Sept. 22, 1931. C. A. OLSON 1,824,494

CYLINDER EDGE DRESSING TOOL

Filed March 24, 1930

Fig. 1.

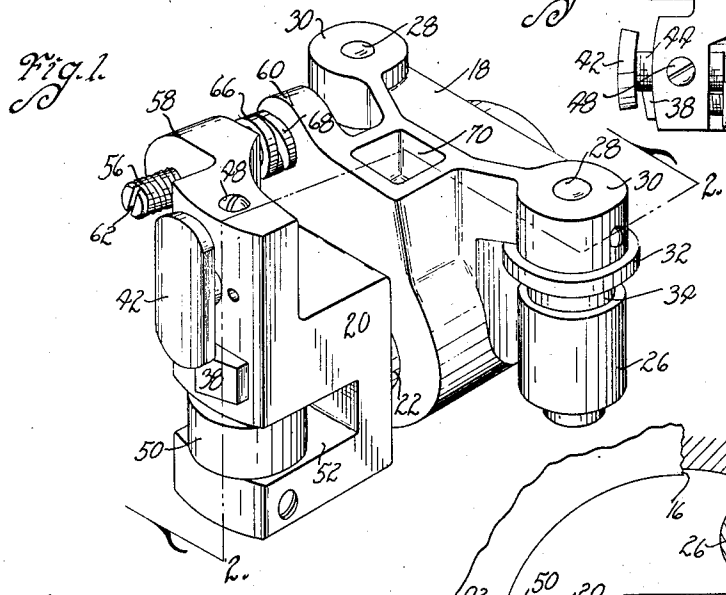


Fig. 5.

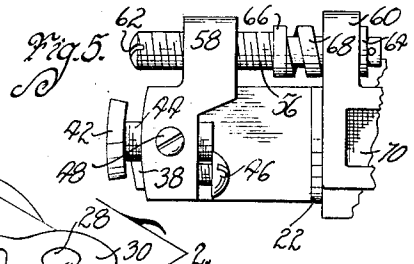


Fig. 4.

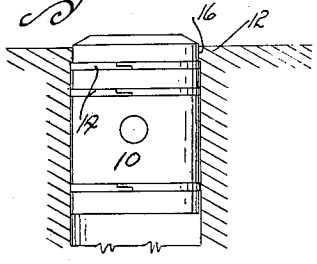


Fig. 3.

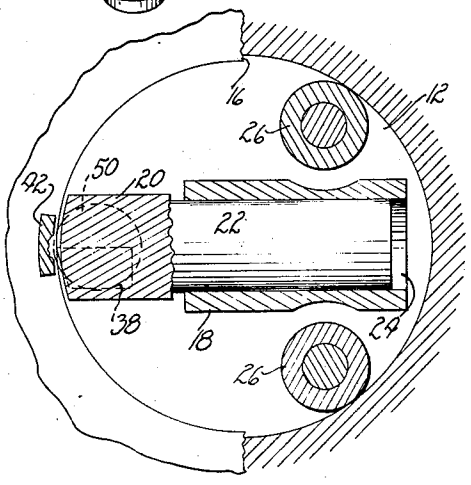
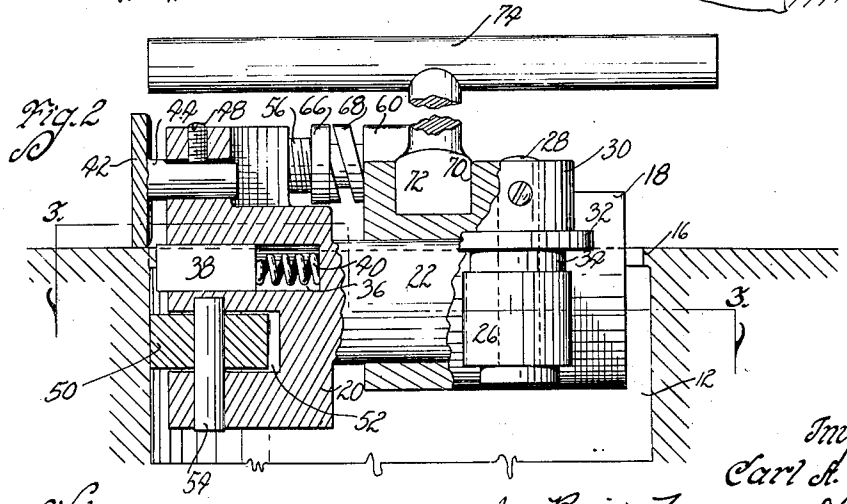


