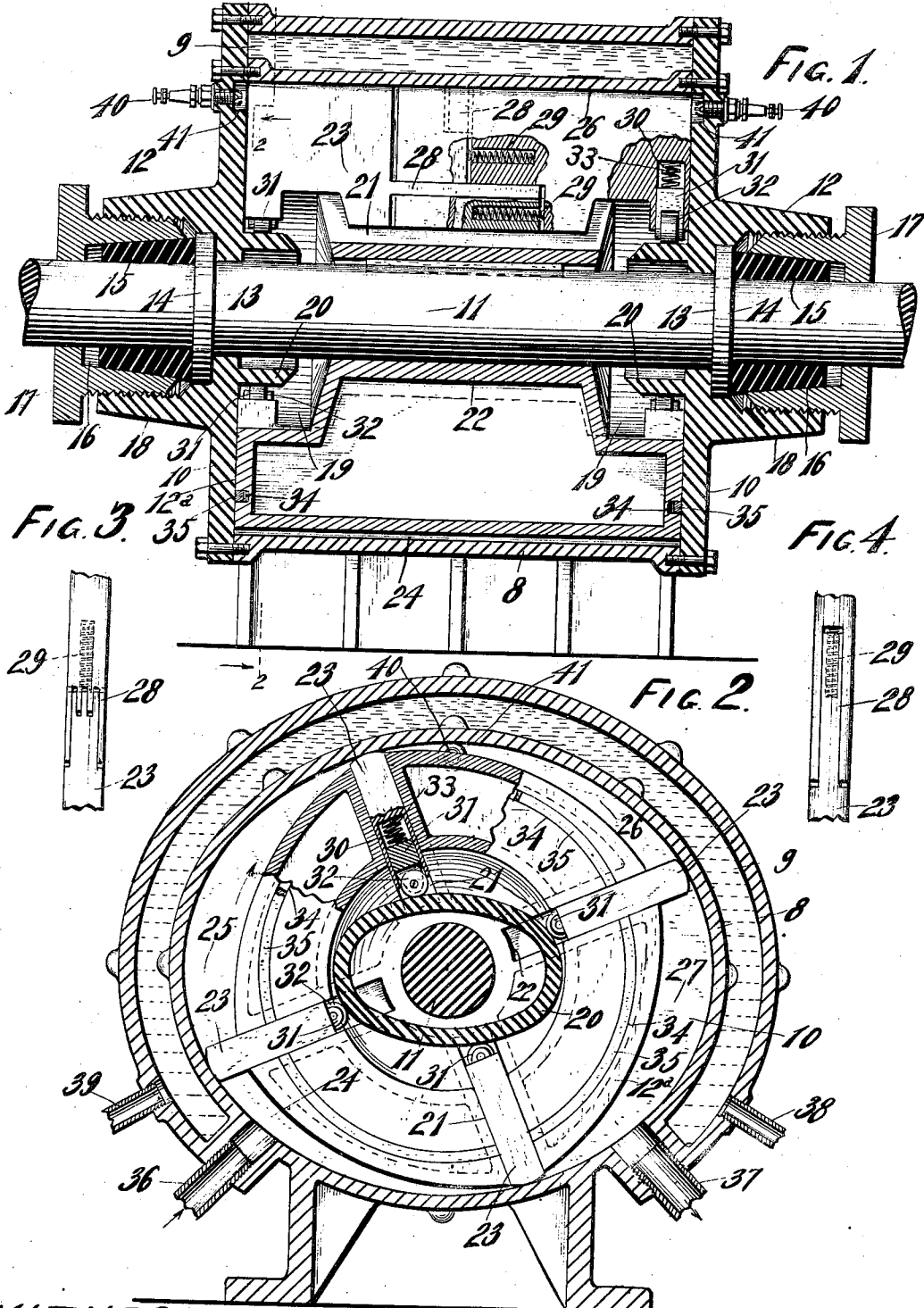


M. A. T. HOFFMANN.
 ROTARY INTERNAL COMBUSTION ENGINE.
 APPLICATION FILED AUG. 19, 1912.

1,121,628.

Patented Dec. 22, 1914.



WITNESSES.

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UNITED STATES PATENT OFFICE.

MATHIAS A. T. HOFFMANN, OF CAMPBELLSPORT, WISCONSIN.

ROTARY INTERNAL-COMBUSTION ENGINE.

1,121,628.

Specification of Letters Patent.

Patented Dec. 22, 1914.

Application filed August 19, 1912. Serial No. 715,804.

To all whom it may concern:

Be it known that I, MATHIAS A. T. HOFFMANN, a citizen of the United States, and resident of Campbellsport, in the county of Fond du Lac and State of Wisconsin, have invented new and useful Improvements in Rotary Internal-Combustion Engines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in rotary internal combustion engines of that type in which the carbureted mixture is received within the engine chambers, is compressed, ignited and burned, and the burnt gases are discharged from the chambers after they have performed their work.

It is one of the objects of the present invention to provide a rotary internal combustion engine having a piston which rotates continuously in one direction and receives an impulse every quarter revolution of said piston.

A further object of the invention is to provide a rotary internal combustion engine with a rotary member having slidable pistons which are constructed in a novel manner and are provided with means for forming gas tight joints in the chambers of which they form a part.

