

(No Model.)

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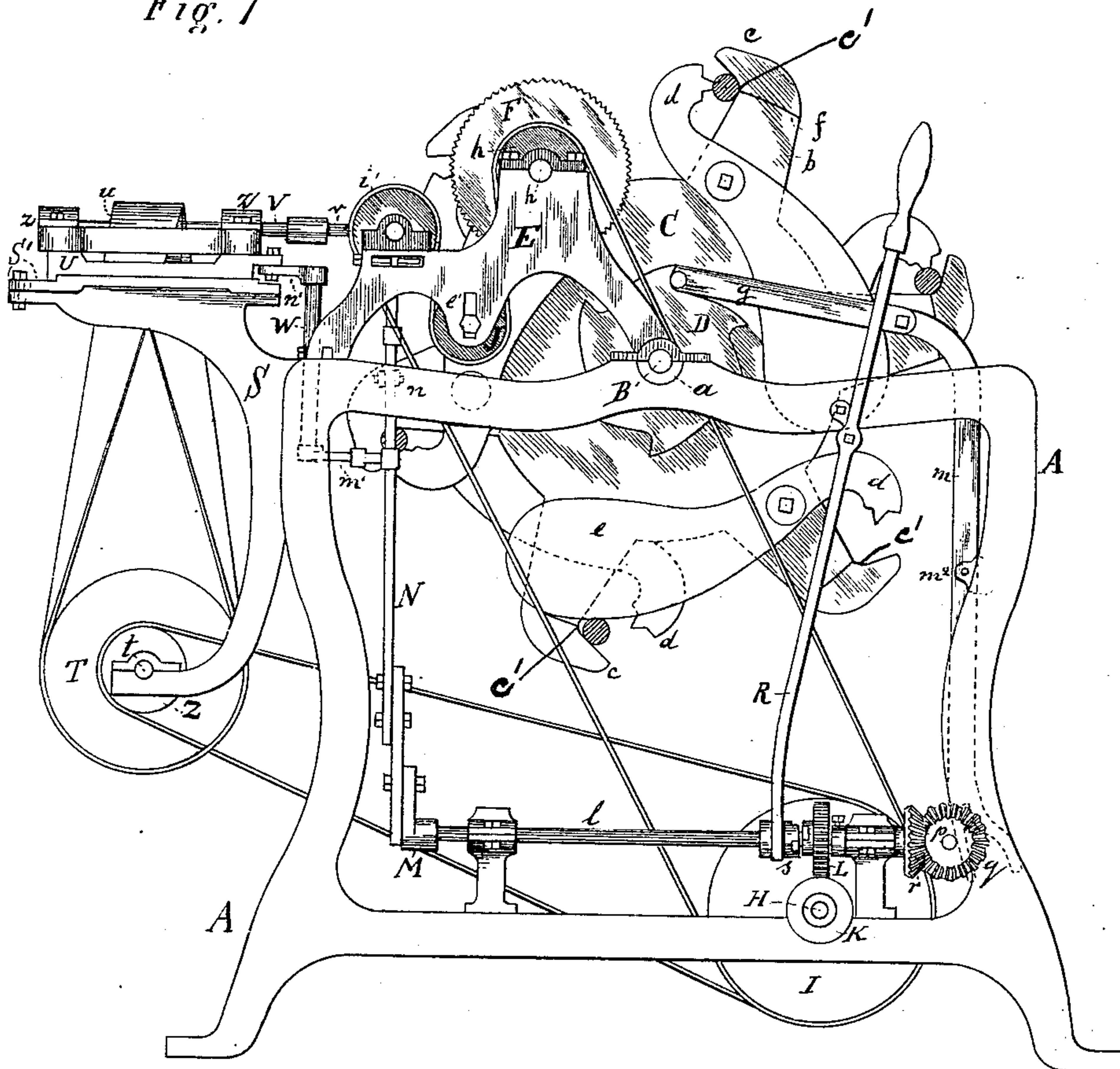
L. BUSH, Jr.

MACHINE FOR SAWING, TENONING, AND BORING CHAIR LEGS, &c.

No. 332,699.

Patented Dec. 22, 1885.

