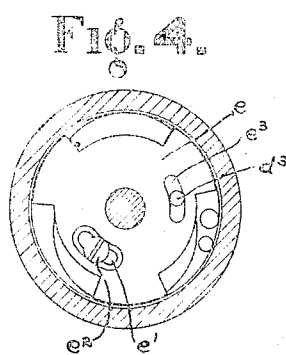
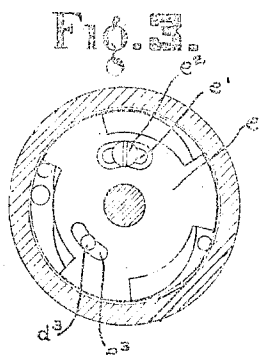
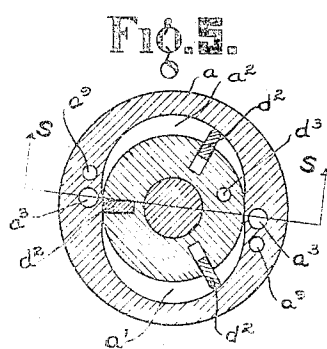
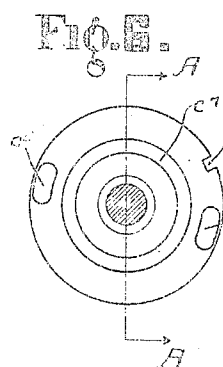
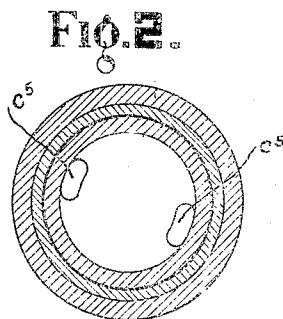
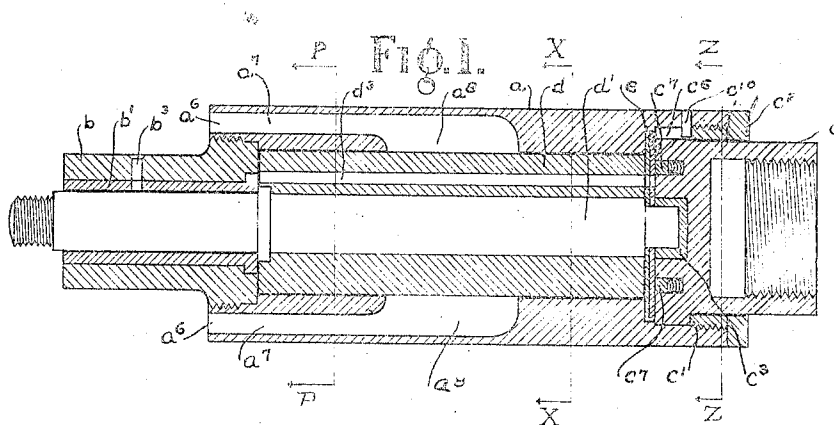


978,086.

H. F. WEINLAND.
 ROTARY MOTOR.
 APPLICATION FILED DEC. 30, 1907.

Patented Dec. 6, 1910.

2 SHEETS—SHEET 1



WITNESSES:

