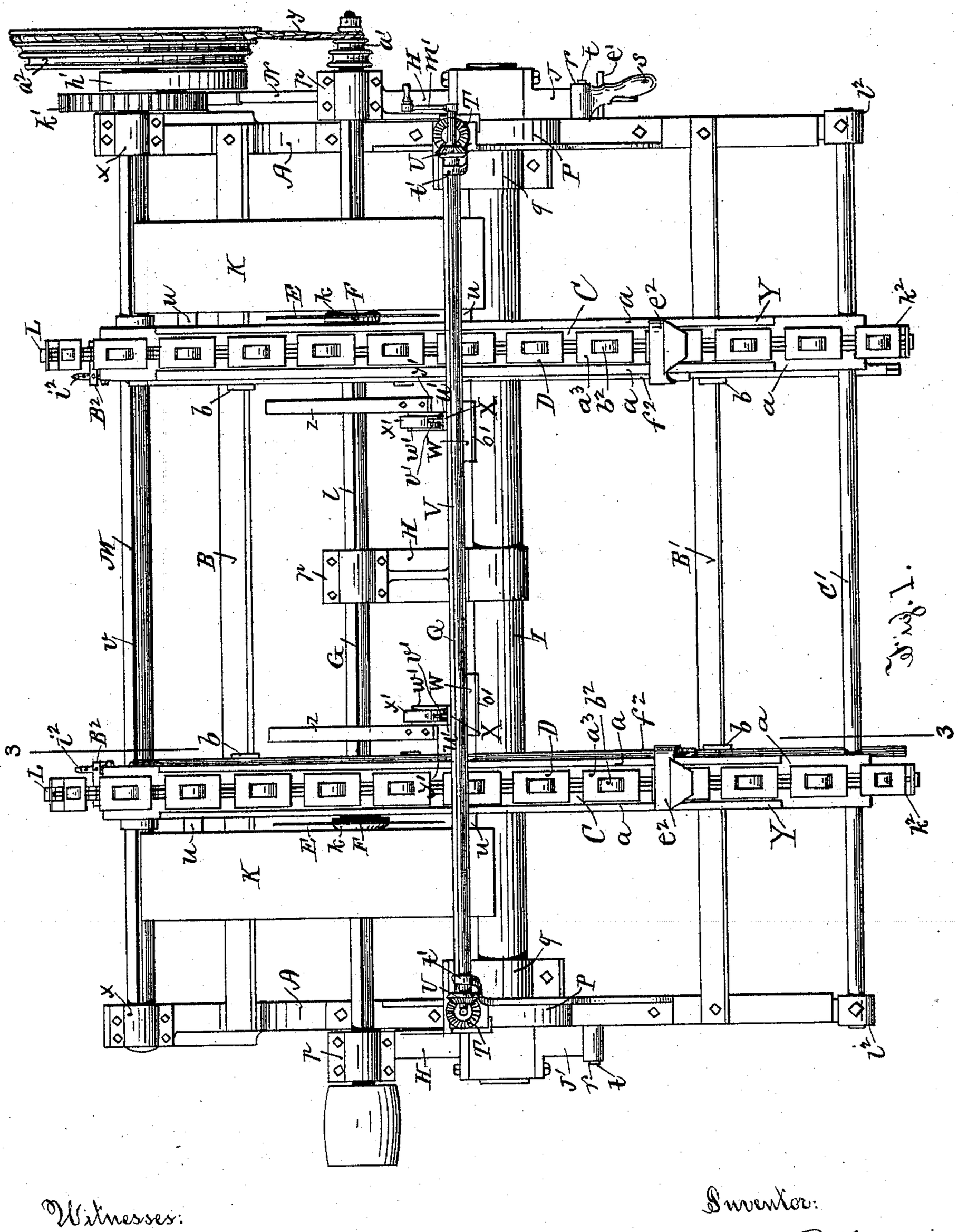
(No Model.) 3 Sheets—Sheet 1.

B. G. LUTHER.

SAWING MACHINE.

No. 578,826. Patented Mar. 16, 1897.



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(No Model.) 3 Sheets—Sheet 2.

