No. 692,393.

Patented Feb. 4, 1902.

F. WEIMAR.

COMPRESSED AIR DRILL.

(Application filed Jan. 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

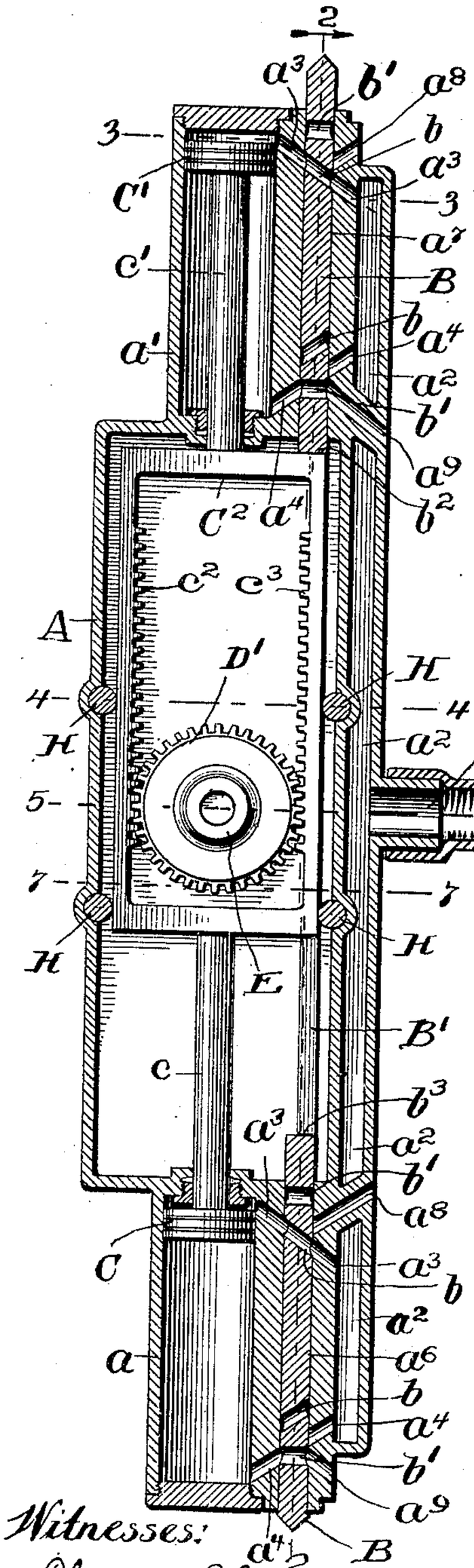
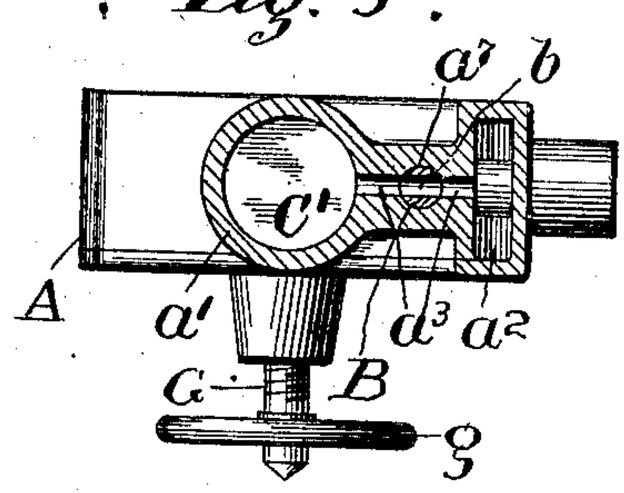


Fig. 3.



