(No Model.)

E. L. HOLCOMB.

MICROMETER CALIPERS.

No. 479,807. Patented Aug. 2, 1892.

Fig-1

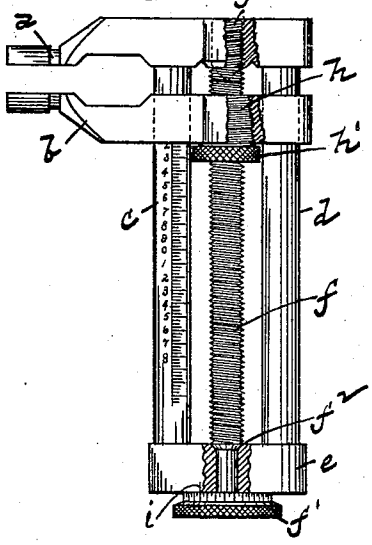


Fig-2

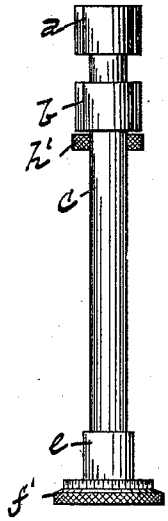


Fig-3

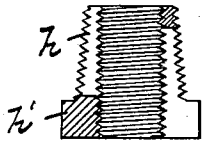


Fig-4

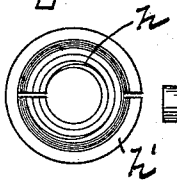
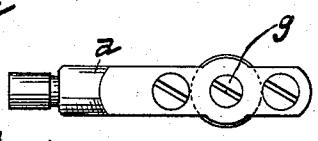


Fig-5



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EDWIN L. HOLCOMB, OF SPRINGFIELD, MASSACHUSETTS.

MICROMETER-CALIPERS.

SPECIFICATION forming part of Letters Patent No. 479,807, dated August 2, 1892.

Application filed April 2, 1892. Serial No. 427,469. (No model.)

To all whom it may concern:

Be it known that I, EDWIN L. HOLCOMB, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Micrometer-Calipers, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention relates to calipers for measuring inside and outside diameters, comprising a fixed jaw, a movable jaw, and a leading-screw for imparting movement to said movable jaw; and it has for its object to improve the construction of such tools in a manner to increase the range of movement of the movable jaw without impairing the accuracy of its adjustment, and to obviate the impairment of said accuracy of adjustment by wear of the parts.

To these ends my invention consists in the micrometer-calipers constructed and operating as hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like letters designate like parts in the several figures, Figure 1 is a side view of micrometer-calipers embodying the invention, a portion of the two jaws and of the end piece being broken away. Fig. 2 is a rear edge view thereof. Fig. 3 is a vertical section of the compressible bushing, drawn to a larger scale. Fig. 4 is an end view of said bushing. Fig. 5 is an end view of the calipers.

The letters *a b* designate, respectively, the fixed and the movable jaws of the tool, which jaws have their acting ends formed, as usual, to facilitate their use in measuring inside and outside diameters. The movable jaw *b* has a sliding bearing upon two parallel guide-rods *c d*, which are secured at one end to the fixed jaw and at their opposite end to an end piece *e*, whereby said jaws are maintained in a truly parallel position to each other at all times. Between said guide-rods is located the leading-screw *f*, which is provided at one end with a conical socket to receive the conical end of a screw *g*, passing through the fixed jaw *a* and at its opposite end passes through the end piece *e* and carries the milled head *f'* at the outer side of said end piece, whereby it can be revolved manually. The inner surface of the end piece surrounding the hole therethrough is beveled, as shown in Fig. 1, and the screw *f* is provided with a beveled shoulder f^2, to engage said surface, thus forming with the screw *g* conical bearings for said screw at both ends thereof. At the point where the leading-screw passes through the movable jaw, I provide a slightly-tapered compressible bushing *h*, which has a milled head *h'*, is exteriorly threaded to engage a tapered and threaded hole in said jaw, and is internally threaded to correspond to the thread on said leading-screw. Said bushing is split longitudinally to render it easily compressible, and I prefer to split it at two diametrically-opposite points, the cuts running from opposite ends and for a portion of the length thereof merely, as shown in Figs. 3 and 4, thereby adapting it to be compressed uniformly throughout its length when advanced within the hole in the jaw *b* and to thereby evenly compensate for wear between itself and the leading-screw.

