Feb. 1, 1938. W. J. SUMMERS 2,107,222

MICROMETER GAUGE

Filed Feb. 19, 1936

Fig. 1

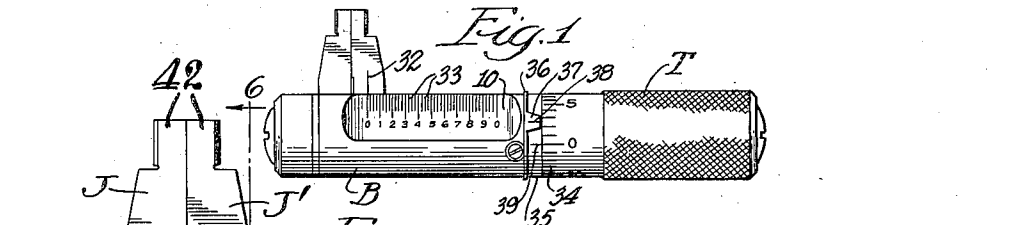


Fig. 2

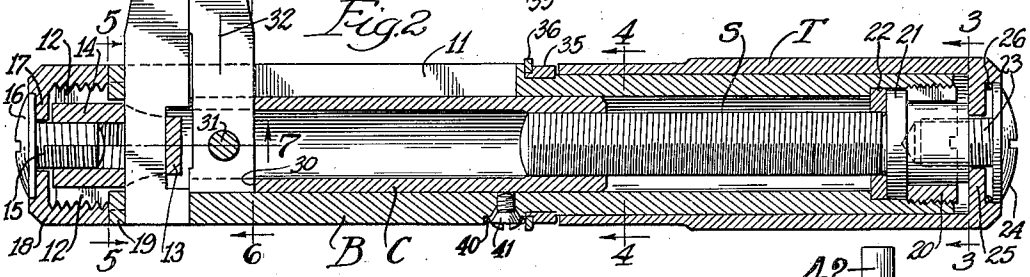


Fig. 3

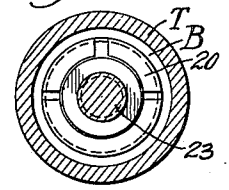


Fig. 4

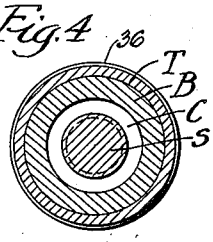


Fig. 5

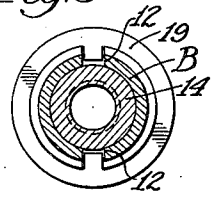


Fig. 6

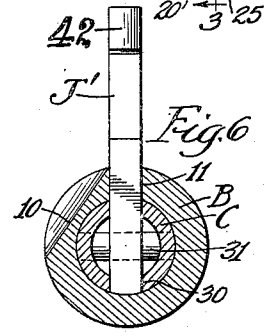


Fig. 7

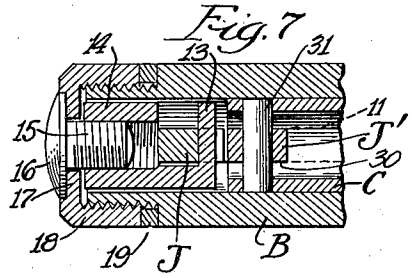


Fig. 8

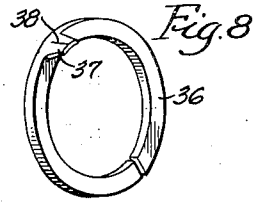


Fig. 9

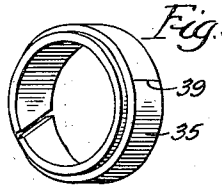
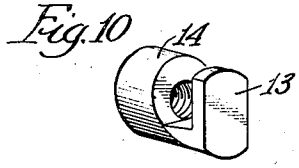


Fig. 10



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UNITED STATES PATENT OFFICE

2,107,222

MICROMETER GAUGE

William J. Summers, Chicago, Ill.

Application February 19, 1936, Serial No. 64,612

8 Claims. (Cl. 33—166)

This invention relates to a micrometer gauge adapted for the measurements of inside surfaces, outside surfaces, or both. The features of improvement hereinafter disclosed have to do with simplicity in construction with consequent reduction in expense, with facility in operation and convenience in computations, with the provision of screw mechanism, including a rotatable thimble, by which the length of the instrument remains constant in all adjusted positions of the jaws, with the provision of two independent marking lines in proximity to one set of graduations by which readings are afforded of both inside and outside measurements, and with the mounting and arrangement of the screw mechanism such that its two principal components are permitted only rotary and longitudinal movements, respectively. These and other features of advantage, as will hereinafter be pointed out, may be embodied in an exemplification of my invention, as set forth in the accompanying drawing, wherein—

Figure 1 is a view in elevation of the micrometer gauge;

Fig. 2 is a longitudinal section through the gauge on an enlarged scale;

Figs. 3, 4, 5, and 6 are transverse sections through the instrument taken, respectively, on lines 3—3, 4—4, 5—5, and 6—6 of Fig. 2;

Fig. 7 is a detail in longitudinal section on line 7 of Fig. 2;

Figs. 8 and 9 are detailed views in perspective of the pointer rings; and

Fig. 10 is a detailed view in perspective of the means by which the fixed jaw is secured in place.

