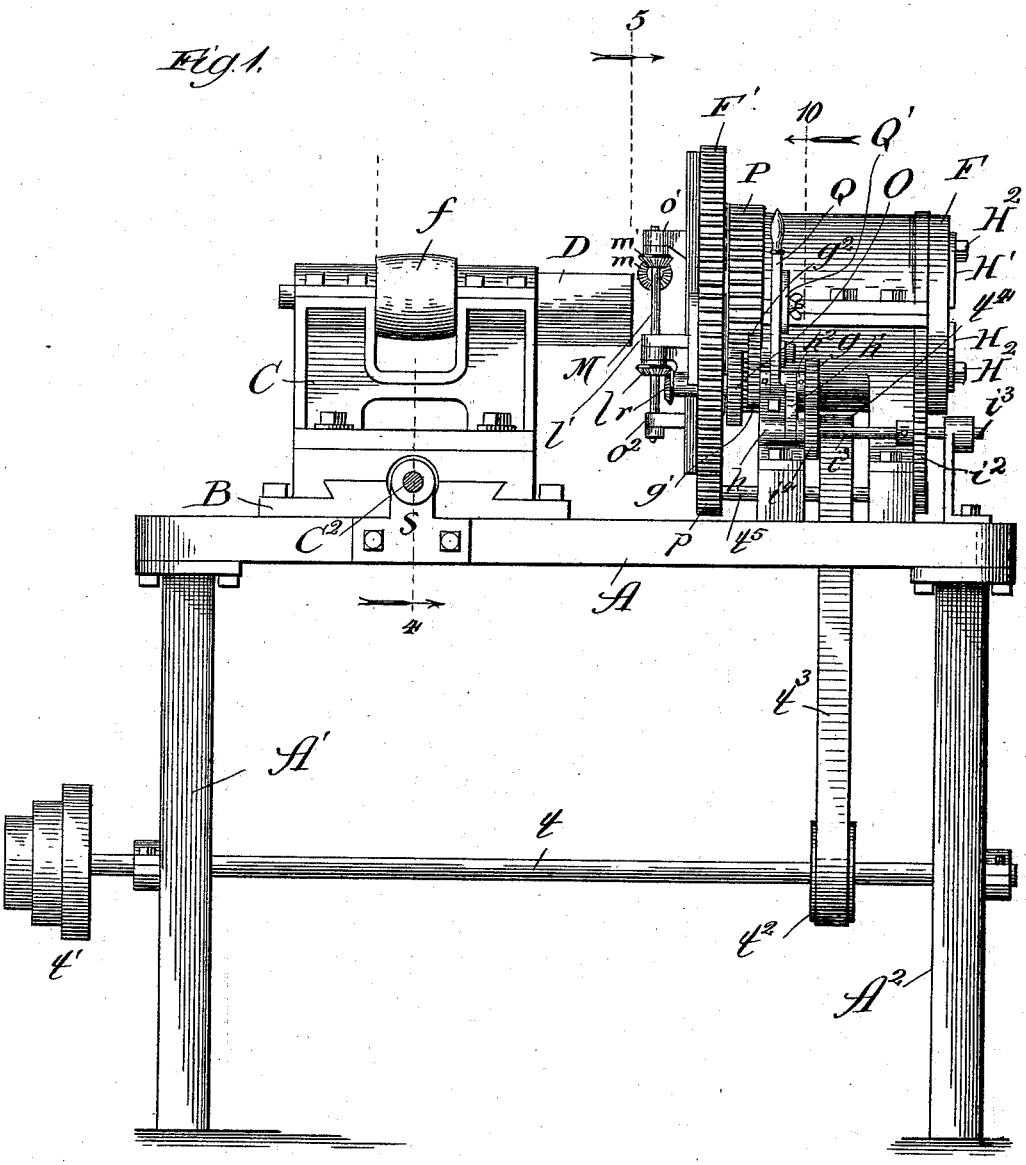
(No Model.) 5 Sheets—Sheet 1.

J. J. SHERMAN, Jr.

WOOD TURNING MACHINE.

No. 524,870. Patented Aug. 21, 1894.

Fig. 1.



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(No Model.) 5 Sheets—Sheet 2.

