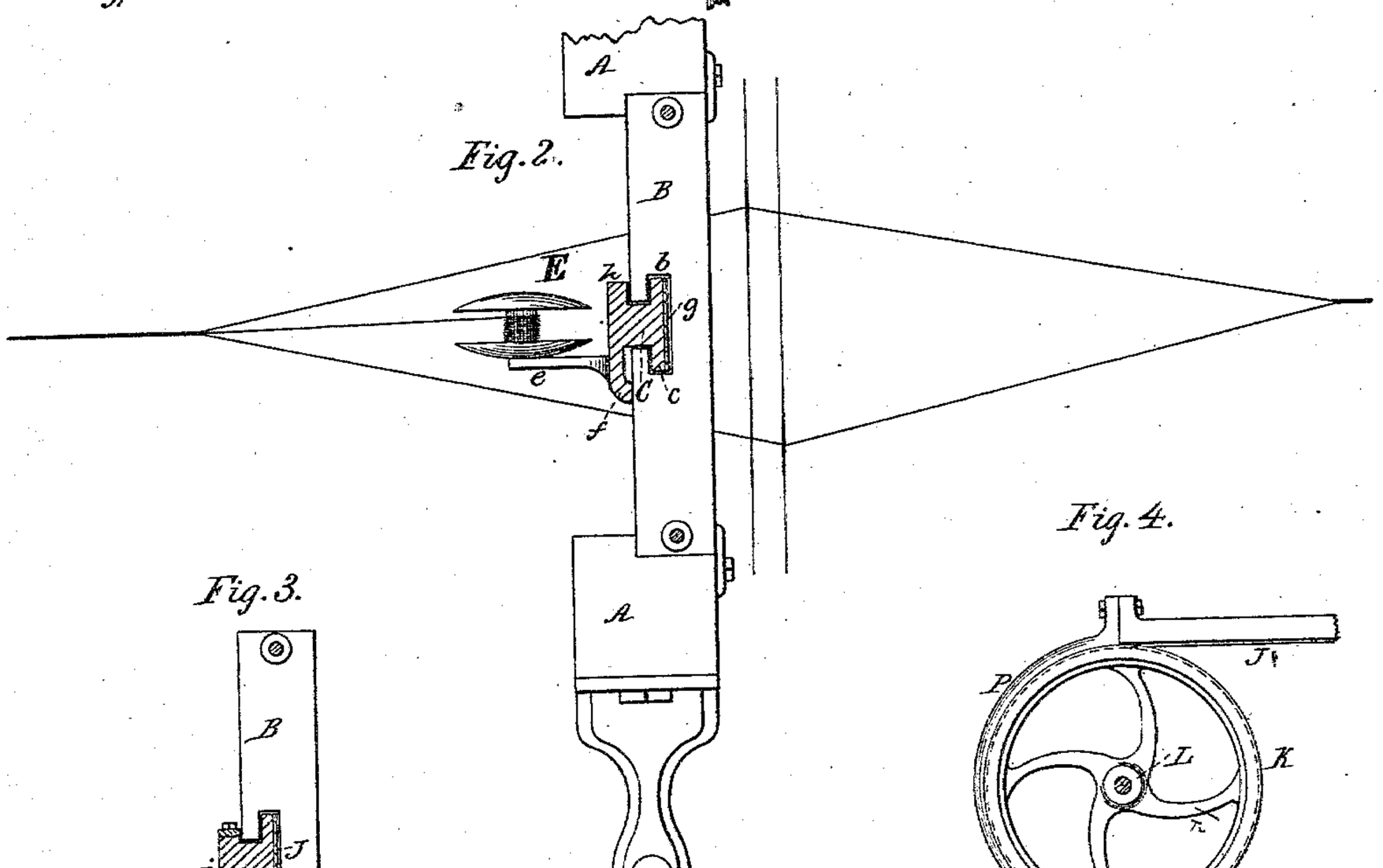

Fig. 3.

Fig. 4.

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his Attorney.

(No Model.) 2 Sheets—Sheet 2.

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POSITIVE SHUTTLE MOTION FOR LOOMS.

