July 9, 1935. A. LESAGE 2,007,575

TWO-STROKE EXPLOSION MOTOR

Filed Oct. 5, 1934

Fig. 1.

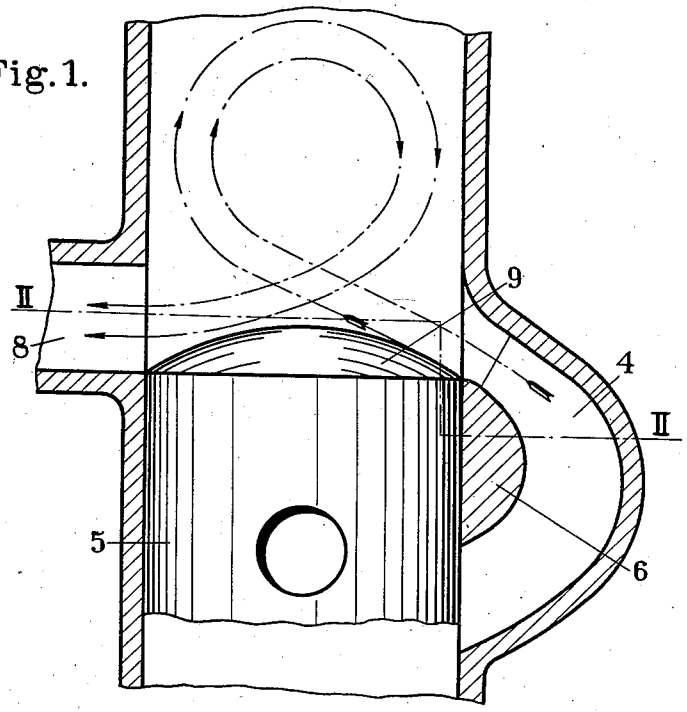
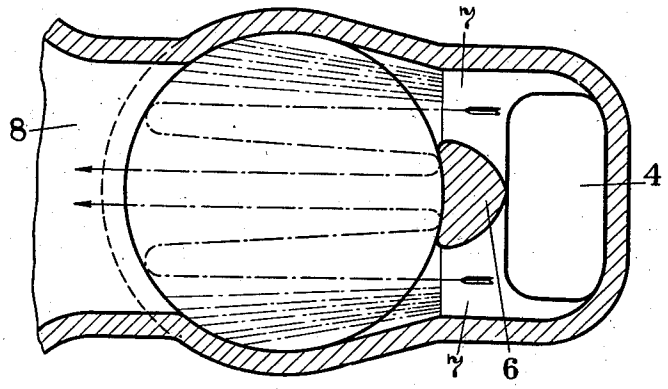


Fig. 2.



Inventor

Alfred Lesage

per

Dean Fairbank Hirsch & Foster

Attys

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TWO-STROKE EXPLOSION-MOTOR

Alfred Lesage, Schweinfurt, Germany

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4 Claims. (Cl. 123—65)

The invention relates to a two-stroke cycle engine adapted for distribution by means of ports and in which the admission openings are entirely or almost diametrically opposed to the exhaust opening.

The object of the invention is to provide a thorough scavenging of the cylinder of the engine by means of fresh gases sweeping the interior of the cylinder in its entire area, thus obtaining a more perfect charge in absence of burnt gases.

This object is attained according to the invention by admitting the scavenging gaseous mixture delivered out of the crank case in two parallel streams obliquely directed towards the cylinder head through a conduit which is divided to form two ports reduced in cross section near the entrance in order to accelerate the velocity of the gases but enlarged thereafter, the streams thus being spread in some degree. A further characteristic consists in the provision of the discharge port which is comparatively large vertically to the axis of the cylinder. In connection with the said disposition of the ports, the curved piston head will give the entering gas streams a special direction and inversion favorable for expelling the exhaust gases through the discharge port.

An embodiment of the invention is diagrammatically illustrated by way of example in the accompanying drawing, in which

Fig. 1 is a longitudinal sectional view of the cylinder and pertinent parts of an engine provided with the scavenging system according to the invention, and

Fig. 2 represents a cross sectional view on the line II—II of Fig. 1.

The admission channel 4 for the fresh gases which communicates with the crank case and is divided at its orifice by a partition 6 into two inlet-ports 7 which are uncovered towards the cylinder above the head of the piston 5 when the latter is in its lowermost position. The said ports are contracted like nozzles at a distance from the cylinder wall and then gradually enlarged again in such a way that the scavenging gases enter the cylinder substantially parallel to each other but permit spreading of the gases on one side tangentially to the cylinder wall. The exhaust port is fully or nearly diametrically opposed to the inlet nozzles and its lateral width is comparatively large and almost corresponds to the distance of the outer walls of the two admission nozzles.

On account of this design of the distribution by means of inclined parallel ports the fresh gases pass through the admission channel 4 into the cylinder in two parallel jets directed upwards in a slanting direction, which jets are still more deflected upwards by the cylinder wall met by them above the discharge aperture where they are combined and inverted as to their direction in the top portion of the cylinder so that they are at the same time urged towards the centre of the cylinder on spiral paths and together directed downwards to the exhaust port in a descending direction, thereby expelling the exhaust gases through the discharge aperture 8.

This guide of the scavenging operation is further assisted by a protrusion 9 of the piston head directed into the combustion chamber, such as a vaulted or roof-like head of the piston.

The scavenging operation produced by the fresh gases in the cylinder while the direction of the flow is inverted takes place with acceleration in nozzle-like admission ports whereas the dimensions of the exhaust port are such that the exhaust gases urged downwards are allowed to escape above the piston head almost over the full width of the cylinder. The inversion of the flow in the cylinder is obtained partly by the admission ports being inclined upwards and partly by the piston head being raised in its central portion so that also on the other side thereof the gases flowing off are directed towards the exhaust port. In addition to this the nozzles are enlarged again behind their point of smallest width so that the streams of gas entering tangentially and with increased velocity scavenge the interior of the whole cylinder and are not only urged upwards at the wall opposite to the admission port but also pressed towards one another. In this way there is obtained a thorough scavenging of the whole cylinder.

I claim:

1. In a two-stroke cycle engine, the combination with a cylinder, of a piston reciprocating therein, parallel admission apertures inclined towards the cylinder head, the said apertures being reduced in cross-section and again gradually increased, a discharge aperture located opposite the admission apertures, and a dome-shaped piston head.

2. In a two-stroke combustion motor, the combination with a duct leading the combustible mixture of fresh gases to the cylinder, of a forking connection forming the admission ports of the motor, said ports being parallel and restricted in width and again gradually increased to accommodate themselves to the wall of the cylinder,

a discharge aperture the lateral width of which corresponds to the lateral widths of the twin-admission ports, and a projecting piston head.

3. In a two-stroke cycle engine, a piston having an elevated piston head, parallel nozzle-shaped twin-admission ports accommodated to the cylinder wall and obliquely directed to the cylinder head, and a single exhaust port corresponding in lateral width to the admission ports, and disposed opposite to said admission ports.

4. A two-cycle internal combustion engine including a cylinder, a pair of similar inlet ports extending substantially parallel for directing a charge along parallel paths on opposite sides of the longitudinal central plane, an exhaust port opposite to said inlet ports and in said plane, and a piston adapted to uncover said ports at the lower end of its stroke, and having a head with surfaces extending from said ports upwardly towards the head end of said cylinder, whereby upon the uncovering of said ports two streams are directed in looped helical paths of opposite pitches from said inlet ports and converge to said exhaust port, the axes of the helices being substantially at right angles to the axis of the cylinder.

ALFRED LESAGE.