Oct. 24, 1944. H. G. VOLIS 2,361,336

MICROMETER PLUG GAUGE

Filed Oct. 6, 1943

FIG.1.

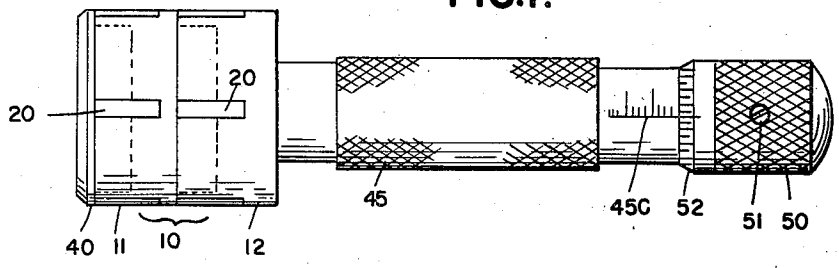


FIG.2.

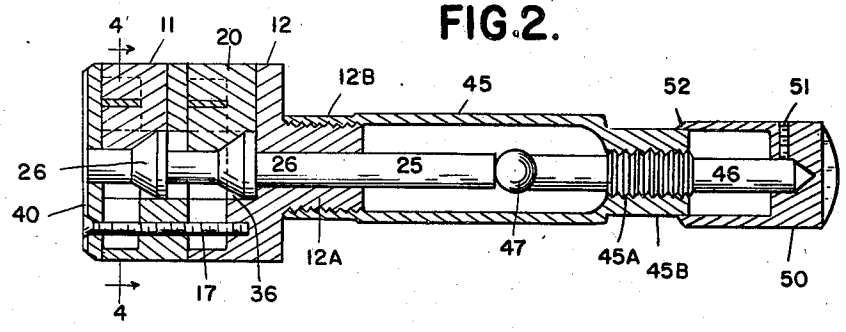
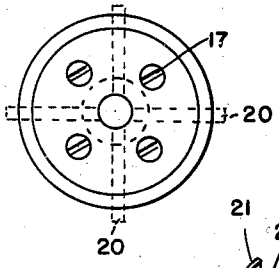


FIG.3.



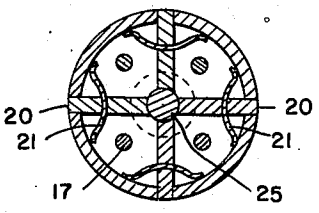
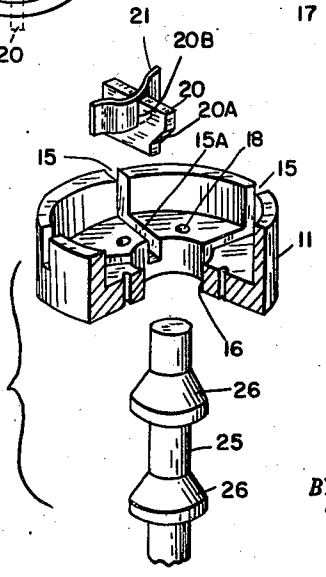


FIG.4.

FIG.5.



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Patented Oct. 24, 1944

2,361,336

UNITED STATES PATENT OFFICE

2,361,336

MICROMETER PLUG GAUGE

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Application October 6, 1943, Serial No. 505,117

2 Claims. (Cl. 33—178)

The present invention relates to plug gauges and specifically to plug gauges having micrometric adjustment whereby to vary the size and obtain accurate measurement of bores.

Among the objects of the invention is a gauge of the type indicated which is greatly simplified and more rugged in construction, and which is easy to manufacture and assemble.

Other objects and advantages will be apparent to those skilled in the art upon reference to the following description and the accompanying drawing in which

Figure 1 is a view in elevation of the gauge.

Figure 2 is a central longitudinal section thereof.

Figure 3 is an end view.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is an exploded view of a portion of the gauge, inverted for clarity.

As shown in the drawing, the gauge consists of a body portion containing a plurality of blades movable radially through the action of a cam carrying rod. The latter is in turn movable longitudinally through the action of a screw as in the conventional micrometer, the number of turns or portions of turns being determined by means of a suitable graduated scale.

In the drawing, the embodiment illustrated comprises a body 10 made up of two portions 11 and 12 which are substantially identical except that portion 12 is provided with an axial boss 12A threaded on the outside as at 12B, while the other portion 11 is flat on the corresponding surface. A further difference is in the axial opening as will appear later.