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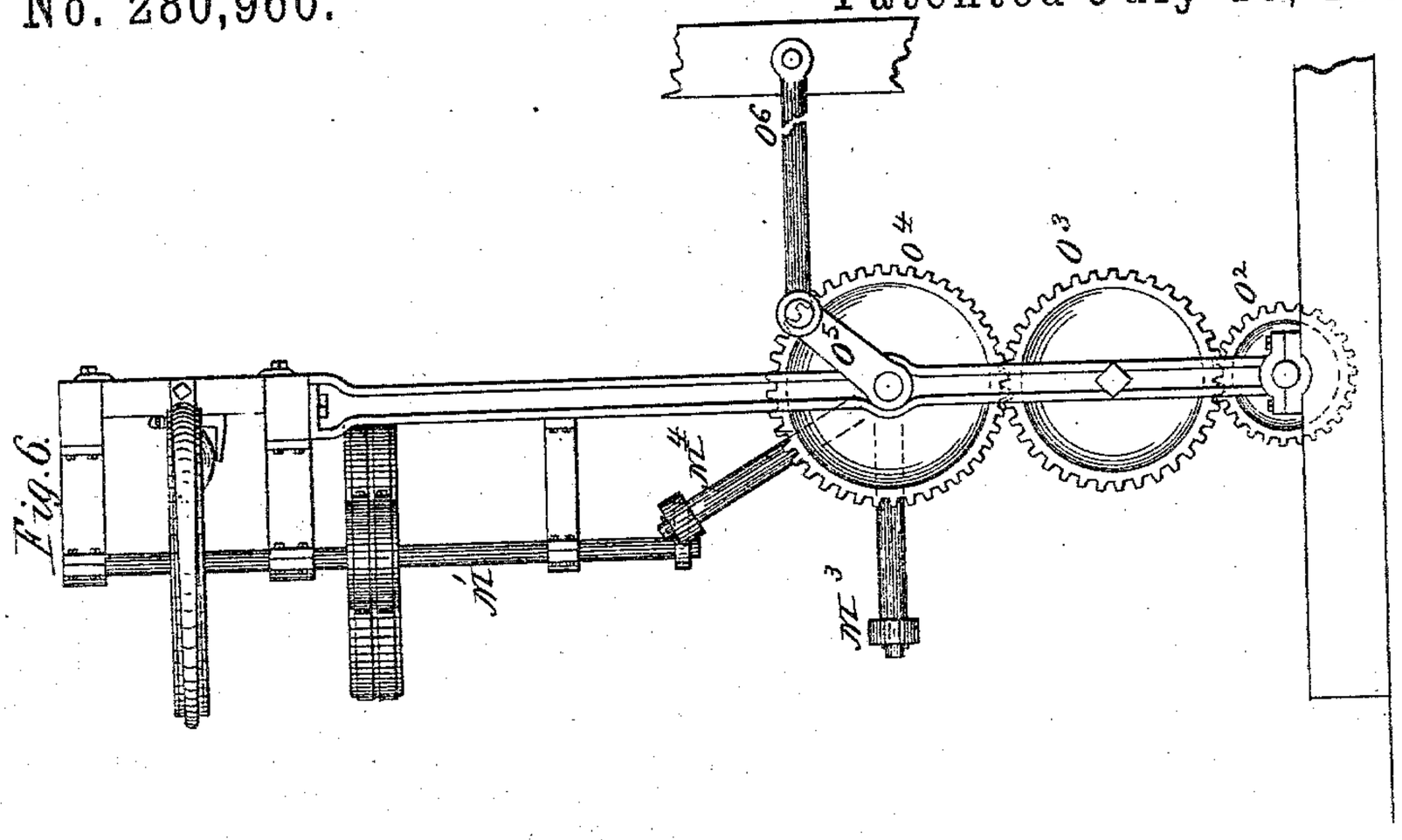

Fig. 6.