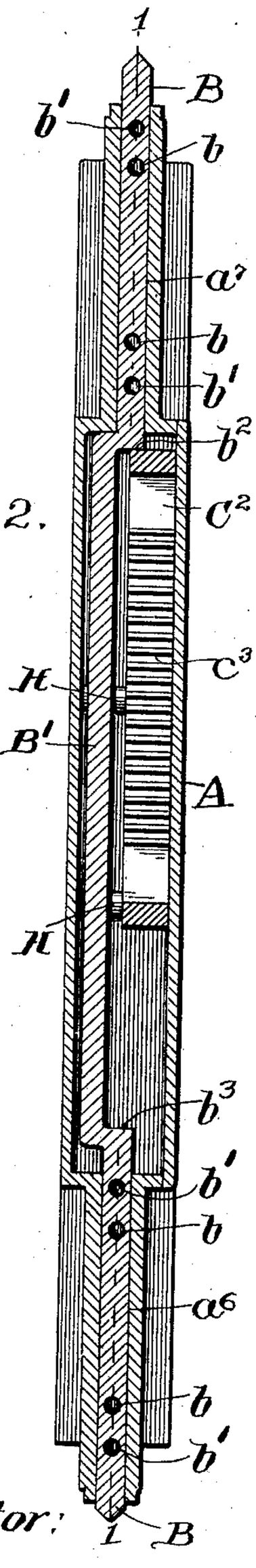
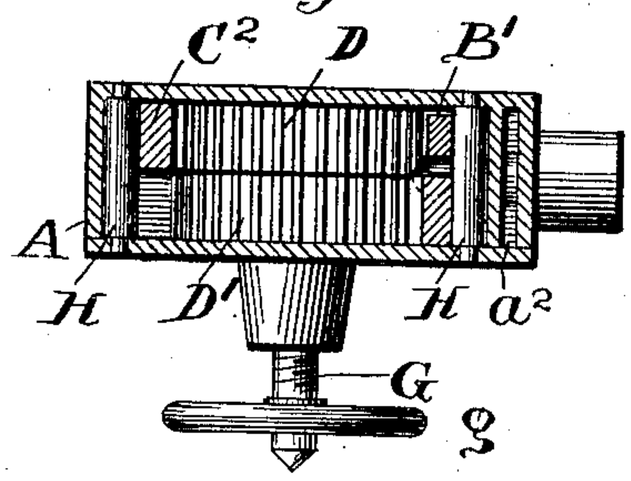


Fig. 2.

Fig. 4.



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No. 692,393. Patented Feb. 4, 1902.

F. WEIMAR.

COMPRESSED AIR DRILL.

(Application filed Jan. 5, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

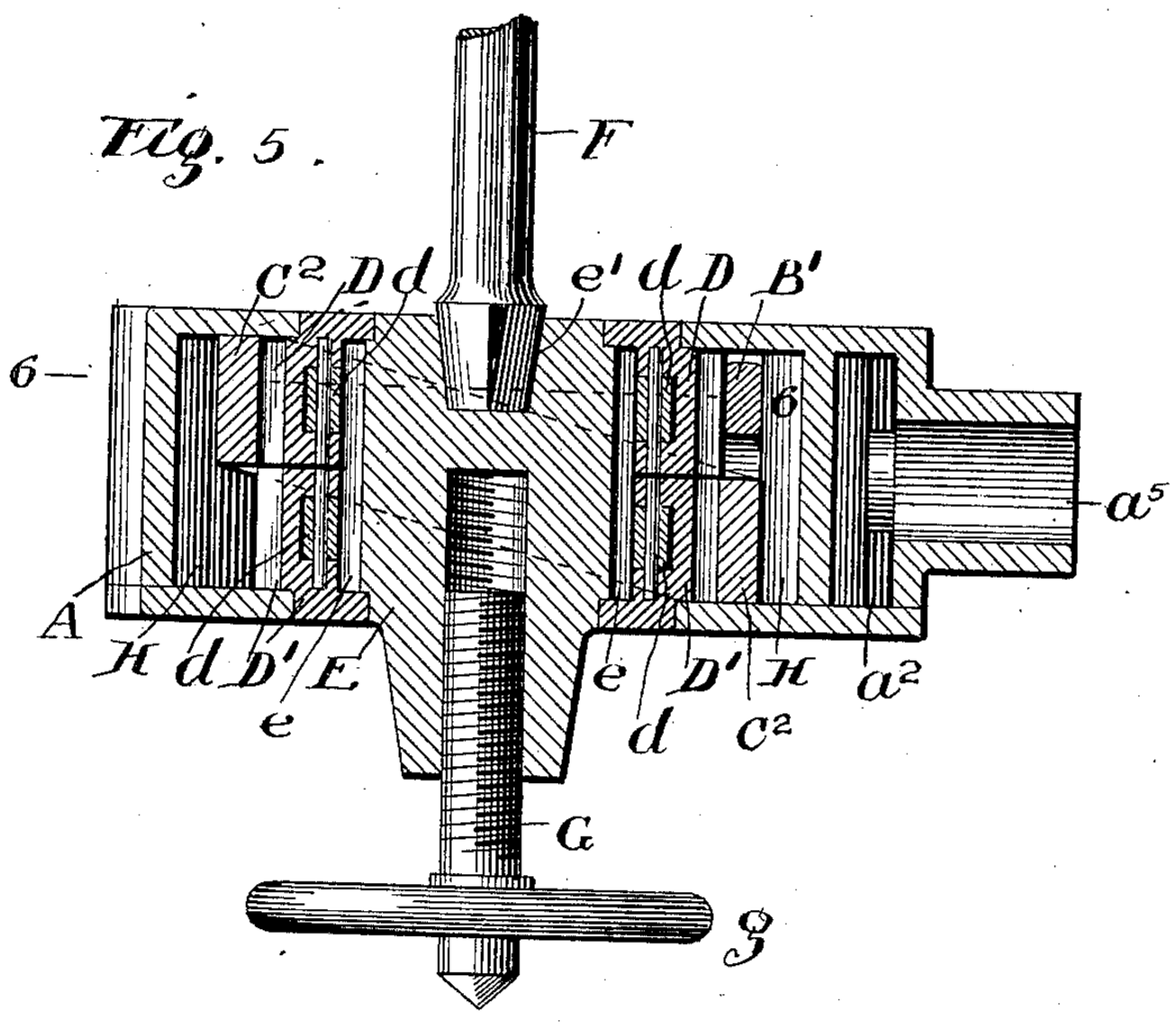


Fig. 6.