Fig. 2



Witness
Edw. Lesley

Inventor
Carl A. Olson
by Bair, Freeman & Sinclair
Attorneys

Patented Sept. 22, 1931 1,824,494

UNITED STATES PATENT OFFICE

CARL A. OLSON, OF CLARINDA, IOWA, ASSIGNOR TO LISLE MANUFACTURING COMPANY, OF CLARINDA, IOWA, A CORPORATION OF IOWA

CYLINDER EDGE DRESSING TOOL

Application filed March 24, 1930. Serial No. 438,495.

The object of this invention is to provide an improved tool which is especially designed for use in trimming off the ledge or projection which is commonly formed at the upper end of the cylinder of an internal combustion engine because of the fact that the uppermost ring of the piston does not ordinarily travel entirely to the top of the cylinder bore.

A further object of the invention is to provide a tool for conveniently, quickly and accurately dressing up a cylinder wall and relieving it of peripheral projections or ledges preparatory to the installation of new pistons or piston rings.

Still another object is to provide a tool of the character described which is adjustable for use with cylinders of different diameters.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of the tool.

Figure 2 is a vertical section substantially on the line 2—2 of Figure 1 showing the tool in position for use.

Figure 3 is a horizontal section on the line 3—3 of Figure 2.

Figure 4 is a sectional view showing a piston in its cylinder and illustrating the condition which my improved tool is designed to relieve.

Figure 5 is a detail plan view of a portion of the tool showing particularly the stop for the cutting blade and the means for adjusting the position of the stop.

It is well known that the constant travel of a piston such as 10 in its cylinder 12 will cause wear of the cylinder wall. The piston of an engine is ordinarily equipped with a series of rings 14 which are of resilient character and which have a tight fit with the wall of the cylinder 12. Usually the uppermost ring 14 does not travel entirely to the upper end of the bore of the cylinder and consequently the wear to which the cylinder wall is subjected does not extend entirely to the top and thereby a peripheral ledge or projection 16 is left at the upper end of the cylinder.

The rings 14 are also subject to wear and are adapted to become rounded at their upper edges. This wearing of the uppermost ring 14 affects the shape of the projection or ledge 16 after continued use.

When it becomes necessary to install new pistons or new rings on the pistons in the cylinders of an engine, it is necessary to remove the ledge or projection 16 at the upper end of each cylinder. If this is not done the new rings, which are true and square at their upper edges, will strike the ledges or projections such as 16, thus causing a click or knock.

Heretofore it has been customary for the workman to remove the ledges 16 by the use of a hand tool or abrasive material. This is not only very slow work but it is also difficult by this method to make the upper end of the cylinder conform to the remaining portions of the cylinder wall which are not always worn to true cylindrical form.

My improved tool is adapted to easily and quickly remove the projection 16 from the upper end of the cylinder wall and to do this in such manner that the upper end will conform to the curvature of the remaining parts of the cylinder wall.

The body of the tool is made up of two parts, a main body member 18 and a cutter carrier member 20 which is adjustable relative to the member 18. Preferably the carrier member 20 is formed at one side with a shank 22 which is slidably received in a cylindrical bore 24 in the opposed face of the body member 18.

The body member 18 is provided with two spaced rollers 26—26 which are mounted for rotation on vertical axes defined by pins 28—28 seated in bosses 30—30 of the member 18.

The rollers 26 are arranged on opposite sides of the bore 24 and each of said rollers is adapted to contact the inner surface of the wall of a cylinder 12 below the projection 16 which may occur at the upper end

of the cylinder wall. Each roller 26 is formed at its upper end with a flange 32 of greater diameter than the roller and adapted to contact the top surface of the cylinder or engine block and thereby assist in supporting the tool in place relative to the cylinder as shown in Figure 2. Below the flange 32, each roller is formed with an annular groove 34 which is designed to embrace or permit clearing of the ledge or projection 16 of the cylinder wall.

The carrier member 20 is formed in its outer face with an angular recess 36 in which a cutter blade 38 is mounted, said blade being backed by an expansive spring 40 mounted in the inner end of the recess. The spring 40 causes the cutting edge of the blade 38, which edge is vertically arranged, to be projected slightly beyond the wall of the carrier member.