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Fig. 2.

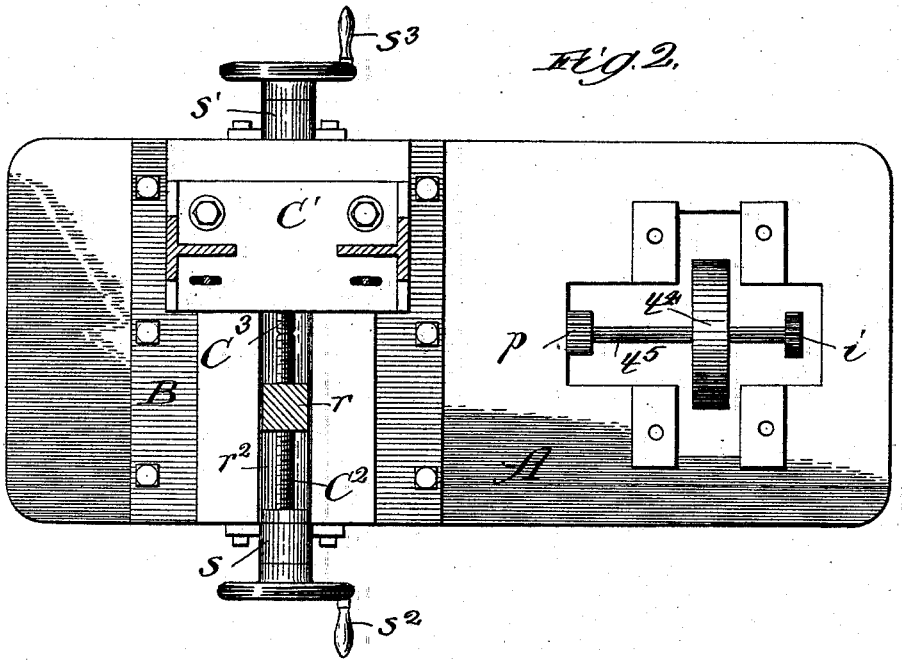


Fig. 3.

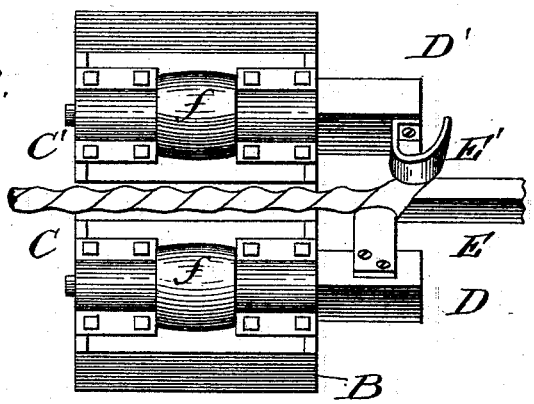
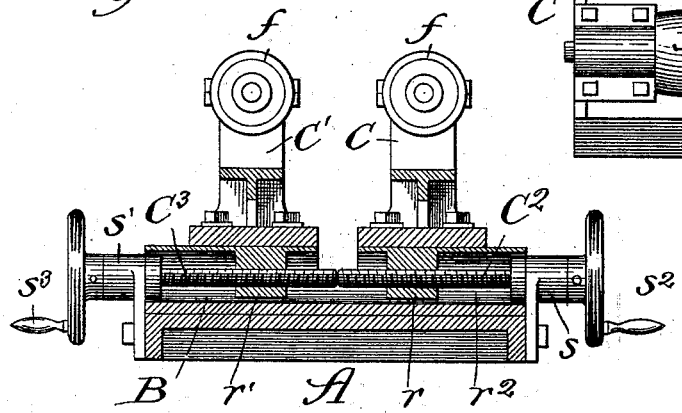


Fig. 4.



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5 Sheets—Sheet 3.

J. J. SHERMAN, Jr.

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Fig. 5.