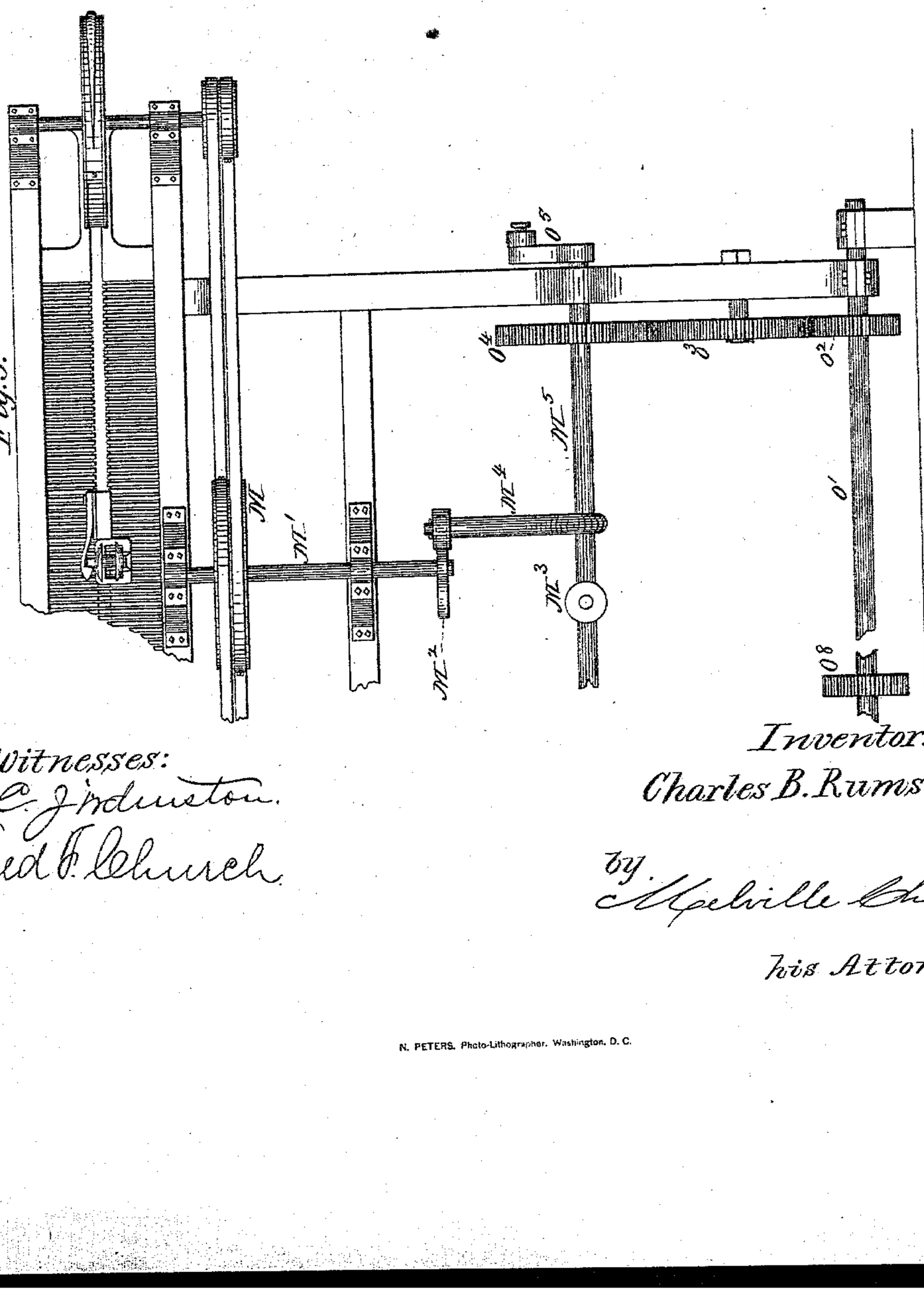

Fig. 5.

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Inventor:
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by Melville Church
his Attorney.

UNITED STATES PATENT OFFICE.

CHARLES B. RUMSEY, OF HOMER, NEW YORK, ASSIGNOR OF TWO-THIRDS TO CHARLES A. SKINNER AND GEORGE D. DANIELS, BOTH OF SAME PLACE.

POSITIVE SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 280,960, dated July 10, 1883.

Application filed January 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. RUMSEY, of Homer, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Positive Shuttle-Motions for Looms; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the figures and letters of reference marked thereon.

My invention relates to that class of shuttle-motions particularly intended for use in wire-weaving looms, in which the shuttle is carried by positively-acting mechanism, in contradistinction to being thrown; and it consists in certain improved novelties of construction and combinations of parts, which I will first describe, and then point out particularly in the claims at the end of this specification.

