Aug. 12, 1924. 1,504,680

J. FERNANDEZ

ADJUSTABLE MICROMETER

Filed Aug. 29, 1921

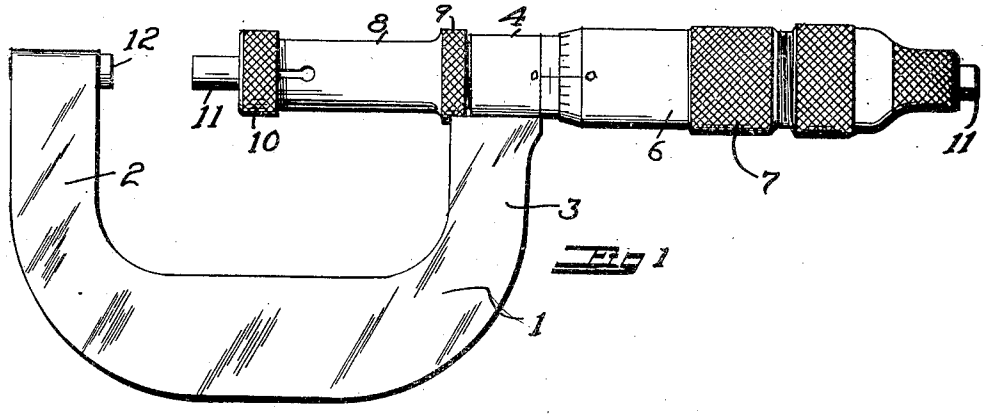


Fig. 1

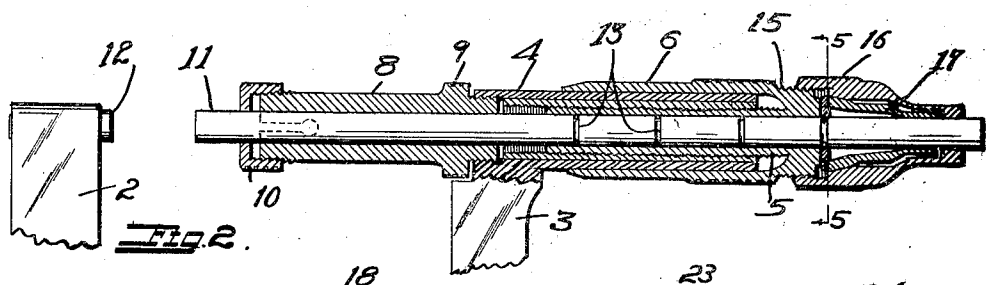


Fig. 2.

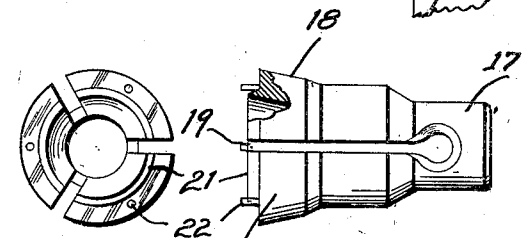


Fig. 3.

Fig. 4.

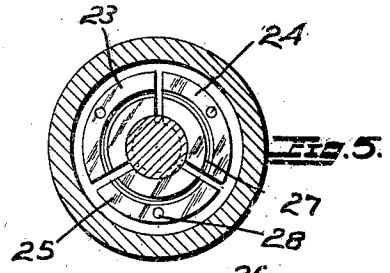


Fig. 5.

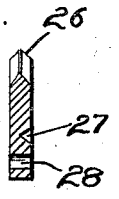


Fig. 7.

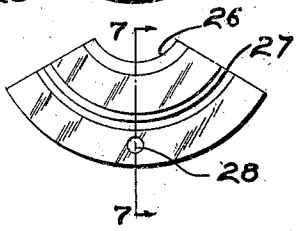


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSEPH FERNANDEZ, OF OAKLAND, CALIFORNIA.

ADJUSTABLE MICROMETER.

Application filed August 29, 1921. Serial No. 496,237.

To all whom it may concern:

Be it known that I, JOSEPH FERNANDEZ, a citizen of Argentine Republic, residing at Oakland, in the county of Alameda, State of California, have invented a new and useful Adjustable Micrometer, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to an adjustable micrometer and its object is to produce a micrometer which is capable of being used throughout a considerably greater range than the ordinary micrometer, the micrometer stem having a series of grooves therein to enable the stem to be placed at any one of several fixed distances away from the measuring arm, and means is provided to seat the retaining devices for said stem in such a manner as to always hold the stem in a fixed relation with the micrometer sleeve and screw.

It will be understood by those skilled in the art that the thread of a micrometer is ordinarily a very fine thread, usually forty to the inch, and the micrometer reading sleeve is provided with twenty-five graduations, thereby enabling one to read thousands directly. The micrometer thread is so very fine that it is ordinarily used only through a few turns in any given instance, but if a given micrometer was to be used over a considerable range much time would be lost in transferring the measuring stem from one position to the other, because of the fineness of the threads. In the present instance, not only is there no time lost in transferring the stem from one position to another where a considerable range is to be measured over, but the measuring sleeve need never be moved more than one-half inch, and the range of operation of a given micrometer may be increased to the total size of the micrometer arms at will.