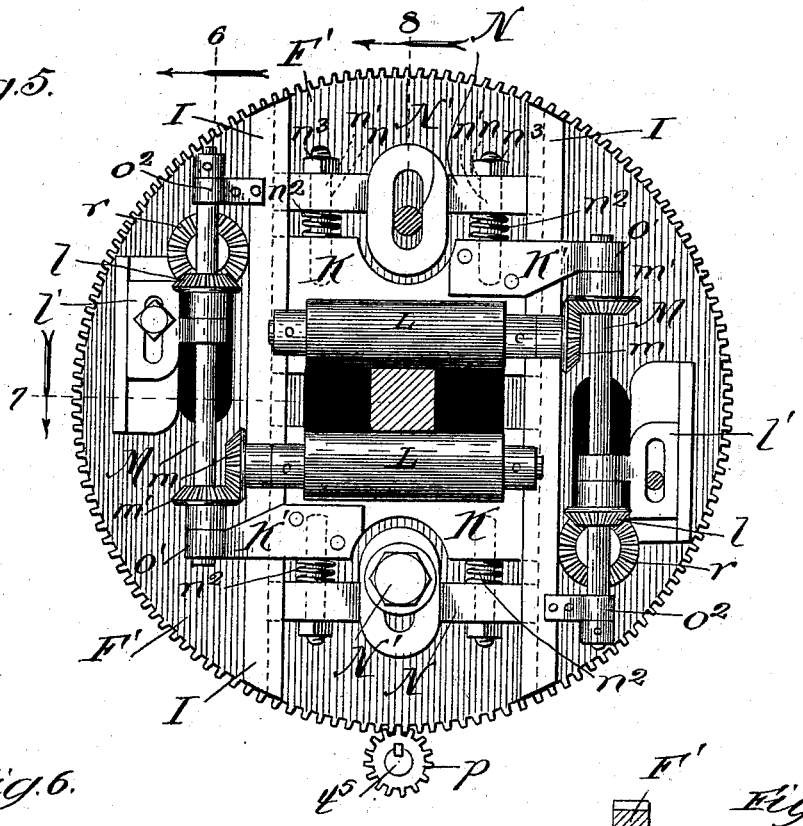


Fig. 6.

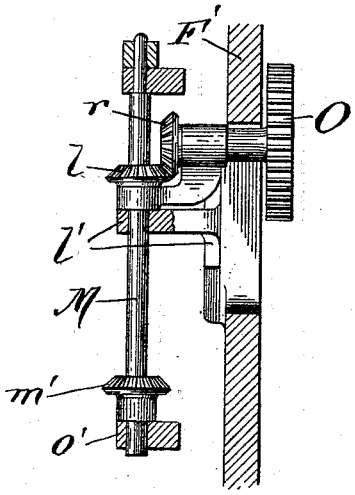
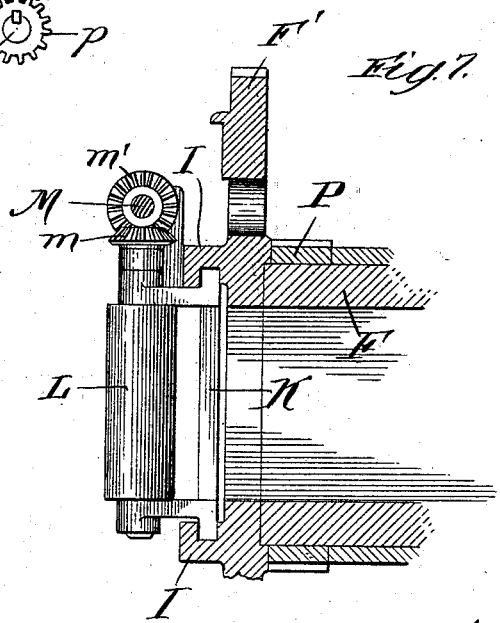


Fig. 7.



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WOOD TURNING MACHINE.

No. 524,870. Patented Aug. 21, 1894.

Fig. 8.

