

No. 695,296.

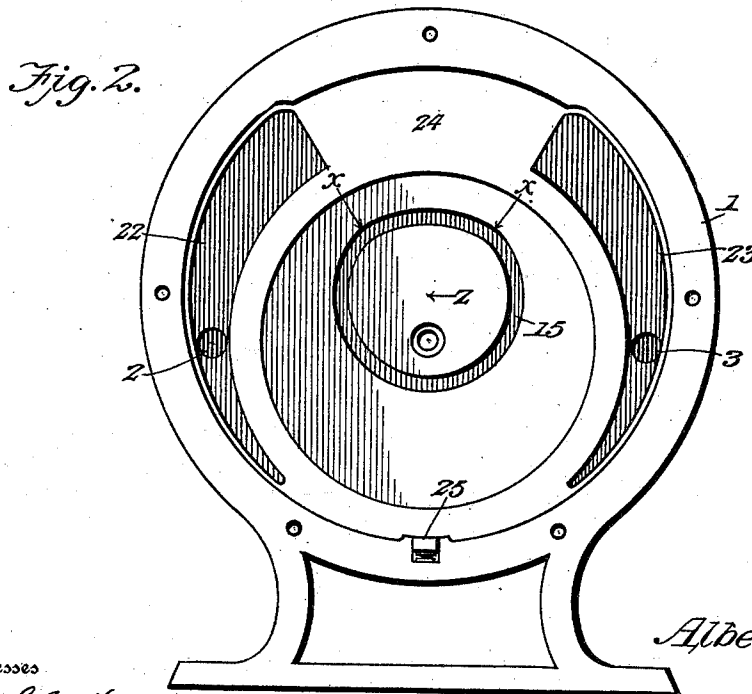
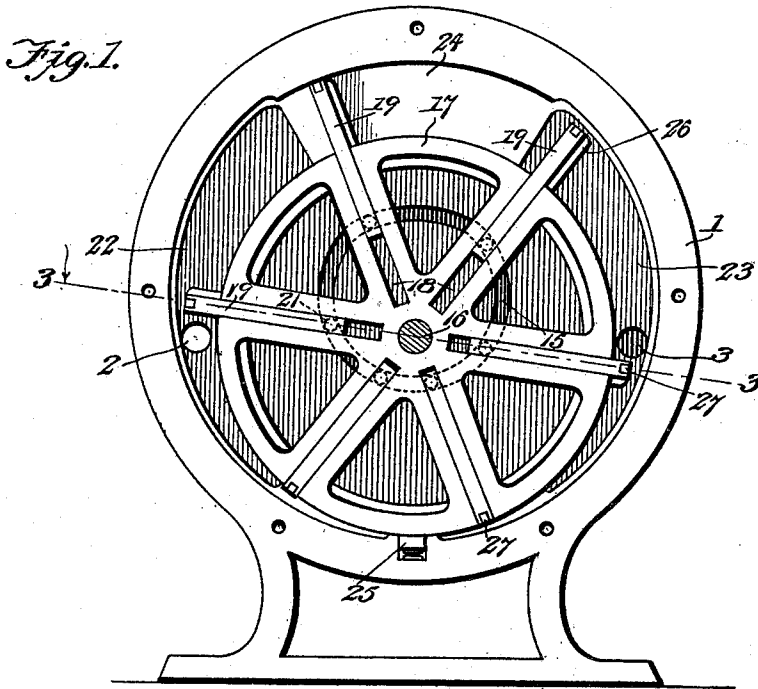
Patented Mar. 11, 1902.

A. E. FISH.
ROTARY ENGINE.

(Application filed Apr. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 3.

