J. H. STACKHOUSE.

HIGH POWER OIL RETURNING PISTON.

APPLICATION FILED NOV. 16, 1920.

1,432,799. Patented Oct. 24, 1922.

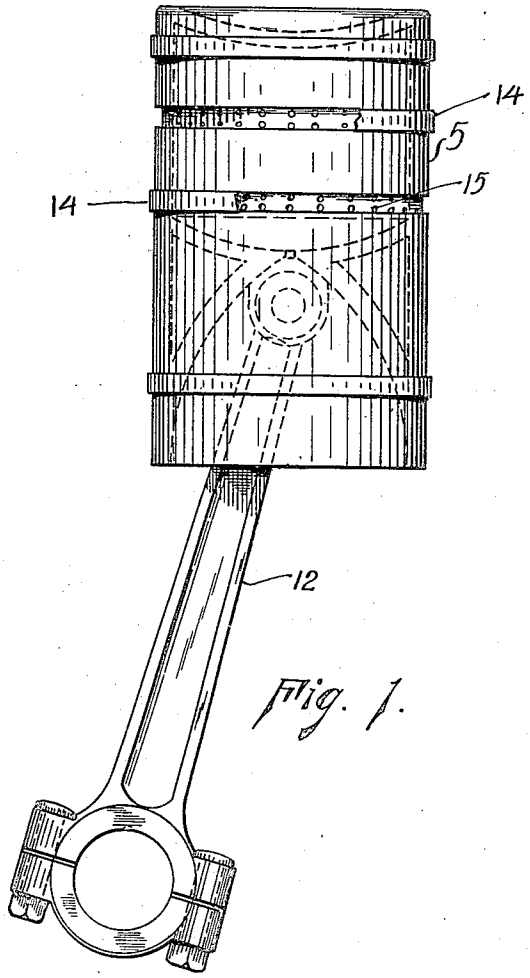


Fig. 1.

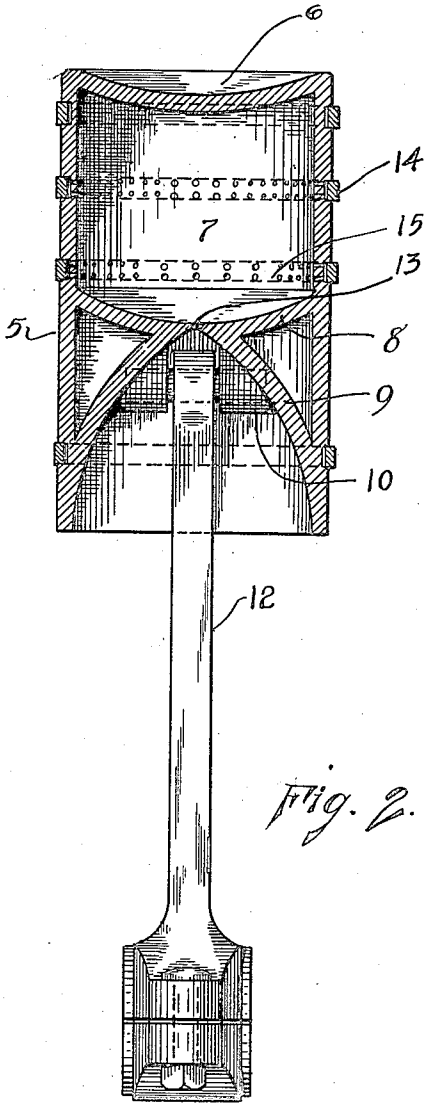


Fig. 2.

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UNITED STATES PATENT OFFICE.

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HIGH-POWER OIL-RETURNING PISTON.

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To all whom it may concern:

Be it known that I, JOHN H. STACKHOUSE, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in High-Power Oil-Returning Pistons; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in oil-returning pistons more especially adapted for use in connection with internal combustion engines. The main object of my improvement is to prevent the lubricating oil from the crank case from passing the piston and entering the firing or combustion chamber of the cylinder. Great difficulty is experienced, as is well known by those familiar with these matters, due to the passage of lubricating oil from the crank case into the combustion or firing chambers of the cylinders, producing carbon and necessitating that the cylinders be cleaned at comparatively short intervals and at considerable expense. Further, the burning of the lubricating oil within the cylinders produces a rather heavy smoke which passes from the machine through the exhaust, contaminating the atmosphere in the vicinity of the car.

Heretofore many efforts have been made to overcome this difficulty, but so far as I am aware, these efforts have been along the line of specially constructed piston rings.