B. G. LUTHER.

SAWING MACHINE.

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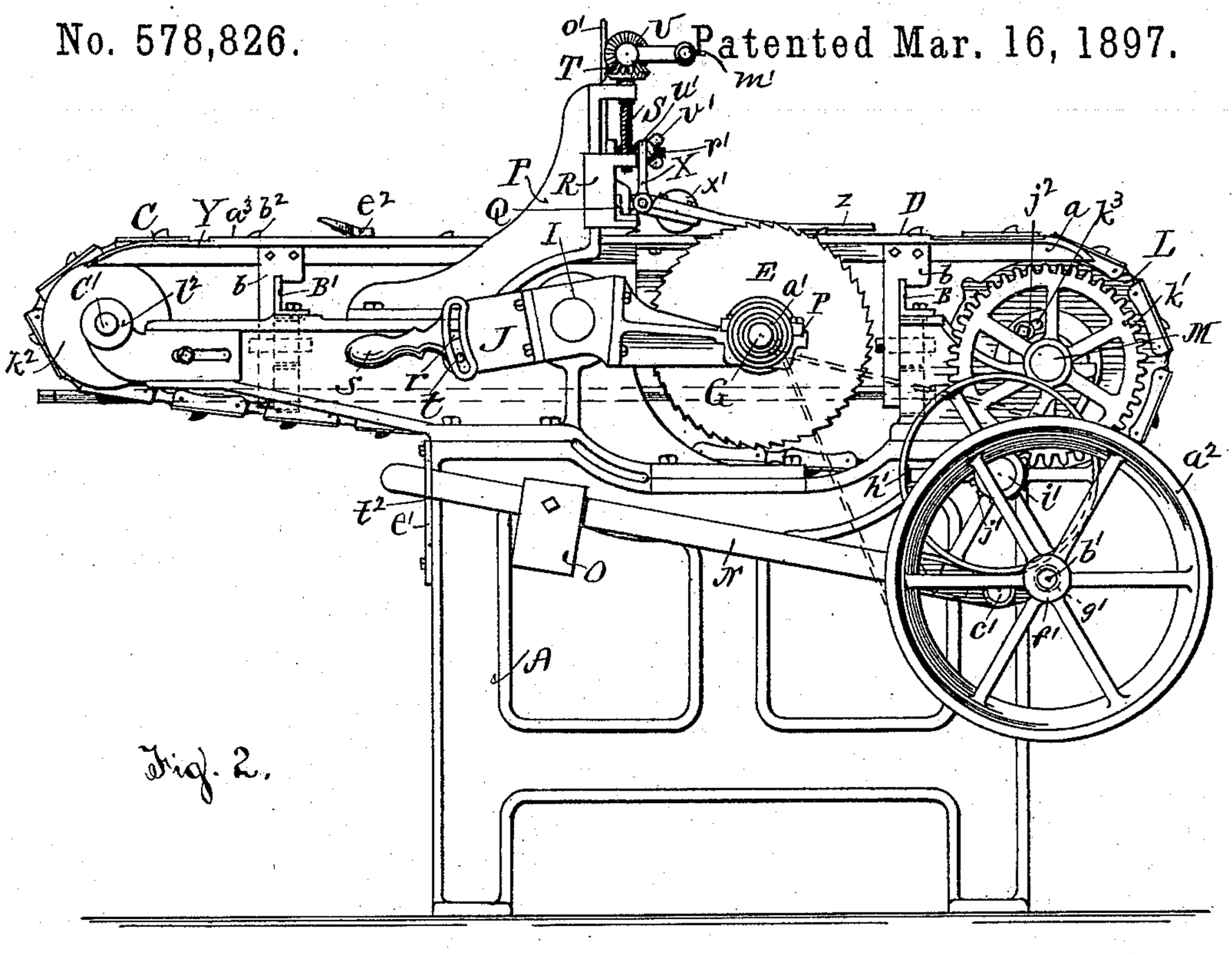

Fig. 2.

