

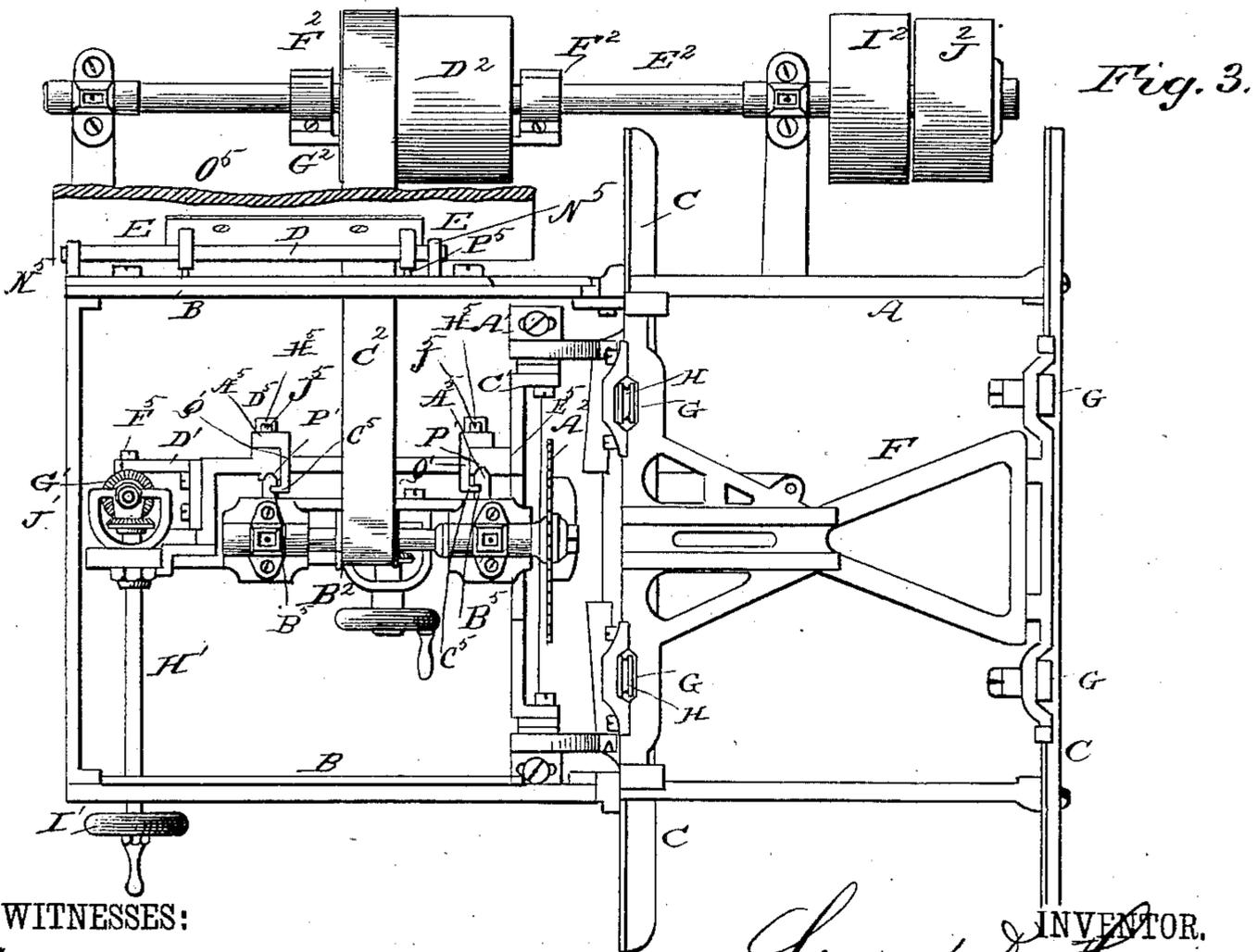
