April 19, 1949. R. H. SACHTLEBER 2,467,499

MICROMETER

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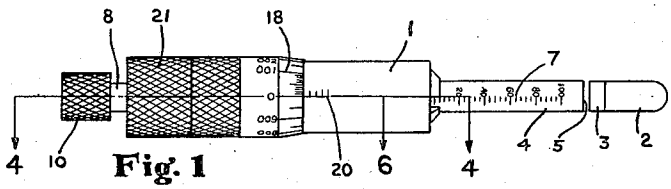


Fig. 1

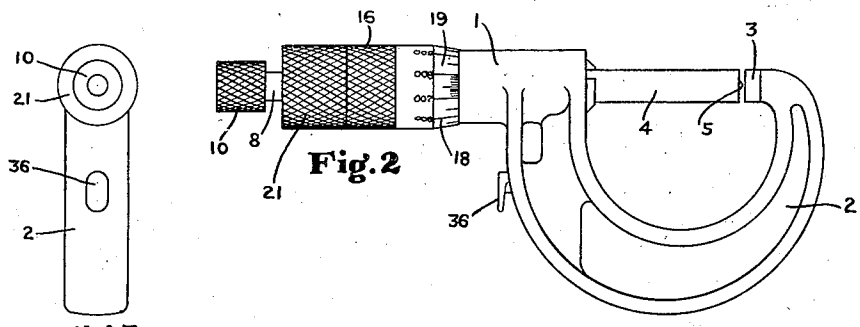


Fig. 2

Fig. 3

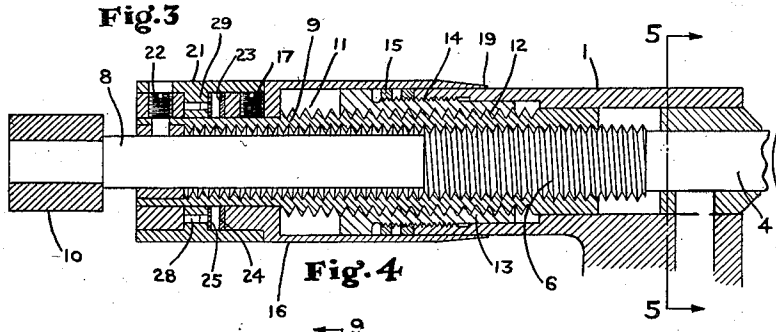


Fig. 4

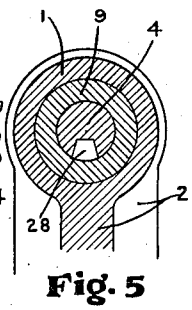


Fig. 5

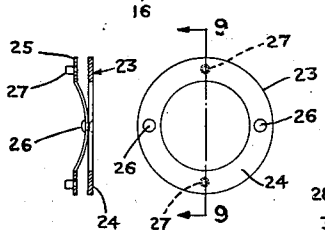


Fig. 9 Fig. 8

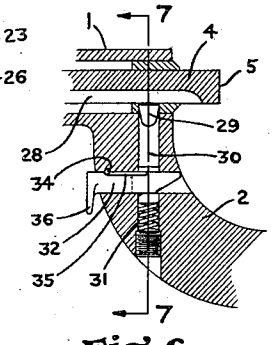


Fig. 6

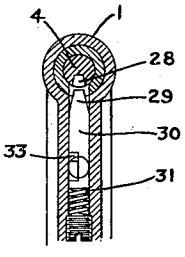


Fig. 7

Rudolph H. Sachtleber
INVENTOR

BY

ATTORNEY

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MICROMETER

Rudolph H. Sachtleber, East Orange, N. J.

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3 Claims. (Cl. 33—164)

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This invention relates to micrometer gauges and an object of the present invention is to provide a micrometer which is easier to manufacture than standard micrometers of approved type, and one which will have long life without impairment of its accuracy in that its movable work engaging parts will be subject to less wear than is had in micrometers of present day approved construction.