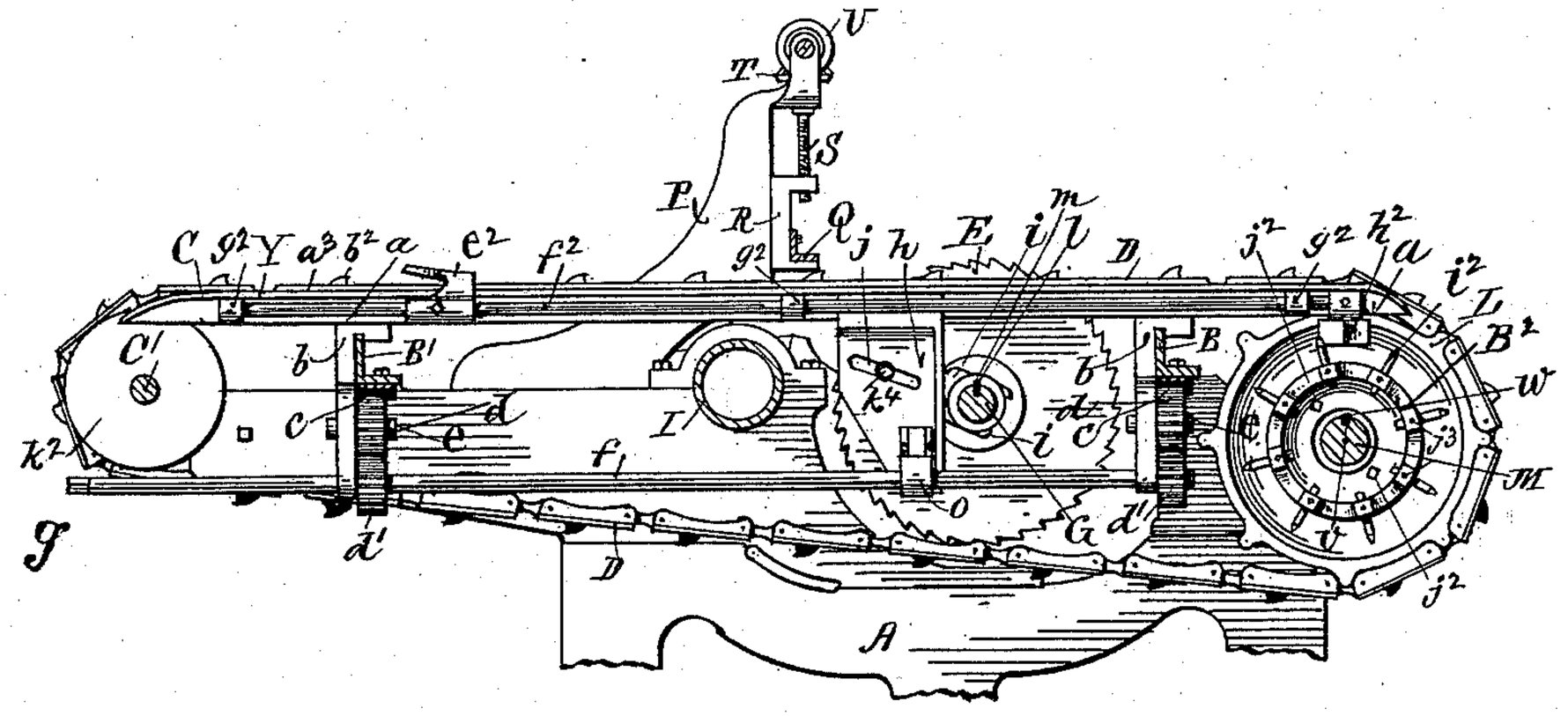

Fig. 3.

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3 Sheets—Sheet 3.

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SAWING MACHINE.

