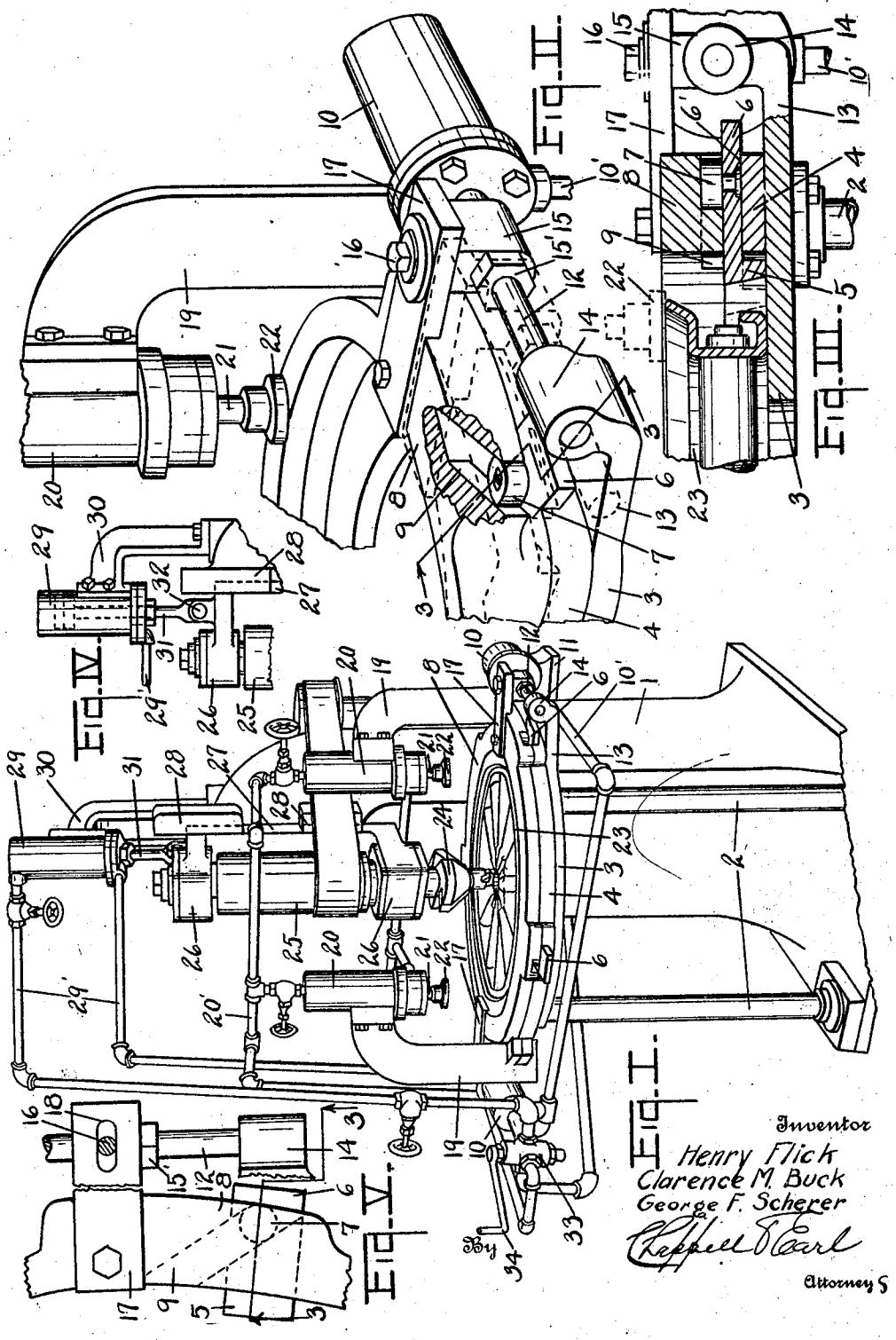
Dec. 23, 1924. 1,520,181

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BORING MACHINE

Filed Dec. 3, 1921



Patented Dec. 23, 1924. 1,520,181

UNITED STATES PATENT OFFICE.

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BORING MACHINE.

Application filed December 3, 1921. Serial No. 519,686.

