(No Model.)

6 Sheets—Sheet 1.

J. N. MORROW & A. N. HEINE.

GANG EDGER FOR CUTTING DIMENSION LUMBER.

No. 412,646. Patented Oct. 8, 1889.

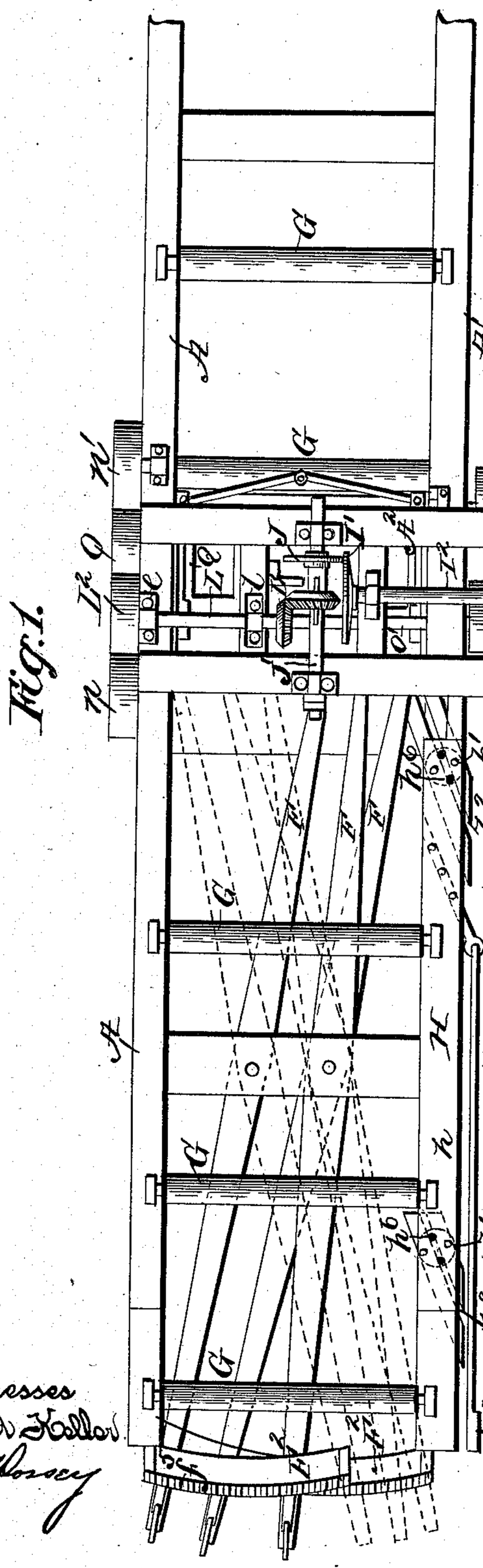

Fig. 1.

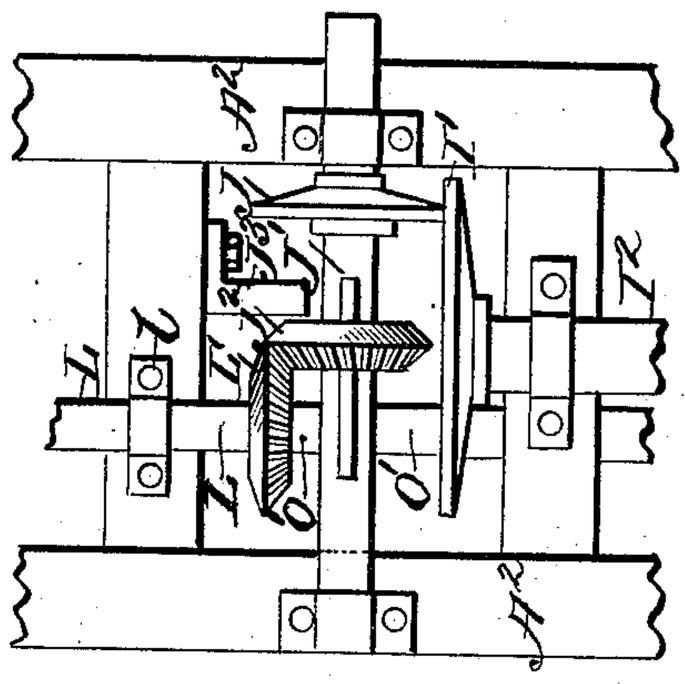

Fig. 10.

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(No Model.) 6 Sheets—Sheet 2.

J. N. MORROW & A. N. HEINE.

GANG EDGER FOR CUTTING DIMENSION LUMBER.

