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(71) Applicant: Van de Vel, Alfons Juul
Kretenborg 39
B-2580 St.Katelijne Waver(BE)

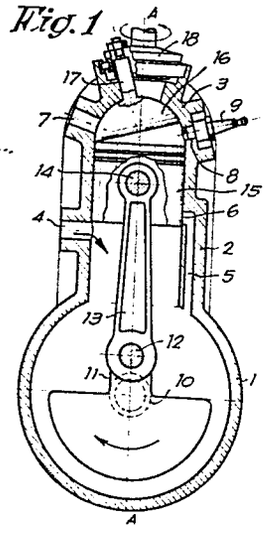
(72) Inventor: Van de Vel, Alfons Juul
Kretenborg 39
B-2580 St.Katelijne Waver(BE)

(74) Representative: Donné, Eddy
M.F.J.Bockstael Arenbergstraat 13
B-2000 Anvers(BE)

(54) **Improved motor.**

(57) Improved motor, characterized in that in the combustion chamber of the motor at least one valve "running around" (16) in this chamber is provided for.

Fig. 1



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"Improved motor"

The present invention substantially relates to an improved motor, in the first instance to a two-stroke motor whereby the working process is accomplished in two strokes or in one revolution of the crank-shaft, which does not exclude that the invention may be applicable to a four-stroke motor.

One knows that in a two-stroke motor, when the piston moves upwards, the gas mixture becomes compressed, whereby at the end of this stroke, the ignition or eventually the injection takes place, whereby the piston moves down, due to the expansion of the gases, and whereby at the end of the downward stroke first the exhaust is being opened, so that a rapid diminution of the pressure is obtained, and a little later the scavenging port is being opened.

One also knows that during the first part of the first stroke the scavenging port and exhaust remain simultaneously open, after which, during the going up stroke the scavenging port closes first and afterwards the exhaust.

The generally current motor construction with ports is very simple and very reliable, a motor of this kind however has a comparatively low efficiency, which is mainly due to the fact that a very great quantity of fresh gases escapes via the exhaust during the scavenging stage, which one must accept due to the fact that due to the construction itself of the motor, a regulation between exhaust and scavenging ports is not possible, due to the fixed position of the ports the one in re-

lation to the other.

In such a two-stroke motor one has already built in with a good result valves, whereby the aforesaid regulation is effectively possible, so that the efficiency, which is reduced by the escape of fresh gases, is ameliorated, however, the number of revolutions of such a motor is limited to 4.000 to 4.500 per minute.

The present invention relates to a two-stroke motor whereby the time during which the scavenging port is open and the exhaust time can be suitably regulated the one in relation to the other, independently from the position of the piston, and whereby this motor is extremely well adapted to rotate at a high number of revolutions, as, for instance, is the case of competition motors.

In second instance, one could build the motor according to the invention as a four-stroke motor, whereby the intake and exhaust of the motor can be better regulated.

The motor according to the invention mainly consists in that in the combustion chamber of the motor there is at least one valve "running around" in this chamber.

In order better to show the characteristics of the invention, hereinafter are schematically described, without any limiting character, a few preferred embodiments of the invention, reference being made to the attached drawings in which :

figure 1 shows a schematic vertical section of a motor according to the invention with the piston in the compression position;
figure 2 shows a view which is similar to the one of figure 1 at the end of the expansion stroke;
figure 3 shows a view which is similar to the one of the preceding figures wherein the piston is at the lower dead centre;

figures 4 and 5 show views which are similar to the one of figure 1, but for execution variants.

The two-stroke motor according to the invention substantially consists of a crank-case 1; a cylinder 2 and a cylinder-head 3, which in this case, for the sake of simplicity, are drawn as if they were made from one piece. In this whole an intake port 4 is provided for; a connection between the crank-case 1 and cylinder 2, which runs into the cylinder 2 by means of an opening 6; an exhaust port 7 and a hole 8 for fitting the sparking-plug 9.

The motor is provided furthermore with a crank rod 11 fixed on the crank-shaft 10, with which crank rod 11, by means of a shaft 12, the connecting rod 13 is connected, which itself is assembled to the piston 15, so as to be able to oscillate, by means of a piston pin 14.

