

Dec. 1, 1931.

G. L. DANNEHOWER

1,834,684

WOODWORKING MACHINE

Filed Sept. 3, 1930

4 Sheets-Sheet 1

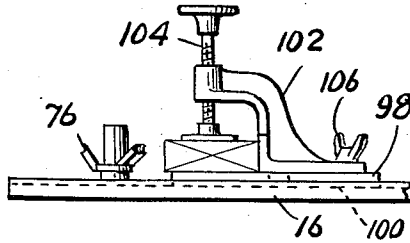
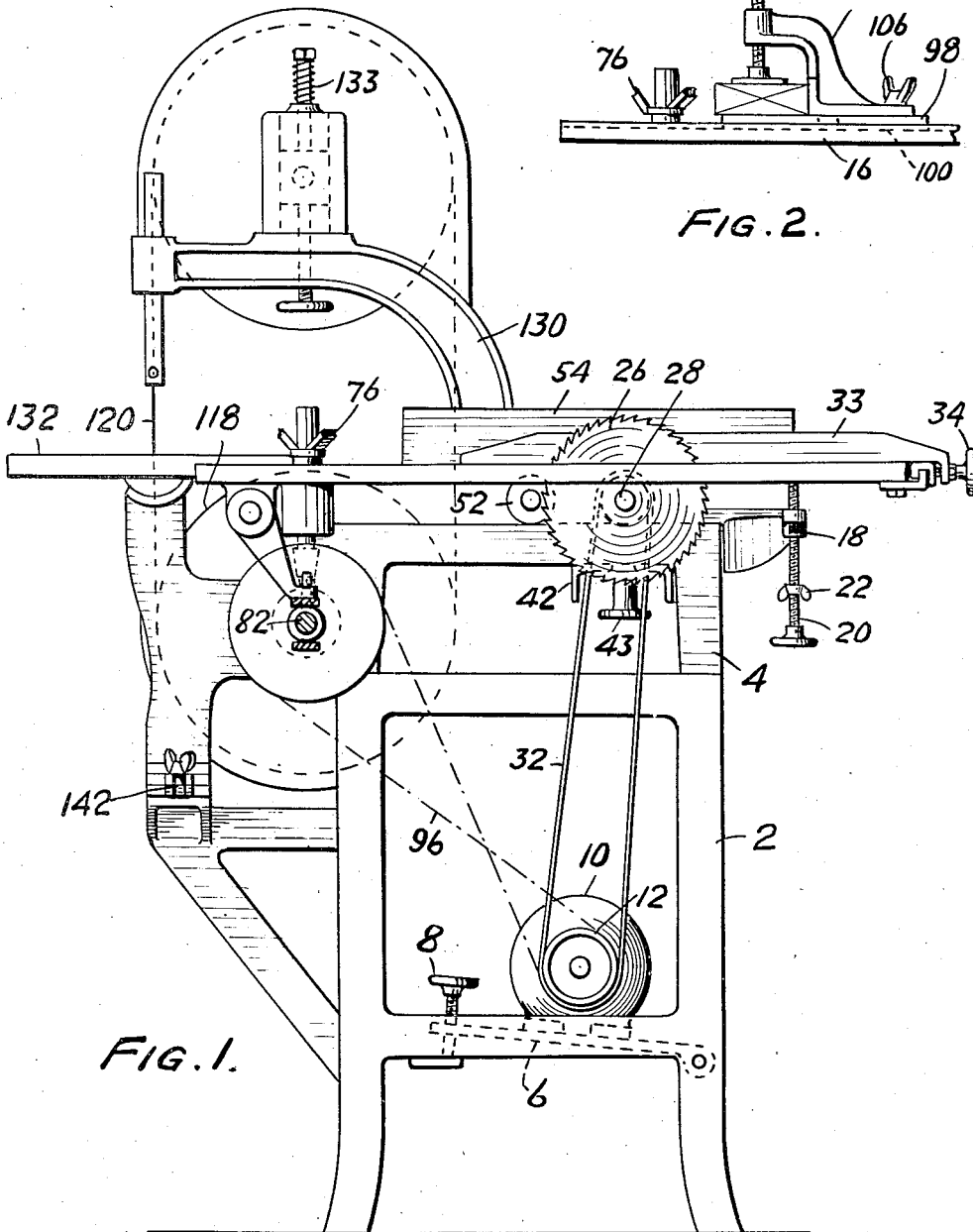


FIG. 2.



