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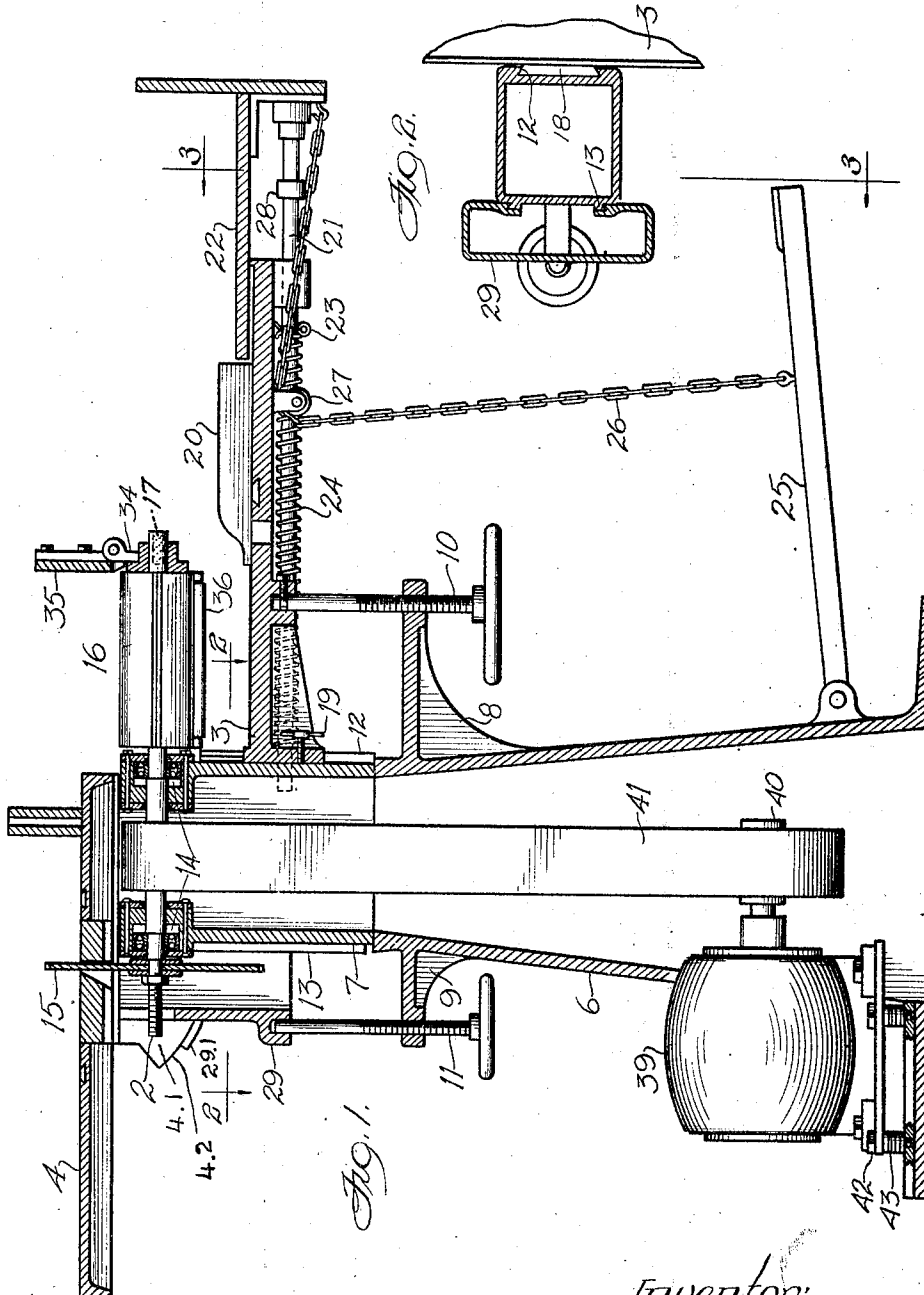
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COMBINATION WOODWORKING MACHINE