Fig. 1



WITNESSES

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(No Model.)

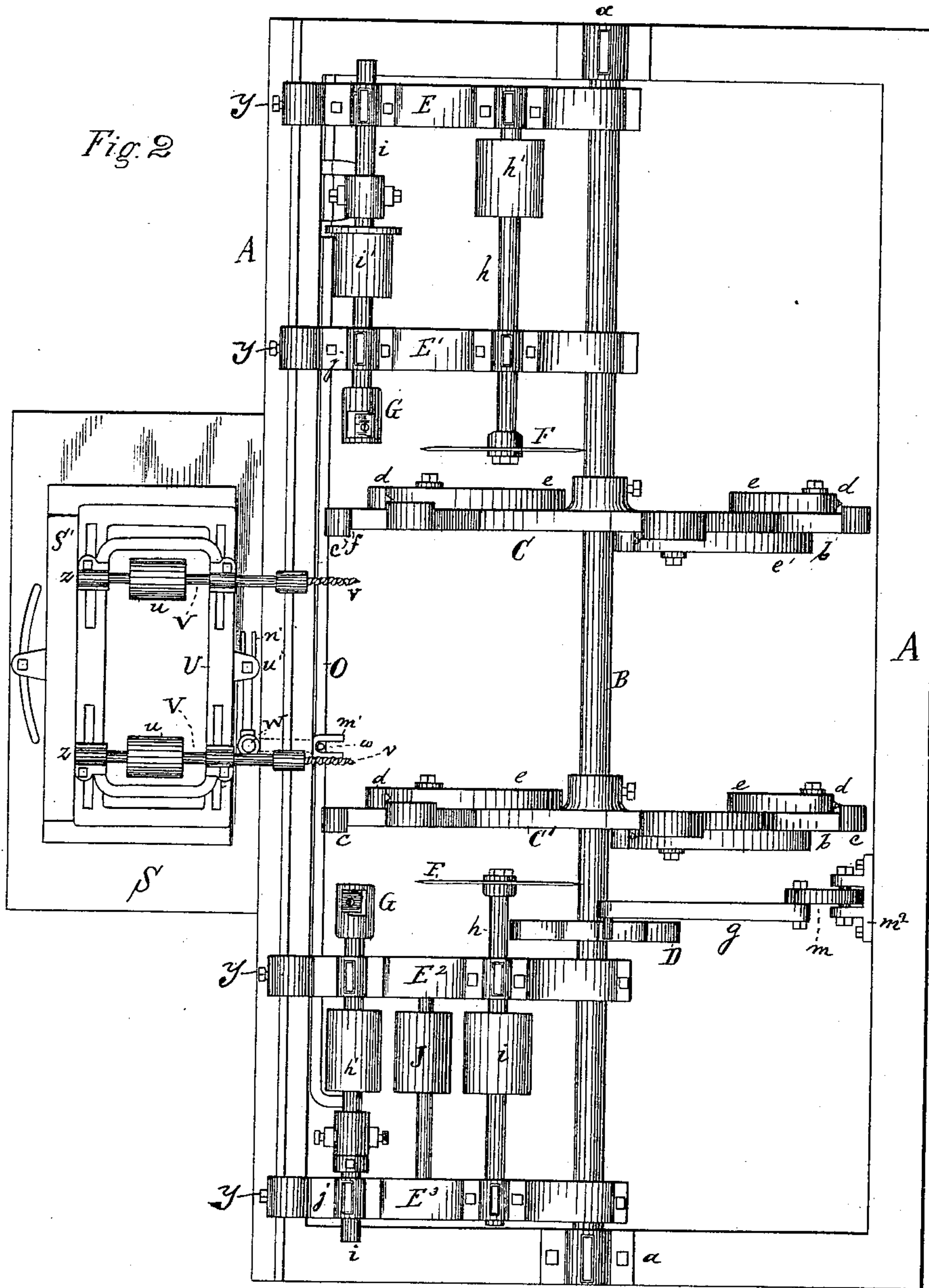
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Fig. 3

