

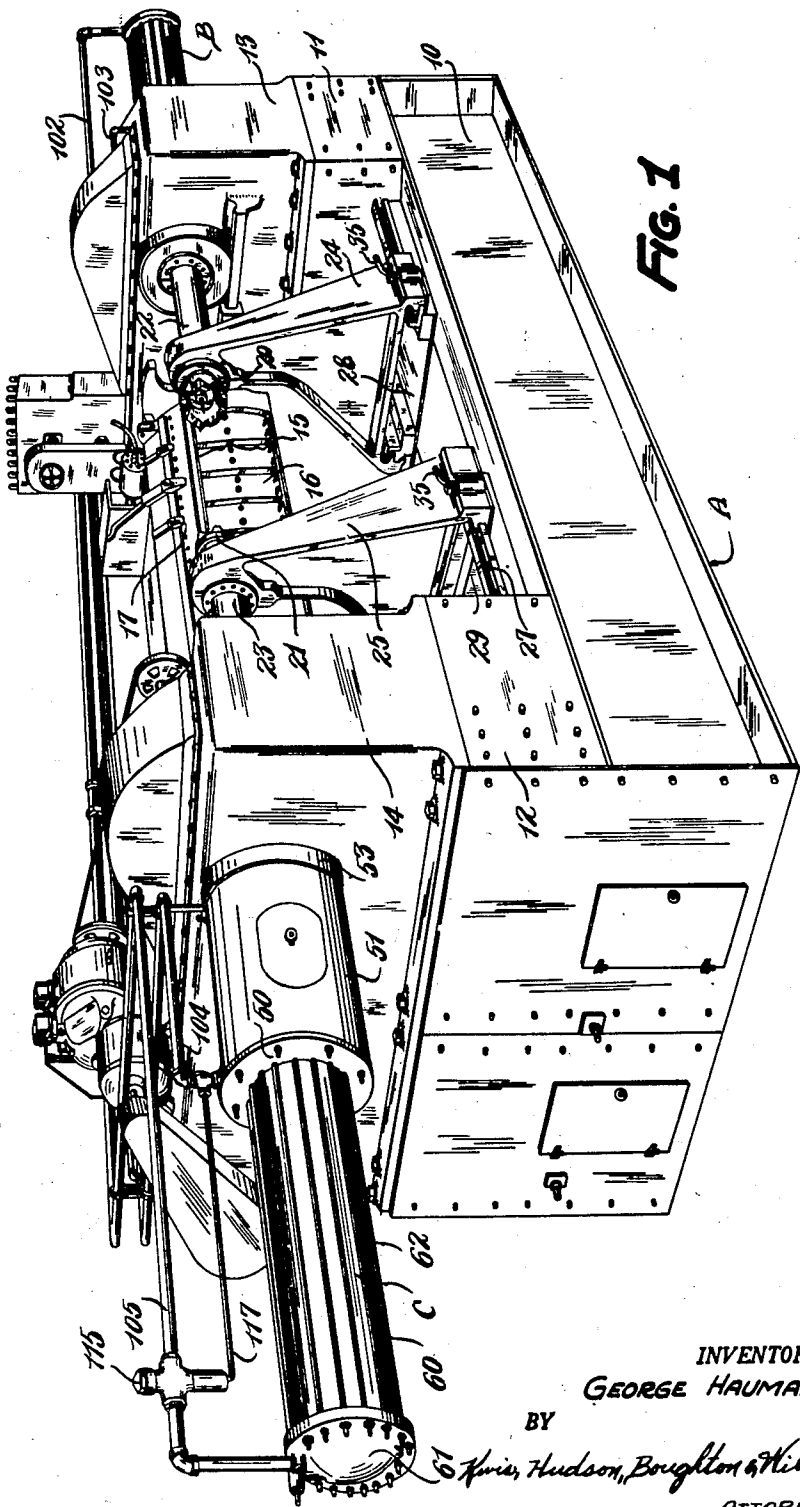
March 21, 1950

G. HAUMANN  
VENEER LATHE

2,501,387

Filed Oct. 23, 1946

4 Sheets-Sheet 1



INVENTOR.  
GEORGE HAUMANN

BY

*Wm. Hudson, Boughton & Williams*  
ATTORNEYS

March 21, 1950

G. HAUMANN  
VENEER LATHE

2,501,387

Filed Oct. 23, 1946

4 Sheets-Sheet 2

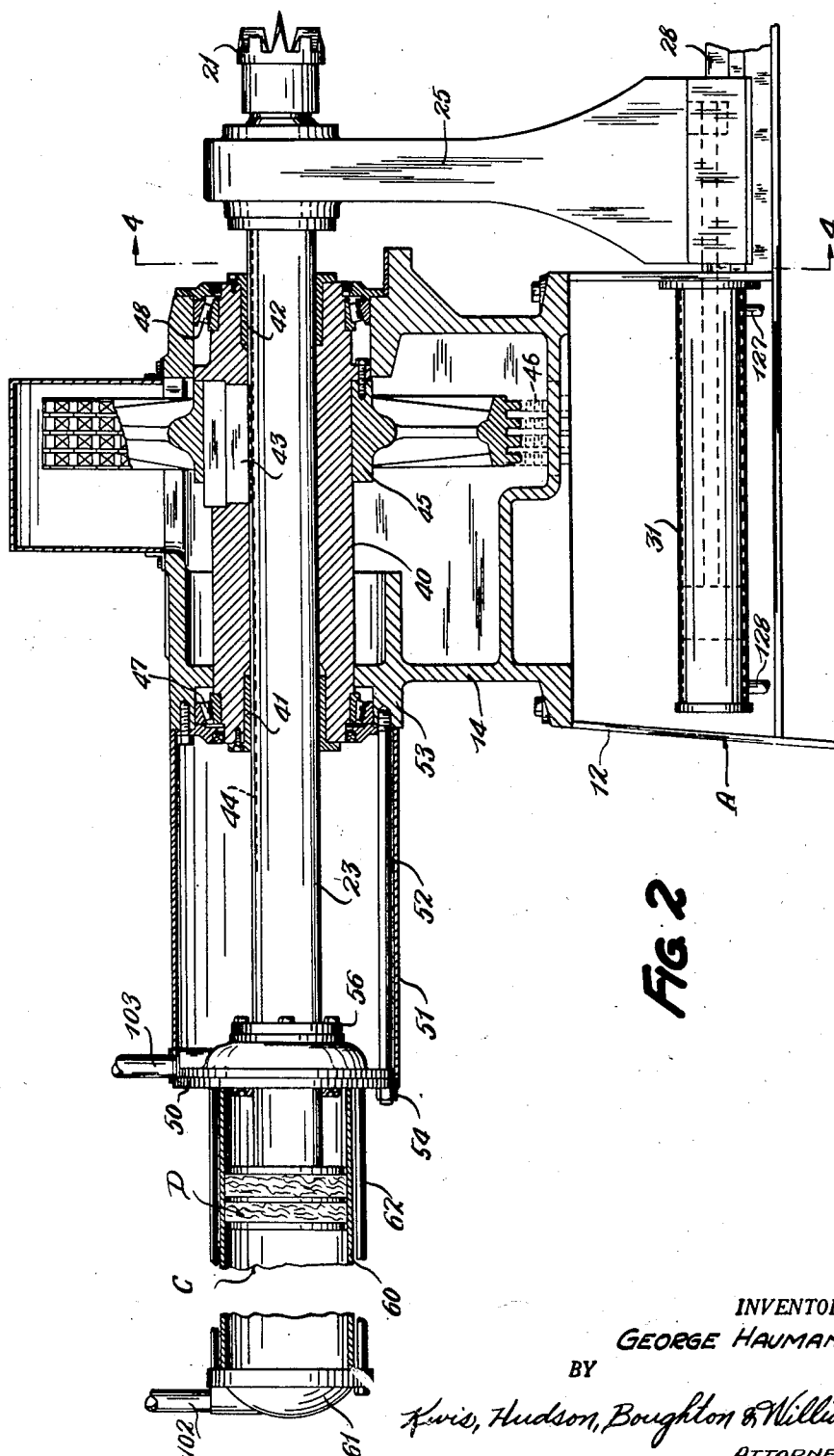


FIG 2

INVENTOR.  
GEORGE HAUMANN

BY

*Kwio, Hudson, Boughton & Williams*  
ATTORNEYS

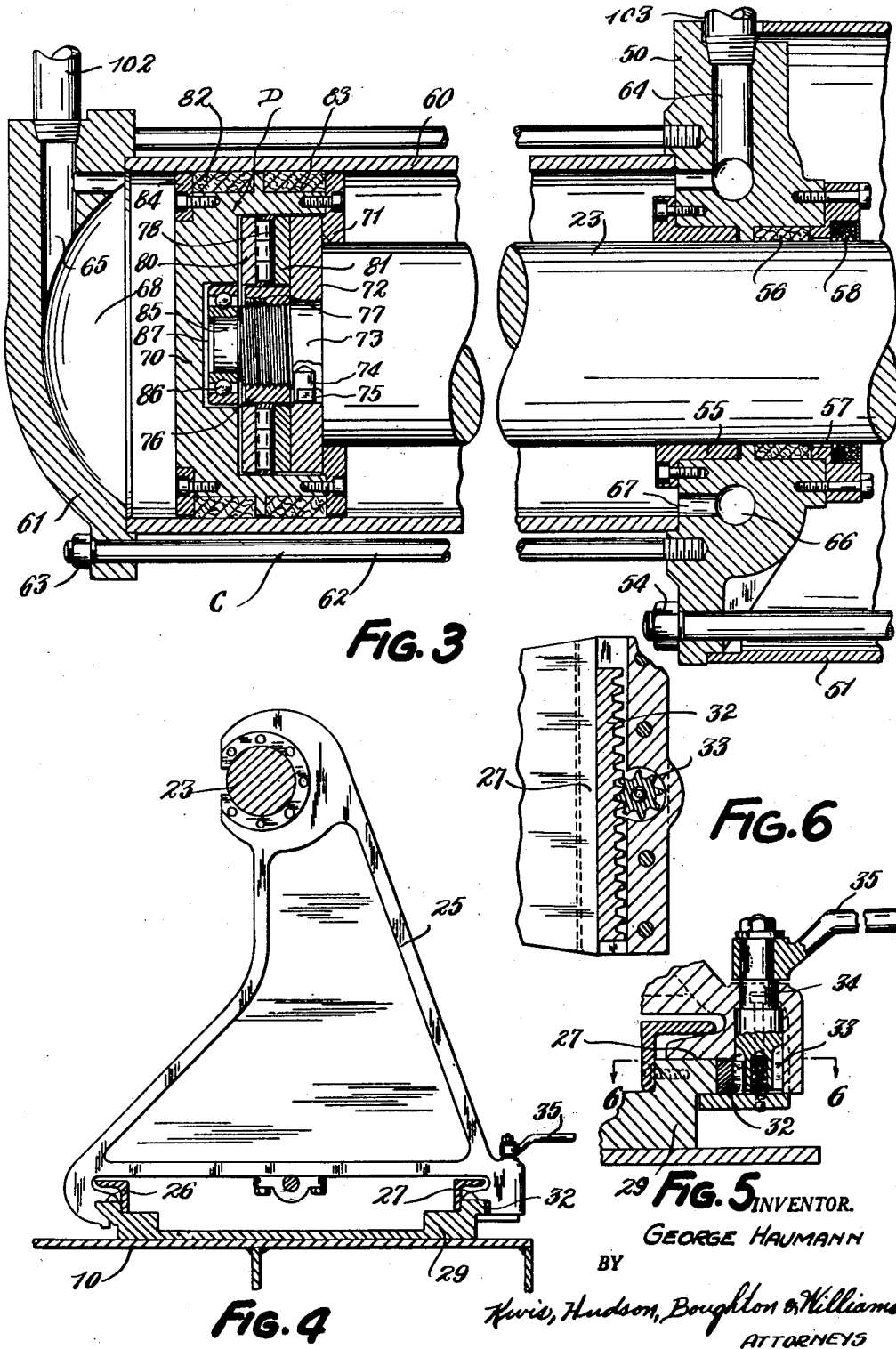
March 21, 1950

G. HAUMANN  
VENEER LATHE

2,501,387

Filed Oct. 23, 1946

4 Sheets-Sheet 3



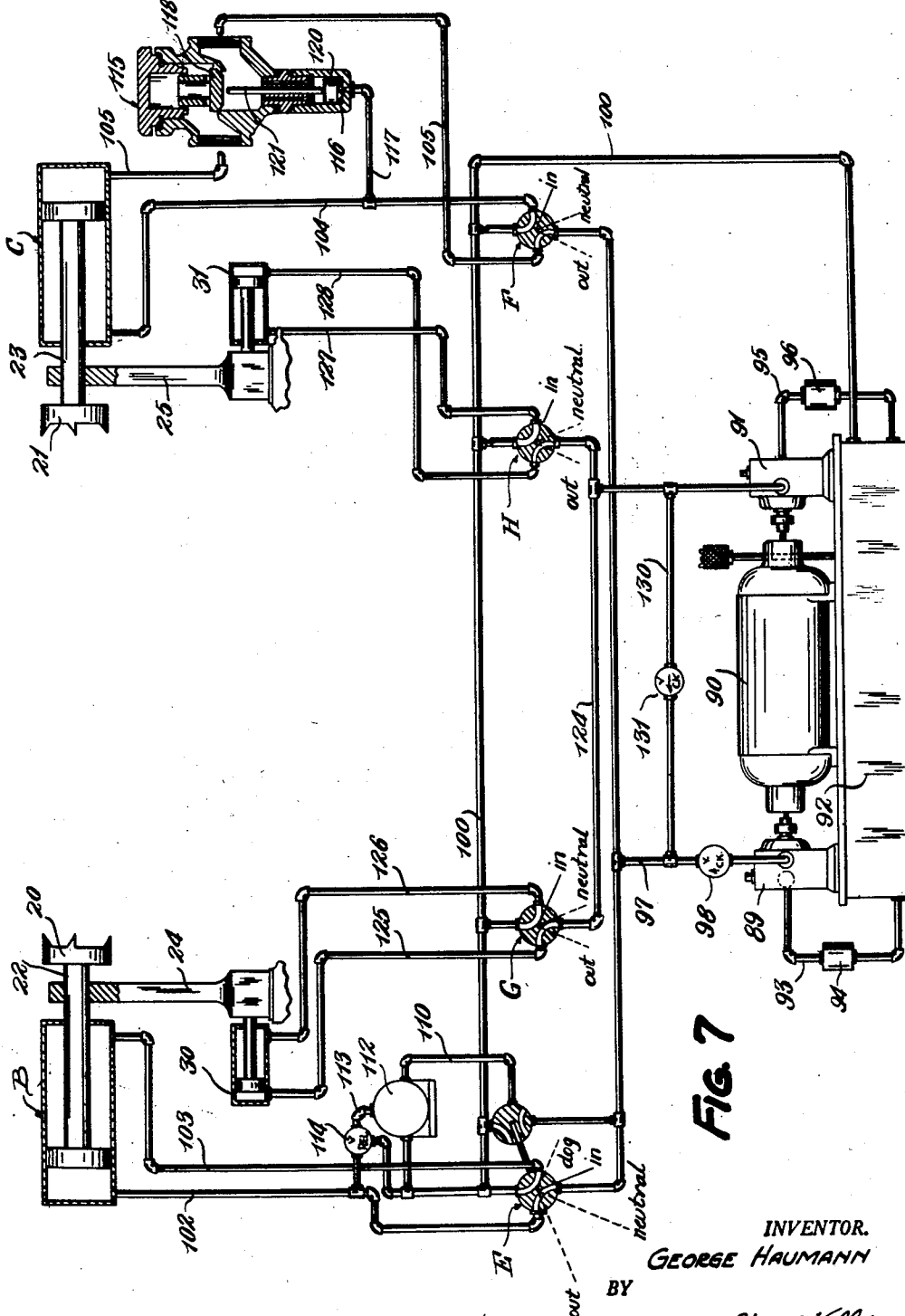
March 21, 1950

G. HAUMANN  
VENEER LATHE

2,501,387

Filed Oct. 23, 1946

4 Sheets-Sheet 4



INVENTOR.  
GEORGE HAUMANN

BY

Kivis, Hudson, Boughton & Williams  
ATTORNEYS

## UNITED STATES PATENT OFFICE

2,501,387

## VENEER LATHE

George Haumann, Portland, Oreg., assignor to  
The Coe Manufacturing Company, Painesville,  
Ohio, a corporation of Ohio

Application October 23, 1946, Serial No. 705,045

2 Claims. (Cl. 144-209)

1

The present invention relates to veneer lathes and, more particularly, to a veneer lathe comprising hydraulic means for holding the log to be cut.

