

W. J. WILSON.
ROTARY PUMP.

APPLICATION FILED AUG. 5, 1914.

Patented Apr. 24, 1917.

2 SHEETS—SHEET 1.

1,223,919.

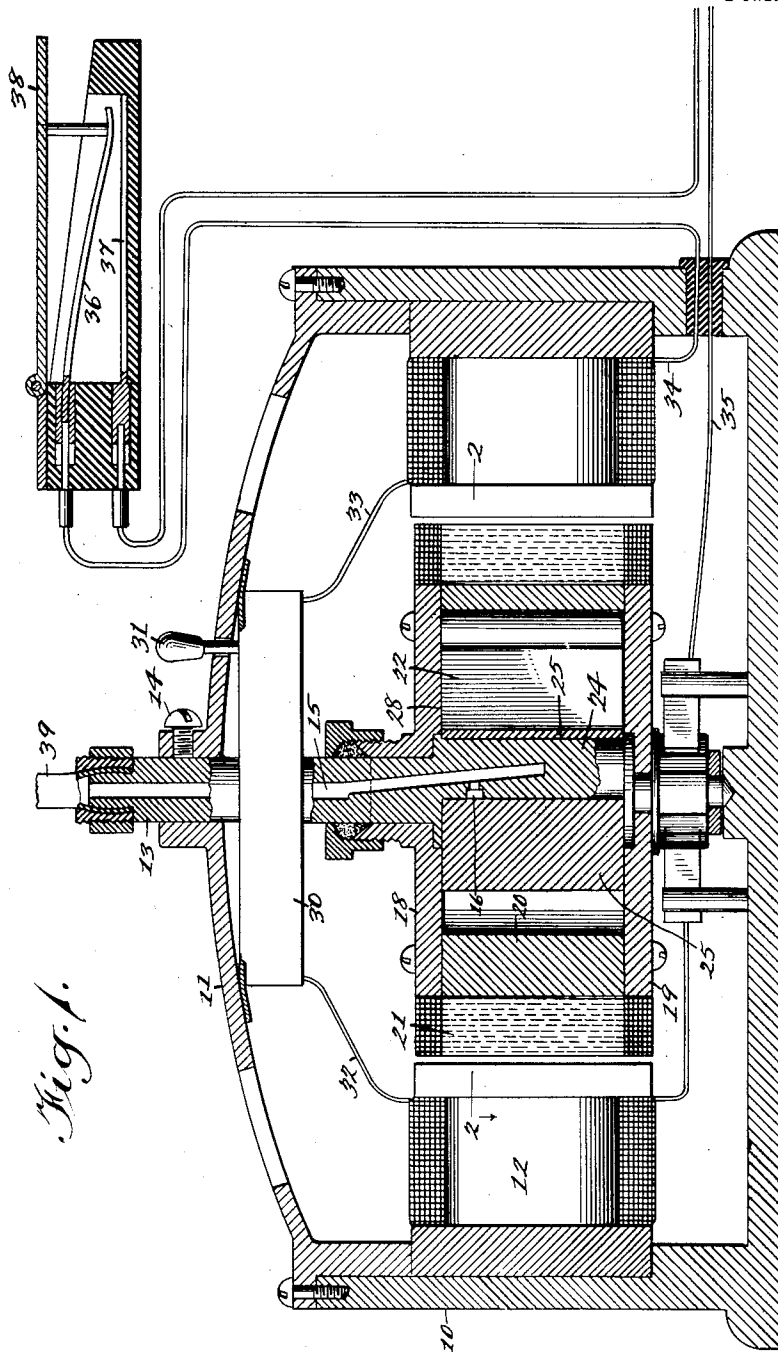


Fig. 1.

