United States Patent [19]

Amery

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[54] **INTERNAL COMBUSTION ENGINE**

[76] Inventor: **Ernest Amery,** Hotel Woodstock, 127 W. 43rd St., New York, N.Y. 10036

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[52] **U.S. Cl.** ..... **123/45 R,** 123/61 R
[51] **Int. Cl.** **F02b 53/00,** F02b 75/16
[58] **Field of Search** ..... 123/61 R, 45 R

[56] **References Cited**

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Primary Examiner—Wendell E. Burns

[57] **ABSTRACT**

An internal combustion engine adapted for use in automobiles and other devices capable of operation under high compression while effecting more complete combustion of its fuel. The engine is of the piston type with the piston mechanically arranged for both oscillatory and related vertical reciprocitory motion. The cylinder is double-headed the heads being oriented in such a manner with respect to the piston faces that maximum compression is effected on the firing stroke of the engine. The double head cylinder permits more complete combustion of the gasoline mixture.

4 Claims, 4 Drawing Figures

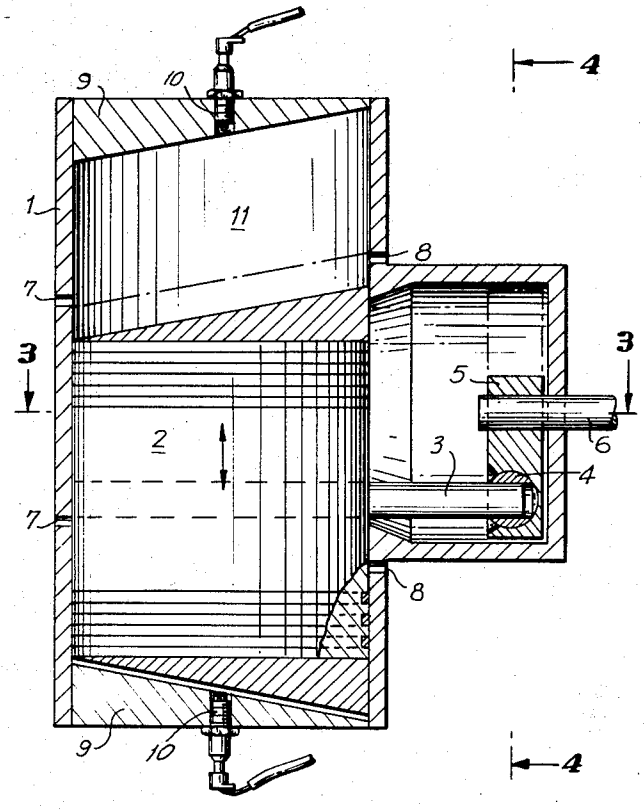


FIG. 2

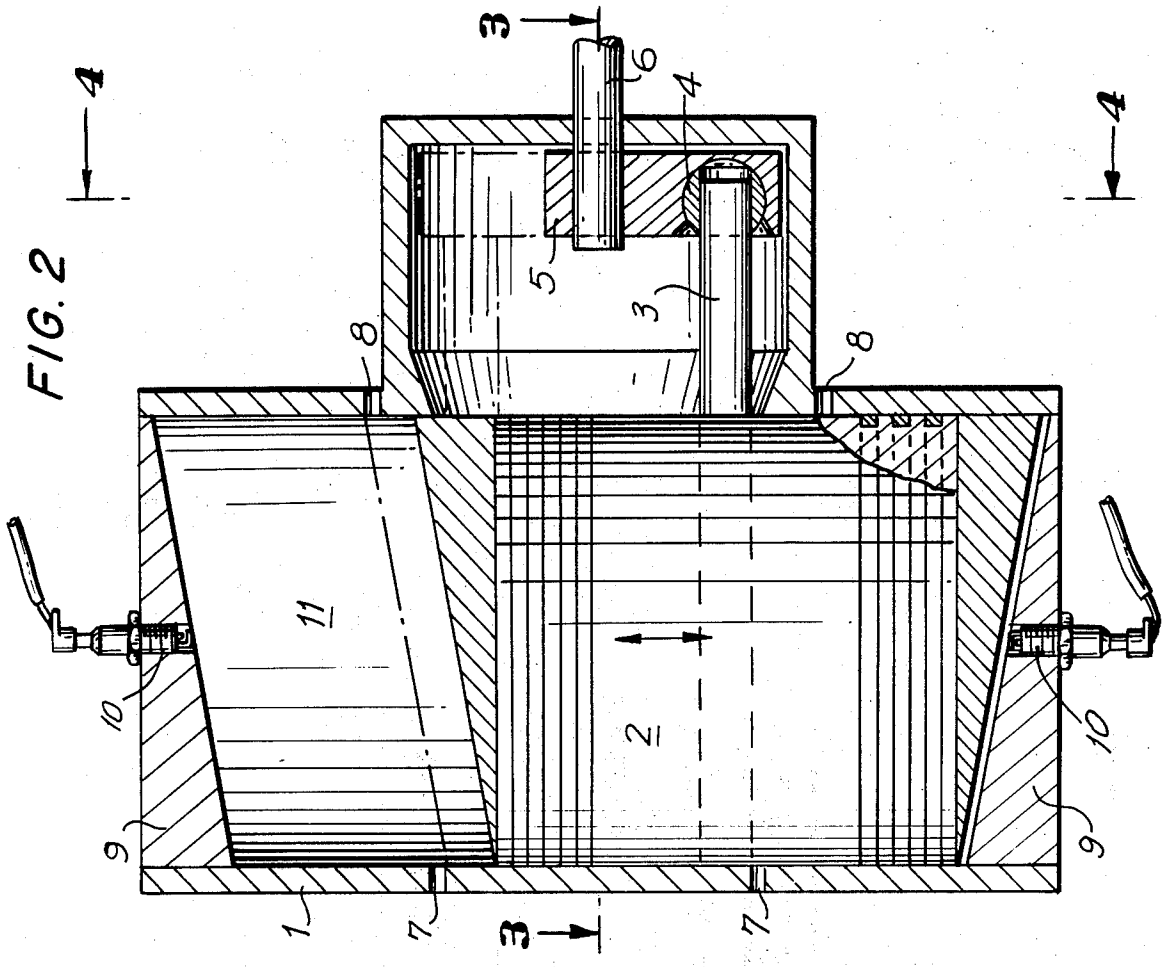
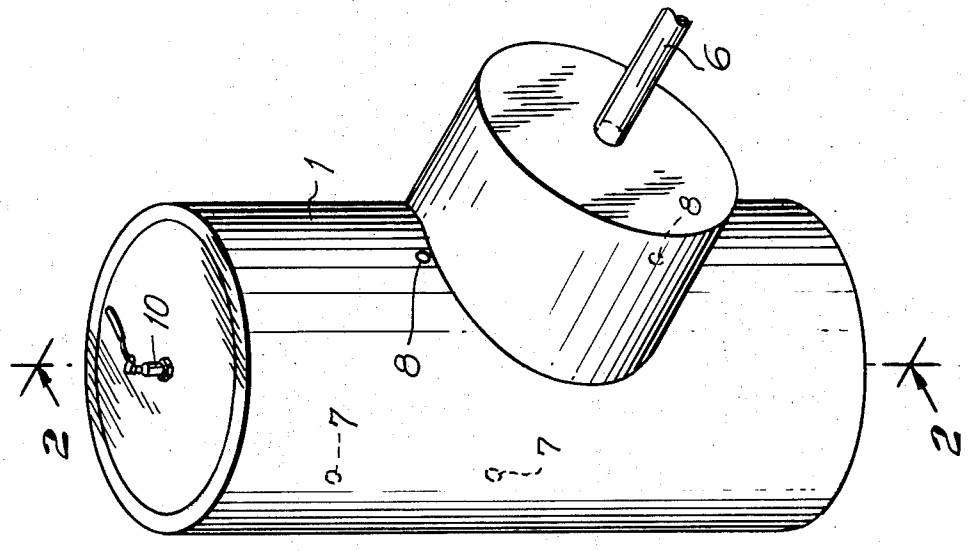


