May 3, 1927. 1,627,403

H. J. OUTCELT

INTERNAL COMBUSTION ENGINE

Filed Nov. 11, 1925

Fig. 1.

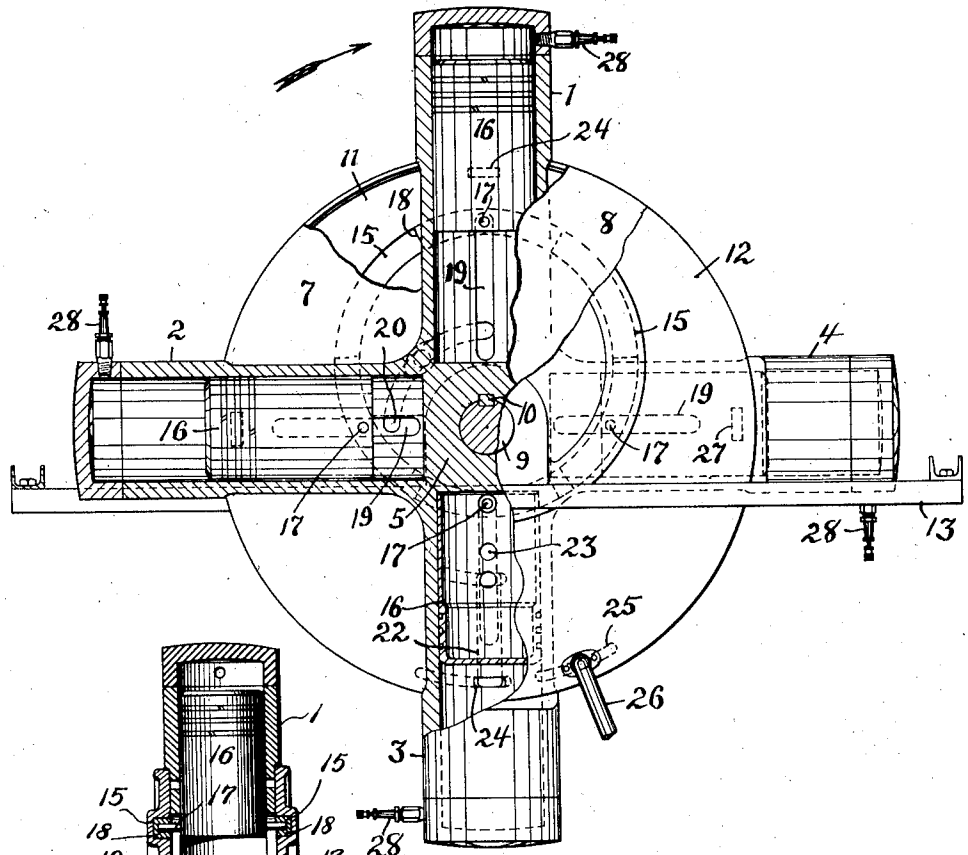


Fig. 2.

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INTERNAL-COMBUSTION ENGINE.

Application filed November 11, 1925. Serial No. 68,282.

This invention relates to improvements in internal combustion engines of the rotary cylinder two-cycle type, and the object thereof is to provide a construction of but few parts and obviate the usual complicated valve mechanism.

This object is accomplished by the construction illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation of an engine embodying the invention, a portion of which is shown broken away; and

Fig. 2 is a section projected from Fig. 1 in a plane at right angles thereto and approximately central.

The characters appearing in the description refer to parts shown in the drawings and designated thereon by corresponding characters.

The invention consists of a removable member including a casting formed with cylinders 1, 2, 3 and 4 radially disposed in opposite pairs, there being a block 5 uniting the inner ends of the cylinders. The casting also has at each side thereof an integral face plate 7—8 of circular form, contiguous with each cylinder, and parallel with each other. The casting is mounted upon a shaft 9 that extends centrally through the block 5 and is secured therein by a key 10.

A pair of stationary circular heads 11 and 12 are fixed upon a base frame 13, each having a central bearing 14 in which the shaft 9 is journaled, and said heads have frictional contact with the corresponding face plates on the cylinder casting. In the inner side of each of said heads is a circular raceway 15 disposed eccentric of the shaft, which raceways are axially aligned with each other.

Each of said cylinders has therein a piston 16 provided near its inner end with a cross-pin 17, the ends of which extend into shoes 18 that are positioned in said raceways correspondingly. The said shoes are loosely pivoted on the cross-pins and have sliding movement in the raceways. The cylinders each have a longitudinally disposed slot 19 at each side thereof, through which the corresponding cross-pins extend, to permit movement of the cross-pins with their pistons when the latter are reciprocated in the cylinders.

