Feb. 9, 1932. J. A. SPEER 1,844,109

INTERNAL COMBUSTION ENGINE

Filed Jan. 25, 1929

Fig 1

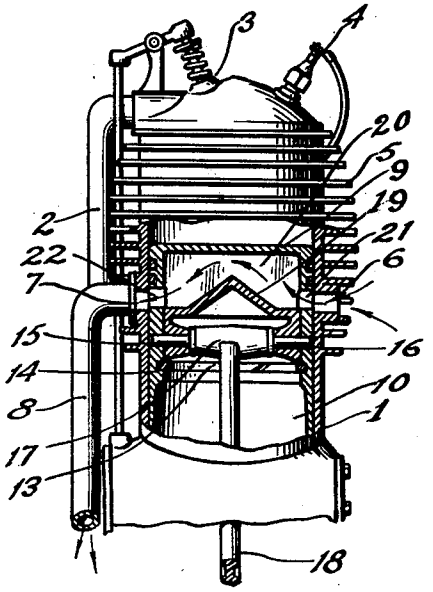
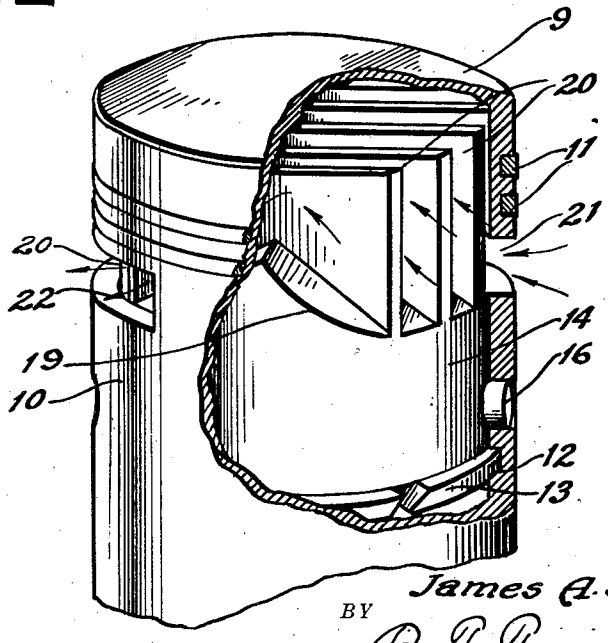


Fig 2



INVENTOR
James A. Speer
BY
B. F. Funk ATTORNEY

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JAMES A. SPEER, OF WICHITA, KANSAS

INTERNAL COMBUSTION ENGINE

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This invention relates to improvements in internal combustion engines and particularly to a means for cooling the piston and utilizing the heat from the piston to vaporize the fuel charge before it enters the combustion chamber of the cylinder. By maintaining the inner end of the piston relatively cool, the charge can be compressed to a higher degree than is possible with ordinary engine construction. It is well recognized that the higher the compression of the fuel charge prior to combustion, the more efficient the engine will be but due to the fact that compression creates heat, it has been considered impracticable to compress the charge more than five or six atmospheres because a charge compressed above such pressure will ordinarily detonate or pre-ignite. By maintaining the piston cool, the compression ratio may be increased over common practice so better efficiency is obtained.

The novelty of the invention will be apparent by reference to the following description in connection with the accompanying drawings in which:

Fig. 1 is a view of a cylinder of a motor, part of which is shown in elevation and part in section, the piston except for the connecting rod being shown in section and

Fig. 2 is a fragmentary view of a piston constructed in accordance with my invention, part being shown in section and part in elevation.

Referring now to the drawings by numerals of reference, 1 designates a cylinder of an internal combustion engine having an intake manifold 2, an intake valve 3, an exhaust valve not shown and a spark plug 4, there being circumferential flanges 5 for air cooling all of which is old and well known. Midway between the ends of the cylinder is an atmospheric air inlet port 6 and diametrically opposite it is an outlet port 7 connected to a tube 8 communicating with the carburetor not shown. The piston particularly illustrated in Figure 2 consists of a head 9 and a skirt 10 of usual cylindrical form having appropriate piston rings 11. In the interior of the skirt is a circumferential groove 12 to receive a split expansible locking ring 13 to retain the removable wing carrying head of block 14, provided with trunnions 15 and 16 on the T-head 17 of the connecting rod 18 which may be fastened to the crank shaft in any appropriate manner.

It will be observed that the head or block 14 has an inverted V-shaped upper end 19 from which projects parallel spaced partitions or outstanding wings 20 held in alinement with the openings 6 and 7 by the trunnions 15 and 16 which pass through the block 14 and into the piston. The V-shaped web 9, in spaced relation with the end or head 19, forms an air chamber or passage-way in which the directional vanes 20 are located. These vanes aline with the openings 21 and 22 in the piston and with the openings 6 and 7 in the cylinder when the piston is in its out-stroke position.

When the parts are in the position shown in Figure 1, the air is drawn through the ports 6, 21, 7, 22, conduit 8, through the carburetor and up through the manifold 2 to the combustion chamber. Therefore, it cools the piston but takes up enough heat to efficiently vaporize the liquid hydrocarbon, one of the component parts of the combustible mixture. Therefore, the mixture can be compressed to a higher degree than is possible with present day engines due to the fact that the piston is relatively cool during the compression stroke.

If the device is used on aeronautical engines, the intake ports 6 and 21 can face forward, preferably in a plane at right angles to the propeller so that there will be a tendency for the air to enter the ports 6 and 21 at some appreciable pressure. In any event, the arrangement as shown will enhance the operating efficiency of the motor.

What I claim and desire to secure by Letters Patent is:—

1. A piston comprising a head and a cylindrical skirt, the skirt being provided with a circumferential groove on its inner wall, a removable block receivable within the skirt and having outstanding wings to aline with openings in the skirt of the piston and a locking ring in the groove to hold the block within the skirt.

2. A piston comprising a head having a

cylindrical skirt provided with alining openings and an internal groove, a block receivable within the skirt having wings to abut against the head of the piston, the wings forming passage-ways between the block and the head of the piston which alines with the openings in the skirt and a locking ring in the groove for securing the block within the skirt.

3. A piston comprising a head having a cylindrical skirt provided with alining openings, a block within the skirt spaced from the head and having wings to abut against the head of the piston, the wings forming passage-ways between the block and the head which aline with the openings in the skirt.

In testimony whereof I affix my signature.

JAMES A. SPEER.