

J. W. GRAY.
WOODWORKING MACHINE.
APPLICATION FILED APR. 2, 1917.

1,284,092.

Patented Nov. 5, 1918.
2 SHEETS—SHEET 1.

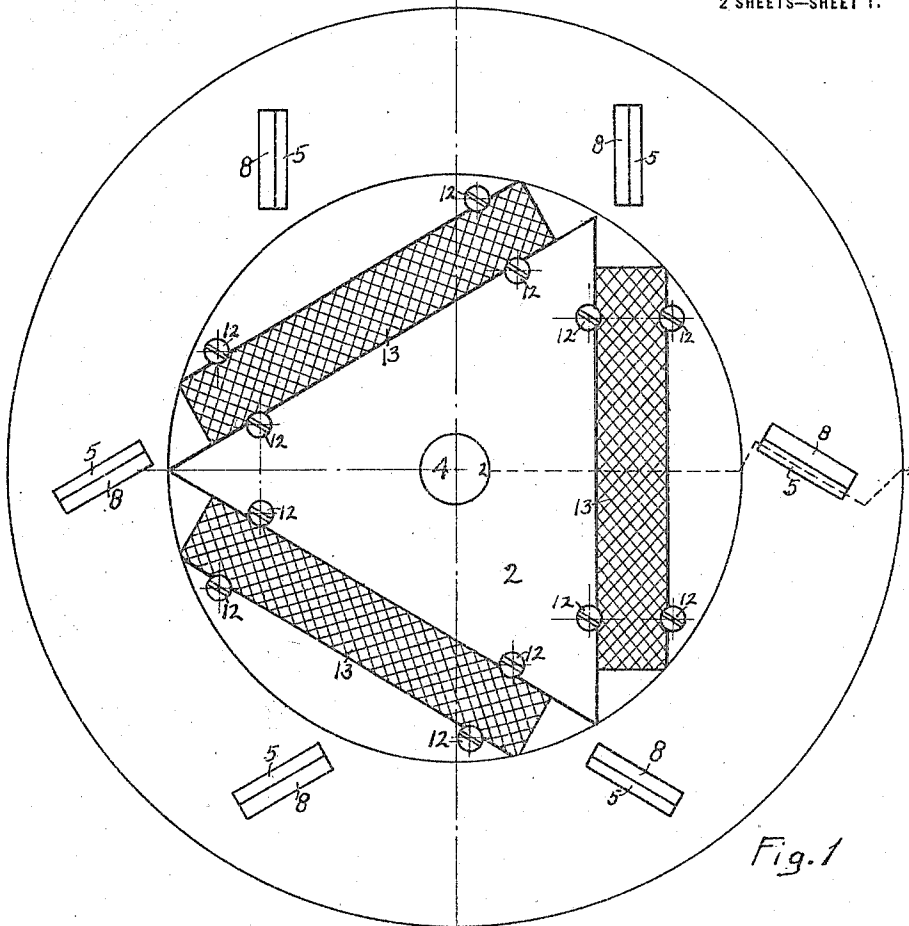


Fig. 1

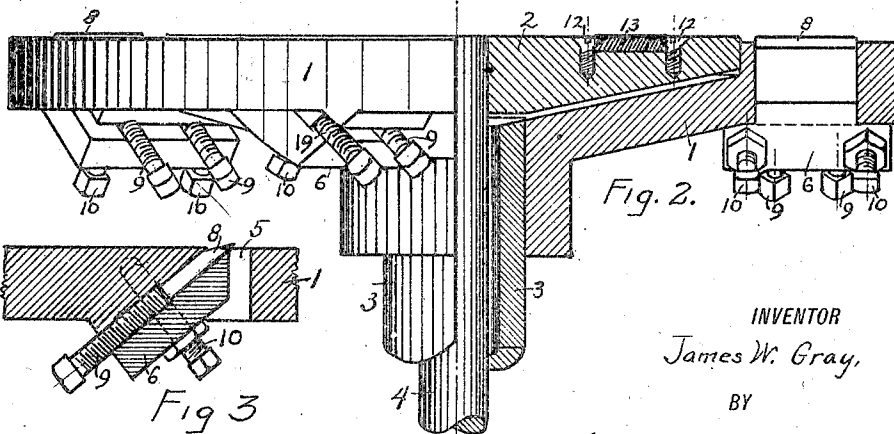


Fig. 2.