A stop member 42 is disposed at the outer side of the carrier member 20 and is arranged above the cutter blade 38. The stop member 42 is formed of a vertically arranged plate having a stem 44 slidably mounted in the upper part of the carrier member 20.

The stop member 42 may be adjusted in a lateral direction by adjusting the position of the screw 46 which is threaded in the carrier member and engages the inner end of the stem 44. When so adjusted, the stop member is held in place by a set screw 48 threaded in the top of the carrier member 20 for radially engaging the stem 44.

The carrier member 20 is equipped with a roller 50 which is arranged below the cutter blade 38 and stop member 42 and entirely below the level of the ledge 16 of the cylinder wall. The roller 50 is seated in and projects slightly from a recess 52 in the carrier member and is mounted on a vertical pin 54.

An adjusting screw 56 is horizontally threaded through a lug 58 formed on the upper part of the carrier member 20 and has one end extended loosely through a lug 60 formed on the upper part of the main body member 18. The screw 56 is formed at one end with a kerf 62 to receive a screw driver and at the opposite end is formed with a removable head 64 which may engage the outer face of the lug.

Between its ends the adjusting screw 56 is provided with a rigidly mounted collar 66 and a coil spring 68 is mounted on said screw between the collar 66 and the adjacent face of the lug 60.

For use of the tool the stop member 42 is first adjusted by means of the screw 46 until its inner face is exactly in line with the outer face of the roller 50 and is locked in such position by means of the set screw 48. The inner face of the stop member 42 provides a cutting limit for the blade 38 and eliminates any possibility that the blade will cut too deep. It also serves to maintain the cut in exact conformity to the cylinder wall.

After the adjusting screw 46 has been properly set, the stop member 42 may be removed to permit removal and grinding of the cutter blade 38, after which the stop member can be replaced to exact position providing the position of the adjusting screw has not been disturbed in the meantime.

In practical use the tool is placed in position within the upper end of the bore of a cylinder and by manipulation of the adjusting screw 56, the tool is expanded to fit the bore of the particular cylinder. In other words the carrier member 20 is adjusted outwardly or away from the body member 18 so that the normal span would be slightly greater than the diameter of the cylinder. This places the spring 68 under tension, between the members 18 and 20, so that the cutter blade 38 is moved into forcible contact with the projecting ledge 16. The spring 40 exerts an outward pressure on the cutter blade and as the tool is rotated the blade cuts away the projecting portion 16 until such time as the cutting edge comes into contact with the inner face of the stop 42.

Any desired means may be provided for rotating the tool. I have shown the body member 18 formed with an angular opening 70 in its top to receive the shank 72 of a socket wrench or T bar 74.

As the tool is rotated the rollers 26 and 50 travel in contact with the interior surface of the cylinder while the flanges 32 and the lower edge of the stop member 42 travel on the upper surface of the cylinder block and serve to hold the tool in place. The contact of the rollers with the interior surface of the cylinder causes the blade to conform to the contour of the cylinder wall so that the blade 38 cuts away the projection 16 in conformity with such contour. Inasmuch as the outer periphery of the roller 50 is in exact vertical line with the inner face of the stop member 42, it follows that the cutting operation will be automatically terminated when the projecting ledge 16 has been cut away to the proper amount to conform to the worn cylinder wall, irrespective of what its contour may be.

By reason of the employment of the expanding screw 56 and the yielding compression afforded by the spring 68, the body member 18 and carrier member 20 are forcibly expanded within the cylinder and the roller 50 is caused to follow accurately the cylinder wall. The tool is very easily operated by manipulating the wrench or hand tool 74 so that the projecting ledge 16 is easily and quickly cut away and the upper

part of the cylinder is caused to conform to the worn part of the wall below it.

While this tool has been especially designed for use on automobile engines, it is obvious that it may be applied in connection with any cylinder that has a similar projecting portion to that indicated by the numeral 16 and I do not desire to be understood as limiting myself to the exact method of use or the particular purpose herein set forth.

