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Nov. 17, 1925. 1,561,946

L. I. RASMUSSEN

ROTARY ENGINE

Filed April 12, 1923

Fig. 1

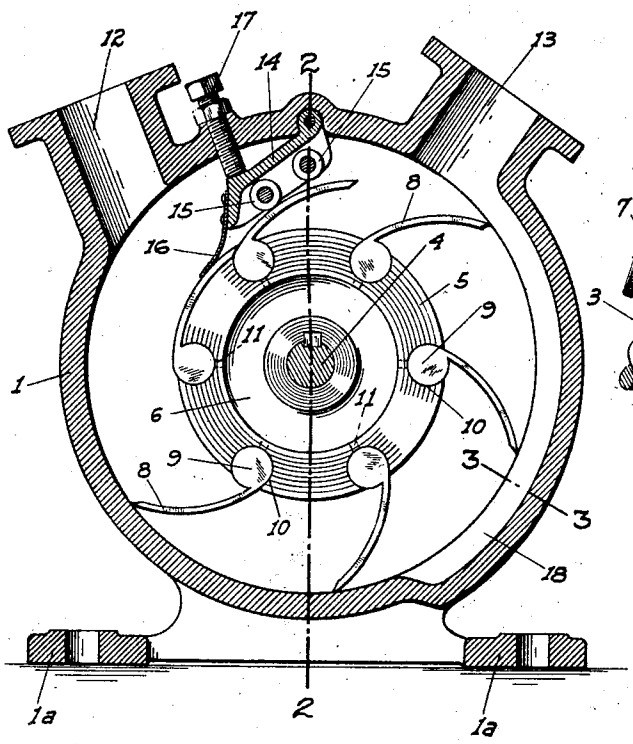


Fig. 2

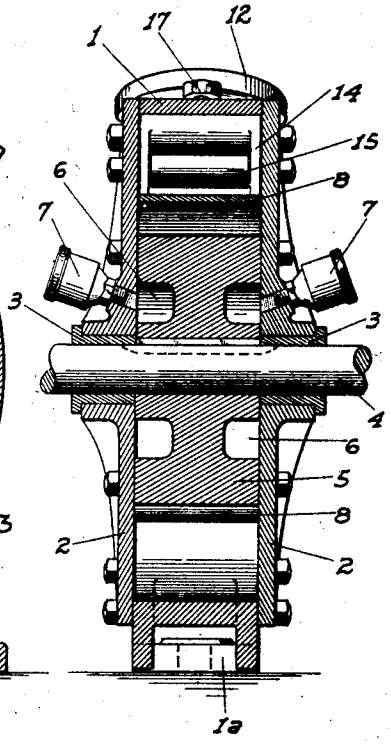
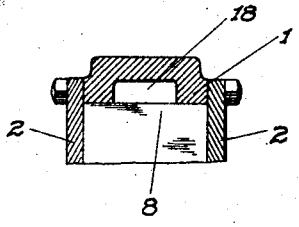


Fig. 3



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UNITED STATES PATENT OFFICE.

LARS IBSEN RASMUSSEN, OF WESTWOOD, CALIFORNIA.

ROTARY ENGINE.

Application filed April 12, 1923. Serial No. 631,628.

To all whom it may concern:

Be it known that I, LARS IBSEN RASMUSSEN, a subject of the King of Denmark, residing at Westwood, county of Lassen, State of California, have invented certain new and useful Improvements in Rotary Engines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in rotary engines adapted to be driven by steam, air, water, or other fluid, the principal object of my invention being to provide a mechanism of this character so constructed that the advantages had with the rotary engine principle, that is, the smooth, even and vibrationless rotation of the rotor shaft, will be retained, while doing away with the complexity thought necessary with ordinary rotary engines and with the accurate adjustment of the vanes during the assembling of the device, which at present is rendered necessary to make them operate efficiently, and which is a source of great expense in manufacture and repair.

Another object is to provide a rotary engine so constructed that the full power thereof will be developed at speeds far below those necessary for efficiency with other rotary engines.

I have also provided a simple means for positively lubricating the moving parts.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Fig. 1 is a side view of the rotary engine, partly in section with the end plate removed.

Fig. 2 is a vertical section on the line 2—2 of Fig. 2.

Fig. 3 is a fragmentary section on line 3—3 of Fig. 1.

Referring now more particularly to the references on the drawings, I provide a casing preferably comprising a cylindrical ring 1 of suitable diameter and width, having feet or supporting pads 1^a, and end cover plates 2 removably secured thereto provided with bearings 3 for a shaft 4, on which, between the covers, and having a running fit therewith, is fixed a rotor-disc 5, of considerably smaller dameter than the casing 1.

