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T. J. BRUCE

2,212,705

PISTON PEENING DEVICE AND THE LIKE

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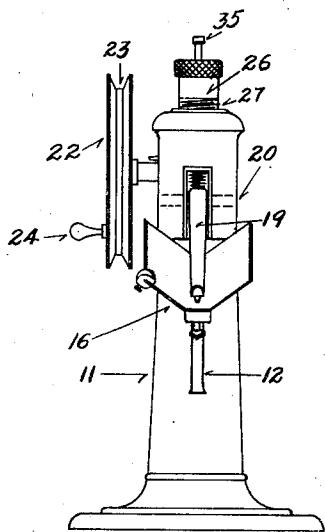


FIG. 1

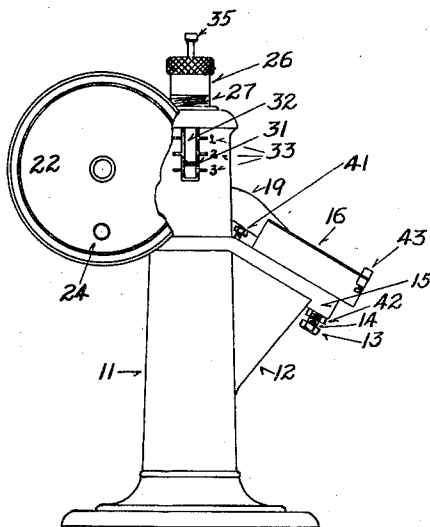


FIG. 2

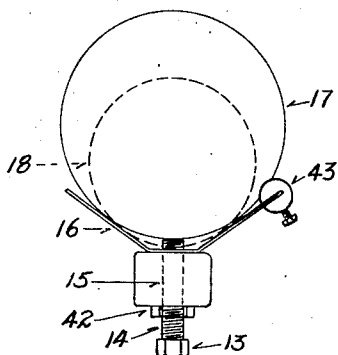


FIG. 3

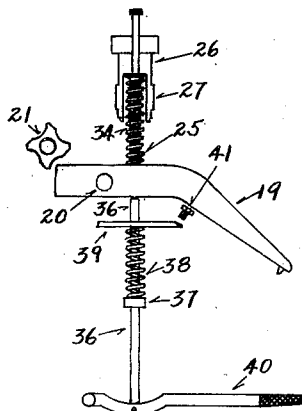


FIG. 4

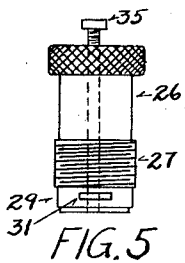


FIG. 5

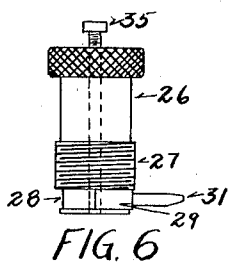


FIG. 6

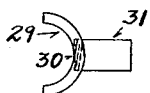


FIG. 7

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UNITED STATES PATENT OFFICE

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PISTON PEENING DEVICE AND THE LIKE

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2 Claims. (Cl. 78—101)

It is a well known fact that pistons frequently collapse, become misfits, and need expanding and resizing as well as reshaping before the original snug fit is restored and the proper operation of the piston is regained. A piston on which the skirt has collapsed will lose compression, leak lubricant and cause noise.

Machines and devices for reshaping and resizing the collapsed piston have been on the market for some time, and they are well known to the machine shop operators and garage men and mechanics. The most successful ones are based on the operation of a cam actuated trip hammer, it being virtually impossible for a mechanic to properly expand, resize and reshape a piston without some tool having a short stroke that can be directed to a point within the confines of a piston skirt.

One shortcoming of machines now available is the failure to provide an anvil surface adjustable to pistons having what is known as "cam shape" or irregular surfaces in the outer face of the piston skirt. Since a large portion of the pistons in use at the present time are so shaped, the devices in use at the present time for peening purposes are of necessity limited in operation to the portion of the piston wall that will rest firmly on a flat support for the whole piston.

One object of the present invention is to provide an adjustable anvil that will properly support that part of the piston skirt on which the peening takes place, whether the piston skirt is uniform in circumference and smooth or is cam-shaped or irregular.

Another object of this invention is to provide a cradle or support of the piston, auxiliary to that of the anvil. This cradle is fixed in position, non-adjustable, but so shaped as to accommodate different size pistons and cooperate with the anvil to properly support and align the piston.

Another object of this invention is to provide a stop or aligning means for use in connection with the anvil and cradle, adapted to attach to the cradle, to prevent longitudinal movement on the cradle, especially in a downward direction lengthwise of the cradle.

Other objects and uses of the invention will appear from a more detailed description of the drawing and features of invention as hereinafter set forth and described.

In the drawing:

Figure 1 shows a front elevation of the device of the present invention.

Figure 2 shows a side elevation of the device embodying the present invention, the pulley

wheel showing being fragmentary to allow view of the tension indicating means.