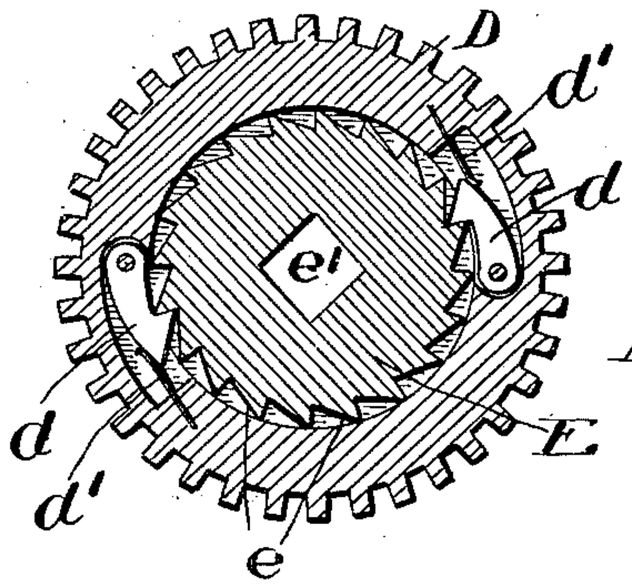
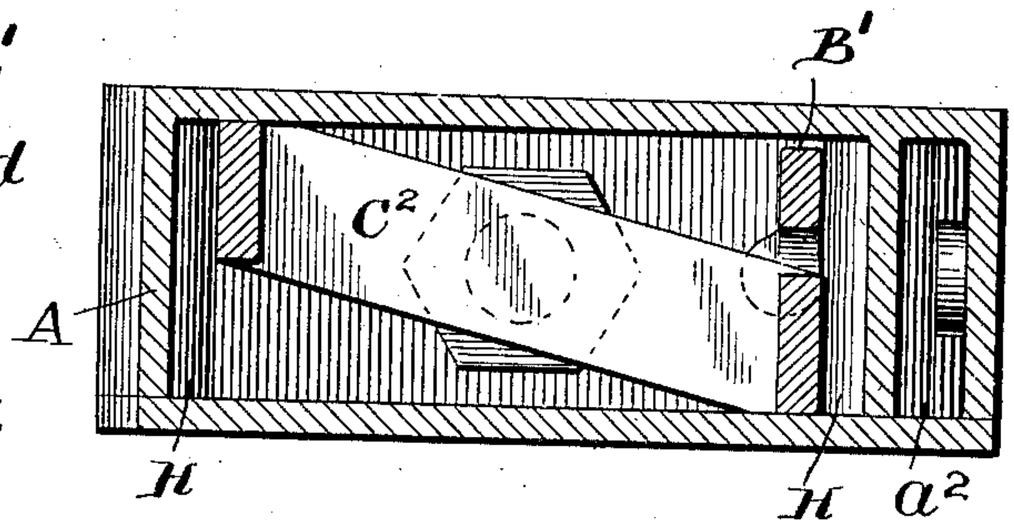


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRED WEIMAR, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO S. A. FRENCH, OF CHICAGO, ILLINOIS, AND T. D. HEWITT, OF FREEPORT, ILLINOIS.

COMPRESSED-AIR DRILL.

SPECIFICATION forming part of Letters Patent No. 692,393, dated February 4, 1902.

Application filed January 5, 1901. Serial No. 42,207. (No model.)

To all whom it may concern:

Be it known that I, FRED WEIMAR, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Compressed-Air Drills, of which the following is a specification.

My invention relates to certain improvements in compressed-air drills designed for the purpose of making a compact, easily-operating, and durable motor for use in such drills, and to such end consisting in certain novel characteristics, which will be fully described and claimed below.

In the drawings, Figure 1 is a longitudinal median section in line 1 1 of Fig. 2. Fig. 2 is a longitudinal section in line 2 2 of Fig. 1. Fig. 3 is a transverse section in the broken line 3 3 of Fig. 1. Fig. 4 is a transverse section in the line 4 4 of Fig. 1. Fig. 5 is a transverse section in the line 5 5 of Fig. 1. Fig. 6 is a detail section in line 6 6 of Fig. 5, and Fig. 7 is a transverse section in line 7 7 of Fig. 1.