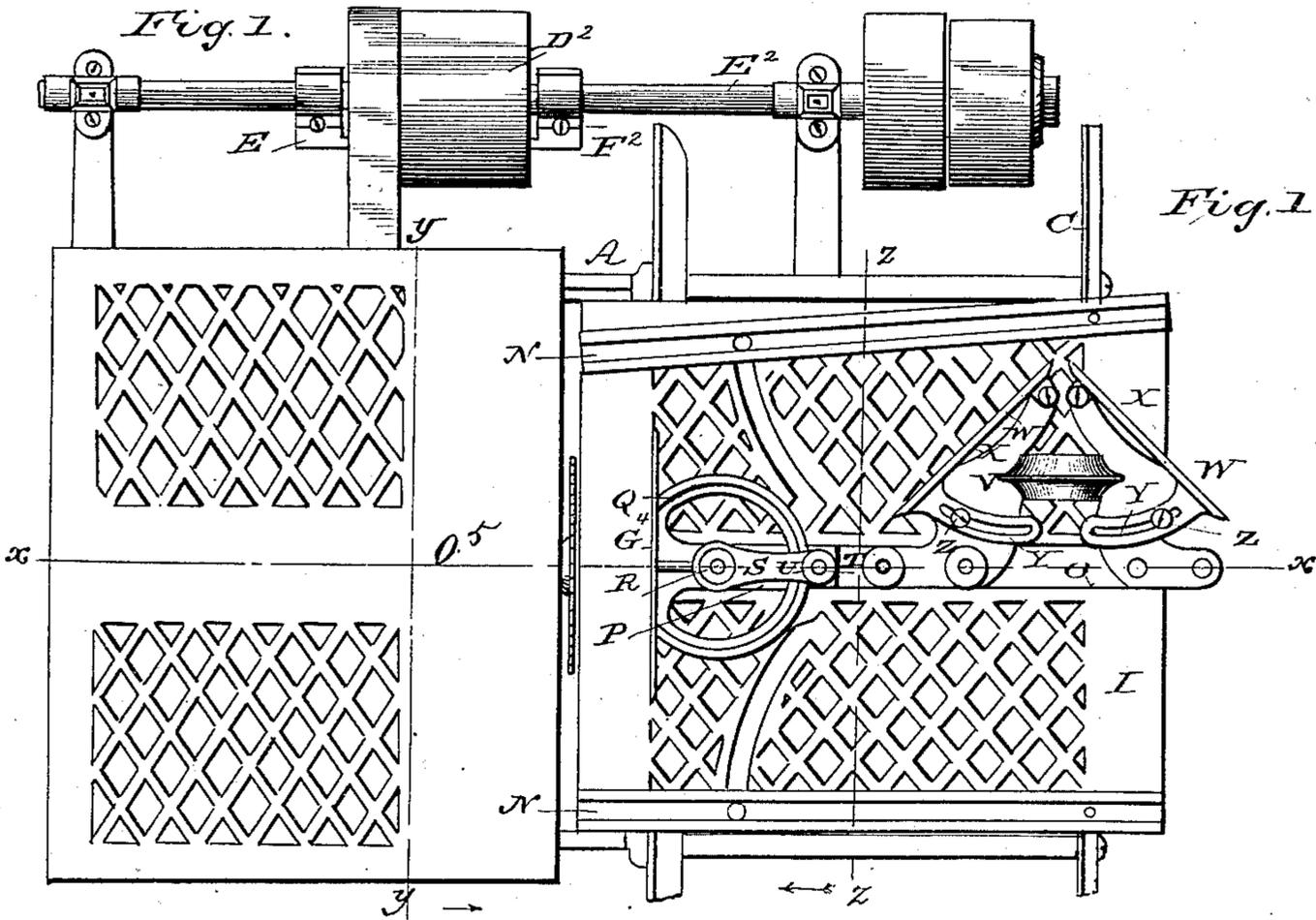
(No Model.)