One of the principal objects of the invention is the provision of a novel and improved veneer lathe having a plurality of rotatably supported spindles provided with chucks or dogs adapted to hold therebetween a log to be cut and pressure fluid actuated means for actuating the spindles to cause the chucks to engage and disengage a log and to maintain the same in tight engagement with the log during the cutting operation.

Another object of the invention is the provision of a novel and improved veneer lathe having chucks or dogs adapted to hold therebetween a log to be cut, which chucks are carried on the adjoining ends of aligned spindles rotatably supported in the machine, in combination with simple, reliable means for quickly moving the chucks into and out of engagement with the logs and for securely holding the chucks in engagement with the logs during the cutting operation, which means includes pressure fluid actuated motors of the reciprocable piston type in axial alignment with the spindles.

Another object of the invention is the provision of a novel and improved veneer lathe having chucks adapted to hold therebetween a log to be cut, which chucks are carried on the adjoining ends of aligned spindles rotatably supported in the machine, in combination with pressure fluid actuated motors of the reciprocable piston type in axial alignment with the spindles for reciprocating the spindles, and anti-friction thrust means between the motors and the spindles, thus permitting free rotation of the spindles relative to the motors.

The invention resides in certain constructions and combinations and arrangements of parts and further objects and advantages will be apparent to those skilled in the art to which it relates from the following description of the preferred embodiment described with reference to the accompanying drawings forming a part of this specification in which similar reference characters designate corresponding parts, and in which

Fig. 1 is a perspective rear view of a veneer lathe embodying the present invention;

Fig. 2 is a fragmentary, longitudinal, sectional view, with portions in elevation, taken on a vertical central plane through the left-hand or dogging spindle of the lathe as viewed in Fig. 1;

Fig. 3 is an enlarged view of portions of Fig. 2;

Fig. 4 is a sectional view approximately on the line 4-4 of Fig. 2;

2

Fig. 5 is an enlarged vertical sectional view through the clamping means shown in Fig. 4;

Fig. 6 is a sectional view approximately on the line 6-6 of Fig. 5; and

Fig. 7 is a diagrammatic view of the hydraulic system of the lathe with the spindles in the relative position which they occupy when the lathe is viewed from the front or operator's side.

The invention is herein illustrated and described as embodied in a more or less conventional veneer lathe and only those parts of the machine which are necessary to a complete understanding of the present invention are herein shown and described in detail. The parts of the machine not shown and described in detail per se form no part of the present invention and are known commercially in the art.

Referring to the drawings, the veneer lathe shown therein comprises a frame, designated generally by the reference character A, and including a rectangular base 10 provided with upstanding ends 11, 12. The frame A shown is of built-up construction and the upper parts 13, 14 of the ends 11, 12 are separately formed and bolted in position to facilitate manufacture and assembly of the lathe. A conventional knife 15, knife bar 16, and pressure bar 17 are located intermediate the end members 11, 12 and movably or adjustably supported in the usual manner.

