

C. SCHOFIELD.
 PORTABLE PNEUMATIC REVERSIBLE DRILLING MACHINE.
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1,008,076.

Patented Nov. 7, 1911.

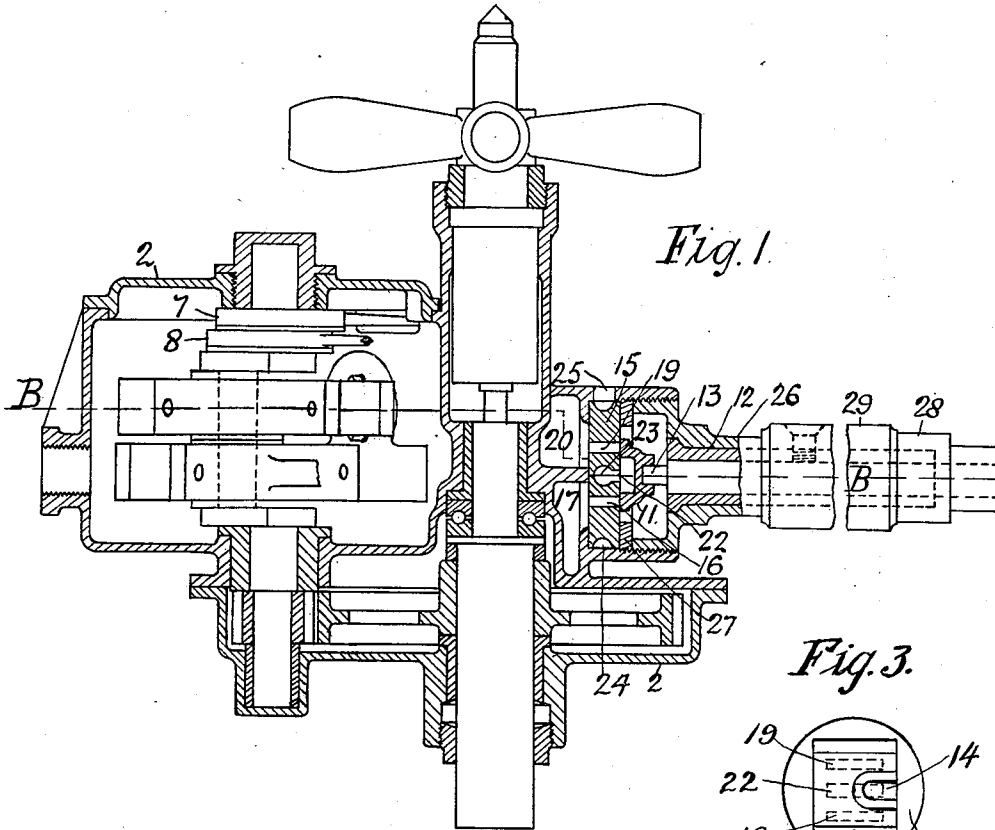


Fig. 1.

Fig. 3.

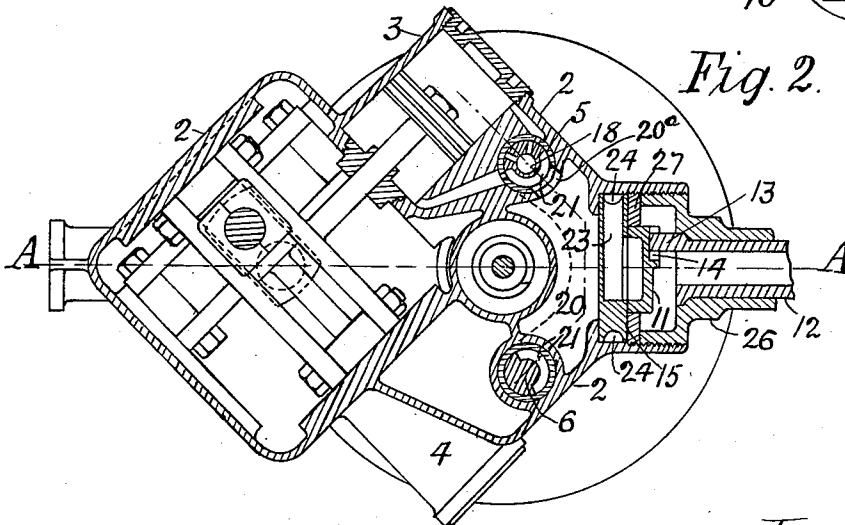
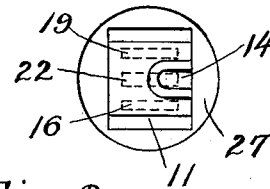


Fig. 2.

Witnesses
A. H. H. H.
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 Charles Schofield
 by his Attorney *H. E. H. H.*

UNITED STATES PATENT OFFICE.

CHARLES SCHOFIELD, OF NEWCASTLE-UPON-TYNE, ENGLAND.

PORTABLE PNEUMATIC REVERSIBLE DRILLING-MACHINE.

