A. H. TAYLOR.

ROTATION DEVICE FOR FLUID PRESSURE OPERATED HAMMER TOOLS.

APPLICATION FILED AUG. 6, 1909.

1,097,997. **Patented May 26, 1914.**

Fig. 2.

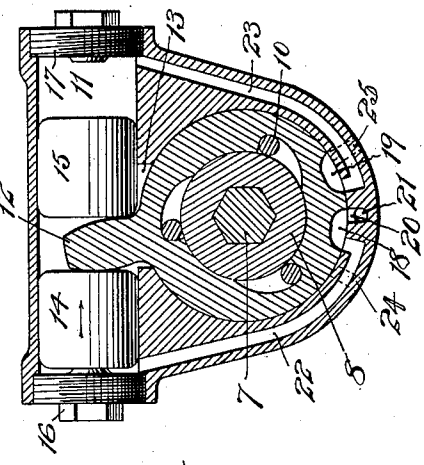


Fig. 3.

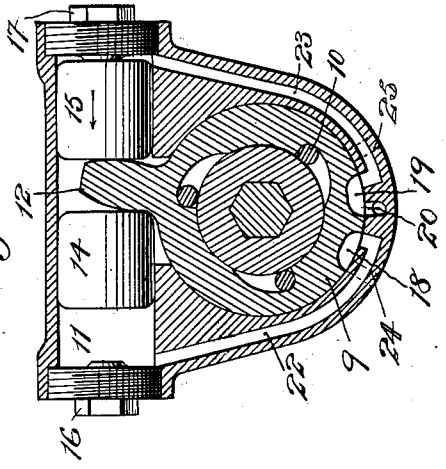


Fig. 1.

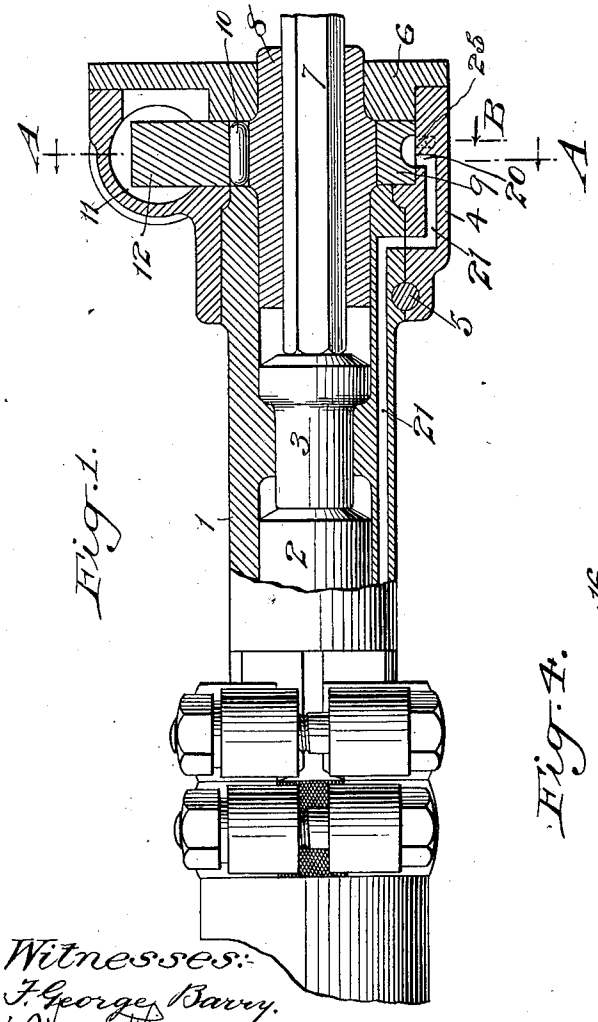


Fig. 5.

