

(No Model.)

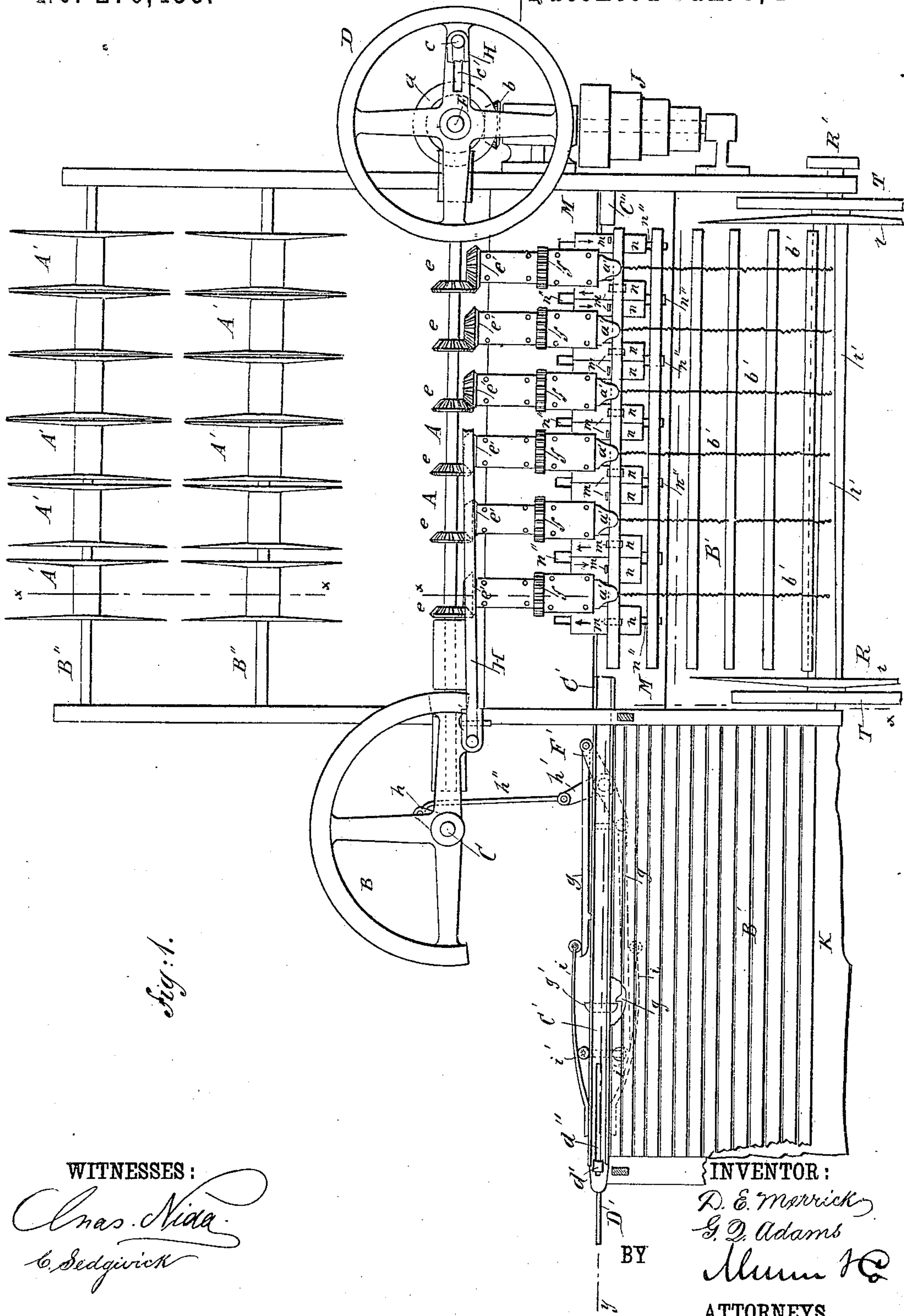
4 Sheets—Sheet 1.