My improvement consists in providing the piston with a chamber, and in perforating the bottom of one or more of the piston ring grooves, so that the lubricating oil will pass through these perforations into the chamber of the piston, thus making it impossible for the lubricating oil from the crank case to enter the firing chamber of the cylinder. I have discovered that the lubricating oil, in passing the piston, does not move outside of the rings but underneath the piston rings. In other words, it works under the piston rings and through the grooves on its way to the firing chamber. Hence, by perforating one or more of these grooves, this oil, in its effort to pass through the groove, will enter and pass through these perforations into the chamber of the piston.

While ordinarily one perforated groove of the piston will be sufficient, it must be understood that the invention is not limited to a single perforated groove since as many may be employed as desired, or as may be found necessary in any particular case or under special conditions.

I prefer that the perforated groove shall be well removed from the firing chamber extremity of the piston in order to prevent the possibility of any loss of pressure in the firing or compression chamber during the outward or compression stroke of the piston.

At the bottom or inner extremity of the chamber of the piston, I form a perforation to allow the oil which enters the said chamber, to pass out and come in contact with the inner extremity of the connecting rod or pitman, where it is connected with the piston. Hence, this oil will serve to lubricate the connecting rod and crank pin, the surplus passing back into the crank case.

Having briefly outlined my improvement, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing:

Figure 1 is an elevation of my improved piston, illustrating also the connecting rod. In this view, two of the piston rings are partly broken away, in order to disclose the perforated bottoms of the grooves in which these rings are located;

Figure 2 is a sectional view of the same structure.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate my improved piston which, as shown in the drawing, is closed at its outer end, which is slightly concaved, as shown at 6. This, I believe, to be the preferable form of construction. Below the outer concaved extremity of the piston, there is a chamber 7, which is closed at the bottom by a curved partition 8 below which is an oppositely curved similar partition 9, which, as illustrated, is provided with lugs through which a pin 10 is passed for connecting the piston rod 12 with the piston. The partitions 8 and 9, where they join, are perforated, as shown at 13, directly in line with the inner extremity of the connecting

rod. The object of this perforation is to allow any oil that may accumulate in the chamber 7 to pass out of the said chamber and come in contact with the inner extremity of the rod 12, whereby this extremity is kept well lubricated.

As shown in the views, the piston is provided with four rings 14, which occupy grooves 15, which may be of ordinary construction except that their bottoms are perforated to allow the lubricating oil, which otherwise would pass the piston into the firing chamber of the cylinder, to pass through the perforations into the chamber 7 and thence through the perforation 13, as heretofore explained. Any surplus of oil which is not required for lubricating the piston rod where it is connected with the piston, will return to the crank case.

It is evident that any desired number of grooves and corresponding piston rings may be employed, and while two perforated grooves are illustrated, I believe that under ordinary circumstances one perforated groove will be sufficient, and it is preferred that the perforated groove be as far removed as practicable from the outer or firing extremity of the piston. It should also be explained that the manner of connecting the piston rod with the piston is entirely immaterial, since any practicable manner of forming this connection will suffice. The broad idea, as I believe, of the invention is the perforation of the bottom of one or more of the piston grooves, the latter being preferably as far removed as practicable from the firing chamber or outer extremity of the piston.

Attention is called to the fact that it is my belief that by forming the outer extremity of the piston slightly concave, as shown at 6, an important power advantage results.

I claim:

1. A piston having a transverse diaphragm forming a chamber and a piston ring groove above said diaphragm whose wall is perforated to allow oil to pass from the exterior of the piston into said chamber, the latter having a drain port to allow the oil in the chamber to return to the crank case.

2. A combination with a piston and its connecting rod, the piston having a transverse diaphragm forming a chamber closed at its outer end and ported at its inner extremity adjacent the upper end of the connecting rod, one or more of the piston ring grooves above said diaphragm having its bottom perforated to allow oil to pass into said chamber.

3. A piston having a head, a connecting rod having a pivotal connection with said piston, a diaphragm located within said piston between said head and said connecting rod whereby a chamber is formed in said piston above the connecting rod pivot an intermediate annular groove in the external surface of said piston and above the upper surface of said diaphragm, a plurality of perforations extending from the inner wall of said groove into said chamber, and an opening in said diaphragm so located with respect to the connecting rod pivot that oil which enters through the aforesaid perforations will serve to lubricate the connecting rod pivot.

4. A piston having a head, a connecting rod having a pivotal connection with said piston, a diaphragm located within said piston between said head and said connecting rod whereby a chamber is formed in said piston above the connecting rod pivot, a plurality of annular grooves, for the reception of piston rings in the external surface of said piston and above the upper surface of said diaphragm, a plurality of perforations extending from the inner wall of the lower one of said grooves into said chamber, an opening in said diaphragm, so located with respect to the connecting rod pivot that oil which enters through the aforesaid perforations will serve to lubricate the connecting rod pivot, and a piston ring below said diaphragm.

In testimony whereof I affix my signature.

JOHN H. STACKHOUSE.