A further object of the invention is to provide a rotary internal combustion engine which is simple in construction, is efficient in operation, and is well adapted for the purpose desired.

With the above and other objects in view, the invention consists of the improved rotary internal combustion engine and its parts and combinations, as set forth in the claim, and all equivalents thereof.

In the accompanying drawing, in which the same reference characters indicate the same parts in all of the views: Figure 1 is a longitudinal vertical sectional view of the improved rotary internal combustion engine; Fig. 2 is a transverse sectional view thereof taken on line 2—2 of Fig. 1; Fig. 3 is a fragmentary detail view of the outer joint of one of the slidable pistons; and Fig. 4 is a similar view of the inner joint thereof.

Referring to the drawing the numeral 8 indicates the outer casing or cylinder of the improved rotary internal combustion engine and 9 the water chamber or cooling means thereof. The cylinder is of elliptical form in cross section with its greatest length in

horizontal plane and the opposite ends of the cylinder are closed by cylinder heads 10 bolted thereto. A shaft 11, passing centrally through the cylinder heads and through stuffing boxes 12 formed on the heads, has keyed thereto a piston member 12^a approximately annular in form. The outer end portions of the shaft are reduced in diameter to form the shoulders 13 against which collars 14 bear and to receive the soft metal packing sleeves 15 mounted thereon. The peripheries of these sleeves are tapered slightly to enter the tapered recesses 16 of the stuffing nuts 17' and the nuts 17 are threaded into the tubular bosses 18 of the heads to form tight bearings between the shaft and the heads.

The opposite end portions of the piston member have recesses 19 formed therein to accommodate the elliptical cams 20 projecting inwardly from the cylinder heads 10. These cams are curved concentrically with relation to the elliptical form of the cylinder. The piston member is provided with four piston slots 21 extending radially from the hub 22 of the piston member to the periphery thereof, and pistons 23, slidably and yieldingly positioned within said slots, are adapted to bear against the inner periphery and the inner faces of the cylinder heads and form four separate cylinder chambers 24, 25, 26 and 27 respectively. While these chambers constantly change and merge into one another while the piston member is rotating, they are indicated by different numerals for convenience of description.

Each slidable piston is formed in two parts connected together by tongue and grooved joints 28 and coiled springs 29 interposed between the two parts serve to yieldingly press the outer ends of the parts against the cylinder heads and form a tight joint. The portions of the piston parts adjacent to the cylinder heads are provided with recesses 30 in which slide blocks 31, having rollers 32 journaled therein, bear against the elliptical cams 20 of the cylinder heads. Coiled springs 33 within these recesses and bearing against the slide blocks force the outer rounded edge of the piston against the inner surface of the cylinder. The opposite end portions of the piston member are provided with annular grooves 34 to accommodate piston rings 35 positioned therein.

The engine receives its carbureted gas

through the intake pipe 36 and exhausts through the pipe 37 on the opposite side of the cylinder. The pipe 38 provides the cooling water for the water chamber and the pipe 39 receives the discharge therefrom. Spark plugs 40, extending into the pockets 41 of the cylinder heads, provide for igniting the charge within the cylinder. These plugs are mounted in the upper opposite end portions of the cylinder and are adapted to ignite the charge when under pressure.

In operation with the piston member, turning in the direction indicated by the arrow and the parts in the position shown in Fig. 2, the charge will be drawn into the chamber 24 as the chamber increases in size with the rotation of the piston member. When the said chamber has increased to the greatest extent it will be closed by the piston forming the rear wall of said chamber passing by the inlet pipe and as indicated by the piston will compress the charge and when compressed to the extent indicated in the chamber 26 the charge will be ignited and the burning and expanding gases will react against the piston forming the advancing wall of this chamber and rotate the piston member to the right (in Fig. 2), due to the fact that the piston forming the said advancing wall is extended from the piston member a greater distance than the piston following. As the piston member continues to rotate the chamber will increase in size until the chamber reaches the position indicated by the chamber 27, when the said chamber will be in communication with the exhaust opening and the spent gases dis-

charged therefrom. This cycle of operation will continue in the same manner during the rotation of the rotary member.

The construction permits the spark to be advanced or retarded as desired.

From the foregoing description it will be seen that the rotary internal combustion engine is of simple construction and is well adapted for the purpose desired.

What I claim as my invention is:

A rotary internal combustion engine, comprising a cylinder elliptical in cross section and having inlet and outlet openings, heads closing the ends of said cylinder and provided with inwardly projecting cams approximately concentric with the elliptical portion of the cylinder, a shaft extending through the heads, a piston member mounted on the shaft and positioned within the cylinder and having end recesses into which the cams project, said piston member also provided with radial slots, pistons slidably positioned within the slots and bearing against the cylinder and the heads and dividing the cylinder into a number of chambers, the inlet and outlet openings of said cylinder communicating with the chambers, said pistons provided with slidable blocks having rollers which ride on the cams, and springs interposed between the pistons and the slidable blocks to yieldingly mount the pistons upon the cams.

In testimony whereof, I affix my signature, in presence of two witnesses.

MATHIAS A. T. HOFFMANN.

Witnesses:

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