WITNESS:

Robt R Kitchel.

INVENTOR

Gilbert L. Dannefower

BY
Bussell & Harding
ATTORNEYS.

Dec. 1, 1931.

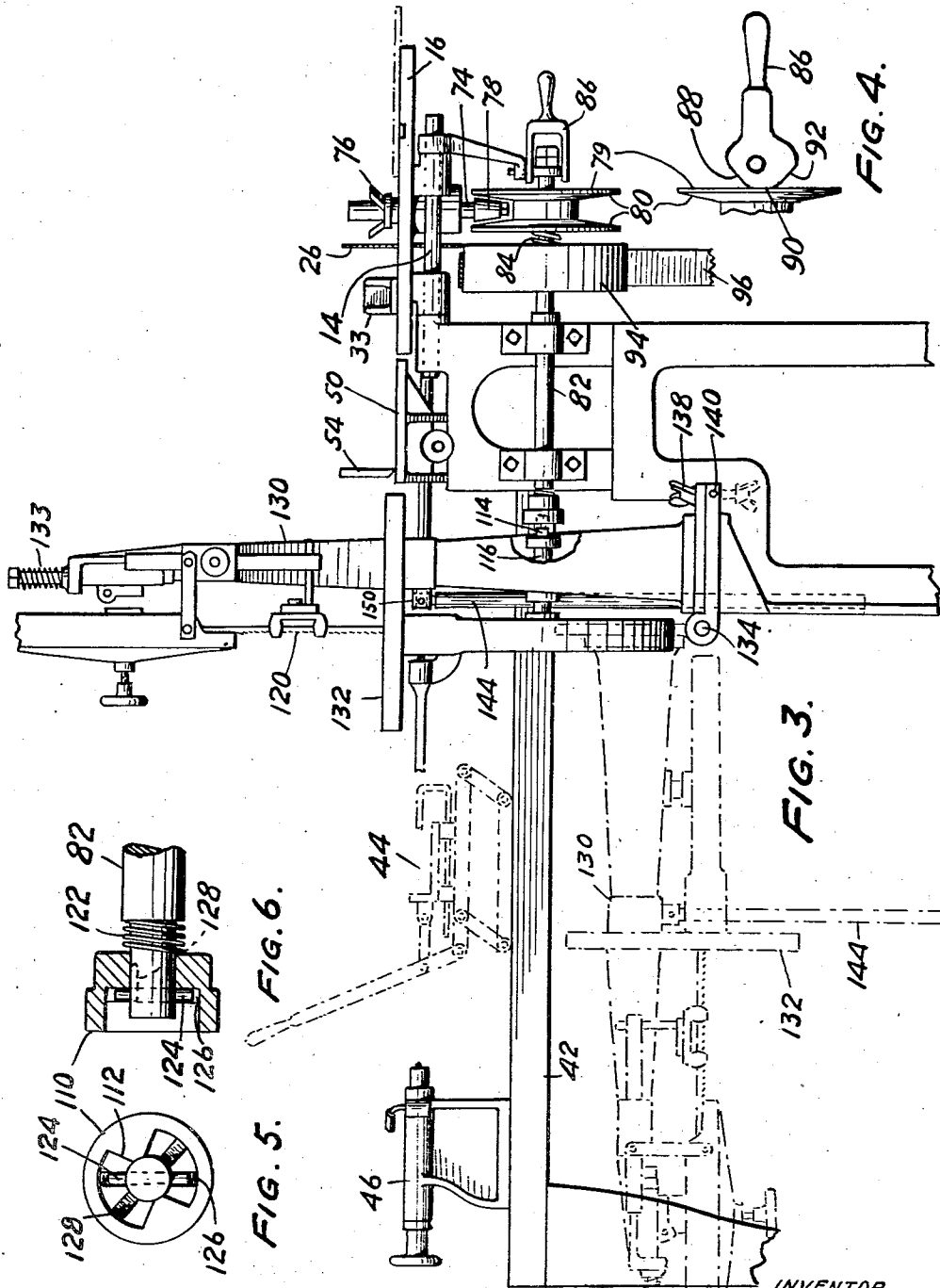
G. L. DANNEHOWER

1,834,684

WOODWORKING MACHINE

Filed Sept. 3, 1930

4 Sheets-Sheet 2



WITNESS:
Robt. R. Mitchell

Gilbert L. Dannehower

BY
Bussor & Harding
ATTORNEYS.