Filed Feb. 28, 1924

2 Sheets-Sheet 1



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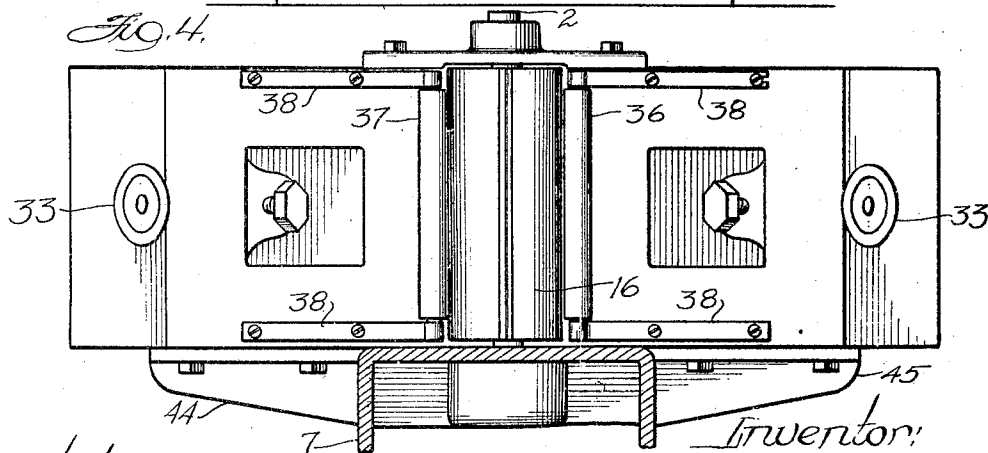
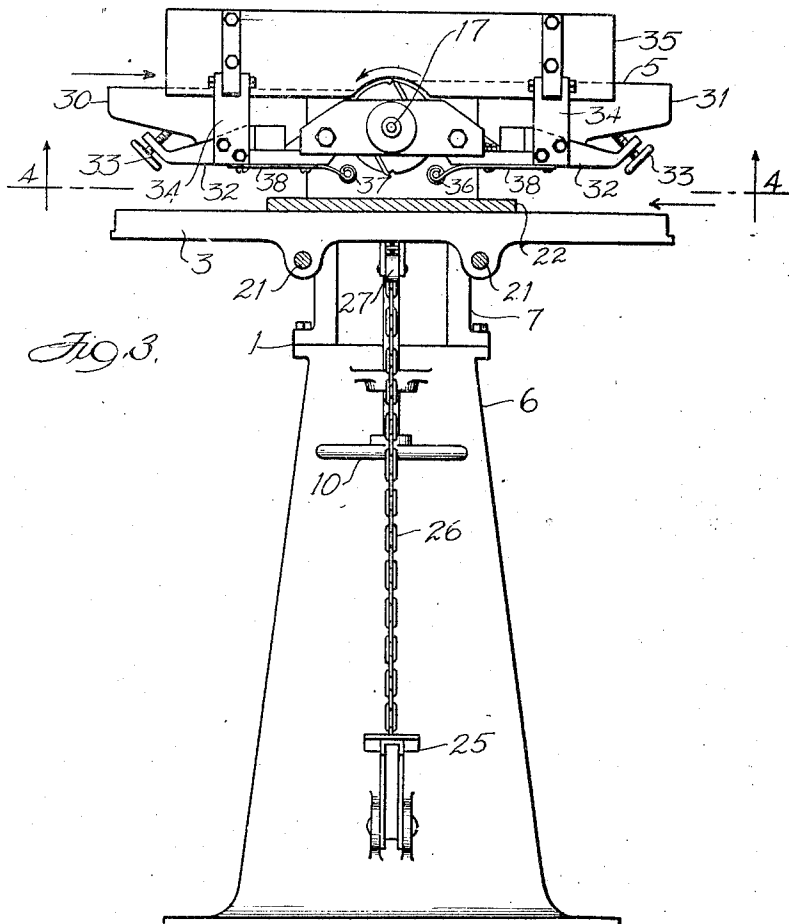
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COMBINATION WOODWORKING MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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COMBINATION WOODWORKING MACHINE.

Application filed February 28, 1924. Serial No. 695,712.

The main objects of this invention are to provide a woodworking machine of compact construction having an improved relative arrangement of parts whereby all of the common woodworking operations, such as sawing, planing, jointing, mortising, tenoning, rabbeting, sanding, boring, grinding, polishing, and the like, may be performed on a single machine; to provide an improved mounting for the operating spindle; to provide an improved construction and arrangement of frame for housing and supporting the operating mechanism; to provide an improved relative arrangement of adjustable tables for supporting the work to be acted upon in various positions with respect to the cutting tools; and to provide an improved form of mounting for a pressure roller arranged to hold the work firmly on one of said tables during one of the operations.

An illustrative embodiment of this invention is shown in the accompanying drawings wherein—

Figure 1 is a central vertical section of the machine.