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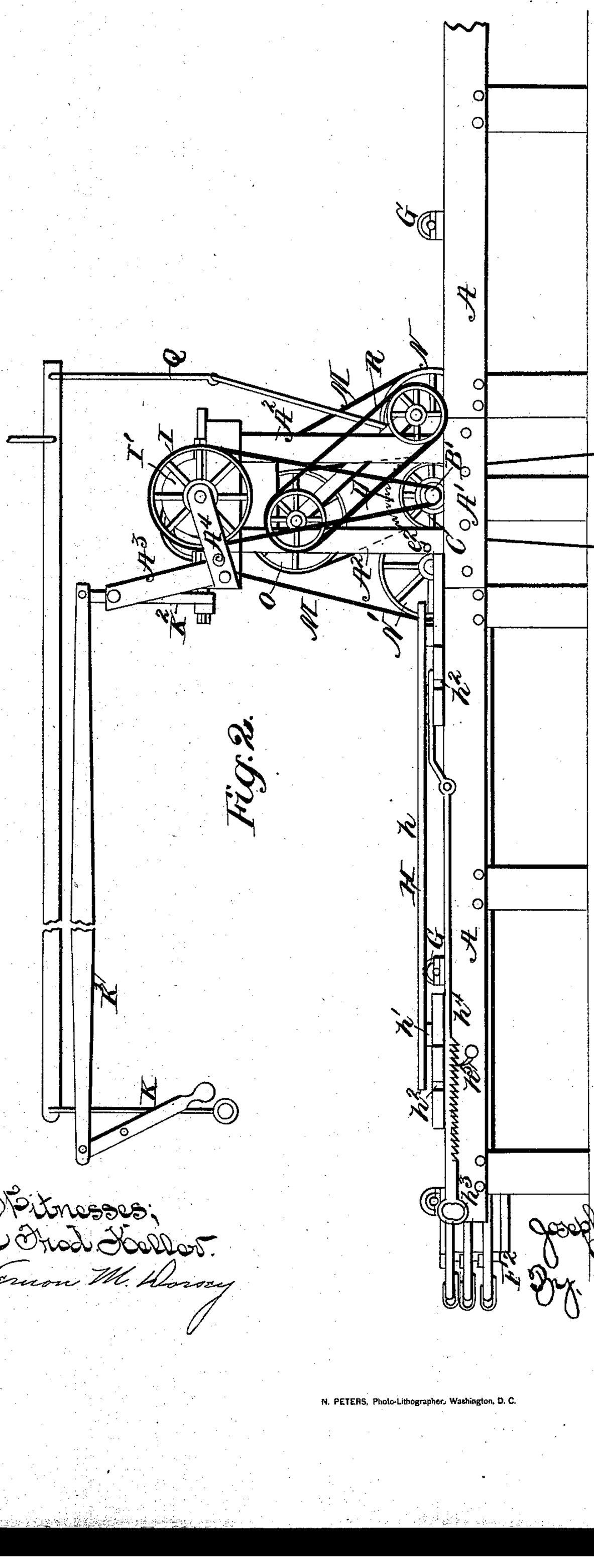

Fig. 2.

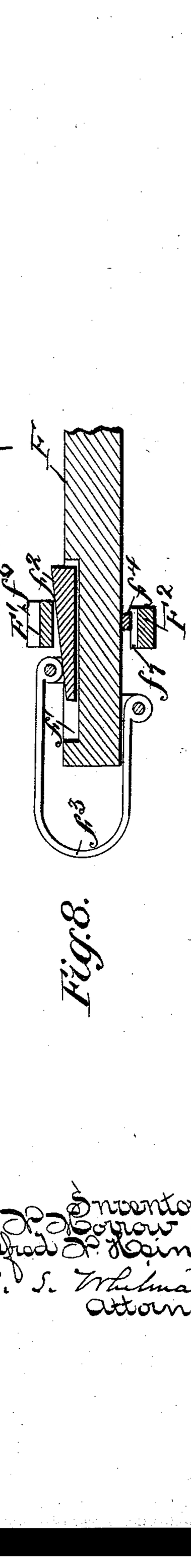

Fig. 8.

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(No Model.) 6 Sheets—Sheet 3.