D. E. MERRICK & G. Q. ADAMS.

FENCE LOOM.

No. 270,456.

Patented Jan. 9, 1883.



(No Model.)

4 Sheets—Sheet 2.

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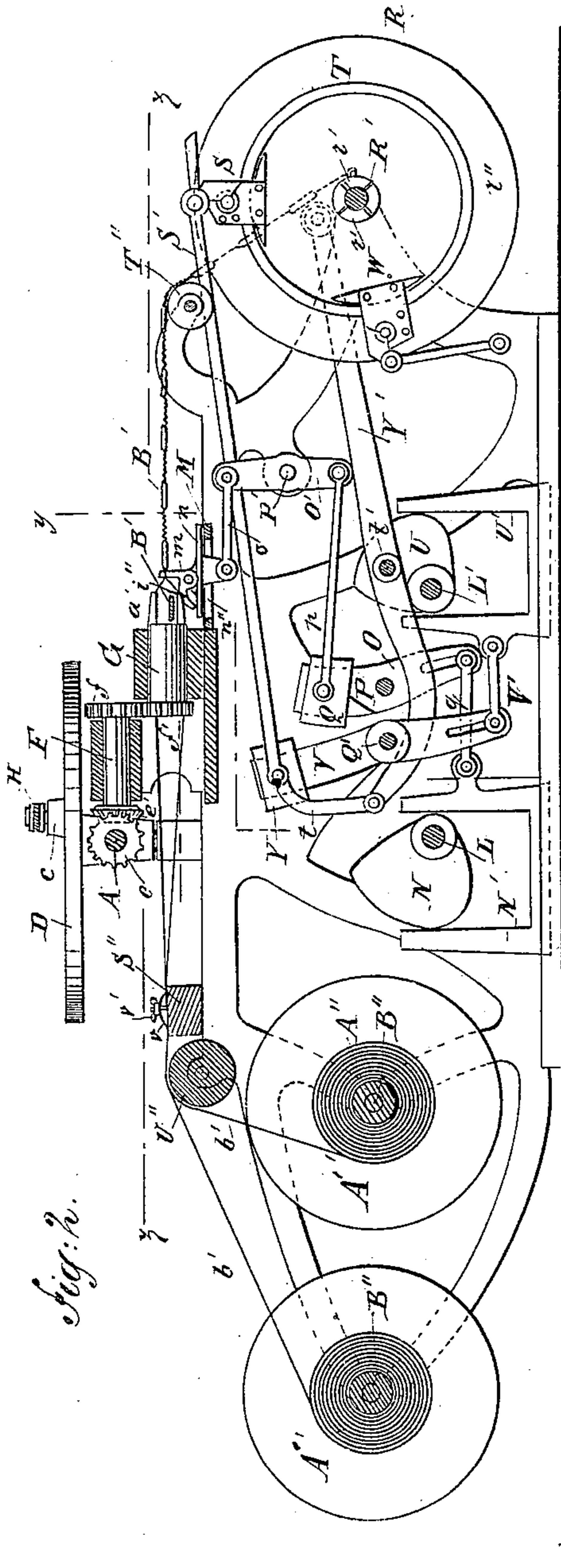
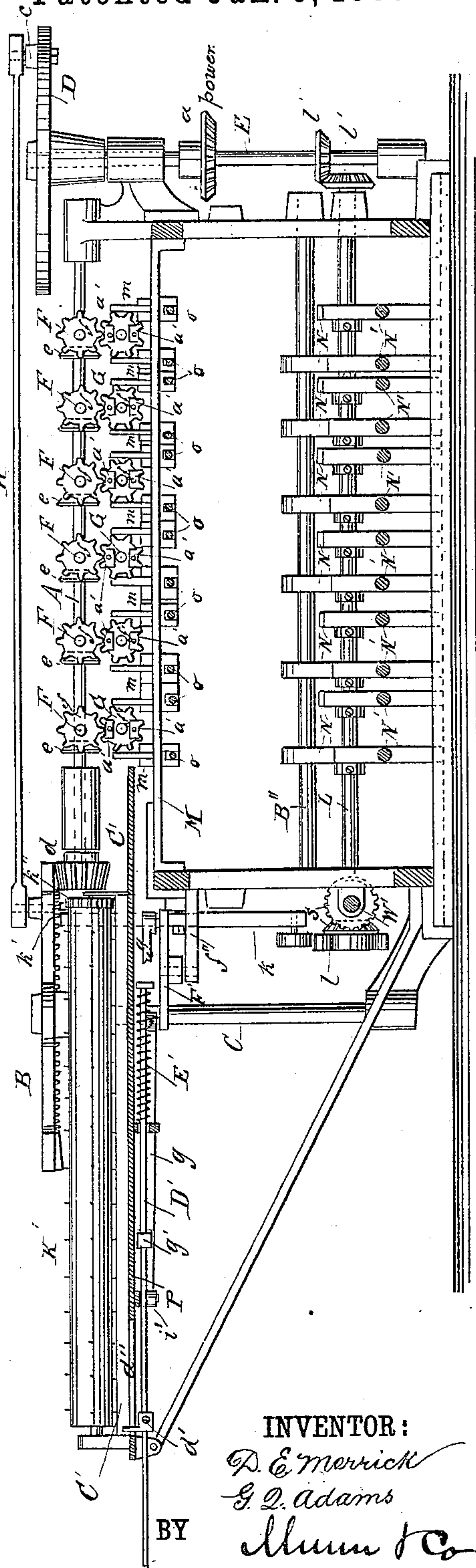