4 Sheets—Sheet 1.

L. D. HOWARD.
MITER SAWING MACHINE.

No. 314,843.

Patented Mar. 31, 1885.



WITNESSES:

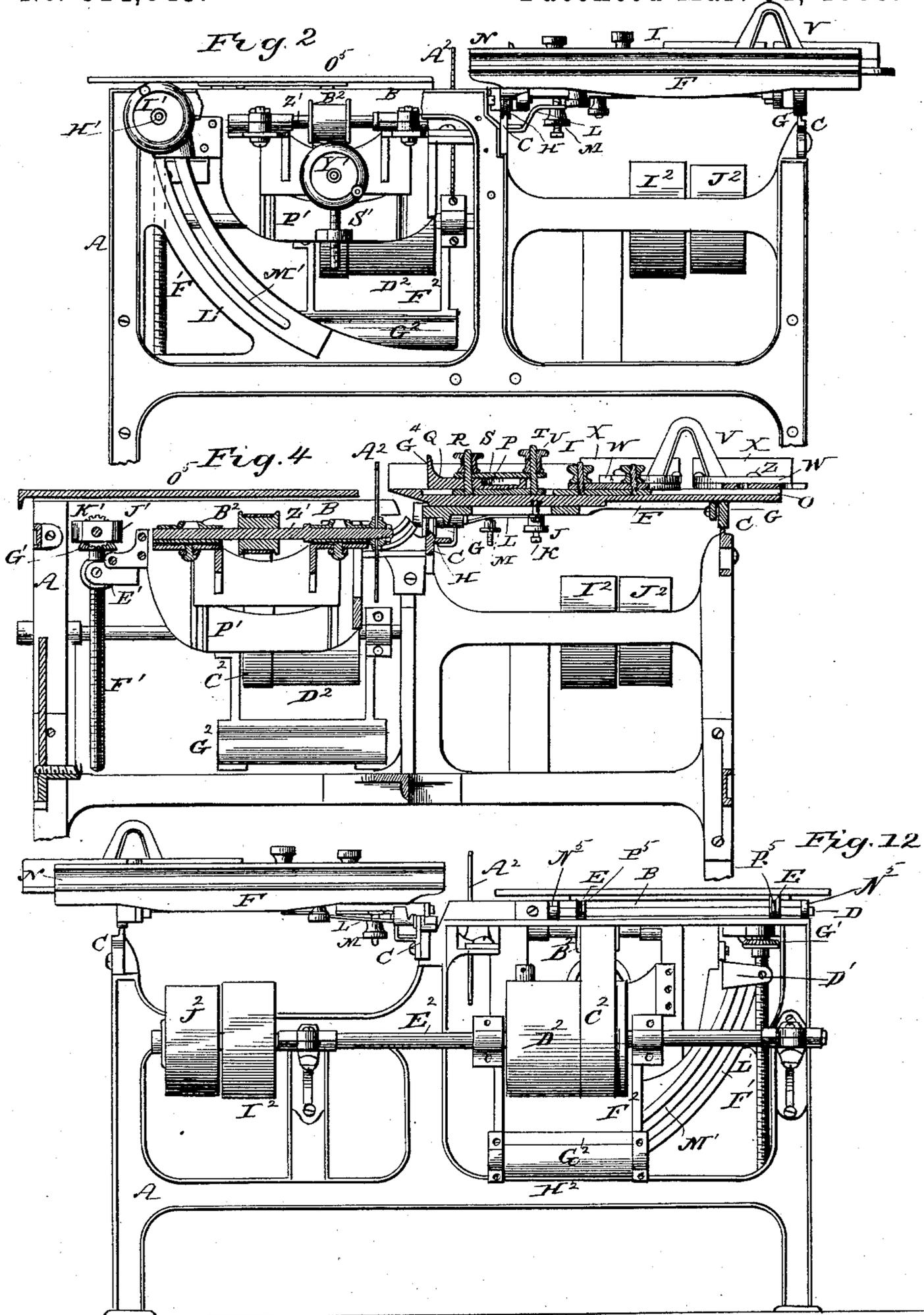
A. L. Dutcher,
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Fig. 7.