J. N. MORROW & A. N. HEINE.

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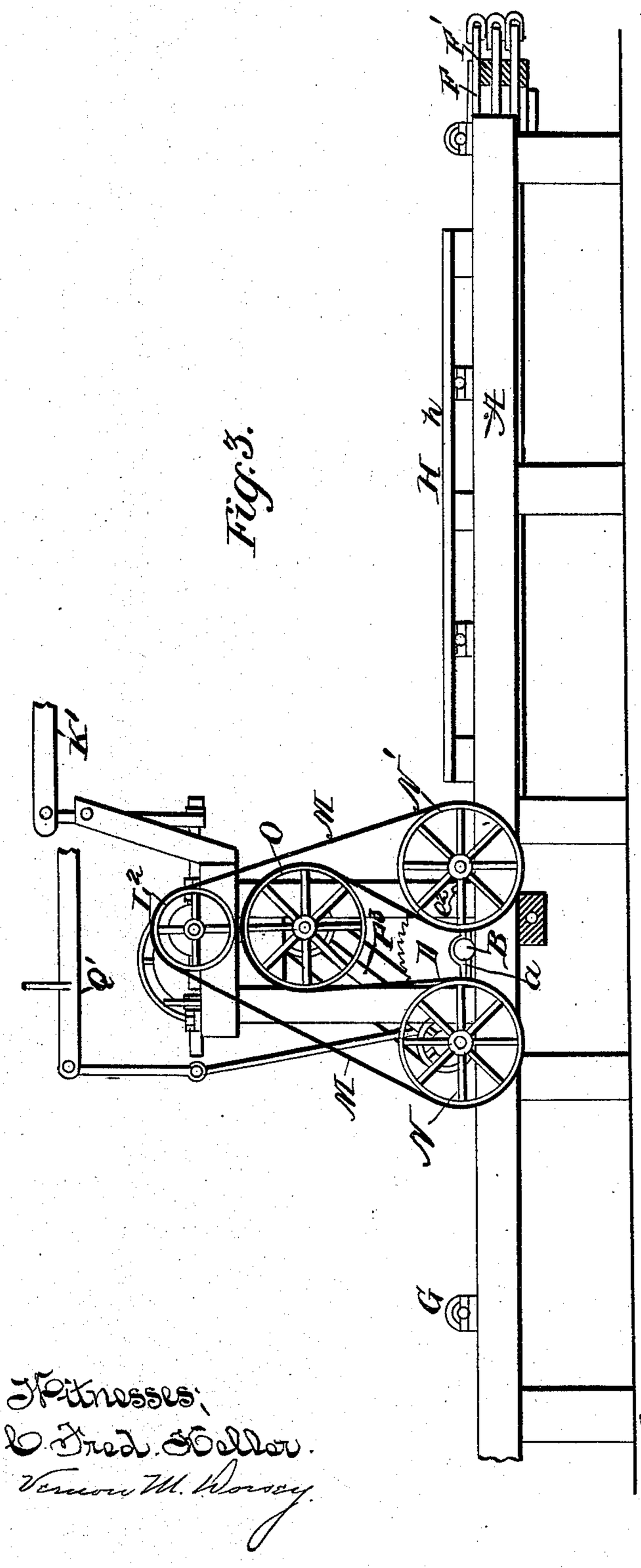

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(No Model.) 6 Sheets—Sheet 4.

J. N. MORROW & A. N. HEINE.

GANG EDGER FOR CUTTING DIMENSION LUMBER.

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Fig. 3.

