Feb. 14, 1967 G. DE COYE DE CASTELET 3,303,829

ROTORS FOR ROTARY ENGINES

Filed March 31, 1965

Fig-1

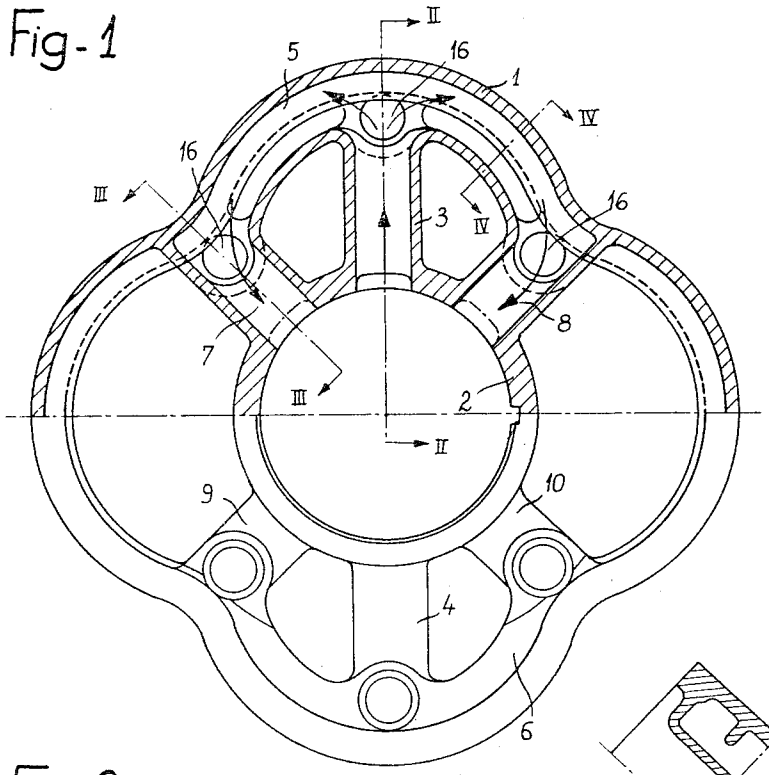


Fig-2

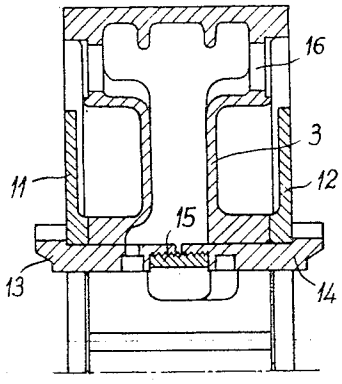


Fig-4

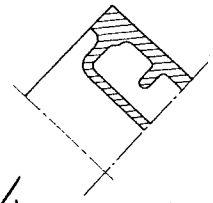
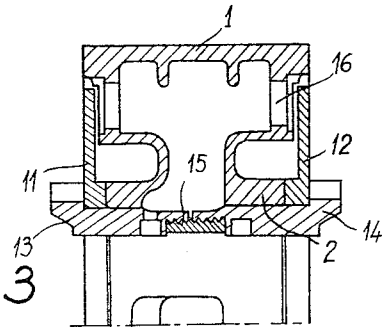


Fig-3



Inventor

Gaëtan De Coye De Castelet

By Stevens, Davis, Miller & Mosher

Attorneys

United States Patent Office

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1

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ROTORS FOR ROTARY ENGINES

Gaëtan de Coye de Castelet, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

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3 Claims. (Cl. 123—8)

The parts of a rotary engine, in particular the rotor, are subjected to a thermal flux and also to heat stresses which make special cooling arrangements necessary.

A known solution consists of providing a circulation of a cooling liquid in the interior of the rotor, this circulation being effected by starting from the hottest zones.