Fig. 2 is a horizontal fragmentary section, on a reduced scale, taken on the line 2—2 of Figure 1.

Fig. 3 is a side elevation of the same, the adjustable boring table being in section taken on the line 3—3 of Figure 1.

Fig. 4 is an enlarged horizontal fragmentary section taken on the line 4—4 of Fig. 3.

In combination woodworking machines heretofore in use involving a so-called thickness planer wherein the work-supporting table is adjustably mounted below the cutter-head, the parts have been arranged so as to render impossible the planing of a board having a greater width than the cutter-head. In such constructions, the cutter-head is journaled in frame parts extending upwardly on opposite sides of the table and, consequently, these frame parts or standards form obstructions which prevent any board of greater width than the table from being fed to the cutter-head.

Moreover, in woodworking machines heretofore in use, combining jointer, thickness planer, saw and boring table, the frame has not been of a closed construction and has consisted merely of upright standards, so that the operating parts have been in the way of the operator, complicated in con-

struction, and requiring a large amount of floor space.

In the specific construction herein shown, the present invention is applied to a woodworking machine wherein the operating spindle extends beyond the frame, and the rotatable cutter-head is mounted on the projecting part of the spindle. The work-supporting table, which is mounted below the spindle, extends beyond the outer end of the cutter-head, and the space between the table and the head is free from obstruction. This construction permits the planing to any desired thickness of a board of greater width than the head by passing the board through the machine a second time with edges reversed. The frame is of hollow, columnar construction and houses the driving mechanism so as to preserve it substantially free from dust. The columnar construction of the frame, instead of the customary horizontal open type, greatly economizes on floor space and simplifies the construction.

In the construction herein shown, the invention is applied to a woodworking machine comprising a hollow columnar frame 1, on which is mounted an operating spindle 2, and vertically adjustable tables 3, 4, and 5, which are arranged to support the work in various positions to be acted upon by the cutting tools which are mounted on the spindle.

As illustrated, the frame 1 comprises a base part 6 and head 7. Formed on the base part 6, are brackets 8 and 9, in which are mounted adjusting screws 10 and 11, respectively, connected to the tables 3 and 4, whereby said tables may be vertically adjusted with respect to the spindle 2 for varying the depth of the cut. Formed on opposite sides of the head 7, are vertical guide-ways 12 and 13, which coact with corresponding parts on the tables 3 and 4, respectively, and arms 44 and 45, to which are rigidly attached the guide-members 32.

The spindle 2 is journaled on a horizontal axis in bearings 14 mounted in the upper part of the head 7. One end of the spindle 2 is adapted to support a disk saw 15, or similar tool, which extends through an opening in the table 4. The other end of the spindle 2 projects beyond the head 7 for supporting a rotatable cutter-head 16, and also, by means of the socket 17, in its outer extremity for supporting certain other tools,

such as a disk sander, mortiser, tool grinder, boring tool, etc. (not shown). The improved mounting of the spindle 2 permits the cutter-head 16 to overhang the table 3, without the use of any vertical supporting member at the outer extremity of the spindle.

The table 3 extends beyond the outer end of the cutter-head 16, and the space between said table and the overhanging head is free from obstruction, whereby a board of greater width than the head 16 may be planed, as hereinbefore described. Formed on the inner end of the table 3, is a dove-tailed member 18, which coacts with the guideways 12 for supporting the table. A hand screw 19, extending through the member 18, is arranged to clamp the table 3 in any of its adjusted positions. A gauge 20 is adjustably mounted on the upper face of the table 3 for guiding the work in rabbeting and similar operations.

Slidably mounted on the lower side of the table 3, is a pair of rods 21, on the outer ends of which is supported a boring table 22 which is thereby movable toward and away from the spindle 2 for feeding a piece of work to the boring or other tool supported in the end of the spindle. Embracing the rods 21 and bearing between the head 7 and cotter pins 23 on said rods, are helical springs 24 which normally urge the boring table outwardly. The boring table 22 is shifted inwardly against the action of the springs 24 by a foot lever 25 which is connected to said table by a cable 26 passing around an idler 27 mounted on the table 3. Mounted on one of the rods 21 and adapted to coact with the adjacent end of the table 3, is a collar 28 which is adjustable for setting the depth of the cut in the work on the boring table. The boring table is removable so that it may be taken off of the machine when not in use.