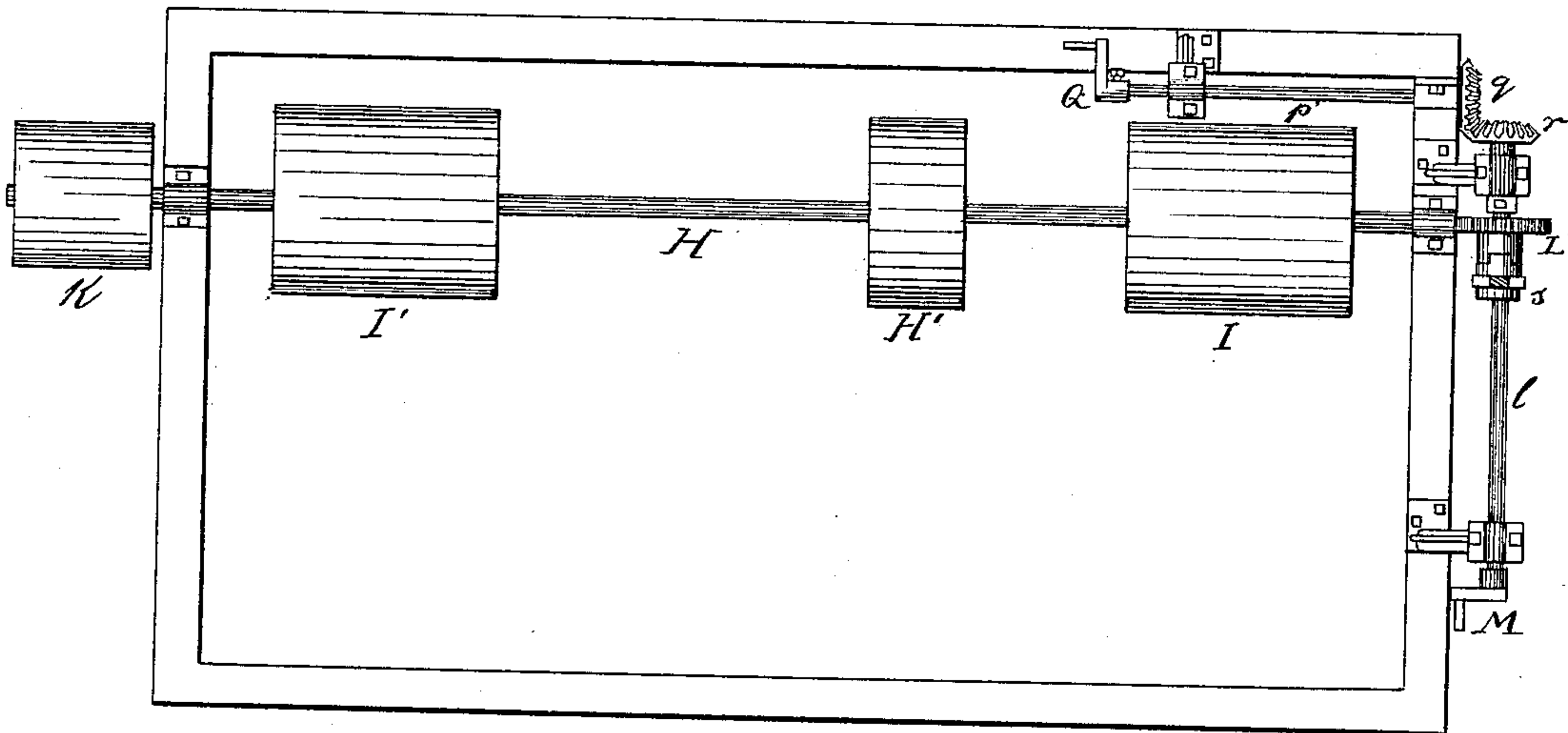


Fig. 4