The portion 11 is shown in perspective in Fig. 5 and consists of a cup having a plurality of slots 15 which pass through the cup walls and are continuations of grooves 15A cut in the bottom of the cup and extending radially from the central opening 16. There are also a plurality of axially extending openings 18 through the cup bottom, through which extend suitable screws 17 adapted to hold the body parts in assembled relation.

In each of the slots 15—15A is a blade 20 provided at one end with an inclined surface 20A and in one lateral edge a narrow slot 20B adapted to receive a flat spring 21.

The blades 20 extend from the bottoms of the slots to the top edge of the cup, being substantially flush therewith, while the spring 21 is arranged with its free ends against the inside surface of the cup wall as shown best in Figure 4. Further, the blades 20 are sufficiently long to have the inclined end 20A extend into the central opening 16 when the outer end is flush with the outside wall of the cup.

Mounted to slide longitudinally in the central opening 16 is a rod 25 having formed thereon the conical cams 26 adapted to coact with blade surfaces 20A to move the blades radially of the cup against the action of springs 21.

As shown best in Figure 2, the body 10 is preferably made of two portions 11 and 12, the portion 11 having just been described. The portion 12, insofar as the cup portion is concerned, is the same as portion 11, having slots similar to slots 15—15A and containing identical blades 20 and springs 21. The central opening 36, however, is somewhat different. It is of the same size as opening 16 for a part of its length, but is smaller where it extends through the threaded boss 12A. This latter portion is preferably of such size as to make an accurate sliding fit with the rod 25.

In assembling the parts so far described, the rod 25 is first passed through the portion 12 and then the blades 20 and springs 21 installed therein. Over the cup portion of the portion 12 is then placed the flat side of portion 11 to act as a cover. After the blades 20 and springs 21 have been assembled in portion 11, a cover plate 40 is applied to the cup of the latter and the screws 17 used to hold the assembly together, these screws passing through the cover plate 40, the portion 11 and threaded into the portion 12.

As shown in Fig. 2, the rod 25 extends beyond the part 12 and is flattened on the end and is enclosed in a suitable tube 45 threaded on the boss 12A. The outer end of tube 45 is closed except for a threaded axial opening 45A and is reduced somewhat in diameter as at 45B, being provided with suitable graduations 45C.

Threaded into the opening 45A is a short rod 46 which extends into tube 45 a sufficient distance to coact with rod 25, being preferably cupped at its end to retain a steel ball 47 which contacts the rod 25 and permits the exertion of thrust upon the latter with a minimum of friction.

Upon the outer end of rod 45 is fixed a thimble 50, a suitable set screw 51 being used. This thimble 50 is provided with a beveled surface 52 suitably graduated as shown, so that the number of turns of the thimble and thereby the rod 46 may be ascertained, as is conventional in micrometers. The tube 45 and thimble 50 are preferably knurled as shown in Figure 1.

It should be noted that while the gauge is shown as consisting of the two sections 11 and 12 and each with four blades 20, it is obvious that the

gauge may be made up of a single section 12 or of three or more sections as desired and that instead of four blades to a section there may be used a greater or less number if found necessary or desirable.

Now having described the invention and the preferred embodiment thereof, it is to be understood that said invention is to be limited, not to the specific details herein set forth, but only by the scope of the claims which follow.

I claim:

1. A micrometer plug gauge consisting of a relatively thin walled cup-shaped body having radial grooves in the inner surface of the cap bottom and slots in the wall of said cup, said slots being continuous with and equal in width with said grooves, blades in said grooves and slots, a transversely arranged flat spring carried by each of said blades and having its free ends acting against the inner surface of said body and tending to move said blades radially inward, means to move said blades radially outward, and means to indicate the amount of such outward movement.

2. A micrometer plug gauge consisting of a relatively thin walled cup shaped body having radial grooves in the inner surface of the cup bottom and slots in the wall of said cup, said slots being continuous with and equal in width with said grooves, blades in said grooves and slots, spring means tending to move said blades radially inward, a cam on the inner end of each blade, an axially located longitudinally movable rod provided with a cam adapted to coact with the blade cam to move said blades radially outward upon longitudinal movement of said rod and means to indicate the amount of such movement.

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