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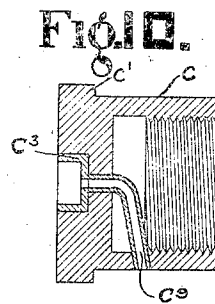
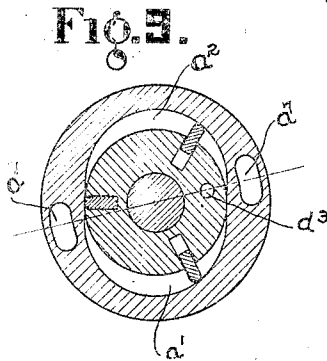
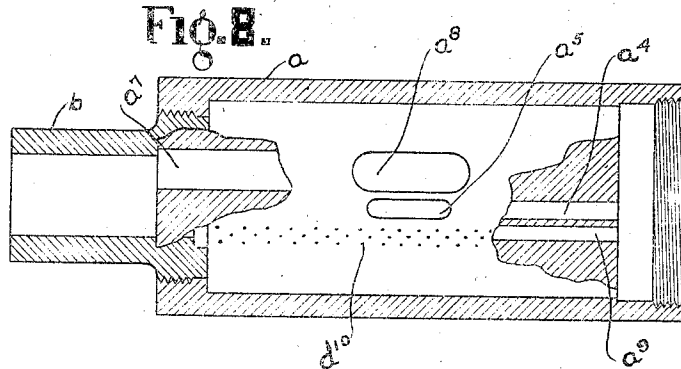
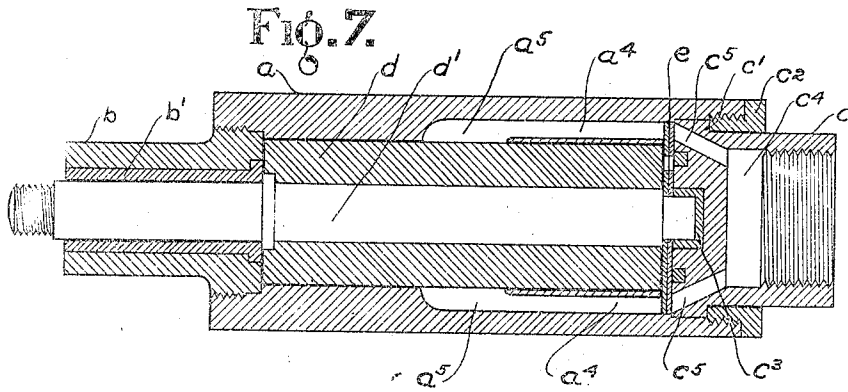
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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ROTARY MOTOR.

978,086.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed December 30, 1907. Serial No. 408,456.

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, 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.

My invention relates to rotary motors and especially to a motor actuated by air or steam.

The object of my invention is to provide a motor which can be used for general purposes but is more particularly adapted to drive tube cleaners, the motor being formed to follow the cleaner into the tube.

A motor of this character must be compact in form and of such strength and durability as to withstand the severe work incident to its use and it has been my object to provide a motor that will meet these requirements.

A further object has been to provide improved means to use the actuating medium expansively thereby increasing the efficiency and economy of the motor; and I have further arranged to vary the cut off as desired.

With these and other objects in view, my invention consists of the construction and combination hereinafter described and set forth in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a motor embodying my invention. Fig. 2 is a cross section on the line Z Z of Fig. 1 showing inlet ports in feed head looking in the direction of the arrow. Figs. 3 and 4 taken on the line Y Y of Fig. 1 show a face view of the cut-off valve, the inlet ports of one side being shown open in Fig. 3 and the opposite ports being shown open in Fig. 4. Fig. 5 is a cross section through the runner and casing, taken on the line X X of Fig. 1. Fig. 6 is a view looking at the inner end of the feed head, showing the ports opening on to the valve and the sealing ring. Fig. 7 is a longitudinal sectional view of the motor taken on the line S S of Fig. 5. Fig. 8 is a sectional view of the casing showing an inlet and exhaust port and a field of fine perforations, with the casing partly broken away to show the conduits leading to said ports and field of perforations. Fig. 9 is a cross section on the line P P of Fig. 1, Fig. 10 is a sectional

view through the feed head taken on the line A A of Fig. 6 showing the means of oiling the rear bearing of runner.

In the drawings *a* represents a casing, *b* a front and *c* a rear head for same. The front head is shown screwed directly into the casing but the rear head is formed with a shoulder *c*¹ and a screw threaded collar or coupling *c*² abutting on said shoulder is screwed into the casing to hold the head in place.

A runner *d* is mounted on a shaft *d*¹, the rear end of which is reduced and journaled in a recess, preferably having a bushing *c*³, in the head *c*; and the forward or driving end of the shaft extends through and is journaled in an opening in the front head *b*, a bushing *b*¹ being preferably used as a bearing for the shaft.

A chamber of such form and dimensions is provided that when the runner is mounted therein it will contact the walls of the chamber in two places opposite each other forming two oppositely disposed crescent shaped chambers *a*¹ and *a*² as particularly shown in Figs. 5 and 9. Inlet ports *a*⁴ opening into the crescent shaped working chambers, preferably at *a*⁵ in the longitudinal center thereof, are provided for each of said chambers, as shown in Figs. 5, 7 and 8.

