J. GOALARD.

ROTARY ENGINE.

APPLICATION FILED JUNE 13, 1910.

1,000,257. **Patented Aug. 8, 1911.**

2 SHEETS—SHEET 1.

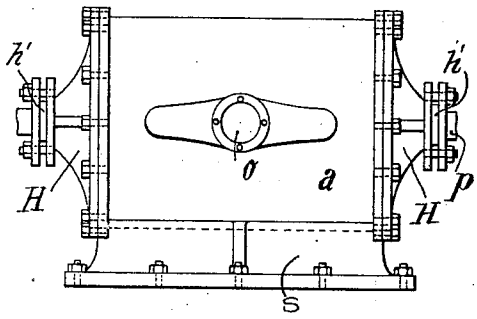


Fig. 1.

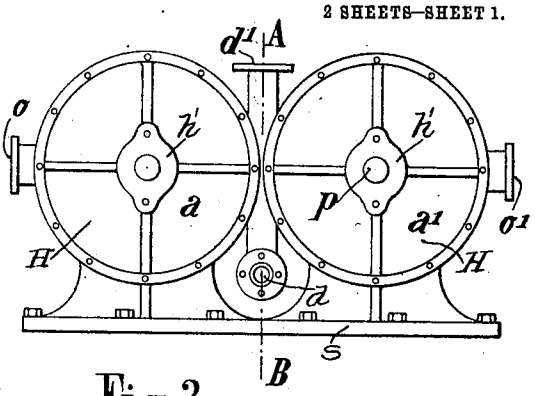


Fig. 2.

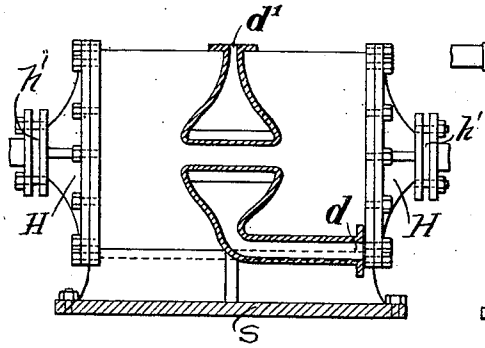


Fig. 3.

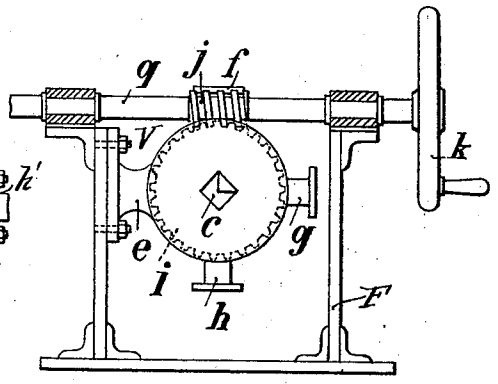


Fig. 4.

Fig. 5.

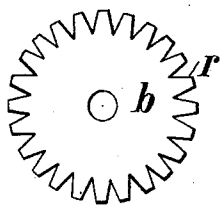
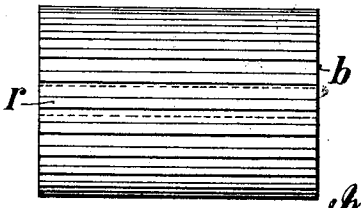


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 7.

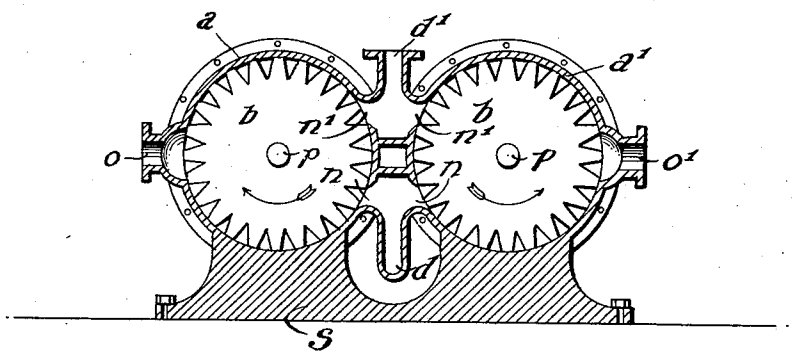


Fig. 8.