To all whom it may concern:

Be it known that we, HENRY FLICK, CLARENCE M. BUCK, and GEORGE F. SCHERER, citizens of the United States, residing at Jackson, county of Jackson, State of Michigan, have invented certain new and useful Improvements in Boring Machines, of which the following is a specification.

This invention relates to an improved boring machine for accurately boring the centers of wood spoke wheels.

The objects of the invention are:

First, to provide in such a structure a rapid and effective clutch means for engaging the periphery of the wheel and centering the same.

Second, to provide an improved pneumatic holding means for the wheel.

Third, to provide an improved pneumatic actuating and control means for the entire structure.

Further objects, and objects relating to details and economies of construction and operation will definitely appear from the detailed description to follow.

We accomplish the objects of the invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is fully illustrated in the accompanying drawing, forming a part of this application, in which:

Fig. I is a detail perspective view of a machine embodying all of the features of our invention, portions of the base being broken away.

Fig. II is an enlarged detail perspective view with certain portions broken away of one of the clutch jaw details and the pneumatic clutch clamp for the wheel.

Fig. III is an enlarged detail sectional view on line 3—3 of Figs. II and V, showing details of one of the clutch jaws and actuating means, taken looking in the direction of the little arrows at the ends of the section lines.

Fig. IV is a detail view showing the connection of the boring bar feeding and control means.

Fig. V is an enlarged detail view, portions being broken away of one of the clutch actuating means.

In the drawing similar numerals of reference refer to similar parts throughout the several views.

The parts of the drawing will be considered by their numbers. 1 is the main base with supplemental posts 2, 2 carrying the top plate or table 3 which, in rough outline, is in the form of a ring. 4 is the main clutch ring disposed on the table and carrying a series of radially adjustable clutch jaws 5 having shanks 6 disposed in radial ways 6′ in the upper face of said clutch ring 4.

Journaled on a suitable pin on the upper side of each shank 6 is an anti-friction roller 7. A movable clutch ring 8 is disposed above the main clutch ring 4 and partially rotates thereon and retains the shanks 6 in their guides by resting upon the same. The ring 8 is provided with diagonal slots 9 in its under face, there being a slot corresponding to each anti-friction roller 7. Each slot is adapted to act on the corresponding anti-friction roll 7 to force the jaw simultaneously out and in when the clutch ring 8 is reciprocated or oscillated by the actuating means.

The movable ring 8 is oscillated by means of an air engine cylinder 10 or a plurality of the same. These are carried on brackets 11 secured either to the base or top plate of the frame. They are supplied with air through pipe 10′. The piston rod 12 thereof is disposed to reciprocate tangentially to the clutch ring in the guide 14 carried by the arm 13 projecting from the table 3. A head 15 adjustable by lock nuts 15′ is on the piston rod 12 and carries an upwardly projecting pin 16 which acts upon the arm 17 which is bolted to the top ring 8 of the clutch. A radial slot 18 is in the arm 17 to avoid binding upon the pin when the piston rod is actuated. A plurality of these arms 17 and these actuating means is provided.

Standards 19 are secured to the table top and carry upright air cylinders 20, the piston rods 21 of which extend downwardly and are provided with feet or pads 22 adapted to engage upon the rim of a wheel 23, which is being bored. The clamping relation clearly appears by dotted lines in Fig. III. The cylinders 20 are supplied with air from the pipe 20′.

The boring tool 24 is driven by the elongated pulley 25 supported in bracket bear-

ings 26, 26 at the opposite ends of the vertical slide 27, which slide 27 is disposed and retained by suitable guide ways 28, 28. A double acting air cylinder 29 is supported on the standard 30 having its piston rod 31 pivotally connected at 32 to the vertically reciprocating slide 27,—see particularly Fig. IV. Air is connected to the cylinder 29 through the pipes 29′, 29′.

A multiple way valve 33 of any suitable design controls the delivery of air to the various cylinders successively. The operation of the machine follows:

First, the wheel is clutched, then clamped in place, the center bored, the boring tool withdrawn, and the work released. A multiple valve timed for this purpose is readily produced and is consequently not detailed here. The valve is controlled by the handle 34. The wheel is placed in position by the operative, clutched and centered, then clamped down, then bored, then removed. No central support is required for the wheel and consequently none is shown.

