Nov. 25, 1930. C. E. JOHNSON 1,782,426

PISTON RING

Filed Aug. 27, 1928

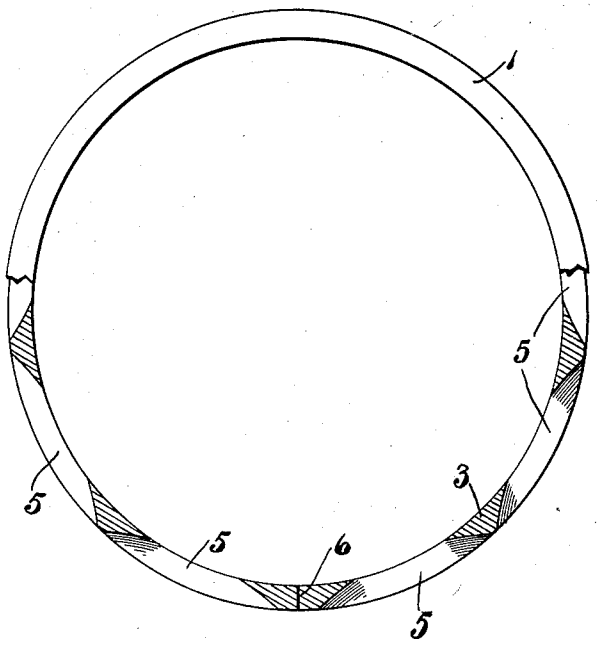


Fig. 1.

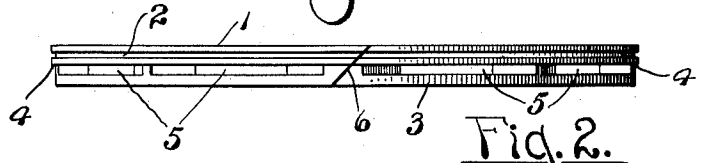


Fig. 2.

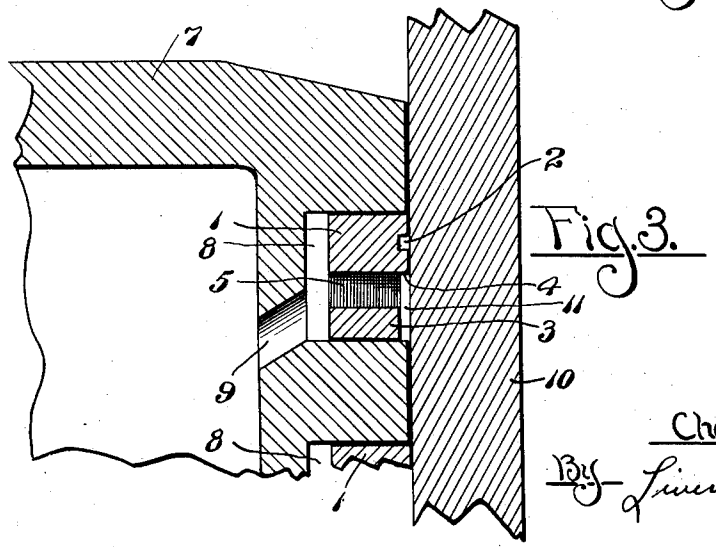


Fig. 3.

Inventor
Charles E. Johnson
By Lancaster & Van Antwerp
Attorneys

Patented Nov. 25, 1930 1,782,426

UNITED STATES PATENT OFFICE

CHARLES E. JOHNSON, OF MUSKEGON, MICHIGAN, ASSIGNOR TO THE PISTON RING COMPANY, OF MUSKEGON HEIGHTS, MICHIGAN, A CORPORATION OF MICHIGAN

PISTON RING

Application filed August 27, 1928. Serial No. 302,166.

This invention relates to piston rings particularly useful in connection with internal combustion engines. It is an object and purpose of the present invention to provide a novel construction of piston ring which is particularly efficient in saving oil used in internal combustion engines and with which the passage of oil to above the piston, or into the combustion chambers above the pistons in an internal combustion engine, is greatly lessened thereby avoiding excess consumption of oil with a burning of the same in the combustion chambers of the engine, resulting in smoky exhaust gases and in the excessive production of carbon which fouls the combustion chamber and spark plugs of the engine. A further object of the invention is to provide a ring having these advantages and characteristics which is simple and economical to manufacture.