Another object of the invention is to provide a micrometer which is easy to read, one in which the spindle may be quickly moved to the work to be measured, and one in which the work engaging spindle does not turn during the final setting thereby reducing wear on the spindle and providing more accurate measurements.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a micrometer of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings—

Figure 1 is a top plan of the improved micrometer.

Figure 2 is a side elevation of the micrometer.

Figure 3 is an end view of the micrometer.

Figure 4 is a longitudinal section through the micrometer taken on the line 4—4 of Figure 1.

Figure 5 is a cross-section taken on the line 5—5 of Figure 4.

Figure 6 is a fragmentary vertical section through the micrometer taken substantially on the line 6—4 of Figure 1.

Figure 7 is a section taken on the line 7—7 of Figure 6.

Figure 8 is a plan view of a friction member employed in a micrometer structure.

Figure 9 is a section on the line 9—9 of Figure 8.

Referring more particularly to the drawings the improved micrometer includes a body 1 having a depending accurate saddle or anvil carrying member 2 formed thereon to which the micrometer anvil 3 is attached in any suitable manner. A spindle 4 is adjustably carried by the body 1 and its work engaging surface 5 co-operates with the work engaging surface of the anvil 3 to measure work.

The spindle 4 has a portion of its outer surface externally screw threaded as shown at 6 with the indicia carried portion 7 and the operating

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portion 8 formed at the outer ends. The threaded portion 6 of the spindle 4 is threadably engaged in the internal screw threads of the sleeve 9 and a knurled head 10 is carried by the operating end 8 of the spindle 4 for rotating the spindle to cause movement thereof longitudinally of the sleeve 9. The sleeve 9 has external threads 11 on its outer surface which co-operate with the internal threads 12 in a sleeve 13. The sleeve 13 is carried by the body 1 and is adjustably connected thereto by means of a threaded connection 14 and a lock nut structure 15. This adjustable connection between the body 1 and the sleeve 13 will permit adjustment of the spindle 4 with respect to the relative portions of the sleeve 13, sleeve 9 and anvil 3 to compensate for wear.

The threads on the outside of the sleeve 9 are larger and less in number per inch, than are the internal threads or the threads on the inside of the sleeve 9. These threads may be in the relation of twenty (20) threads per inch on the outside of the sleeve 9 and twenty-five (25) threads per inch on the inside of the sleeve 9, or in any other suitable relation to each other to provide the desired differences in speed of longitudinal movement of the spindle by its rotation or by the rotation of the thimble 16.

The sleeve 9 is connected to the thimble 16 by a set screw 17 and the thimble 16 which is in the form of a sleeve-like shell has graduations 18 on its tapered inner-end 19 which co-operate with longitudinally extending graduations 20 formed on the outer surface of the body 1. The sleeve 9 which is the internal and external threaded sleeve is connected to a rotating sleeve 21 by a set-screw or dog-point screw 22 and this rotating sleeve 21, by means of which the sleeve 9 is rotated is connected to the thimble 16 by a friction clutch structure generically indicated at 23 in Figure 4 of the drawings. The friction clutch structure 23 comprises a friction disc or ring 24 which engages the outer end of the thimble 16 and has a spring ring 25 connected thereto by rivets 26. The spring ring 25 is bowed and has pins 27 carried thereby which pins engage in openings 28 in the internal flange 29 formed on the sleeve 21. The friction clutch structure 23 will permit a slipping action between the sleeve 21 and the thimble 16 when the pressure of the spindle 4 on the work (not shown) reaches a degree in excess of the strength or tension of the spring ring 25.

The spindle 4 is provided with a longitudinally extending key-way 28 which is adapted to receive the tapered end 29 of a locking plunger or key

30. The locking plunger or key 30 is spring pressed by means of a spring 31 and it is carried by the anvil carrying saddle or member 2 as clearly shown in Figures 6 and 7 of the drawings. A locking pin 32 is provided for locking the plunger 30 in inoperative position out of the key-way 28. The locking pin 32 is slidably carried by the saddle 2 and moves into and out of a groove 33 formed in the plunger 30. The movement of the locking pin 32 is limited by means of the pin 34 which rides in the slot 35 formed in the locking pin. The locking pin 32 may have an operating head or lip 36 formed on its outer end.