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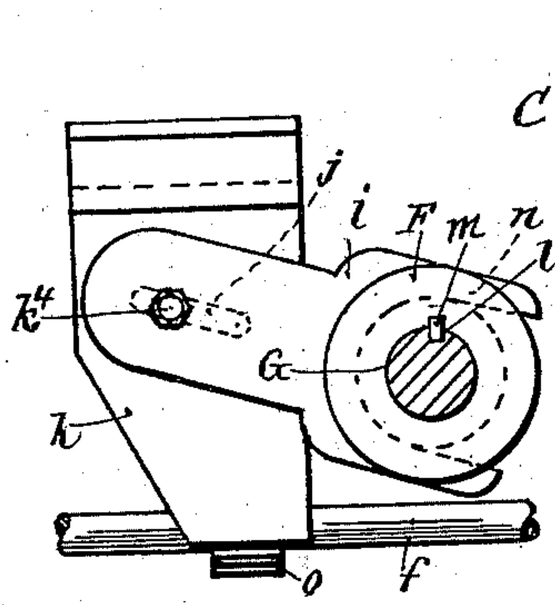

Fig. 4.

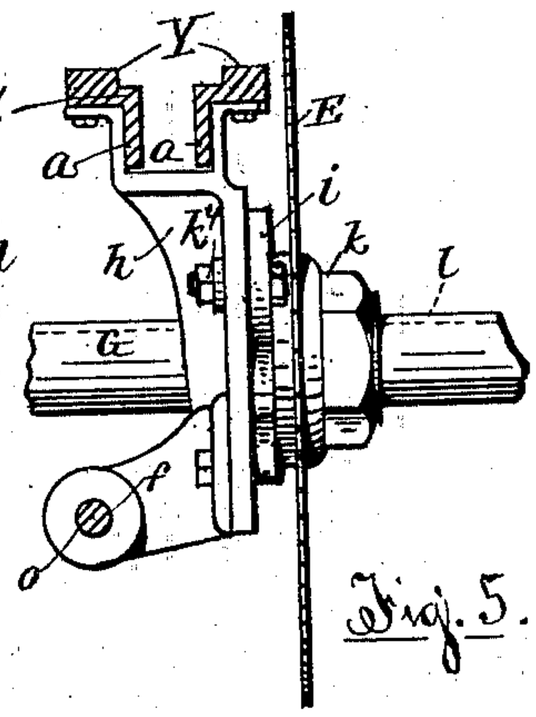

Fig. 5.

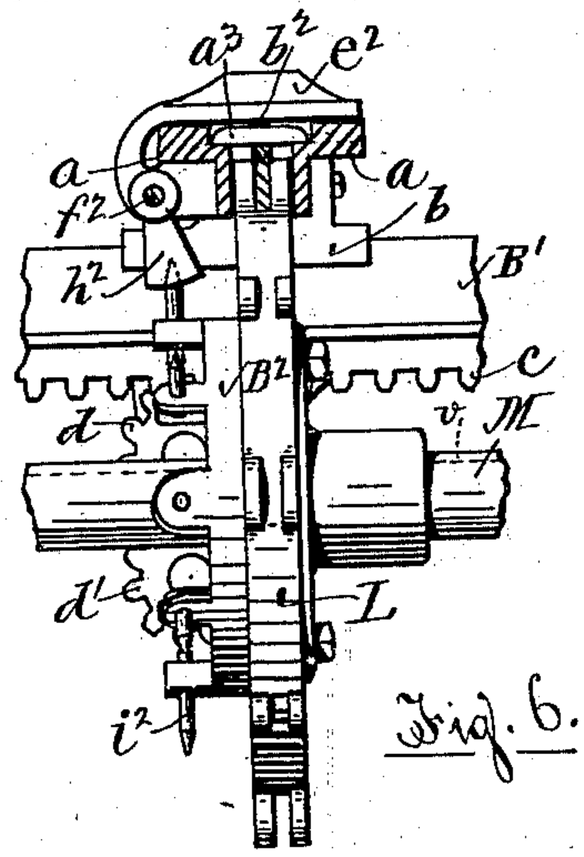

Fig. 6.