An understanding of the invention may be had from the following description taken in connection with the accompanying drawing, in which,

Fig. 1 is a partial plan and horizontal sectional view of the piston ring made in accordance with my invention.

Fig. 2 is an edge view of the ring, and

Fig. 3 is a fragmentary enlarged vertical section illustrating the ring of my invention located in a piston ring groove of a piston and bearing against the inner wall of the cylinder in which the piston is mounted for reciprocation.

Like reference characters refer to like parts in the different figures of the drawing.

The piston ring of the present invention is preferably of cast iron, circular in form, and includes an upper section 1 in which a continuous groove 2 is made around the same and at the outer curved side thereof. Integral with the upper section 1 is a lower section 3 which at its outer side is cut away so as to remove metal and leave a continuous annular shoulder 4 at the lower side of the upper section 1, it being evident that the width of the lower section 3 is less than the width of the upper section 1 by an amount equal to the annular cut of metal which is removed at the outer curved surface of said lower section 3.

A plurality of slots 5 are cut through the ring in the lower section 3 thereof, the upper sides of the slots, preferably, being in the same horizontal plane with the annular shoulder 4 described. While these slots are shown as horizontal it is, of course, to be understood that the same may be cut at an angle to the horizontal as disclosed in my prior patents having Numbers 1,558,091 and 1,558,092, issued October 20, 1925.

The ring has the usual parting 6 at one side which while shown as a diagonal cut may be any conventional type of joint used in piston ring partings. This ring, as with all piston rings, is adapted to spring apart at the parting when free to do so but when placed in an engine the ring is squeezed together so as to substantially close the parting, as shown in Fig. 2. It is also to be understood that the slots 5 cut through the ring are spaced apart short distances from each other and in practice are made preferably by sawing with a circular metal saw through the ring from its outer to its inner curved side.

The rings of the construction illustrated and described are adapted to be used in the same way that all piston rings are used. The piston illustrated at 7 is provided with a plurality of piston ring grooves 8 around it towards its upper end, in which the rings are seated with the upper sections 1 of the rings in the upper portions of the grooves 8. The ring grooves 8 communicate with the interior of the piston by means of oil carrying passages 9, as shown in Fig. 3. The outer curved sides of the upper sections 1 of the rings bear against the inner walls of the cylinders 10 whereby there is left a space 11 between the lower sections 3 of the rings and the inner walls of the cylinders having a height equal to the height of the lower section 3 and a width equal to the width of the annular shoulder 4. This is fully shown in Fig. 3. The rings spring outwardly until the outer curved sides of the upper sections 1 bear against the inner walls of the cylinders.

It is evident that a piston equipped with rings of this character, on reciprocation in a cylinder in which it is mounted, collects

oil which adheres to the walls of the cylinders so that the groove 2 is filled with the oil, this providing a very efficient manner of perfecting a seal between the rings and the walls of the cylinder. On the down stroke of the piston excess oil is scraped from the walls of the cylinder below the shoulders 4 of the rings and the oil is conducted through the slots 5 to the ring grooves and thence through the passages 9 to the interior of the piston which communicates with the crank case in which the oil is contained.

The ring is of a very practical construction from the standpoint of ability to manufacture in large quantities. With it excess consumption of oil is completely avoided, and any oil over and above the necessary amount needed for proper lubrication of the piston as it reciprocates in a cylinder is removed from the walls of the cylinder and returned to the crank case.

This construction of piston ring has proved exceptionally efficient and satisfactory in use. The invention is defined in the appended claim and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

In combination with a piston having a ring groove therein and drainage openings extending from the ring groove to the interior of the piston, and a cylinder in which said piston is adapted to reciprocate, of a piston ring located within said ring groove, said ring being of metal and comprising upper and lower sections, the upper section having somewhat greater width than the lower section and bearing at its outer curved side against the inner walls of the cylinder, the outer curved side of the lower section being spaced from said inner walls of the cylinder, said lower section of the ring having slots therethrough connecting the space between the inner walls of the cylinder and the outer curved side of said lower section with said drainage openings, said upper section of the ring having a continuous groove, rectangular in cross section, formed therein in its outer curved side.

In testimony whereof I affix my signature.

CHARLES E. JOHNSON.