The log to be cut is adapted to be supported between chucks or dogs 20, 21 fixedly secured to adjacent ends of axially aligned spindles 22, 23 rotatably supported in the end members 13, 14, respectively, and adapted to be moved lengthwise in a manner hereinafter specifically referred to, to engage and disengage the chucks with the opposite ends of the log. The log is rotated relative to the knife 15 upon rotation of the spindles. In the embodiment shown, the spindles 22, 23 are provided with steady rests or outboard supports 24, 25, respectively, slidably supported on suitable ways 26, 27 formed on members 28, 29 fixed to the upper surface of the base 10. The steady rests 24, 25 are adapted to be moved along their ways by pressure fluid actuated motors 30, 31 of the reciprocating piston type located in the ends 11, 12 and operatively connected to the outboard supports in a suitable manner.

The front ways 26 for the steady rests are generally V-shaped with the narrow part of the V pointing toward the front of the machine. The upper surface of the way is generally horizontal and the lower surface thereof is downwardly inclined rearwardly from the upper surface, as clearly shown in Fig. 4. The rear ways 27 are horizontal ways. The steady rests are

3

adapted to be clamped to their respective ways by manually operable clamps, one for each of the rests. Each of the clamps comprises a movable, wedge-shaped member 32 slidably supported within the steady rest housing between the rear face of the horizontal way 27 and an operating member in the form of a gear wheel 33 connected to the lower end of a vertically extending shaft 34, the upper end of which is provided with a hand lever 35 for facilitating rotation thereof. The gear 33 meshes with rack teeth on the rear side of the wedge member and, upon rotation of the handle 35 in one direction, moves the member 32 relative to the steady rest housing and the way 27 to wedge the member between the way 27 and the gear 33 and draw the steady rest housing tightly against the front V-shaped way 26.

The arrangement of the ways and clamps is such that when the steady rests are clamped to their respective ways, a predetermined dimension always exists between the front way 26 and a vertical center plane through the spindles; in other words, the steady rests are always clamped in a predetermined relative position with respect to the cutting knife, etc., and there is no possibility of so clamping the steady rests as to vary or change the distance between the knives, etc., and the axes of rotation of the work supporting spindles or work carried thereby. As will be readily apparent, there is considerable advantage in clamping the steady rests so that the axes of rotation of the spindles are in a predetermined location with respect to the knife, frame, etc., not only because this eliminates undue stress upon the spindle bearings but it permits the knife to be accurately located with respect thereto by the use of appropriate means for indicating the position of the knife with respect to the frame and, in turn, the axes of rotation of the spindles.

The construction of both the dogging spindle 22 and the tail spindle 23 is alike, as is the construction of the supporting and reciprocating mechanisms, and only the construction of the tail spindle 23, its supporting and operating mechanism will be described in detail, with the understanding that the dogging spindle 22 and its supporting and operating mechanisms are the same.

Referring particularly to Figs. 2 and 3, the spindle 23, the right-hand overhanging end of which is supported by the steady rest 25, is slidably supported intermediate its ends in a rotatable spindle sleeve or quill 40 by bearing members 41, 42 fixedly secured to opposite ends of the member 40 and having sleeve portions projecting into counterbored ends of the aperture in the spindle sleeve 40 through which the spindle 23 projects. The spindle 23 is keyed to the sleeve 40 by an elongated key 43 located in a slot or aperture in the sleeve 40, the radial inner end of which key projects into an elongated keyway 44 in the spindle. The radial outer end of the key 43 projects beyond the sleeve 40 and keys thereto a sprocket wheel 45, through the medium of which the spindle sleeve 40 and, in turn, the spindle 23 are rotated upon rotation of the sprocket wheel.

As shown, the sprocket wheel 45 is fixedly secured to the spindle sleeve 40 by being bolted to an external flange on the sleeve; however, any suitable means may be employed. The sprocket wheel is adapted to be selectively rotated from a suitable power source, not shown, but including a driving sprocket wheel located in the base 10 and connected to the sprocket wheel 45 by a flexible chain-type drive 46. The spindle sleeve 40

4

is rotatably supported in the part 14 of the end 12 by anti-friction bearings 47, 48 located at opposite ends thereof and provided with suitable oil retaining rings fixedly secured to opposite sides of the member 14.

The outer or left-hand end of the spindle 23, as viewed in the drawings, projects through a suitable aperture in a disk-like member 50 spaced from the left-hand side of the member 14 by a cylindrical sleeve 51 and is fixedly connected to the member 14 by a plurality of rods 52, the right-hand ends of which are threaded into tapped apertures in the left-hand end of an annular boss 53 on the member 14 and within which boss the anti-friction bearing 47 is located. The opposite or left-hand ends of the rods 52 project through apertures in the member 50 and are provided with nuts 54 for fixedly securing the parts together and maintaining the same in assembled relationship. The spindle 23 is slidably supported in the member 50 by a bearing member 55, connected to the outer side of the member 50 and having a cylindrical portion surrounding the spindle 23 and projecting into a counterbore through which the spindle projects. The opposite end of the aperture is counterbored and provided with suitable packing 56 to prevent the escape of pressure fluid around the spindle 23. The packing 56 is retained in position by a packing gland 57 connected to the opposite side of the member 50 and having a cylindrical portion extending into the counterbore. The right-hand end of the packing gland 57 is counterbored and provided with a commercial oil seal 58.