The opposed side faces of the rotor are grooved concentric with the shaft as at 6, to contain a lubricant, which may be fed thereto from the outside of the covers as by means of cups 7.

Extending between the covers 2 and between the peripheral faces of the casing 1 and rotor 5 is a plurality of vanes 8 secured to pins or rollers 9 turnably mounted in transverse recesses or sockets 10 provided at evenly spaced intervals in the periphery of the rotor. The length of these vanes is greater than the radial distance between the rotor and casing peripheries, so that they not only set at a suitable angle to radial lines, but while they may fold down onto the rotor in one direction, they cannot do so in the other. These vanes also have a curvature the same as that of the rotor, so that when they fold down as above stated, they will rest directly on the rotor, as shown in Fig. 1, and not form a pocket therewith. In order to lubricate the rollers 9, holes 11 may be drilled from the grooves 6 to the sockets 10, the lubricant in the grooves passing thereto by reason of the centrifugal action set up with the rotation of the shaft and rotor, which also causes the lubricant to work out between the rotor and covers, lubricating these wearing surfaces.

Suitably spaced from each other on the periphery of the casing 1 are fluid intake and exhaust passages 12 and 13 respectively, adapted to be connected to suitable piping.

Mounted in the casing intermediate the intake and exhaust passages is a combined fluid-baffle and vane deflecting structure, comprising a rigid member 14 flexibly mounted in the casing transversely thereof with a fluid-tight fit therewith and with the covers 2, and forming a bearing for transversely disposed and peripherally spaced rollers 15 so disposed as to bear against the vanes as they approach the same in rotation with the rotation of the rotor, and to cause said vanes to be folded down against the rotor. Mounted on and projecting beyond the member 14 at its free end is a transverse flat spring strip 16, adapted to bear against the vanes as they pass from

under the rollers to hold each vane in turn against the rotor for a certain period and also to form a fluid-tight seal with the vane, to prevent the direct passage of any fluid from the intake to the exhaust, and insure that no dead steam can remain pocketed by the vanes when the latter move under the baffle.

An adjustable screw 17 is provided to regulate the pressure of said spring upon the vanes, the latter when released from the spring, moving out so that their outer ends bear against the periphery of the casing beyond the intake by centrifugal action. It will therefore be seen that as each vane is released, the fluid from the intake, preferably steam or compressed air, will impinge directly thereon, and will cause said vane to be moved and the rotor and shaft to be turned.

This steam or air not only exerts a direct pushing pressure against the vane, but an expanding action similar to that of an ordinary reciprocating engine as well, the time this expanding action may take place depending on the spacing between the vanes, since it is evident that as soon as another vane is released from the spring 16, the steam etc. is pocketed between this released vane and the vane ahead, and can expand no further, said released vane now receiving the steam pressure thereon.

I may either hold the fluid confined between the vanes until the latter have nearly reached the deflector before being allowed to allowed to exhaust, or the fluid may be permitted to escape from a pocket as soon as a vane behind is released, as by means of a peripheral groove 18 in the casing from that point to the actual exhaust outlet 13. In the former case, I believe that the tendency of the fluid pressure at the intake side of the rotor to force the latter in the opposite direction or out of center and thus wear the bearings will be offset by the cushioning effect and opposed pressure of the confined fluid in the otherwise empty pockets between the vanes.

In the second case however, the back pressure of the fluid in the pockets tending to resist the expanding fluid on the vane behind is eliminated by allowing said fluid, its rotative work done, to immediately escape, and it is a question at this time with me as to which arrangement will prove the most beneficial.

The severity of the force of the blow of the vanes against the deflector rollers 15 is lessened in any case by reason of the fact that a certain percentage of the fluid will be carried past the exhaust outlet, and being unable to pass the baffle structure, will form a cushion between the vanes and rollers.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A fluid turbine comprising an enclosed casing having spaced intake and exhaust passages, a rotor turnably mounted in the casing, vanes flexibly mounted on the rotor and extending therefrom to the casing, and adapted to fold down toward the rotor in one direction, and a combined fluid baffle and vane deflecting structure in the casing extending at an angle to a radial line and disposed between the intake and exhaust, said structure comprising a body member, rollers mounted therein and with which the vanes contact when being deflected, and a spring apron on the body at the end thereof nearest the rotor and bearing against the vanes as they are folded against the rotor after being deflected by the rollers.

2. A structure as in claim 1, in which means is provided for adjusting the body member to and from the rotor, whereby to enable the pressure of the spring against the vanes to be altered and enabling wear to be taken up.

In testimony whereof I affix my signature.

LARS IBSEN RASMUSSEN.