The boring tool could be disposed beneath the wheel and bore upwardly and could be arranged to that end in an obvious manner. The same machine could be provided with boring tools both above and below to be used successively or independently according to the exigencies of the work required.

This machine can be designed to operate effectively with other actuating means than the air cylinders, although it is especially designed and is especially effective with such air cylinders because of the facility with which the parts can be operated successively. However, one or all of the engine cylinders might be superseded by other means. It will, therefore, be seen that it is desired to claim the invention in the specific form shown with the pneumatic means and also to claim the features broadly and generally as pointed out in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. The combination of a suitable base, a table therefor annular in form, a main clutch ring disposed on the said table with radially movable clutch jaws in suitable ways in the upper surface thereof, upwardly projecting actuating anti-friction rollers on said jaws, a jaw actuating clutch ring disposed on the main clutch ring with diagonal slots for engaging the jaw actuating rollers, tangentially disposed engine cylinders carried by the said table and connected to actuate the upper clutch ring, vertically disposed engine cylinders with downwardly projecting pistons with clamping means for clamping a wheel on to the said table, a vertical boring tool with means for driving the same comprising an elongated pulley, a vertical slide with journal bearings for said pulley, an engine cylinder for actuating and reciprocating the said slide, and fluid delivery means to the said engine cylinders comprising a multiple way hand controlled valve for delivering the air successively to actuate the clutch, clamp the wheel upon the table and actuate the boring tool, as specified.

2. The combination of a suitable base, a table therefor annular in form, a main clutch ring disposed on the said table with radially movable clutch jaws in suitable ways in the upper surface thereof, upwardly projecting actuating anti-friction rollers on said jaws, a jaw actuating clutch ring disposed on the main clutch ring with diagonal slots for engaging the jaw actuating rollers, tangentially disposed engine cylinders carried by the said table and connected to actuate the upper clutch ring, a vertical boring tool with means for driving the same comprising an elongated pulley, a vertical slide with journal bearings for said pulley, an engine cylinder for actuating and reciprocating the said slide, and fluid delivery means to the said engine cylinders comprising a multiple way hand controlled valve for delivering the air, clamp the wheel upon the table and actuate the boring tool, as specified.

3. The combination of a suitable base, a table therefor annular in form, a main clutch ring disposed on the said table with radially movable clutch jaws in suitable ways in the upper surface thereof, upwardly projecting actuating anti-friction rollers on said jaws, a jaw actuating clutch ring disposed on the main clutch ring with diagonal slots for engaging the jaw actuating rollers, tangentially disposed engine cylinders carried by the said table and connected to actuate the upper clutch ring, vertically disposed engine cylinders with downwardly projecting pistons with clamping means for clamping a wheel on to the said table, a vertical boring tool with means for driving the same, and fluid delivery means to the said engine cylinders comprising a multiple way hand controlled valve for delivering the air, as specified.

4. The combination of a suitable base, a table therefor annular in form, a main clutch ring disposed on the said table with radially movable clutch jaws in suitable ways in the upper surface thereof, upwardly projecting actuating anti-friction rollers on said jaws, a jaw actuating clutch ring disposed on the main clutch ring with diagonal slots for engaging the jaw actuating rollers, tangentially disposed engine cylinders carried by the said table and connected to actuate the upper clutch ring, a vertical boring tool with means for driving the same, and fluid delivery means to the said engine cylinders comprising a multiple

way hand controlled valve for delivering the air, as specified.

5. The combination of a suitable table, clutch means for clutching the periphery of a wheel, an engine cylinder connected to actuate said clutch means, engine cylinders with clamps on the pistons thereof for clamping a wheel to the table, a boring tool, a slide with suitable journals for the said boring tool, an engine cylinder connected to said slide, and a multiple way valve for controlling the said engine cylinders, as specified.

6. The combination of a suitable table, clutch, means for clutching the periphery of a wheel, an engine cylinder connected to actuate said clutch means, a boring tool, and a multiple way valve for controlling the said engine cylinders, as specified.

7. The combination of a suitable table, clutch means for clutching the periphery of a wheel, and an engine cylinder connected to actuate said clutch means, as specified.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

HENRY FLICK. [L. S.]
CLARENCE M. BUCK. [L. S.]
GEO. F. SCHERER. [L. S.]

Witnesses:
MARY LOCKS,
A. R. HAMILTON.