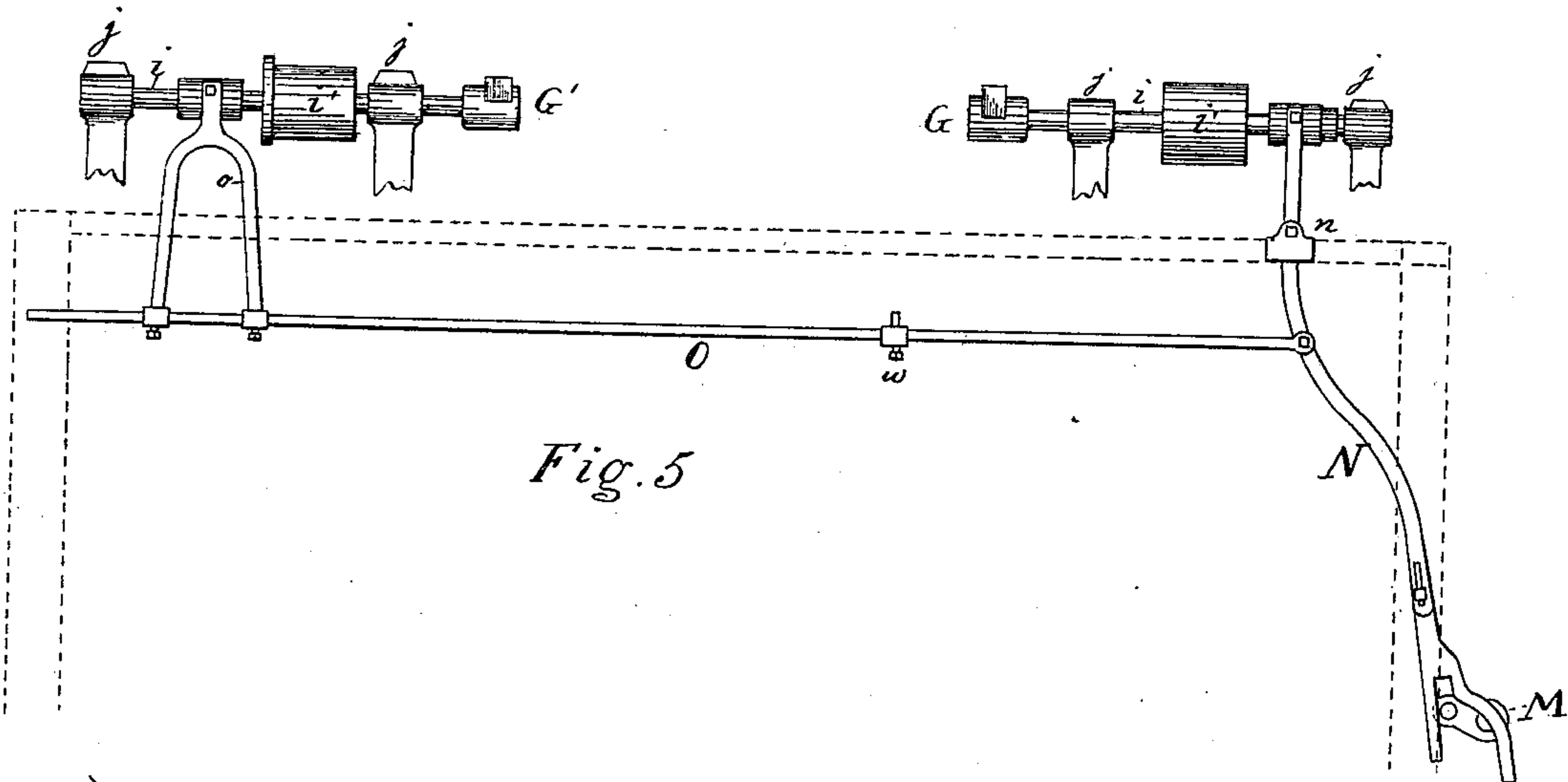
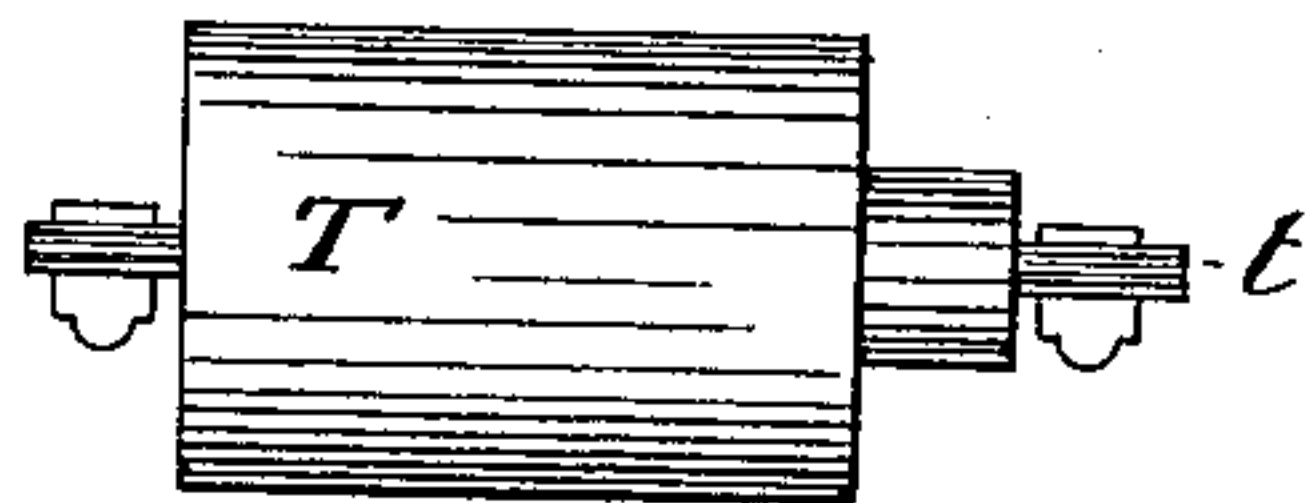