Figure 3 is an end view of the cradle means on a plane in horizontal alignment therewith, showing also the adjustable anvil means.

Figure 4 is a side elevation of the mechanism within the casing or housing for the device, the casing being eliminated.

Figure 5 is a side view of the spring tension adjustment nut, the tension indicator being in place.

Figure 6 is a back elevation of the device of Figure 5.

Figure 7 is a plan view of the tension indicating pointer.

Referring more in detail to Figures 1 and 2, particularly, and to the other figures as the particular details shown by said other figures are reached for consideration, 11 shows the casing or housing for the device which is usually a casting or the like; 12 is that portion of the housing that acts as a brace or support for the anvil and cradle assembly.

Number 13 designates the screw head of the bolt shaped anvil 14, as best shown in Figures 2 and 3. The anvil 14 is threaded through the extended housing support 15, and through the cradle 16. In Figure 3, a piston 17 is indicated to show how the cradle and the anvil support it in position. A smaller piston 18 is indicated by dotted lines, which shows that the cradle is kept the same, but the anvil must be threaded out to the proper adjustment in order to secure the correct support and alignment of the piston 18. Other size pistons are handled in a similar way. This entirely does away with the adjustable cradle having hinged sides, and provides a firmer support for aligning the piston.

The anvil 14, while shown in Figure 3 as resting flush against the side of the piston (the piston 40 is shown only schematically in this drawing) is adaptable to insertion and to irregularities in the surface of the piston, the anvil being—for this purpose—small enough to enter into any irregularities on which peening may take place. This provides adequate support opposite peening hammer regardless of whether the surface being peened is smooth, cam-shaped, or otherwise irregular.

A peening hammer 19 pivoted about a shaft (with suitable bearing means—not shown) 20, is actuated by the cam 21 which in turn is driven by connections (not shown) to the pulley wheel 22. This pulley wheel may be driven by motor 55

for which a belt groove 22 is provided, or may be operated by hand by means of the handle 24.

Referring to Figure 4 and Figures 2, 5, 6, and 7, a spring tension means 25 for the peening hammer 19, is adjustable to increase or decrease the pressure or tension on the hammer by adjustment of the knurled lug 26 which threads into the upper part of the housing 11 by means of the threads 27. The lug 26 has a groove around its lower extremity at 28 into which sets the semi-circular metal band 29. This band is threaded at 30 to receive the pointer 31 which is screwed into place through the opening 32 after the lug 26 is in place. Suitable indicating figures or letters 33 are provided in relation to the pointer 31 so movement up and down of the lug 26, carrying the pointer 31, will be indicated. This will necessarily indicate the tension on the spring 25.

To damp the vibration of the spring 25, a second spring 34 fits inside the spring 25. Tension on this spring 34 is regulated by the adjustable bolt 35 which passes through lug 26 longitudinally. This bolt 35 is threaded into lug 26, and adjustment of lug 26 automatically changes the pressure of spring 34. However, finer and additional adjustment may be had by threading the bolt 35 in or out.

A means for disengaging the hammer 19 from the cam 21 is provided, thus rendering the hammer inoperative. This same disengaging means may also be used to counteract the tension in spring 25 and spring 34 (combined) and to thus lighten the stroke of the peening hammer 19. This disengaging means comprises the rod 36 onto which is threaded the adjustable nut 37. This nut 37 is attached to the spring 38, which in turn is attached to the housing or other support 39. This spring 38 is a spring that gains its tension by lengthening, whereas the springs 25 and 34 gain tension by compression. Spring 38 is strong enough to offset the springs 25 and 34 when

pressure is relieved from the foot or hand pedal 40. This pedal 40 is attached to the rod 36. With a little practice a skilled operator can exercise very accurate control over the force of the blow from the peening hammer 19 by means of the pedal 40.

A set screw 41 is provided to limit the downward stroke distance of the hammer 19. This is adjustable for different size pistons, and is threaded into the housing 11 on the extension 15.

A lock-nut 42 may be provided to hold the anvil in place.

A stop 43, adjustable with respect to the cradle 16, is provided to hold the piston against downward displacement endwise. This stop generally comprises a slotted lug with a set-screw, and may be moved from place to place on the cradle to accommodate varying sizes of pistons.

I claim:

1. A piston supporting and retaining means for peening purposes comprising in combination a cradle on a supporting member of the piston peening machine housing, said cradle being non-adjustable, anvil means passing through said cradle and being adjustable vertically with relation to said cradle, locking means comprising a lock-nut or the like retaining said anvil in adjusted position, and an adjustable lug movable on the cradle means comprising a support against horizontal movement of the piston, substantially as described.

2. A piston supporting and retaining means for peening purposes comprising in combination a cradle, said cradle being non-adjustable, anvil means passing through said cradle and being adjustable vertically with relation to said cradle, locking means comprising a lock-nut or the like retaining said anvil in adjusted position, and an adjustable lug movable on the cradle means comprising a support against horizontal movement of the piston, substantially as described.

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