The present gauge comprises a cylindrical barrel B having a flat exterior panel 10 adjacent a slot 11 which extends for perhaps half the length of the instrument in one end region where opposed slots 12 provide a seat for a fixed jaw J which is secured in place as by a hook 13 that is extended from a nut 14 wherein is entered a threaded shank 15 projecting from a head 16 which bears against the end wall 17 of a cap 18 that is screw-threaded on the barrel end in juxtaposition to a ring 19. At the opposite barrel end which is internally recessed and threaded, I have fitted a circular split nut 20 adapted to rest against a shoulder 21 formed on a feeding screw S which extends axially of the barrel throughout the proximate end region. The shoulder in turn bears against a hardened ring 22 that is fitted within a seat internally of the barrel. Within a threaded socket in the feeding screw end is entered a threaded shank 23 having a head 24 which overlies the sunken end wall 25 of a knurled thimble T that is rotatably fitted over the barrel in the same region as that occupied by the feeding screw internally thereof.

As by means of a split spring 26 fitted between the thimble end wall and the head 24, the latter is frictionally locked in a selected adjusted position. The nut 20 which engages the feeding screw shoulder 21 is opposed by the threaded shank 23 in engagement with the feeding screw end socket, the result being a fixed non-rotative mounting of the feeding screw upon the end wall of the thimble, axially with respect thereto and to the instrument barrel. By reason of the nut 20 and associated parts, the feeding screw and thimble are normally secured against disassembly.

Fitted to slide within the barrel is a hollow cylinder C whose length is perhaps half that of the barrel. One end of the cylinder which is telescopically fitted over the feeding screw is internally threaded for engagement therewith whereby it may be moved endwise, in either direction, within the barrel in response to rotations of the feeding screw imparted from the thimble. The cylinder end opposite the feeding screw is formed with opposed slots 30 wherein is fitted a movable jaw J' which extends outwardly through the body slot 11 to complement the fixed jaw J alongside of which it is disposed. As by a pin 31 passing transversely through the movable jaw and opposite walls of the cylinder (see Fig. 7), this jaw is secured fixedly in place. A pointer line 32 which is carried on one side of the movable jaw is disposed adjacent the panel on the barrel exterior where graduations 33 are placed. Also other graduations 34 parallel with the axis of the barrel are arranged around the thimble adjacent its end which lies proximate to a split ring 35 that is fitted within a groove extending circularly of the barrel (see Fig. 9), there being a seat at one end of this ring for the reception of a second ring 36 (see Fig. 8) from which is laterally extended a lip 37 which closely overlies the periphery of the ring 35. This lip is provided with a pointer line 38, and another pointer line 39 is carried upon the ring 35 as well. Either ring, or both, may be adjusted rotatively upon the barrel and then secured as by means of a locking split ring 40 adapted to be spread laterally against the ring 36 which, in turn, is thereupon pressed laterally against its companion ring 35. To spread this locking ring laterally I may utilize the cone head 41 of a binding screw 42 that is entered radially into the barrel wall (see Fig. 2).

The two jaws are provided with end extensions in the form of nibs 42 adapting them to enter between opposed surfaces whose spacing is to be

measured. Also by reason of their straight meeting surfaces, the same jaws may be fitted against the outside surfaces of an object which is to be measured. The graduations on the flat panel of the barrel may be spaced say, .025" apart. By utilizing say, forty threads to the inch on the feeding screw, the graduations on the thimble may be spaced to read .001" apart. Accordingly, the pointer lines on the movable jaw and on the two companion rings **35** and **36** may be consulted, in conjunction with the associated graduations, to obtain a very exact reading. The pointer line on the one ring may be set to indicate inside readings, and on the other to indicate outside readings, whereby the instrument fulfills a dual purpose. As required because of wear or other reasons, the pointer rings may be readjusted from time to time, simply by loosening the screw **42**. Adjustments may also be made to permit a resetting of the feeding screw with respect to the actuating thimble.

A feature which characterizes my improved micrometer gauge is the fixed mounting of the jaw which lies proximate to one end of the instrument, the movement of the other jaw between the fixed jaw and a point intermediately of the two ends of the instrument, the distance which remains constant between the fixed jaw and the instrument end remote therefrom, the fixed longitudinal position of the thimble with respect to the barrel and graduations carried thereupon, and the mounting for the feeding screw which is confined to one end thereof, so as to be wholly independent of the barrel. These several features contribute to simplicity in construction as well as to accuracy in operation and convenience in readings.