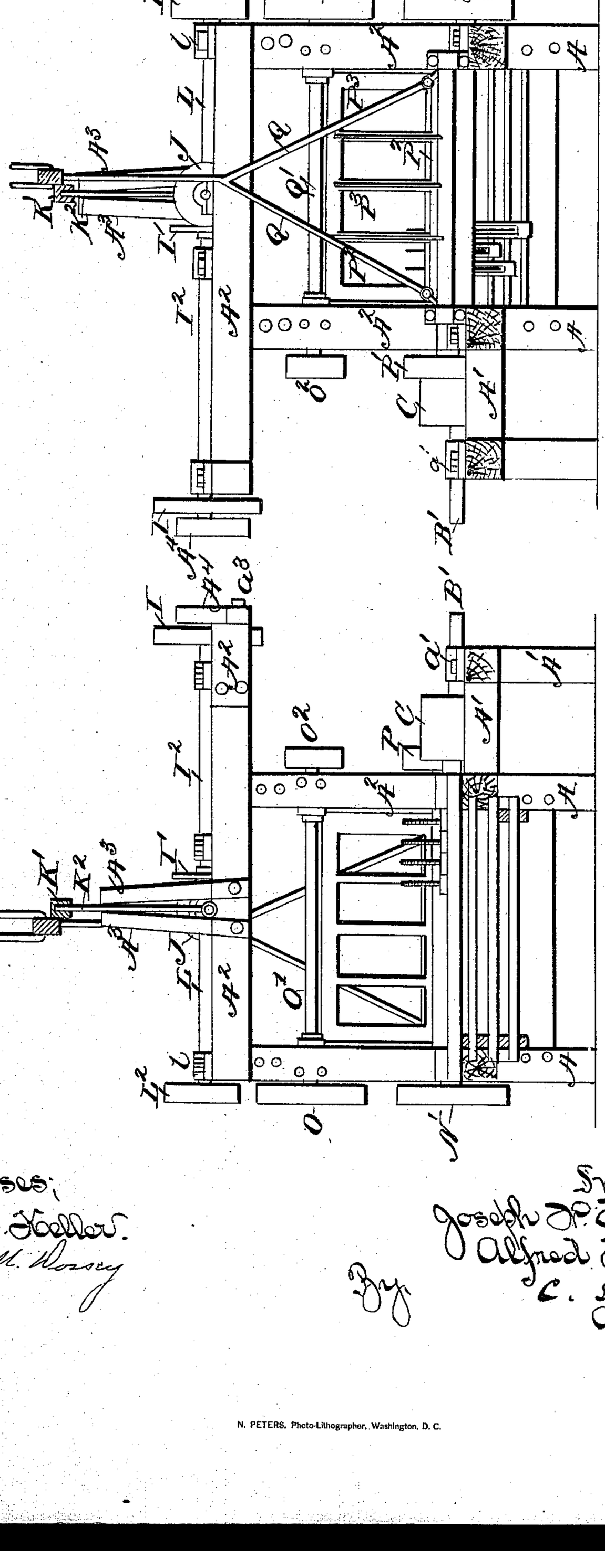

Fig. 4.

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(No Model.) 6 Sheets—Sheet 5.

J. N. MORROW & A. N. HEINE.

GANG EDGER FOR CUTTING DIMENSION LUMBER.

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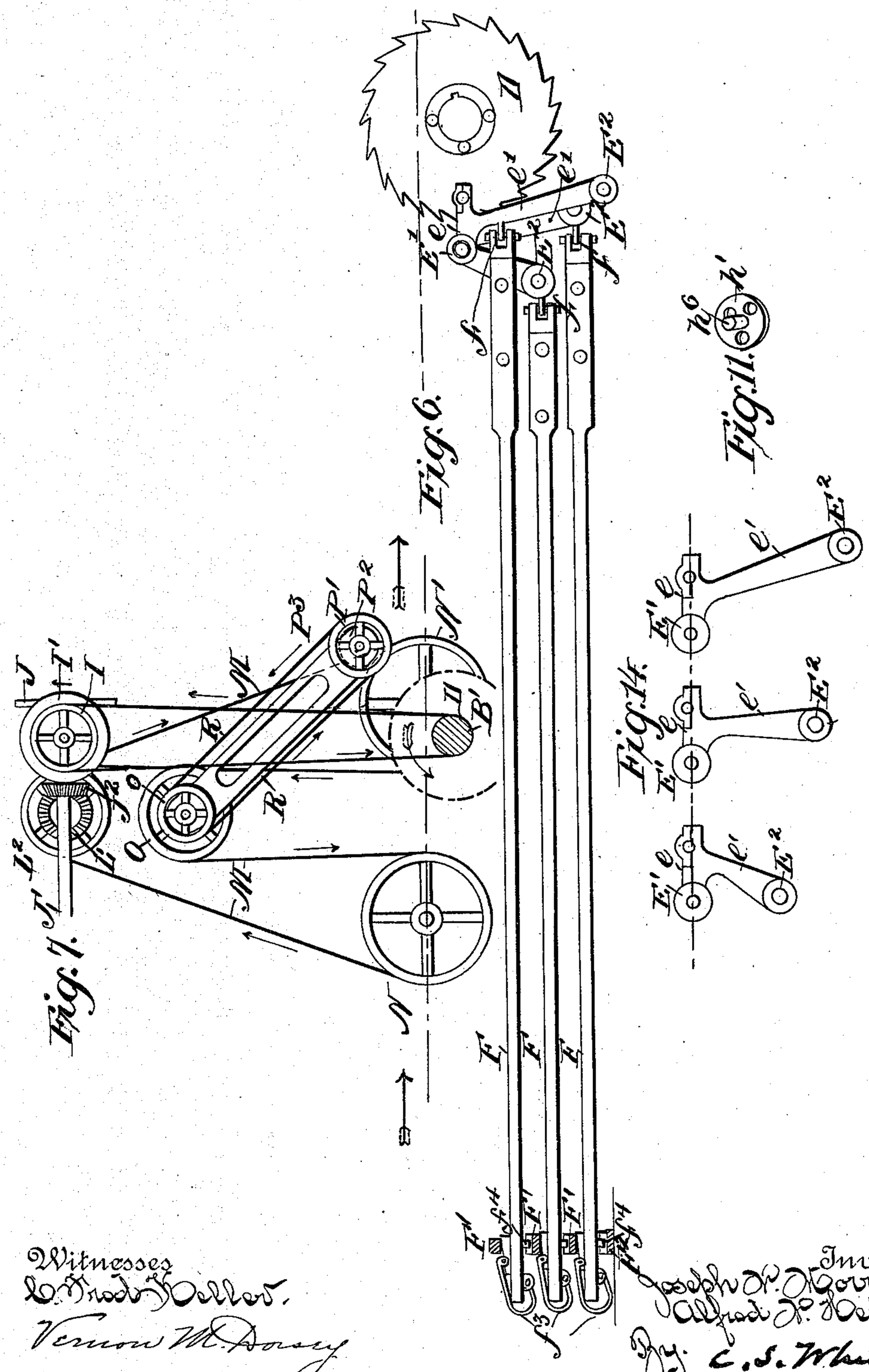