Dec. 1, 1931.

G. L. DANNEHOWER

1,834,684

WOODWORKING MACHINE

Filed Sept. 3, 1930

4 Sheets-Sheet 4

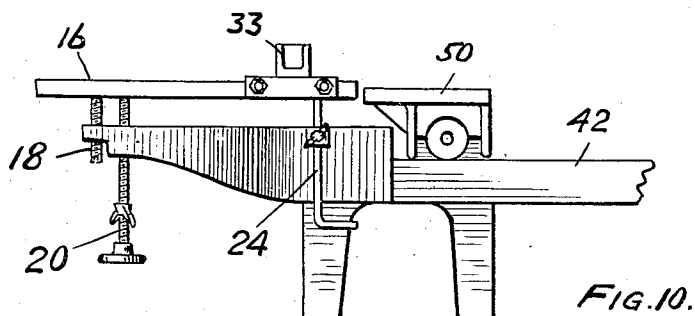


FIG. 10.

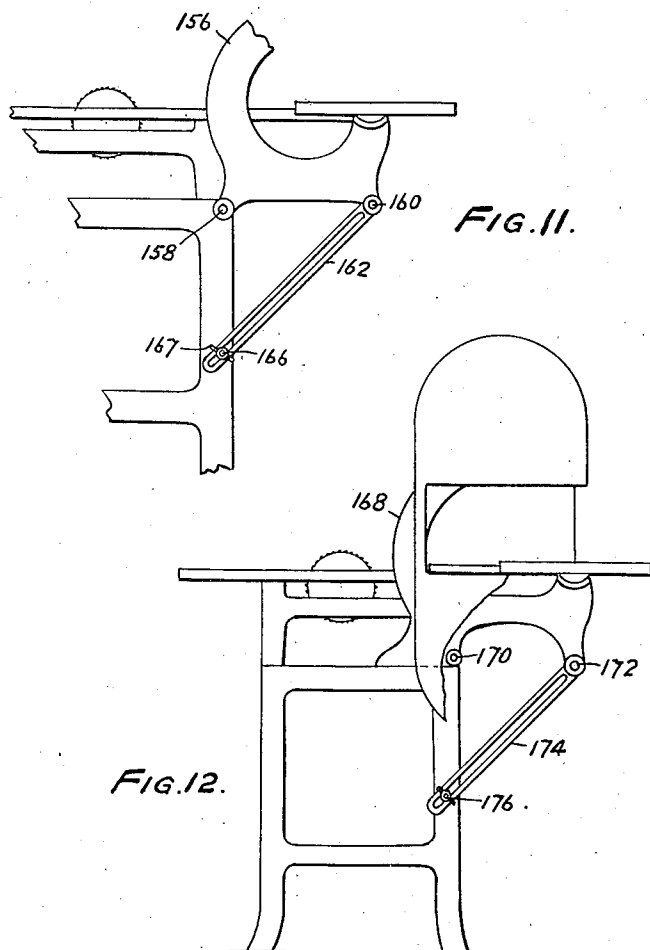


FIG. 11.

FIG. 12.

WITNESS:

R. F. Mitchell

INVENTOR

Gilbert L. Dannehower
BY
Bruce & Harding
ATTORNEYS.

UNITED STATES PATENT OFFICE

GILBERT L. DANNEHOWER, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR TO
WOODWORKING MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA

WOODWORKING MACHINE

Application filed September 3, 1930. Serial No. 479,465.

This invention relates to a woodworking machine and more particularly to a combination machine having various woodworking tools arranged for convenient and easy operation.