Fig. 5

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# UNITED STATES PATENT OFFICE.

LEWIS BUSH, JR., OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN MACHINERY COMPANY, OF SAME PLACE.

MACHINE FOR SAWING, TENONING, AND BORING CHAIR-LEGS, &c.

SPECIFICATION forming part of Letters Patent No. 332,699, dated December 22, 1885.

Application filed May 16, 1882. Renewed April 7, 1884. Serial No. 127,002. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS BUSH, Jr., of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Machines for Sawing, Chucking, and Boring Chair Legs and Spindles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and  
10 to the letters of reference marked thereon, which form a part of this specification.

The object of the invention is to construct a machine that will first grasp a chair leg or spindle, will next carry it between and past  
15 two circular saws for cutting it the proper lengths, that will next move and hold the leg or spindle in line between two hollow cutters having a lateral sliding motion and moving toward and away from each other for cutting  
20 the tenons on the ends of such chair leg or spindle, and that is provided with two arbors pivoted in a transversely-sliding frame and carrying augers for simultaneously boring into each chair-leg two sockets for the ends of the  
25 cross-braces, and that will finally drop each spindle after it is thus completed, the several movements of the machine to be automatic for completing in continuous succession the chair legs or spindles as they are fed to it.

30 Therefore my invention consists of the novel devices and combinations of devices herein-after described and specifically claimed.

In the accompanying drawings, forming a part hereof, Figure 1 represents an end elevation of the machine; Fig. 2, a plan view; Fig.  
35 3, a sectional plan showing the automatic driving mechanism in the lower part of the machine; Fig. 4, a detached elevation of the drum for driving the auger-arbors, and Fig.  
40 5 an elevation of the hollow cutter-shafts and their shifting mechanism.

A denotes the frame of the machine, on the center of which a shaft, B, is pivoted longitudinally in journal-boxes *a*. Upon this shaft  
45 B are rigidly mounted at a proper distance apart two disks, C, each with six radial arms, *b*, that are equal distances apart, and at the extremities of which are formed rounded seats *c'* and hooks *c*. The seat *c'* and vertex of  
50 each hook *c* form the rest for a chair leg or spindle, which is automatically held in posi-

