July 4, 1933. E. D. WATT 1,916,701

PILE BORING AND FACING MACHINE

Filed June 6, 1931 3 Sheets-Sheet 1

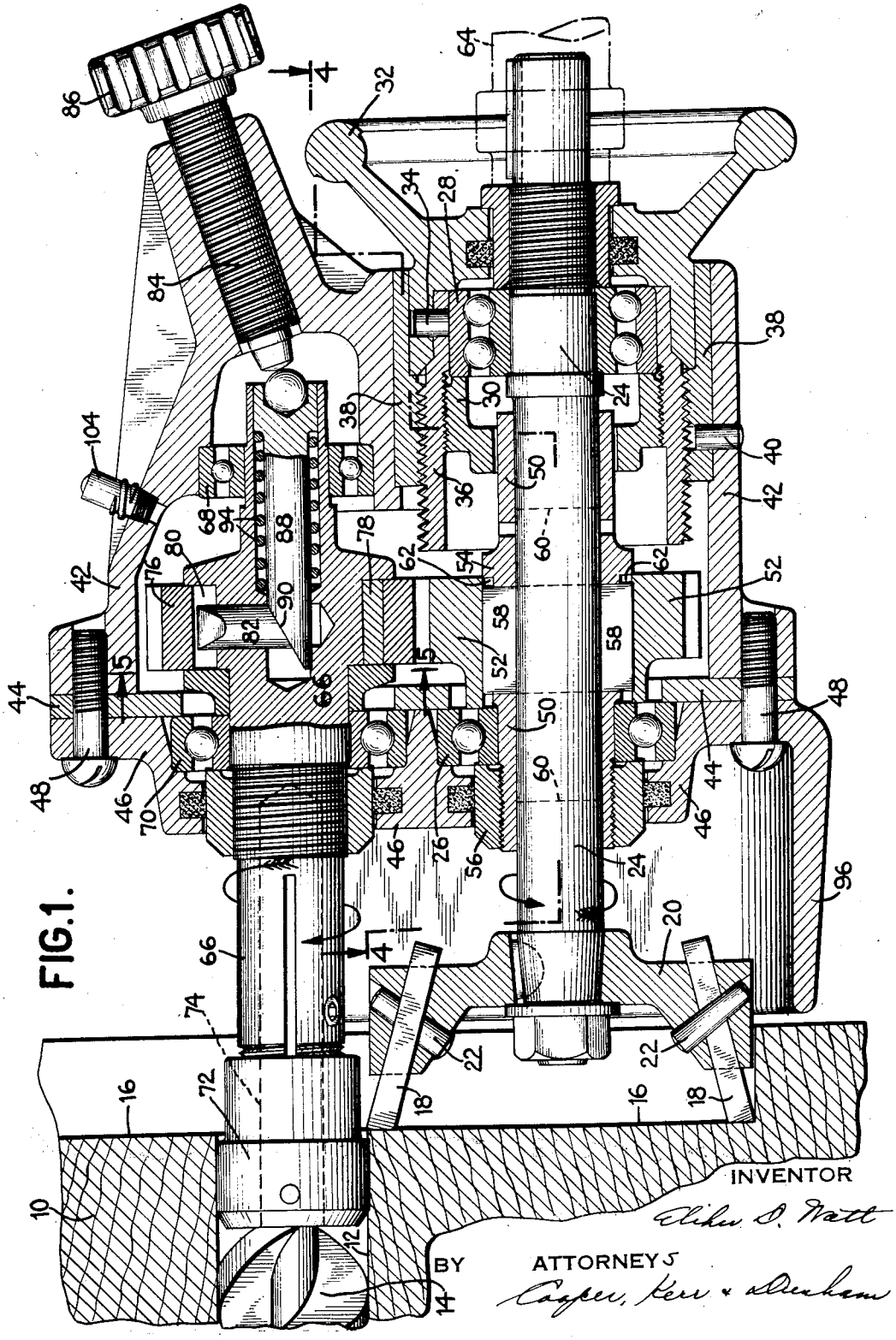


FIG. 1.

