July 26, 1960 V. CASINI 2,946,324

INTERNAL COMBUSTION ENGINE

Filed May 20, 1957 2 Sheets-Sheet 1

Fig.1

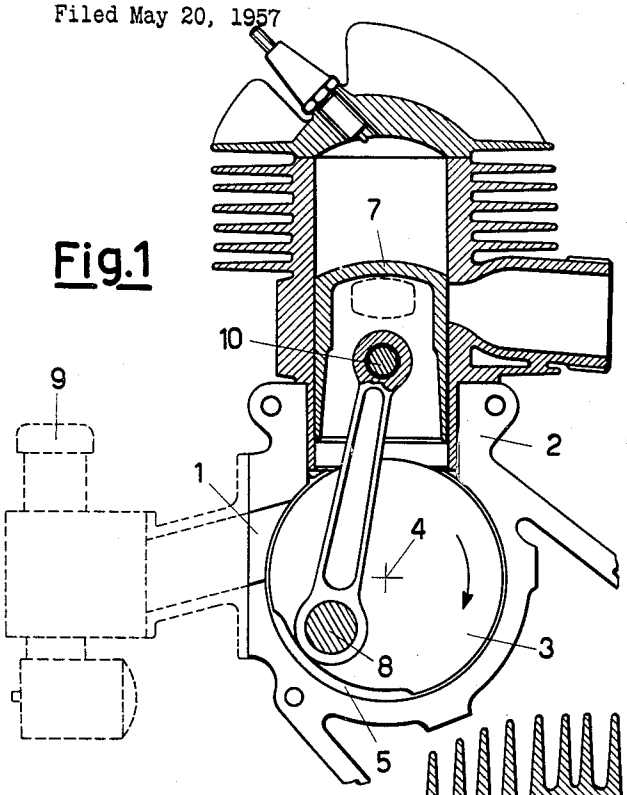
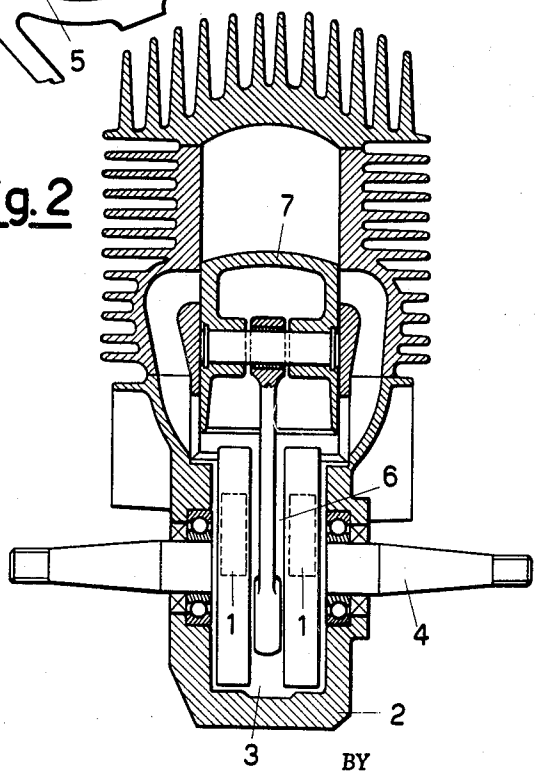


Fig.2



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INTERNAL COMBUSTION ENGINE

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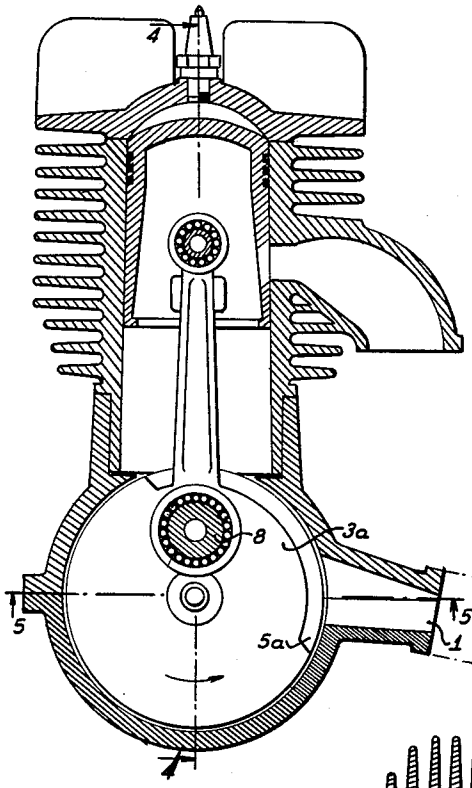


