E. E. HAUER.

ROTARY MOTOR FOR DRIVING TOOLS.

APPLICATION FILED MAY 22, 1914.

1,167,996. Patented Jan. 11, 1916.

Fig. 1.

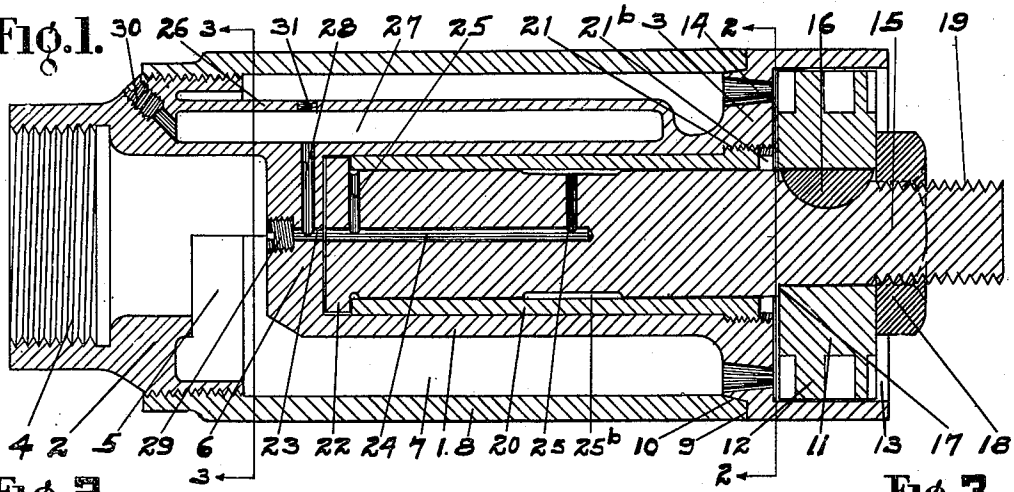


Fig. 2.

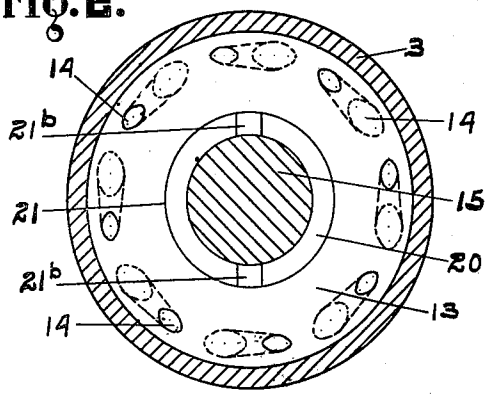


Fig. 3.

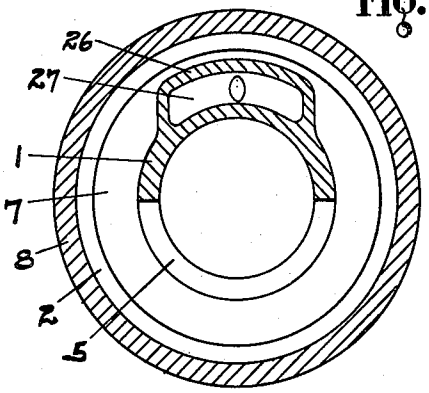
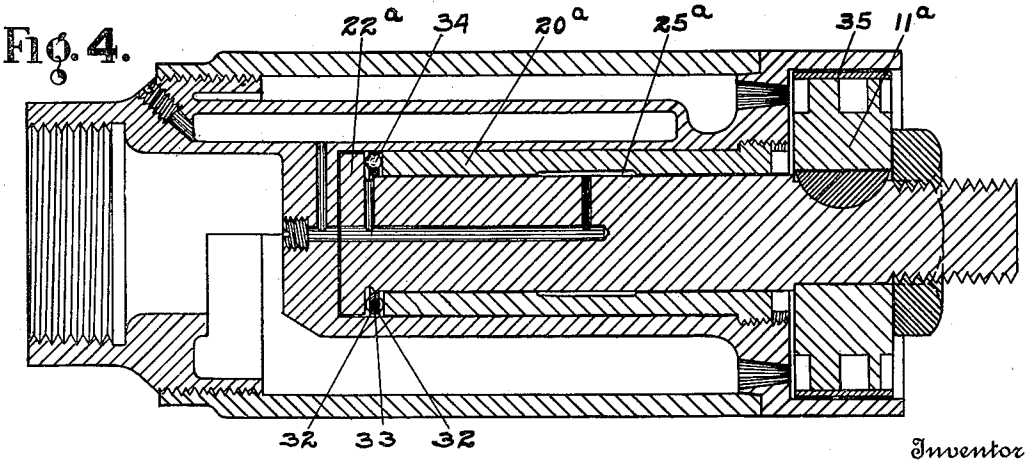


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTARY MOTOR FOR DRIVING TOOLS.