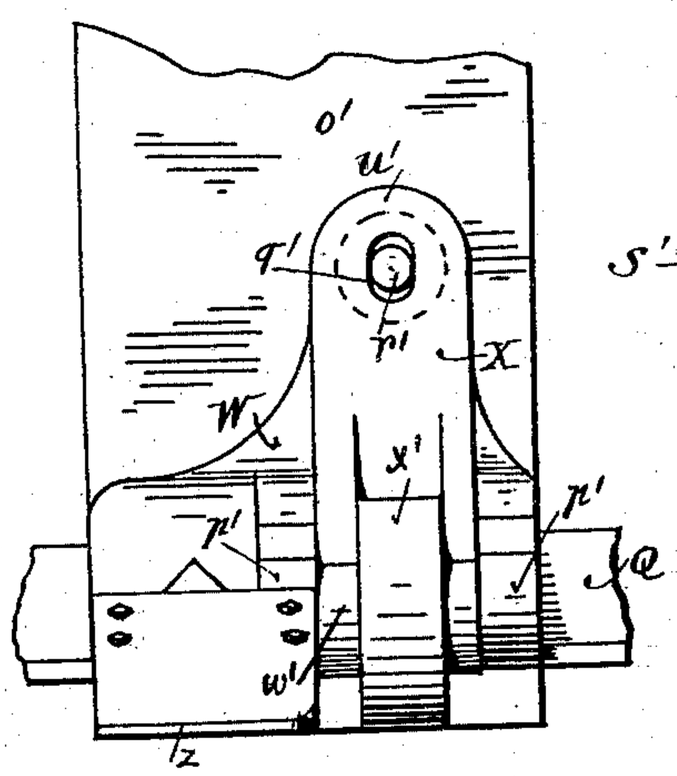

Fig. 7.

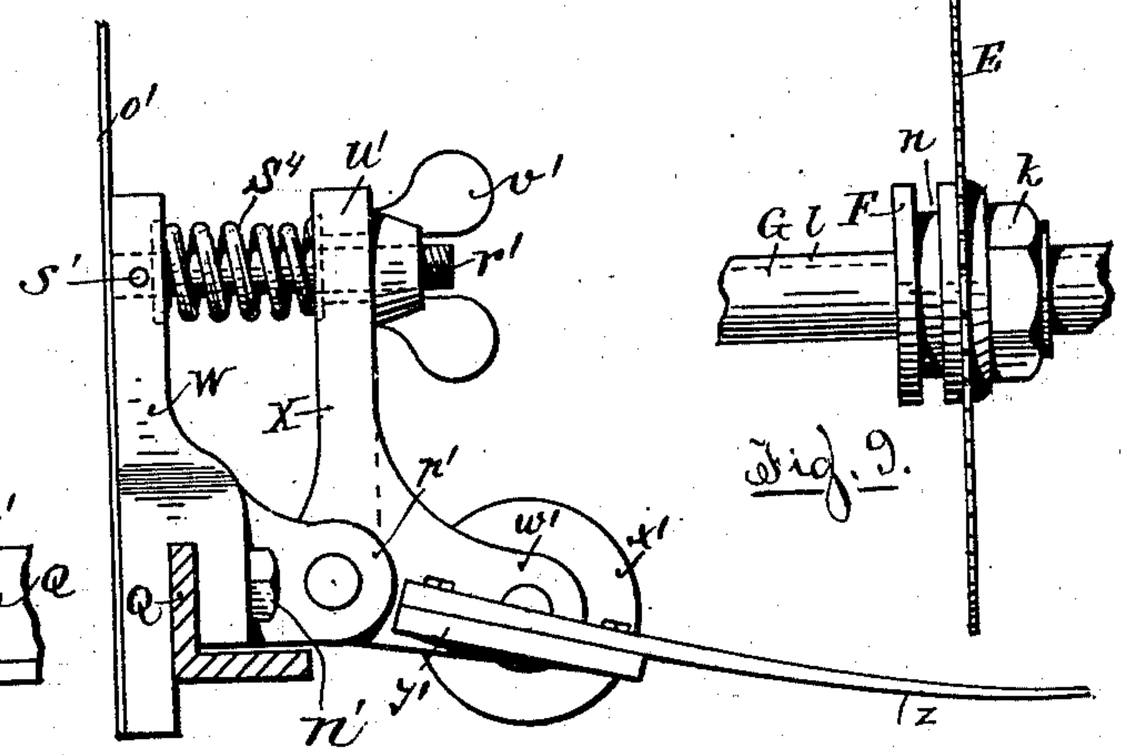

Fig. 8.

Fig. 9.

