

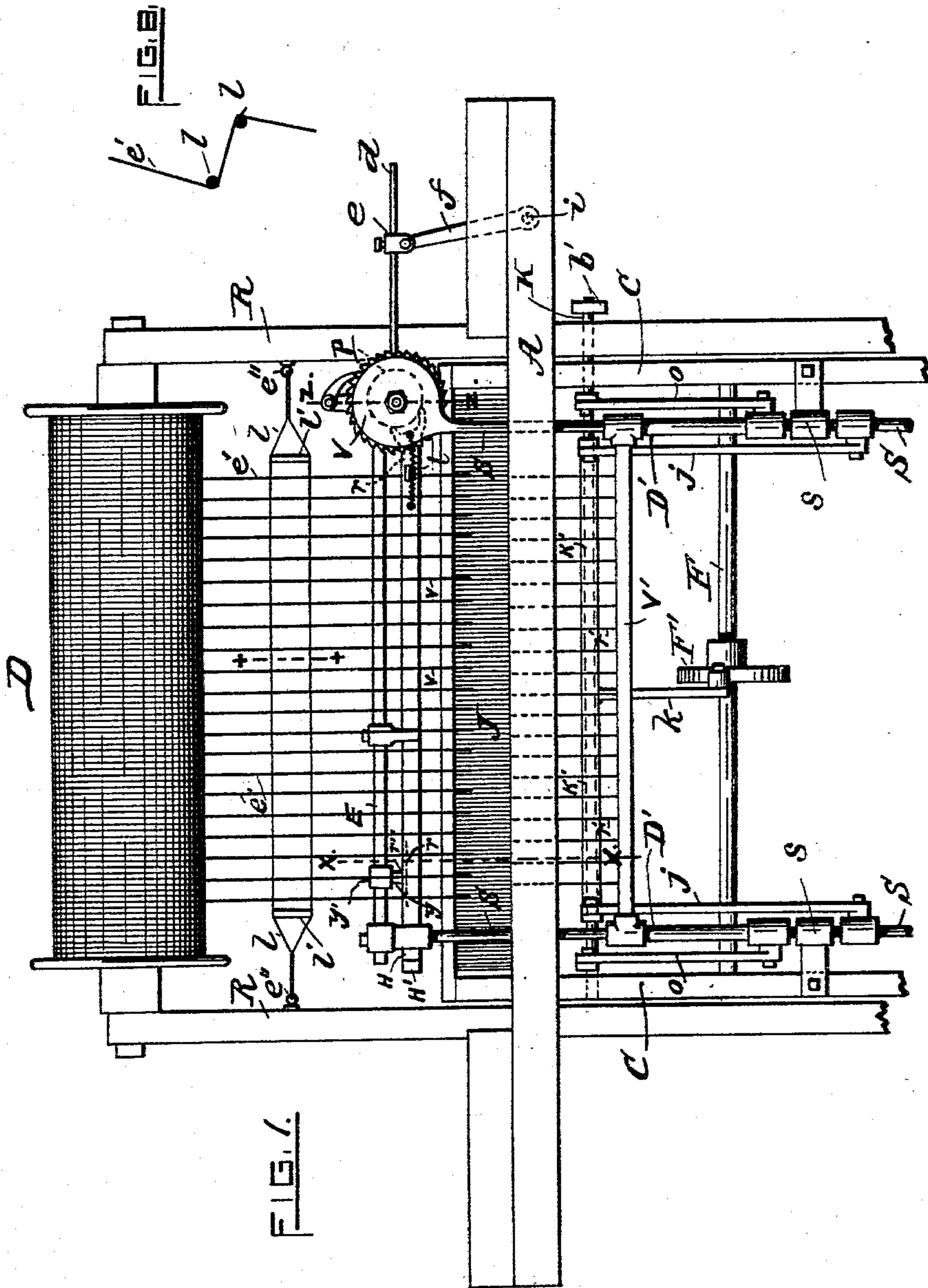
(No Model.)

3 Sheets—Sheet 1.

J. T. BOLTON.  
LAPPET LOOM.

No. 561,647.

Patented June 9, 1896.



WITNESSES.

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J. M. Richardson

INVENTOR.