As previously stated, the spindles 22, 23 are reciprocated axially to engage and disengage the chucks carried thereby with and from the work by pressure fluid operated motors of the reciprocating piston type located in alignment with the spindles. The pressure fluid operated motors are designated generally by the reference characters B, C, the motor B being associated with the spindle 22 and the motor C with the spindle 23. Both motors are alike and only the motor C associated with the spindle 23 is herein shown and described in detail.

The outer end of the spindle 23, see Fig. 3, is provided with a piston head assembly, designated generally by the reference character D, reciprocable within a cylindrical sleeve or cylinder member 60 and forming therewith and with the member 50 and a cylinder head 61, the double-acting pressure fluid actuated motor C of the reciprocating piston type, the piston rod of which is formed by the outer end of the spindle 23. The right-hand end of the cylinder 60, which is preferably formed of brass, projects into a counterbore in the left-hand side of the member 50 and the opposite end projects into a similar counterbore in the piston head 61 and the parts are fixedly held in assembled relationship by a plurality of rods 62, the right-hand ends of which are threaded into tapped apertures in the left-hand side of the member 50 and the opposite ends of which project through openings in the piston head 61 where they are provided with nuts 63. The member 50 and cylinder head 61 are provided with radial conduits 64, 65 for the admission and exhaust of pressure fluid to and from the cylinder at opposite sides of the piston assembly D. The conduit 64 communicates with an annular aperture 66 which, in turn, is connected to the right-hand end of the cylinder by a plurality of longitudinal apertures 67 opening into the left-hand side of the member 50 within cylinder 60.

The inner end of the aperture 65 communicates with a recess 68 formed in the right-hand side of the cylinder head 61.

The piston assembly D comprises a cup-shaped member 70, the open end of which faces toward the right as viewed in Fig. 3. The member 70 is operatively connected to the outer end of the spindle 23 by a ring-like member 71 detachably bolted to the rim of the member 70, the radial inner part of which member 71 projects radially inwardly beyond the outer end of a disk-like member 72 keyed to a reduced portion 73 of the spindle 23 by a member 74, the radial inner end of which engages within an aperture in the portion 73 while the outer end thereof engages within an internal, longitudinally extending slot 75 in the member 72. The member 71 is held in assembled relationship with the end of the spindle 23 by a sleeve 76 threaded onto a portion of the spindle to the outside of the portion 73 and locked in position thereon by a setscrew 77. An end thrust, anti-friction bearing comprising rollers 78 interposed between annular race plates 80, 81 adapted to abut the bottom of the recess in the cup-shaped member 70 and the left-hand side of the member 72, respectively, permits free rotation of the spindle 23 relative to the piston assembly D while pressure is applied to the outer or left-hand end of the piston assembly by the admission of pressure fluid to the outer end of the cylinder through the conduit 65. The piston assembly D comprises suitable packing rings 82, 83 located in grooves formed in the circumference of the member 70 partly by the radial outer portion of the member 71 and a ring 84 located in a recess in and bolted to the left-hand end of the member 70. As an alternative construction, the piston head D could be fixedly connected to the end of the spindle 23 and the spindle 23 made in two sections connected by a suitable thrust coupling which would permit free rotation between the sections. A coupling of the type referred to could be located within the cylindrical sleeve 51 which could be elongated, if necessary.

As shown, the extreme outer end 85 of the spindle 23 is rotatably supported in the piston head assembly D by an anti-friction bearing 86 of conventional construction located in a central bore 87 in the bottom of the cup-shaped member 70. Preferably the diameter of the bore 87 is slightly greater than the outside diameter of the outer race of the bearing 86, thus permitting a slight radial movement of the outer end of the spindle 23 relative to the piston assembly D but providing a support for the outer or overhanging end of the spindle in the event the radial movement thereof exceeds a predetermined small amount. It will also be observed that in the embodiment shown, the thickness of the thrust bearing, including the race plates 80, 81 and the member 72, is slightly less than the distance between the left-hand face of the member 71 and the bottom of the aperture in the member 70 within which the thrust bearing is located, thus permitting a slight axial movement of the spindle 23 relative to the piston head assembly D. This clearance, together with the clearance referred to between the outer race of the bearing 86 and the member 70, prevents the spindle 23 from binding within the piston head assembly D which would tend to rotate the piston head assembly with the spindle.