The primary object of the invention is the provision in a unitary machine of a number of woodworking tools with means for readily throwing into or out of operation the various tools in order to perform the work desired.

It is a further object of the invention to provide a machine of this character in which the tools are so arranged as to conserve floor space to as great degree as possible.

Another object of the invention relates to the provision of means whereby a band saw may be moved to a position so as not to interfere with the cross-cutting of large pieces of lumber and a clutch arrangement whereby it is automatically or manually connected to or disconnected from the driving means.

More detailed objects referring particularly to the arrangements of the various parts to facilitate their use and the arrangement of the driving means and other details of construction will be apparent from the following description read in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevation of a machine illustrating one embodiment of the invention;

Fig. 2 is a fragmentary side elevation of a detail omitted from Fig. 1;

Fig. 3 is a rear elevation of the machine;

Fig. 4 is a plan view of a detail;

Fig. 5 is an elevation of a clutch member used in the machine;

Fig. 6 is an axial section thereof;

Fig. 7 is a plan view of the machine;

Fig. 8 is a section on the plane indicated by line 8—8 in Fig. 7;

Fig. 9 is a detail view partly in section;

Fig. 10 is a front elevation of a portion of the machine;

Fig. 11 is a side elevation of a portion of the machine showing a modification; and

Fig. 12 is a view similar to Fig. 11 showing a further modification.

This application is in part a continuation

of my application Ser. No. 304,125, filed September 5, 1928.

The machine in its preferred embodiment comprises a supporting frame which may be formed in separate parts, for example, a lower part 2 and an upper part 4. Pivoted to the lower part of the frame is a bracket 6 vertically adjustable through the medium of a screw 8 threaded therein and engaging a fixed portion of the frame and carrying a motor 10 provided with a pulley 12 about which may be trained belts for driving various portions of the mechanism. The upper portion 4 of the frame has pivoted thereto on a fixed rod 14 a saw table 16 the horizontal position of which is determined by engagement with a stop screw 18, the table being adjustable above this position through an adjusting screw 20 which is threaded in the frame and engages the table, its adjusted position being held by reason of the provision of a lock nut 22. In order to prevent any looseness of the table, a rod 24 is arranged to be adjustably fixed in the frame and engage the bottom of the table in its various positions.

Projecting upwardly through a slot in the table 16, or preferably through a slot in an insert in the table, is a circular saw 26 which may be either a combined cross-cut and rip saw, or either of these types. The saw is removably carried on the end of a mandrel 28 journaled in the frame and carrying a pulley 30 vertically above the pulley 12 and adapted to be connected thereto through the medium of a belt 32. A fence 33 having opposed finished surfaces so that it may be used either on the right-hand or left-hand side of saw 26 slides in a transverse slot 36 formed in the forward edge of the table, being held in adjusted positions therein by means of a clamping screw 34.

The end of the mandrel opposite that which receives the saw is adapted to carry either a chuck or sanding, or other abrasive disc, or a bit such as indicated at 38, the bit in this instance being illustrated as passing through a mortising chisel 40 which may be removably secured to the frame, the bit and chisel extending over the lathe bed 42 which

is illustrated as carrying a mortising table 44. The lathe bed 42 is lengthwise adjustable in the frame, being held in adjusted position by nuts 43 threaded upon bolts projecting from the frame and passing through slots in the bed. A tail stock 46 is adjustable on the lathe bed in the usual manner. Suitable supporting members for holding work to be sanded or to be bored may be secured to the lathe bed. The lengthwise adjustment of the bed relatively to the frame provides ready means for changing the floor space occupied by the machine, the lathe bed being moved inward to conserve space when its entire length is not needed.

On the right-hand side of the saw table 16 is a jointer 48 carried by a spindle extending in parallelism with the mandrel 28 and carrying a pulley 52 lying in the same vertical plane as the pulley 30 and at substantially the same distance from the pulley 12 so that the belt 32 may be used alternately to drive either the mandrel 28 or the jointer. Tables 50 at the front and rear of the jointer are vertically adjustable in the usual manner for adjusting the depth of cutting. Since it is undesirable to have both the jointer and saw operating at the same time, the alternate use of the belt 32 is unobjectionable and in fact is very convenient, since the change from one to the other may be very readily effected, this change being facilitated by the manual raising of the table 16 to an extreme upper position.