One of the guide-rods *c d* is provided with graduations reduced to the desired scale—say, to one-fortieth of an inch—and if the thread on the leading-screw be of a corresponding pitch one complete revolution of said screw will move the jaw *b* a distance corresponding to one of said graduations, or, in the case supposed, one-fortieth of an inch. For accurately securing fractional parts of a complete revolution of the leading-screw, the milled head *f'* thereof is provided at its inner side with a portion of reduced diameter, which portion is peripherally graduated to the desired scale—say, to one twenty-fifth of a complete revolution of the screw—while the end piece *e* is provided with a single graduation-mark, as shown at *i* in Fig. 1, with which said graduations on the head can be brought into register. The finest measurements can thus be accurately made by using the two sets of graduations conjointly.

By positively guiding the movable jaw upon two rods and locating the leading-screw between said rods, as described, I am enabled to use a leading-screw of greater length than has heretofore been practicable without impairing in any degree the accuracy of adjustment of said jaw, and thus increase the working capacity of this class of tools. By using two guide-rods also I prevent the wear

between the movable jaw and its supports from disturbing the true parallelism between the former and the fixed jaw, as is the case when a single rod or other support is used, the movable jaw in such case being rendered capable of a slight tilting movement upon its support after long use. Furthermore, by supporting the leading-screw at both ends in conical bearings and providing means for longitudinal adjustment thereof, I am enabled to compensate for the slightest wear between the screw and the movable jaw, while the adjustable and compressible bushing *h* serves to compensate for any wear between its thread and that of said screw. It will thus be seen that by means of my improvements I provide a tool which will retain its accuracy and efficiency under all circumstances, thereby greatly enhancing its value as a measuring-instrument.

It is obvious that slight modifications of the construction herein described can be made within the spirit of my invention. For example, the head *f'* of the leading-screw could be reduced in diameter and located inside of the end piece *e* and between the rods *c d* instead of outside of said end piece, as shown, and that conically-pointed screws could be utilized at both ends of said screw to support the same; but I prefer the construction shown because of the greater convenience afforded for turning said head *f'*. It will be obvious, also, that so far as the means shown and described for guiding and operating the leading-screw are concerned the bushing *h* can be omitted and the screw be caused to engage directly with the movable jaw.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The micrometer-calipers herein described, comprising a fixed jaw and end piece, two guide-rods extending between said jaw and end piece, a movable jaw having a sliding bearing upon both of said rods, and a leading-screw journaled at its ends in said fixed jaw and end piece, respectively, between said rods and operatively engaging said movable jaw, combined and operating substantially as set forth.

2. The micrometer-calipers herein described, consisting of a fixed jaw, an end piece, two parallel guide-rods secured at their ends in said jaw and end piece, respectively, a movable jaw having a sliding bearing upon both of said rods, and a leading-screw supported at its ends in conical bearings on said fixed jaw and end pieces, respectively, and operatively engaging said movable jaw, one of said conical bearings being adjustable to compensate for wear of said screw, substantially as described.

3. The micrometer-calipers herein described, consisting of a fixed jaw, an end piece, two parallel guide-rods supported at their ends in said jaw and end piece, respectively, a movable jaw embracing both of said rods and having therein a slightly-tapered threaded hole to receive a bushing, an externally and internally threaded tapered bushing adapted to enter the hole in said jaw, said bushing being split longitudinally to render it compressible, and a leading-screw journaled at its ends in said fixed jaw and end piece, respectively, and engaging between its ends the internal threads of said bushing, said screw carrying a milled head to enable it to be revolved manually, substantially as set forth.

4. In micrometer-calipers, the combination, with a fixed jaw, an end piece, and two parallel rods extending between the same, one of said rods having graduations marked thereon, of a movable jaw embracing both of said rods, and a leading-screw journaled at one end in said fixed jaw and having its opposite end extended through said end piece and provided with a milled head for turning the same, which head is also provided with peripheral graduations, said screw operatively engaging between its ends said movable jaw, arranged and operating substantially as described.

5. In micrometer-calipers, the combination, with fixed jaw *a*, rods *c d*, end piece *e*, and jaw *b*, movable upon said rods, of leading-screw *f*, having one end thereof passed through said end piece and having a beveled shoulder engaging a beveled surface at the inner side of said end piece and conically-pointed screw *g*, passing through said fixed jaw and engaging a conical socket in the opposite end of said leading-screw, substantially as set forth.

EDWIN L. HOLCOMB.

Witnesses:
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