Fig. 2.

Fig. 3.



WITNESSES:

Chas. Nida
C. Bedgwick

INVENTOR:

D. E. Merrick
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ATTORNEYS.

(No Model.)

4 Sheets—Sheet 3.

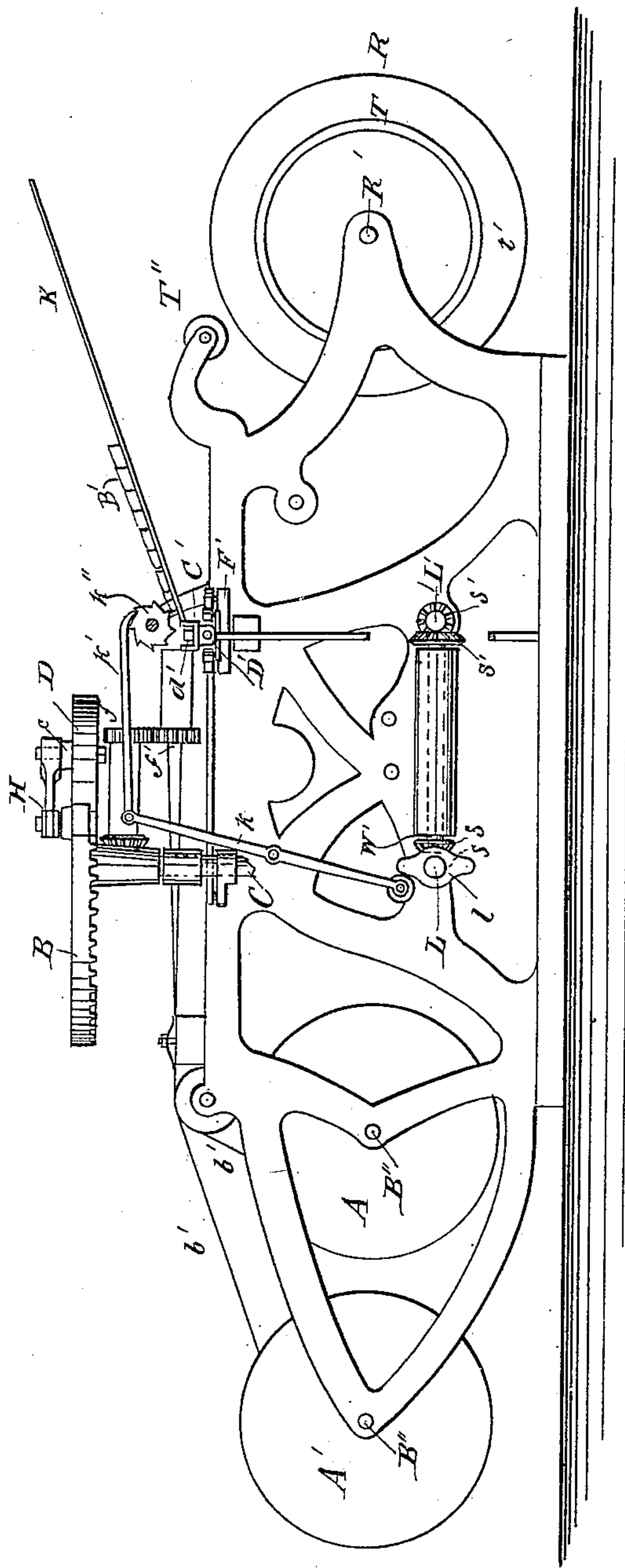
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Fig. 4.