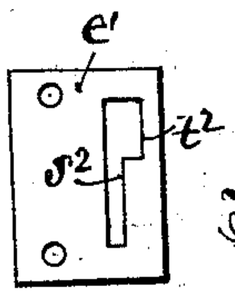

Fig. 11.

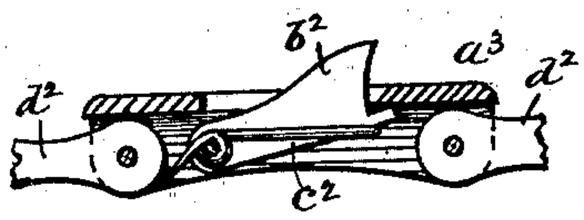

Fig. 10.

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UNITED STATES PATENT OFFICE.

BENJAMIN G. LUTHER, OF WORCESTER, MASSACHUSETTS.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,826, dated March 16, 1897.

Application filed January 22, 1894. Serial No. 497,705. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. LUTHER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Sawing-Machines, of which the following is a specification.

The object of my invention is to provide a sawing-machine adapted to feed the boards automatically to the saws and cut off or groove both ends of the boards at the same time; and it consists in the improved construction and arrangement of parts, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a top view of the machine. Fig. 2 represents an end elevation of the same. Fig. 3 represents a transverse section taken in the line 3 3 of Fig. 1. Fig. 4 represents an enlarged side view of the bracket for holding the fork by means of which the saw is connected with the chain-carrying frame. Fig. 5 is a detail view showing a section of the track for the carrier-chain and an edge view of the bracket and the fork for connecting the saw to the chain-carrying frame. Fig. 6 is a detail view showing an edge view of the sprocket-wheel for operating the carrier-chain, a section of the carrier-chain and the track for the same, and a side view of the lifting-guard for the dogs of the carrier-chain. Fig. 7 represents an enlarged front view of the presser-bar for holding the boards while under the action of the saws. Fig. 8 represents a side view of the same. Fig. 9 represents an enlarged edge view of the saw, showing the groove adapted to receive the fork for effecting the proper adjustment of the saw. Fig. 10 represents an enlarged longitudinal section of the carrier-link of the chain. Fig. 11 represents a side view of the slotted guide-plate for the lever which supports the movable friction-wheel.

In the drawings, A A represents the end frames of the machine, and B B′ are the tracks for supporting the chain-carrying frames C C, the said tracks being preferably made of angle-iron bolted to the end frames A A. The chain-carrying frame C is formed of the two angle-iron bars *a a*, which form a track Y for the chain D, the said bars being attached to the slide-pieces *b b*, which rest upon the guiding-tracks B B′, the said guiding-tracks being provided at their under sides with the racks *c c*, adapted to receive the teeth of the pinions *d d*, which are held to turn loosely upon the studs *e*, the said pinions *d d* engaging with the gears *d′ d′* on the shaft *f*, which shaft is journaled in the lower ends of the slide-pieces *b b* and adapted at its outer end *g* for the reception of a hand-crank, by means of which the chain-carrying frame C is operated for adjustment to the required position upon the guiding-tracks B B′.

To the angle-iron bars *a a*, which form the track Y for the chain D, is attached the pendent bracket *h*, to the outer side of which is bolted the fork *i*, so that the said fork will be pivoted upon the bolt k^4 in the inclined slot *j* in the bracket *h*, the said slot being shown by the dotted lines in Fig. 4.

The saw E is attached by means of the nut *k* to the sleeve F, which is adapted to slide upon the saw-shaft G, the said shaft being provided with the longitudinal groove *l*, which loosely embraces an inwardly-directed spline *m* in the sleeve, the said sleeve being also provided with the circumferential groove *n*, adapted to receive the fork *i*, which serves to connect the saw with the bracket *h* of the chain-carrying frame C. The bracket *h* is also provided with the bearing *o* for the shaft *f*, by means of which the adjustment of the saw upon the shaft G is effected.

