

E. E. HAUER.
 ROTARY MOTOR.
 APPLICATION FILED OCT. 15, 1909.

994,392.

Patented June 6, 1911.
 2 SHEETS—SHEET 1.

FIG. 1.

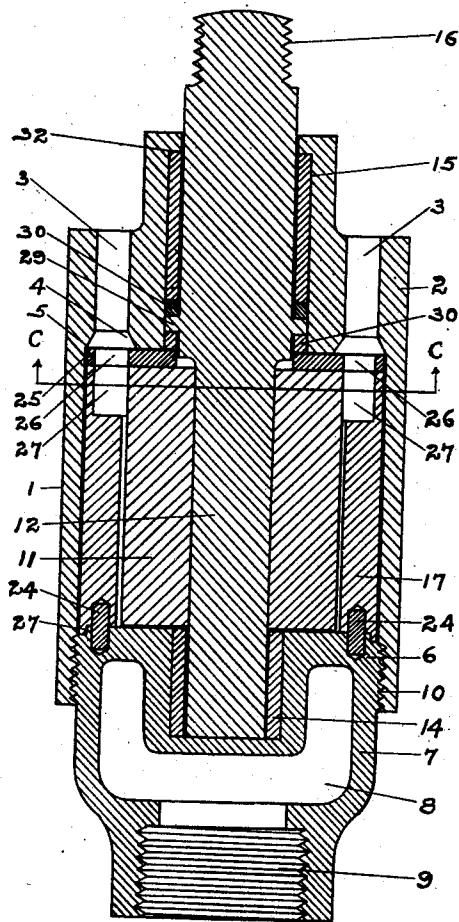
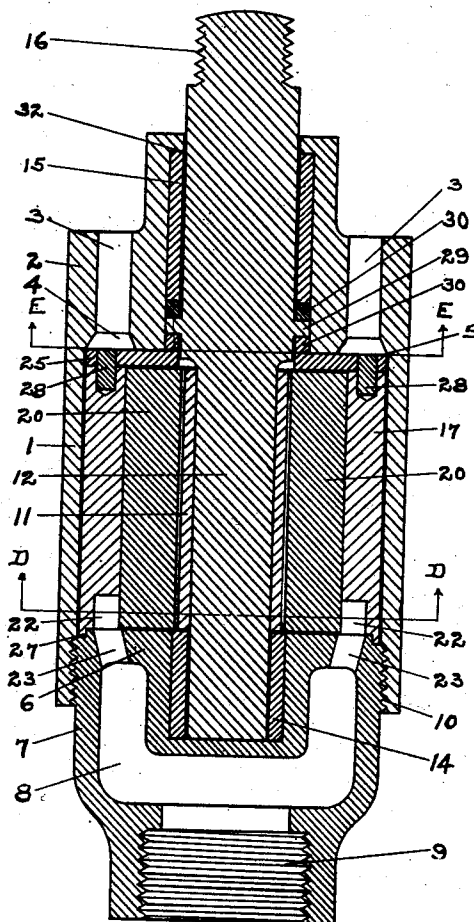


FIG. 2.