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(No Model.) 6 Sheets—Sheet 6.

J. N. MORROW & A. N. HEINE.

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No. 412,646. Patented Oct. 8, 1889.

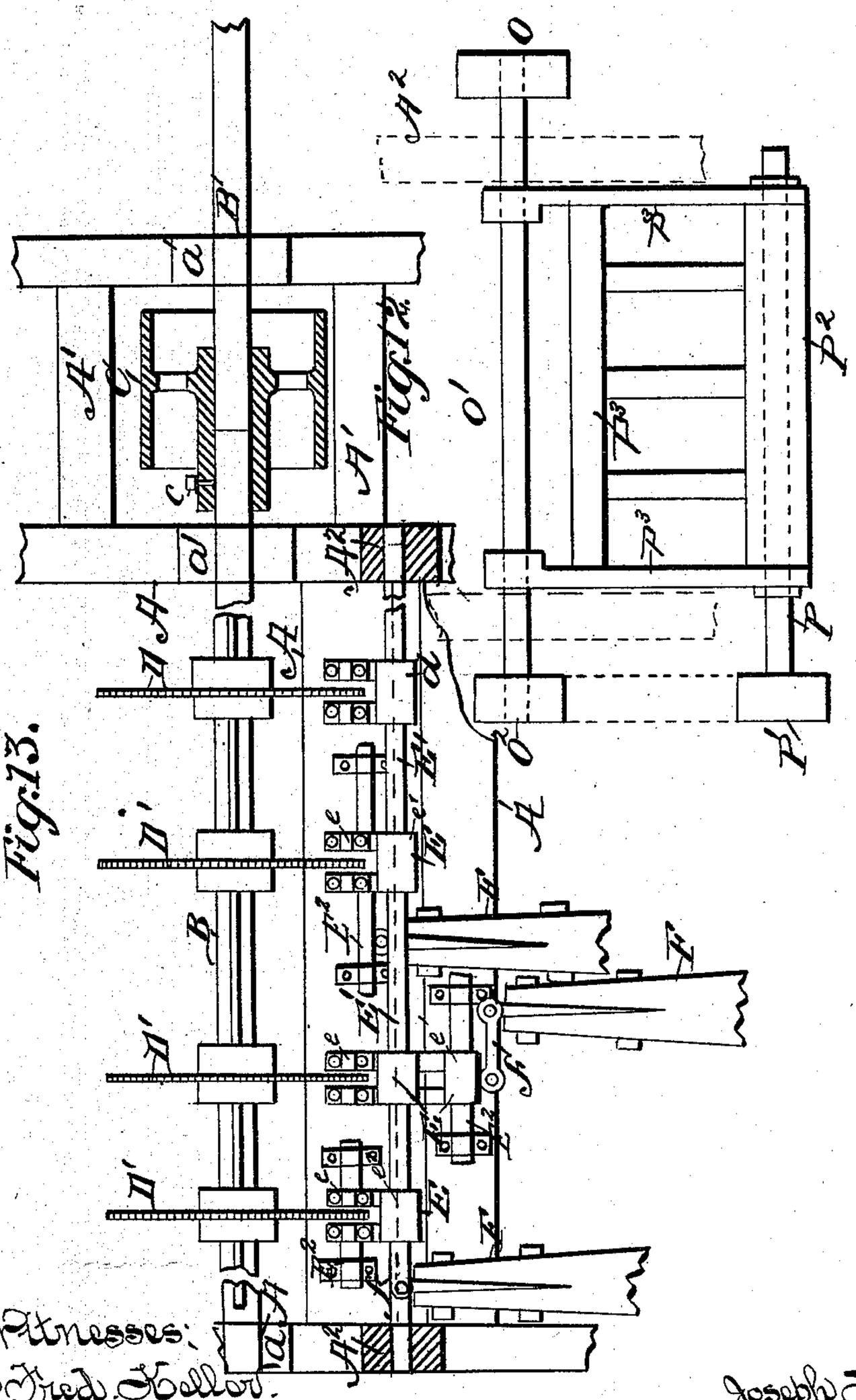

Fig. 13.

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UNITED STATES PATENT OFFICE.

JOSEPH N. MORROW AND ALFRED N. HEINE, OF EVANSVILLE, INDIANA.

GANG-EDGER FOR CUTTING DIMENSION LUMBER.

SPECIFICATION forming part of Letters Patent No. 412,646, dated October 8, 1889.

Application filed September 3, 1887. Serial No. 248,755. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH N. MORROW and ALFRED N. HEINE, of Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Dimension Gang-Edger for Cutting Dimension Lumber; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to certain new and useful improvements in saw-mills, and relates more particularly to that class known as "gang-edgers" for cutting dimension lumber; and it has for its object to provide means whereby the dimensions of the lumber and the speed with which it is supplied to the saws may be regulated.

Our invention to accomplish these purposes consists of a spline-shaft having saws movable thereon by means of levers, whereby they may be caused to approach or recede, and of disks the periphery of one of which bears upon the face of the other, the distance of the point of contact from the center of the latter disk being capable of being changed at will, whereby the speed of the feed may be increased or decreased, and in the necessary parts to secure the proper interaction and dependency between these features, and in other details of construction, as will be hereinafter fully described and claimed.

Referring to the accompanying drawings, in which corresponding parts are designated by similar letters, Figure 1 is a plan view of our invention with the rod K′ and lever Q′ broken away. Fig. 2 is a side view taken on the right-hand side thereof. Fig. 3 is a side view taken on the left-hand side thereof. Fig. 4 is a front view, and Fig. 5 a rear view, thereof. Fig. 6 is a detail longitudinal elevation showing the saws and saw-adjusting mechanism detached from the body of the machine. Fig. 7 is a detail side elevation of the adjustable feed-roller and mechanism for