The saw-shaft G is held in the bearings *p p p*, arranged upon the arms H H H, which are bolted to the hollow bar I, the said bar being held in the bearings *q q* of the end frames A A and provided at the opposite side with the arms J J′, which are bolted to the bar I and are provided with curved slots *r*, as shown in the arm J in Fig. 2, the said arm J being provided with a handle *s*, by means of which the saw-shaft may be raised or lowered by turning the bar I in the bearings *q q*, the said bar being then held in its properly-set position by means of the tightening-screws *t*, which pass through the slots of the arms J J′ and enter the side frames.

At the outer side of the saw is placed the table K for supporting the small pieces cut off from the ends of the boards, the said table being attached to the chain-carrying frame by means of suitable brackets *u u*.

The chain D passes over the sprocket-wheel L, which is held to slide upon the shaft M by means of the groove *v*, made in the said shaft, and the spline *w* in the sprocket-wheel, which spline loosely fits the said groove, the said sprocket-wheel being held at its upper side between the bars *a a* of the chain-track Y, so as to be moved therewith upon the shaft M, the said shaft being supported in the bearings *x x* of the end frames and driven from the saw-shaft G by means of the cross-belt *y*, which passes over the scored pulleys a' a^2, the pulley a^2 being held loosely upon a stud b', attached to the outer end of the lever N, which is pivoted to the end frame A by means of the stud c' and provided with the adjustable weight O, the outer end of the lever being held for up-and-down movement in the slotted guide-plate e', attached to the end frame A, the said guide being provided with a side notch l^2 for holding the lever N in its elevated position, as shown in Fig. 2, in which the friction-wheels g' and h' are out of contact with each other. The friction-wheel g' is formed upon the hub f' of the pulley a^2, and the position of the wheel g' is shown by the dotted line in Fig. 2, the said wheel being caused to engage with the surface of the larger friction-wheel h' upon the fixed stud i', secured to the end of frame A.

To the hub of the friction-wheel h' is secured the pinion j', which engages with the gear k' upon the said shaft M, so that by means of the friction-wheels g' and h' the carrier-chain D will be operated in a yielding manner upon the engagement of the said wheels with each other when the lever N has been released from the holding-notch t^2 in the slot of the guide-plate e'.

To the top of the end frames A A are bolted the brackets P P, which form suitable guides for the up-and-down movement of the cross-bar Q, the said cross-bar being preferably made of angle-iron and having at its ends the slide-pieces R R, which are connected with the operating-screws S S, by means of which the said cross-bar Q may be raised or lowered as desired. The screws S S are provided at their upper ends, which are suitably journaled to the upper end of the brackets P P, with the bevel-gears T T, which engage with corresponding bevel-gears U U upon the shaft V, the said shaft being held in the bearings t' t', which form a part of the said brackets P P, and the shaft V is provided with the hand-crank m', by means of which the screws S S may be operated to raise or lower the cross-bar Q.

Upon the cross-bar Q are placed the brackets W, which are adjustably held upon the bar Q by means of the set-screw n', and to the back of the brackets W are attached the upwardly-extending plates o' o', the said plates serving to form a stop, against which the boards to be sawed may be piled on top of each other and be fed consecutively to the saws E E from the bottom of the pile by means of the carrier-chains D D. Between the forwardly-projecting ears p' of the bracket W is pivoted the bell-crank lever X, the upper arms u' of the said lever being provided with the slot q', which incloses the bolt r', secured to the sliding bracket W by means of a pin s', and upon the bolt r', between the bracket W and the bell-crank lever X, is placed the spiral spring s^4, which serves to press the arm u' forward, the proper adjustment of the pressure of the spring s^4 against the arm u' being effected by means of the thumb-nut v'.

To the arm w' of the bell-crank lever X is pivoted the roller x', which, by pressing down upon the top of the board, will hold the same firmly upon its first engagement with the teeth of the saw and during its continued forward movement, and to the lug y' at the outer side of the arm w' is secured the yielding spring-arm *z*, adapted to press upon the board and properly hold the same when it leaves the saw and is being carried along by the chains D D.

The chain D is formed with carrier-links a^3, provided with a pivoted dog b^2, which is held in an elevated position for action upon the edge of the board by means of the spring c^2, as shown in the enlarged section, Fig. 10, the carrier-links a^3 being connected to each other by means of the intermediate links d^2, and at the feeding side of the chain-carrying frame C the chain D is supported by means of the wheel k^2, which is arranged to slide loosely upon the rod C', held in the adjustable brackets l^2 l^2 of the frame, the said wheel k^2 being held at its upper edge between the bars *a a* of the track Y, so as to be moved with the chain-carrying frame C in its adjustment upon the tracks B B'.

The boards to be sawed are to be placed upon the tracks Y Y, the flanges of which project slightly above the horizontal plane of the upper surface of the chain-links a^3 and lie below the horizontal plane of the engaging points of the yielding pivoted dogs b^2, so that when a board is placed to rest above the chain upon the flanges of the track the under side of the board will be free from contact with the links a^3 of the chain, but adapted for the engagement of the dogs therewith.

The guard e^2 is adjustably attached to the rock-shaft f^2, which is held in the bearings g^2 at the inner side of track Y for the chain D, the said guard e^2 being inclined at its under side over the chain D, and when in its normal position over the said chain the dogs b^2 of the carrier-links a^3 will be forced down against the action of the spring c^2 by their engagement with the said inclined under side of the guard e^2.

Upon the forward end of the rock-shaft f^2 is placed the cam h^2, which is engaged by the removable pins i^2, held in radially-directed openings in the pin-carrying wheel B^2, the said wheel being adjustably clamped to the side of the sprocket-wheel L by means of the clamping-screws j^2 j^2, which pass through curved slots k^3 in the web of the sprocket-

wheel, and by means of this adjustment the pins i^2 in the wheel B^2 may be set to act upon the cam h^2 to cause the turning of the rock-shaft f^2 at any desired time in the revolution of the sprocket-wheel. The pins i^2 are held in the wheel B^2 by means of set-screws j^3, and by the removal or insertion of said pins the required movement of the guard e^2 may be effected to adapt the machine for feeding boards of different widths.

The operation of the machine will be as follows: The guards e^2 e^2 are first to be adjusted to their proper position upon the rock-shafts f^2 according to the widths of the boards to be sawed, the rear edges of the boards extending back to the forward edges of the said guards, and the boards are to be piled one upon the other upon the tracks Y Y at the front of the upright plates o' o'. Then upon releasing the lever N from its holding-notch in the slotted guide e', so that the friction-wheel g', formed upon the hub f' of the pulley a^2, will be pressed into operative contact with the surface of the friction-wheel h', movement will be imparted to carrier-chains D D for conveying the boards to the saws, and as the said chains move forward the dogs b^2 will be depressed by the inclined under surface of the guards e^2, and will pass under the lower board of the pile until one of the pins i^2 in each of the pin-carrying wheels B^2 engages with the cams h^2 to cause the lifting of the guards e^2 e^2, so that the succeeding dogs b^2 of the chains will engage with the rear edge of the lower board of the pile and carry the same forward under the cross-bar Q and under the spring-actuated rollers x' to the saws E for cutting off or grooving the ends of the board, and immediately upon the engagement of the dogs b^2 with the edge of the board the cams h^2 will be released from the engaging-pins i^2, so that the guards e^2 will drop to their former position to depress the succeeding dogs of the chain until the previously-engaged lower board has been entirely withdrawn from under the pile. Then upon the reëngagement of the cams h^2 by the pins i^2 the guards e^2 will be again raised to allow the dogs b^2 of the chain to engage with the succeeding lower board of the pile, and so on until the boards in the whole pile have been fed, successively, one after the other, to the saws E E.

I claim as my invention—

1. In a sawing-machine, the combination with the parallel chain-carrying frames, and the saws connected with the said frames, of the chains provided with the engaging dogs, means for driving the chains, the guards for depressing the dogs of the chain, and means for raising the guards to allow the dogs to engage with the edge of the board, substantially as described.

2. In a sawing-machine, the combination with the parallel chain-carrying frames, and the saws connected with the said frames, of the chains provided with the engaging dogs, means for driving the chains, the guards for depressing the dogs of the chain, the cams for operating the guards, and the pin-carrying wheels for engagement with the cams, substantially as described.

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