

F. O. JAKES, JR.
MICROMETER CALIPERS.
APPLICATION FILED JUNE 11, 1907.

902,492.

Patented Oct. 27, 1908.

Fig. 1.

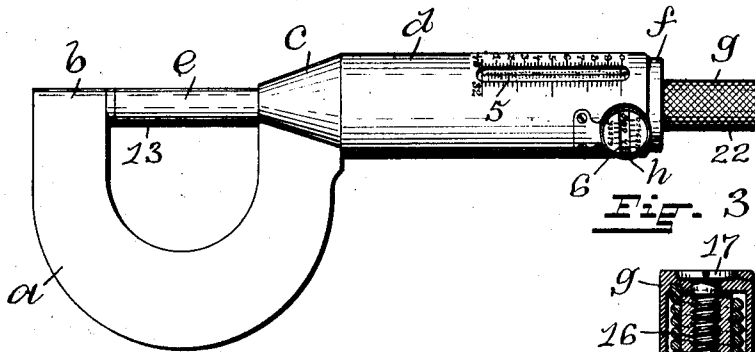


Fig. 3.

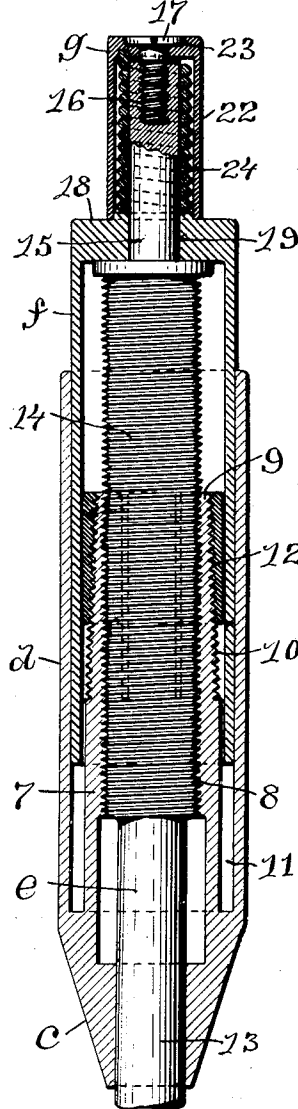


Fig. 2.

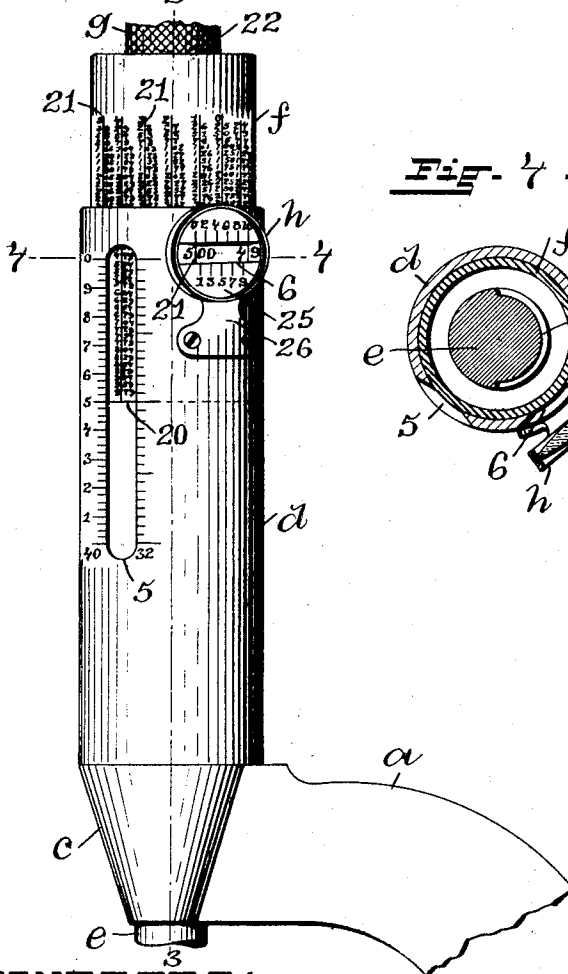
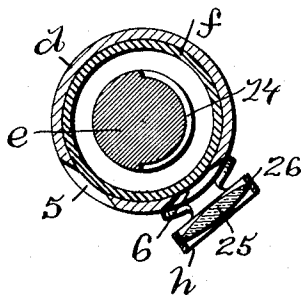


Fig. 4.



