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PISTON CONSTRUCTION

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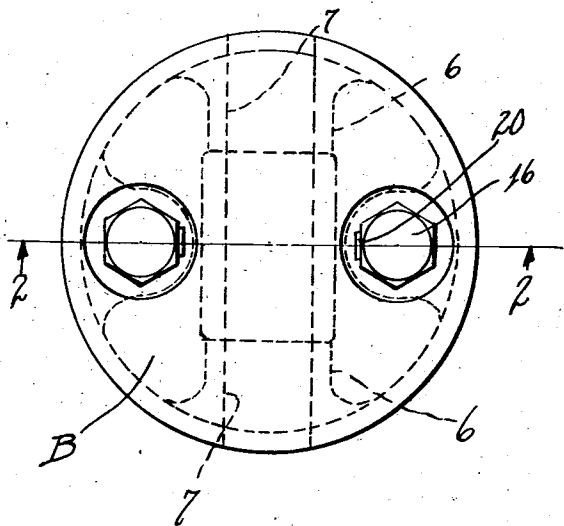


Fig. 1.

Fig. 2.

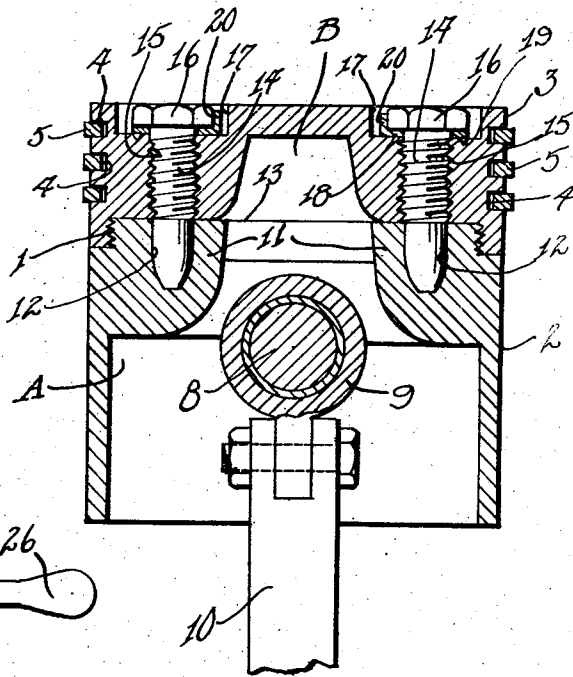
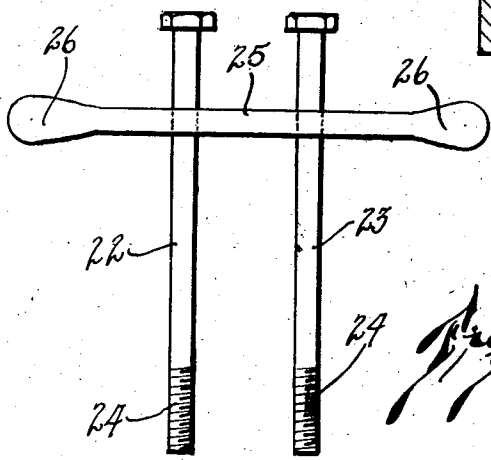


Fig. 5.

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PISTON CONSTRUCTION.

Application filed May 4, 1925. Serial No. 27,881.

To all whom it may concern:

Be it known that we, EMILE W. NAGEL and HARRY G. ZEHNER, both citizens of the United States, and residents of New Orleans, Orleans Parish, State of Louisiana, have invented a new and useful Improvement in Piston Constructions, of which the following is a full, clear, and exact description.

Our invention relates to improvements in piston constructions, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of our invention is to provide a piston which is so constructed as to permit the replacement of the piston rings by removing that portion of the piston upon which the rings are disposed through the upper end of the engine block after the head of the block has been removed. Most internal combustion engines in use today are provided with removable heads. Our invention, therefore, is particularly intended for use in internal combustion engines of this type, where heretofore it has been necessary to remove the entire piston by first disconnecting the piston from the crank shaft. This latter operation necessitates the removal of portions of the crank case.

A further object of our invention is to provide a piston construction of the character described in which novel means is employed for maintaining the two cooperating parts of the piston against movement relative to one another during use in the engine.

A further object of our invention is to provide a piston construction of the character described which is simple in construction, durable, and thoroughly practical for the purpose intended.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claim.

