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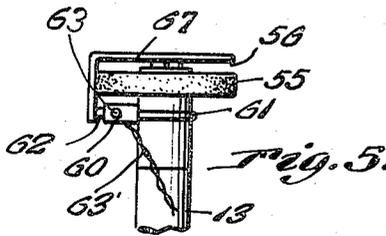
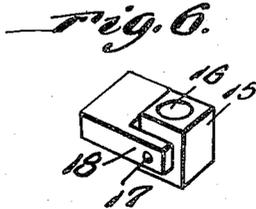
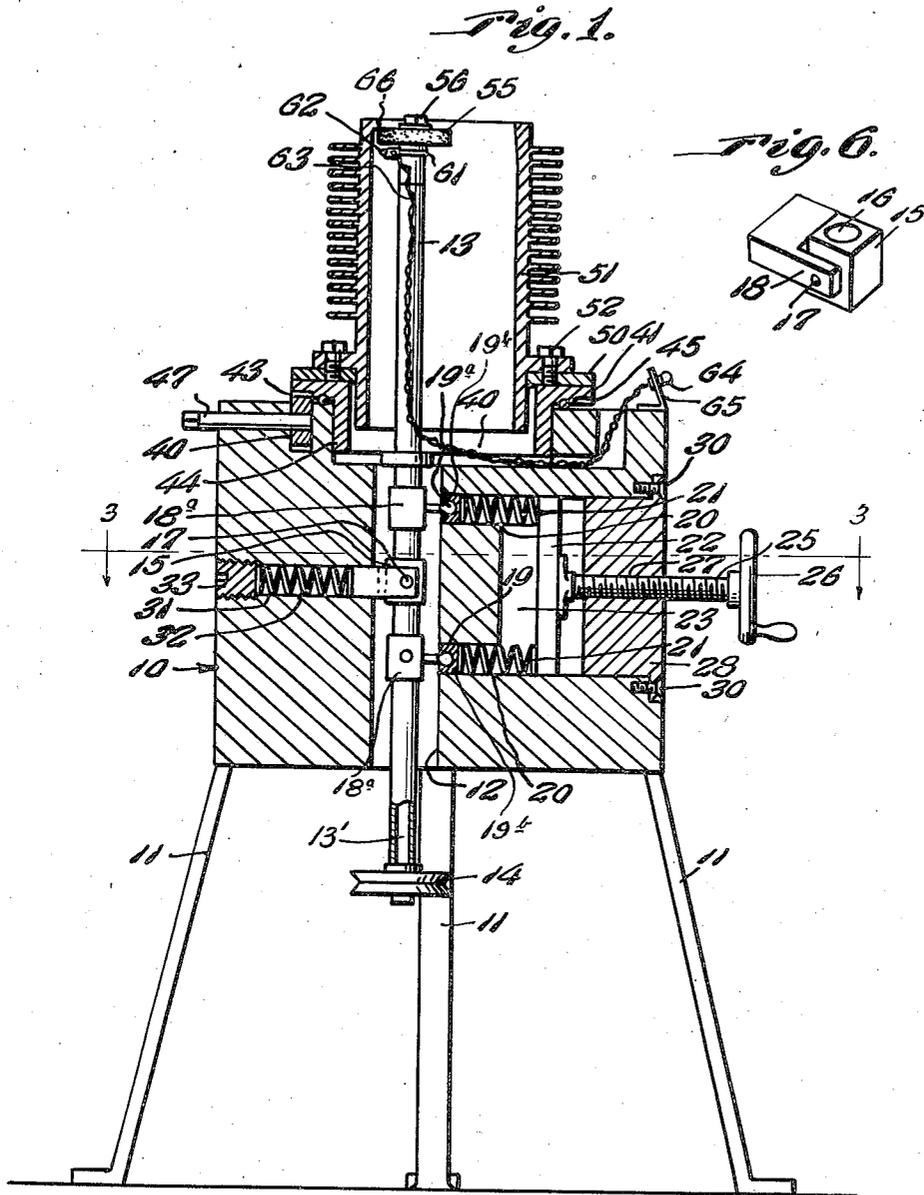
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2,444,614