Inventor

Witnesses

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By

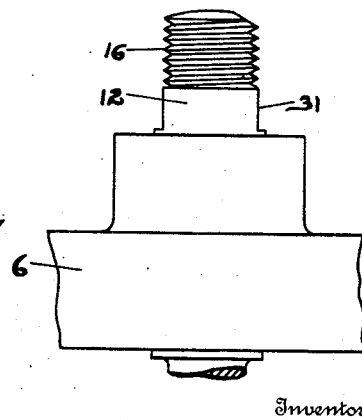
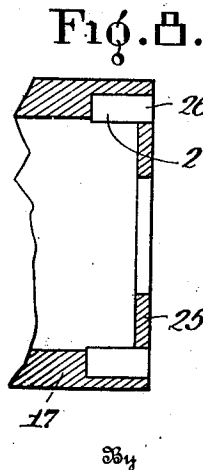
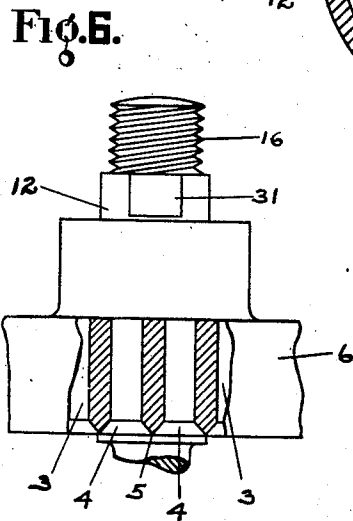
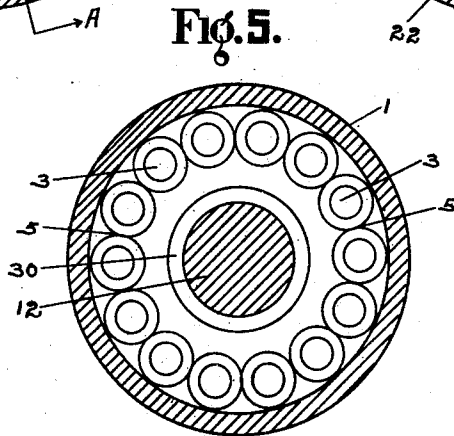
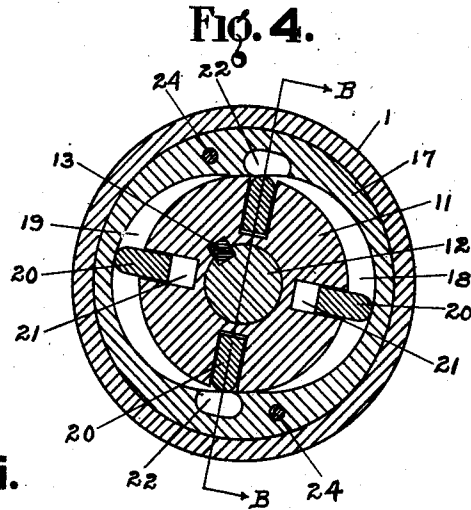
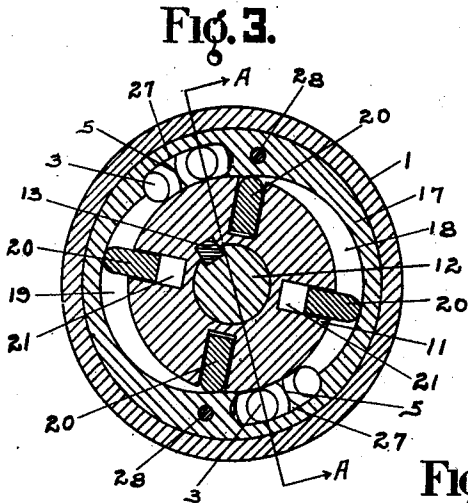
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ELMER E. HAUER, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

ROTARY MOTOR.

994,392.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed October 15, 1909. Serial No. 522,893.

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, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to motors and more particularly to rotary motors operated by air or steam or like actuating mediums.

The object of my invention is to provide a compact, simple and efficient motor, easily assembled and readily taken apart, for driving tools to remove scale and other deposits from the interior of boiler tubes although it may be used for other purposes.

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 Figure 1 is a longitudinal section of a motor embodying my invention, taken on the line A A of Fig. 3 through the exhaust ports, looking in the direction of the arrows, Fig. 2 is a longitudinal section of the motor, taken on the line B B of Fig. 4 through the inlet ports, looking in the direction of the arrows. Fig. 3 is a cross section of the motor on the line C C of Fig. 1, looking in the direction of the arrows. Fig. 4 is a cross section on the line D D of Fig. 2, looking in the direction of the arrows. Fig. 5 is a cross section on the line E E of Fig. 2. Fig. 6 is a detail showing walls between discharge openings of exhaust head sharpened at their receiving ends. Fig. 7 shows shaft flattened to be held by wrench, and Fig. 8 shows fragment of the sleeve with the ported exhaust plate formed integrally therewith.

Like numerals represent the same parts in the several views.

In the drawings 1 represents a cylinder with a head 2 preferably formed integrally therewith as shown, having a plurality of exhaust openings 3 countersunk at their inner ends 4 forming sharp receiving edges 5 between said openings. A removable head 6 with a rearwardly extending hollow portion 7 forming a chamber 8 and having a screw-threaded opening 9 suitable to attach a feed conduit, is screw-threaded at 10 to the rear end of said cylinder as shown; and said head

is preferably formed with a shoulder 27 seated in a recess in a sleeve to be hereinafter described.

A rotary piston 11 is mounted on a shaft 12 and secured thereto by a key 13, said shaft being journaled at its rear end in the head 6, a bushing 14 being preferably provided to form a bearing therefor. Said shaft has an enlarged portion projecting forwardly through the head 2 and journaled therein, a bushing 15 being preferably provided to form a bearing therefor; and the front end 16 of the shaft is screw-threaded to attach the tool to the driver. Between the screw-threaded portion 16 and the head 2 the shaft has flattened portions 31 to which a wrench can be applied to hold the shaft stationary while the tool is being attached.