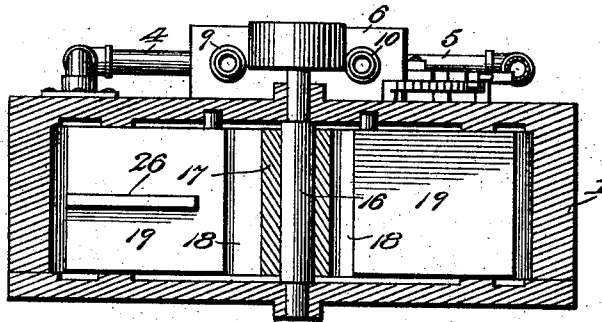


Fig. 4.

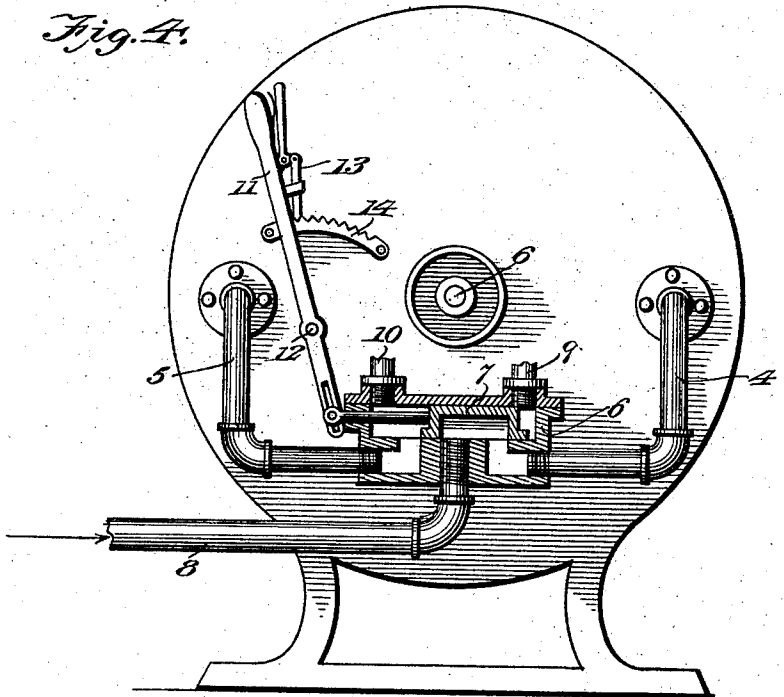
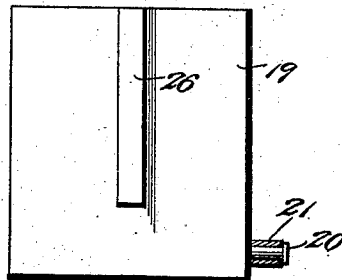


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT E. FISH, OF HARTFORD, CONNECTICUT.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 695,296, dated March 11, 1902.

Application filed April 2, 1901. Serial No. 54,053. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. FISH, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to rotary fluid-motors; and the primary object thereof is to so construct a device of the character described that the pressure from the source of supply will act upon the piston when said piston presents the greatest surface resistance thereto.

The construction of the invention will be fully described hereinafter in connection with the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of the motor constructed in accordance with my invention and illustrating the assembled pistons therein. Fig. 2 is a similar view of the casing, showing the pistons removed. Fig. 3 is a transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is a side elevation of the motor, and Fig. 5 is an enlarged detail view of one of the pistons.

Referring now to the drawings by numerals of reference, 1 designates a suitable casing provided with an interior approximately cylindrical steam-chamber provided with inlet and outlet ports 2 and 3, which communicate with branch pipes 4 and 5, leading into a steam-chest 6, in which is arranged a sliding reverse-valve 7, the steam-chest being supplied with suitable fluid through the medium of an inlet-pipe 8. One or the other of the pipes designated by the reference-numerals 9 and 10 acts as the exhaust-pipe, according to the position of the sliding valve 7, and the position of this valve is conditioned upon the direction of the rotating piston-drum.

It will be noticed that in order to reverse the valve I provide a lever 11, fulcrumed intermediate its ends, as at 12, and carrying a spring-pawl 13, which indicates a segmental rack on the engine-casing. This rack I designate by the reference-numeral 14. However, any well-known form of valve of reversing mechanism may be employed, if found convenient.