Pressure fluid, preferably oil, is selectively supplied to opposite sides of the piston heads of the dogging and tail spindles B, C, respectively,

from a hydraulic pump 89 of commercial construction and preferably of the constant pressure, variable volume type, which pump is merely shown diagrammatically in Fig. 7. The pump 89 is connected to and driven by an electric motor 90, which also drives a similar pump 91, hereinafter referred to. The inlet or suction side of the pump 89 is connected to an oil reservoir or sump 92 through a conduit 93 having a filter 94 located therein. The inlet or suction side of the pump 91 is connected to the sump 92 in a similar manner by a conduit 95 having a filter 96 therein.

The discharge or pressure side of the pump 89 is connected by a conduit 97 including a check valve 98, to two control valves, designated generally by the reference characters E, F, which valves are also connected to the sump 92 by a return conduit 100.

The valves E and F are manually operated and control the flow of pressure fluid to and from the dogging and tail spindle motors, designated generally as B, C, through the medium of conduit means 102, 103 and 104, 105 interposed between the control valves E, F and the motors B, C, respectively. As shown, the conduit 102 connects the left-hand side of the valve E with the corresponding end of the motor B, the conduit 103 connects the right-hand side of the valve E with the right-hand end of the motor B, the conduit 104 connects the right-hand side of the valve F with the left-hand end of the motor C, and the conduit 105 connects the left-hand side of the valve F with the right-hand end of the motor C. The valves E and F may be of commercial construction.

The valve F which controls the flow of pressure fluid to and from the motor C which moves the tail spindle, is a conventional, three-position, four-way valve. The valve E is a four-position valve and when moved into the fourth position, designated "Dog" on Fig. 7, it not only closes the valve end of the conduit 102 but connects a conduit 110 to the conduit 97 to supply pressure fluid to a booster 112, which booster is, in turn, connected to the conduit 102 by a conduit 113 having a relief valve 114 set at some relatively high pressure; for example, 750 pounds to a square inch. The booster 112 and the relief valve 114 may be of commercial construction; for example, the booster may be the booster shown in United States Patent No. 2,296,647.

When the booster 112 is connected in the circuit by proper manipulation of the control valve E, the pressure of the fluid supplied to the booster, which may be 200 to 250 pounds or less, is boosted to 600 or 700 pounds and supplied at this pressure to the outer end of the motor B of the dogging spindle to force the dog or chuck 20 carried thereby tightly against the log so that the log will be securely held between the chucks or dogs during the turning operation.

In order to permit the application of extremely high pressure to the dogging spindle motor B, the conduit 105 connected to the outer end of the tail spindle motor C includes a pilot-operated check valve 115, the control chamber 116 of which is operatively connected to the conduit 104 by a branch conduit 117. The pilot-operated check valve may be of any commercial construction and is not herein described in detail. Suffice it to say that the check valve shown comprises a gravity-operated, normally closed valve member 118, which permits free flow of pressure fluid through the conduit 105 from the control valve

F to the outer end of the motor C, but prevents the flow of fluid in the opposite direction until the valve member 118 is raised from its seat by the application of pressure fluid by way of the branch conduit 117 to the underside of a piston 120 slidably supported in the chamber 116, previously referred to, and operatively connected to the valve 118 by a slidable plunger or rod 121. The construction is such that the pilot valve 115 does not interfere with the normal operation of the tail spindle motor C, but prevents movement of the tail spindle toward the right, as viewed in Fig. 7, by the motor B when a higher pressure is applied to the motor B than that applied to the motor C.

As previously mentioned, the outboard supports 24 and 25 are adapted to be moved along the guide members 28, 29 on the upper surface of the base 10 by a double-acting, pressure fluid operated motor housing within the end members 11, 12 of the frame A. Both of these motors are diagrammatically shown in Fig. 7 where they are designated generally by the reference characters 30, 31. Pressure fluid for actuating these motors is supplied by the pump 91 and controlled by four-way manually operated valves G, H similar to the valve F previously referred to.

The valves G and H are connected to the pump 91 by conduit means 124 and to the motors 30 and 31 by conduit means 125, 126 and 127, 128, respectively. If desired, the conduits 97 and 124 may be interconnected by a conduit 130, preferably having a check valve 131 which prevents the flow of pressure fluid from the conduit 97 to the conduit 124. This construction provides an adequate supply of pressure fluid for effecting rapid movement of the motors B, C and permits the use of a pump 89 of less capacity than would otherwise be required for moving the dogging and tail spindles at the same speed.

The booster, check valve, and pump system shown not only reduce the size of the pumps required to move the spindles at a given speed into and out of engagement with a log but does not require the application of high pressure to the spindles until after the chucks are engaged with the log. If high pressure were to be employed throughout the entire chucking operation, it would be dangerous to the men blocking the logs and there would be a possibility of the chucks hitting the log with sufficient force to damage the lathe and/or split the log. With the present construction, the chucks can be moved into engagement with a log at a fairly rapid rate but without excessive force and thereafter high pressure can be applied to cause the chucks to securely hold the log. The high pressure is applied throughout the cutting operation and maintains the chucks in engagement with the log. This prevents the chucks from becoming loose and boring into the log, as is often the case with the prior art lathes wherein pressure is not maintained upon the chucks during the cutting operation but the operator is depended upon to tighten the chucks when he observes them becoming loose in the log.