imparting motion thereto. Figs. 8 and 9 are details of the mechanism for locking the saw-guide levers in place. Fig. 10 is a detail of the mechanism for varying the motion transmitted to the feed-rollers. Fig. 11 is a detail of one of the plates h', showing the lug h^6 thereon. Fig. 12 is a detail of the hanging frame. Fig. 13 is a detail plan view of the saws, saw-arbor, and guides; and Fig. 14 is a series of saw-guides detached and separate.

A suitable frame-work A of the ordinary character has formed upon one side thereof (the right-hand side in the drawings annexed hereto) an extension frame-work A′, having bearings a a' formed thereon and upon the opposite side of the main frame-work A to receive a spline-shaft B and an extension thereof B′. The main driving-pulley C, to which motion is imparted in any suitable manner, is mounted half upon the shaft B and half upon the extension B′, being secured to the former by bolts c, and being permanently attached to the latter. By this construction saws may be placed upon and removed from the shaft B without removing pulleys or belting, as when the bolts c are loosened and the extension B′ and pulley C are moved outward the latter is by the slight lateral movement drawn off the shaft B and permitted to fall upon boxing within the extension A′, thus freeing the end of the spline-shaft.

A circular saw D is fastened permanently on the shaft B in the usual manner and steadied by a fixed guide d, while circular saws D′ are mounted upon the shaft and adapted to be moved laterally thereon by means of guides E, located beneath the bed of the machine. Each of these guides consists of two arms e e', uniting at a different angle for each of the guides, the arms e being slotted to receive a portion of the forward lower quadrant of the saws. A bar E′ passes through all of the guides at or near the junction of the two arms of which they are composed, and is attached to the upright frame A^2 at e^2, while the arms e' of each of the said guides are of different length and work upon independent bars E^2, fastened to the frame A, each of the said bars E^2 being at a different level and on a different vertical plane under the bed of the machine, this being permitted by the different angles made by the arms e and e' and by the difference in the