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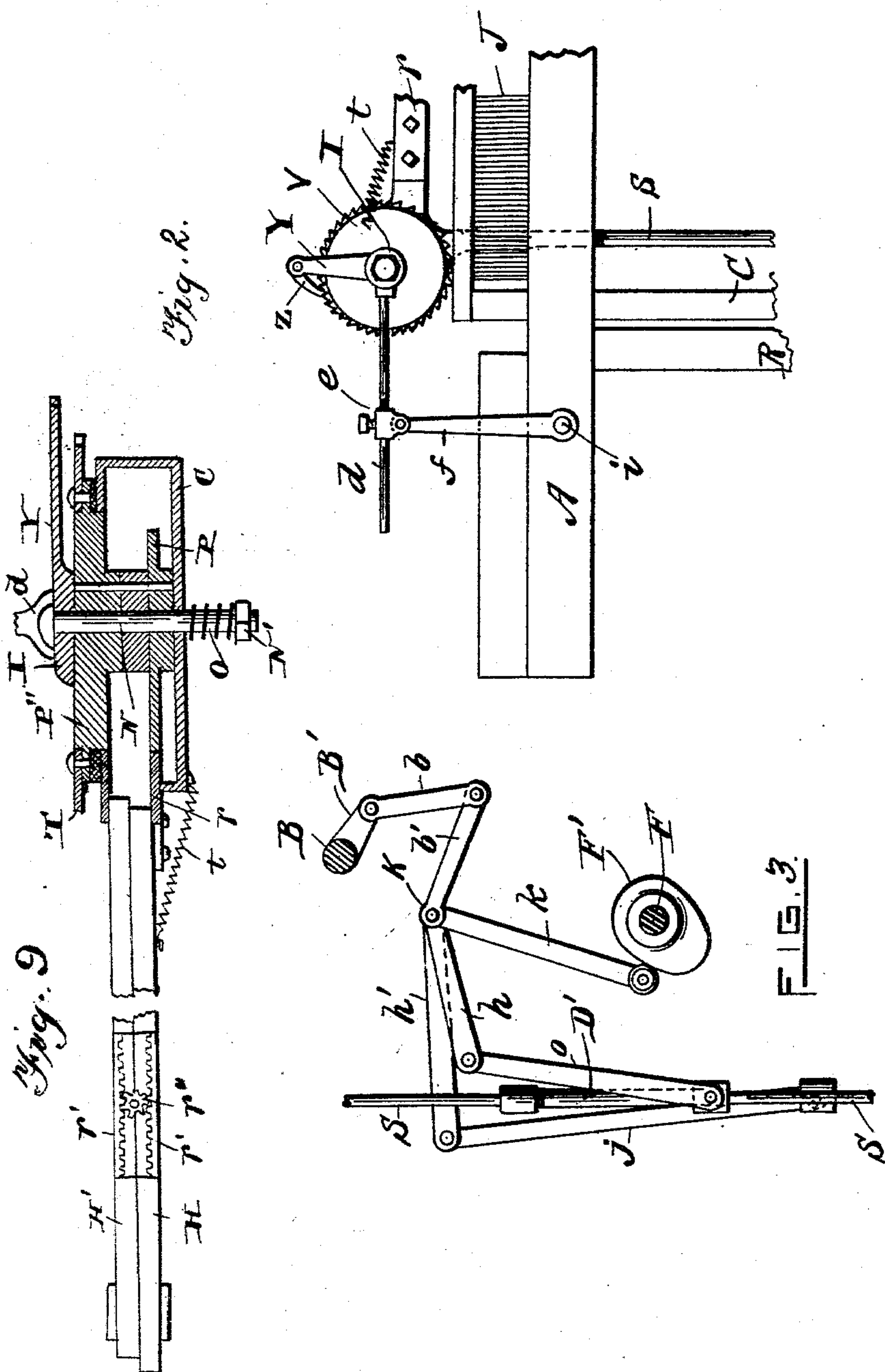
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3 Sheets—Sheet 2.