FIG. 1



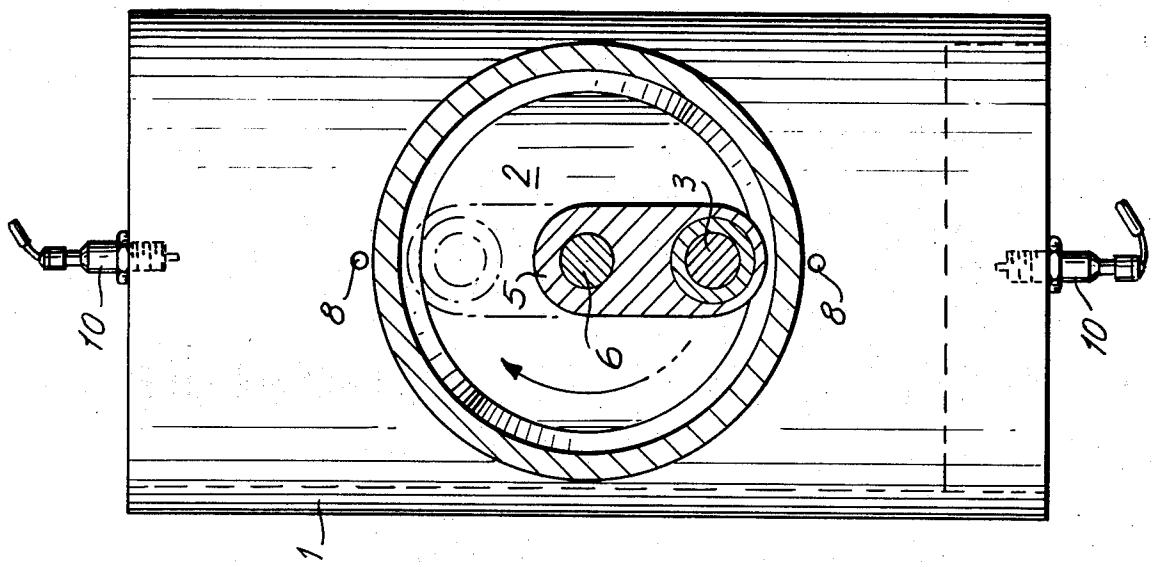


FIG. 4

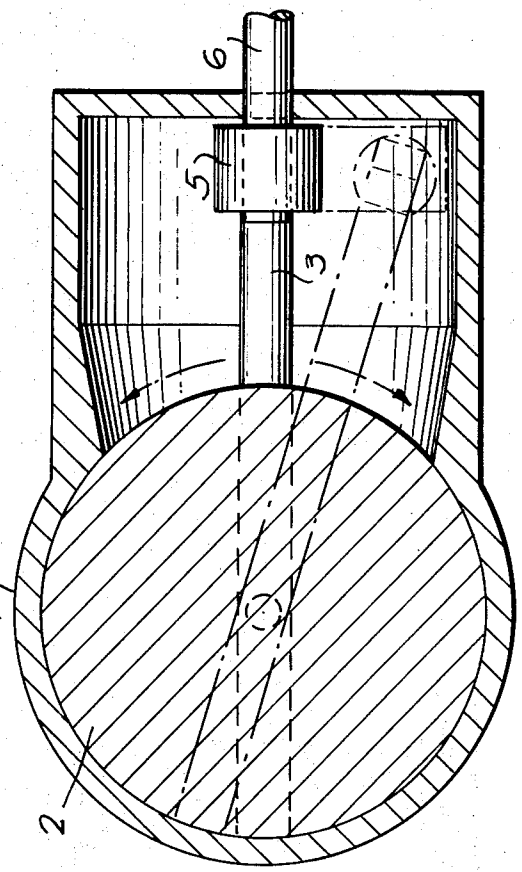


FIG. 3

INTERNAL COMBUSTION ENGINE

The invention relates to internal combusion engines and in particular such engines of the reciprocating piston type.