length of the arms e'. Levers F are fastened to the arms e' of the guides by means of links f, and pass to the front of the machine at different levels under the bed thereof, being pivoted at the middle to the frame-work A. Each lever near its front end passes under bars F′, having a graduated scale f^5 thereon extending across the front of the machine, so that the movement of a lever a certain distance by the scale will cause a corresponding movement of the guide attached thereto and of the corresponding saw, the link f permitting the guide to move on a straight bar E′, while the movement of the rear end of the lever is in the arc of a circle. To secure the levers in the exact position in which they may be placed, the forward end of each lever has a longitudinal slot f' in the top thereof, in which a wedge f^2 is caused to move forward or backward by the action of a U-shaped piece f^3, pivoted to the bottom of the forward end of the lever and to the top of the forward end of the wedge. The bottom of the forward end of the lever also has a lip f^4 formed thereon, while the upper surface of each of the graduated scale-bars F′ is provided with corrugations f^6, in order to receive the lip f^4 of the lever immediately above it. When the piece f^3 of any lever is thrown down, the wedge f^2 is drawn forward between the lever and its scale-bar, pressing the former downward and causing the lip f^4 to engage the corrugation in the top of the scale-bar immediately below the lever, or in case of the lower lever in corrugations f^7 upon a bar F^2 beneath it, thus locking it in position, while the contrary effect is produced by an upward movement of the piece f^3, this difference being clearly shown in Figs. 8 and 9.

For regulating the thickness of the slab or board cut by the immovable end saw D, we use a sliding guide H. This guide consists of a flat piece h, of suitable material, having plates h', provided with lugs or projections h^6 on their lower surfaces at both of its ends, the said projections of each plate moving in equally-inclined diagonal grooves h^2, cut or formed upon the frame A, so that any movement of the piece h toward the front or rear of the machine causes it to recede from or approach the center of the saw-bed, and thus to cause a greater or less width of lumber to be cut by the end saw D. The slide-piece h is adapted to be moved forward or backward by the handle h^3, attached to the rod h^4, which has teeth formed upon its under surface and adapted to engage a lip h^5, formed upon the frame A. The said teeth may be so graduated as to show the thickness of the board made by the end saw, and thus serve both as a measure and as a means for holding the sliding gage in the required position.

In order to vary the speed of the feed, we construct a vertical frame-work A^2 upon the main frame-work A and extension A′, to provide supports and bearings for the hereinafter-described mechanism. The free end of the shaft B′, upon which is mounted the main driving-pulley C, and which extends beyond the extension frame-work A′, acts as a pulley to impart motion by means of a belt and wheel I to a disk I′, mounted upon a shaft I^2, running partially across the machine. A second disk J is firmly fixed upon the spline-shaft J′, running at right angles to the shaft I^2, and which has also mounted thereon a gear-wheel J^2, secured in a fixed position in relation to the frame A^2 by means of a brace J^3, while the shaft itself is adapted to be moved in a longitudinal direction by the hereinafter-described means, thus causing the point of contact between the disks I′ and J to vary to a point either farther or nearer the circumference of the former, and causing a corresponding decrease or increase in the rotation of the latter and of the shaft upon which it is mounted, as well as of the gear-wheel J^2. The longitudinal motion of the shaft J′ is effected by means of a handle K, pivoted at its middle, while to its upper end is attached one end of a bar K′, while the other end of the said bar is attached to a lever K^2, pivoted at its center to a bracket A^3, projecting from the frame-work A^2, while the lower end of the said lever is attached to the shaft J. Thus a movement of the lower part of the handle toward the rear of the machine will cause a corresponding motion of the disk J and an increase in its speed. The outer end of the shaft I^2 bears against a bracket A^4, attached to the frame-work A^2. This bracket is adapted to be drawn inward by means of a bolt a^2, provided with a nut a^3, causing the disk I′ to bear more firmly upon the periphery of the disk J.

A shaft L, carried in bearings l upon the frame-work A^2 at right angles to the shaft J′, has upon its inner end a gear-wheel L′, meshing with the wheel J^2, while upon its outer end is the pulley L^2, which drives by means of a belting M, passing around the take-up rollers N and N′, journaled in the frame-work A, the pulley O, mounted upon one end of the shaft O′, running transversely through the frame-work A^2, while upon the other end thereof is secured the pulley O^2. A shaft P, having pulley P′ on one end thereof and a feed-roller P^2 in the middle portion, is hung in a frame-work P^3 upon the shaft O′, and is adapted to be raised or lowered by means of the stirrups or bars Q, attached to a lever Q′, passing above the machine to the front end thereof. A belt R passes over the pulleys O^2 and P′, and is kept at a constant tension by means of the hanging frame P^3 and imparts a motion to the feed-roller P^2, which communicates it to the lumber supplied to the saws in the usual manner, the speed of the feed of which depends upon the relative position of the disks J and I′ to each other and upon the position of the feed-roller P^2, which may be varied and placed at different heights above the anti-friction rollers G by means of the lever Q′ and rods or stirrups Q.