I claim as my invention:—

1. An internal cutting tool for dressing cylinder walls and the like, comprising a body, rollers pivoted on the body and adapted to travel in contact with the wall adjacent the portion to be dressed, a carrier member having a sliding connection with said body, a roller pivoted on said carrier member, said body and carrier being formed with parallel lugs, a screw threaded through one of said lugs and having a swivel connection with the other and providing means for adjusting the span of the rollers for use in bores of different diameters, a cutter blade carried by the carrier, means for causing said blade to be advanced toward the work, a stop member adjustably mounted on the carrier and adapted to be engaged by the blade for stopping the advance of the latter when the operation has been carried to the required extent, and means for rotating the body and carrier.

2. An internal cutting tool for dressing cylinder walls and the like, comprising a body, rollers pivoted on the body and adapted to travel in contact with the wall adjacent the portion to be dressed, a carrier member having a sliding connection with said body, a roller pivoted on said carrier member, said body and carrier being formed with parallel lugs, a screw threaded through one of said lugs and having a swivel connection with the other, an expansive spring coiled on said screw, thereby providing yielding means for adjusting the span of the rollers for use in bores of different diameters, a cutter blade carried by the carrier, means for causing said blade to be advanced toward the work, a stop member adjustably mounted on the carrier and adapted to be engaged by the blade for stopping the advance of the latter when the operation has been carried to the required extent, and means for rotating the body and carrier.

3. An internal cutting tool for dressing cylinder walls and the like, comprising a body, rollers pivoted on the body and adapted to travel in contact with the wall adjacent the portion to be dressed, a cutter blade carried by the body, means for causing said blade to be advanced toward the work, a stop member adjustably mounted on the body and adapted to be engaged by the blade for stopping the advance of the latter when the operation has been carried to the required extent, and means for rotating the body, some of said rollers being formed with enlarged portions overhanging the end of the cylinder for supporting the tool in its rotary movement and also being formed with peripheral grooves beneath the enlarged portions for embracing the part to be dressed.

4. An internal cutting tool for dressing cylinder walls and the like, comprising a pair of relatively adjustable body members, a threaded connection for expanding and contracting said members relative to each other, a yielding pressure means between said members normally urging them apart, rollers pivoted on said members for traveling engagement with a cylinder wall, a spring pressed cutter blade carried by one of said members, and a stop member adjustably carried by said body member adjacent the blade, said stop member adapted to be engaged by the blade to terminate the cutting operation, and also having a portion adapted to be aligned with the periphery of one of said rollers for causing the cutting operation to conform to the contour of the wall over which said roller travels.

5. An internal cutting tool for dressing cylinder walls and the like, comprising a main body member adapted to be mounted in a cylinder bore, a carrier member mounted for lateral adjustment relative to said body member, a screw connection for initially adjusting the relative position of the carrier and body members, a yielding pressure means acting to force said carrier and body members apart, a roller pivoted on the carrier member for traveling engagement with the cylinder wall adjacent the portion to be dressed, a spring pressed cutter blade mounted in said carrier member, and a stop member mounted on said carrier member, having a portion in line with the periphery of said roller and adapted to be engaged by said blade for stopping the cutting operation in conformity with the contour of that part of the cylinder wall engaged by said roller.

6. A reaming tool for cylinder bores and the like, comprising a body member, a carrier member movably connected with the body member for lateral movement to expand and contract its effective span, manually actuated means for adjusting said members relatively to each other to fit the span to a cylinder bore, resilient means acting between said members and adapted to be placed under compression through operation of said manually actuated means when said members are confined in a bore, guide means held in forcible contact with the cylinder walls by action of said resilient means, a resiliently mounted cutter carried by said carrier member, and a stop member on said carrier member in line with one of said guide means and adapted to be engaged by said cutter for limiting its cutting operation

in conformity with the contour of the surface engaged by said guide means.

7. An internal cutting tool for dressing cylinder walls and the like, comprising a rotatable body, said body being formed in a plurality of relatively movable parts, guide means on the body adapted to travel in contact with the cylinder wall at one side of the portion to be dressed, a cutter blade carried by one part of said body, resilient means for causing said blade to be advanced toward the work, expansive pressure means acting with respect to the parts of said body for causing the guide means to forcibly engage and follow the contour of the cylinder bore, and a stop member carried by said one part of the body for engagement by said blade, said stop member being arranged in line with a wall engaging element of said guide means whereby the advancement of the cutter blade will be automatically limited in conformity with the contour of the wall engaged by said guide means.

Des Moines, Iowa, March 5, 1930.

CARL A. OLSON.