According to the execution of the figures 1 through 3, the cylinder-head 3 is internally made concave and hemispherical, whereby in this half spherical cavity a valve, in this case in the shape of a spherical segment 16 is provided for, which can free the exhaust 7, on the one hand, and the hole 8 for the sparking-plug 9, on the other hand, whereby this spherical segment 16 is connected with a rod 17 which is fixed in an appropriate way in a driving disc 18 which is mounted and guided in the cylinder-head 3 in such a way that it turns around an axis A-A and whereby in the disc 18 the rod 17 is fixed under a well determined angle.

The rod 17 shall be fitted in such a way that the spherical segment "runs around" in the combustion chamber, in other words that the shaft 17 is freely rotatably mounted in the plate 18. If necessary, on the shaft 17 a pinion can be provided for which meshes with a crown-wheel which is fixed in relation to the motor housing, whereby any stoppage of the spherical segment 16 in relation to the disc 18 is excluded.

The functioning of the motor according to the invention is very simple.

It suffices indeed to regulate the position of the spherical segment 16 in such a way that, during the compression stroke, the exhaust 7 is closed, see figure 1, whereby there is automatically obtained that the compressed fuel-air mixture can be ignited by the sparking-plug 9 which has been freed, whereby towards the end of the expansion stroke, before the scavenging port 6 becomes freed by the piston 15, the exhaust 7 becomes opened in order already to obtain a partial exhaust of the burned gases, so that during the upward motion of the piston 15, see figure 3, the scavenging port 6 remains open only quite a short time simultaneously with the exhaust 7, in order so to obtain that as little as possible unburned gases escape through the exhaust 7.

One obtains in this way that the being simultaneously open of the scavenging port 6 and exhaust 7 can be regulated in a suitable way, so that the efficiency of the two-stroke motor, amongst others through the lesser escape of unburnt gases, is being increased, whereby the construction is such that high numbers of revolutions can be attained.

In the figures 4 and 5, variants of execution are shown, which are substantially similar to the one according to the figures 1 through 3, with this difference that in figure 4 the valve or spherical segment 16 is replaced by a valve in the shape of a disc 19 oscillating to and fro, whilst in figure 5 this valve 16 is replaced by a rotating cylindrical body 20 with an inclined basis face 21.

The functioning of the motors as shown in figures 4 and 5 is similar to the one as described hereinabove.

It is clear that the present invention is absolutely not limited to the embodiment described as an example and shown in the attached drawings, but that such a motor can be made

in various shapes and dimensions without going outside the scope of the invention.

So it is that, in case air is being compressed in this motor and the sparking-plug is being replaced by an injector for diesel fuel oil, the motor can be adapted for driving with this fuel.

It is also clear that the expulsion of the exhaust gases can be ameliorated through suitably profiling the piston and/or the components 16, 19 or 21.

Although in the figures and execution is shown whereby the intake is ensured by a crank-case pump, it is clear that the same effect can be obtained if one uses a separate scavenging pump.

In a certain execution of the two-stroke motor, in combination with what preceeds, auxiliary and main valves could be provided for, which would be located adjacent to the sparking-plugs and through which a part of the exhaust gases would be expelled.

In such a case, these valves may function as an auxiliary gas exhaust, whereby exhaust 7 the main exhaust remains, or as a main exhaust, whereby the exhaust 7 functions as an auxiliary exhaust.

Should the motor according to the invention be built as a four-stroke motor, either the intake or the exhaust would be opened and closed by the aforesaid spherical segment, the exhaust or intake respectively taking place in the traditional way through ordinary valves.

One could also build a four-stroke motor whereby the intake and exhaust are each being opened and closed by a spherical segment.

Claims.

1.- Improved motor, characterized in that in the combustion chamber of the motor at least one valve "running around" (16) in this chamber is provided for.

2.- Improved motor according to claim 1, characterized in that the "running around" valve (16) controls the exhaust (7).

3.- Improved motor according to claim 1, characterized in that the "running around" valve (16) controls the intake.

4.- Improved motor according to claim 1, characterized in that for the intake as well as for the exhaust (7) a separate "running around" valve (16) is provided for.

5.- Improved motor according to one of the preceding claims, characterized in that the valve (16) is formed by a spherical segment which exactly fits in the concave hemispherical cylinder-head (3) of the motor.

6.- Improved motor according to one of the claims 1 through 4, characterized in that the aforesaid valve (16) is formed by a disc (19), the periphery of which exactly fits in the concave hemispherical cylinder-head (3) of the motor.