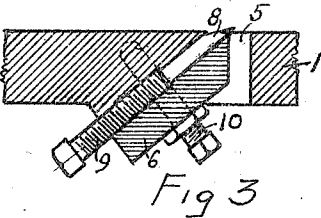


Fig. 3

INVENTOR
James W. Gray,
BY

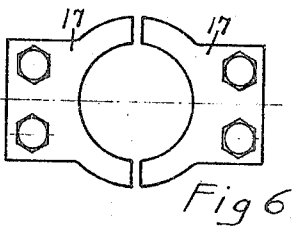
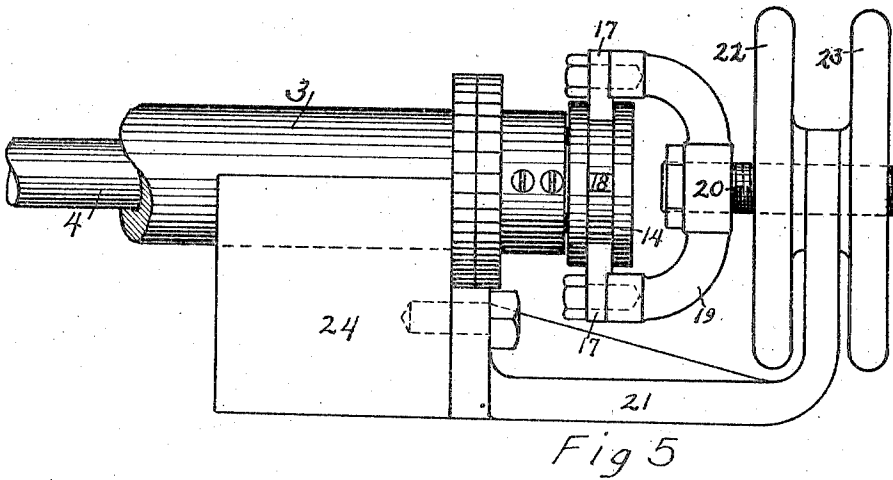
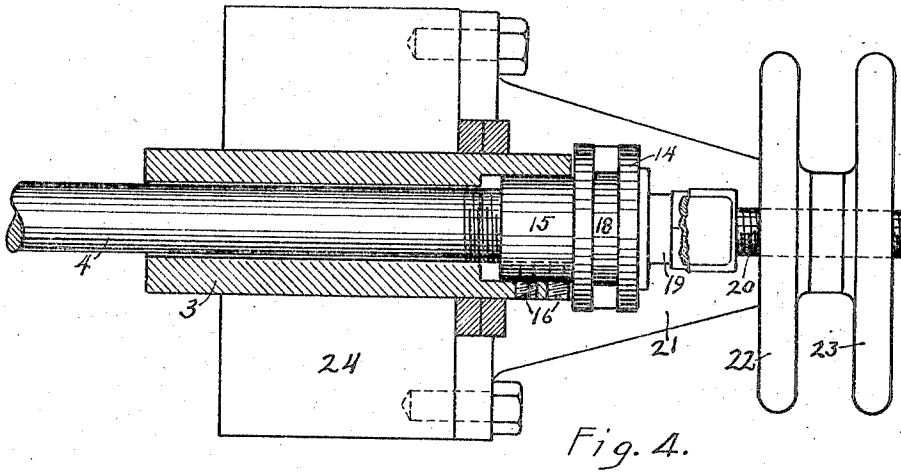
Geo. W. Bullard, ATTORNEY

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UNITED STATES PATENT OFFICE.

JAMES W. GRAY, OF TACOMA, WASHINGTON.

WOODWORKING-MACHINE.

1,284,092.

Specification of Letters Patent.

Patented Nov. 5, 1918.

Application filed April 2, 1917. Serial No. 159,358.

To all whom it may concern:

Be it known that I, JAMES W. GRAY, of the city of Tacoma, county of Pierce, and State of Washington, have invented new and useful Improvements in Woodworking-Machines, of which the following is a specification.

My invention relates to woodworking machines for finishing the flat surfaces of woods for all kinds of finished products. I have herein added novel means by which my former invention is improved. The object of my improvement is not only to obtain a smoothly finished surface, but to provide improved mechanical devices whereby the rotating disks with the cutters and smoothers fixed therein may be perfectly adjusted to each other and to the surfaces being finished.

I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a face view of the disks showing the cutters and smoothers fixed therein. Fig. 2 is a side view of Fig. 1 with one-half shown in section. Fig. 3 is a section through one of cutters. Fig. 4 is a top view of the opposite end of the shafts on which disks are mounted, with tubular shaft in longitudinal section, showing mechanism whereby disks are adjusted. Fig. 5 is a side view of Fig. 4. Fig. 6 is a face view of the split ring designed to engage the adjusting head.

Similar characters refer to similar parts in the separate views.

My invention comprises an annular disk 1 with a central disk 2 as in my former application, and is to be operated as described therein. The outer or annular disk contains the slots 5 set at angles approximately 30 degrees with the radii of the disk. The angle of inclination is made to alternate so that each knife or cutter is appositely inclined from the one preceding it as described in my former application and for the purposes set forth. It will be observed in Figs. 2 and 3 that the setting of the knives has been improved by using two adjusting screws 9 and two set screws 10 instead of one each as formerly shown. This enables me to perfectly adjust and fix the knives 8 in the cutter head 1. The clamping plates 6 and the knife slots 7 remain as in my former application. The width of the knives 8 may be varied to suit the annular width of the disk 1.

