Dec. 1, 1931. A. E. WILSON 1,834,884

PISTON RING STRUCTURE

Filed Feb. 26, 1931

FIG. 1.

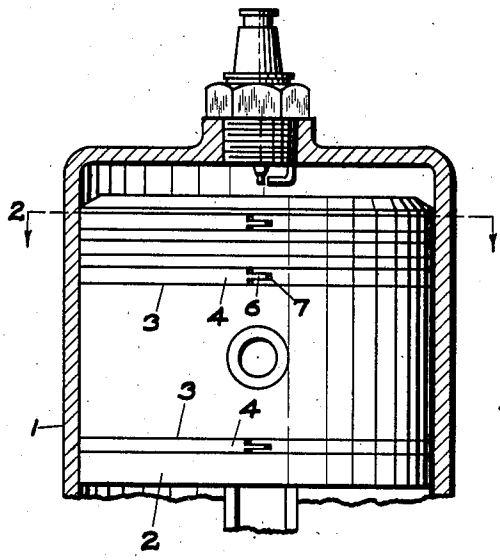


FIG. 2.

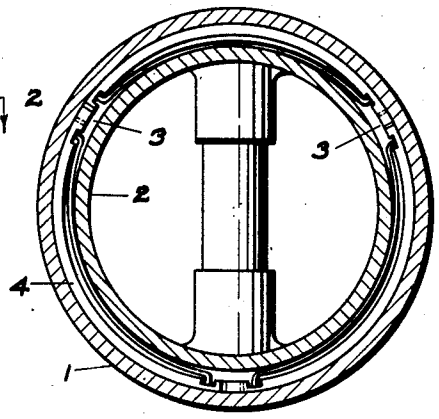


FIG. 3.

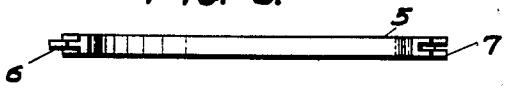


FIG. 4.

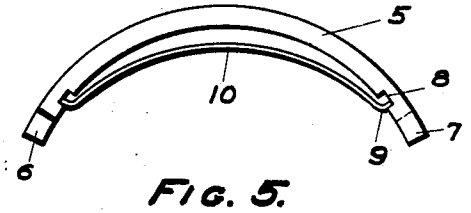
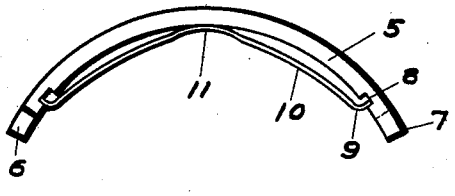


FIG. 5.



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UNITED STATES PATENT OFFICE

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PISTON RING STRUCTURE

Application filed February 26, 1931. Serial No. 518,352.

This invention relates to piston ring structures and of that class adapted primarily for use in connection with internal combustion engines, although it may be used in connection with the pistons and cylinders of other engines, pumps and the like and one feature of the invention is the provision of a sectional ring and means for interlocking the ends of the sections together to form a complete expansible ring.

A further feature of the invention is the provision of means for directing constant outward pressure against said sections for seating said sections against the worn or pitted surface of a cylinder.

A further feature of the invention is in so attaching the pressure directing means to the ring forming sections that said pressure directing means will not casually release from the ring forming sections.

A further feature of the invention is in so constructing and attaching the pressure applying means that the ring sections will be held against shimmying action when in use.

A further feature of the invention is in so constructing the pressure directing means that the same may expand or contract without effecting its relative position with the ring forming section.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specification.

In the accompanying drawings which is made a part of this application,

Figure 1 is a sectional view through the upper portion of an internal combustion engine showing packing rings in position on the piston thereof.

Figure 2 is a sectional view as seen along line 2—2, Fig. 1.

Figure 3 is an elevation of one section of the ring forming member removed from the piston.

Figure 4 is a top plan view thereof, and,

Figure 5 is a similar view showing a slightly modified form of pressure applying spring.

Referring to the drawings, the numeral 1 indicates the cylinder of an engine, in which is reciprocatingly mounted a piston 2, the peripheral face of which is provided with circumferential grooves 3.

It is customary to provide piston rings, which fit in said grooves 3 and expand for forming a seal between said cylinder and piston, but when the face of the cylinder becomes worn in spots or pitted from some cause, the ordinary piston ring will not properly function to prevent leakage.

To this end, therefore, I have provided a piston ring 4, which is built up of a plurality of segments 5, one end of each segment having a tongue 6 which enters a slot 7 in the abutting segment, the tongues and slots being of such extent that the sections of the ring may readily expand or contract without forming a gap between the ends of the segments. By forming the rings in sections, said rings can expand more at one point than at another, so that they may more readily enter and fill worn spaces in the face of the cylinder.

In order to direct constant outward pressure against the segments of the ring, each segment is provided on its inner face and preferably adjacent the ends of the segment, with notches 8, into which extend the ends 9 of pressure applying springs 10, said ends 9 being substantially at right angles to the remainder of the spring, while the body of the spring is in the arc of a circle, with a radius greater than that of the segment to which it is attached and the radius of the groove 3 in which the segment is seated.

By forming the springs 10 of a greater radius than that of the segments 5, the ends 9 will press against the outer ends of the notches 8, when the springs are first introduced into engagement with the segments 5, this pressure being such that the spring will be held in engagement with the segment under all ordinary conditions.

When the segments 5 are forced into the grooves 3, the springs 10 will be depressed at their central portion first, which will draw the ends 9 away from the outer ends of the notches 8, as indicated in Fig. 2, thus tensing the springs 10 and causing them to exert constant outward pressure against the segments 5 and causing said segments to enter any un-

even space that may be formed on the inner face of the cylinder 1, thus maintaining a substantially perfect seal between the cylinder and piston. In the event the segments 5 are removed from the grooves 3, the springs 10 will again expand until the ends 9 again contact with the outer end walls of the notches 8, thus retaining the springs in engagement with the segments until they are again entered in the grooves.

In Fig. 5, a modified form of spring 10 is shown, in that the spring is provided with a bowed portion 11, which normally rests against the inner face of the segment 5, so that a much lighter and thinner spring may be used without detracting from the amount of pressure applied.

As best shown in Fig. 3, the springs 10 are of the same width as the width of the segments 5, so that the segments will be held against shimmying action while in operation, thus obviating any possibility of the segments becoming worn at their edges and also preventing undue wear against the cylinder walls.

While the description and drawings illustrate in a general way certain instrumentalities which may be employed in carrying the invention into effect, it is evident that many modifications may be made in the various details without departing from the scope of the appended claim, it being understood that the invention is not restricted to the particular examples herein described.

What I claim is:

A piston ring structure comprising interlocking segments which have uniform width and thickness from one termination to the other, said segments having cross channels in their inner surfaces adjacent the ends thereof, flat springs the ends of which have subsubstantially right angular offsets, each offset having inner and outer flat faces transverse to the trend of the springs, said offsets entering said channels, the inner offset surfaces facing the inner walls of said channels and the outer offset surfaces facing the outer walls of said channels, whereby the positions of said springs are limited longitudinally by both the inner and outer channel surfaces, in cooperation with the transverse offset faces, when said segments are assembled in position in a piston groove, so that the bottom surface of the groove bears against said springs between their ends.

In testimony whereof, I have hereunto set my hand on this the 12th day of February, 1931.

ALMOND E. WILSON.