Referring to the accompanying drawings, Figure 1 represents a front elevation of a portion of a wire-weaving loom, showing the application of my improvement thereto. Fig. 2 is a sectional view of the lathe, taken on the line *x x* of Fig. 1. Fig. 3 is a similar view taken on the line *y y* of Fig. 1. Fig. 4 is a top detailed view. Fig. 5 is a front elevation of one end of the lathe, showing particularly the means by which the lathe is vibrated back and forth, and also the means for giving motion to the central actuating-drum. Fig. 6 is a side elevation of the same.

Similar letters of reference in the several figures denote the same parts.

A represents the upper frame of the lathe, containing the series of reed-dents B, each consisting, preferably, of a broad, thin metallic blade having a substantially T-shaped slot, *b*, at its front edge, as shown, the slots of the several reed-dents being all in line, and forming a practically continuous raceway extending from side to side of the lathe, as shown. The form of the slots may be varied, though the T shape I prefer.

C represents the shuttle, consisting of a frame having a shank, *c*, which fits the slots *b* of the reed-dents, so as to slide freely therein, a laterally-projecting arm, *e*, having a stud for supporting the bobbin or spool E, and a depending flange, *f*, which is adapted to bear against the front edges of the reed-dents and assist in sustaining the weight of the spool and its supporting-arm *e*. The rear end of the shank *c* is provided with a facing of thin steel, *g*, which affords a smooth and durable wearing-surface. The shuttle is further provided on its upper side, at or near its middle, with a projection or stud, *h*, with which the clutches of the shuttle-carriers I I are adapted to alternately engage, as will be further on explained, so as to reciprocate the shuttle back and forth across the lathe and lay the filling or weft wire. Each of the shuttle-carriers is provided with a shank, *j*, similar to the shank of the shuttle, and which likewise fits within the slots of the reed-dents, so as to move freely therein; but the shanks of the shuttle-carriers, instead of being merely faced at the backs with a facing of thin steel, as is the back of the shuttle-shank, are each rigidly connected to a separate thin steel band, J, which passes in through the slots in the reed-dents, being connected at its outer end at *k* to a grooved wheel or drum, K, mounted on a vertical shaft, L, having bearings in the lathe-frame, as shown.

Mounted upon each of the shafts L, near its lower end, is a small drum or pulley, N, to which are connected, one above the other and on opposite sides, the ends of a pair of belts or straps, *m m*, the opposite ends of which are secured to opposite sides of a central actuating-drum, M, which is mounted upon a shaft, M′, having bearings in the lathe-frame and carrying at its lower end a cross-bar, M^2, the opposite ends of which are arranged to be struck alternately by arms M^3 M^4, carrying friction-rollers at their extremities, and mounted rigidly on a cross-shaft, M^5, at a slightly acute angle to each other, as shown in Fig. 6. The lathe-frame is mounted upon a cross-shaft, O′, so as to swing freely thereon, and a pinion, O^2, fixed to said shaft O′, serves to transmit the motion of said shaft through an intermediate idler-pinion, O^3, and a fixed pinion, O^4, to the shaft M^5, which carries the arms M^3 M^4. Motion is given shaft O′ by means of a suitably-

driven gear, O^8, fixed thereto, or by other suitable means. A crank-arm, O^5, is secured to the shaft M^5, and has connected to it a pitman, O^6, which is secured at its opposite end to a stationary part of the machine. From this arrangement it results that when motion is imparted to the shaft O′ the shaft M^5, through the gearing O^2 O^3 O^4, is caused to rotate, and the arms M^3 M^4, mounted thereon, engage alternately with the opposite arms of the cross-bar M^2, thus causing a semi-rotary motion to the drum M in opposite directions, and also a to-and-fro movement of the whole lathe upon its shaft O′. The straps *m m* of one of the drums N are crossed, so as to cause reverse motions of the shafts L L. The drum M is preferably four times the diameter of the small drums N N, from which it results that when a one-fourth revolution is given drum M the drums N N will be caused to make a complete revolution in opposite directions, thus producing a revolution also of the grooved wheels or drums K K in opposite directions, and through the agency of the metal straps or bands J J causing the shuttle-carriers to be slid toward the middle of the lathe. A reverse rotation being given to the grooved wheels K K, the shuttle-carriers will be simultaneously drawn back to the ends of the lathe, as will be readily understood.