In operation, when any piece of work is to be measured the work engaging end 5 of the spindle 4 is moved inwardly away from the anvil 3 so that the piece of work to be measured may be positioned between the spindle 4 and the anvil 3. During this time the locking plunger 30 is held out of the key-way 28 by the locking pin 32. The spindle is then moved forward by its rotation until it touches the work to be measured at which time the locking pin 32 is moved out of locked position relative to the plunger 30 and the plunger 30 then moves into the key-way by action of the spring 31. In the event that the plunger 30 and key-way are not in proper position for interengagement, the spindle is turned in reverse or left hand direction for a part of a turn or until the key or locking plunger 30 passes into the key-way 28. The spindle is thus locked against rotary movement but is free to move longitudinally through the body 1, thus the spindle is moved against the work in close relation thereto for measuring the work. The accurate measurement of the work in thousandths of an inch is provided by the movement of the spindle finally against the work through the rotation of the thimble 16 by means of the sleeve 21 which gives the final accurate movement of the spindle. The friction clutch structure 23 is tensioned so as to prevent too tight a pressure between the spindle and the work. The thickness or diameter of the work being measured is then read on the scale 7 plus the scales 18 and 20 which will give the accurate reading of the thickness or diameter of the work in thousandths of an inch.

It will be understood that the invention is not to be limited to specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In a micrometer, a body having a stationary work engaging anvil thereon, a spindle extending through said body, and having one end thereof co-operating with said anvil for measuring work, threads on said spindle for a portion of its length, a sleeve provided with internal threads and external threads, said external threads being larger and less in number to the inch than said internal threads, the threads on said spindle engaging said internal threads, a thimble rotatable independently of said spindle and co-acting with said external threads, means connecting said thimble to said sleeve for rotating the sleeve upon rotation of the thimble, a second internally threaded sleeve co-operating with said external thread for moving the thimble and said first named sleeve longitudinally upon rotation of the thimble, and means adjustable on said second sleeve for adjusting the position of said spindle to compensate for wear on the anvil.

2. In a micrometer, a body having a stationary work engaging anvil thereon, a spindle extending through said body and having one end thereof co-operating with said anvil for measuring work, threads on said spindle for a portion of its length, a sleeve provided with internal threads and external threads, said external threads being larger and less in number to the inch than said internal threads, the threads on said spindle engaging said internal threads, a thimble rotatable independently of said spindle and co-acting with said external threads, means connecting said thimble to said sleeve for rotating the sleeve upon rotation of the thimble, a second internally threaded sleeve co-operating with said external thread for moving the thimble and said first named sleeve longitudinally upon rotation of the thimble, means adjustable on said second sleeve for adjusting the position of said spindle to compensate for wear on the anvil, and locking means for locking said spindle against rotation at predetermined times whereby said spindle will move longitudinally but not rotate upon combined rotary and longitudinal movement of said thimble.

3. In a micrometer, a body having a stationary work engaging anvil thereon, a spindle extending through said body and having one end thereof co-operating with said anvil for measuring work, threads on said spindle for a portion of its length, a sleeve provided with internal threads and external threads, said external threads being larger and less in number to the inch than said internal threads on said spindle engaging said internal threads, a thimble rotatable independently of said spindle and co-acting with said external threads, means connecting said thimble to said sleeve for rotating the sleeve upon rotation of the thimble, a second internally threaded sleeve co-operating with said external thread for moving the thimble and said first named sleeve longitudinally upon rotation of the thimble, means adjustable on said second sleeve for adjusting the position of said spindle to compensate for wear on the anvil, said spindle provided with a longitudinally extending key-way, a spring pressed locking key carried by said body for engagement with said spindle to hold the spindle against rotation, and a locking plunger for holding said key out of engagement with said spindle.

RUDOLPH H. SACHTLEBER.

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