WITNESSES:

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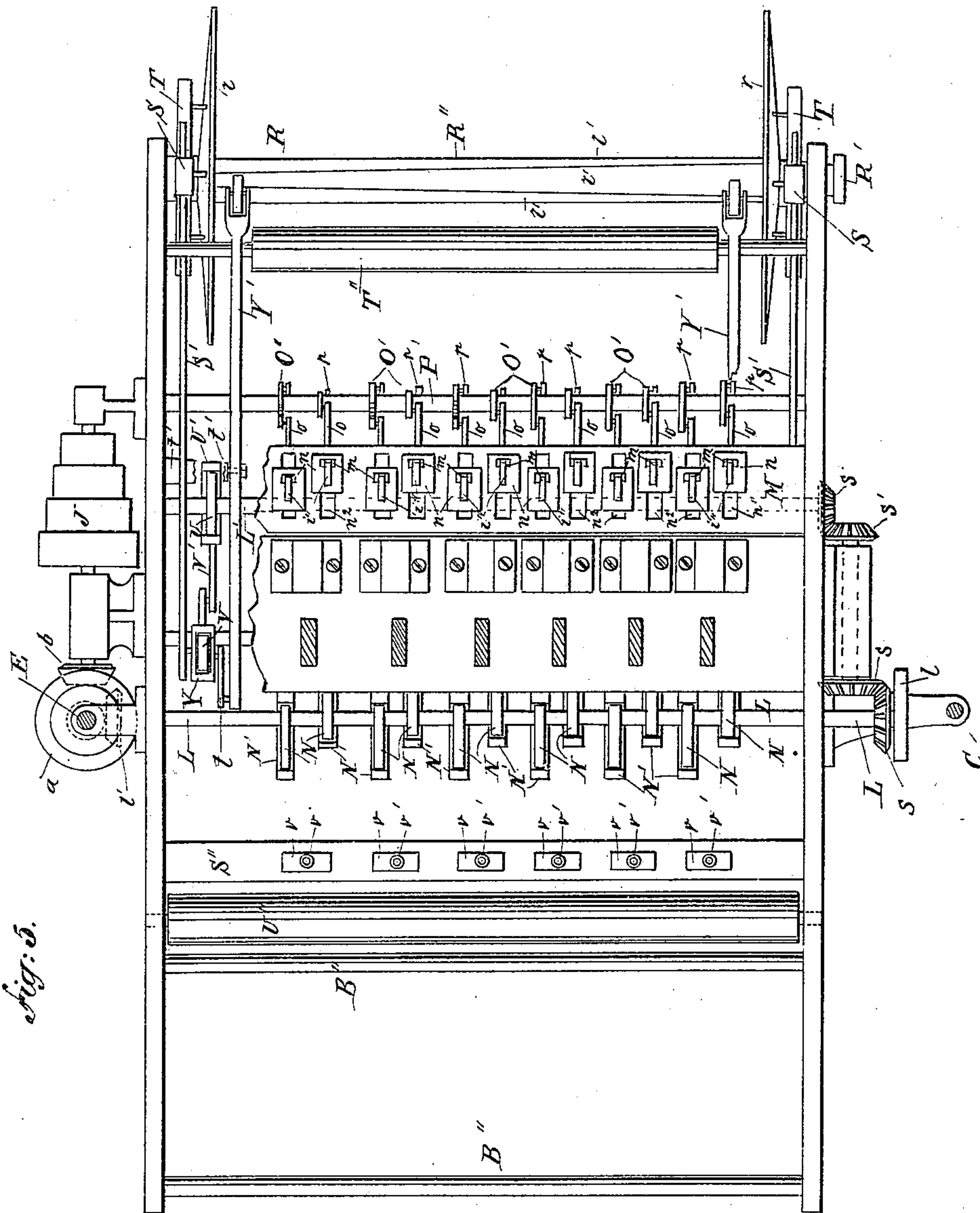
4 Sheets—Sheet 4