1,008,076.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed June 7, 1909. Serial No. 500,472.

To all whom it may concern:

Be it known that I, CHARLES SCHOFIELD, a subject of the King of England, residing at Newcastle-upon-Tyne, in the county of Northumberland, in England, have invented certain new and useful Improvements in Portable Pneumatic Reversible Drilling-Machines, of which the following is a specification.

10 This invention relates to portable pneumatic drilling machines more particularly of that class in which the controlling and reversing valve for motive fluid is rotated to cover and uncover ports in a seating disk
15 whereby the motive fluid is admitted to opposite sides of the cylinder valves according to the direction of movement. In known apparatus of this class a circular valve has been rotated by means of an exterior sleeve
20 operating an auxiliary member within the fluid supply pipe said valve being also provided with a series of circular apertures and recesses co-acting with the inlet ports in the seating valve and also with an exhaust
25 port therein which communicates with a series of radial channels leading to a peripheral exhaust channel.

The object of the present invention is to considerably simplify the construction and
30 operation of such controlling and reversing valve mechanism, this being accomplished by rotation of the fluid supply pipe itself and connecting such pipe by means of an eccentric pin or equivalent with a valve of
35 D type which is not provided with any ports therethrough and is guided in its movements over the seating disk to cover and uncover the ports therein by means of a slotted disk or the like. The seating disk itself is
40 also of simplified construction having a single radial passage from the central exhaust port to the peripheral channel above mentioned.

The invention is represented in the annexed drawings in which—

45 Figure 1 is a central section on the line A—A of Fig. 2 of a drill having two cylinders and embodying my invention. Fig. 2 is a section on the line B—B of Fig. 1, and
50 Fig. 3 is a plan view of the slide valve and slotted disk in operative relation with the valve face.

Referring to the drawings 2 designates the casing, 3 and 4 the cylinders provided
55 respectively with the rotary valves 5 and 6

operated by eccentrics 7 and 8 respectively on the crank shaft of the apparatus.

The reversing valve 11 is of the D type of slide valve said valve being loosely connected to the inner end of the air pipe or
60 tube 12 of the machine, and moved backward or forward on the valve face, by turning said air tube, through the medium of an eccentric pin 13 on the end of the tube engaging in a slot 14 at the back of the valve.
65 The valve face 15 consists of a circular disk of suitable thickness fixed in the machine casing 2. There are two ports through the disk at a certain distance apart, one of said
70 ports 16 opens into a chamber 17 in communication with the underside of the cylinder valves 5 and 6, the air passing thence up the center 18 of each valve and through the
75 ports to the cylinders thus driving the drill forward. The other port 19 through the disk 15 opens into a chamber 20 in communication by means of ports 20^a with the
80 outer edge or back 21 of the cylinder valves, and into which the air from the cylinders exhausts when the drill is running forward. Between the two said ports 16 and 19 in the
85 disk is an exhaust port 22 which does not pass through the disk but is in communication with a hole or port 23 in the body of the disk leading to a groove or space 24 in
90 its circumference, and a hole 25 in the casing opposite to said groove allows the exhaust to pass into the atmosphere. The casing is shaped to receive an attachment 26 which
95 forms a valve chest, and also serves as a guide for the air pipe or tube 12 which is fitted into and is free to revolve therein. Within the valve chest is a slotted disk or
the like 27 which engages and serves as a
100 air tube, the valve is caused to move to such an extent that either of the two through ports 16 or 19 in the disk can be opened to the air pressure in the valve chest. Therefore if the port 16 which opens into the
105 chamber 17 in communication with the underside of the cylinder valves 5 and 6 is open, the drill will be driven forward and the exhaust will pass through the other port 19. If however the said port 19 which opens
into the chamber 20 in communication with the back of the cylinder valves 5 and 6 is open, the motion of the drill is reversed, and it runs backward. The outer end of the air
110 tube 12 is provided with the usual coupling

28 for attachment to the air main supply. For the purpose of turning, a sleeve or handle 29 encircles the air tube, and is suitably connected thereto.

5 What I claim as my invention and desire to secure by Letters Patent is:—

10 In a pneumatic drilling machine, the combination of a disk having ports therethrough communicating respectively with alternately operated cylinder valves, said disk being provided with a single exhaust passage communicating with a groove in the periphery thereof, a D-valve slidably mounted on the disk adapted to close one of the ports and
15 permit communication between the other port and the exhaust passage, a frame sur-

rounding the valve for limiting the movement of same, the valve being provided with a protuberance having a lateral U-shaped recess, an axially rotatable fluid supply pipe, 20 and an eccentrically arranged projection on the end of the fluid supply pipe for engaging the wall of the U-shaped recess whereby the D-valve will be operated by the rotation of said fluid supply pipe, substantially as 25 described.

In witness whereof I have signed this specification in the presence of two witnesses.

CHARLES SCHOFIELD.

Witnesses:

A. H. B. WILSON,

J. B. SCHOFIELD.

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