In the form shown, the table 4 is mounted on a box-like bracket 29, which is vertically slidable on the guideways 13.

The table mounting comprises a pair of bearing members 4.1 depending from the table and having arcuate bearing surfaces 4.2 which engage corresponding bearing surfaces of bearings 29.1 on the bracket 29. This mounting of the table 4 permits said table to be swung on an axis which is coincident with the line of intersection between the planes of the table top 4 and the saw 15.

The table 5 is of well-known construction, comprising a pair of separate sections 30 and 31, which are adjustable along upwardly inclined guide members 32 by means of adjusting screws 33. Extending upwardly from the stationary guide members 32, are brackets 34, on which is mounted a hinged gauge or guide 35 adapted to be adjusted to various angular positions relative to the

table 5 for guiding the work along said table in position to be acted upon by the rotatable cutter-head 16. The guide 35 permits the work which is fed along the table part 30 in the direction of the arrow—Fig. 3, to be jointed accurately at any desired angle.

Arranged below the table 5 on opposite sides of the head 16, is a pair of pressure rollers 36 and 37, which are supported in resilient brackets 38 mounted on the underside of the guide members 32. The pressure rollers are both used to hold the work firmly against the table 3 as it is being fed along said table in the direction of the other arrow—Fig. 3. However, in some classes of work, such as making a deep rebate, (rabbet) wherein the work is fed along the outer end of the cutter-head 16, it is desirable to remove the roller located in advance of the cutter, otherwise said roller would prevent a sufficient depth to the rabbet in the work. For this reason, the roller 36 and its outer bracket 38^a are removable so as to leave the work in advance of the cutter free from obstruction when it is desired to cut deeply into the work.

In the specific construction herein shown, the driving mechanism comprises an electric motor 39, having its drive shaft 40 projecting into the base 6 and connected to a pulley on the spindle 2 by an endless belt 41, which is completely housed within the columnar frame 1. To permit tensioning of the belt 41, the motor 39 is mounted so as to be vertically adjustable. For this purpose the motor is secured to the base of the frame 1 by bolts 42 having the desired number of washers 43 arranged between the base and the motor.

The machine is so arranged that the four different parts,—the saw table, the jointer table, the planer table, and the boring spindle—may be used simultaneously by four men without interfering with one another. It is believed that the various operations which may be performed on this machine are sufficiently clear from the foregoing description without any detailed description of the many possible uses.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A woodworking machine comprising a frame, a vertically adjustable table mounted on one side of said frame, an operating spindle journaled adjacent the top of said frame on a horizontal axis and having a portion thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging por-

tion of said spindle, a pair of stationary supporting members rigidly attached to said frame on respectively opposite sides of said spindle and located substantially in the horizontal plane of said cutter-head, and a bearing member located beyond the outer end of said cutter-head and secured to said stationary supporting members to form a bearing for the outer end of said spindle whereby the top of said vertically adjustable table is free from obstruction both underneath and beyond the end of said cutter-head and is adapted to support wider material than said cutter-head while the upper surface of said material is being operated on by said cutter-head substantially as described.

2. A woodworking machine comprising a frame, a vertically adjustable table mounted on one side of said frame, an operating spindle journaled near the top of said frame on a horizontal axis and having a portion thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging portion of said spindle, a pair of stationary supporting members rigidly attached to said frame on respectively opposite sides of said spindle and located substantially in the horizontal plane of said cutter-head, a bearing member located beyond the outer end of said cutter-head and secured to said stationary supporting members to form a bearing for the outer end of said spindle whereby the top of said vertically adjustable table is free from obstruction both underneath and beyond the end of said cutter-head, and a second table comprising two independent parts supported respectively on said stationary supporting members above the plane of said cutter-head so that said second table is adapted to hold material the lower surface of which is being acted on by said cutter-head, substantially as described.

3. A woodworking machine comprising a frame, a vertically adjustable table mounted on said frame, an operating spindle journaled in said frame on a horizontal axis and having one end thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging part of said spindle, said table extending beyond the outer end of said cutter-head, the entire upper face of said table being free from obstruction below said cutter-head and beyond said head, a pair of stationary supporting members overhanging said table on respectively opposite sides of said spindle and located substantially in the horizontal plane of said cutter-head, a bearing member mounted on said supporting members and forming a bearing for the outer end of said spindle, another table located in a plane above said spindle and comprising a pair of parts respectively supported on said supporting members for holding work in position to have the lower face thereof acted upon by said cutter-head, a pair of substantially flat springs mounted on the lower face of each of said supporting members and having bearing parts formed therein, and a pair of rollers journaled in said bearing parts and located on

holding work in position to have the lower face thereof acted upon by said cutter-head, and a pair of spring pressed pressure rollers supported on the lower faces of said overhanging supporting members on respectively opposite sides of said spindle.