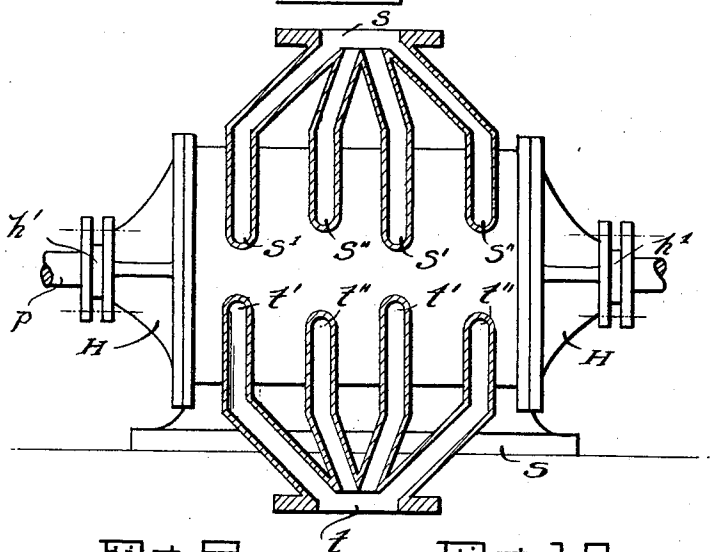


Fig. 9.

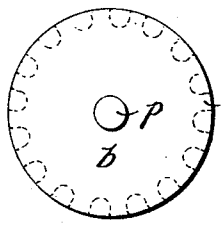
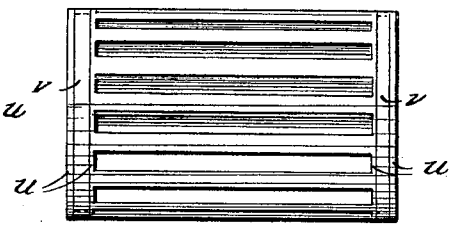


Fig. 10.



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JEAN GOALARD, OF BAYONNE, FRANCE.

ROTARY ENGINE.

1,000,257. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed June 13, 1910. Serial No. 566,556.

To all whom it may concern:

Be it known that I, JEAN GOALARD, of Villa Mary, Rue Bergeret, in Bayonne, France, have invented a Rotary Engine, and do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement.

My present invention relates to rotary engines which include a casing formed with a plurality of cylinders, and rotors within the cylinders adapted to rotate in opposite directions, the engine being especially adapted for use as a motive power in boats having propellers rotating in opposite directions.

The objects of my invention are to provide an engine, simple in construction, enabling the rotors thereof to operate in opposite directions and means whereby the direction of rotation may be reversed.

Another object of my invention is to provide means for distributing the fluid pressure used in operating the engine, to utilize the maximum amount of expansive force of the fluid consistent with the construction of the engine.

Further objects and novel features of the invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out in and by the appended claims.

In the drawings,—Figure 1 is a longitudinal elevation of a rotary engine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a cross sectional view on the line A—B of Fig. 2. Fig. 4 is a front elevation, in part section, of a device controlling the steam inlet ports of the engine. Fig. 5 is a side elevation of a form of rotor used in connection with the engine. Fig. 6 is a front elevation of the same. Fig. 7 is a central transverse section taken through the engine embodying my invention. Fig. 8 is a view similar to Fig. 3 showing a modified form of inlet ports. Fig. 9 is a side elevation of a modification of the rotor used in connection with my invention. Fig. 10 is a front elevation of the same.

Similar characters refer to similar parts throughout the several views.