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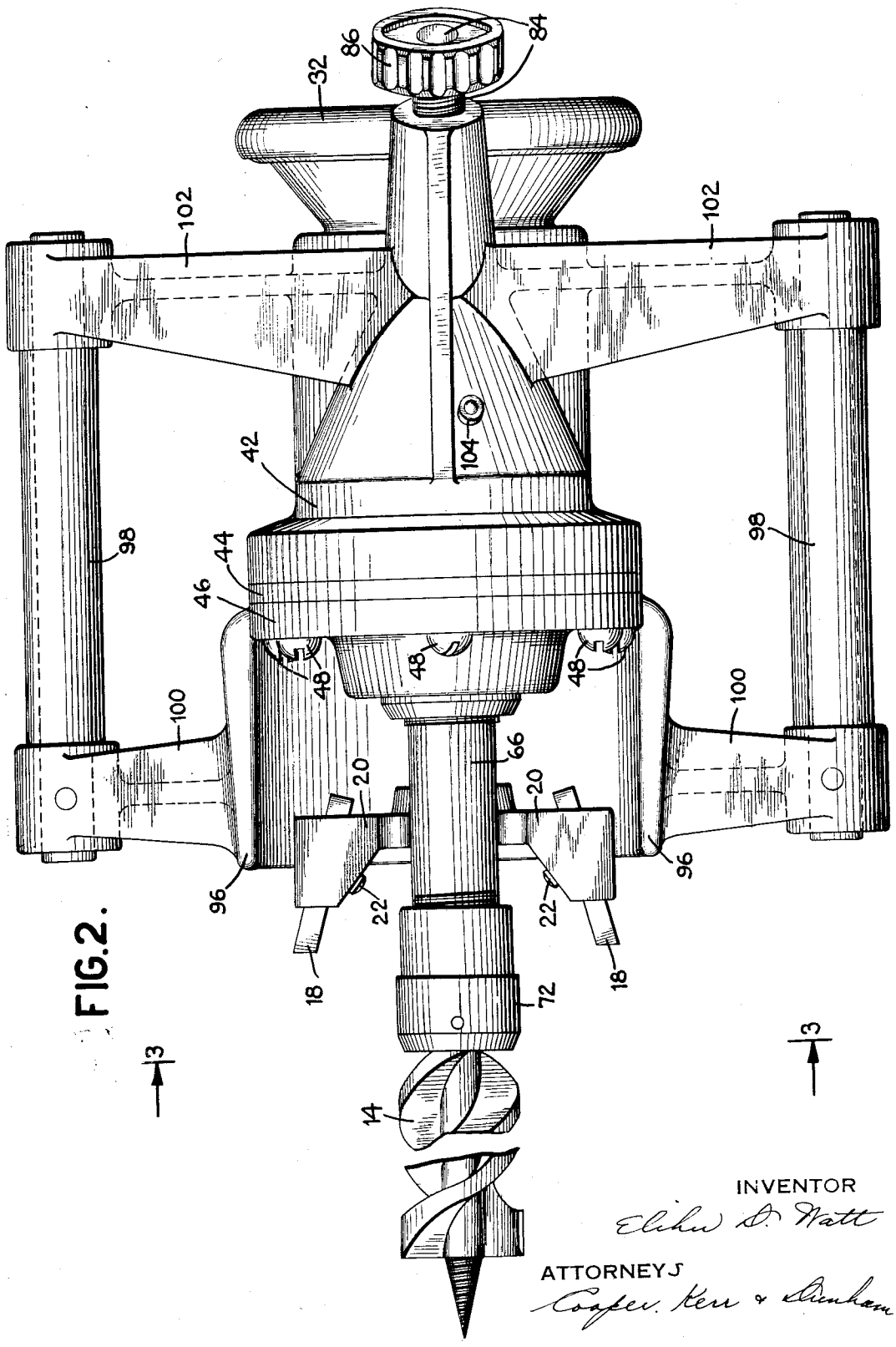


FIG. 2.

INVENTOR
Elihu D. Watt

ATTORNEYS
Cooper, Kerr & Dunham

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PILE BORING AND FACING MACHINE

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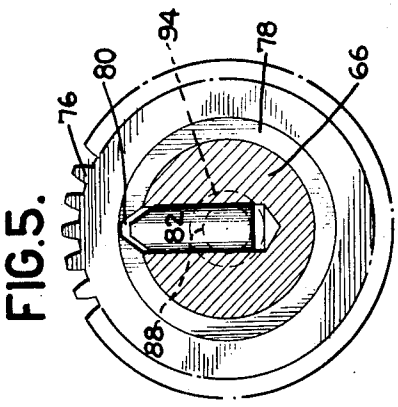


FIG.5.

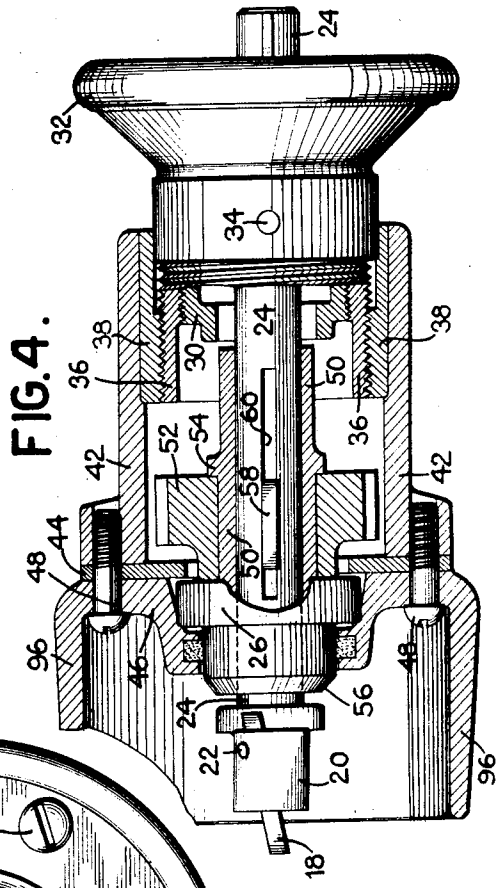


FIG.4.