I claim:

1. In a micrometer gauge, the combination of a barrel having an elongated slot extended radially through a wall thereof in one end region, a thimble rotatively fitted over the barrel in its opposite end region and secured thereto against longitudinal travel, a ring arranged circumferentially of the barrel adjacent one end of the thimble in a longitudinally fixed relationship with respect to the barrel and thimble and rotatable with respect thereto, means for adjustably securing the ring against movement relative to the barrel, screw mechanism connected for operation with the thimble disposed wholly within the barrel, a pair of jaws extended laterally of the barrel, one carried thereby and the other extended through the barrel slot for connection with the screw mechanism adapted to be moved thereby in response to operations of the thimble, graduations on the barrel adjacent the slot and other graduations on the thimble adjacent the ring, and pointer lines on the movable jaw and ring adapted to furnish readings in conjunction with the graduations proximate thereto.

2. In a micrometer gauge, the combination of a barrel having an elongated slot extended radially through a wall thereof in one end region, a thimble rotatively fitted over the barrel in its opposite end region, a pair of rings independently adjustable circumferentially of the barrel adjacent an end of the thimble, screw mechanism connected for operation with the thimble disposed wholly within the barrel, a pair of jaws extended laterally of the barrel, one having a fixed mounting thereupon and the other extended through the barrel slot for connection with the screw mechanism adapted to be moved thereby in response to operations of the thimble, graduations on the barrel adjacent the slot and other graduations on the thimble adjacent the two rings, pointer lines on each of said rings adjacent the thimble graduations, and pointer lines on the movable jaw adapted to furnish readings in conjunction with the graduations proximate thereto and the pointer lines on the rings in cooperation with the graduations on the thimble.

3. In a micrometer gauge, the combination of a cylindrical barrel having an elongated slot extended radially through a wall thereof in one end region, a thimble rotatively fitted over the barrel in its opposite end region and held against longitudinal movement with respect thereto, screw mechanism within the barrel having one element connected for rotation with the thimble and another element mounted for longitudinal travel within the barrel, and a pair of jaws laterally extended from the barrel, one fixedly mounted thereon and the other affixed to the longitudinally traveling element of the screw mechanism and extended therefrom through the barrel slot to lie alongside of the fixed jaw, the interior walls of the barrel engaging slidingly with the movable jaw to serve as a guide and support therefor.

4. In a micrometer gauge, the combination of a cylindrical barrel, a jaw fixedly mounted on the barrel adjacent one end thereof, a thimble on the barrel adjacent its opposite end having a mounting for rotary movements and fixed against movement longitudinally of the barrel, screw mechanism connected for operation with the thimble and extended toward the fixed jaw, a second jaw movable with respect to the first jaw connected with the screw mechanism and adapted to be operated thereby, graduations on the barrel adjacent the movable jaw, a pointer on the movable jaw adjacent said graduations adapted to furnish readings in conjunction therewith, the interior walls of the barrel engaging slidingly with the movable jaw to serve as a guide and support therefor, graduations around the thimble adjacent an end thereof, and a marker on the barrel adjacent the graduations adapted to furnish readings in conjunction therewith.

5. In a micrometer gauge, the combination of a cylindrical barrel, a jaw fixedly mounted on the barrel adjacent one end thereof, a thimble on the barrel adjacent its opposite end having a mounting for rotary movements and fixed against movement longitudinally of the barrel, screw mechanism connected for operation with the thimble and extended toward the fixed jaw, a second jaw movable with respect to the first jaw connected with the screw mechanism and adapted to be operated thereby, graduations on the barrel adjacent the movable jaw, a pointer on the movable jaw adjacent said graduations adapted to furnish readings in conjunction therewith, the interior walls of the barrel engaging slidingly with the movable jaw to serve as a guide and support therefor, graduations around the thimble adjacent an end thereof, and a pointer adjustable circumferentially of the barrel adjacent the graduations adapted to furnish readings in conjunction therewith.

6. In a micrometer gauge, the combination of a barrel, a jaw fixedly mounted on the barrel adjacent one end thereof, a thimble on the barrel adjacent its opposite end having a mounting for rotary movements only, screw mechanism connected for operation with the thimble and

extended toward the fixed jaw, a second jaw movable with respect to the first jaw connected with the screw mechanism and adapted to be operated thereby, graduations around the thimble adjacent an end thereof, said jaws constructed for external and internal measurements, and two pointers independently adjustable circumferentially of the barrel adjacent the graduations adapted to furnish two sets of readings in conjunction therewith corresponding with the external and internal measurements respectively to be made with the gauge jaws.

7. In a micrometer gauge, the combination of a pair of relatively movable jaws for external and internal measurements, a barrel whereon the jaws are mounted, rotary means for moving one jaw relative to the other, graduations carried by the rotary means, and two pointers independently adjustable circumferentially of the barrel adjacent the graduations adapted to furnish two sets of readings in conjunction therewith corresponding with external and internal measurements respectively to be made by the gauge jaws.

8. In a micrometer gauge, the combination of a pair of relatively movable jaws for external and internal measurements, a barrel whereon the jaws are mounted, rotary means for moving one jaw relative to the other, graduations carried by the rotary means, two pointers independently adjustable circumferentially of the barrel adjacent the graduations adapted to furnish two sets of readings in conjunction therewith corresponding with external and internal measurements respectively to be made by the gauge jaws, and a single means for locking both pointers in selected positions of adjustment.

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