It is known that in rotary engines of the kind having five working chambers in the stator and four lobes on the rotor, five explosions are produced for one-half revolution of the rotor, and since the rotor and the stator act like two gears differing by one tooth, and since on the other hand the order of firing is 1, 3, 5, 2, 4, the result is that only two opposite lobes are associated with the explosions of the engine, which subjects them to high thermal and mechanical fatigue stresses, whereas the other two lobes are less effected by the working of the engine.

In a previous application in the name of the same applicant, it has been proposed to provide in the rotor two conduit systems for the cooling liquid, each of these comprising a radial intake conduit which leads the liquid to a peripheral conduit which first passes round a hot lobe and then round a cold lobe before bringing the said cooling liquid to a radial outgoing conduit.

The present invention has for its object a rotor which is cooled by a circulation of cooling liquid associated solely with the so-called hot lobes, and which is effected for each hot lobe by a central liquid-intake arm, a peripheral channel and two return arms for the said liquid towards the hub; the rotor having openings in the zones comprised between the arms, there are provided lateral end-plates against which the sealing joints are in continuous frictional contact.

This arrangement provides the following advantages:

A substantial reduction in the weight of the rotor;
A substantial reduction of the mass of cooling liquid;
A better performance of the joints which rub against the end-plates, the latter being less hot than when they belong to the rotor, since they are practically isolated from the hot parts of the said rotor. This isolation may furthermore be made still more complete by interposing between the end-plates and the rotor a ring and washers of heat-insulating material.

The invention will now be described with reference, by way of example, to the accompanying drawings, in which:

FIG. 1 is a transverse section of a rotor in accordance with the invention;

FIG. 2 is a half-section taken along the line II—II of FIG. 1;

FIG. 3 is a half-section along the line III—III of FIG. 1;

FIG. 4 is a half-section taken along the line IV—IV of FIG. 1.

As can be seen from FIG. 1, the rotor with four lobes is provided with openings; it is generally constituted by a peripheral rim 1 and an interior rim 2 forming the

2

hub, and a certain number of hollow arms coupling together these two rims and serving for the circulation of the cooling liquid. These arms comprise, in the first place, two hollow arms 3 and 4 directed along the axes of two opposite lobes so that the cooling liquid passing in through the base reaches the summits of these lobes, from which it passes into a peripheral conduit 5 or 6, the extremities of which are coupled together by hollow radial arms 7, 8 and 9, 10 to the hub 2.

As this rotor does not comprise side walls, it is completed, so as to provide friction surfaces for the fluid-tight segments, by separate end-plates 11 and 12, made preferably of a light metal, and held in position by the driving gears 13 and 14. These gears are mounted without play in the bore of the rotor and are rigidly fixed to the rotor by a nut 15 having a right-hand and left-hand pitch.

In order to hold in position in the mould the cores which serve for the casting of the hollow portions, supplementary supporting surfaces 16 have been provided.

These openings are then closed by plugs, the outer surface of which does not require to be machined level, since the friction of the joints takes place on the end-plates 11 and 12.

By this conformation of the rotor in the shape of a wheel with spokes with circulation of cooling liquid through the radial arms and through a peripheral channel solely in the zone of the hot lobes, a substantial reduction in the weight of the rotor is obtained together with greater ease of production in the foundry.

What is claimed is:

1. A rotor for a rotary engine of the type having five working chambers in the stator and four lobes on the rotor, two of the said lobes working as hot lobes and the others as cold lobes, the said rotor comprising internal and external annular rims coupled together by radial arms, characterized in that two arms are arranged along the axes of two opposite lobes, the said arms each opening into a part of the peripheral circuit associated only with the same lobe, while two radial arms couple the extremities of the said circuit portion to the hub in order to ensure the return of the cooling liquid, the rotor being formed with openings in the zones between the arms.

2. A rotor for a rotary engine in accordance with claim 1, and further comprising end-plates intended to constitute the rubbing surfaces of the fluid-tight joints.

3. A rotor for a rotary engine in accordance with claim 2, characterized in that the said end-plates are held in position by the driving gears assembled to each other by a nut.

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DONLEY J. STOCKING, *Primary Examiner.*

W. J. GOODLIN, *Assistant Examiner.*