WITNESSES

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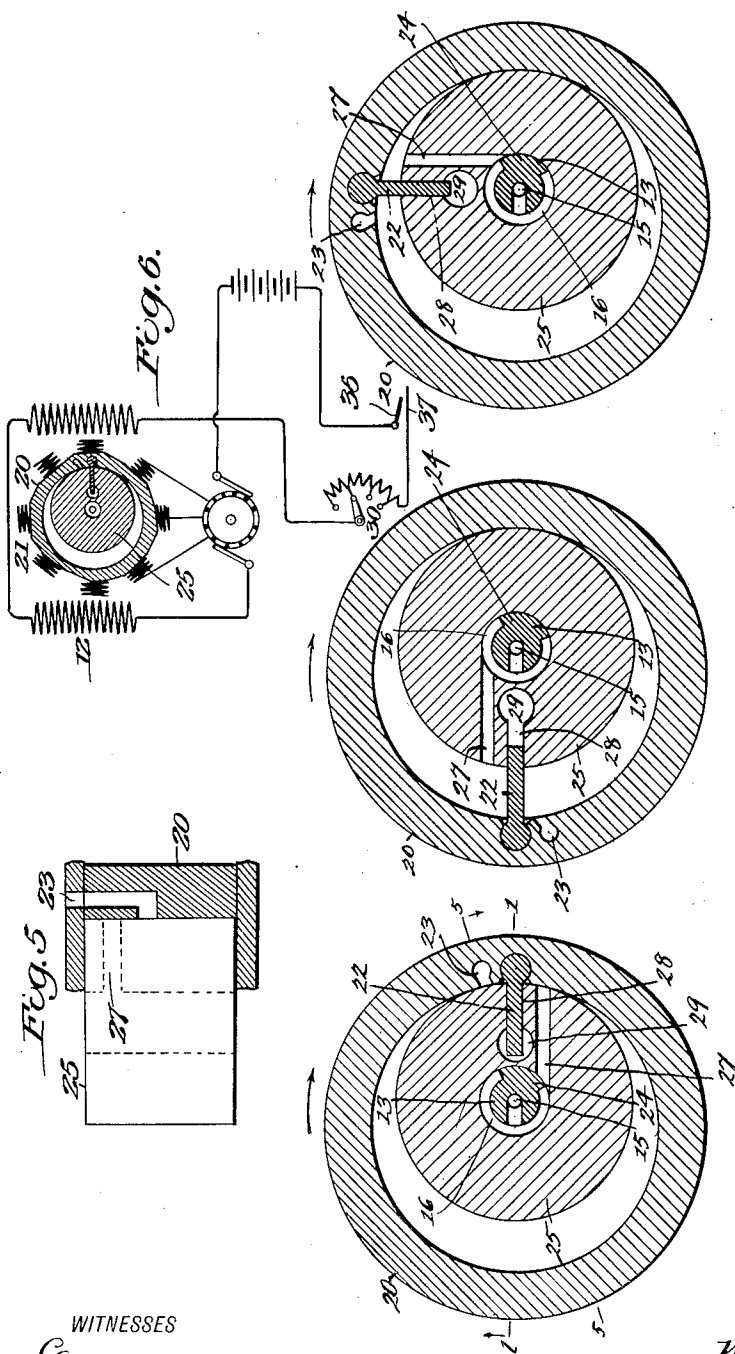
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WALTER J. WILSON, OF PETERSBURG, INDIANA.

ROTARY PUMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER J. WILSON, a citizen of the United States, and a resident of Petersburg, in the county of Pike and State of Indiana, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification.

My invention relates to air pumps, and one of the main objects thereof is to provide a compact, portable fluid pump primarily designed for the use of dentists and physicians, as for spray-bottles, blow-pipes, or other devices requiring air under pressure, although it may be used for liquids also; a further object is to provide a pump which is inclosed within the rotor of an electric machine, thus reducing the number of parts, economizing space, reducing friction incident to power transmission, and of low manufacturing cost; and a further object is to provide such a pump which will deliver air under constant pressure, due to the absence of piston reciprocation, in which the pressure of delivered fluid may be under control.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which the similar parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a central, vertical, section taken through one form of embodiment of my invention;

Fig. 2 is a partial section taken on the line 2—2 of Fig. 1, and showing the pump elements in one position;

Fig. 3 is a similar view with the elements in a different position;

Fig. 4 is a similar view with the elements in a still different position;

Fig. 5 is a partial section taken on the line 5—5 of Fig. 2; and

Fig. 6 is a diagrammatic view of the electric pump actuating means.

In the drawings forming a part of this application I have shown a casing 10, having a top 11 secured thereto and serving to maintain the stator 12 of an electric motor in position, as well as a shaft 13, held stationary by any suitable means, as the set-screw 14, Fig. 1, and said shaft has a bore 15 communicating with a segmental air chamber 16 in the periphery of the shaft.