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WITNESSES:

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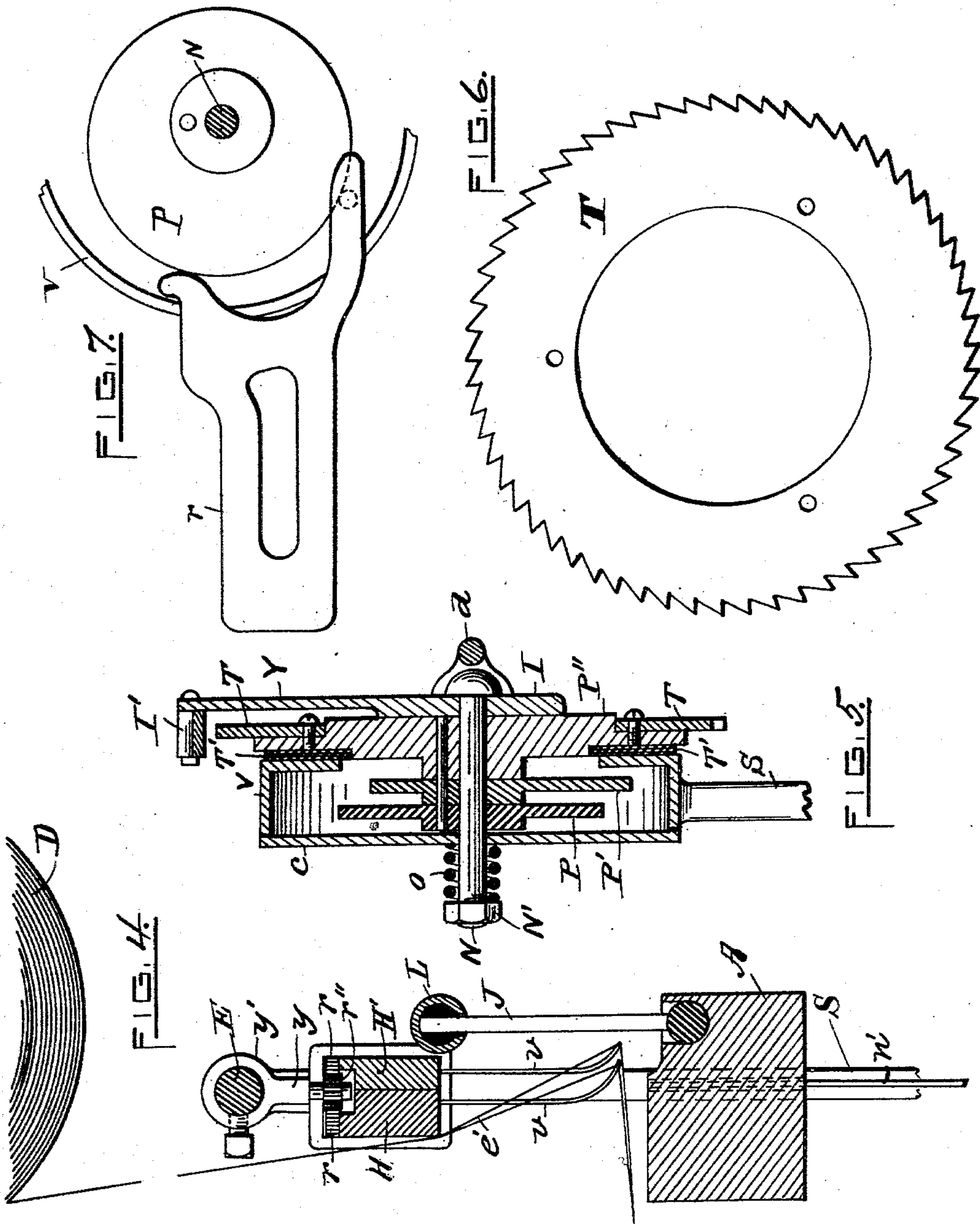
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# UNITED STATES PATENT OFFICE.

JOHN T. BOLTON, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF ONE-THIRD TO GEORGE GRIME, OF SAME PLACE.

## LAPPET-LOOM.

SPECIFICATION forming part of Letters Patent No. 561,647, dated June 9, 1896.

Application filed October 18, 1895. Serial No. 566,070. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. BOLTON, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and  
5 useful Improvements in Lappet-Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked  
10 thereon, which form a part of this specification.

This invention relates to that class of looms called "lappet-loom;" and it consists of improvements on the invention disclosed in my  
15 application for Letters Patent filed April 4, 1895, Serial No. 544,404. It is fully explained and illustrated in this specification and the accompanying drawings.