D. E. MERRICK & G. Q. ADAMS.

FENCE LOOM.

No. 270,456.

Patented Jan. 9, 1883.



WITNESSES:

Chas. Viola
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INVENTOR:

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UNITED STATES PATENT OFFICE.

DANIEL E. MERRICK AND GEORGE Q. ADAMS, OF QUINCY, ILLINOIS.

FENCE-LOOM.

SPECIFICATION forming part of Letters Patent No. 270,456, dated January 9, 1883.

Application filed October 21, 1882. (No model.)

To all whom it may concern:

Be it known that we, DANIEL E. MERRICK and GEORGE Q. ADAMS, both of Quincy, in the county of Adams and State of Illinois, have
5 invented a new and Improved Fence-Loom, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in
10 which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a broken plan view of our invention, parts being omitted. Fig. 2 is a sectional side elevation of the same, taken on the line
15 *xx* of Fig. 1. Fig. 3 is a sectional elevation taken on the line *yy* of Figs. 1 and 2. Fig. 4 is a broken side elevation of the machine; and Fig. 5 is a sectional plan view taken on the line
20 *zz* of Fig. 2, the picket-feeding mechanism and table being left out of the figure.

The object of our invention is to provide a machine for weaving fence-pickets together in continuous lengths with wires which are to be
25 subsequently set up and held by fence-posts for forming the fence.

The machine consists of means for twisting the wires between the pickets, the wires being drawn off from suitable spools attached to the machine, of means for feeding the pickets be-
30 tween the strands of wires, of means for moving the pickets outward just before the wires are twisted in the rear of them, of a winding-drum for receiving the web of pickets, of means for giving the winding-drum intermittent
35 movement, and of means whereby the distance of each intermittent movement of the drum is automatically decreased as the web accumulates on the drum, of devices for regulating the movements of the different parts, and in
40 combinations of parts, as hereinafter set forth.

The means for twisting the wires consist of the horizontal shaft A, the horizontal segmental rack B, secured to the upper end of the vertical shaft C, the horizontal crank or drive wheel
45 D, secured to the upper end of the vertical shaft E on the opposite side of the machine, the series of short horizontal shafts F F, and the corresponding series of short twisting-heads, G G. The drive-wheel D is connected
50 to the segmental rack B by the connecting-rod

