

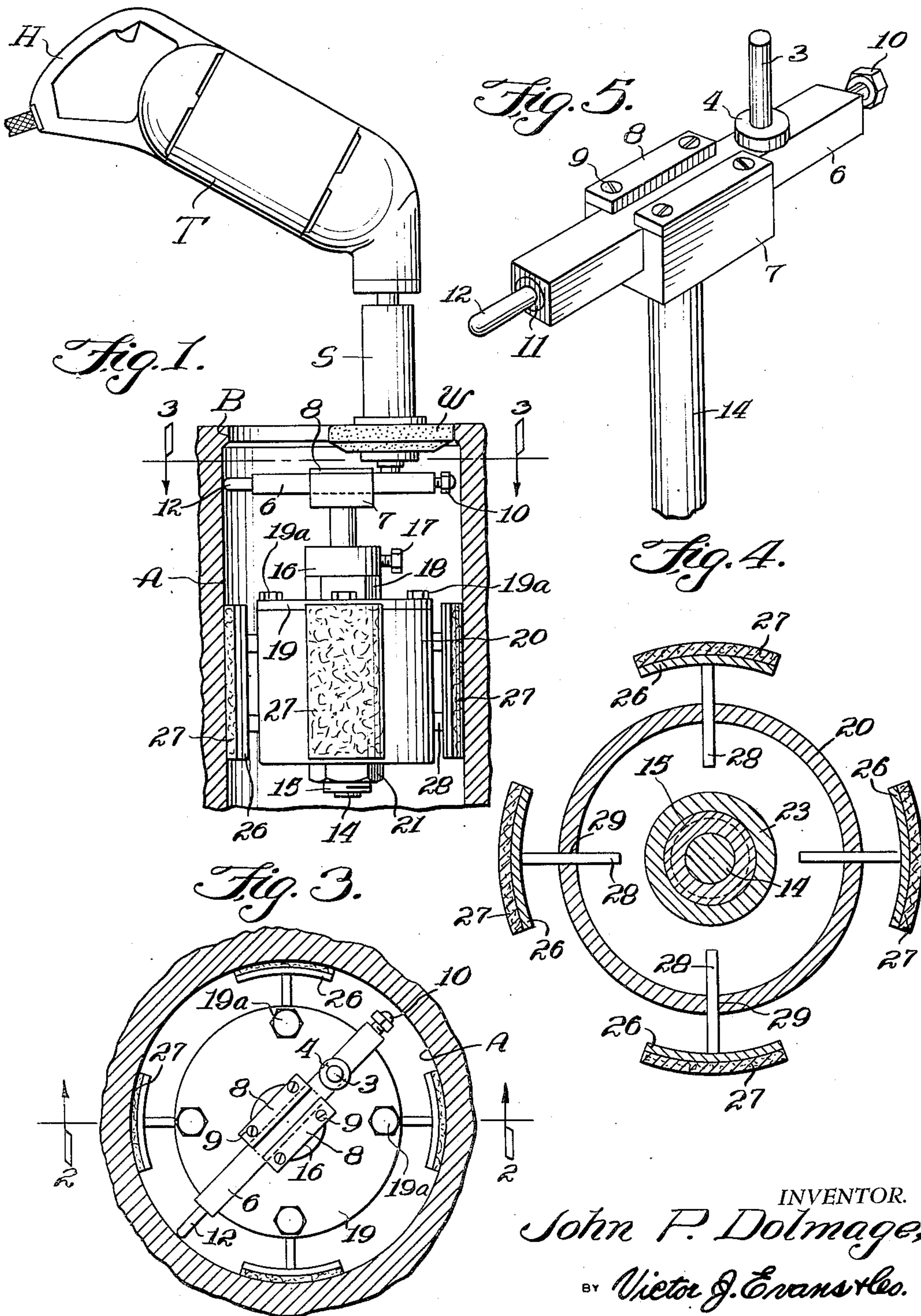
Oct. 31, 1950

J. P. DOLMAGE
CYLINDER RIDGE GRINDER

2,528,043

Filed Dec. 27, 1948

2 Sheets-Sheet 1



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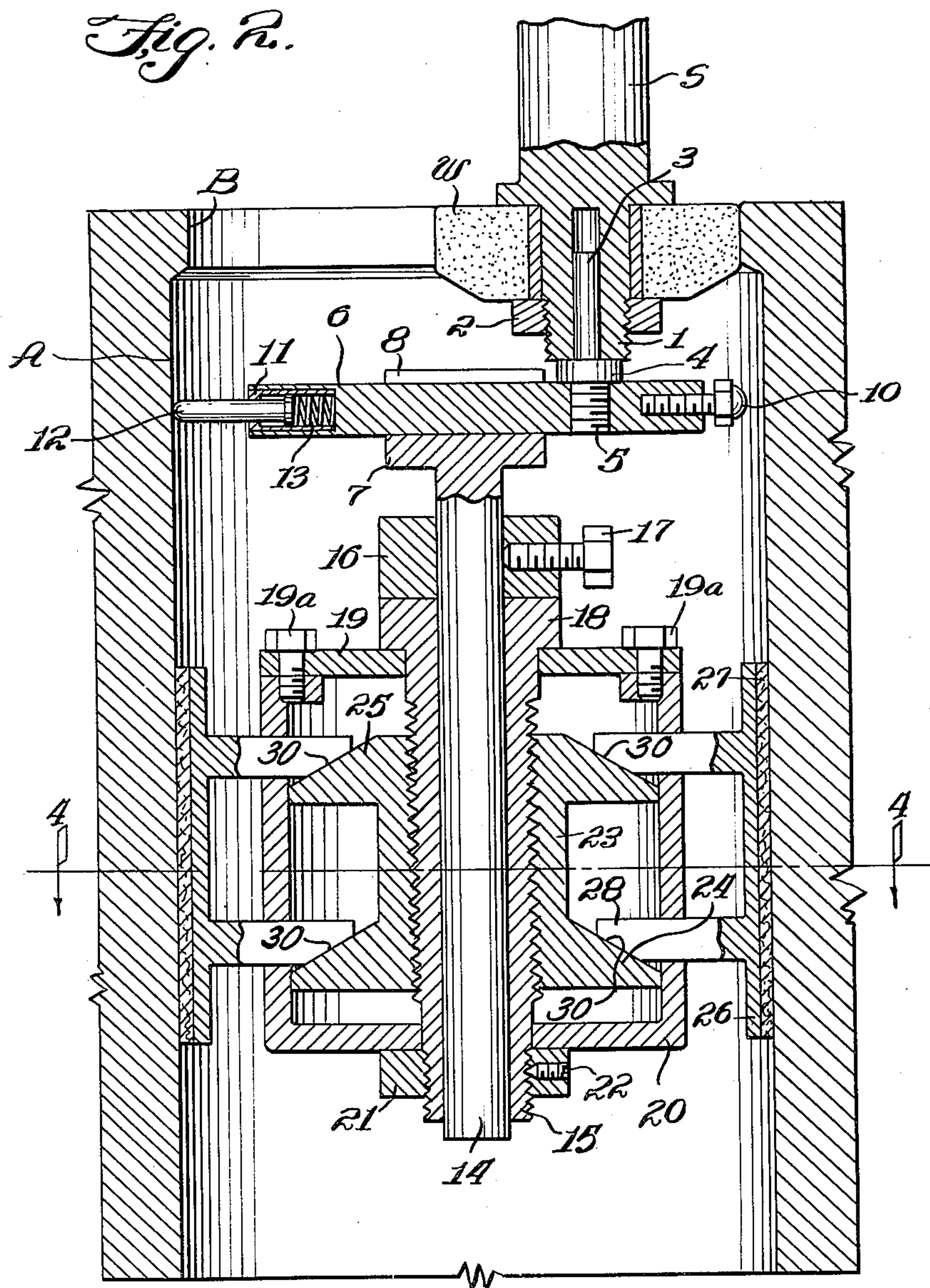
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UNITED STATES PATENT OFFICE

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CYLINDER RIDGE GRINDER

John P. Dolmage, Iowa City, Iowa

Application December 27, 1948, Serial No. 67,411

1 Claim. (Cl. 51—245)

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The present invention relates to the general class of rotary power operated and portable grinding and abrading machines of the manually controlled type, and more specifically to an improved cylinder ridge grinder which while adapted for various purposes and uses, is especially designed for reaming or removing an inner annular ridge from the upper end of the bore of an engine or motor cylinder. As is well known, the reciprocating movements of a piston cylinder, due to friction, wear away the inner surface of an engine cylinder, leaving at the top of the cylinder an undesired and objectionable inner annular ridge, and the purpose of the present invention is to provide a high speed grinding or abrading appliance of this type whereby the ridge may be removed with a minimum expenditure of time and labor.

In carrying out my invention I utilize a standard type of portable, power operated, and manually controlled rotary grinder of the type employed for grinding valve seats, and the grinder, or its grinding wheel, is supported upon a swivel assembly that is removably mounted in a detachable frame of the expanding mandrel type that is adjustably fixed, as an attachment, within the bore of the cylinder.

The invention includes a minimum number of component parts that may with facility be manufactured at low cost of production, and the parts may be assembled with convenience, to assure an appliance that may be attached with ease to its work, which is durable and reliable, and which is highly efficient in the performance of its required functions.

The invention consists in certain novel features of construction and combinations and arrangements of parts as will hereinafter be described and more particularly pointed out in the appended claim.

In the accompanying drawings I have illustrated a complete example of a physical embodiment of my invention wherein the parts are combined and arranged in accord with one mode I have devised for the practical application of the principles of my invention. It will however, be understood that changes and alterations are contemplated and may be made in these exemplifying drawings and mechanical structures, within the scope of my claim, without departing from the principles of the invention.