In order to properly guide work presented to the jointer, there is provided a fence arrangement, illustrated in plan in Fig. 7 and in sectional detail in Fig. 8. This fence consists of a guiding plate 54 adjustably carried so that it may assume either a vertical position perpendicular to the jointer axis or a sloping position as indicated in dotted lines in Fig. 8. To effect this adjustment one of the tables 50 is provided with bracket extensions 56 on which is supported a supporting member 58 slotted as indicated in Fig. 7 and held in fixed position by manually adjustable screws 60 threaded into the brackets 56. Pivoted to upstanding members 62 carried by the supporting member 58 are links 64 which are also pivoted to the guide plate 54. A link 66 is also pivoted to the guide plate and slotted as indicated at 68 to permit the passage of a screw 70 which passes through the slot and is threaded into an upstanding post carried by the member 58 whereby the link 66 may be clamped in adjusted position, thereby determining the angular position of the guiding plate 54. The vertical position of plate 54 is determined by an adjustable stop screw 72 against which it abuts when in vertical position.

Journalled in the table 16 is an upright spindle 74 arranged to carry at its upper end a shaper 76 or other tool adapted to operate

on a vertical axis. At its lower end the spindle 74 carries a conical follower member 78 provided with suitable friction facing material. Below the spindle 74 is a clutch member provided with opposed conical surfaces 80 extending on opposite sides of the follower 78, this member being splined to a shaft 82 and urged towards the right, as illustrated in Fig. 3, by a spring 84 against a cam 86 pivoted to the frame and provided with three cam faces 88, 90 and 92 at different distances from its pivot. By the adjustment of the cam 86 manually to bring the various faces into engagement with the clutch member either of the conical faces 80 may be engaged with the follower or, alternatively, a central position may be assumed in which the follower member is not engaged. As a result, if shaft 82 is driven in one direction, either a clockwise or counterclockwise rotation may be imparted to the spindle 74 by suitable adjustment of the cam. It is found desirable to form the faces 80 of aluminum, since proper frictional engagement is thereby provided without danger of heating at the high speeds of operation.

Motion is imparted to the shaft 82 through a pulley 94 carried thereby over which is trained a cross belt 96 adapted to be driven from the pulley 12 of the motor. When the belt 96 is used the belt 32 may be removed. However, here again no inconvenience is caused, since the shaper is not used at the same time as the saw or jointer. The pulleys 94 and 12 are, of course, in the same vertical plane together with the pulleys 30 and 52.

In order to properly present work to the shaper, particularly when tenoning is being done, there is provided a guiding element consisting of a base 98 slidable in a slot 100 formed in the table 16. Pivoted to the base 98 about the vertical axis is a supporting carrier 102 including a base and a vertical fence designed to engage material to be operated upon to properly hold the same in alignment, a screw 104 being provided to clamp the work in position. The adjusted angular relationship between the member 102 and the base 98 is maintained by the engagement within a slot 108 formed in an extension of member 102 of a stud carried by the base 98 on which is threaded a wing nut 106 designed to clamp the two parts together.

At its inner free end the shaft 82 carries a clutch element 110, this arrangement being shown in detail in Figs. 5 and 6. The clutch element 110 is provided with a noncircular opening 112 adapted to engage a corresponding projection 114 on a shaft 116 which drives the lower pulley 118 of a band saw, the saw 120 being guided over the pulley 118 and an upper guiding pulley in the usual fashion, the two pulleys being supported in

properly spaced relationship by a frame 130 carrying a table 132 adjustable through various angles in the usual manner. A spring tension adjustment of the usual type indicated at 133 serves to maintain the proper tension on the blade. Referring to Figs. 5 and 6, it will be noted that a spring 122 urges the clutch element 110 outwardly, this outward movement being limited by a pin 124 which may engage within either a shallow slot 126 or a deep slot 128 formed in the element 110. In the position illustrated in Figs. 5 and 6, the pin 124 engages the bottom of the shallow slot. At this time the element 110 will not project sufficiently far to engage its cooperating element 114 and accordingly the shafts 82 and 116 will not be operatively connected with each other. On the other hand, if the element 110 is manually moved against the tension of spring 122 and turned so as to bring the pin 124 into alignment with the slot 128, the element 110 will be projected sufficiently to engage the member 114, thereby coupling the two shafts. It will be obvious that the spring 122 will permit the element 110 to yield inwardly upon the application of pressure in an axial direction. This feature is of considerable utility, as will be hereafter pointed out.

