

Nov. 18, 1930.

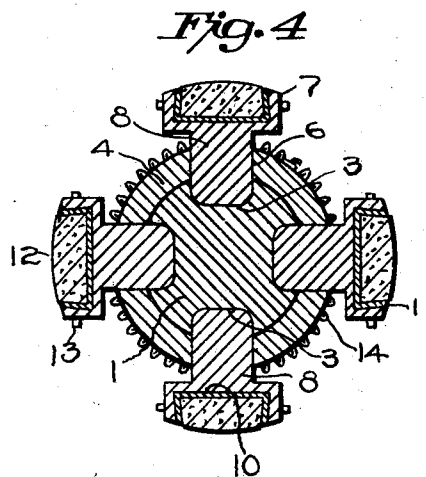
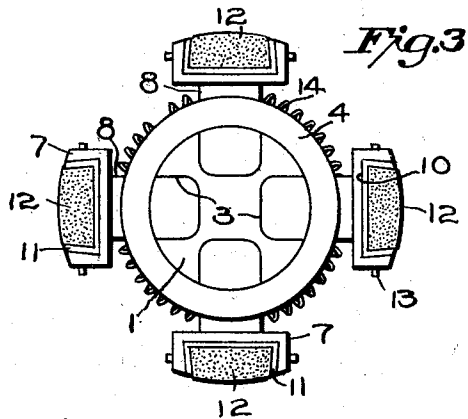
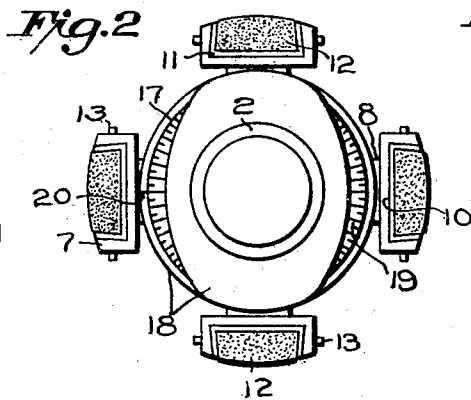
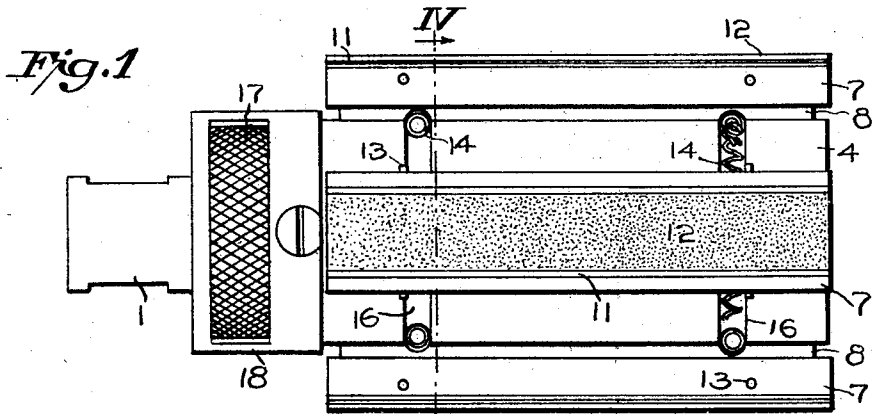
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1,781,856