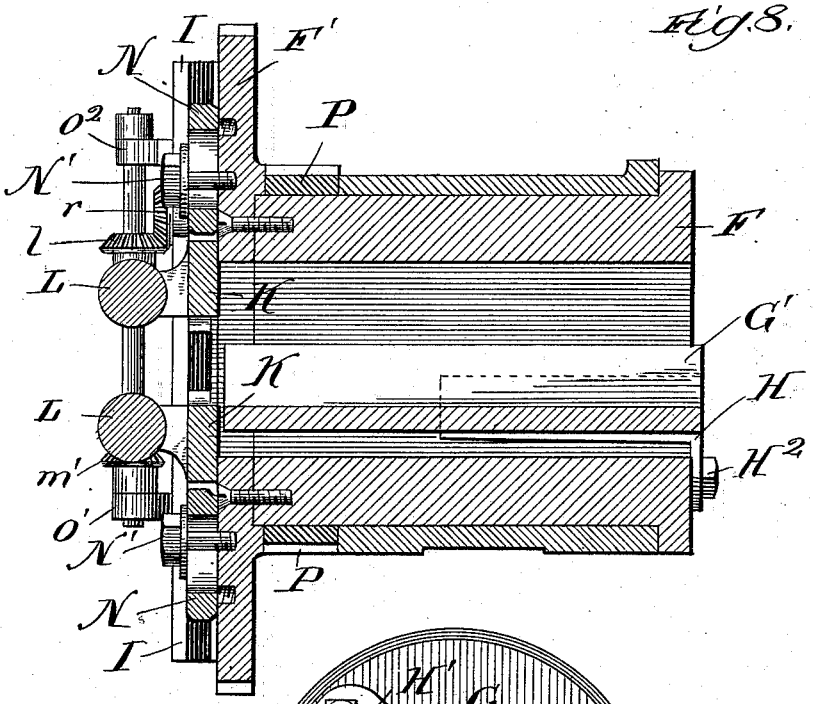
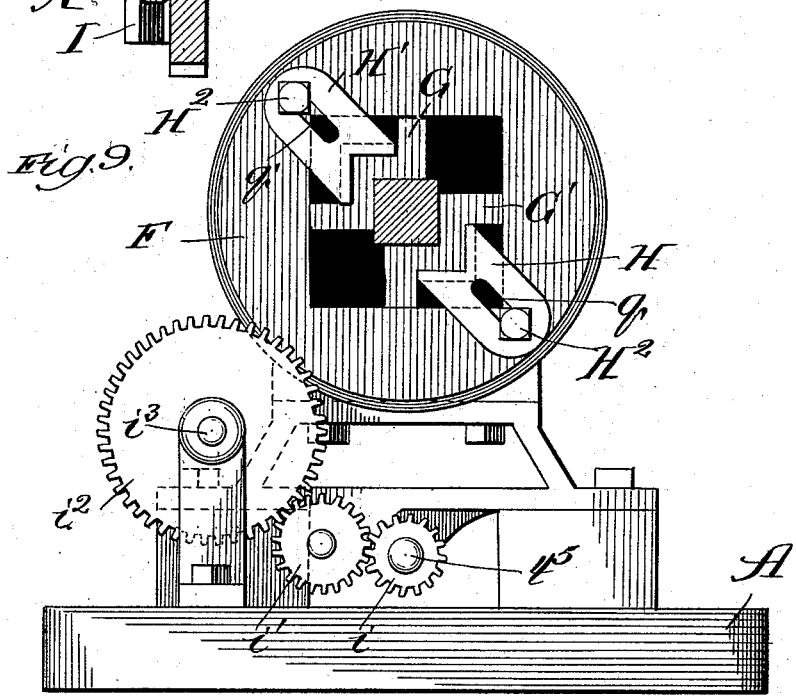


Fig. 9.



