

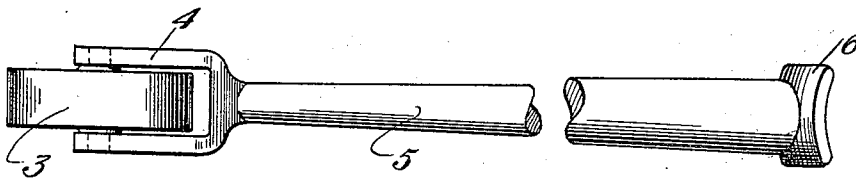
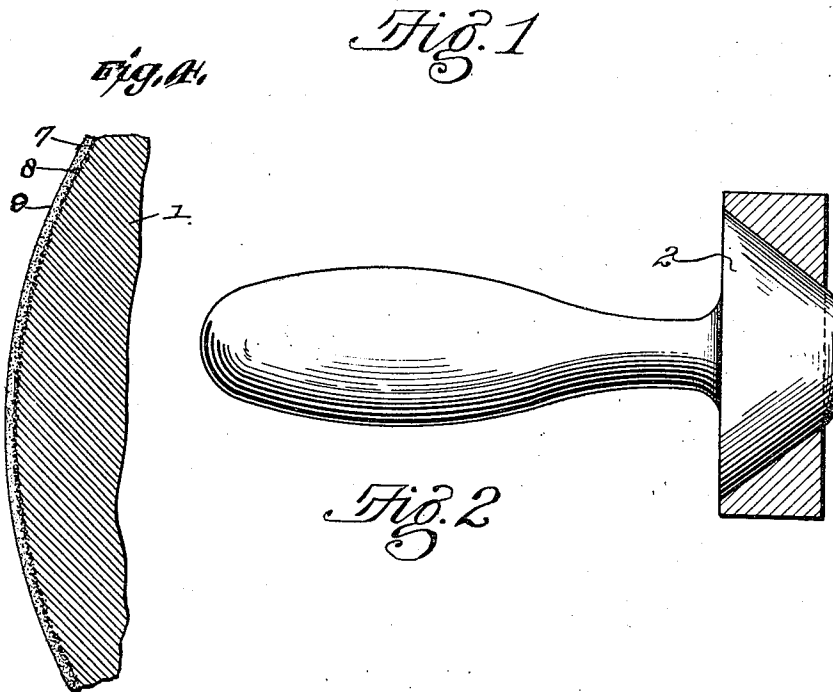
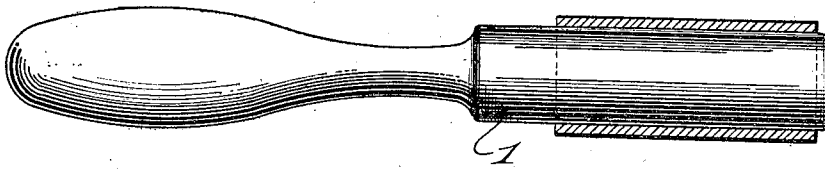
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C. E. MYERS

GAUGE PLUG

Filed Aug. 20, 1920



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GAUGE PLUG.

Application filed August 20, 1920. Serial No. 404,936.

To all whom it may concern:

Be it known that I, CHARLES E. MYERS, a citizen of the United States, and resident of Canton, in the county of Stark and State of Ohio, have invented new and useful Improvements in Gauge Plugs, of which the following is a specification.

The invention relates to plugs for testing and gauging the size of apertures in machine construction; and the object of the improvement is to make a gauge with a hard smooth surface which will withstand the wear of use without abrading the apertures.

The constant wear of such a plug caused by a repeated insertion as well as by a turning in the aperture of a metallic machine part, soon reduces its diameter and renders the plug useless as a gauge, even when made of very hard tool steel; thus requiring a constant replacement of the plugs for properly testing and gauging machine bearings, which frequently require accuracy to within less than the thousandth part of an inch.

This difficulty is overcome by making the plug of soft machine steel or copper, then rolling diamond dust into its periphery, and finally grinding and polishing the periphery of the plug to the exact diameter for use.

The accompanying drawing illustrates in Figure 1, an ordinary form of cylindric plug inserted in a tubular journal bushing, shown in section; in Fig. 2, an ordinary form of conical plug inserted in a roller bearing cup, shown in section; in Fig. 3, an ordinary form of tool which may be employed for rolling diamond dust into the plugs; and in Fig. 4, a greatly magnified fragmentary section of a gauge plug, showing two grades of diamond dust embedded in its surface.

The cylindric plug 1 or the conical plug 2 may be made either of soft machine steel or copper, formed or turned with such a diameter that when rolled with diamond dust it will be slightly in excess of its final size, which excess preferably depends upon the diameter of the plug and may be four thousandths of an inch for a diameter of one inch and may increase one thousandth of an inch for every half inch increase in the diameter of the plug.

Diamond dust may be rolled into the wearing or working surface of the plug by means of a roller 3 made of hard tool steel, and journalled for manual use between the

forks 4 of a handle 5 which may have a rest 6 on its end for bearing against the shoulder of the operator. The diamond dust is mixed in pure olive oil or other like pasty substance, with which it is spread upon the periphery of the roller; and the plug is preferably rotated in a lathe or like support, while the periphery of the roller carrying the diamond dust is pressed against it with sufficient force to embed the dust into the relatively soft surface of the plug.

For ordinary purposes, it is preferred to use the grade of diamond dust known as No. 1 or No. 2, and a sufficient quantity of the same is rolled into the periphery of the plug to completely fill and cover the same so that no metal will appear when inspected under a magnifying glass, or two or more grades of diamond dust may be employed, in which case the coarser dust 7 is first rolled into the working surface of the plug to roughly cover the same, and a finer grade 8 is then applied to more uniformly coat the same, until the entire surface is completely filled and covered, as shown in Fig. 4.

After the diamond dust is thus rolled into the surface of the plug, the same is then smoothed to its exact size, which smoothing may be performed by power driven grinding and polishing wheels, while the core is being rotated in a lathe.

The operation of grinding may be performed by a metal wheel having its periphery rolled with diamond dust, as described for the first step in making the plug; but such a coarser grade of dust is employed in the grinding wheel and the same is so rapidly rotated as compared with the turning of the plug, that the surface of the plug is ground by the wheel.

And finally the polishing operation may be done by a power driven wheel made of boxwood, tortoise shell or hard rubber driven at a high speed. The ground surface of the plug is thus reduced to the exact diameter required, with a surface 9 as hard as diamond and as smooth as glass, which will contact with metal without any appreciable wearing of the plug or abrasion of the metal.

It will be understood, however, that it is not always necessary to use separate grinding and polishing operations, for if a very fine grade of diamond dust is used for completing the rolling, the resulting surface is so uniform that it may be sufficiently

smoothed by a single grinding or polishing operation.

It will be furthermore understood that although diamond dust is described and is believed to be the best material, for the purpose intended, it is evident that sapphire or carborundum dust or the like may be used in lieu thereof without departing from the spirit of the invention; and the reference to diamond dust in the claims is intended to cover such substitute substances.

I claim:

1. A gauge plug made of metal with

diamond dust embedded in its working surface and smoothed to exact size.

2. A gauge plug made of metal with diamond dust embedded in its working surface and ground and polished to exact size.

3. A gauge plug made of metal with different grades of diamond dust embedded in its working surface and smoothed to exact size.

4. A gauge plug made of soft steel or the like with diamond dust embedded in its surface and smoothed to exact size.

CHARLES E. MYERS.

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