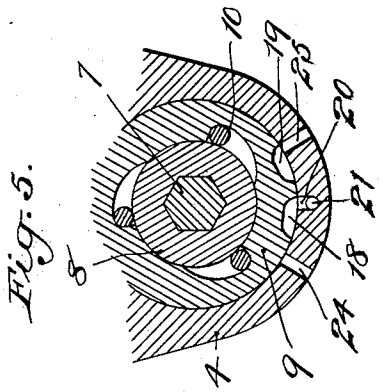
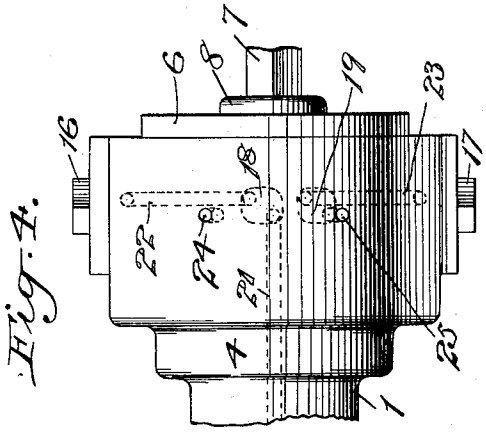


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTATION DEVICE FOR FLUID-PRESSURE-OPERATED-HAMMER TOOLS.

1,097,997. Specification of Letters Patent. Patented May 26, 1914.

Application filed August 6, 1909. Serial No. 511,554.

To all whom it may concern:

Be it known that I, ALBERT H. TAYLOR, a citizen of the United States, and resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Rotation Devices for Fluid-Pressure-Operated-Hammer Tools, of which the following is a specification.

This invention has for its object to provide certain improvements in the construction, form and arrangement of the several parts of a rotation device for fluid pressure operated hammer tools whereby the rotation of the tool steel will be produced independent of the hammer piston or its operating mechanism and which will be positive in its motion.

In the accompanying drawings, Figure 1 represents, partly in side elevation and partly in longitudinal central section, so much of a hammer tool as will give a clear understanding of the construction, location and operation of my improved rotation device, Fig. 2 is a transverse section taken in the plane of the line A—A of Fig. 1, Fig. 3 is a similar view showing the rotation ring and its operating pistons at the limit of their movement away from the positions shown in Figs. 1 and 2, Fig. 4 is a partial inverted plan view of the tool, and Fig. 5 is a partial transverse section taken in the plane of the line B of Fig. 1.

The cylinder 1 of the tool is provided with a piston hammer 2 and an anvil block 3. A casing 4 is provided for the front end of the cylinder 1, which casing is fixedly secured to the cylinder, as, for instance, by a cross pin 5. A front plate 6 is secured to the outer end of the casing 4.

The shank 7 of the tool steel extends through the chuck 8 into engagement with the anvil block 3. This chuck is shown herein as being rotatably mounted within the front plate 6 and the front of the cylinder 1.

An oscillating ring 9 is mounted in the casing 4 around an enlarged portion of the chuck 8. Any suitable device may be employed for clutching and releasing the chuck and oscillating ring, that shown herein being of the roller clutch type, the rollers being denoted by 10. The front plate 6 serves to retain the rollers and oscillating ring in position.

A transversely arranged cylindrical piston chamber 11 is provided in the casing 4 and the oscillating ring 9 is provided with an arm 12 which projects through a slot 13 into the cylindrical chamber 11. Pistons 14, 15, are located within the cylindrical chamber 11 upon opposite sides of the arm 12 of the rotation ring 9. Caps 16, 17, screwed into the opposite ends of the chamber 11, serve to limit the outward movements of the pistons 14, 15. The peripheral wall of the rotation ring 9, preferably at a point opposite the arm 12, is provided with two bridge ports 18, 19, which are brought alternately into open communication with a port 20 of a passage 21 leading from a source of motive fluid supply independent of the hammer piston 2 and its operating mechanism.

Ports 22, 23, lead from the opposite ends of the piston chamber 11 to the periphery of the rotation ring 9 at such points that the port 22 is always in open communication with the bridge port 18 in the rotation ring and the port 23 is at all times in open communication with the bridge port 19 of the said ring.

Exhaust ports 24, 25, lead from external atmosphere to the periphery of the rotation ring 9 in such position that the bridge port 18 alternately opens and closes communication between the ports 22 and 24 and the bridge port 19 alternately opens and closes communication between the ports 23 and 25. The arrangement of the ports is furthermore such that when the rotation ring is at the limit of its movement in one direction, the port 18 opens communication between the fluid supply port 20 and the piston port 22 while the port 19 at the same time opens communication from the piston port 23 to external atmosphere through the port 25. When the rotation ring is at the limit of its movement in the opposite direction, the bridge port 19 opens communication from the motive fluid supply port 20 to the piston port 23 and at the same time the bridge port 18 opens communication from the piston port 22 to external atmosphere through the port 24.