H, and this wheel receives a continuous rotary motion from the main shaft J, Fig. 1, through the beveled gears *a* and *b*. The connecting-rod H is connected to the drive-wheel D by the adjustable block *c*, placed in the slot *c'*, made in
55 one of the spokes of the wheel, and this block *c* is to be always so held in the slot that while the wheel D is rotated the rack B will be reciprocated, thus imparting through the beveled cog-wheel *d*, Fig. 3, a rotary reciprocating motion
60 to the shaft A. This rotary reciprocating motion of the shaft A imparts through the sets of beveled gears *e e'*, Fig. 1, a like motion to each of the short shafts F F, and through the sets of gears *f f'*, Figs. 1 and 2, a like motion also to
65 each of the twisting-heads G G. The twisting-heads G are each longitudinally perforated with two holes, and they are each formed with the two projections *a' a'*, and the perforations in the heads extend through these projections,
70 as shown in Fig. 3, and the wires *b' b'*, coming from the spools A' A' on the rods B'' B'', pass through the said perforations, as shown in Fig. 2.

The space between the projections *a' a'* of
75 the twisting-heads is the space into which the pickets B' are successively fed between the wires when the machine is in operation. The pickets are fed or thrown endwise, one by one, into the said spaces between the projections *a'*
80 *a'* from the channel C', and by means of the lip *d'*, which is secured to the spring-actuated rod D', placed under the said channel, which lip reaches up through the slot *d''*, made through the bottom and near the outer end of
85 the said channel C', as shown clearly in Fig. 3. The rod D' is moved outward against the tension of its spring E' by the hooked push-rods *g g*, Fig. 1, pivoted to the ends of the walking-beam F'. This walking-beam is jour-
90 naled in the bracket *f''*, Fig. 3, and is oscillated so as to bring the hooks of the rods *g g* alternately in contact with the flange *g'*, that is secured on the rod from the vertical shaft C, through the medium of the cranks *h h'*, Fig. 1,
95 that are attached respectively to the said shaft and walking-beam, and the rod *h''*, which connects the said cranks. The rods *g g* are held in proper position for engagement with the flange *g'* by the springs *i i*, Fig. 1, and they
100

are disengaged from the said flange at the proper time to permit the spring E' to throw forward the pickets by the stationary friction wheels or studs *i' i'*, against which the outwardly-curved outer ends of the rods come just before they reach the limit of their outward movement.

To prevent more than one picket entering the channel C' at a time from the inclined table K, on which they are placed by hand, the machine is provided with the intermittently-revolving bradded roller K', which is journaled near and a little above the channel C', as shown in Figs. 3 and 4. This roller derives its intermittent rotary motion from the shaft L, Figs. 3 and 4, which is revolved from the vertical shaft E by the beveled cog-wheels *l' l'*, (shown in Fig. 3,) through the medium of the cam *l*, placed on the shaft L, pawl-lever *k*, pawl *k'*, and ratchet *k''*, and this roller is so timed in its movement that it causes a picket to be moved from the table back into the channel just after the preceding one has been forced or thrown forward by the spring-actuated rod D'. After the pickets have been thrown by the rod D' into the spaces between the arms or projections *a' a'* of the twisting-heads, between the strands of wires, they are successively moved out of these spaces and held against the previous twist in the wires by the dogs *m m*—in this instance twelve in number, two for each twisting-head—which are pivoted upon the sliding plates *n n*, Figs. 1 and 2, which move on the slotted plate M, secured in the frame of the machine in front of and a little below the twisting-heads, as shown clearly in Figs. 1, 2, and 3. In this instance the dogs are reciprocated in the slots *n''* in the plate M in sets of six—that is, while every other dog is being moved forward the other six are being moved backward, and the movement of the dogs is derived from the before-mentioned shaft L through the cams N N, Figs. 2, 3, secured on the shaft, the sliding cam-yokes N' N', the sets of centrally-pivoted rocking levers O O and O' O', Figs. 2 and 3, pivoted respectively on the rods P P', and the three sets of connecting-rods *o o*, *p p*, and *q q*. (Shown clearly in Fig. 2.) The alternate movement of the dogs is obtained by securing the series of cams N N alternately on opposite sides of the shaft L, as shown in Fig. 3, and the distance of travel of the dogs may be increased or diminished to suit the width of the pickets by moving upward or downward the sleeves Q Q, Fig. 2, placed adjustably on the upper ends of the rocking levers O O, to which sleeves the connecting-rods *p p* are attached, as will be clearly understood from Fig. 2.