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MICROMETER-CALIPERS.

No. 902,492.

Specification of Letters Patent.

Patented Oct. 27, 1908.

Application filed June 11, 1907. Serial No. 378,337.

To all whom it may concern:

Be it known that I, FERNANDO O. JAKES, Jr., a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Micrometer-Calipers, of which the following is a specification.

This invention has reference to an improvement in micrometer calipers and more particularly to an improvement in micrometer calipers having or adapted to have measurement-indicating means reading to one thousandth of an inch or less.

The leading object of my present invention is to provide for readings in plain figures and by means of ordinary scales similar to those of the foot rule, so as to obviate the mental calculations required by verniers and by the ordinary graduations of micrometer calipers, and thus to prevent the mistakes due to such calculations.

Another object is to provide for so indicating in plain figures successive multiples of a micrometric fractional unit, in a series as long as may be required, by means of a micrometer caliper of the simplest form, which (apart from the customary means for taking up wear) is composed of only two relatively movable members, one of which is a rotatable and longitudinally movable spindle member and the other is a frame member, and in which the screw-threaded portions are inclosed and protected against dirt and rust and the movable sleeve is inclosed and protected against accidental disturbance.

Another object of my invention is to improve the construction of a micrometer caliper adapted to give readings to one ten thousandth of an inch, whereby such readings of the caliper are easily accomplished without the use of dials or similar devices, the construction of the caliper is simplified and the cost of manufacturing the same reduced.

Other objects are set forth in the general description which follows.

My present invention consists in certain novel combinations of parts hereinafter set forth and claimed, and in an improved micrometer caliper embodying the same or any of them.

Figure 1 is a side view of my improved micrometer caliper. Fig. 2 is an enlarged detail view, showing the frame broken away and the caliper barrel in the position it would

assume to show a reading of one-half an inch or five hundred one-thousandths of an inch. Fig. 3 is an enlarged longitudinal sectional view taken on line 3 3 of Fig. 2, and Fig. 4 is an enlarged transverse sectional view taken on line 4 4 of Fig. 2.

In the drawings, *a* indicates the U-shaped frame of the caliper, *b* the anvil end of the frame, *c* the spindle end of the frame, *d* the tubular sleeve extending from the frame end *c*, *e* the spindle, *f* the barrel on the spindle, *g* the frictional turning member on the end of the barrel, and *h* the magnifying glass secured to the sleeve *d* of the caliper.

The tubular sleeve *d* has a longitudinal opening 5, on one edge of which is a one-inch scale divided into thirty-seconds of an inch and on the opposite edge a one-inch scale divided into fortieths of an inch, a transverse opening 6 having scales along its sides indicating one one-thousandth of an inch divided into ten equal parts by alternate lines on the respective sides of the opening to indicate the ten-thousandths of an inch, and an internal tube 7 having the screw-threaded bore 8 for the spindle *e*, and a split end 9 having the tapered externally screw-threaded portion 10, Fig. 3. The tube 7 forms an annular space 11 intermediate the sleeve *d* and the tube 7 for the barrel *f*; and a nut 12, Fig. 3, for taking up wear, is screwed onto the split end 9 of the tube 7 within the same space.

The spindle *e* has the usual measuring end 13 which extends through a hole in the frame end *c*, the screw-threaded portion 14 having a suitable micrometer screw-thread in screw-thread engagement with the bore 8 of the tube 7, and the stud 15 on its outer end having the screw-threaded hole 16 in its outer end for the screw 17, as shown in Fig. 3.