Figure 1 is a front elevation of a loom, showing the lathe, the devices attached to it, and some of the other parts. Fig. 2 is a back elevation of one end of the lathe, showing the cam-moving connection with the lathe. Fig. 3 is a diagram showing the parts connecting  
25 the needle-bars and guide-wire bar and the crank-shaft and cam-shaft of the loom. Fig. 4 is an enlarged vertical section of the lathe and the needle-bars, taken on line *xx*, Fig. 1, looking to the left. Fig. 5 is an enlarged  
30 section of the cam-case and its mechanisms, taken vertically through the center of the case on line *zz*, Fig. 1. Fig. 6 is an enlarged view of the ratchet-ring. Fig. 7 is an enlarged view of one of the cams with its connecting-plate. Fig. 8 shows a section of the  
35 "slack take-up" on line *++*, Fig. 1. Fig. 9 represents a top view, enlarged, of parts of the sliding needle-bars, showing the racks and gear by which one moves the other and a  
40 horizontal section of the cam-case and a single cam to operate the bars.

The mechanism of the improvement is adapted to be attached to looms already in use for plain weaving, using either one or  
45 more shuttles and harnesses. Its construction is as follows:

A is the lathe-beam of the loom.

C C are the swords that support the lathe-beam.

50 D is an auxiliary yarn-beam that holds the yarn that forms the figures on the cloth. It is

held in the supports R R, that extend up from the end frames of the loom.

B is the crank-shaft that operates the lathe.

F is the cam-shaft.

J is the reed.

S S are two vertical rods, one at each side of the loom, sliding in bearings in the lathe-beam and also in guides *s s* on the lower parts of the swords C C. A top rod E is made  
60 fast at the left end to the upper end of one of the vertical rods S, Fig. 1, and at its right end it is secured to the case V, to the lower side of which the other vertical rod S is attached, so that when the rods S are moved  
65 up and down the rod E and case V will move with them. Two flat plates H H' are held movably in a mortise in the upper end of the vertical rod S, at the left side, and in an opening in the case V, at their other ends, by extension-plates *r*, that are attached one to  
70 each of the plates H H', and one of which is shown enlarged, with a portion of the case V and the cam P in Fig. 7, showing the bearing of the plate on that cam, and the other  
75 plate *r*, part of which is shown in Fig. 2, bears in like manner on the cam P'. These plates H H' have needles *v v*, with eyes in their lower ends, set in their lower edges. The lower ends of the needles *v v* are curved to-  
80 ward the dents of the reed (see Fig. 4) to bring the yarn in them close to the reed that when the weft is beaten in and the reed is clear forward the eyes of the needles will not be brought any farther forward from the  
85 point on the web to which the yarn in the needles is attached than could be avoided, because of its stretching the yarn and figure out of shape.

The plates H H', with their needles *v v*, have  
90 a motion endwise, which they receive from cams P P' in the case V, a section of which is shown in Fig. 5. The case V consists of a rim of two flanges and a front plate *c*, made fast to the rim. A stud N extends through the  
95 center of the case and has two cams P P' made fast on it, and also plate P'', that holds a ratchet-rim T in a recess on its outside and a leather washer T' in a recess on its inner side. A plate I is held free to turn on the  
100 stud N and has an upright arm Y, that carries a pawl I', that engages in the teeth of the



ratchet T. An open spiral spring O is held on the outer end of the stud N, and a nut N' is fitted on the end outside of the spring to regulate the pressure of the spring on the case V, which causes a friction between the inner flange of the case and the leather washer T' on the plate P". The object of the friction of the washer T' is to prevent the plate with the cams from going too far when pushed quickly by the pawl and also from following back when the pawl returns. The horizontal arm d of the plate I has a connecting-block e fitted to slide on it, and a set-screw in it to make it fast on the rod when set. A bar f is pivoted at its upper end to this block, and its lower end is held on a pin i in the lathe A, so that when the case V rises with the vertical bar S and raises the needles v out of the web the arm d will be drawn down by the bar, and the pawl I' on the upright arm Y will push the ratchet-rim over and move the needle-plates H H' endwise by the cams P P' and the plates r, that are fast on the ends of the plates H H' at their inner ends, and have their outer ends bearing against the faces of the cams P P', with spiral springs t to draw the plates and oblige them to follow the periphery of the cams.

Toothed racks r' are secured to the top of each plate H H', and a pinion r'' is held on a stud y, adjustably secured to the top rod E, so as to engage with the racks r', and when one plate is moved endwise the pinion will give a motion to the other plate in the opposite direction. In this case only one cam P is used. When the plates are required to move together or independently of each other, the stud-block y' is loosened, so as to slide on the rod E by unscrewing the set-screw in the top of it. This allows cams of different forms to be used at the same time to make combinations of different figures.

The vertical motion of the plates H H' is limited to bringing the lower ends of the needles down to the lathe-beam, so that the shuttle with the filling will pass over the yarn in the eyes of the needles, and upward, so that the needle-eyes will hold their yarn a little above the upper shed of the warp a, that the shuttle may pass under it on its return.

The bar V', which is held at each end on sleeves D', sliding on the vertical rods S S, has a series of vertical guard-wires n' placed in its upper side that stand at all times in holes made through the lathe-beam A. They are carried up by the bar V' high enough above the beam to serve as guards to prevent the shuttle from falling back against the reed-dents when the needles v v are not down and from hitting the needles when they are down.

The vertical bars S S and the parts they carry receive an up-and-down motion, as follows: A crank B', made fast on the loom crank-shaft B, is connected by a bar b to an arm b' on a rocker-shaft K, held in bearings in the end frames for that purpose. (See

Fig. 3.) Two arms h h, made fast in this shaft, are connected by rods o o to the sleeves D' on the rods S S, that carry the bar V', with guide-wires n', one arm to each sleeve. A sleeve K' is held on the shaft K, and an arm k, fast on the sleeve K', extends downward and has a friction-roll in its lower end that bears on a cam F', fast on the loom cam-shaft F, which gives motion to the sleeve K', and by means of two arms h' h', fast on the sleeve K' and connected by bars j j with the lower ends of the vertical rods S S, an up-and-down motion is given to those rods and parts carried by them. (See Figs. 1 and 3.)

To take up the slack in the yarns e' made by the needles v v going down and drawing yarn off of the beam D, two cords l l are attached by eyes e'' e'' to the supports R R between the beam and needles. These cords are held apart by the pieces l' l' a little distance in from the end and twist the cords together between the pieces l' and the eyes. Then by conducting the yarns e' between these cords the twist in the end portion will turn the cords and take up any slack that may be made in them. (See Figs. 1 and 8.) The tension on the cords can be increased or diminished by pushing the pieces l' nearer to or farther from the eyes e''.

Having thus described my improvements, I claim as my invention and desire to secure by Letters Patent—

1. In a loom, the combination with the lathe of vertical sliding bars having bearings in the lathe-beam and on the swords below, a top bar connecting the upper ends of said vertical sliding bars, plates sliding at one end in mortises in the upper end of one of said vertically-sliding bars, and at their other end sliding in a case attached to the other vertical sliding bar, said case, needles in the lower edges of said plates, toothed racks fast on said plates, a gear-wheel held on said top bar and engaging with the racks, a ratchet-wheel and a cam fast to each other and to a pivot held loosely in the front plate of the case attached to said sliding bar, end plates fast on said sliding plates and bearing against the cam, a lever held on the ratchet-wheel pivot and having a pawl on its upper end engaging in the ratchet-wheel, a connecting-bar fast to said lever and connected to the lathe to operate said lever and pawl, with means for operating said vertically-sliding bars, substantially as described.

2. In a loom, the combination with the lathe of vertical sliding bars having bearings in the lathe-beam and on the swords below, a top bar connecting the upper ends of said vertical sliding bars, plates sliding at one end in mortises in the upper end of one of said vertical sliding bars and at their other ends sliding in a case attached to the other vertical sliding bar, said case, needles in the lower edges of said plates, toothed racks fast on said plates, a gear-wheel held on said top bar and engaging with the racks, a ratchet-wheel and



a cam, fast to each other and to a pivot loosely held in the front plate of the case attached to said sliding bar, end plates fast on said sliding plate and bearing against the cam, a  
5 lever held on the ratchet-wheel pivot and having a pawl on its upper end engaging in the ratchet-wheel, a connecting-bar fast to said lever and connected to the lathe to operate said lever and pawl, a cross-bar having

pins in its upper side and sliding on said vertically-sliding bars with means for sliding said vertical bars, and said cross-bars independently, substantially as described. 10

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Witnesses:

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