The frame 130 of the band saw assembly is pivoted at 134 to the frame about an axis transverse to the lathe bed 42. When the band saw assembly is in its operative position, illustrated in full lines in the drawings, it is maintained in that condition by means of an aligning pin 136 entering aligned holes in the frame 130 and the frame of the machine and also by suitable bolts 138 pivoted to the frame at 140 and adapted to enter slots 142 formed in the frame of the band saw, this latter frame being clamped against the frame of the machine by suitable wing nuts threaded on the bolts.

By release of the pin 136 and the bolts 138 the band saw assembly may be moved as a unit to the dotted line position illustrated in Fig. 3, wherein it lies below the level of the table 16, permitting cross-cutting of larger pieces of lumber which will be free to move over the table from which the various guides, fences, etc. have been removed. In order to limit the downward position of the band saw assembly, there is provided a rod 144 which is provided at its upper end with an elongated slot 146 embracing a pin 148 carried by a sidewise extending bracket 150 carried by the frame 130. This bracket is provided with a slide 152 which will permit inward movement of the rod 144 so that its cylindrical portion may enter a cylindrical opening 154. The slide 152 is opened so that the rod 144 may normally occupy a depending position such as is illustrated in Fig. 3. As the band saw assembly

is pivoted downwardly, the rod 144 maintains a vertical position and when it engages the floor seats within the cylindrical opening 154 as the band saw assembly reaches its inoperative position. The engagement of the cylindrical portion of the rod with the cylindrical opening maintains it in fixed relationship so that it cannot accidentally pivot out of vertical position beneath the assembly.

While there has been described and illustrated in Figs. 1, 3 and 7 a preferred arrangement of the band saw assembly so that when it is moved into inoperative position it occupies the floor area to the rear of the lathe bed 42, which is only used when an operator is using the band saw or mortising, Figs. 11 and 12 illustrate further possible arrangements of the band saw which, however, are less desirable in that when the band saw is moved to inoperative position additional and possibly valuable floor area is taken up.

Referring first to Fig. 11, the band saw assembly is illustrated at 156, being pivoted to the frame on an axis 158 which in this instance is parallel to the saw mandrel 28. In order to maintain it in upright position a link 162 is pivoted to the assembly at 160, being provided with a slot 164 embracing a stud 166, the link being clamped to the frame through the medium of a wing nut 167. The lower inoperative position of the band saw assembly may be conveniently determined by the engagement of the stud 166 with the end of the slot 164 adjacent the pivot 160.

A further modification is illustrated in Fig. 12, in which the band saw assembly 168 is pivoted intermediate its forward and rear ends on a pivot 170 which also is parallel to the mandrel 28. A link 174 equivalent to link 162 is pivoted to the assembly at 172 and a wing nut 176 serves to similarly hold the assembly in its operative position. In this case, while the entire assembly does not move below the level of the pivot 170, the pivot is located a sufficient distance below the horizontal plane of the saw table so that the entire assembly is moved below this plane out of position to interfere with cross-cutting.

It will be obvious that other arrangements than those disclosed may be used to permit the movement of the saw assembly to either operative or inoperative positions.

The mortising table 44 is described in detail and claimed in my copending application Ser. No. 479,466, filed of even date herewith, entitled "Woodworking machine."

It will be obvious that numerous variations may be made without departing from the invention as defined in the following claims, such arrangements including various portions of the improved machine used without others.