Another object of the invention is to produce means whereby the measuring stem will be supported when used in an extended position to prevent faulty measurements from being made, due to slight bending of the stem.

Other objects of the invention will appear as the description proceeds.

An embodiment of the invention is shown in the accompanying drawings in which the same reference numeral is applied to the same portion throughout, but I am aware that there may be modifications thereof.

Fig. 1 is a side elevation of the complete micrometer.

Fig. 2 is a side elevation of the micrometer with a portion of the arms broken away for purpose of illustration, and showing the adjustable stem and its associate parts in section.

Fig. 3 is an end elevation of the device for locking the adjustable stem in any given position.

Fig. 4 is a side elevation of the device shown in Figure 3.

Fig. 5 is a transverse sectional view on the line 5—5 Figure 2, showing the locking washers.

Fig. 6 is a plan view of one of the locking washers, and

Fig. 7 is a transverse sectional view of one of the locking washers on the line 7—7 looking in the direction of the arrows.

The numeral 1 indicates the body of the micrometer, said body having two arms 2 and 3. The arm 3 has a tubular head 4, which tube has an internally threaded bushing to receive the stem 5. This stem has the graduated reading thimble 6 integral therewith, which thimble is rotated by means of the knurled portion formed at 7.

Within one end of the tubular head 4, a bearing tube 8 is secured, said tube having a knurled portion 9 to aid in securing it in position. The object of the bearing tube 8 is to provide for stiffening the rod 11 when it is used in an extended position such as is shown in Figs. 1 and 2. This tube is split in the middle of the other end and has the knurled lock nut 10 thereon to fix the stem 11 in a given position.

The stem 11 operates against an abutment 12 on the arm 2, and the grooves 13 in the stem 11 are all arranged so that they will secure the stem 11 at some definite distance from the abutment 12. For example, in the present instance the grooves 13 are precisely one-half inch apart and are arranged to secure the end of the stem 11 at any half inch distant from the abutment 12, when the two zeros of the tubular head 4 and reading thimble 6 coincide.

The end of the reading thimble is threaded as indicated at 15 to receive a hollow nut 16. This nut bears upon the frusto conical faces of the member 17 which slides over

the stem 11. This member has three sections 18, 19 and 20 spring-held in the expanded position, and each of these sections is provided with a knife edge 21 and with a pin 22.

On the top or end of the reading thimble 6 there is a surface at right angles to the axis of the stem 11 and which supports a flat washer in three sections as indicated at 23, 24 and 25. These washer sections have their edges wedge-shaped as indicated at 26 and they are each provided with a groove as shown at 27 and with a hole 28 larger than the pins 22. The purpose of the pins 22 is to prevent the washer sections from moving circumferentially and becoming engaged with one of the sections 18, 19, 20, not intended to be engaged by that particular washer section.

It will be understood by those skilled in the art that in the operation of a micrometer, it is very essential to have the parts mechanically correct as to their relative movements, in order to prevent the micrometer from being inaccurate in its measurements, and this is obtained in the present instance by forcing the three washer sections to move by the wedge action of the knife edges 21 because of the pressure exerted thereon against the top of the measuring thimble 6 which is arranged to be truly at right angles to the axis of the stem 11.

The operation of the apparatus is as follows: Assuming it to be desired to measure an object between one-half inch and such a space as would go between the abutment 12 and locknut 10, the thimble 6 is rotated until the proper reading can be taken on the graduations shown in Figure 1. If the micrometer is to be on larger work, the bearing tube 8 is removed from the micrometer. The hollow nut 16 is then loosened and the stem is moved outwardly until another groove engages the sectional wedges; thereupon the hollow nut 16 is tightened on the member 17, and its pressure upon the sectional washers forces them into engagement with the stem to hold it in a given position without moving it longitudinally during such tightening operation.

What I claim is as follows but various modifications may be made in the construction shown in the drawings and above particularly described form, within the purview of my invention:

1. An adjustable micrometer, having a fixed abutment and a slidable measuring stem, a tubular extension bearing supported on a tubular head and adapted to support said stem when it is in an extended position and contacting with the stem for a considerable distance to form a bearing for said stem, and a micrometer for reading the measurements.

2. In a micrometer the combination with a micrometer body having a fixed abutment and a slidable stem with a plurality of spaced grooves cut therein, of a washer comprising segmental parts, means to move said parts at right angles to the axis of the stem to lock the stem in any one of several adjustments, and means to shift the stem and locking mechanism bodily to determine a given measurement.

3. An adjustable micrometer having a fixed abutment, a slidable measuring stem, means to secure the slidable measuring stem at various united positions, means to move said stem short distances when fixed in the united positions to provide accurate measurements, a tubular member secured on the micrometer forming an extension bearing for the slidable stem, and a lock nut thereon to tighten the tubular bearing on the stem to provide against wear the micrometer having scales for making readings.

In testimony whereof I have hereunto set my hand this 22nd day of August, A. D. 1921.

JOSEPH FERNANDEZ.