R is the winding-drum, journaled in the rear end of the machine. It is given an intermittent rotary motion for winding up the web of pickets by means of the clutches S S, Figs. 2 and 5, acting on the rims T T of the drum. The clutches are attached to and operated by the rods S' S', which receive the necessary

longitudinal reciprocation from the shaft L' through the two cams U U secured thereon, sliding cam-yokes U' U', rocking levers V V, which are centrally pivoted on the rod Q', and the rods V' V', which connect the lower ends of the said rocking levers to the cam-yokes, as shown in Figs. 2 and 5. The drum is held from backward movement, when the clutches S S are drawn back by the rods S' S', by the clutches W W, applied to the rims T T, as shown in Fig. 2. The shaft L' receives motion from the shaft L through the short shaft W' and sets of beveled gears *s s* and *s' s'*, as shown in Figs. 4 and 5.

When the machine is in operation, as the diameter of the roll of fencing on the drum R increases it is evident that the distance of travel of the drum at each intermittent movement must be gradually decreased, so that the peripheral movement of the roll will be uniform, that the distances between the pickets may be equal. To accomplish this automatically, the rods S' S' are attached to the upper ends of the rocking levers V V by means of the sleeves Y Y, Figs. 2 and 5, which are adapted to slide on the levers for varying the distance of longitudinal movement of the said rods S' S'; and in operation these sleeves are gradually drawn down on the rocking levers V V by means of the equalizing-levers Y' Y', which are connected at their forward ends to the said sleeves Y Y by the connecting-rods *t t*, and which are fulcrumed on the studs *t' t'* at the sides of the machine, and reach back and have rollers at their rear ends running upon the roll of fencing on the drum, so that as the fencing accumulates on the drum the rear ends of the equalizing-bars Y' Y' will be gradually raised and their forward ends correspondingly lowered, thus drawing down gradually the sleeves Y Y on the rocking levers V V, decreasing the distance of longitudinal movement of the rods S' S', and thus decreasing accordingly the rapidity of the revolution of the drum.

The rod R', on which the winding-drum revolves, is removable, and the flanges *r r* are placed on the sleeve R'', through which the rod R' passes. This sleeve is composed of four tapering pieces, *r' r'*, Fig. 5, of wood, which are held in place in the central passages of the flanges *r r* by the insertion of the rod R'. When the roll of fencing on the drum has reached sufficient size it may be taken out of the machine and left in its rolled state by removing the rod R'. The roll being out of the machine, the tapering pieces *r' r'* are left free to be removed from the center of the roll and placed, together with the flanges *r r*, back in the machine.

Near to and a little above the drum R is placed in the machine the roller T'', Figs. 2 and 5, over which the web of fencing as it is formed passes to the drum.

S'', Figs. 2 and 5, is a cross-bar placed in the machine in front of the shaft A, on which

are secured the tension-plates *vv*, under which the wires *b' b'* pass on their way from the spools to the twisting-heads. These tension-plates may be caused to exert a greater or less tension on the wires, as required, by turning the thumb-screw *v' v'*, placed on screw-rods that pass up through the centers of the tension-plates.

In front of the tension-bar *S''* is placed the roller *U''*, over which the wires pass from the spools *A' A'* to the tension-plates.

To prevent the pickets as they are thrown into the machine by the spring-actuated rods *D'* from striking too hard against the frame of the machine, we provide the frame with the spring *C''*. (Shown in Fig. 1.)