In order to cause the shuttle to be drawn from side to side of the lathe, it will only be necessary to provide means for engaging the shuttle alternately with each shuttle-carrier and disengaging it from the other shuttle-carrier when the two shuttle-carriers meet at the middle of the lathe. This may be effected in a variety of ways by a variety of means; but I show in the drawings a very simple and efficient means, which I have practically tested, and which admirably answers the purpose. It is as follows: Upon each of the shuttle-carriers I mount a spring clutch or pawl, O, the outer end of which is made pointed and tapering and provided with a shoulder at *o*, while its inner end or shank is secured to the carrier by a bolt, screw, or in any other suitable manner. Upon either of the shuttle-carriers approaching the shuttle the stud or projection *h* on the shuttle will strike the beveled end of the clutch or pawl of the shuttle-carrier, raise said clutch or pawl, and pass back under its shoulder *o*, as shown in Fig. 1, thus effecting a secure coupling of the parts; but if, while so coupled, the other shuttle-carrier is made to approach the shuttle, then the pointed beveled end of its clutch or pawl will force itself in between the end of the engaged clutch or pawl and the frame of the shuttle and force the said last-mentioned clutch out of engagement with the stud *h*, and at the same time ride up over said stud *h* and become itself engaged therewith.

From the above description the operation of the invention will be readily understood. When the loom is set in operation with the shuttle coupled to one of the shuttle-carriers, both shuttle-carriers are simultaneously carried toward the middle of the lathe through the warp-wires, and, meeting at the middle, the unoccupied shuttle-carrier disengages the shuttle from the carrier to which it is coupled and becomes itself coupled to the shuttle, and, on reversing its motion, draws the shuttle across the remaining half of its path through the warp-wires. The harness of the loom then shifting the warp-wires, the shuttle is then carried back, the first part of its throw by the one shuttle-carrier and the latter part of its throw and out at the other side of the warp-wires by the other shuttle-carrier, this operation being continuously repeated while the loom remains in operation, the lathe after the laying of each weft-strand moving up in the usual manner and pressing such strand up to the edge of the woven portion of the cloth. Both the shuttle and the shuttle-carriers, being mounted upon the reed-dents and guided by the slots therein, are caused to act with great uniformity and precision, and the positive engagement of the clutches alternately with the shuttle is thereby insured.

For the purpose of holding the metal bands within the grooves of the wheels K K, I preferably employ shoes P P, secured to the frame of the lathe, and made to bear lightly against the bands.

Having thus described my invention, I claim as new—

1. The combination of the lathe and reed, a shuttle supported and guided by and moving transversely across the reed-dents, the independent shuttle-carriers having a motion to and from the middle of the lathe, clutches on such shuttle-carriers for engaging alternately with the shuttle, and means for imparting to the shuttle-carriers their back-and-forth movements, substantially as described.

2. The combination of the lathe and slotted reed-dents, the shuttle guided and moving in the slots, the shuttle-carriers, also guided in the slots and bearing clutches, and means for imparting to the shuttle-carriers their back-and-forth motions, substantially as described.

3. The combination of the lathe and reed with the shuttle guided and supported by the reed-dents, shuttle-carriers, means for imparting simultaneous movements to the shuttle-carriers toward and away from each other, and clutches on the shuttle-carriers operating automatically to alternately release each other from the shuttle and to become themselves engaged therewith, substantially as described.

4. The combination of the lathe and slotted reed-dents, the shuttle guided and supported by the reed-dents, the shuttle-carriers, also guided and supported by the reed-dents and bearing clutches, the bands to which the shuttle-carriers are connected, the wheels or drums to which the said bands are attached, and

means for imparting to said wheels rotary reciprocating movements, substantially as described.

5. The combination of the lathe and slotted reed-dents, the shuttle guided in the slots in the reed-dents, the shuttle carriers and clutches, the metal bands to which the shuttle-carriers are connected, the rotary reciprocating shafts and their wheels, the actuating-wheel, means for operating said wheel, and the bands connecting the actuating-wheel to the lower wheels on said shafts, substantially as described.

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Witnesses:

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