Figure 1 is a view in elevation of the appliance in which my invention is embodied, and shown in operative position for grinding or abrading the ridge of a cylinder.

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Figure 2 is an enlarged detail vertical sectional view as at line 2—2 of Fig. 3.

Figure 3 is a transverse sectional view at line 3—3 of Fig. 1.

Figure 4 is a transverse sectional view at line 4—4 of Fig. 2; and

Figure 5 is a perspective view of the swivel mount for supporting the grinding wheel.

In order that the general arrangement and utility of parts may readily be understood I have indicated an engine cylinder as A having at its upper end an inner peripheral ridge B that is to be ground by the rotary grinding wheel W of a well known type of power operated and portable tool T. The grinding tool is provided with a handle H by means of which it may easily be manipulated under manual control, and the abrading wheel W is mounted on the lower end of a rotary spindle S, which as seen in Fig. 2 terminates in a socket or chuck 1 that is externally threaded to receive a nut 2, and by means of which a centering pin, or pilot pin 3 is journaled in the socket. The centering pin is provided with a bearing collar 4, and the lower end of the pin, as 5 is externally threaded for attachment to a swivel assembly in which the grinding wheel is supported and guided in its grinding operations on the ridge.

The swivel assembly is detachably mounted upon a supporting frame or expanding mandrel, which, as an attachment, is removably mounted within the cylinder below the ridge.

The end 5 of the centering pin or pilot is threaded through one end portion of a transversely arranged swivel bar or cross arm 6, here shown as rectangular in cross section, which is slidably mounted in a swivel head 7, and the slidable arm is retained within the grooved head against displacement by means of spaced plates or flanges 8, 8, secured on top of the head by screws 9.

The wheel-supporting end of the swivel arm is equipped with a round-head bolt 10 that forms an adjustable gauge for contact with the bore of the cylinder, directly beneath the grinding wheel, to limit the grinding action of the wheel to the inner diameter of the cylinder.

At the other end of the swivel arm resilient means are employed for feeding or forcing the arm and the grinding wheel into positions in order that the wheel may grind the ridge throughout its inner periphery, as the tool is manipulated, until the gauge contacts the bore of the cylinder. For this purpose, the swivel arm is provided with a socket, in its end remote

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from the grinding wheel, to receive and retain a spring casing 11 in which a headed plunger bar 12 is mounted, and a spring 13 is interposed between the base wall of the socket and the bar that presses the outer end of the bar into contact with the bore of the cylinder, and thus resiliently holds the swivel arm under pressure, and also holds the grinding wheel in operative relation to the face of the ridge.

For mounting the swivel assembly within the bore of the cylinder the swivel head is fashioned with an integral swivel pin or shaft 14 that is journaled in a tubular screw bar 15, and the spindle is equipped with an adjustable bearing collar 16 that may be fixed in adjusted position by set screw 17.

The bearing collar 16 rests upon the top surface of the angular head 18 of the adjusting screw, and the head 18 rests upon the removable top plate 19 that is bolted at 19a on the top of an open top cylindrical housing 20. The adjusting screw is centrally mounted to turn in the top plate and the bottom wall of the housing, and a retaining nut 21 is threaded on the lower projecting end of the tubular adjusting bolt or screw bar, and fixed by a set screw 22.

The cylindrical housing forms part of an expanding mandrel that is clamped rigidly against the surrounding bore of the cylinder to support the swivel assembly, and for this purpose a traveling spreader is threaded on the tubular screw bar, within the housing, which spreader includes a sleeve 23 and two spaced integral heads 24 and 25 of frusto-conical shape. In Fig. 2 the non-traveling screw bar has been turned to move the traveling spreader upwardly for clamping the mandrel to the cylinder, and by a reverse turning movement of the screw bar, the spreader may be lowered to release the clamped mandrel.

For a clamping action of the mandrel the housing is equipped with four diametrically arranged shoes 26 faced with pads 27, and each

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shoe is equipped with a pair of arms 28 radially movable in slots 29 of the housing. The inner ends of the radial arms are beveled or biased at 30 for frictional contact and engagement with the spreader heads, and it will be apparent that as the spreader is screwed upwardly, its tapered heads will force outwardly the arms and clamp the padded shoes against the bore of the cylinder.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

In an attachment as described, the combination with a removable support adapted to be clamped within a work piece, of a spindle swiveled in the support, a head provided with a groove mounted on the spindle, an arm arranged transversely with respect to said spindle and slidably mounted in the groove in said head and a centering pin carried by said arm, a gauge screw threaded in one end of the arm and a socket in the other end of the arm, a spring casing mounted in the socket, a presser pin mounted in the casing, and a spring arranged in said casing and having one end engaging the inner end of said presser pin for urging the presser pin into engagement with the work piece.

JOHN P. DOLMAGE.

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