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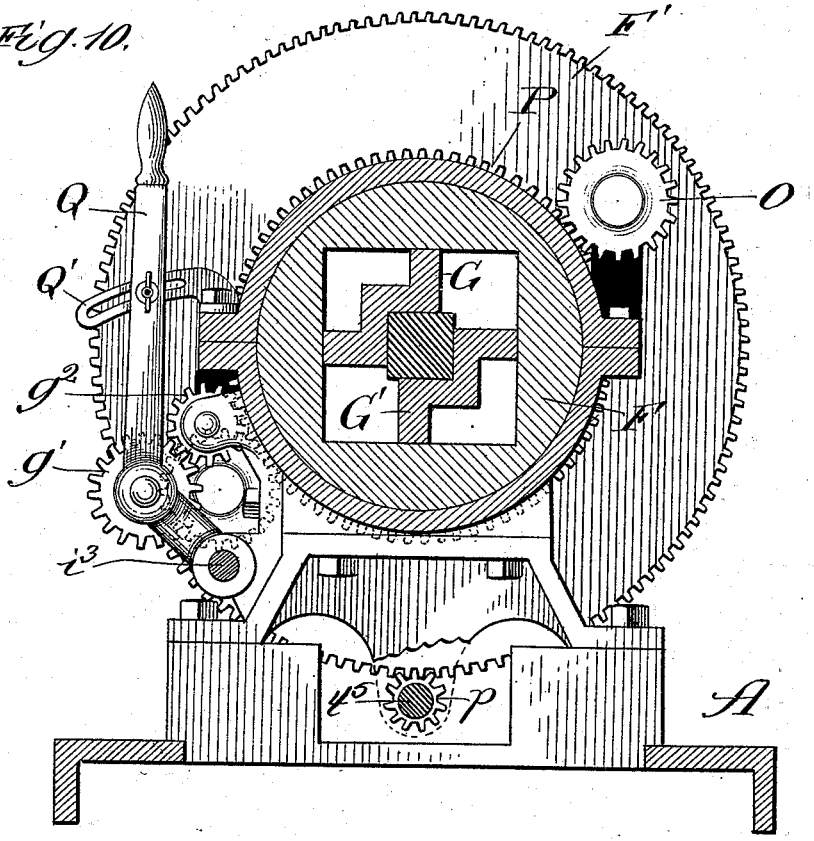
J. J. SHERMAN, Jr.

WOOD TURNING MACHINE.

No. 524,870. Patented Aug. 21, 1894.

Fig. 10.



Witnesses:
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C. R. Shipley

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UNITED STATES PATENT OFFICE.

JOHN J. SHERMAN, JR., OF CHICAGO, ILLINOIS.

WOOD-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,870, dated August 21, 1894.

Application filed April 24, 1893. Serial No. 471,682. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SHERMAN, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Wood-Turning Machines, of which the following is a specification.

My invention relates to an improvement in wood turning machines, and more particularly to an improvement in machines of the class employed for cutting a spiral in a wooden blank.

A particular purpose of the machines involving my improvement is to produce rapidly so-called mosaic molding strips or spiral frets.

A further object of my invention is to provide for the cutting in the same machine of spiral strips or spirally cut strips of different diameters, different depth of cut and different pitch of spiral.

My invention consists generally in a machine comprising a support and feed for the wood and knives rotating on axes parallel with the line of movement of the strip and adjustable toward and from the strip while in motion.

My invention consists further in the particular arrangement of parts, whereby the rate of feed may be regulated; and it consists further in the construction and arrangement of parts by which the pitch of the spiral cut may be varied.

My invention consists in the general and specific details of construction and arrangement of parts, all as hereinafter more fully set forth.

In the drawings—Figure 1 is a side elevation of a wood turning machine constructed in accordance with my invention. Fig. 2 is a plan view of the same, one of the knife carriages being removed to illustrate a detail. Fig. 3 is a view detached of the knife carriages, showing them in operative position in engagement with a blank. Fig. 4 is a vertical transverse section taken through the knife-carrying mechanism on the line 4 of Fig. 1, viewed in the direction of the arrow. Fig. 5 is an end elevation of the blank-supporting and feeding mechanism taken on the line 5 of Fig. 1, and viewed in the direction of the arrow. Fig. 6 is a view in cross section taken at the forward end of the blank supporting and feeding mechanism on the line 6 of Fig. 5 and viewed in the direction of the arrow. Fig. 7 is a view taken at right-angles to Fig. 6 on the line 7 of Fig. 5 and viewed in the direction of the arrow. Fig. 8 is a central vertical section through the blank carrying and feeding mechanism on the line 8 of Fig. 5, viewed in the direction of the arrow. Fig. 9 is a rear elevation of the blank carrying and feeding mechanism and showing the means for locking in place blanks of varying dimensions; and Fig. 10 is a vertical transverse section through the blank carrying and feeding mechanism on the line 10 of Fig. 1, viewed in the direction of the arrow.

A represents the bed of the machine supported on legs A′.