The barrel *f* has the outer end 18 in which is a central hole 19 for the stud 15 by which the barrel is secured to the spindle *e* by driving the same onto the stud 15. The barrel has on its peripheral face a circumferential transverse index line 20 which shows through the longitudinal opening 5 in the sleeve *d* and indicates measurements of one thirty-second or one fortieth of an inch on its respective scales, a series of longitudinal graduation lines 21 dividing the peripheral face of the barrel into equal spaces each of which is the equivalent of one one-thousandth of an inch, this being the micrometric fractional unit, and figures forming numerals from zero to

999 in succession in a continuous spiral line, corresponding to the pitch of the thread 14 on the spindle *e*, and arranged in longitudinal rows associated with said graduation lines 21, respectively, and in common therewith parallel to each other and to the axis of the barrel. These lines 21 and the figures associated therewith show successively through the transverse opening 6 in the sleeve *d* and indicate measurements of thousandths of an inch.

The frictional turning member *g* consists of a thimble 22 knurled on its peripheral face, as shown in Fig. 1, and having a central countersunk hole 23 in its outer end through which the thimble is rotatably secured to the end of the stud 15 by the screw 17, and a left-hand coiled spring 24 secured at its outer end to the closed end of the thimble 22 (by an outwardly-bent end on the spring entering a hole in the thimble) and having a snug fit on the stud 15, as shown in Fig. 3.

The magnifying glass *h* consists of a suitable lens 25 mounted in the frame 26 which is secured to the sleeve *d* in a position to bring the lens over the opening 6 in the sleeve, as shown in Figs. 2 and 4.

In the operation of my improved micrometer caliper the measurement is taken by turning the frictional turning member *g* to the left to open the caliper. This movement tends to tighten the coils of the spring 24 onto the stud 15 thereby practically locking the frictional turning member *g* to the spindle *e*. In closing the caliper onto the work to be calipered the frictional turning member *g* is turned to the right. This movement of the member *g* tends to uncoil the spring 24, leaving just enough frictional contact between the spring and the stud 15 to turn the spindle *e*, when the end 13 of the spindle is brought into extremely delicate contact with the work, without jar and without depending on the delicacy of touch of the operator. The readings of the caliper in thirty-seconds and fortieths of an inch are given through the opening 5 by the annular transverse line 20, and in one-thousandths or ten-thousandths by the longitudinal lines 21 and said numeral-forming figures through the opening 6 and lens 25 which latter magnifies the same to the eye four or more diameters. In the position shown in Fig. 2, the reading of the caliper is one-half an inch, sixteen thirty-seconds of an inch, twenty fortieths of an inch, and five hundred one-thousandths of an inch. By turning the barrel *f* to the left to bring the line 21 at the number 500 on the barrel into alinement with the line having the numeral 1 of the scale on the inner edge of the opening 6, the reading would be five hundred thousandths and one ten-thousandth of an inch, which can be easily seen through the magnifying glass *h*.

The line on the sleeve *d* behind the magni-

fying glass *h* marked 0 may be termed distinctively the index line, and this line or the lines behind the magnifying glass as a whole and the opening 6, or their mechanical equivalents, may be termed measurement indicating means adapted to register with the graduation lines 21 successively and to expose to view the measurement indicating numerals on the barrel *f*.

It is evident that the frame 26 of the magnifying glass *h* could be pivotally secured to the sleeve *d* whereby the glass could lie flat with the sleeve *f* when not in use, or brought up into correct focus when the fine readings of the caliper are required, without materially affecting the spirit of my invention.

I hereby disclaim in favor of my companion specification forming part of an application for patent filed November 23, 1907, Serial No. 403,446, all those patentable combinations of parts hereinbefore described which are generic with reference to the subject matter of my present specification and that of said companion specification.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A micrometer caliper having, in combination, an internally screw-threaded part, a rotatable and endwise movable spindle having a threaded portion interacting therewith, a barrel movable with said spindle and provided on its periphery with figures forming numerals representing successive thousandths from 0 to 999 for indicating micrometric measurements, arranged in a spiral series corresponding with the screw thread and in longitudinal rows parallel to each other and to the axis of the barrel, and with longitudinal graduation lines dividing the periphery of the barrel into equal spaces each of which is the equivalent of one such thousandth, associated with the longitudinal rows of said figures, respectively, and an outer sleeve immovably connected with the part first named and provided with a transverse index opening through which the appropriate measurement indicating figures on said barrel and a portion of the graduation line associated therewith are exposed to view and with an index line adjacent to said opening arranged to aline with said graduation lines successively.