CYLINDER HONING DEVICE

Filed Feb. 26, 1929

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5

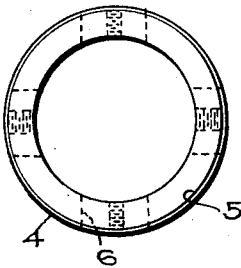


Fig. 6

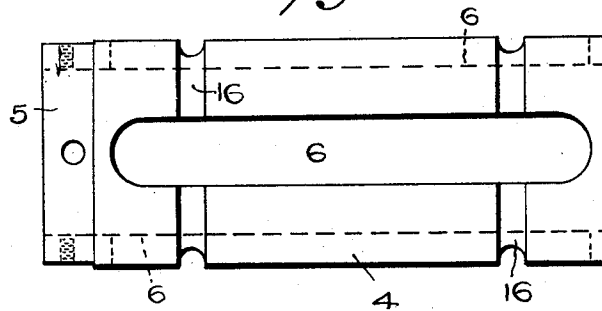


Fig. 7

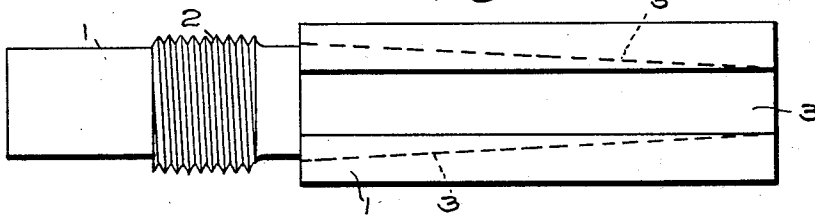


Fig. 8

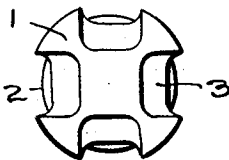


Fig. 9

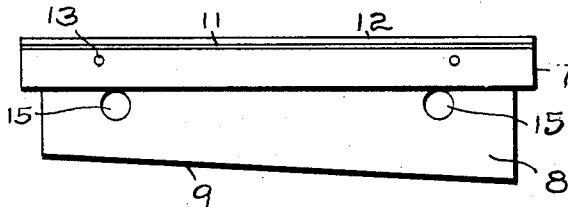


Fig. 10

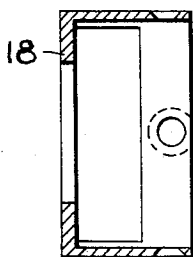
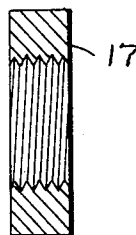


Fig. 11



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CYLINDER HONING DEVICE

Application filed February 26, 1929. Serial No. 342,690.

My invention relates to cylinder finishing devices, relating in particular to a device for hone finishing the bore of cylinders.

My invention has for its principal objects, to provide a device constructed of few parts; which will automatically lock the working parts thereof against possible movement during operation; that will present practically a solid structure; to provide a device with hone tool holders that can readily be removed and replaced by others, and to provide a device having flexible balanced pressure means for securing the tools in place and that will be disposed where same is out of the way of injury thereto.

Other objects and advantages of the device will appear from the description following later.

In the accompanying drawings, I have shown a preferred embodiment of my invention, wherein—

Figure 1 is a side elevation of the device.

Figure 2 is a view of the one end of Figure 1.

Figure 3 is an end view of the opposite end of Figure 1.

Figure 4 is a sectional view through Figure 1 on line IV looking in the direction indicated by the arrows.

Figure 5 is an end view of the tool holding sleeve.

Figure 6 is a side view thereof.

Figure 7 is a side view of the operating mandrel.

Figure 8 is an end view thereof.

Figure 9 is a side view of one of the tool holders and hone tool.

Figure 10 is a cross sectional view through the sleeve housing, and

Figure 11 is a cross sectional view through the adjusting nut.

Similar numerals refer to similar parts throughout the several views.

The device comprises a mandrel 1, adapted to be rotated by suitable power, through the medium of a flexible shaft, or otherwise. The mandrel is provided upon its reduced or power applied end portion with a screw thread 2 and has formed within its larger shouldered body portion a plurality of in-

clined channels or seats 3 extending the entire length thereof.

The enlarged body portion of the mandrel has slidably fitted thereon a sleeve 4, having a slight shoulder 5 at one end thereof and has formed through its body a plurality of longitudinal elongated openings 6 registering with the inclined channels or seats of the mandrel.

A like number of tool holders 7 are provided; each having an integral base rib 8 extending longitudinally thereof and of substantially the same length as the holder, each being inclined at its surface portion 9 corresponding to that of the channels of the mandrel. These holders are supported upon the mandrel and are operated radially thereby, each being fitted through one of the openings 6 of the carrying sleeve and seated or engaging in the mandrel channel registering therewith. Each tool holder has a longitudinal slot 10 therein into which is dovetailedly fitted a gib or secondary holder 11, for the honing tool 12, which is also dovetailed in the gib, said gib and tool being removably secured to the holder by pins or screws 13 extending through registerable openings formed therein. The holders are retained in seated position within the mandrel channels by garter springs 14 passing through openings 15 adjacent the ends of the holders and within the peripheral grooves 16 in the sleeve, said springs being provided with hook and eye connecting ends to hold same in flexed condition and may be readily removed by uncoupling.

Upon the threaded portion of the mandrel 1 is fitted the knurled adjusting nut 17, partly enclosed by a housing 18. The housing, which is virtually a part of the sleeve is partly cut away, as shown, so that the nut may be operated and is secured upon the shouldered portion 5 of the sleeve by suitable screws passed therethrough and into the sleeve, rigidly and removably connecting the same to said sleeve.

The nut 17 has suitable graduations 19 formed upon its outer face, any one of which may be set to or register with the mark 20 provided on the housing in adjusting the

tools of the device to any desired measurement within the limits thereof.