What I claim and desire to protect by Letters Patent is:

1. In a woodworking machine, a supporting frame, a driving pulley, a horizontally mounted mandrel, a saw table provided with a slot, a saw mounted on one end of said mandrel and projecting upwardly through said slot, the other end of said mandrel carrying a tool member, a second mandrel mounted parallel to said first mandrel and carrying a jointer at an edge of the saw table, and a third mandrel mounted parallel to said other mandrel, and operatively connected to drive a band saw and an upwardly projecting spindle carrying a shaper, and a pulley on each of said mandrels aligned with the driving pulley and arranged to be belt connected therewith, said supporting frame having an extension in line with the axis of the first mentioned mandrel and carrying lathe elements, and said band saw facing in the direction of said frame extension whereby an operator using the band saw may occupy a position adjacent the extension.
2. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a lathe bed projecting laterally from the frame, and a band saw assembly pivoted to the frame about an axis transverse to the direction of extension of the lathe bed so as to be movable either to an operative position in which it is adjacent the saw table and project thereabove, or to an inoperative position at the rear of the lathe bed in which it is below the plane of the table.
3. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, and a band saw assembly pivoted to the frame about an axis extending approximately parallel to the plane of the circular saw, the band saw rotating about axes parallel to the axis of rotation of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table.
4. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, and a band saw assembly pivoted to the frame about an axis extending approximately parallel to the axis of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table.
5. In a woodworking machine, a supporting frame, a saw table carried by the frame,

a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame about an axis extending approximately parallel to the plane of the circular saw, the band saw rotating about axes parallel to the axis of rotation of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, and means for holding the band saw assembly rigidly in operative position.

6. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame about an axis extending approximately parallel to the axis of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, and means for holding the band saw assembly rigidly in operative position.

7. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame about an axis extending approximately parallel to the plane of the circular saw, the band saw rotating about axes parallel to the axis of rotation of the circular saw whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, and means for limiting movement of the band saw assembly towards inoperative position.

8. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame about an axis extending approximately parallel to the axis of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, and means for limiting movement of the band saw assembly towards inoperative position.

9. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the

table, and means for limiting movement of the band saw assembly towards inoperative position, said means including a rod carried by the assembly and arranged to extend between the floor and the assembly to support the latter in inoperative position.

10. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame about an axis extending approximately parallel to the plane of the circular saw, whereby the assembly is movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, and means for limiting movement of the band saw assembly towards inoperative position, said means including a rod carried by the assembly and arranged to extend between the floor and the assembly to support the latter in inoperative position.

11. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, a rotatable spindle carried by the frame, and clutch means between the band saw and spindle, said clutch means being automatically engaged and disengaged as the assembly moves respectively towards or from its operative position.

12. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, a rotatable spindle carried by the frame, and clutch means between the band saw and spindle, said clutch means being automatically engaged and disengaged as the assembly moves respectively towards or from its operative position, and being also manually disengageable when the assembly is in operative position.

13. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a lathe bed projecting laterally from the frame, and a band saw assembly supported by the frame rearwardly of the lathe bed, the band saw assembly including a saw having teeth facing laterally in the direction of projection of the lathe bed, whereby an operator using

the band saw may occupy a position at the rear of the lathe bed, said band saw assembly being pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove, or to an inoperative position rearwardly of the lathe bed in which it is below the plane of the table.

14. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a lathe bed projecting laterally from the frame, a spindle supporting the circular saw and extending laterally to carry tools over the lathe bed, and a band saw assembly including a saw having teeth facing laterally in the direction of projection of the lathe bed, whereby an operator using the band saw may occupy a position at the rear of the lathe bed, said band saw assembly being pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove, or to an inoperative position in which it is below the plane of the table.

15. In a woodworking machine, a supporting frame, a saw table carried by the frame, a circular saw projecting above the table to cut material supported thereby, a band saw assembly pivoted to the frame so as to be movable either to an operative position in which it is adjacent the saw table and projects thereabove or to an inoperative position in which it is below the plane of the table, driving means carried by the frame, and connections between the driving means and the band saw releasable when the band saw assembly is moved to its inoperative position.

In testimony of which invention, I have hereunto set my hand, at Norristown, Pennsylvania, on this 29th day of August, 1930.

GILBERT L. DANNEHOWER.