It will be thus seen that the position of the saws to each other and to the frame-work and the speed of the feed may be varied from the front of the machine without interfering with its operation in any manner and while it is running at full speed.

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

1. In a gang-saw, the combination, with a shaft having saws movable thereon, of a bar extending below the saw-bed, guides for the saws sliding thereon, and bars upon different horizontal and vertical planes for steadying each of the said guides, as and for the purposes described.

2. In a saw-mill, the combination, with a shaft having saws movable thereon, of guides consisting of two arms, a bar passing through all the guides, bars arranged in different vertical and horizontal planes, each one thereof passing through one arm of one of the said guides, the other arm thereof being slotted to receive and guide a saw, as and for the purposes described.

3. In a saw-mill, the combination, with a frame-work and a shaft having saws mounted thereon, of guides, levers adapted to move the said guides passing between graduated scale-bars, the upper portion of the said bars being corrugated, wedges on the tops of the said levers, U-shaped pieces adapted to draw the said wedge forward, and lips on the under surfaces of the levers, whereby they are locked in position, as and for the purposes described.

4. In a gang-saw mill, a series of saw-guides, each of the said guides consisting of two arms and having the angle formed by the said arms of every guide differing from the corresponding angle of the other guides, as and for the purposes described.

5. In a gang-saw mill, the combination, with a shaft having saws adjustably mounted thereon, of guides, each one thereof consisting of two arms, one arm of each of the said guides receiving one of the said saws, the other arm of each of the said guides terminating at a different level and attached to a lever extending to the front of the mill, a bar passing through all of the said guides at the junction of the two arms, and independent bars, each one situated on a different vertical and horizontal plane and passing through the lever-arm of one of the said guides, as and for the purposes described.

6. In a gang-saw mill, the combination, with a frame-work and shaft having saws adjustably mounted thereon, of a bar extending below the saw-bed, guides for the saws sliding thereon, bars upon different vertical and horizontal planes, also below the saw-bed, for steadying each of the said guides, and a gage having lugs upon its ends moving in equally-inclined bearings in the frame-work, whereby a forward or backward motion of the gage is converted into a lateral one, as and for the purposes described.

7. In a gang-saw mill, the combination, with a main frame-work A and a shaft provided with adjustable saws mounted thereon, of a bar extending below the saw-bed, guides for the saws sliding thereon, bars, each upon a different vertical and horizontal plane below the saw-bed, for steadying each of the said guides, a frame-work A^2, rising from the frame-work A, a shaft O′, mounted on the said frame-work A^2 and having a shaft P, carrying a feed-roller depending therefrom in a frame, and suitable gearing imparting motion from the saw-shaft to the shaft O′ and from the shaft O′ to the feed-roller shaft P, as and for the purposes described.

8. In a gang-saw mill, the combination, with a main frame-work A and a shaft provided with adjustable saws mounted thereon, of a bar extending below the saw-bed, guides for the saws moving thereon, bars upon different vertical and horizontal planes, also below the saw-bed, for steadying each of the saw-guides, a frame-work A^2, rising from the main frame-work A, a shaft I^2, mounted thereon and receiving motion by any suitable means, a disk I′ on one end thereof, and a shaft J′ at right angles to shaft I^2, and having a disk J movably bearing upon the disk I′, as and for the purpose described.

9. In a gang-saw mill, the combination, with a shaft having saws adjustably mounted thereon, of a bar extending below the saw-bed, guides for the saws moving thereon, bars upon different vertical and horizontal planes, also below the saw-bed, for steadying each of the said guides, a feed-roller capable of a vertical motion, and disks movable in relation to each other and forming a part of a gearing between the said saw-shaft and feed-roller, as and for the purposes described.

10. In a gang-saw mill, the combination, with suitable saw-guides, of corrugated bars, lever, each one thereof passing between two of the said bars and attached to one of the saw-guides, and having a wedge moving in a slot in the upper surface of its forward end and a lip formed on the lower surface thereof, and of a U-shaped handle pivoted to the said lever and wedge, whereby the lip may be caused to engage the corrugations of the bar below it, as and for the purposes described.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

JOSEPH N. MORROW.
ALFRED N. HEINE.

Witnesses:
J. E. WILLIAMSON,
JOHN E. MCELFATRICK.