The essential elements of my invention are confined within the casing 1, and they con-

sist of the peculiar arrangement of sliding pistons, as well as the construction, and of the interior of the casing. By reference to Figs. 1 and 2 it will be seen that an eccentrically-arranged groove 15 is provided in vertical walls of the casing and which surround a shaft 16, projecting through said casing and carrying a revoluble piston-drum 17.

The piston-drum is provided with a plurality of radial slots 18, in which are slidably secured a corresponding number of sliding pistons 19. On the inner ends of these pistons I provide laterally-projecting pins 20, on which are antifriction-sleeves 21, which project within the groove designated by the reference-numeral 15.

Within the walls of the casing 1 I provide cut-out portions 22 and 23, which are arranged adjacent the inlet and outlet ports above referred to and on either side of the breast 24, which is positioned at the highest point within the casing and which bears against the sides of the pistons when they are extended or projected to their greatest stroke.

The groove 15 is constructed by striking a circle from the center of the shaft between the points marked *x x* and then striking a circle from the point marked *Z* and continuing the same downwardly around until the complete groove is made. By reason of the peculiar contour of this groove the pistons will be held approximately retracted until they reach the point at the beginning of the breast 24, when the full supply-pressure will be exerted at a time when said pistons are in the best possible position for the reception of the same.

By reference to Fig. 1 it will be noted that the steam or other fluid entering the inlet-port 2 will pass by the pistons within the cut-out portion or chambers 22 and act directly upon the single piston at the top of the motor.

Should the fluid-pressure of seventy-five pounds to the square inch be introduced to the casing, the motive power of the shaft will be increased proportionately to the number of square inches exposed upon the side of the piston moving between the extremities of the breast 24. The other pistons will not be acted upon until they successively move to the position just described, and any fluid which en-

ters the inlet 2 will pass directly to the piston, which is projected to its greatest length. As soon as the motive piston passes from one extremity of the breast to the other the motive fluid will pass the same through the cut-out portion 23, and by reason of the fact that said piston will immediately begin to retract and permit a space to be formed between its end packing and the circular walls and the casing the steam of the other fluid will be readily exhausted. The object of this is to relieve all possible or back pressure or force upon the blade and, further, to exhaust the motive fluid as soon as possible.

15 The reference-numeral 25 designates a packing which is positioned diametrically opposite the breast and is for the purpose of preventing the escape of the utilized fluid into the motive chamber. This construction, however, has been used in other engines. In order to form guides for the pistons, I arranged intermediate their longitudinal edges one or more longitudinally-extending ribs 26, which slide in corresponding grooves in the piston-head. Of course it is obvious that these ribs may be arranged on either or both sides of the pistons and that a plurality may be used, if desired. Packing-rings 27 are also provided in order to prevent the leaking of the motive agent.

30 By my improved construction back pressure caused by expansion of the steam within the space between any two pistons is avoided, as only one piston is presented at a time to the impact of steam, spaces being left be-

tween the end and side of the next adjacent piston and the casing.

While I have specifically described what to me appears to be the very best means of accomplishing the desired result, I would have it understood that I do not limit myself to the exact details of construction shown, but reserve the right to make such slight changes and alterations as may suggest themselves from time to time without departing from the spirit of this invention or affecting the operation thereof.

What I claim, and desire to secure by Letters Patent, is—

A rotary engine comprising a casing having supply and exhaust ports and formed with an eccentric groove, a piston-drum mounted upon a shaft within the casing, and having a plurality of radial slots, sliding pistons within said slots provided with pins entering said groove, a segmental projection over which the pistons successively pass, said pistons being adapted to receive the impact of steam singly and only as they pass said projection, and being so constructed and relatively arranged that steam will not be confined between any two pistons at any point in their revolution.

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

ALBERT E. FISH.

Witnesses:

HUGH M. STERLING,
B. F. FUNK.