A sleeve 17 forms a chamber of such dimensions that when the piston 11 is mounted therein it will contact the walls of the chamber in two places opposite each other forming two oppositely disposed crescent shaped chambers 18 and 19 as particularly shown in Figs. 3 and 4. Paddles 20 are seated in recesses 21 of the piston 11 and are adapted to move radially into the chambers 18 and 19 in a well known manner. Said sleeve is formed with inlet recesses 22 held in register with inlet ports 23 of the head 6 by dowel pins 24. A wearing plate 25 between said sleeve and exhaust head 2 is provided with exhaust ports 26 held in register with exhaust recesses 27 formed in said sleeve by dowel pins 28. It is obvious the plate 25 may be formed integrally with the sleeve as shown in Fig. 8; but I preferably form it separately as described. A thrust collar 29 on the shaft 12, preferably provided with spacing rings 30 on each side thereof, is located between the head 2 and plate 25; and the bushing 15 is preferably interposed between said collar and shoulder 32 in said head.

The motor is readily assembled by first placing the bushings 14 and 15 in place; then placing the shaft 12 with spacing rings 30, wearing plate 25 and piston 11 in the sleeve 17, the wearing plate 25 and head 6 being secured to the sleeve by dowel pins 24 and 28; then inserting the several parts so assembled into the cylinder and screwing the head 6 to the cylinder, thus securing all the parts including the thrust bearing in

place, the dowel pins holding the exhaust openings of the wearing plate and sleeve and the inlet openings of the inlet head and sleeve in register while being turned by the head. The walls of the adjacent longitudinally extending exhaust openings 3 which are arranged in a circle in the exhaust head, are tapered and terminate at their receiving ends in sharp receiving edges 5 between the openings, so that said openings will take the exhaust from the ported plate 25 in whatever position to which it may be turned or rotated by screwing the inlet head into place.

It will be seen that by the use of a sleeve the piston chamber with its inlet and exhaust openings can be formed more accurately and economically, especially when the exhaust head is formed integrally with the cylinder, for in that case it is difficult to turn the front end of the piston chamber accurately in the cylinder.

The operation of the motor will be readily understood; the actuating medium being introduced through the inlet openings 22 and 23, moves the paddles through the chambers and discharges through the exhaust openings 26 and 27 and escapes through the openings 3 of the exhaust head, the paddles successively operating through each of the chambers in like manner to rotate the piston.

Having thus described my invention, I claim:

1. In a rotary motor, a cylinder having a head at one end thereof with a plurality of adjacent longitudinally extending openings therethrough, arranged in a circle, the walls thereof being tapered and terminating at their inner ends in sharp receiving edges between said openings, a rotatable plate having a port therethrough, abutting the inner end of said head, a head screw-threaded into the opposite end of said cylinder having an inlet port and means to fix the relation of said inlet head and plate with their respective ports in communication, whereby when said inlet head is screwed in place, the exhaust head will receive and discharge the exhaust from the ported plate in any position to which it may be turned, substantially as described.

2. In a rotary motor, a rotary piston, a shaft having a collar thereon, a cylinder having an exhaust head with a central open-

ing having an inwardly extending flange at its outer end, a bushing in said opening between said flange and collar forming a bearing for said shaft adapted to take the end thrust in one direction and means abutting the opposite side of said collar to take the end thrust in the opposite direction, substantially as described.

3. In a rotary motor, a rotary piston, a shaft having a collar thereon, a cylinder having an exhaust head with a central opening having an inwardly extending flange at its outer end, a bushing in said opening between said flange and collar forming a bearing for said shaft adapted to take the end thrust in one direction, means to take the end thrust in the opposite direction, said head also having a plurality of adjacent longitudinally extending discharge openings arranged in a circle, the walls thereof being tapered and terminating at their inlet ends in sharp receiving edges between said openings, substantially as described.

4. In a rotary motor, a rotary piston, a shaft having a collar thereon, a cylinder having an inlet head screw-threaded thereto and an exhaust head formed integrally therewith having a central opening with an inwardly extending flange at its outer end, a bushing in said opening between said flange and collar, said exhaust head also having a plurality of adjacent longitudinally extending discharge openings arranged in a circle, the walls thereof being tapered and terminating at their inlet ends in sharp receiving edges between said openings, a sleeve having inlet and exhaust ports, a ported plate between said sleeve and said exhaust head and collar, means to fix said sleeve, ported plate and inlet head in their relation to each other, whereby when said inlet head is screwed in place the ports of said head, sleeve and plate will be maintained in register and the openings in the exhaust head will receive the exhaust from the ported plate in any position to which said plate may be turned, substantially as described.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ELMER E. HAUER.

Witnesses:

GROVER ILGEN,
ROBT. C. RODGERS.