With reference to Figs. 1 to 7 inclusive, the engine comprises two cylinders *a* and *a'*, carried by a suitable base S, the cylinders being preferably formed integral with each other. At each end, the cylinders are provided with heads H, by which shafts *p*, carrying rotors *b* within the cylinders, are supported. The cylinder heads are provided with stuffing-boxes *h'* of any suitable design and the rotors, with pockets *r* extending transversely of the periphery thereof. The cylinders *a* and *a'* are provided with inlet ports *d* and *d'* each communicating with each cylinder and the fluid pressure is directed to act upon the pockets of the rotors by the nozzle openings *n* and *n'* of the inlet ports *d* and *d'* respectively. As shown in Fig. 3, the inlet ports are widened out at their juncture with the cylinders in order to spread the fluid pressure and allow a greater area of the pocket surface of the rotors to be acted upon. Outlets for the cylinders *a* and *a'* are provided at *o* and *o'* respectively, which openings are widened out at their juncture with the casing to facilitate the exhausting of the fluid used in operating the engine.

In order to provide means for operating the engine with the rotors rotating in opposite directions and to reverse the direction of the rotation of the rotors simultaneously, I provide a structure shown in Fig. 4, termed a three way valve. It comprises a suitable frame F, which supports a valve proper V through the arm *e* thereof, and worm gearing to operate the valve. The valve is provided with an inlet port *g* which is adapted for connection to the source of fluid pressure supply means, and outlet ports *f* and *h* adapted for connection with the inlet ports *d* and *d'* respectively, of the engine. The valve is provided with a stem *e* having a port therein which opens at the periphery of the stem at an angle of 90° and is thus adapted to form a communication between either the ports *g* and *h*, or *h* and *f*. Movement is imparted to the stem by a worm gear and worm *i* and *j* respectively, the latter being mounted on a spindle *q* supported by the frame F and provided with a wheel *k* to facilitate rotation thereof.

From the above description it will be seen that with the valve affording communication between the ports *g* and *h*, the fluid pressure enters the engine port *d* by which the rotors rotate in the directions shown by arrows in Fig. 7. A reverse movement of the rotors is obtained by setting the valve stem with a communication between the ports *g* and *f*.

In the modification shown in Fig. 8, the inlet ports *s* and *t* are provided with

branches s' and s'', and t' and t'' respectively, which provide separate conveying means for the fluid pressure at different points along the periphery of the rotors. As will be seen in the drawings, the entrances of branches s' and t' are not in alinement with those of branches s'' and t'', and by this means the fluid enters different pockets of the rotors contemporaneously.

In Figs. 9 and 10, is shown a modification of the rotor in which flanges u are provided at either end thereof, the pockets extending intermediate the flanges and a spring ring v, similar to those used in the pistons of engines, fitted between the flanges to form a surface joint.

From the foregoing description it will be seen that I provide a rotary engine, the inlet and outlet ports of which are so arranged as to facilitate reversing of the direction of rotation of the rotors and that the fluid pressure is distributed along the pockets of the rotor to utilize the maximum amount thereof consistent with the simplicity of construction of the engine.

I claim:

1. A rotary engine comprising, a plurality of cylindrical casings having outlet ports, a rotor for each casing, having pockets extending transversely of the periphery thereof, and revolubly mounted within said casing, and an inlet port provided with a plurality of branches adapted to deliver fluid pressure against the said pockets to rotate said rotor, said inlets being arranged to deliver to different pockets of the rotors simultaneously, combined substantially as described.

2. A rotary engine comprising in combination two cylinders provided with outlet ports, rotors revolubly mounted within each of said cylinders, and provided with pockets extending transversely of the periphery thereof, an inlet port, provided with branches, adapted to convey fluid pressure to both of said cylinders with outlets directed to rotate said rotors in opposite directions, a second inlet port, provided with branches adapted to convey fluid pressure to both of said cylinders with outlets directed to rotate said rotors in opposite directions and in directions reverse to that of which the first mentioned port is adapted to rotate the same, the said branches of both of said inlet ports being arranged to deliver to different pockets of each of said rotors simultaneously, and means forming communication between either of said inlet ports and the source of fluid pressure supply to rotate said rotors in a predetermined direction.

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

JEAN GOALARD.

Witnesses:
JEAN LARRY,
PIERRE DAWHING.