It will be apparent that the arrangements of parts present a substantially rigid structure, or such that the operating tools cannot move or become accidentally adjusted and it is therefore self locking.

Again, it will be apparent that in adjusting the sleeve carrying the tool holders, by movement of the nut, the said tool holders will under all conditions have firm seating their entire length in the mandrel channels and the springs being adjacent the ends thereof balanced seating pressure is applied, thus avoiding any possible tendency to rock upon the mandrel.

As the nut upon the mandrel is rotatively adjusted the sleeve is slidably adjusted longitudinally thereupon, and as the tool holders are carried by the sleeve the sliding of the same upon the inclined surfaces of the mandrel causes the said holder to be radially adjusted. Furthermore, the housing partly enclosing the nut, and carried by the sleeve, prevents any movement of said nut, other than manually in a rotative direction.

As the device may be employed for boring, grinding, reaming or honing, I have used the word "tool" throughout the specification, it being understood that it includes whether a cutting or polishing element be employed.

While I have shown and described a preferred embodiment of my invention, I desire that said embodiment shall be regarded as illustrative only, and that the appended claims shall be accorded the broadest construction consistent with the prior art.

What I claim is—

1. In a device for the purpose set forth, the combination of a mandrel having inclined channels spaced thereabout, tool holders correspondingly inclined at their base and engaging within the said channels, a honing tool secured in each of said holders, a sleeve within which the mandrel is slidably fitted and provided with openings through which said tool holders extend into the mandrel channels, and a nut on said spindle cooperating with said sleeve whereby rotative adjustment of said nut effects a longitudinal sliding movement of the sleeve on the spindle and radial adjustment of the tool holders therethrough.

2. In a device for the purpose set forth, the combination of a mandrel having inclined channels spaced thereabout, a sleeve loosely fitted over said mandrel and provided with openings therethrough which register with the said channels, tool holders, each having an inclined rib thereon corresponding thereabout in form to and extending through the sleeve openings and seated in said mandrel channels, means for maintaining contact between the inclined surfaces of said

mandrel channels and tool holders, said holders being movable longitudinally with the sleeve, a nut on said spindle cooperating with said sleeve whereby rotative adjustment of said nut effects a longitudinal sliding movement of the sleeve and tool holders upon the spindle and radial adjustment of the tool holders therein.

3. In a device for the purpose set forth, the combination of a mandrel including a body portion and an integral direct drive shank portion of lesser diameter at one end thereof, said shank portion having a screw thread thereon and terminating in a drive end and said body portion having spaced longitudinally disposed inclined channels formed therein, a sleeve loosely fitted over the body portion of said spindle and provided with longitudinal openings through its wall between the ends thereof and registerable with the mandrel channels, tool holders each having a longitudinal tool holding channel in the outer face thereof and an elongated rib on the inner face corresponding in form to and disposed through said sleeve openings into the mandrel channels and correspondingly tapered thereto, a honing tool secured in the channel of each holder, an adjusting nut on the shank end of said mandrel, an extension on said sleeve within which said nut is partially confined, said nut adapted upon being rotatively adjusted to effect a longitudinal sliding of said sleeve and tool holders upon said mandrel to radially adjust said tool holders, and circumferentially disposed springs passing through openings in the ends of said tool holders and engaging about said sleeve and adapted to maintain contact between the mandrel and tool holders.

4. In a device for the purpose set forth, the combination of a unitary mandrel including a main body portion and an integral direct-drive shank of less diameter at one end thereof, said body portion having longitudinal inclined channels in spaced relation thereabout and said shank having a thread thereon, a nut on said shank, a sleeve slidably fitted on the mandrel body and having elongated openings through the wall thereof between its ends and registering with the mandrel channels, a housing carried by one end of the sleeve and provided with an opening through which the said shank extends, said housing partly enclosing the nut, said nut adapted when rotatively adjusted to slidably adjust the sleeve longitudinally on the mandrel, said channels and openings adapted to receive tool holders.

5. In a device for the purpose set forth, the combination of a plain bore mandrel sleeve provided with spaced longitudinally disposed elongated openings extending through the wall thereof and further provided with exterior circumferentially disposed grooves, tool holders each carrying a

5 honing tool and fitted for radial adjustment
in said elongated openings and each having
openings therethrough aligning circumferen-
tially with the sleeve grooves, springs extend-
ing through said holder openings and engag-
ing in sleeve grooves, and a nut housing on
one end of said sleeve.

In testimony whereof I affix my signature.

FREDERICK C. MOSER.

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