By adjusting the block *c* of the connecting-rod *H* in the slot *c'* of the crank or drive wheel *D* it will be understood that the travel of the segmental rack *B* may be increased or diminished for giving the twisting-heads two, three, four, or more turns, according to the number of twists it is desired to make in the wire between each two pickets, and by adjusting the sleeves *Q* on the rocking levers *O* the distance of movement of the dogs *m* may be regulated accordingly and according to the width of the pickets. The dogs *m* are held from turning on their pivots when they are brought against the pickets for moving them outward from between the projections *a' a'* of the twisting-heads by means of the stops *i'' i''*, Fig. 2; but on their reverse movement they are free to tip, so that they will pass under and in front of the following picket. These stops *i''* also serve as weights to bring the dogs to an upright position after having passed under the picket on their return movement, as will be clearly understood from Fig. 2.

Instead of weaving the pickets together with wire, small tarred ropes or cords may be used and not depart from the spirit of our invention.

The operation of the machine will be easily understood from the foregoing description. The pickets are fed into the channel *C'* by the roller *K'*, are thrown between the projections *a'* of the twisting-heads *G* by the spring-actuated rod *D'*, and are then moved forward against the twist of the wires *b'* by the dogs *m*. The twisting-heads are then revolved by the rack *B*, and the intermediate gearing to give the desired twist to the wires. The woven fence is then wound upon the drum *R* and another picket thrown between the wires, &c., the twisting-heads revolved in the opposite direction, and the whole operation repeated, the various movements being all properly timed in relation to each other.

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

1. The segmental rack *B* and means for oscillating the same, the cog-wheel *d*, the shaft *A*, the beveled gears *ee'*, and the short shafts *F*, provided with the gear-wheels *f*, in combina-

tion with the longitudinally-perforated twisting-heads *G*, provided with gear-wheels *f'* at one end and with the projection *a'* at the other end, whereby pairs of wires may pass longitudinally through each one of a series of twisting-heads and be twisted thereby without winding around the shaft thereof, as specified.

2. The twisting-heads *G*, provided with gear-wheels *f'*, the short shafts *F*, provided with gear-wheels *f* and *e'*, the shaft *A*, provided with a series of beveled gears, *e*, and the beveled pinion *d*, and the geared segment *B*, in combination with the connecting-rod *H*, adjustably secured to the arm of the wheel or crank *D* by means of the pin *c* and block securable along the slot *c'*, substantially as specified.

3. The combination, with the series of twisting-heads *G* and series of reciprocating dogs *m*, of the pocket-channel *C'* and spring-actuated rod *D'* for throwing the pickets between the strands of wire, as set forth.

4. The combination, with the channel *C'* and means, substantially as described, for throwing the pickets between the wires, of the abutting spring *C''*, as and for the purpose specified.

5. The combination, with the slotted channel *C'*, table *K*, and spring-actuated rod *D'*, of the bradded roller *K'*, adapted to have intermittent rotary motion for moving the pickets one by one from the table into the channel *C'*, as set forth.

6. The combination, with the channel *C'*, spring-actuated rod *D'*, roller *K'*, and table *K*, of the shaft *L*, cam *l*, pawl-lever *k*, pawl *k'*, and ratchet *k''*, secured to one end of the roller *K'* for revolving the same intermittently, as set forth.

7. The rod *D'*, having the projection *d'*, spring *E'*, and collar *g'*, in combination with the slotted channel *C'*, hooked push-rods *g g*, walking-beam *F'*, levers *h h'*, connecting-rod *h''*, springs *i i*, and stationary stops *i' i'*, substantially as and for the purposes set forth.

8. The shaft *L*, provided with the series of cams *N*, in combination with the sliding yokes *N'*, rocking levers *O O'*, sliding plates *n*, dogs *m*, and connecting-rods *o p q*, substantially as and for the purposes set forth.

9. The rocking levers *O*, having the movable sleeves *Q*, in combination with the rocking levers *O'*, plates *n*, dogs *m*, and connecting-rods *o p*, whereby the distance of travel of the dogs may be regulated, as set forth.

10. The combination, with the sliding plates *n*, of the dogs *m*, pivoted thereto and provided with the stops *n''* for holding and bringing the dogs to upright position, as and for the purposes set forth.

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Witnesses:

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