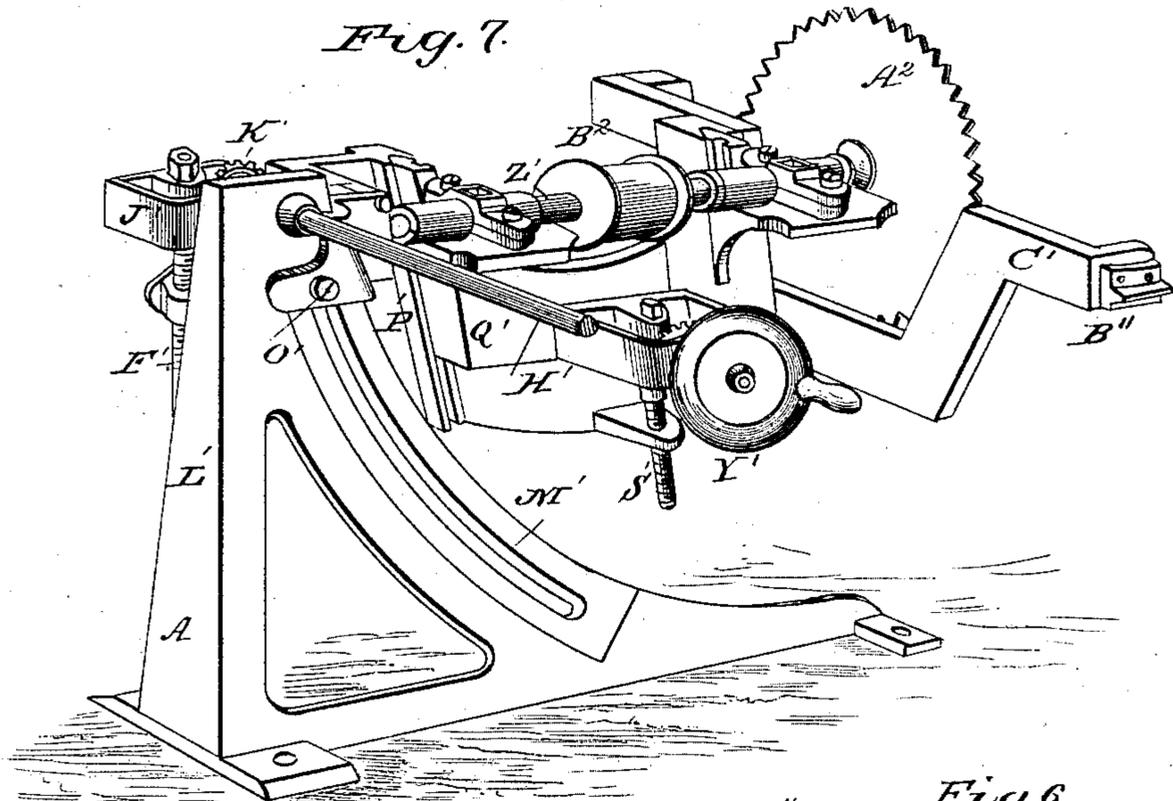


Fig. 5.

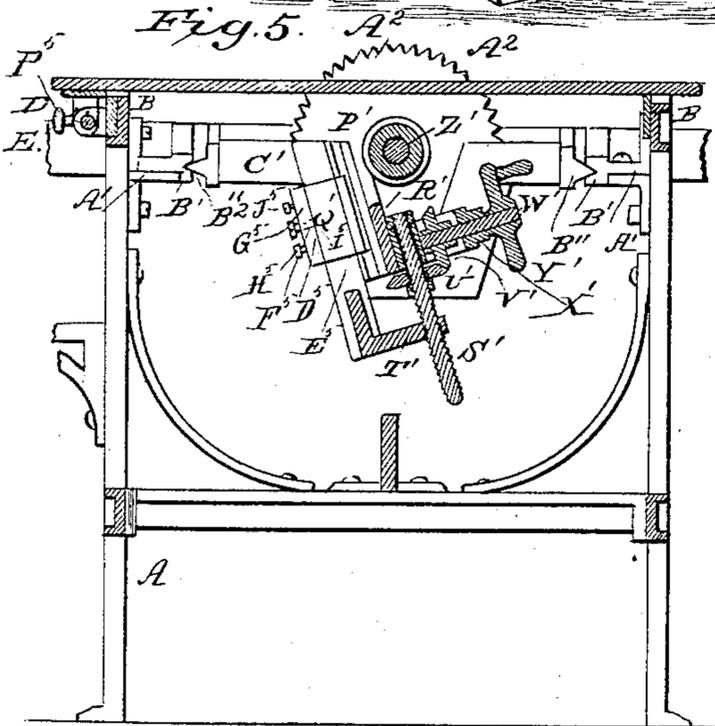


Fig. 6.

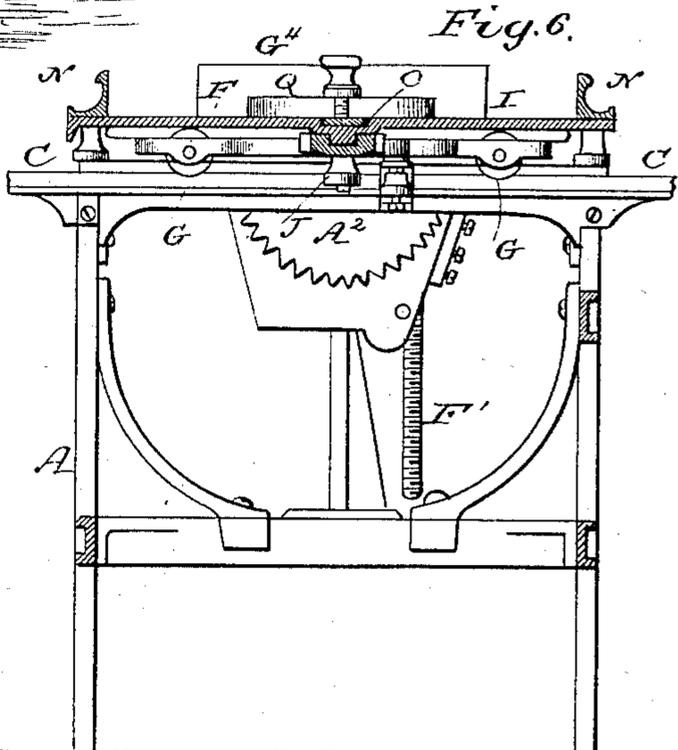
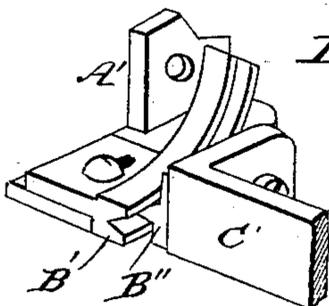