According to the invention, the instant piston engine is fabricated of two moving parts with the connection to the drive mechanism from the piston extending through the side wall of the cylinder. Such provision permits firing to occur at both the top and bottom of the cylinder and eliminates the need, as in the case of automobile vehicles, for the conventional crankcase. In addition, there is the advantage of providing, in a sense, for recycling the uncombusted gasoline mixture from one cylinder head to the other for more complete combustion of the gasoline, thus rendering the engine more efficient and consierably cleaner in operation in terms of minimizing atmosphere pollution.

Just as importantly, the engine is highly efficient in operation in terms of permitting higher compression than is presently allowable in automobile engines as for example. This is due to two factors, namely a provision for oscillating the piston during its reciprocatory motion and for so orienting the piston faces with respect to their respectively opposing cylinder heads that maximum compression will not occur until the piston has completed its so-called compression stroke at which point the maximum compression state is quickly established as a consequence of the rotation of the piston and the peculiar orientation of its face relative to the plane of the cylinder head.

One object of the invention is to provide a gasoline driven internal combustion engine of the piston type, which operates on relatively high compression.

Another object of the invention is to provide a piston engine which is clean and uniquely efficient in operation.

Other objects and advantages of the invention may be appreciated on reading the following description of one embodiment thereof, which is taken in conjunction with the accompanying drawings, in which

FIG. 1 is an exterior view of the internal combustion engine, shown in perspective;

FIG. 2 is a section taken on the line 2—2 of FIG. 1;

FIG. 3 is a section taken on the line 3—3 of FIG. 2; and

FIG. 4 is a section taken on the line 4—4 of FIG. 2.

Referring to the drawings, there is disposed in cylinder housing a piston 2. Secured in a bore of the piston 2 is piston rod 3 extending through an opening in the opposite wall of the piston to have a sliding connection with ball and socket bearing 4 which is encased in crank fly wheel 5 to impart a semi-rotary and vertical movement of the piston. Output power shaft 6 is in driven connection with the fly wheel 5.

The cylinder housing has a pair of exhaust ports 7 on one side and a pair of carburetor inlet ports 8 on the other side thereof.

The top and bottom cylinder heads 9 are each provided with a spark plug 10 so that compression and firing can occur on each stroke of engine operation. The inner faces of the cylinder heads and the top and bottom faces of the piston reside in planes which are not normal to the cylinder wall, the purpose of which is explained below.

In operation, the piston rod 3 imparts rotary motion to the piston 2 due to the connection of the rod with the crank fly wheel 5. The orientation of the planes of the piston faces and cylinder heads are such that during the reciprocatory movement of the piston, opposing planes become parallel immediately after the firing stroke has begun, at which point maximum compression is reached. That is, maximum compression is prevented during the compression stroke since the compression faces of the head and piston do not come to their closest point during that stroke. Each stroke of the piston begins as a firing and scavenging stroke and finishes as a compression stroke on closure of the ports 7. In effect, the engine operates, therefore, in the manner of a two cycle engine.

Various modifications of the invention may be effected by persons skilled in the art without departing from the scope and principle thereof, as defined in the appended claims.

What is claimed is:

1. An internal combustion engine comprising a cylinder, a reciprocatory piston disposed in said cylinder, said cylinder having a head at one end with an operative face which is both planar and not normal to the reciprocating axis of said piston, said piston having an opposing operative face also planar and not normal to said axis, a rotary device having a universally mounted bearing disposed off the center of rotation of said device, an output shaft in driven connection with and at the center of rotation of said device, said cylinder having an opening in its side wall structure, and a piston rod rigidly connected to said piston, extending through said opening and in sliding connection with said bearing whereby rotary and reciprocating motion is imparted to said piston during operation.

2. An internal combustion engine defined in claim 1, wherein the piston and cylinder at the other end thereof have opposing operative faces both planar and not normal to the reciprocating axis of the cylinder.

3. An internal combustion engine as defined in claim 2 wherein a spark device is provided in each cylinder head.

4. An internal combustion engine as defined in claim 3 where at least two exhaust ports and at least two carburetor inlet ports are provided in the cylinder housing.

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