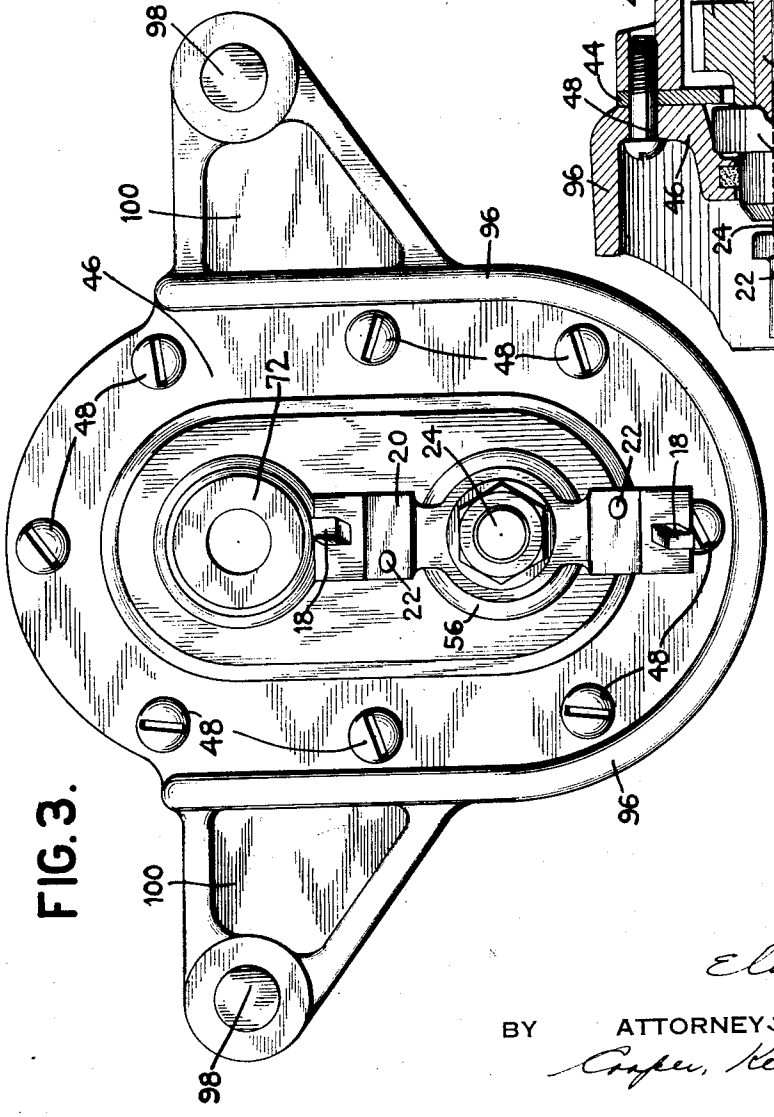


FIG.3.

INVENTOR
Elisha D. Watt

BY ATTORNEYS
Cooper, Kerr & Dunham

Patented July 4, 1933 1,916,701

UNITED STATES PATENT OFFICE

ELIHU D. WATT, OF LA GRANGE, ILLINOIS, ASSIGNOR TO RAYMOND CONCRETE PILE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY

PILE BORING AND FACING MACHINE

Application filed June 6, 1931. Serial No. 542,566.

This invention pertains to the boring and facing of the heads of wooden piles preparatory to turning tenons thereon whereby they are adapted for use as the lower sections of composite piles.

The tenon forming operation is preferably divided into two steps, each performed by a portable machine attached temporarily to the pile on which it is to operate. The machine herein disclosed drills a hole in the center of the head of the pile and faces the head at right angles to the hole. Then the tenon turning machine, disclosed in my copending application, is applied and performs the operation of turning the tenon to proper length and diameter.

In the accompanying drawings which illustrate one embodiment of the invention:

Fig. 1 shows the machine in cross-section at the completion of its work.

Fig. 2 is a view of the machine from the top of Fig. 1.

Fig. 3 is a view on line 3—3 of Fig. 2.

Fig. 4 is a view on line 4—4 of Fig. 1.