Our invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a top plan view of an embodiment of our invention,

Figure 2 is a sectional view along the line 2—2 of Figure 1, and

Figure 3 is a plan view of one of the tools employed for disconnecting the cooperating parts of the piston.

In carrying out our invention we make

use of a body member A, in cross sectional contour similar to the lower portion of the standard piston. This member A has a reduced exteriorly threaded portion 1 at the upper end thereof by means of which a ring bearing member B is secured, there being an internally threaded portion at the lower end of the member B which engages with the threaded part 1 of the body member A. The outer walls 2 and 3 of the body member A and member B respectively are cylindrical and contiguous, so that when the parts A and B are secured together they have substantially the same outward appearance as the standard piston. Annular grooves 4 are provided in the member B and piston rings 5 are disposed in the grooves. The piston rings 5 are standard piston rings.

With reference to Figure 1 it will be noted that a pair of aligned bosses 6 are provided on the inner walls of the body member A. Coaxial bores 7 are provided through the bosses 6 by means of which a wrist pin 8, projected through the bores 7, may serve as a support for the upper bearing portion 9 of a connecting rod 10, the wrist pin 8 being projected through the bearing portion.

The body member A has a pair of inwardly extending portions 11 having their upper surface contiguous with the upper end of the reduced portion 1. These portions 11 each have bores 12 extending longitudinally of the body member A and communicating with the upper surface 13 of the body member. A pair of machine screws 14 is projected through threaded bores 15 in the member B and adapted to engage with and be received in the bores 12.

The bores 15 and 12 are in alignment with one another, when the member B has been turned tightly upon the reduced threaded portion 11 of the body member A. Thus the bolts 14 serve to prevent rotation of the parts A and B relative to one another, and hence separation of the parts.

The heads 16 of the bolts 14 are substantially hexagonal, and are entirely received in cavities 17 provided in the member B.

Means for preventing the loosening of the bolts 14 relative to the member B is provided in a pair of lock washers 18 which have sharp depending incision points 19, adapted to be received in tiny bores provided in the bottom wall of the cavities 17, thus

preventing the washers 18 from rotating relative to the member B.

Wing portions 20 of the washers 18 are provided which, when bent into engagement with the side walls of the threads 16, as shown in Figure 2, effectually prevent rotation of the bolts relative to the member B.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. Let us assume that it is desired to replace the piston rings 5. Formerly this procedure necessitated the entire removal of the piston from the bore of the cylinder, which could not be accomplished until a part or all of the lower section of the crank case of the engine was removed and the bearings of the connecting rods disconnected from the crank shaft.

With our improved piston construction the mechanic removes the cylinder head and with a screw driver or the like he prys the wings 20 out of engagement with the face of the heads of the bolts 14. He then removes the bolts 14 with an ordinary socket wrench.

A special tool, such as illustrated in Figure 3 is then inserted into the cylinder bore having a pair of long bolts 22 and 23 rotatably mounted at distances equal to the distances between the axes of the bores 15 through a horizontal handle member 25 having grips 26 at the opposite ends thereof. When the bolts 22 and 23 are securely engaged with the member B the handle member 25 is turned by means of the hand grips 26, thus unscrewing the member B from the reduced threaded portion 1 of the body member A. In this manner the entire member

B may be lifted out of the cylinder bore and the rings 5 replaced.

The member B is then replaced in the bore of the cylinder and by means of the tool illustrated in Figure 3 it is screwed upon the reduced threaded portion 1 of the body member A. The tool is then removed from engagement with the member B, and the bolts 14 replaced, as shown in Figure 2.

After the bolts have been properly tightened, the wings 20 of the lock washers 18 are moved into engagement with the outer walls of the heads 16 of the bolts, and the cylinder head may be replaced.

We claim:

A piston of the character described comprising a tubular body member forming the lower section of the piston, a second member forming the upper section of said piston, said lower section and said upper section being provided with threads by means of which the two sections are screwed into engagement with one another, said body member having inwardly extending portions on the inner side walls thereof, with tapering bores therein extending longitudinally of the body member, and bolts having tapering portions at the outer ends thereof, said bolts projected through threaded portions of the upper section and arranged for projection into and in engagement with the side walls of the bores in said inwardly extending portions, whereby the sections may not be moved upon their threads when the bolts are in place.

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