Fig. 10.



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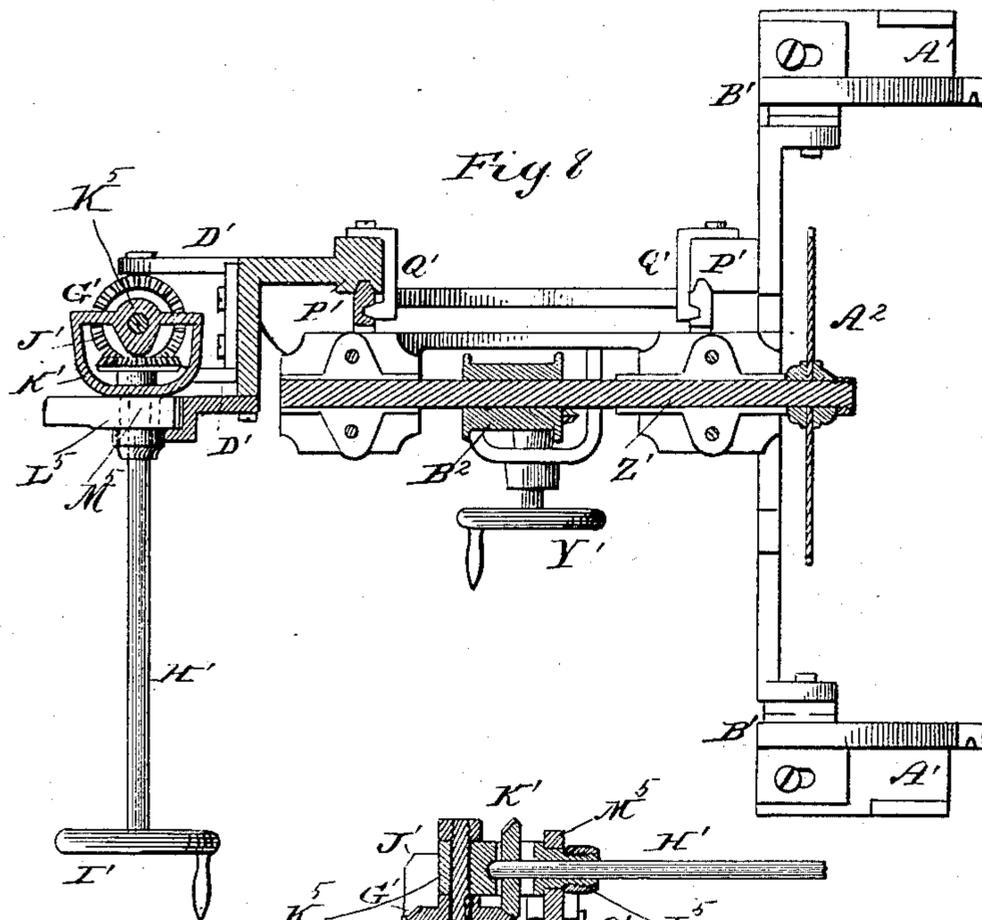


Fig. 8

Fig. 13.