In operation, presupposing the parts to be the position shown in Fig. 2, the motive fluid supply will be open to the outer side of the piston 14 while the outer side of the piston 15 is open to external atmosphere. The pressure of the fluid will rock the rota-

tion ring to the limit of its movement as shown in Fig. 3, the arm 12 of the ring pushing the piston 15 along with it. In the arrangement of the clutch as shown herein, this movement of the rotation ring will not move the chuck 8. As the rotation ring reaches the limit of its movement as shown in Fig. 3, the motive fluid supply will be open to the outer side of the piston 15 while the outer side of the piston 14 is open to external atmosphere. This will cause the ring to be moved back to its position shown in Fig. 2 and because of its clutching engagement with the chuck 8, it will rotate the chuck and thereby the tool steel. The cycle of operations is then repeated.

What I claim is:—

1. In a fluid pressure operated hammer tool, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, and piston chamber ports, said oscillating ring having bridge ports which open the pressure fluid supply port alternately to the piston chamber ports.

2. A fluid pressure operated hammer tool and its operating mechanism, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, means for supplying pressure fluid thereto independent of the hammer operating mechanism, and piston chamber ports, said oscillating ring having bridge ports which open the pressure fluid supply port alternately to the piston chamber ports.

3. In a fluid pressure operated hammer tool, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, piston chamber ports and exhaust ports, said oscillating ring having bridge ports which alternately open the pressure fluid supply port and the exhaust ports to the piston chamber ports.

4. A fluid pressure operated hammer tool and its operating mechanism, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, means for supplying pressure fluid thereto independent of the hammer operating mechanism, piston chamber ports and exhaust ports, said oscillating ring having bridge ports which alternately open the pressure fluid supply port and the exhaust ports to the piston chamber ports.

5. In a fluid pressure operated hammer tool, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, piston chamber ports and exhaust ports, all leading to the face of the oscillating ring, the said ring having bridge ports which alternately open the pressure fluid supply port and exhaust ports to the piston chamber ports.

6. A fluid pressure operated hammer tool and its operating mechanism, a tool steel, a piston, a ring separate therefrom and oscillated thereby, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, means for supplying pressure fluid thereto independent of the hammer operating mechanism, piston chamber ports and exhaust ports, all leading to the face of the oscillating ring, said ring having bridge ports which alternately open the pressure fluid supply port and the exhaust ports to the piston chamber ports.

7. In a fluid pressure operated hammer tool, a piston chamber, a pair of pistons therein, a tool steel, an oscillating ring having an arm projecting into the piston chamber between said pistons, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, and piston chamber ports, the said oscillating ring having bridge ports which open the pressure fluid supply port alternately to the piston chamber ports.

8. A fluid pressure operated hammer tool and its operating mechanism, a piston chamber, a pair of pistons therein, a tool steel, an oscillating ring having an arm projecting into the piston chamber between said pistons, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, means for supplying pressure fluid thereto independent of the hammer operating mechanism, and piston chamber ports, the said oscillating ring having bridge ports which open the pressure fluid supply port alternately to the piston chamber ports.

9. In a fluid pressure operated hammer tool, a piston chamber, a pair of pistons therein, a tool steel, an oscillating ring having an arm projecting into the piston chamber between said pistons, a clutch connection between the ring and steel for rotating the steel, a pressure fluid supply port, piston chamber ports and exhaust ports, said oscillating ring having bridge ports which alternately open the pressure fluid supply port and exhaust ports to the piston chamber ports.

10. A fluid pressure operated hammer tool and its operating mechanism, a piston chamber, a pair of pistons therein, a tool steel, an oscillating ring having an arm projecting into the piston chamber between said pistons, a clutch connection between the ring and steel for rotating the steel, a pressure

fluid supply port, means for supplying pressure fluid thereto independent of the hammer operating mechanism, piston chamber ports and exhaust ports, said oscillating ring having bride ports which alternately open the pressure fluid port and exhaust ports to the piston chamber ports.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this fourth day of August, 1909.

ALBERT H. TAYLOR.

Witnesses:
WARD RAYMOND,
RUSSELL H. WILHELM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."