4. A woodworking machine comprising a frame, a vertically adjustable table mounted on said frame, an operating spindle journaled in said frame on a horizontal axis and having one end thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging part of said spindle, said table extending beyond the outer end of said cutter-head, the entire upper face of said table being free from obstruction below said cutter-head and beyond said head, a pair of stationary supporting members overhanging said table on respectively opposite sides of said spindle and located substantially in the horizontal plane of said cutter-head, a bearing member mounted on said supporting members and forming a bearing for the outer end of said spindle, another table located in a plane above said spindle and comprising a pair of parts respectively supported on said supporting members for holding work in position to have the lower face thereof acted upon by said cutter-head, a pair of springs mounted on the lower face of each of said supporting members and having bearing parts formed therein, and a pair of rollers journaled in the bearing parts of said springs and normally urged downwardly by said springs.

5. A woodworking machine comprising a frame, a vertically adjustable table mounted on said frame, an operating spindle journaled in said frame on a horizontal axis and having one end thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging part of said spindle, said table extending beyond the outer end of said cutter-head, the entire upper face of said table being free from obstruction below said cutter-head and beyond said head, a pair of stationary supporting members overhanging said table on respectively opposite sides of said spindle and located substantially in the horizontal plane of said cutter-head, a bearing member mounted on said supporting members and forming a bearing for the outer end of said spindle, another table located in a plane above said spindle and comprising a pair of parts respectively supported on said supporting members for holding work in position to have the lower face thereof acted upon by said cutter-head, a pair of substantially flat springs mounted on the lower face of each of said supporting members and having bearing parts formed therein, and a pair of rollers journaled in said bearing parts and located on

respectively opposite sides of said spindle adjacent said cutter-head, one of said springs being removable to permit its roller to be removed.

5 6. A woodworking machine comprising a hollow columnar frame having vertical guideways on opposite sides thereof, a pair of vertically adjustable tables supported on said guideways, an operating spindle jour-
10 naled in said frame on a horizontal axis and having one end thereof projecting beyond said frame and overhanging one of said tables, a rotatable cutter-head mounted on the overhanging part of said spindle,
15 said one table extending beyond the outer end of said cutter-head, a pair of arms mounted on one side of said frame on respectively opposite sides of said spindle and extending at substantially right angles
20 thereto, a pair of supporting members mounted on said arms and located substantially in the plane of said cutter-head, a bearing member mounted on said supporting member and forming a bearing for the outer
25 end of said spindle, and a third table located in a plane above said spindle and comprising a pair of separate parts respectively supported on said supporting members for
30 holding work in position to have the lower surface thereof acted upon by said cutter-head.

7. A woodworking machine comprising a

frame, a vertically adjustable table mounted on one side of said frame, an operating spindle journaled near the top of said frame
35 on a horizontal axis and having a portion thereof projecting beyond said frame and overhanging said table, a rotatable cutter-head mounted on the overhanging portion
40 of said spindle, a pair of stationary supporting members rigidly attached to said frame on respectively opposite sides of said spindle and located substantially in the horizontal
45 plane of said cutter-head, a bearing member located beyond the outer end of said cutter-head and secured to said stationary supporting members to form a bearing for the outer
50 end of said spindle so that the top of said vertically adjustable table is free from obstruction both underneath and beyond the end of said cutter-head, a second table comprising two independent parts supported
55 respectively on said stationary supporting members above the plane of said cutter-head so that said second table is adapted to hold material the lower surface of which is being acted on by said cutter-head, and means on each of said stationary supporting members for independently adjusting said
60 second table parts, substantially as described.

Signed at Chicago this 7th day of January, 1924.

JOHN D. PIERCE.

CERTIFICATE OF CORRECTION.

Patent No. 1,621,999.

Granted March 22, 1927, to

JOHN D. PIERCE.

It is hereby certified that the State of Incorporation in the above numbered patent was erroneously given as "Ohio", whereas said State should have been given as "Illinois"; as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of April, A. D. 1927.

Seal.

M. J. Moore,
Acting Commissioner of Patents.