tion each by a pointed hook, *d*, that is pivoted to the disk C. Each hook *d* has a heavy tail-extension, *e*, which will move the point of hook *d* toward and against the vertex of hook  
55 *c* while traveling around the upper semicircle, and will thus hold by gravity the chair leg or spindle placed upon such hooks *c*, but which will act in the opposite direction while moving around the lower semicircle, and will then  
60 rest against a shoulder, *f*, at hook *c*, thus releasing the chair spindle or leg. These weighted hooks *d* are pivoted in alternate succession against the two opposite sides of the disk C. Upon shaft B is also mounted a  
65 ratchet-wheel, D, having six teeth, and being intermittently rotated by a pawl, *g*. Yoke-plates *E E' E<sup>2</sup> E<sup>3</sup>* are secured to the top of frame A so as to be longitudinally adjustable thereon. These frames *E* rest with one end  
70 upon one side rail of frame A, and with their opposite ends they are sleeved upon shaft B, and each pair carries fixed bearings for the arbor *h* of a circular saw, F, and journal-boxes  
75 *j* for the mandrel *i* of a cutter-head, G. These journal-boxes *j* can be laterally adjusted each by a set-screw, *y*, to bring the mandrels *i* longitudinally in line with each other and with the chair leg or spindle held in the hooks of  
80 disk C.

H is the main driving-shaft, pivoted in suitable journal-boxes in the lower portion of the frame A, and rotated from the line-shafting by a belt that is stretched over the pulley *k*. Upon this shaft are mounted two drums, I I',  
85 and belts Y are passed around each drum I I', and over a pulley, *h'*, on each saw-arbor *h* and, over a pulley, *i'*, on each mandrel *i*. One of these belts Y is held taut by an idler-pulley, J, that is mounted upon a shaft pivoted in  
90 journal-boxes which are secured against the yoke-plates each by a bolt passed through a slot, *e'*, so as to be vertically adjustable. By this device it will be seen one belt will drive both the circular saw and the cutter-head  
95 mandrel, and yet, for insuring the required traction, such belt will cover about one-half the circumferential surface of each pulley. Upon the overhanging end of the main driving-shaft H is mounted a worm, K, which  
100 meshes into a worm-wheel, L, that is sleeved upon a shaft, *l*. This shaft *l* is pivoted in



pedestal-bearings secured to the base of frame A, and a clutch-coupling, *s*, laterally slides on a feather on this shaft, and the worm-wheel has teeth to its hub, which engage with the coupling, that is arranged to be thrown in or out of gear by a forked hand-lever, R, for starting and stopping the rotation of shaft *l*. Upon one end of shaft *l* is secured a crank, M, and a lever, N, is pivoted to the frame A at *n*, and is bifurcated at its lower end to engage with the crank-pin on crank M, to be oscillated by the rotation of such crank, while its upper forked extremity connects with a collar of mandrel *i*. A bar, O, is coupled with one end to the lever N below its pivot *n*, and is guided in a suitable bracket at its opposite end. Upon this bar O is adjustably secured a crutch, *o*, the upper bifurcated end of which connects with a collar on the mandrel *i* of the opposite cutter-head, G'. The coupling center of bar O with lever N is just as far below the fulcrum of such lever N as the center of the mandrel *i* is above such fulcrum, so that the oscillation of the lever N will always shift the mandrels of the cutter-heads G G' an equal distance toward or away from each other. The lever N is made in two sections, adjustably bolted together in any well-known manner for varying the lengths of the tenons. The cutter-heads G and G' have each a socket that carries one or several adjustable knives.

A shaft, *p*, is journaled in suitable boxes that are secured to the base of the frame. This shaft *p* is placed parallel with the main shaft H, and is rotated by miter-gears *q* and *r*, one of which is mounted upon the end of shaft *l*, and the other one upon the end of shaft *p*. The opposite end of this shaft *p* has a crank, Q, attached, the crank-pin of which engages with the bifurcated end of a lever, *m*, which at *m*<sup>2</sup> is pivoted to the frame, and to the upper extremity of which is pivoted the pawl *g*, that engages with the ratchet-wheel D. S is an auxiliary frame, which is bolted to the side of the machine, and so as to be longitudinally adjustable. Upon this frame S is secured a plate, S', which can be radially adjusted by a bolt passed through a lug of said plate and through a segmental slot in frame S. The upper face of plate S' has guides, and is planed for a table, U, to slide laterally thereon. This table U is longitudinally slotted for adjustably securing the journal-boxes *z*, which are cast in pairs, each pair forming the bearings for a mandrel, V, that is socketed for inserting an auger, *v*. These mandrels V have each a pulley, *u*, for driving it by a belt from a drum, T, mounted upon a shaft, *t*, that is journaled upon the lower extensions of frame S, and is driven from the main shaft H by a belt passed over pulleys H' and Z. The table U has a projecting lug, *u'*. An upright shaft, W, is pivotally attached to the auxiliary frame S, and has two bifurcated cranks, *m'* and *n'*, secured at right angles, one of which is connected with the lug *u'* by a

pivot-pin, and the other one with the stud of a collar, *w*, which is adjustably attached to sliding bar O by a set-screw.