In my new improvement I have designed

to make the central disk 2 some larger in proportion to the outer disk 1 than formerly. In the outer part of the face of the central disk 2 are grooves extended in triangular or other form into which, by means of set screws 12 are firmly secured thin files or rasps 13 which produce a perfectly smooth and finished surface on the face of the material after the knives 8 have surfaced it. By this novel mechanism the material will be perfectly finished in one operation. No sandpapering will be required, thus saving the expense of the sandpaper machine and the labor of handling the material there-through. The surface is thereby finished smoothly, free of grit and sand marks.

It will be observed the disks 1 and 2 are made sufficiently strong and heavy for the required service. Disk 2 is recessed into disk 1 and each has a proper hub for shaft mounting. The annular disk 1 is set on a heavy tubular shaft 3 and disk 2 is mounted on a solid shaft 4 loosely inserted within shaft 3, and so fitted together that each turn about one central axis. The disks are so milled that 2 fits perfectly into 1, and each so mounted that the planes of their faces are parallel.

Central disk 2 is made adjustable independent of disk 1 by means of shaft 4 which extends lengthwise through tubular shaft 3. A grooved head 14 is firmly screwed onto the opposite end of shaft 4. The end of tubular shaft 3 and the neck 15 of the grooved head 14 are milled to fit each other. Set screws 16 through the side of shaft 3 engage a keyway in neck 15 and cause the two shafts 3 and 4 with the disk 1 and 2 respectively mounted thereon to rotate together. See Figs. 4 and 5.

A split ring 17 (see Fig. 6) is set to engage the groove 18 in head 14 when bolted to the arms of the yoke 19. The center of yoke 19 is firmly locked on the threaded stem 20 which is supported on a fixed bracket arm 21 with screw hand wheels 22 and 23 on each side thereof. The bracket arm 21 is firmly bolted to the bearing box block 24 in which shafts 3 and 4 rotate. By means of the screw hand wheels 22 and 23 on each side of the fixed bracket arm 21, the shaft 4 and the central disk 2 can be adjusted to the annular disk 1 while the two disks are in rotation. The faces of the finishing files or rasps can thus be so accurately adjusted to the plane of the cutters as to

finish the wood surface perfectly and hold the finished surface clear of the knives passing in the rear.

With this design of machine the manufacturers can finish their products in a satisfactory manner. It eliminates the probability of cross-grained portions of material being made unfit for the purposes desired by finishing them sufficiently smooth without the necessity of sand finishing.

The application of the cutters are so arranged as to press on the cross-grained portions of the surface in place of lifting or tearing it out. This eliminates all knife marks and produces a smooth surface. When desired for finished smoothing only, the central disk can be adjusted independently of the annular cutting disk without materially reducing the stock in thickness.

In surfacing air-dried stock it is found most satisfactory results are secured by simply reversing the cutting knives end for end. This will place the beveled face of the cutting knife 8 away from the wood instead of next to it, as shown in Fig. 3.

It is to be observed that shafts 3 and 4 rotate in a horizontal position with the face of each of the disks 1 and 2 in a vertical plane. It is to be further observed that an opposite pair of disks is designed to be used when surfacing both sides of the lumber. Then the mechanism herein described is but for one-half of a complete finishing machine. Any usual means of adjustment and methods of construction not mentioned herein will be used in assembling a machine with my improvements.

I do not limit myself to any size or proportion in designing and constructing the cutting and finishing disks, but reserve the right to so vary and proportion the same as manufacturing demands may require.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a woodworking device as described, the combination with a central disk, said disk surrounded with an annular disk into which it is fitted and so mounted as to rotate therewith, of a plurality of knives mounted in the annular disk a plurality of oblong flat files or rasps set in grooves cut in triangular or other form in the face of said central disk, and said disk so adjustably mounted that the face of the files may be made to conform with the cutting edges of the knives mounted in the said annular disk, to regulate the depth of their cut and to smoothly finish the material surfaced by said knives.

2. In a woodworking device as described, the combination with an annular cutting disk and a central smoothing disk, each independently mounted to rotate on a common axis, of an adjusting device attached to the opposite end of the shaft of said central disk, said device comprising a fixed grooved head on the end of said shaft, the neck of said grooved head being fitted into the tubular shaft of said annular disk, set screws on one side of said tubular shaft engaging a slip key-way in said neck of said grooved head, a split ring fitted into the groove of said head, said split ring mounted on a yoke, said yoke having a central threaded stem, said stem supported by a bracket arm fixed on the bearing of said tubular shaft, and said central stem having a hand set screw on each side of said bracket arm whereby the said central shaft and the said central disk mounted thereon can be adjusted to the annular disk and the cutters thereon while said disks are in rotation.

JAMES W. GRAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."