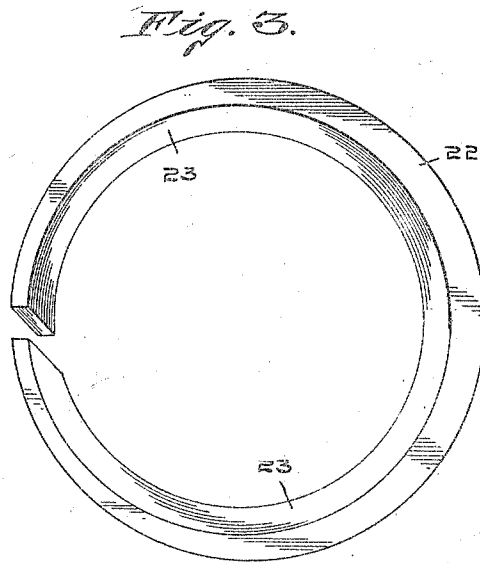
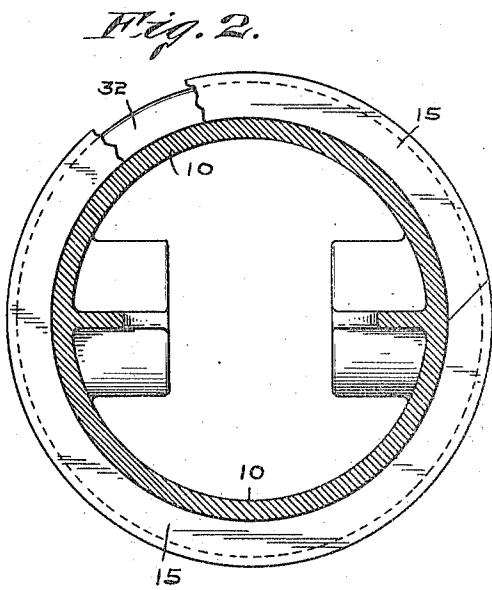
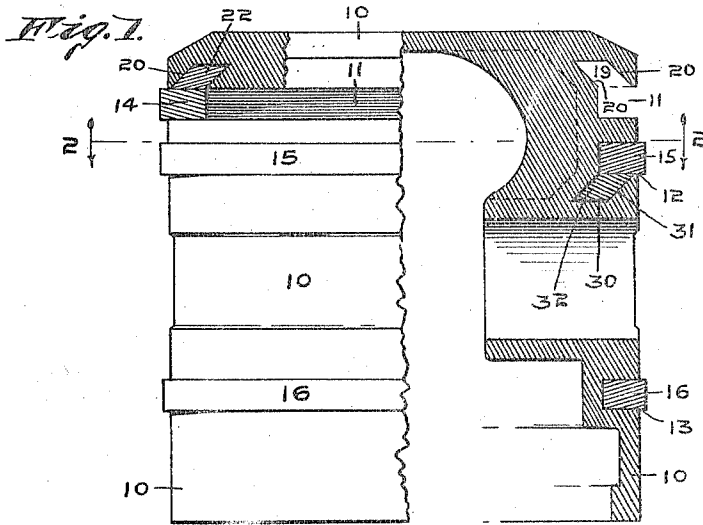


B. O. WHITE.
COMBINED PISTON AND RING.
APPLICATION FILED OCT. 25, 1917.

1,286,463.

Patented Dec. 3, 1918.



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COMBINED PISTON AND RING.

1,286,463.

Specification of Letters Patent.

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Application filed October 25, 1917. Serial No. 198,455.

To all whom it may concern:

Be it known that I, BENJAMIN O. WHITE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Combined Pistons and Rings, of which the following is a specification.

This invention relates to a piston and its associated piston-rings for use in the cylinders of engines of all types, but which are particularly adapted for use in connection with the cylinders of internal combustion engines, where piston and piston-rings are subjected to extremely high and frequent impulses of energy exerted through the result of the explosion of successive charges of gas, this resulting in premature wearing down of the piston-rings and resulting in a corresponding loss of power.

The object of the present invention consists in the provision of a piston and its associated piston-rings together with certain means adapted to constantly exert pressure in a given direction for expanding and keeping the peripheries of the piston-rings constantly in contact with the inner peripheral wall of the engine cylinder, the arrangement being such that any sudden increase of energy exerted against the end of the piston for accelerating the movement of the latter, caused by the explosion of the charges of gas, or any sudden retardation in the travel of the piston, will have a tendency to expand and more firmly hold the outer peripheries of the rings against the adjacent peripheral wall of the cylinder, thereby overcoming any decrease in diameter of the ring through wear, whereby the working parts are enabled to render efficient service for a greater length of time.