1,167,996. Specification of Letters Patent. Patented Jan. 11, 1916.

Application filed May 22, 1914. Serial No. 840,337.

To all whom it may concern:

Be it known that I, ELMER E. HAUER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Rotary Motors for Driving Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to rotary motors and more particularly to a rotary motor for driving tube cleaners that is adapted to travel through a tube with the cleaner, although it may be used for other purposes.

The object of my invention is to provide a simple, strong and efficient motor to meet the conditions of a very severe service. To avoid joints which are liable to be jarred loose I have provided a supporting body having heads at its respective ends formed integral therewith. This affords a very rigid construction of great endurance and reduces the motor to a simple form of few parts.

With these and other objects in view my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings which form a part of this specification Figure 1 is a longitudinal section of a motor embodying my invention. Figs. 2 and 3 are cross-sections on the lines 2—2 and 3—3 respectively of Fig. 1 and Fig. 4 is a longitudinal section showing some modifications.

Like numerals represent the same parts in the several views.

In the drawings 1 represents a supporting body with enlarged ends preferably integral therewith forming heads 2 and 3. This affords a very rigid construction to meet the conditions of the very severe service for which the motor is particularly designed.

The supporting body and heads have a central bore or opening which extends from a motor chamber 13 formed in the front head, through said body and the rear head 2, said rear head being screw-threaded at 4 to attach a supply conduit. An opening 5 through the wall of the body, in the rear of a cross-partition 6, admits the motive agent to an annular chamber 7 formed about the body by a cylinder 8, which may be secured in any suitable way; but is shown as being screw-threaded at its rear end to the head 2 and tightened in place with its front end against a shoulder 9 of the head 3. Said shoulder 9 preferably has an inclined portion 10 and the front end of the bore of the cylinder has a like inclination so that when tightened against the same it will be more securely held in place.

A rotary motor member 11 which is shown in the form of a turbine having buckets 12 operates within the motor chamber 13 formed in the head 3, the motive agent being admitted thereto from the annular chamber 7 by ports or passages 14 that extend through the rear wall of said head. Said rotary motor member 11 is keyed upon a shaft 15 by a key 16 and is tightened against a shoulder 17 on said shaft by a nut 18 on the screw-threaded end 19 of said shaft, said screw-threaded end also forming the means of attaching the tool to be driven. Said shaft is journaled within the central bore of said front head and body in front of the cross-partition 6 and a removable bushing 20 is preferably provided which may be secured in place in any suitable way, but is shown as screw-threaded at 21 to the body, cross-slots 21^b being provided for the engagement of a tool to screw the same in place. Said shaft is provided at its rear end with a flange 22 which bears against the rear end of the bushing 20 and takes the forward thrust of the rotary motor member.

Provision is made to lubricate the shaft either by the motive agent or by oil as may be desired. The motive agent is introduced through a longitudinal passage 23 in the cross-partition opening into a conduit 24 in the shaft which in turn opens to the bearing by cross-conduits 25 and a recess 25^b is provided to aid in the distribution of the lubricant. The supporting body 1 is provided with an enlarged portion 26 having an oil reservoir 27 therein with a cross-passage 28 opening into the longitudinal passage 23. This passage 23 is enlarged and screw-threaded at its outer end and is provided with a plug 29. A supply opening for the reservoir is closed by removable screw 30. It will be seen that when oil is supplied to the reservoir and the plug 29 is in place the oil will flow to the bearing; and that by removing the plug 29 the motive agent will be introduced to the bearing. An opening made in the shell of the reservoir to drill the passage 28 is closed by a plug 31.

In Fig. 4 an anti-friction thrust bearing

is shown interposed between the rear end of the bushing 20^a and shaft flange 22^a, said bearing comprising two rings 32 each having oppositely disposed hemispherical recesses opening through the outer walls so that when the rings are riveted together by rivets 33 with balls 34 in the recesses the balls will project slightly beyond the outside wall of said rings and contact with the end of the bushing 20^a and shaft flange 22^a. In this figure a recess 25^a is shown in the bushing to aid in the lubrication of the shaft. A further modification is shown in that the rotary motor member 11^a is provided with a shroud 35.

Having thus described my invention I claim:—

1. In a rotary motor, a supporting body having heads of greater diameter at its respective ends, one of said heads having a motor chamber therein, a rotary motor member in said chamber having a shaft journaled in said body and means to supply the motive agent to said member, said means including a cylinder screw-threaded to one of said heads and abutting an inclined portion of the other head, substantially as described.

2. In a rotary motor, a body having a supply opening, an oil reservoir and a bearing, a rotary motor member having a shaft journaled in said bearing and means to admit the motive agent from said supply opening or oil from said reservoir to said bearing as desired, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ELMER E. HAUER.

Witnesses:
OLIVER H. HAUSE,
GROVER ILGEN.

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