The operation of the machine is as follows, to wit: The chair legs or spindles as they come from the mill, where they have been cut and turned previous to perfect seasoning, are placed by a boy one by one upon the hooks *c* of disks C and C', at the front of the machine. These disks being now intermittently rotated by the ratchet D and pawl *g*, the weights *e* of hooks *d* acquire an angle that will force the points of such hooks *d* against the chair leg or spindle, and will thus firmly hold the leg or spindle in hooks *c*. With the further rotation of these disks the chair leg or spindle is moved between the circular saws F, where it is cut off the proper length, and next it is brought in line between the two cutter-heads G G', which, by the automatic mechanism before described, are moved toward each other for cutting the tenons on both ends of the spindles. For chair-legs, a tenon only to one end being required, one of the belts Y, that drive the cutter-head G, is taken off, so that this cutter-head will not be rotated, and its reciprocating motion can be stopped by disconnecting the crutch *o* from bar O. This belt Y is then stretched over the pulley H' and the small pulley on the shaft *t* of drum T, that will drive the auger-mandrels. These auger-mandrels, by the connections herein described, will be moved forward automatically simultaneously with the cutter-head G', thus, while forming the tenon, to also bore two sockets in such leg for the spindle-tenons. As soon as the cutter-heads have cleared the chair-spindle, or the cutter-head and the augers have cleared the chair-leg, the shaft B will receive another partial rotation, thereby bringing another leg or spindle that has passed the circular saws into the proper position between the cutter-heads, while the leg or spindle completed will move downward with the disks C, where the weights, by their own gravity, will be turned to a position to draw the hooks *d* away from the leg or spindle and allow it to drop out.

The advantages of the machine above described are, that it will perform a large amount of work without necessitating much attention, as after the machine has been properly adjusted it can be attended to by a boy and will deliver the chair legs or spindles all of uniform dimensions, thus saving the extra handling and expense.

What I claim is—

1. The combination, with the intermittently-rotated disks C C', for chucking the chair legs or spindles, substantially in the manner described, of the circular saw F and the cutter-heads G, having laterally-adjustable journal-boxes *j*, as and for the purpose set forth.

2. In a machine for the purpose substantially described, the shaft H, having drums I I', for driving the circular saws F and cutter-heads G G', and the worm K, for driving worm-



wheel L, that is mounted upon shaft *l*, and having crank M, for imparting reciprocating movement to the mandrels of such cutter-heads G and G', in the manner and for the purpose described and shown.

3. In a machine for the purpose substantially described, the cutter-heads G G', mounted upon the ends of mandrels *i*, having pulleys *i'* and laterally-adjustable boxes *j*, in combination with crank M, bifurcated lever N, bar O, and crutch *o*, the same being constructed and arranged to operate in the manner substantially as and for the purpose set forth.

4. The combination, with the intermittently-rotated disks C C', for chucking the chair-legs, the circular saws F, and the longitudinally-moving cutter-head G, of the laterally-sliding auger-mandrels V, the whole being constructed and arranged substantially as and for the purpose described and shown.

5. The combination, with frame A, shaft H, with pulley H' and worm K, shaft *l*, with worm-wheel L and crank M, and lever N, with bar O and stud-collar *w*, of the auxiliary frame S, having shaft *t*, with drum T and laterally-sliding journal-boxes *z* for mandrels V, that carry augers *v* and have pulleys *u*, and of vertical rocker-shaft W, having arms *m'* and *n'*, the whole being constructed and arranged substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

LEWIS BUSH, JR.

Witnesses:

F. W. KASEHAGEN,  
W. C. ADAMS.