PISTON RING RIDGE REMOVER

Filed Oct. 17, 1944

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

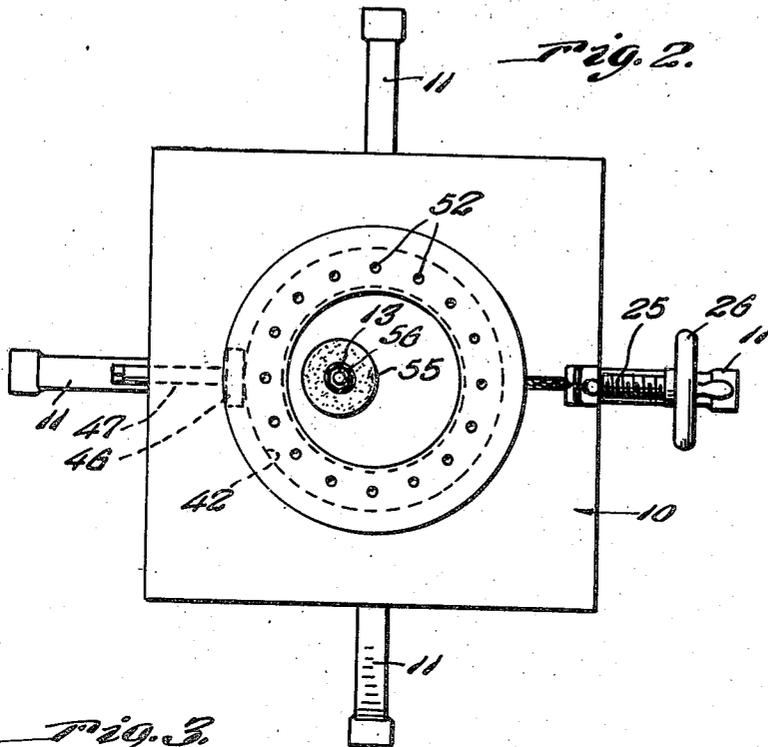


Fig. 2.

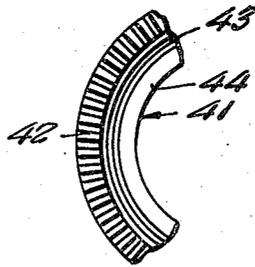
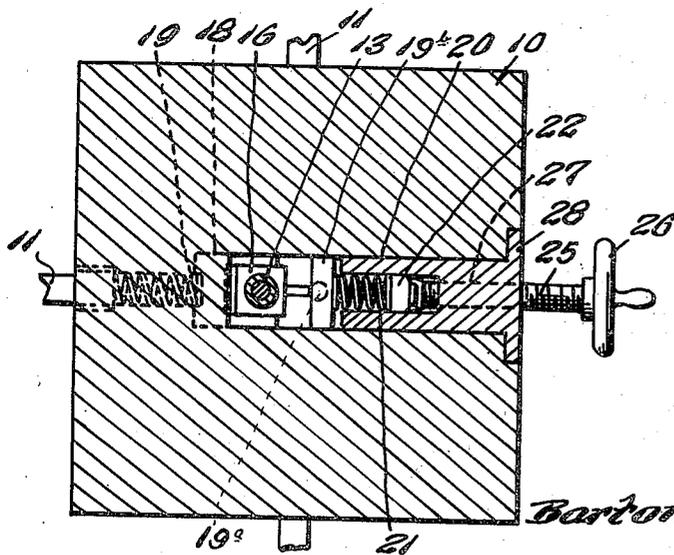


Fig. 4.

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UNITED STATES PATENT OFFICE

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PISTON RING RIDGE REMOVER

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4 Claims. (Cl. 51—105)

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This invention relates to a piston ring ridge remover and more particularly to such a device adapted for removing the ridges in the cylinders of an internal combustion engine.

A primary object of this invention is the provision of an improved ridge remover adapted to remove the ridges formed, or worn in the interior walls of the cylinders, without affecting the accuracy of the internal alignment and diameter of the cylinder.

A further object is the provision of such a device which will remove such ridges, provided with a control means, whereby cutting into the walls of the cylinder is precluded.

An additional object is the provision of such a device adapted to be particularly effective in removing ridges formed at only one portion, or only along a certain portion of the surface of, the interior of the cylinder wall.

A still further object is the provision of such a device which may be utilized effectively to remove ridges as above mentioned, by a comparatively unskilled workman.

