June 7, 1932. P. G. TACCHI 1,862,440

ROTARY ENGINE

Filed Oct. 19, 1931

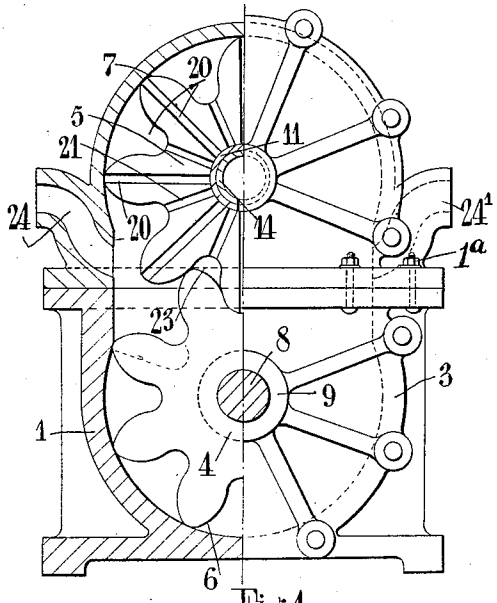


Fig. 1.

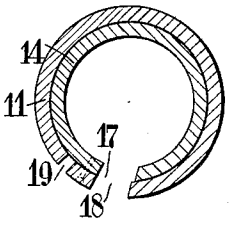


Fig. 3.

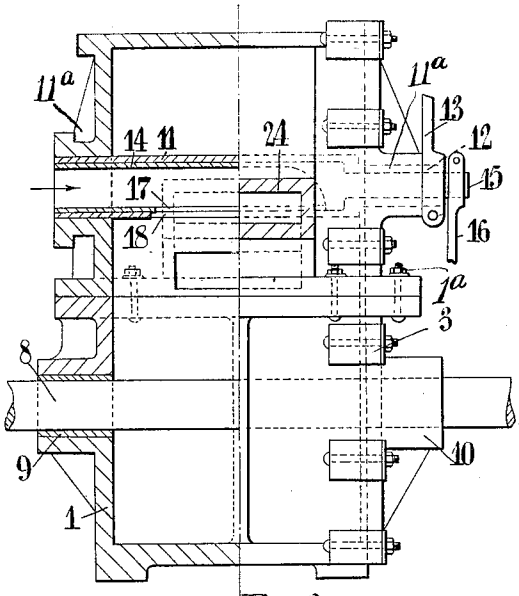


Fig. 2.

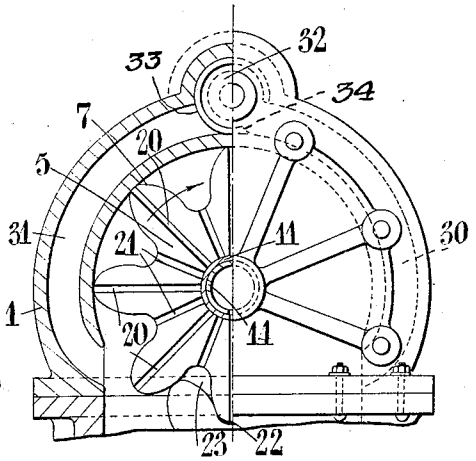


Fig. 4.

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UNITED STATES PATENT OFFICE

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ROTARY ENGINE

Application filed October 19, 1931, Serial No. 569,752, and in Great Britain October 20, 1930.

This invention relates to rotary engines of the kind in which the rotors are provided with continuously intermeshing teeth and a propulsive medium is supplied in succession to the spaces enclosed between adjacent teeth on the respective rotors, that is to say, the propulsive medium is first supplied to a space between adjacent teeth on the rotors and then to the space between the next succeeding teeth on the rotors from a conduit coaxial with one of the rotors.

The invention consists in a rotary engine of the kind referred to having passages or ports formed in one of the rotors through which passages the working medium is supplied from the coaxial conduit to the spaces enclosed between adjacent teeth on the respective rotors.

Further features of the invention will be apparent from the description given hereafter with reference to the accompanying drawing which illustrates by way of example one convenient form of apparatus in accordance with the invention and in which:—

Figure 1 is an end view of the engine partly in section;

Figure 2 is a side view of Figure 1 partly in section;

Figure 3 is a detail of Figure 1;

Figure 4 shows an alternative form of the exhaust duct.