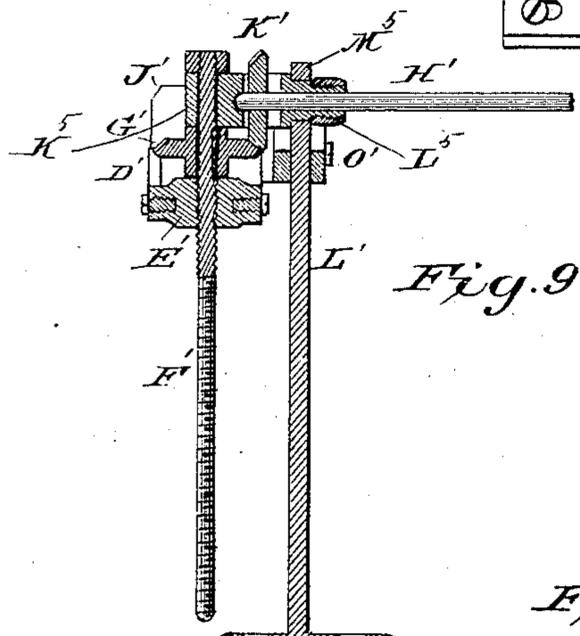
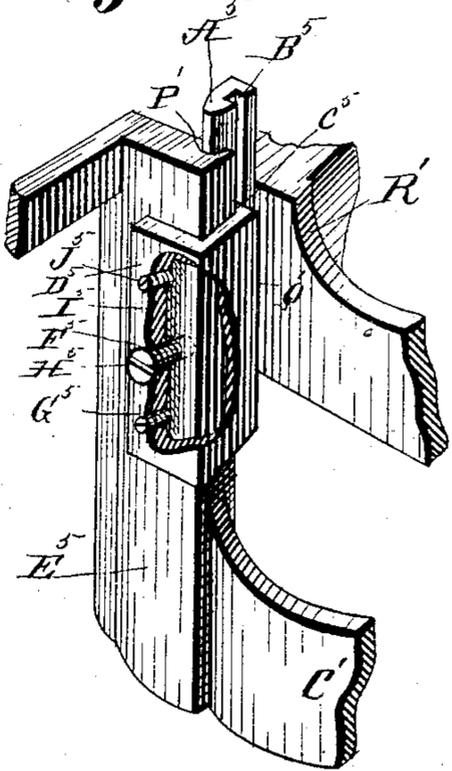
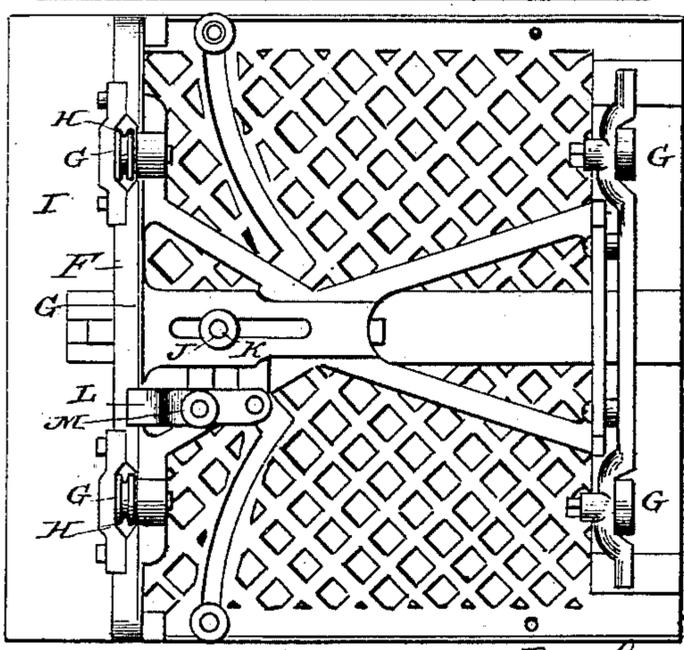


Fig. 9

Fig. 11.



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UNITED STATES PATENT OFFICE.

LEONARD D. HOWARD, OF ST. JOHNSBURY, VERMONT.

MITER-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 314,843, dated March 31, 1885.

Application filed January 12, 1885. (No model.)

To all whom it may concern:

Be it known that I, LEONARD D. HOWARD, a citizen of the United States, and resident of St. Johnsbury, in the county of Caledonia and State of Vermont, have invented certain new and useful Improvements in Miter-Sawing Machines; and I 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, which form a part of this specification, and in which—

Figure 1 is a top or plan view of my improved mitering-machine. Fig. 2 is a front view of the same. Fig. 3 is a plan view of the machine with the hinged table raised and with the sliding table detached, showing, however, the sliding frame of the latter in position. Fig. 4 is a transverse vertical sectional view of the machine, taken on the line *xx* in Fig. 1 of the drawings. Fig. 5 is a longitudinal vertical sectional view taken on the line *yy* in Fig. 1. Fig. 6 is a longitudinal vertical sectional view taken on the line *zz* in Fig. 1. Fig. 7 is a detailed view, in perspective, of the mechanism for adjusting the saw. Fig. 8 is a horizontal sectional view taken through the saw-adjusting mechanism. Fig. 9 is a vertical sectional view taken longitudinally through the swinging end of the saw-adjusting mechanism. Fig. 10 is a detail view of one of the inner ends of the saw-adjusting frame. Fig. 11 is a bottom view of the sliding table with its attachments. Fig. 12 is a rear view of the machine, and Fig. 13 is a perspective detail view, with a portion broken away, of one of the adjustable flanged plates for the vertically-sliding frame and a portion of one of the side pieces of the swinging frame.