Fig. 2

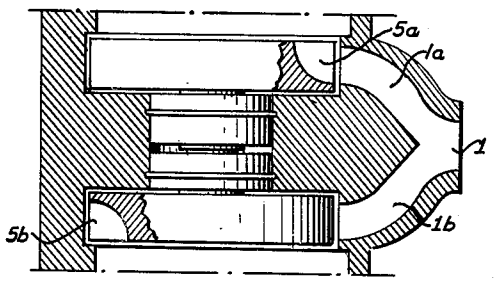


Fig. 5

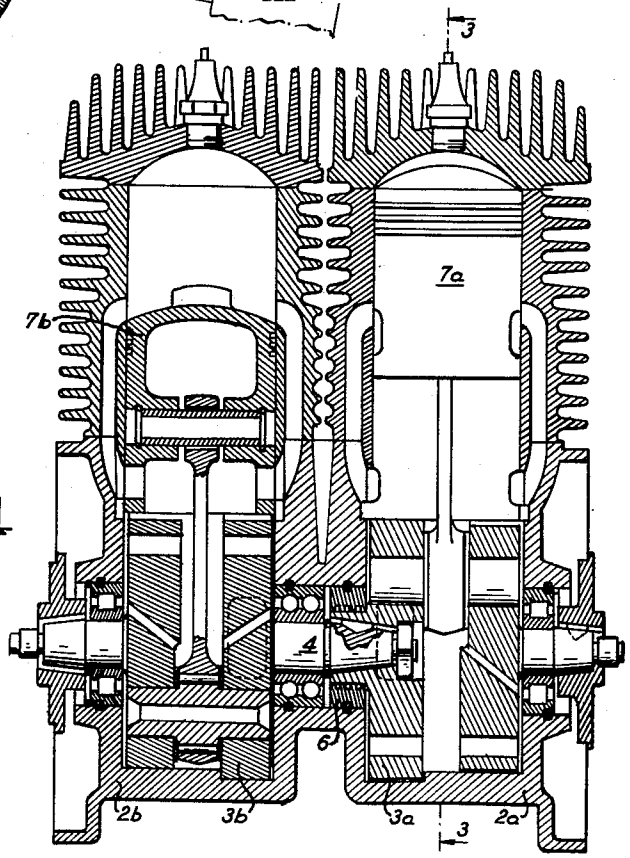


Fig. 4

United States Patent Office 2,946,324 Patented July 26, 1960

2,946,324

INTERNAL COMBUSTION ENGINE

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2 Claims. (Cl. 123—73)

This invention relates to internal combustion engines and, more particularly, to two-stroke-cycle crankcase-compression internal combustion engines.

The present invention provides, in accordance with a preferred embodiment, a two-stroke-engine characterized in that an admission port is arranged in a crankcase in register with the periphery of a crank disc on an associated drive shaft for the main purpose of improving the charging of the cylinder, the lubrication of the crank system and the distribution of temperature over the cylinder walls.

In the accompanying drawing there is illustrated diagrammatically, by way of example, one of the various possible embodiments of the invention, as follows:

Fig. 1 shows a diagrammatical view in section taken along a plane normal to the axis of the engine.

Fig. 2 shows a view in section taken along an axial plane.

Fig. 3 is a cross-sectional view of a two-cylinder engine, according to the invention, taken along line 3—3 of Fig. 4.

Fig. 4 is a cross-sectional view taken along line 4—4 of Fig. 3.

Fig. 5 is a cross-section view along line 5—5 in Fig. 3.