Referring to these drawings, A is a suitable casing provided, preferably, at both ends with air-cylinders a a', an air-chest a^2 being connected to the cylinders by means of oblique ports a^3 a^4 and with a suitable supply-pipe by means of a port a^5. Said case is also provided with ways a^6 a^7 at each end, in which is tightly fitted a slide-valve B, provided with diagonal ports b and adjacent straight ports b'. The diagonal ports when in proper position are adapted to connect the two portions of the compressed-air ports, and the straight ports are adapted to connect the inner portions of the air-ports with the exhaust-ports a^8 a^9. The slide-valve has an offset middle portion B', affording shoulders b^2 b^3. The cylinders are provided, respectively, with pistons C C', from which piston-rods c c' extend to a rectangular frame C^2, adapted to engage the shoulders b^2 b^3 during the last portion of its movement in each direction and inclosing two gears D D', journaled in the casing, as shown in Fig. 5, and having rotatably mounted within them a concentric chuck E, provided within the gears with ratchet-teeth e. Each of the gears is provided with a pawl d, pressed by a spring d' toward the ratchet-teeth of the chuck and all adapted to rotate said chuck in some direction. The opposite sides of the frame C^2 are provided with racks c^2 c^3, and the frame is arranged obliquely, so that these racks may engage, respectively, with the gears D D'. As the frame moves back and forth it rotates these gears first in one direction and then in the other, the two gears at any given time being rotated in opposite directions. They alternately rotate the chuck E in the proper direction by means of the pawls and ratchet-teeth, and said chuck is provided with a socket e' to receive the shank of the drill F and is preferably fitted with a pin G, screw-threaded in the opposite end and provided with a hand-wheel g, by means of which the pin may be rotated to advance the drill to its work. The frame is preferably guided between antifriction-rollers H and as it moves back and forth operates the slide-valve to reverse the action of the air.

I claim as new and desire to secure by Letters Patent—

1. The combination with a portable reciprocating-engine cylinder and its piston, of a flexible pipe for delivering motive fluid to the cylinder, a rigid frame extending from the cylinder alongside the path of the piston-rod, two gears mounted in said frame to rotate upon an axis perpendicular to the axis of the cylinder, two racks connected directly to the piston-rod, to reciprocate therewith, and engaging the two gears, respectively, but upon opposite sides, a tool-chuck mounted in the common axis of the gears, clutch devices arranged to transmit to the chuck like alternate movements of the gears, and a slide-valve operated directly by parts accompanying the piston in its reciprocation.

2. The combination with a portable reciprocating engine and its piston, of a rigid frame extending from the cylinder alongside the path of the piston-rod, two gears mounted in said frame to rotate about a common axis, a rigid rack-frame connected directly to the outer end of the piston-rod and provided with two sets of rack-teeth engaging said gears, respectively, but upon opposite sides, a chuck mounted centrally within said gears, clutch

mechanism arranged to transmit to said chuck like alternate movements of the gears, and a slide-valve extending outward alongside the path of the rack-frame and provided with shoulders in position to be struck alternately by the rack-frame near the limits of its movements.

3. In devices of the class described, the combination with two engine-cylinders having a common axis, of a suitable casing connecting the cylinders, two gears mounted in the casing to rotate about a common axis transverse to that of the cylinders, a tool-holding chuck lying in the axis of the gears, ratchet devices connecting the gears with the chuck, to rotate it, two racks engaging the gears, respectively, a piston in each cylinder, a piston-rod connecting each piston with the corresponding ends of the racks, and means for operating the pistons.

4. The combination with the casing, A, having the cylinders, a, a', of the pistons, C, C', the piston-rods, c, c', the frame, C^2, secured at its opposite ends to the piston-rods, and provided with the racks, c^2, c^3, the two gears respectively in mesh with the respective racks and journaled in the casing, the chuck journaled in the gears and provided with ratchet connections therewith tending to rotate in the same direction, suitable air and exhaust ports in the casing, and the slide-valve, B, provided with suitable ports and having the shoulders, b^2, b^3, adapted for engagement with the frame, C^2, to shift the valve; substantially as described.

5. In a device of the class described, the combination with the casing, A, provided with suitable cylinders, air-chest, oblique air-ports, a^3, a^4, and adjacent exhaust-ports, a^8, a^9, of the slide-valve, B, guided in the casing and having the oblique air-ports, b, adapted to register and line up with the ports, a^3, a^4, and the adjacent ports, b', adapted to connect the inner portions of the air-ports with the exhaust-ports, a^8, a^9; substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the county of Cook and State of Illinois, this 22d day of December, A. D. 1900.

FRED WEIMAR.

Witnesses:
CHAS. O. SHERVEY,
S. BLISS.