The same letters refer to the same parts in all the figures.

This invention relates to mitering-machines; and it has for its object to construct a machine of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency.

With these ends in view, the invention consists in the improved construction and arrangement of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, A designates the frame of the machine, which is provided at its upper end with transverse tracks or ways B B and longitudinal ways C C, the latter being at right angles to the former.

D is a shaft, parallel to the ways B B and turning with its ends in hangers N^s upon the frame, and the table O^s, which slides upon the ways B, is provided with two downwardly-projecting perforated lugs, E E, which slide upon the shaft, one of which lugs is provided with a set-screw, P^s, by means of which the lug and the table may be adjusted at various distances from the saw while it may be tilted back, as shown in Fig. 3, where the outer portion of the table is shown broken away, so as to give free access to the mechanism below the table, which mechanism will be described hereinafter.

The ways C C form bearings for a sliding frame, F, the under side of which is provided with rollers G G, the inner ones of which are provided with V-shaped grooves H H, adapted to catch over the correspondingly-shaped tracks or ways. The outer rollers slide or roll upon the upper faces of the outer tracks or ways, as will be seen in the drawings. The frame F is provided at its front and rear ends with supports or bearings for the transversely-sliding table I, which may be moved to any desired position upon the supports or bearings, and secured in any position to which it may be adjusted by means of a nut, J, adjustable upon a rod, K, which extends from the table downwardly through a slot in the frame F. The latter is provided on its under side with a pivoted catch, L, adjustable by means of a set-screw, M, and adapted to retain the frame and its attachments in position by catching under the side flange of the inner rail, C.

The upper side of the table I is provided at its front and rear edges with adjustable guide-flanges N N, pivoted at their outer ends, and provided near their inner ends with screw-threaded rods extendingly downwardly through segmental slots in the table, and provided with tightening-nuts, whereby they may be conveniently secured in any position to which they may be adjusted.

The upper side of the table I is also provided with a central transverse dovetailed groove, O, adapted to receive two separate

and independent mitering devices, one of which consists of a slide, P, having a pivoted segment, Q, one side of which is constructed with a guide or gage board, G⁴. Arranged upon the common center and adapted to be secured thereon by a tightening-nut, R, is a plate, S, the outer end of which extends beyond the segment Q, and is adapted to tighten the latter to the plate or slide P by means of a nut and bolt, T U. By this arrangement it will be seen that the slide P may be secured in any desired position upon the table and the gage G⁴ in any desired position with relation to the slide and the table. The other or double mitering device consists of a plate or casting comprising two plates arranged at an angle to each other and joined by an inverted V-shaped bracket, V. The ends of this base-plate are provided with perforations to receive screws, by means of which it may be connected with slides movable in the transverse dovetailed groove of the table, and at the adjoining ends of the plates are pivoted guides W W, having vertical flanges X X, and provided at their inner ends with segmental slots Y Y, through which tightening-screws Z Z may be inserted for the purpose of securing the said guides in any position to which they may be adjusted.

It will be readily seen that the double may be substituted for the single guide, and vice versa, according to the purpose for which the machine is to be used.

The central uprights of the frame are provided on their inner sides with brackets A' A', having segmental grooved tracks B' B', adapted to receive lugs B'' upon the ends or arms of a swinging frame, C', of substantially the construction illustrated in the drawings. This frame C' is provided at its outer end with a pair of lugs, D' D', between which is pivoted a cross-piece, E', having a screw-threaded bearing for a screw, F', the upper end of which is provided with a pinion, G'. The upper end of screw F', above the pinion, is journaled in a vertical bearing, K⁵, in the outer cross-bar of a stirrup-shaped frame, J', and the inner end of a shaft, H', journaled longitudinally in the machine-frame and having a hand-wheel, I', at its outer end, is journaled in a horizontal bearing in the tubular shank L⁵ of the stirrup-shaped frame, which shank oscillates in a bearing, M⁵, in the machine-frame. The inner end of shaft H' has a pinion, K', which engages pinion G'.