In the inner face of the stationary head 11 is a semicircular cavity 20 or intake port which has a feed pipe connection 21, the port being so located as to have communication with the inner end of each cylinder through the adjacent slot 19 thereof during the outward stroke of its piston. Also in the head 11 is made a by-pass duct 22 which affords communication between the inner and outer ends of said cylinders when the corresponding pistons reach their innermost positions, there being openings 23 in said pistons to facilitate communication with the inner ends of the cylinders, and a port 24 in each cylinder controlling communication of the by-pass with the outer end thereof.

The stationary head 12 has in its inner face an exhaust port 25 having a pipe connection 26 therewith, which port has communication with the outer ends of said cylinders as the corresponding pistons complete their inward strokes, there being an exhaust port 27 in each cylinder through which the exhaust therefrom is controlled.

The cylinders are provided each with a spark plug 28, for igniting the gas mixture therein, which plugs function in the usual manner, there being suitable apparatus (not shown) in connection with said plugs for their operation.

In utilizing the invention, a suitable air and gas mixture is supplied through the feed pipe to the cylinders as the cylinder casting is revolved and the pistons are reciprocated, the mixture being drawn into the inner end of each cylinder as its piston moves outward, and compressed therein during the inward stroke of the piston.

The mixture thus compressed is admitted into the outer ends of the cylinders when their respective ports 24 register with the by-pass duct 22 and is subsequently recompressed in the outer ends of the cylinders during the succeeding outward strokes thereof and is then ignited in the usual manner so that the pistons are forced inwardly by the resultant explosions and the cylinder casting revolved. The burnt mixture is liberated from the outer ends of the cylinders as their respective ports 27 register with the exhaust port 25, which occurs prior to the periods of connection between the corresponding ports 24 and the by-pass duct 22. Thus as the cylinder block rotates, in each cylinder there is drawn into its inner end a charge of fuel and therein compressed, which compressed charge is expelled into the outer end of the cylinder and therein re-

compressed, exploded and subsequently exhausted.

What I claim is:—

1. In an internal combustion engine, a revoluble member having cylinders radially disposed in opposite pairs, each cylinder having a longitudinal slot in each side thereof at its inner portion, and having a receiving port and exhaust port in its outer portion; a pair of stationary heads spaced apart and having bearing contact with the corresponding sides of said revoluble member, each having a circular raceway in its inner face eccentrically disposed, one of said heads having an intake port with which said cylinders have communication at their inner ends, and also a by-pass duct with which said cylinders have communication at their inner and outer ends, the other of said heads having an exhaust port with which said cylinders have communication at their outer ends; a shaft keyed in said revoluble member and rotatably mounted in said heads; a piston in each cylinder having a cross-pin at the inner end thereof, the ends of which pin project through the corresponding side slots of the cylinder; a shoe on each end of each cross-pin having sliding movement in the corresponding race-way; and ignition means including a spark-plug in each of said cylinders.

2. In an internal combustion engine a pair of opposed stationary heads spaced apart, each having an annular raceway in its inner face eccentrically disposed, said raceways being axially alined, one of said heads having an intake port adjacent its center and having also a by-pass duct, the other head having an exhaust port; a revoluble member having radially disposed cylinders and a shaft supported centrally in said heads, said member being positioned between said heads and having bearing contact therewith at its sides respectively, there being a longitudinal slot in each side of each cylinder at its inner portion, each cylinder having ports therein for communication with said intake port, by-pass duct and exhaust port respectively; a piston in each cylinder having a cross pin adjacent its inner end; a shoe on each end of each cross pin having sliding movement in the raceway of the corresponding head; and ignition means in connection with each of said cylinders.

3. An internal combustion engine having opposed stationary heads; a body having radially disposed cylinders rotatably positioned between said heads; a piston in each of said cylinders operably connected with said heads so as to have reciprocal movement as said body rotates, there being an intake port in one of said heads for communication with said cylinders at the inner ends thereof and also a by-pass duct for establishing communication between the inner and outer ends of said cylinders, the other of said heads having an exhaust port for communication with said cylinders; and ignition means in connection with each of said cylinders.

4. An internal combustion engine having spaced stationary heads; a body having radially disposed cylinders revolubly mounted between said heads; and a piston in each cylinder operatively connected with said heads so as to have reciprocating movement as said body rotates, there being an intake port in one of said heads for communication with said cylinders at their inner portions, and also a by-pass duct through which communication is established between the inner and outer portions of said cylinders, and also an exhaust port in the other of said heads having communication with said cylinders at their outer portions.

In testimony whereof I affix my signature.

HENRY J. OUTCELT.