Extending longitudinally of the machine below the bed is a pulley shaft t carrying at one end cone pulleys t', and toward the other end a pulley t^2, the belt t^3 from which passes over a pulley t^4 on the shaft t^5 supported above the bed A.

Upon the bed A is located a guide-way B, of common construction, to receive the carriages C, C′, upon which are supported the cutter heads D D′.

Screws C^2 and C^3 passing, respectively, through sockets s s' at opposite sides of the bed A, and supplied with handles s^2 s^3 for turning them, engage internally screw-threaded downward projecting blocks r r' securely bolted or otherwise attached to the carriages C and C′, respectively, and extending into a slot r^2 in the guide B. The screws C^2 C^3 being stationary, turning them serves to move either carriage C or C′ toward or from the longitudinal center of the bed or table A, and hence toward or from the blank, which, as will presently appear, is supported to extend centrally and longitudinally of the table at an elevation to adapt it to be acted upon by the knives E E′ supported on the cutter heads D and D′, respectively.

In its details the construction of the cutter carrying mechanism and the mode of moving the carriages toward and from the longitudinal center of the machine, though preferably of the form shown in the drawings, may be of any suitable character, and no claim is laid to the specific construction here shown. The

cutters or knives E and E′ are, however, by preference different in their character, one, E′, being a so-called rough cutter or coarse cutter, its function being to take off of the blank on a spiral line the greater amount of surplus material, while the opposite cutter, E, is of the form and character necessary to produce the cut required for the finished product.

The cutters, as is usual in machines of this class, are removably secured to the cutter heads, so that different kinds and sizes of cutters E E′ may be employed to suit the peculiar requirements of the work operated upon. The obvious advantage of the arrangement of cutters shown is found in the fact that from a square blank a product of the kind eventually desired is produced in a single movement through the machine.

The blank carrying and feed mechanism comprises a cylindrical hollow body F, to the forward face of which is secured the gear wheel F′, by the rotation of which the blank support F is turned. The rotation of the gear F′ is accomplished through the medium of the pinion p, on the shaft t^5, which, as before described, carries the drum t^4 rotated by the belt t^3.

The bore of the cylinder F is rectangular and of uniform diameter from end to end, and an opening is formed in the gear F′ coincident in diameter with the diameter of the bore. The blank to be operated upon is supported centrally within the bore of the cylinder, for which purpose there are introduced into the cylinder opposite clamp plates G G′, each presenting a rectangular face, and each supported on the bearing H H′, the rear of which has elongated slots q q' to receive the adjusting bolt and nut H^2. It will be apparent that by loosening the bolt and nut H^2 either bearing may be brought nearer to or farther from the center of the bore of the blank supporting cylinder F.

On the front face of the gear wheel F′ is firmly secured a guide-way I, shown in the drawings as cast integral with the gear wheel. In these guides move the opposite tables K carrying opposite bearings o' to receive the journals of the serrated feed rollers L. Projecting laterally from each table K is a plate K′ terminating in a bearing o' for one end of a shaft M, the other end of which has its bearing in an ear o^2, extending laterally from the guide I upon the gear. In rear of each table K is a centrally slotted bar N having its lateral edges supported in the guide I and adapted to receive an adjusting bolt N′ in the slot, said bolt entering the face of the gear wheel F′ and serving to hold the bar N in fixed relation to the gear. Each bar N is provided with a perforation n to receive the smooth part of a bolt n', the opposite end of which bolt enters a screw-threaded recess in the table K. Between the table K and bar N the bolts n' are embraced by springs n^2. The head n^3 on the bolt presents a stop to the inward movement of the table K, while the spring permits the table to yield outwardly to provide for any slight increase in the dimension of the blank being operated upon.