Revoluble on the shaft 13 are two disks

18 and 19 connected with each other by means of a cylindrical section 20 to form a cylinder which carries the rotor windings 21, in the plane of the stator 12, and also carries an inwardly directed leaf 22 which is provided with a cylindrical end revoluble within a similar recess in the wall of the cylinder, and said cylinder 20 is also provided with an air inlet port 23 which opens to the interior of said cylinder, as clearly shown in Figs. 2, 3, 4 and 5.

The shaft 13 is cut away, within the cylinder 20, to form a crank 24 upon which is a revoluble drum 25 having a substantially radial passage 27 adapted for intermittent communication with the air chamber 16 and with the interior of the cylinder 20, and it will be noted by reference to Figs. 2 to 4, inclusive, that the said drum is concentric with the crank-shaft 24 but eccentric to the shaft 13, proper, and is in constant contact with the interior walls of the cylinder 20, over which it moves.

The drum 25 is maintained in relative position with respect to said cylinder by means of the leaf 22, hereafter referred to as the abutment, which slides in a radial slot 28 having an enlarged chamber 29 at its inner end, air being compressed in said chamber 29 on the inward movement of the said abutment to assist the movement thereof, and by reference to Figs. 2, 3 and 4, it will be seen that the said abutment is always in connection with said cylinder and with said drum, whereby it divides the crescent shaped space within said cylinder into distinct portions during the greater part of the revolution of said cylinder and said drum, thus preventing air from passing from one side of said abutment to the other.

At 30 I have shown a rheostat, of any desired form, controlled by means of a button 31, exteriorly of the casing 10, and being connected with the stator by means of wires 32 and 33, and I also show wires 34 and 35 leading to a suitable source of electrical energy, the former of which, however, is interrupted by a switch comprising two spring contact plates 36 and 37 normally held apart by the spring of the former but adapted to be brought into contact by a foot-lever 38, thus permitting a person using my pump to utilize both hands on the work being done.

When the switch is closed the motor is energized, and the rotor carries the cylinder

20 therewith, the abutment 22 carrying the drum therewith but, in such movement, around the fixed shaft 13, the drum moves along the inner periphery of the cylinder, thus forcing air forwardly thereof, but the air is prevented from following the said drum because of the abutment 22 and said air is, therefore, forced into the passage 27, and thence, under pressure, passes through the shaft 13 to the point of use through a suitable flexible tube 39, the extreme inner position, extreme outer position, and one intermediate position of the pump being clearly shown in Figs. 2, 3 and 4, respectively, and by reason of the fact that the rotor movement is constant, the air forced to the point of use is practically constant, this being of great advantage, and highly desirable, in practically all the uses for such pumps by physicians and dentists.

It will be seen that I make my pump of relatively small size and of little weight, whereby it may be readily portable and ready for use in any room or apartment provided with the ordinary electric light sockets, and my pump may be placed in any desired portion of such room or apartment because of the fact that the electrical connection is flexible, as is also the tubing 39, but I do not limit myself to such portability, as I may make pumps for permanent installation, neither do I confine myself to the exact shapes of the parts shown and described, nor to the materials of which the parts are composed, my intent being, as hereinbefore stated, to provide a pump contained within an electric motor, and carried by the rotor thereof.

My invention is simple in construction and use, highly efficient, well adapted for the purposes for which it is designed, as

well as for other purposes, light, compact, and inexpensive, and, with a reservation to myself of all such changes in and modification of the details shown and described as may come within the scope of the following claims, what I claim as new, and desire to secure by Letters Patent, is:—

1. The combination with an electric motor, of a fixed crank shaft, having an air passage therein, a cylinder carried by the rotor of said motor, a concentric drum carried by said shaft within and eccentric to said cylinder, and an abutment in rocking connection with said cylinder and in sliding engagement with said drum, said cylinder being provided with an air inlet and said drum with a passage in intermittent communication with the passage in said shaft.

2. The combination with an electric motor, of a fixed crank shaft having an air passage therein, a cylinder carried by the rotor of said motor and provided with a longitudinal cylindrical recess in the inner wall thereof, a concentric drum carried by said shaft within and eccentric to said cylinder and provided with a radial slot extending to the periphery thereof, and an abutment provided with a cylindrical head filling said cylindrical recess and comprising a plate filling said radial slot, said cylinder being provided with an air inlet and said drum with a passage in intermittent communication with the passage in said shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER J. WILSON.

Witnesses:

JAMES F. VAN NUDO,
WILLIAM D. CROW.