The control or distribution valves E to H, booster 112, and relief valve 114, are all connected to the return conduit 100, as is clearly shown in Fig. 7.

The valves E to H, inclusive, are not shown on Figs. 1 to 4 of the drawings but may be located at any convenient place about the lathe, as will be readily understood by those skilled in the art to which the invention relates. In the particular

lathe shown, the operator's station is adjacent to the rear right-hand corner, as viewed in Fig. 1, which figure, as previously stated, is a rear view and the control valves are located at the control station.

It is believed that the operation of this lathe will be readily apparent from the foregoing description thereof. Suffice it to say that the dogging and tail spindles 22, 23 may be readily and quickly moved to any desired position by manual manipulation of the control or distribution valves E, F and while dogged the log is securely held by the application of high pressure to the dogging spindle motor B. With the present machine, the time required to change logs is a minimum because of the rapid movement that can be imparted to the spindles. The outboard supports 24, 25 can be properly positioned without loss of excessive time by manipulation of the control or distribution valves G, H. The fact that the pressure fluid motors which reciprocate the dogging and tail spindles are connected to the spindles by means which permit free relative rotation therebetween allows the chucks or dogs to be forced by the motors into tight engagement with a log without interfering with its rotation. During operation, the piston heads remain stationary or substantially so and do not wear the walls of the cylinder. If the cylinder walls were permitted to wear, it would be difficult to maintain the high pressure required for securely holding the logs.

It will be apparent from the foregoing description of the preferred embodiment of the invention that the objects heretofore enumerated and others have been accomplished and that a new and improved veneer lathe has been provided which utilizes pressure fluid for manipulation of the tail and dogging spindles. While the lathe shown has been described in considerable detail, the invention is not limited to the particular construction referred to, which may be varied without departing from the invention, and it is my intention to cover hereby all adaptations, modifications and uses thereof which come within the practice of those skilled in the art to which the invention relates and within the scope of the appended claims.

Having thus described my invention, I claim:

1. A veneer lathe comprising a frame, spaced axially aligned quills rotatably supported in said frame, dogging and tail spindles slidably keyed within said quills, means for rotating said quills, pressure fluid operated motors of the reciprocating piston type located in axial alignment with said spindles for reciprocating said spindles toward and from each other, each of said motors comprising a piston rotatably connected to and enclosing the outer ends of said spindles, conduits for supplying fluid pressure to said motors on either sides of the pistons therein, means for controlling the flow of pressure fluid to one of said motors comprising a three position distribution valve, a fluid pressure operated check valve in the conduit connected to the outer end of the said one motor permitting application of fluid pressure to the outer end of said one motor but normally preventing release of fluid pressure therefrom, a conduit for supplying fluid pressure to the operating mechanism of said check valve connected to the conduit leading to the opposite end of said one motor so that application of fluid pressure to the last-mentioned conduit operates said check valve to release fluid pressure from the outer end of said one motor, a four

9

position valve for controlling the flow of pressure fluid to and from the other of said motors, and a booster adapted to be operatively connected to the conduit leading to the outer end of said other motor when said four position valve is moved to one of its positions, whereby the said check valve retains the fluid pressure in the outer end of said one motor against the force exerted thereon throughout a workpiece positioned between the spindles when the said booster is operatively connected to said other motor, the said check valve releasing the fluid pressure from the outer end of said one motor when the said three and four position valves are positioned for effecting movement of said spindles away from each other.

2. In a veneer lathe, a frame, axially aligned spindles rotatably supported in said frame, way means on said frame having oppositely facing sides one of which is inclined inwardly, steady rests for the projecting ends of said spindles, each of said steady rests comprising a housing slidably supported for movement longitudinally of the axes of rotation of said spindles, each of said housings having portions cooperating with said way means with one of said portions having a shape complementary to the said inclined side of

10

said way means, and means interposed between said housings and the other of said sides of said way means for clamping said housings in engagement with said way means and with the said inclined side of the latter in gripping engagement with the said complementary shaped portions of said housings, whereby the axes of said spindles are located in predetermined position with respect to said frame upon said rests being clamped to said way means.

GEORGE HAUMANN.

## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

| Number    | Name     | Date           |
|-----------|----------|----------------|
| 1,299,883 | Warren   | Apr. 8, 1919   |
| 1,700,668 | Damerall | Jan. 29, 1929  |
| 1,776,662 | Merritt  | Sept. 23, 1930 |
| 1,857,986 | Turcott  | May 10, 1932   |
| 2,042,123 | Pierle   | May 26, 1936   |
| 2,049,444 | Hirvonan | Aug. 4, 1936   |
| 2,214,390 | Wahlmark | Sept. 10, 1940 |
| 2,340,532 | Jackson  | Feb. 1, 1944   |