Fig. 5 is a detail view on line 5—5 of Fig. 1

In the drawings 10 designates the head of a wooden pile which has been bored at 12 by bit 14 and has been faced on surface 16 by cutters 18 which are held in rotary head 20 by keys 22. Head 20 is keyed to shaft 24 which passes horizontally through the machine, being supported for rotation by ball bearings 26, 28.

The inner race of bearing 28 is mounted directly on shaft 24, the outer race being clamped between bushing 30 and the hub of handwheel 32. The handwheel hub is secured by pins 34 to one end of sleeve 36, and bushing 30 is threaded internally in sleeve 36. Sleeve 36 is threaded through a bushing 38 which is secured by pins 40 to the casing 42 of the machine.

The outer race of bearing 26 is clamped in fixed position between an inner plate 44 and an outer plate 46 which serves as a head or closure for the machine frame or casing 42, to which it is attached by screws 48. The inner race of bearing 26 is mounted on a sleeve 50 in contact with the hub of a gear 52, the race and hub being clamped to the bushing between shoulder 54 fixed on the sleeve and bushing 56 threaded onto the sleeve.

A plate 58 passes through a comparatively long slot 60 in shaft 24. The ends of plate 58 enter keyways 62 in gear 52, and the plate is held against lateral motion by the slots through which it passes in sleeve 50. Bearing 26 prevents longitudinal movement of sleeve 50. Therefore, from the above description it will be appreciated that rotation of handwheel 32 will cause shaft 24 to move longitudinally through sleeve 50, so that the cutters may be moved to or from the head of the pile.

Power for rotating shaft 24 may be supplied in any desired manner, as for instance by a flexible shaft 64.

Parallel to shaft 24 is the drill shaft 66, supported for rotation by ball bearings 68, 70. On the free end of shaft 66 is a chuck 72 adapted to hold the shank 74 of bit 14. This shaft is driven from gear 52 on shaft 24, which meshes with gear 76, mounted on spring clutch ring 78, which encircles an enlarged portion of shaft 66 (Figs. 1 and 5). Clutch ring 78 is split as at 80 and may be expanded by plunger 82 which is adapted to be forced into space 80 whenever it is desired to cause shaft 66 to turn in unison with gear 76. Plunger 82 is forced outwardly by means of manually operable screw 84 having a handle 86, through the instrumentality of plunger 88 which has a beveled surface 90 in contact with a beveled surface on plunger 82. Whenever screw 84 is retracted, spring 94 retracts plunger 88, and spring ring 78 draws away from gear 76, thus permitting shaft 66 to come to rest.

For the protection of the operator, head 46 has a skirt 96 surrounding cutter head 20 and its knives 18. For the convenience of the operator in handling the machine, handles 98, 98 are provided, spaced from the body of the machine by arms 100, 100 integral with apron 96, and by arms 102, 102 integral with casing 42. The mechanism may be oiled or greased through a fitting 104 tapped into the casing.

In operation with shaft 24 rotating handle 86 is turned to actuate plunger 82 and there-

by force shaft 66 to rotate, as above described. Then, cutter head 20 being retracted by means of wheel 32, the operator holding the machine by handles 98, applies bit 14 to drill hole 12 axially in the pile head until chuck 72 enters the hole and cutter knives 18 are nearly in contact with the pile head. Then shaft 66 is brought to a standstill by manual rotation of handle 86, and the shaft and chuck are utilized as a support around which the entire machine is manually rotated, shaft 24 moving in a circular orbit about the support and being fed longitudinally towards the pile whereby cutter knives 18 serve to face the head of the pile to form a circular surface 16 of greater diameter than the tenon to be formed. When that operation is complete the power is shut off, the bit is removed from the hole, and the pile is ready for the tenon-turning operation.

It is to be understood that the invention is not limited to the specific embodiment herein illustrated and described, but may be used in other ways without departure from its spirit as defined by the following claims.

I claim:

1. In apparatus of the class described, in combination, means comprising a chuck and a drill bit for drilling a hole in the head of a pile, and means for facing said pile head, said drilling means serving to support said facing means and said facing means being adapted to revolve on its own axis in an orbit about said drilling means during the facing operation.

2. In apparatus of the class described, in combination, means comprising a chuck and a drill bit for drilling a hole in the head of a pile, a rotary cutter for facing said pile head, said drilling means serving to support said cutter and said cutter being adapted to revolve on its own axis in an orbit about said drilling means during the facing operation.

3. The invention set forth in claim 2 in which means is provided for interconnecting said cutter and said drilling means whereby the devices may be operated simultaneously or said cutter may be operated alone.

4. The invention set forth in claim 2 in which a clutch is provided for interconnecting said cutter and said drilling means whereby the devices may be operated simultaneously or said cutter may be operated alone.

In testimony whereof I hereto affix my signature.

ELIHU D. WATT.