7.- Improved motor according to one of the claims 1 through 4, characterized in that the aforesaid valve (16) is formed by a cylindrical body (20) which at its underside is provided with an inclined face (21).

8.- Improved motor according to one of the preceding claims, characterized in that the valve (16) described a circular path.

9.- Improved motor according to one of the claims 1 through 7, characterized in that the valve (16) has an oscillating to and fro motion.

10.- Improved motor according to one of the preceding claims, characterized in that the valve (16) is provided at its upper side with an inclined rod (17) which is rotatably mounted in a horizontally driven disc (18).

11.- Improved motor according to one of the claims 1 through 9, characterized in that the valve (16) is provided at its upper side with a rod which is being turned around its axis.

12.- Improved motor according to claim 10, characterized in that on the inclined rod (17) a pinion is provided for which constantly meshes with a crown-wheel fixed in relation to the motor housing.

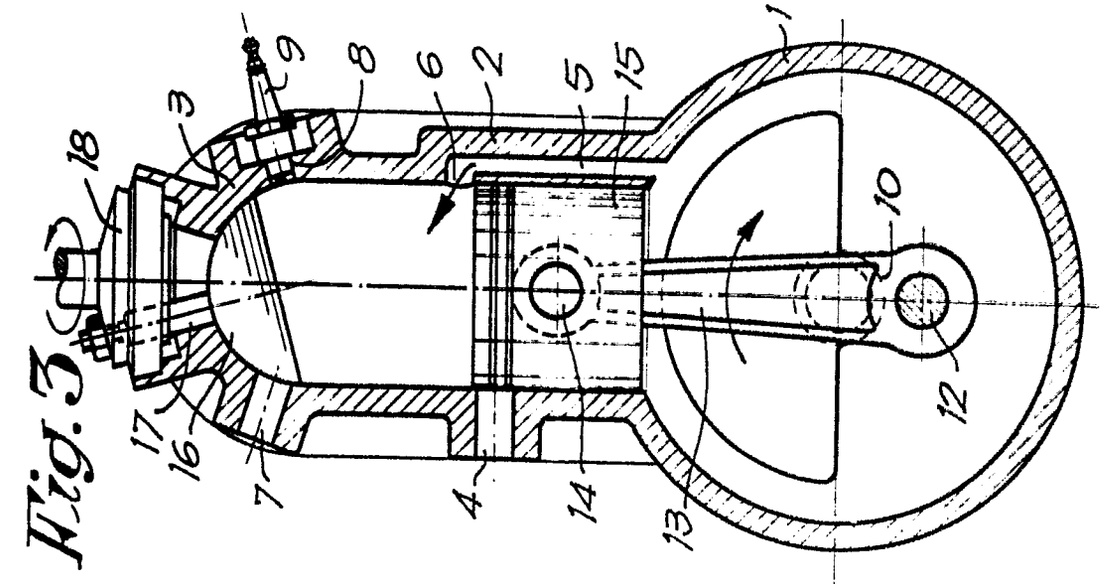

Fig. 3

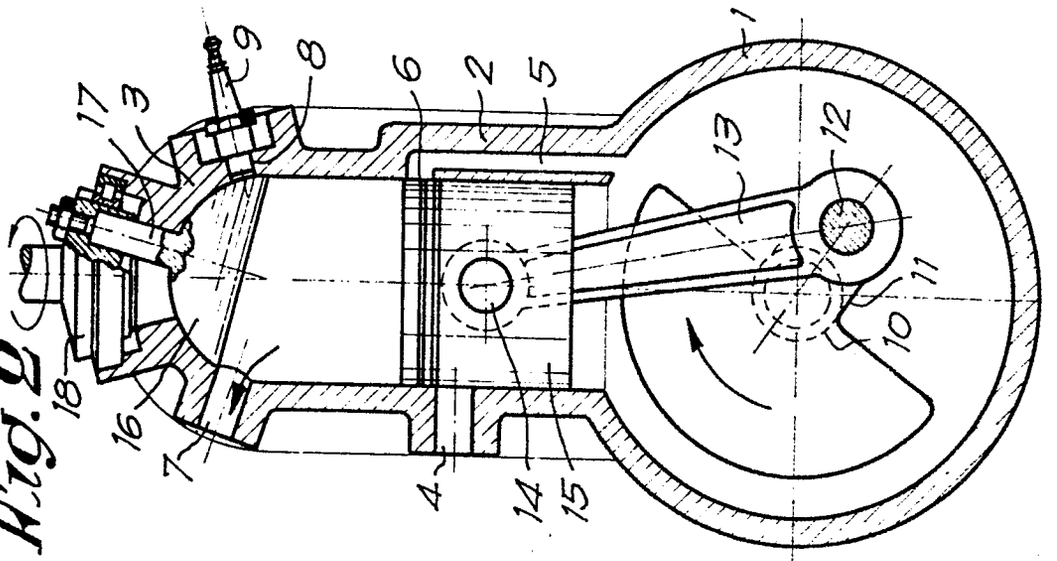

Fig. 2

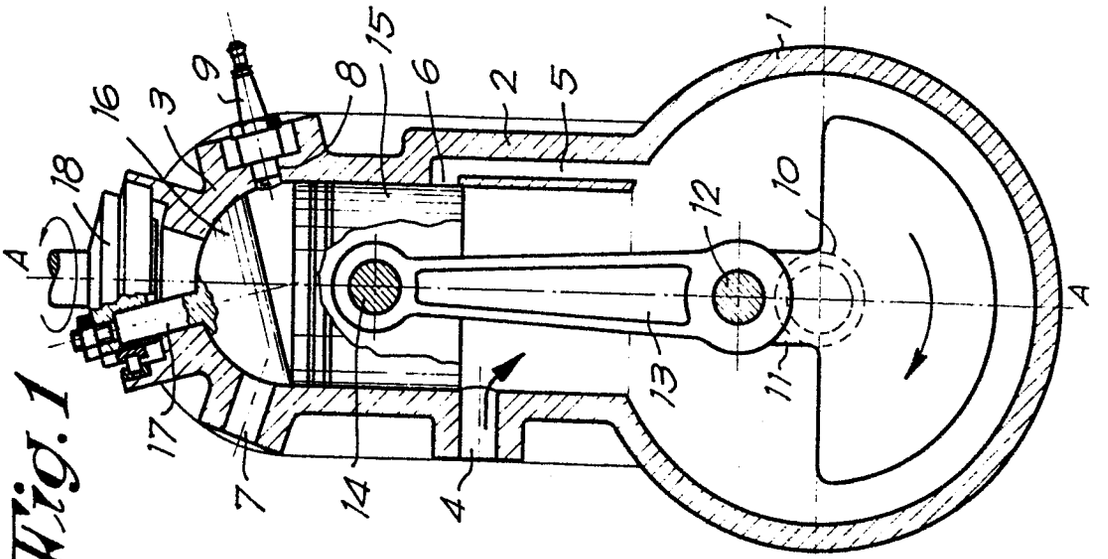

Fig. 1

Fig. 4

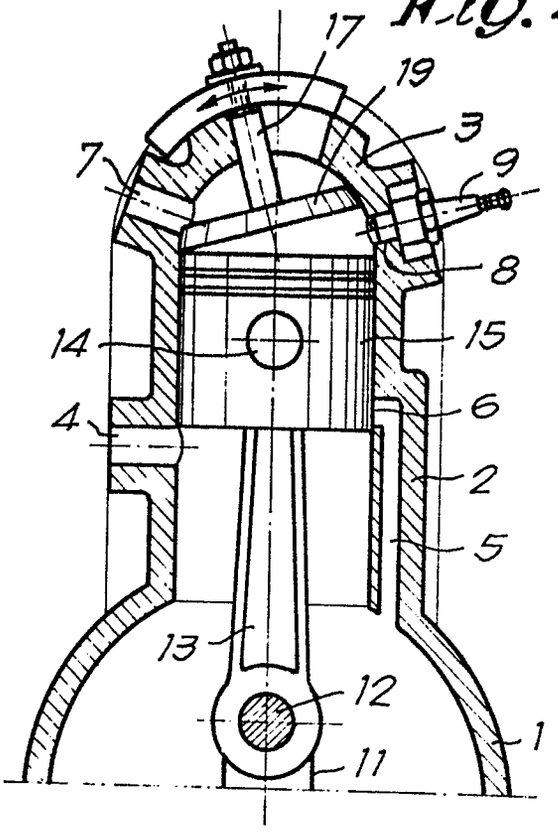

Fig. 5