The feed head *c* is provided with an entrance chamber *c*⁴ having inlets *c*⁵ through the head; and a longitudinal recess *c*⁶ in the head *c* in which a pin *c*¹⁰ fixed in the casing is adapted to slide, forms a guide for the head to bring the inlets *c*⁵ of the head into register with the inlet ports *a*⁴ of the casing. Exhaust ports *a*⁷ opening into each of the working chambers, preferably at *a*⁸ in the longitudinal center thereof are provided for each of the chambers.

Three paddles *d*² seated at equal distances from each other within slots in the runner are adapted to move radially into the working chambers in a well known manner. The operation of the motor will be readily understood, the actuating medium being introduced through the inlet ports to the crescent shaped working chambers, moves the paddles through the chambers and escapes through the exhaust ports, the paddles successively operating through each of the chambers in like manner to rotate the runner.

In order to use the actuating medium expansively I provide a cut-off valve *e*, com-

prising two abutting disks, formed with peripheral recesses e^4 exactly alike, carried by the runner and operating between the head c and the casing to cut off the inlets c^5 from the ports a^4 before the full stroke or passage of the paddles through the working chambers, allowing the actuating medium to act expansively the balance of the stroke.

The valve disk next to the runner is set with the forward end of each peripheral recess opposite a paddle and said recesses are of such length as to cut off at a pre-determined time or distance; and the other valve disk can be moved to vary the cut-off, both disks being slotted at e^1 and provided with a set screw e^2 to fix them in position. To prevent end thrust of the actuating medium against the valve and runner I provide an annular recess in the head c in which a ring c^7 is seated and spring pressed in a well known manner against the valve; but if for any reason the seal becomes imperfect I further provide a conduit d^2 extending longitudinally through the runner and opening at each end thereof and a slotted opening e^3 in the valve registering therewith, whereby the pressure of the escaping actuating medium will be equalized and the end thrust avoided.

Naturally the paddles should by centrifugal force move radially and follow the wall of the chambers but in practice I have found that when the paddles pass the inlet ports the force of the actuating medium drives them back, and in their rebound they strike the walls of the chamber with considerable force causing wear and consequent imperfect working of the paddles in their operation through the chambers. Owing to the great peripheral speed of the runner the paddles strike and cause this wear and imperfection beyond the inlet ports within the working chambers. To overcome this difficulty I provide a field of fine perforations d^1 , preferably extending the full length of the working chambers as shown in Fig. 8, the drawing in said figure being partly broken away showing a conduit a^6 to feed said perforations, said conduit at its outer end registering with the inlet c^5 of the head c . The actuating medium admitted through

the field of fine perforations forms a cushion for the paddles in their outward movement, which prevents damage to the walls of the chamber and thereby insures the perfect working of the paddles.

An oil hole b^2 extending through the head b and bushing b^1 is provided for oiling the front bearing of the shaft; and an oil conduit c^8 extending through the head c and bushing c^3 is for the purpose of oiling the rear bearing. It will be seen that these oil holes open through the reduced portions of the casing that will not rub against the wall of a boiler tube when the motor is used for cleaning tubes and the rubbing of the dirt and grit by the tube into the oil holes is avoided. The forward end of the shaft is shown screw threaded to attach the machine to be driven but the coupling may be made in any suitable manner.

Having thus described my invention, I claim:

1. In a rotatable motor, a runner having paddles adapted to move outwardly from the axis thereof, a casing forming with the runner oppositely disposed chambers having inlet and exhaust ports opening into the chamber in the longitudinal center thereof and a field of fine perforations opening into each chamber where the paddles in their outward movement strike the walls of the chambers, said perforations admitting the actuating medium to cushion the paddles and protect the walls of the chambers, substantially as described.

2. In a rotatable motor, a runner, a casing forming a chamber for the runner, said casing having ports communicating with the chamber, a pin fixed in said casing, a removable ported head having a longitudinal recess adapted to receive said pin to guide the head in place with its ports to register with the ports of the casing and means to secure said head in place, substantially as described.

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

HENRY F. WEINLAND.

Witnesses:

WM. GUGENHEIM,
CARL CASKEY.