An inclined admission port 1 for a fuel mixture of fuel and lubricant is provided in a crankcase 2 in register with the periphery of rotatable crank discs 3 each on drive shaft 4. The crank discs 3 have circular contours and have normal play with respect to the respective crankcase housing. The circular contour on the two cranks is interrupted by a special peripheral recess 5 permitting the admission into the crankcase of a fresh mixture when the recess finds itself in register with the port 1. The duration of admission is determined by the angle by which the drive shaft must turn to make the recess 5 of the crank pass completely by the port 1.

The seal between crank and crankcase, as needed to block the port 1 completely and to enable the subsequent pre-compression of the mixture in the crankcase, is essentially insured by a layer of centrifuged oil provided by the crank discs, which fills completely the peripheral and radial play or annular chamber between said crank discs and the crankcase. Port 1 enables source 9 to open tangentially into each annular chamber.

The admission port 1 may be divided into two ports, one for each crank disc. The advantages of the invention, in addition to that of the possibility of varying the angular position of the admission period with respect to the bottom dead center of the piston 7 (asymmetrical admission) as in rotary valve engines, through the relative arrangement of the recess on the crank disc and the port in the crankcase, are mainly as follows:

(*a*) Elimination of wear between the mobile member and the respective seat;

(*b*) Perfect lubrication of the crank mechanism since the recess in the crank disc may be provided in register with the crankpin 8 in such a manner as to be directly hit by the jet mixture coming from the carburetor 9 and to project subsequently the oil of the mixture towards the small end 10 of the piston rod and the crown of the piston;

(*c*) Possibility of reduction of the percentage of oil in the petrol or gasoline;

(*d*) Elimination of the admission port in the cylinder with consequent greater symmetry thereof and greater uniformity of temperature owing to the elimination of the low temperature zone, corresponding to the admission zone in normal engines with three-port cylinders;

(*e*) Elimination of sealing members between the surface of revolution of the cranks and the orifice of the port of admission, the seal being constituted by an oil film adhering to the two parts.

The induction conduit 1 coming from a carburetor 9, is bifurcated into the channels 1*a* and 1*b*, the opening whereof into the crankcases 2*a* and 2*b* is controlled (as in the single-cylinder engines) by the cranks 3*a* and 3*b* of the crankshaft 4. Due to the phase shift between the cylinders, also the recess 5*a* and 5*b* on the cranks are consistently shifted with respect to each other. For the same reason, tightness must be ensured between the crankcases with respect to the pistons 7*a* and 7*b*.

In Fig. 4 the seal between the two crankcases is obtained by means of the member 6. In Fig. 3 is also shown the particular inclination of the induction conduits in the sense of rotation of the cranks.

It should be understood that the foregoing description and the accompanying drawing are merely by way of example, since the structures of the invention may vary in shape without departing from the spirit of said invention.

I claim:

1. A two-stroke-cycle crankcase-compression internal-combustion engine comprising a cylinder, a piston in said cylinder, a crankcase connected to said cylinder and opening into the same, a source of fuel and lubricant connected to said crankcase and opening into the latter, a rotatable crank disc in said crankcase, the periphery of said disc cooperating with the crankcase to define an annular chamber, said annular chamber being adapted to accommodate lubricant to form a seal between the disc and crankcase, said disc having a recess in its periphery for conveying said fuel and lubricant towards said cylinder, a crank pin eccentrically mounted on said disc adjacent the recess and adapted to be cooled by said fuel and lubricant, and a piston rod coupling said pin to said piston, said source opening tangentially into said annular chamber in the direction of rotation of said disc.

2. A two-stroke-cycle crankcase-compression internal-combustion engine comprising a cylinder, a piston in said cylinder, a crankcase connected to said cylinder and opening into the same, a source of fuel and lubricant connected to said crankcase and opening into the latter, two rotatable crank discs in said crankcase, the peripheries of said discs cooperating with the crankcase to define annular chambers, said annular chambers being adapted to accommodate lubricant to form seals between the discs and crankcase, said discs having recesses in their respective peripheries for conveying said fuel and lubricant towards said cylinder, crank pins eccentrically mounted on said discs adjacent the respective recesses and adapted to be cooled by said fuel and lubricant, and a piston rod coupling said pin to said piston, said source opening tangentially into said annular chambers in the direction of rotation of said discs.

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