Still other objects reside in the combinations of elements, features of construction, and arrangements of parts, all as will be more fully pointed out hereinafter and shown in the accompanying drawings, wherein there is disclosed a preferred embodiment of this inventive concept.

In the drawings:

Figure 1 is a side sectional view of one form of device embodying the instant invention, shown in association with a cylinder upon which it is to be used.

Figure 2 is a top plan view of the device of Figure 1.

Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 1, certain parts thereof being indicated in dotted lines.

Figure 4 is an enlarged fragmentary bottom plan view of a certain constructional detail.

Figure 5 is an enlarged side elevational view of certain additional constructional details, and

Figure 6 is an enlarged perspective view of still further constructional details.

Like reference numerals refer to like parts throughout the several views of the drawings.

Having reference now to the drawings and more particularly to Figure 1, there is generally indicated at 10 a body block suitably supported as on legs 11 and having a bore or aperture 12 passed vertically therethrough. Bore 12 has extending therethrough and mounted therein for rocking movement, a drive shaft assembly 13 containing a drive shaft 13', on the lower extremity of which is mounted a pulley 14 adapted to accommodate a V-belt or the like having driving connection with any desired source of power (not shown) to rotate the shaft 13'.

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The mounting means for shaft assembly 13 takes the form, as best shown in Figure 6, of a block 15 having a vertical bore 16 extending therethrough into which the shaft assembly 13 is fitted, said block 15 being pivotally secured, as by pivots 17, to a U-shaped yoke 18 which is mounted to slide in a bore 31 which extends through one side of the body 10 along an axis perpendicular to the axis of the bore 12. Sleeves 18a surround shaft assembly 13 above and below block 15 and have secured thereto ball headed studs 19a which engage in suitable sockets in blocks 19b which are slidable in vertically spaced horizontal passages 20 formed within block 10. Abutting the inner end of each block 19b is a compression spring 21, the outer end of each of which engages a shiftable stop 22 positioned for movement with a recess 23 which opens into the passages 20 and through the opposite side of the block 10. A screw 25 extends through and engages the threads of a suitable threaded opening 27 in a closure member 28 which closes the end of the recess remote from the passages 20. The inner end of the screw 25 is secured to stop 22 and the outer end of said screw carries an operating handle 26. Closure 28 is adapted to be secured to block 10 as by means of screws 30 or the like passed through a suitable flange formed on closure member 28 and engaging in suitable threaded recesses in the block.

The bore 31 is disposed in the side of the body block opposite the openings 20 and contains a spring 32. The end of bore 31 remote from the bore 12 is closed by a threaded plug 33 which forms a stop engaged by one end of a spring 32, the opposite end of which bears on the yoke 18 and cooperates therewith in forming a spring-loaded neutralizer to oppose the pressure exerted by springs 21 on the shaft assembly 13. From the foregoing, it will be seen that the shaft assembly 13 is mounted within bore 12 for relative pivotal motion, and may be biased toward and away from the cylinder walls, to be described hereinafter, by means of rotation of handle 26 changing the relative position of member 22 and hence the pressure exerted by springs 21.

Mounted for rotation in a suitable recess 40 in the upper portion of block 10 is a work supporting carriage generally indicated at 41 comprising an annulus 42 provided on its lower face with teeth 43. A depending annular flange 44 is carried at the inner edge of the annulus and enters the recess 40. The annulus 42 is mounted on a suitable ball race 45 to permit free rotation thereof, such rotation being effected by means of a pinion gear 46 driven through a shaft 47, from any suitable source of power (not shown), and engaging teeth 43 of annulus 42.

Mounted on the upper surface of annulus 42 is an adapter ring 50 which may be of any suitable

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thickness, or diameter to accommodate varying types and sizes of cylinders 51. This adapter 50 may be secured to the carriage 41 by bolts 52 or the like which may also be used to secure the work 51 to the carriage 41. The upper end of drive shaft 13' has secured thereto, as by screws 56, a disk 55 of any suitable abrasive material. Disk 55 is adapted for the removal of the ridges within a cylinder 51 or the like, in a manner to be described hereinafter.

As best shown in Figure 5, an indicating device comprised of a housing 60 is secured, as by a ring 61, to the drive shaft assembly 13 adjacent the disk 55 and secured within the housing 60 is a contact button 62 which is positioned beneath and adjacent abrasive wheel 55. This contact button 62 is connected by a suitable conductor 63' to a suitable indicator light 64 mounted in a bracket 65 secured to any suitable portion of block 10.