2. A micrometer caliper having, in combination, an internally screw-threaded part, a rotatable and endwise movable spindle having a threaded portion interacting therewith, a barrel movable with said spindle and provided on its periphery with figures forming numerals representing successive thousandths from 0 to 999 for indicating micrometric measurements, arranged in a spiral series corresponding with the screw thread and in longitudinal rows parallel to each other and to the axis of the barrel, and

with longitudinal graduation lines dividing the periphery of the barrel into equal spaces each of which is the equivalent of one such thousandth, associated with the longitudinal rows of said figures, respectively, and an outer sleeve immovably connected with the part first named and provided with a transverse index opening through which the appropriate measurement indicating figures on said barrel and a portion of the graduation line associated therewith are exposed to view, together with an index line adjacent to said opening arranged to aline with said graduation lines successively and also provided with scales the graduation lines of which are located adjacent to opposite transverse edges of said opening and are arranged to read with reference to said graduation lines on the barrel successively to indicate intermediate measurements.

3. A micrometer caliper having, in combination, an internally screw-threaded part, a rotatable and endwise movable spindle, having a threaded portion interacting therewith, a barrel movable with said spindle and provided on its periphery with figures forming numerals representing successive thousandths from 0 to 999 for indicating micrometric measurements, arranged in a spiral series corresponding with the screw thread and in longitudinal rows parallel to each other and to the axis of the barrel, and with longitudinal graduation lines dividing the periphery of the barrel into equal spaces each of which is the equivalent of one such thousandth, and associated with the longitudinal rows of said figures, respectively, an outer sleeve immovably connected with the part first named and provided with a transverse index opening through which the appropriate measurement indicating figures on said barrel and a portion of the graduation line associated therewith are exposed to view, together with an index line adjacent to said opening arranged to aline with said graduation lines successively and also provided with scales the graduation lines of

which are located alternately adjacent to opposite transverse edges of said opening and arranged to read with reference to said graduation lines on the barrel successively to indicate intermediate measurements, and a magnifying glass secured to said sleeve in a position to locate its lens over said opening and over said lines adjacent thereto.

4. In a micrometer caliper, the combination with a frame *a*, a sleeve *d*, a spindle *e* having the stud 15 with the screw-threaded hole 16 in its end for a screw 17 and a barrel *f* on the spindle *e*, of a frictional turning member *g* consisting of a knurled thimble 22 having a central countersunk hole 23 through which the thimble is rotatably secured to the end of the stud 15 by the screw 17 and a left hand coiled spring 24 secured at one end to the thimble 22 by an outwardly-bent end on the spring entering a hole in the thimble and having a snug fit on the stud 15, as described.

5. In a micrometer caliper, the combination of the following instrumentalities: a U-shaped frame *a* having the anvil end *b* and the spindle end *c*, a sleeve *d* having a longitudinal opening 5 and a transverse opening 6 on the spindle end *c* of the frame *a*, an internal screw-threaded tube 7 on the spindle end *c* in the sleeve *d*, a screw-threaded spindle *e* in the tube 7 and extending through a hole in the spindle end *c* of the frame *a*, a barrel *f* on the spindle *e* in the sleeve *d* and having a transverse line, a series of longitudinal lines and numeral-forming figures reading from zero to 999 in a continuous spiral line on the peripheral face of the barrel, a frictional turning member *g* on the spindle *e*, and a magnifying glass *h* secured to the sleeve *d* in a position to bring the lens over the transverse opening 6, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FERNANDO O. JAKES, Jr.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER.