

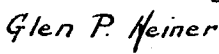
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CYLINDER

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UNITED STATES PATENT OFFICE

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CYLINDER

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My invention relates to all types of internal combustion engines in which pistons are operated within cylinders and has for its object to provide a new and efficient cylinder for said engine which may be renewed or changed to take up the wear which comes in all engines after continued use.

A further object of my invention is to provide a new and economically constructed cylinder which may be reversed within the motor block or which may be turned or rotated partially or completely to take up the wear of continued service.

A still further object is to provide a cylinder for internal combustion engines which may be located within the cylinder block but which may be released and removed therefrom and a new cylinder placed therein to take up the wear of the cylinder walls.

These objects I accomplish with the device illustrated in the accompanying drawings in which similar letters and numerals of reference indicate like parts through the several views and as described in the specification forming a part of this application and pointed out in the appended claim.

In the drawings in which I have shown the best and most preferred manner of building my invention. Figure 1 is a section through a portion of a motor block showing my cylinder therein. Figure 2 is a side elevation of my cylinder. Figure 3 is a section longitudinally and diametrically through a modified form of constructing the cylinder showing the outer surface tapered. Figure 4 is another modification of constructing the cylinder. Figure 5 is a plan view of Figure 2. Figure 6 is a plan view of Figure 3 parts cut away. Figure 7 is a plan view of a modification of Figure 3 parts cut away.

In the drawings I have shown the engine block as A in which my cylinders B are placed. The engine block will be made with the cylinder hole 1 turned with the top of said hole enlarged at 2 to form a flange. My cylinder B is then threaded on each end thereof at 4 and 5 and a ring 6 is screwed down on to the threads 4 on the top end of the cylinder and a threaded hole 7 is made through said

ring and into said cylinder wall, through the threaded portion thereof, and a bolt or screw 8 passed through the hole 7 in the ring and into the hole in the cylinder locking the ring and cylinder together.

Holes 9 are then bored either quarterly, or on eight sides of the cylinder wall and crescent-shaped holes 10 are cut in the outer periphery of said ring 6. Stud bolts 11 are then passed down into the holes in the block with the heads thereof fitted into the holes 10 in the periphery of the ring 6.

This construction locks the ring and piston together and locks the ring from rotation or longitudinal movement preventing the cylinder from moving in any direction whatever when the engine is in operation.

The head of the motor when it is placed over the top of the cylinder and the cylinder block will then prevent the stud bolts from coming out and will prevent the ring 6 from movement therein.

In the modified form shown in Figure 4 the lower end of the cylinder is cut away at 12 forming a step 13 thereon. In this modified form the engine block will also be provided with a step thereon with the step 13 of the cylinder adapted to rest on the top side thereof.

Stud bolts 15 will then be passed into holes 14 and the cylinder block and will secure the cylinder within the block both from longitudinal movement and from rotation therein.

In the modified form shown in Figure 3 the outer surface or the periphery of the cylinder which is shown as C is tapered from top end 15 to the lower end 16. The wall of the cylinder block is formed with the same taper and the cylinder is adapted to fit therein with stud bolts 16 to secure the cylinder in place.

It will be obvious that the two modifications shown in Figures 3 and 4 may have their upper or top ends thereof externally threaded to be screwed either into the cylinder block itself or to have a ring similar to the ring 6 (shown in Figures 1 and 2) secured thereon with the ring then secured into the cylinder block similarly to the manner shown in Figure 1. Also bosses 17, 18, 19, and 20 may

be formed on the outer periphery of the top end of either manner of building the cylinder and stud bolts passed through holes 21 to secure the cylinder within the cylinder block.

The operation of my invention is as follows:

The ring 6 is threaded either onto the end 4 or 5 of the cylinder B and the screw 8 passed through the ring 6 into the cylinder B. This assembly is then placed within the cylinder block and the stud bolts 11 screwed down into the holes in the top of the block with their heads engaging the crescent-shaped holes 10 in the periphery of the ring 6 locking the cylinder and ring securely within the cylinder block. The piston of the engine may then be placed in the cylinder for operation.

Should the cylinder walls become worn, the cylinder may be removed and reversed with the ring 6 secured on the opposite end of the cylinder and the piston reinserted therein. The cylinder may also be removed and rotated one-quarter, one-half, three-quarters, or completely around within the cylinder block thereby changing the position of the side walls of the cylinder and changing the portion which naturally receives the most wear.

Having thus described my invention I desire to secure by Letters Patent and claim:

In a device of the class described the combination of a cylinder having both ends externally threaded, a ring to be secured on one end of said cylinder, means to secure the ring from rotation around said cylinder, and means to secure said ring and cylinder within the piston block of an automobile engine.

In testimony whereof he affixed his signature.

GLEN P. HEINER.