The operation of the device should now, from the foregoing, be readily understandable. An abrasive disk 55 of the desired diameter and thickness is positioned on the upper end of the drive shaft 13' of the shaft assembly 13, and contact button 62 is adjusted as by means of contact set screw 63 to extend the desired distance outwardly with respect to housing 60, such distance being substantially identical to the radius of the abrasive wheel 55. A suitable adapter 50 is then placed in position on annulus 42 and the cylinder 51 secured in position thereon. Screw 25 is adjusted by means of handle 26 until shaft 13' has moved abrasive wheel 55 into contact with the ridge 66 (see Figure 1) of the cylinder to be removed. The drive shaft 13' is then rotated at a desired speed rotating the abrasive wheel 55. Simultaneously, the annulus 42 is driven by pinion 43 to rotate the cylinder uniformly exposing all portions of the ridge successively to the abrasive wheel 55. It will be seen that those portions of the cylinder wall on which a ridge has not been formed will not be affected by the abrasive wheel 55 since stop or contact 62 by its abutment with the wall of the cylinder prevents the grinding wheel from undercutting the same. Simultaneously a circuit is closed illuminating indicator light 64. Thus, when the ridge has been completely removed, contact 62 will cause light 64 to remain illuminated through an entire revolution of the cylinder to indicate the completion of such removal, whereupon the operation of the machine may be discontinued.

From the foregoing it will now be seen that there is herein provided a device accomplishing all the objects of this invention and others including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment herein shown and described, it is to be understood that all matter hereinbefore is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. A cylinder grinder which includes a cylinder support mounted to rotate about a vertical axis, a shaft mounted adjacent the cylinder support to rotate about an axis eccentric to the axis of the cylinder support and to rock in a plane which lies radial to the axis about which the cylinder support rotates, yielding means to hold the shaft parallel with the axis of the cylinder support, means to rotate the shaft and a grinding

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wheel on the shaft to engage work carried by the cylinder support.

2. A cylinder grinder which includes a work supporting carriage mounted to rotate about an axis, a shaft mounted to rotate about an axis eccentric to the axis about which the carriage rotates, a yoke mounted to move along an axis which intersects the axes of the carriage and the shaft, means carried by the yoke to support the shaft for rocking movement in a plane which intersects the axes of the carriage and the shaft, a grinding wheel on one end of the shaft for contact with work supported on the carriage, a drive wheel at the opposite end of the shaft, means yieldingly to urge the yoke and shaft toward the axis of the carriage, means to urge the shaft under yielding pressure to advance toward work held in the carriage and means to vary the yielding pressure under which the shaft is advanced.

3. A cylinder grinder which includes a work supporting carriage mounted to rotate about an axis, a shaft mounted to rotate about an axis eccentric to the axis about which the carriage rotates, a yoke mounted to move along an axis which intersects the axes of the carriage and the shaft, means carried by the yoke to support the shaft for rocking movement in a plane which intersects the axes of the carriage and the shaft, a grinding wheel on one end of the shaft for contact with work supported on the carriage, a drive wheel at the opposite end of the shaft, means yieldingly to urge the yoke and shaft toward the axis of the carriage, means to urge the shaft under yielding pressure to advance toward work held in the carriage and means to vary the yielding pressure under which the shaft is advanced, and a stop movable with the shaft to engage the work and arrest the advance of the grinding wheel toward the work.

4. A cylinder grinder which includes a work supporting carriage mounted to rotate about an axis, a shaft mounted to rotate about an axis eccentric to the axis about which the carriage rotates, a yoke mounted to move along an axis which intersects the axes of the carriage and the shaft, means carried by the yoke to support the shaft for rocking movement in a plane which intersects the axes of the carriage and the shaft, a grinding wheel on one end of the shaft for contact with work supported on the carriage, a drive wheel at the opposite end of the shaft, means yieldingly to urge the yoke and shaft toward the axis of the carriage, means to urge the shaft under yielding pressure to advance toward work held in the carriage and means to vary the yielding pressure under which the shaft is advanced, and a stop movable with the shaft to engage the work and arrest the advance of the grinding wheel toward the work, and signalling means actuated by the stop to signify the arrest of the grinding wheel.

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