The rollers L are the feed rollers and motion thereof is obtained through the following arrangement of gear: The shaft of each roller L carries at one end a bevel gear m meshing with a bevel gear m' on the shaft M. Having a splined connection with the shaft M is a bevel gear l carried by the adjustable bearing l', slotted, as shown, to receive a bolt and nut, through the medium of which its position with relation to the face of the gear wheel F′ may be varied. The bevel gear l meshes with the bevel wheel r, the shaft of which passes through the face of the gear F, as indicated in Fig. 6, and carries at its opposite end the pinion O. There being two feed rollers L, the operating parts, therefore, are duplicated, and there are hence two pinions O passing through apertures at opposite sides of the gear wheel F′. On the body of the cylinder F immediately behind the gear wheel F′ is supported a toothed ring P, which, therefore, moves with the cylinder F, but is capable of independent movement thereof. Each pinion O meshes with the toothed ring P. Independent motion of the ring P is accomplished by the following train of gear:

With a pinion i on the shaft t^5 meshes the pinion i', and with this meshes the pinion i^2 mounted on the inner end of a shaft i^3. On this shaft i^3 is another pinion i^4, adjacent to which is the opposite bearing h of the shaft i^3. From the bearing h extends upward a rock arm h' terminating in a cylindrical bearing h^2, and carrying an operating lever Q through the medium of which the bearing and rock arm may be moved with relation to the bearing h. A fixed slotted bar Q′ receives a bolt through the medium of which the lever Q may be adjustably held in lifted or lowered position, for a purpose presently described. In the journal h^2 is located a shaft, one end of which carries a pinion g meshing with the pinion i^4, while the other end carries a pinion g', which meshes with the pinion g^2, which in turn meshes with the toothed ring P. The pinion g' is removable from its shaft, while the other pinions in the chain are intended to remain in the position shown. By reason of its removability a pinion of different number of teeth may be substituted for the pinion g', with consequent variation in the rate of movement of the ring P, and hence of the pinion O and feed rollers L. As the pinion g' is supported in the bearing h^2, which by the operation of the lever q, is movable toward and from the pinion g^2, it will be apparent that the pinions g' and g^2 may be readily thrown into and out of engagement. When out of engagement the ring P has no independent movement, but moves with the cylinder F, and hence no movement is given to the pinions O or to the feed rollers, and the blank is held in a stationary position, or,

in other words, rotates without advancing. When by the movement of the lever q, however, the pinions g' and g^2 are caused to intermesh, it is obvious that the rotary movement obtained from the drum t^4 and transmitted through the chain of gears described to the pinion g', is conveyed to the ring P to cause the latter to move upon the cylinder F, and hence to produce a rotation of the pinion O and feed rollers L, to cause the blank to be fed onward.

The rotation of the knives to produce the cutting action upon the blank introduced between them is accomplished in the usual manner through belts or otherwise, pulleys f being shown for this purpose. The relative speed of rotation of the knives and blank is regulated in the common manner at the cone pulley t', or otherwise, expedients for this purpose being common and well-known in the art. The pitch of the spiral cut with the knives is controlled by the size of pinion g' introduced, without requiring any other alteration in the mechanism.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a wood turning machine, the combination with a continuously moving blank feeding and rotating device, of groove cutters supported and rotating on opposite sides of the line of feed on axes parallel with the line of movement of the blank and movable transversely toward and from the blank, substantially as described.

2. The combination, in a wood turning machine, with a blank feeding and rotating device, of cutter heads located on opposite sides of the line of feed and rotating on axes parallel with the line of feed and transversely movable toward the blank, and groove cutters of different characters respectively on the cutter heads on opposite sides of the blank one in advance of the other, whereby one cutter cuts coarsely and the other finishes the cut, substantially as described.

3. In a wood turning machine, the combination with the blank feeding and rotating mechanism, of a cutter head carrying a coarse groove cutting knife, and a cutter head carrying a finishing groove cutting knife, each cutter head rotating on an axis parallel with the line of feed, one on one side and the other on the other side the coarse cutter being arranged to cut in advance of the finishing cutter, substantially as and for the purpose described.

4. The combination with the feed rollers L and the tables K, carrying the same, and supported in guides on the face of the blank supporting and rotating cylinder, the bar N adjustably supported in fixed position with relation to the cylinder, bolts n' and springs n^2 connecting and separating the bar N and table K, all as and for the purpose described.

5. In combination with the blank holding cylinder F having the internal rectangular bore, the blank support comprising the interior bearing G G′ and adjusting bearing plates H H′ engaging and moving the bearing plates G G′ and having the slot for set-screw adjustment, as and for the purpose described.

JOHN J. SHERMAN, JR.

In presence of—
M. J. FROST,
W. N. WILLIAMS.