Referring to Figures 1 and 2, the casing 1 is made in two halves secured together by bolts 1*a* or the like and is provided with a cover 3. Two rotors 4, 5 are mounted in the casing in such a manner that their teeth 6, 7 which, in the example shown, are of cycloidal form, engage with one another. The rotor 4 is suitably secured to the driving shaft 8 which is supported in suitable bearings 9, 10 in the casing and cover. The rotor 5 is mounted so as to rotate freely about a sleeve 11 which is also freely mounted in suitable bearings 11*a* in the casing and cover. It is to be noted that there is only one driving shaft from which the power is taken and that the rotor 5 rotates idly about its axis. A reduced portion 12 of the sleeve 11 is extended through the cover and is provided with a control handle 13.

Within the sleeve 11 is mounted a second sleeve 14 which is also rotatable and which is provided with a solid extension 15 passing through the portion 12 and provided with a control handle 16. Steam is admitted to the inner sleeve 14 and passes through an axially extending opening or port 17 connecting with a similar port 18 in the outer sleeve 11.

Radial passages or ports 20 and 21 extending in the axial direction are provided in the teeth and in the space between the teeth respectively of the rotor 5. These ports coact with the ports 17 and 18 and admit steam into the spaces enclosed between adjacent teeth on the rotors 4 and 5 as shown in Figure 1, one of such spaces being indicated in the drawing at 23. The steam after expansion escapes through the exhaust 24 to any suitable condenser or to the atmosphere as desired. An exhaust port 24^1 is provided on the opposite side for use when rotating in the opposite direction to the arrow in Figure 1.

The steam distributing rotor 5 is kept in good steam-tight contact with the sleeve 11 by virtue of the reaction of the pressure and with the teeth of the rotor 4 by the resistance to the movement of the shaft 8.

By movement of the handles 13 and 16 the two sleeves can be moved to various positions relative to one another so as to control the speed, the point of admission, the point of cut-off, the direction of rotation and the duration of the admission of working fluid to the respective fluid passages in the rotor 5.

In Figure 3 the control is shown in the full open position for operating the engine in one direction.

An alternative form of exhaust is shown in Figure 4 in which the passages 30, 31 are led around the casing and unite in a common duct 32 which may be connected to a condenser or to the atmosphere as desired. This duct is preferably controlled by a valve 33 provided with a port 34 which, on proper adjustment, puts either one or other of the passages 30, 31 in communication with the duct 32 while at the same time preventing all

communication of these two passages with one another.

In applying the invention to internal combustion engines, air may be admitted to the spaces between the vanes of the rotors and the explosive mixture supplied through the sleeves 11 and 14, the ports 17, 18 and the radial passages 20, 21. If desired the fuel may be injected midway between the axes of the two rotors and the air of combustion through the radial passages in the rotors or vice versa. Ignition and expansion will take place in sequence in the spaces formed by the teeth of the rotors, the ignition being effected by the heat of compression or by any other suitable means. Further, cross flash channels may be provided as described in the specification of British Patent No. 124,284 (P. G. Tacchi), if desired. Suitable cooling means such as ducts for the passage of water may be employed around the engine.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A rotary engine, comprising rotors having teeth engaging with one another, a casing enclosing said rotors, a conduit for working medium disposed coaxially of one of said rotors, said rotor having passages therein for supplying working medium from the conduit to the spaces enclosed between adjacent teeth on the respective rotors.

2. A rotary engine as claimed in claim 1, wherein said passages extend some through the teeth of said rotor and others through the portions of the rotor between the adjacent teeth thereon.

3. A rotary engine comprising rotors having teeth engaging with one another, a casing enclosing said rotors, concentric hollow shafts having ports therein and constituting a conduit for working medium, said shafts rotatably supporting one of said rotors and said rotor having passages therein for supplying working medium from the conduit to the spaces enclosed between adjacent teeth on the respective rotors.

In testimony whereof I have signed my name to this specification.

PERCY GEORGE TACCHI.