L' is a frame arranged centrally and transversely in the main frame and having a segmental slot, M', through which passes a stud, O', suitably arranged at the outer swinging end of the swinging frame C'. It will be seen that the latter, by operating the shaft H' by means of the hand-wheel I' at the front end of the latter, may be adjusted to any desired angle within the limits of the segmental slot M', which in practice will compass about forty-five degrees, and that the tubular shank of the stirrup-shaped frame turning in its bearing

will allow the screw F' to swing as the end of the swinging frame follows the segmental slot, the cross-piece E' rocking between the lugs of the swinging frame.

The swinging frame is provided with tracks P' and guide-lugs Q' for a vertically-adjustable frame, R', adjustable by means of a screw, S', journaled in the said frame and extending through a screw-threaded lug, T', in the front side of the frame C'. The screw S' has a pinion, U', meshing with a pinion, V', upon a shaft, W', journaled in a bracket, X', extending from the frame R' and provided with a hand-wheel, Y', whereby it may be manipulated so as to raise or lower the frame R' to any desired position.

The upper end of the frame R' is provided with bearings for the saw-shaft Z', carrying at its inner end the saw A², and provided with a band wheel or pulley, B², from which a band, C², extends to a drum, D², upon a shaft, E², which is journaled in suitable bearings extending rearwardly from the frame of the machine. Journaled upon the said shaft E², adjoining the sides of the drum D², are a pair of arms, F² F², the lower ends of which are connected by a weight, G², and form bearings for a tightening-pulley, H², by which device the belt or band C² is automatically kept tight at any position to which the saw-shaft may be adjusted.

One end of the operating or drive shaft E² is provided with a fixed and a loose pulley, I² J², for the transmission of motion, the latter of which is cored, so as to form an oil-chamber, whereby it may be automatically lubricated.

The flanges A⁵ of the vertically-adjustable frame R' slide in the tracks P' of the swinging frame, and have grooves B⁵ in their inner faces, into which the inner flanges, C⁵, of the guide-lugs Q' engage. These guide-lugs, or, more properly, guide-plates, have flanges C⁵ at their inner edges, which flanges engage the grooves in frame R', and flanges D⁵ at their outer edges, which flanges bear against the outer sides of the vertical side pieces, E⁵, of the swinging frame. These flanges D⁵ are provided with threaded perforations F⁵ at their middles, and threaded perforations G⁵ at their ends, one at each side of the perforations F⁵ and screws H⁵ pass through the middle perforations and into perforations I⁵ in the side pieces of the swinging frame, while screws J⁵ pass through the end perforations and bear with their ends against the side pieces. It will be seen that by unscrewing the middle screws and screwing the end screws farther in against the side pieces of the swinging frame the inner flanges, C⁵, may be drawn outward so as to bear against the outer sides of the grooves B⁵, taking up wear in the grooves or flanges, and it will also be seen that by tightening or loosening the end screws the pitch of the guide-flanges C⁵ may be so corrected as to make them perfectly true with the grooves B⁵ and tracks P'.

By having this vertically-sliding frame sliding in the swinging frame in place of having the swinging frame within the sliding frame, as has been done heretofore, I accomplish an advantage—viz., that the saw, when raised or lowered by the vertically-sliding frame, will travel edgewise in one plane, thus remaining in the exact position relatively to the table and stuff, while, when the swinging frame is within the vertically-sliding frame the saw is raised and lowered in planes parallel to the original plane, but different in their relative positions to the table and stuff to be sawed, the table requiring adjustment when the frame is raised or lowered.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains.

The machine is easily operated, and may be readily adjusted for all purposes of mitering, or for straight sawing.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a mitering-machine, the combination

of a frame pivoted at one end, and having means, substantially as described, for raising or lowering its free end, a frame sliding vertically in the said swinging frame, and having means, substantially as shown, for raising and lowering it, and the saw and saw-shaft journaled in the upper end of the sliding frame, as and for the purpose shown and set forth.

2. The combination of the frame C', having side pieces, E⁵, provided with tracks P' upon their inner sides, and with threaded perforations I⁵ in their outer sides, the sliding frame R', having flanges A⁵, traveling in tracks P', and provided with grooves B⁵, the plates Q', having flanges C⁵ at their inner edges, and outer flanges, D⁵, provided with threaded perforations F⁵ and G⁵, and screws H⁵ and J⁵, as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

LEONARD D. HOWARD.

Witnesses:

STEVEN R. WILLORD,
ANDREW E. RANKIN.