I accomplish the above objects of the invention and such others as may appear from a perusal of the specification and claims, by means of the construction illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a view partly in side elevation and partly in section of a piston and its associated rings, showing my invention in operative position. Fig. 2 is a cross section on the line 2—2 in Fig. 1. Fig. 3 is a top or plan view of an eccentrically formed pressure-ring.

Referring to the drawings, 10 represents a common type of piston employed in cylin-

ders for internal combustion engines, which piston is provided in its periphery with a plurality of annularly extending grooves into which the piston-rings are seated in the usual manner. The number of these grooves in a given type of pistons may vary, this being determined by the designer or manufacturer, and in this instance I have arbitrarily selected three in number, in which two of grooves 11 and 12 are located near the free end of piston 10 and the remaining groove 13 near the opposite end of the piston. Piston rings 14, 15 and 16 are of the "split" type and are sprung over piston 10 and into grooves 11, 12 and 13 respectively.

The wall of groove 11 toward the free end of the piston, is undercut to provide an annularly extending channel 19 having parallel inclined walls 20 disposed toward the longitudinal axis of piston 10. Into channel 19 I insert a pressure-ring 22, of either eccentric or concentric type, the inner and outer peripheral surfaces of ring 22 are cut on parallel planes corresponding approximately with the pitch of the walls 20 of channel 19. As shown in Fig. 3 of the drawings, pressure-ring 22 is of the split expanding type, so that when said ring is inserted and allowed to expand within channel 19 its inclined surfaces engaging the correspondingly shaped adjacent walls 20 of channel 19 will cause pressure-ring 22 to shift toward and tightly impinge the adjacent surface of piston-ring 14. This additional outwardly exerted pressure applied to piston-ring 14 will hold the latter in an expanded condition with its outer peripheral surface tightly against the adjacent internal wall of the cylinder, thereby not only preventing leakage between the outer periphery of piston-ring 14 and the cylinder wall, but leakage between the piston-ring and pressure-ring 22, and between the latter and the adjacent walls 20 of channel 19. As the tendency of wear on the periphery of piston-ring 14 is to reduce its diameter this is overcome through the further expanding of the latter, so that a tight joint is constantly maintained between piston-ring 14 and adjacent wall of the cylinder. Groove 12 is provided with a side-channel 30 which serves the same purpose as channel 19, except that the walls 31 of the latter are cut on parallel planes at right angles to the surface planes of the walls 20 of groove 19, and into channel 30 I insert a pressure-ring 32. The direction of the pitch in which channels

19 and 30 are cut causes pressure-rings 22 and 32 to exert pressure against piston-rings 14 and 15 respectively in opposite directions, whereby one or the other of the two rings will resist sudden shocks and impulses delivered against either end of piston 10. Pressure-rings 22 and 32 also serve the purpose of effectively holding piston-rings 14 and 15 against the adjacent walls of grooves 11 and 12 and prevent rattling noises—commonly known as “slapping”—which noises are oftentimes erroneously attributed to lost motion in the connections between the ends of the connecting-rods and pistons and crank-shaft of the engine.

While I have described my invention with more or less minuteness as regards details of construction and arrangement and as being embodied in certain precise forms, I do not desire to be limited thereto unduly or any more than is pointed out in the claims. On the contrary, I contemplate all proper changes in form, construction and arrangement, the omission of immaterial elements and the substitution of equivalents as circumstances may suggest or as necessity may render expedient.

I claim:

1. As an article of manufacture, a piston having a plurality of annular piston-ring grooves and having obliquely arranged communicating channels disposed toward said grooves, piston-rings arranged in said grooves, and means arranged in said channels for exerting pressure against the opposite sides of the rings for expanding the latter against the adjacent wall of the cylinder.

2. As an article of manufacture, a piston having a plurality of annular piston-ring grooves and having obliquely arranged annular communicating channels disposed toward said grooves, piston-rings seated in said grooves, and pressure-rings having oblique sides arranged in said communicating channels for impinging and exerting pressure against the opposite sides of the rings sustaining the peripheries of the rings against the adjacent wall of the cylinder.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 19th day of October, A. D. one thousand nine hundred and seventeen.

BENJAMIN O. WHITE. [L. s.]