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L. S. STARRETT & J. A. ADELL.

QUICK ADJUSTING MICROMETER.

APPLICATION FILED MAY 25, 1905.

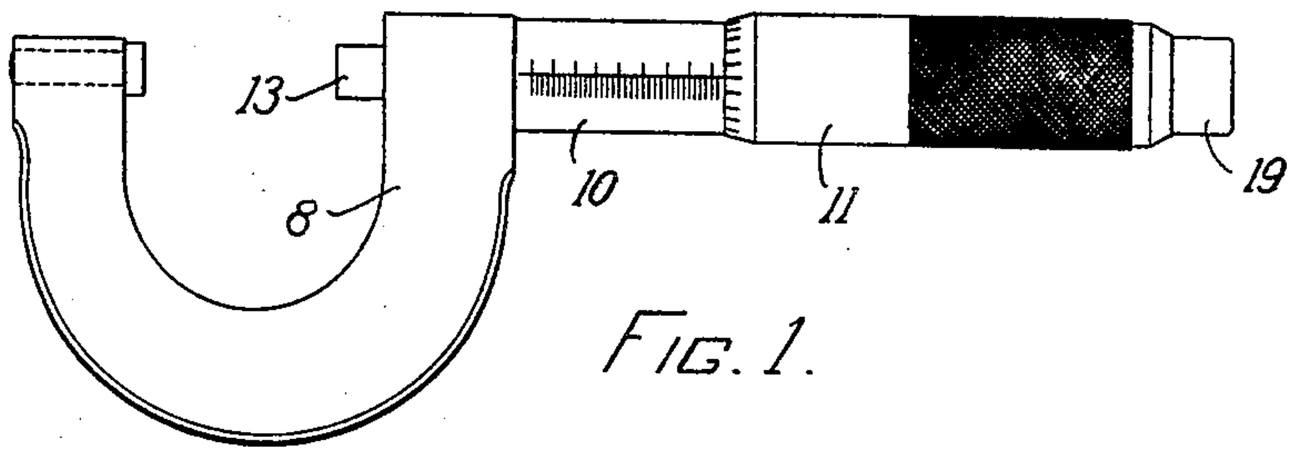


FIG. 1.

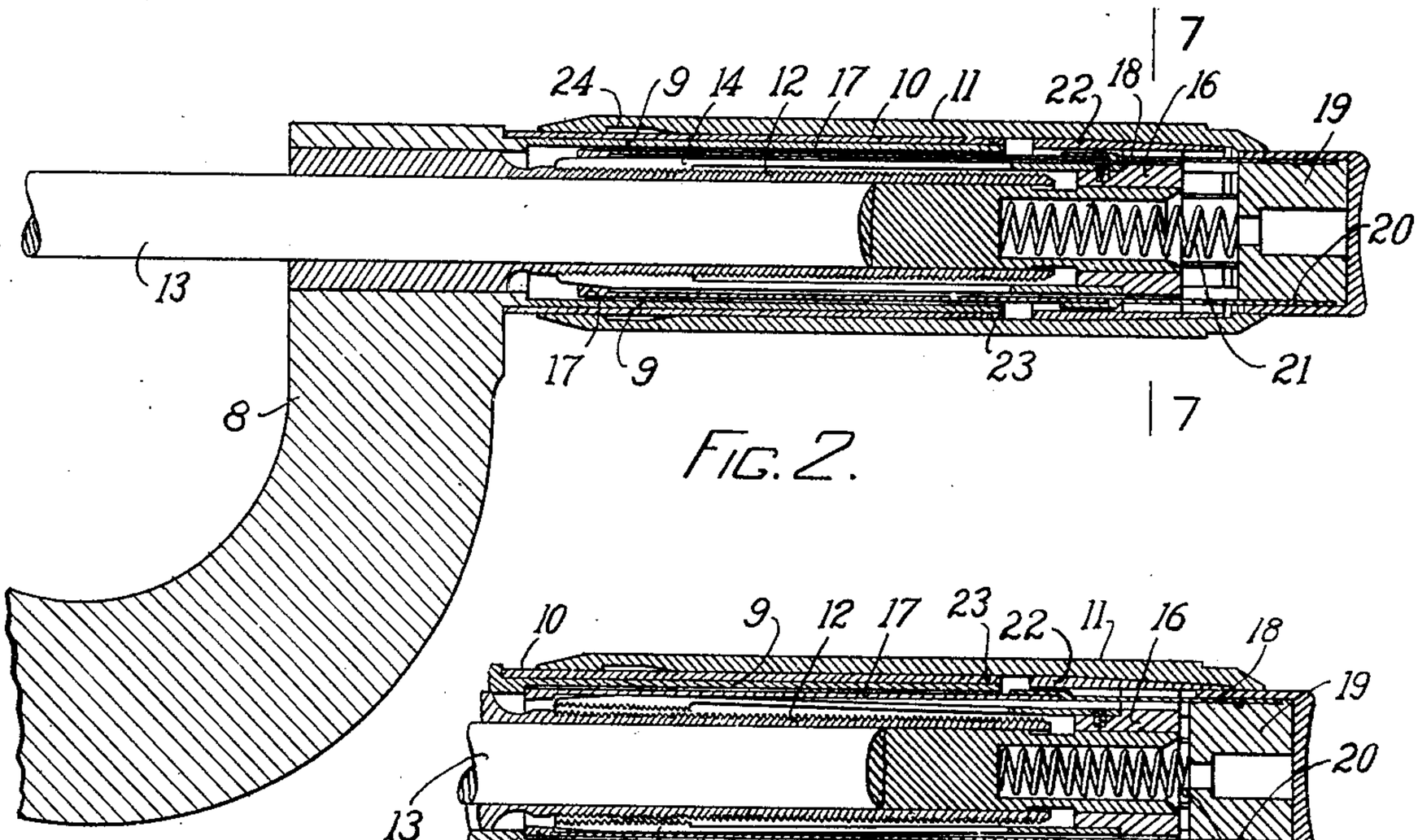


FIG. 2.

FIG. 3.

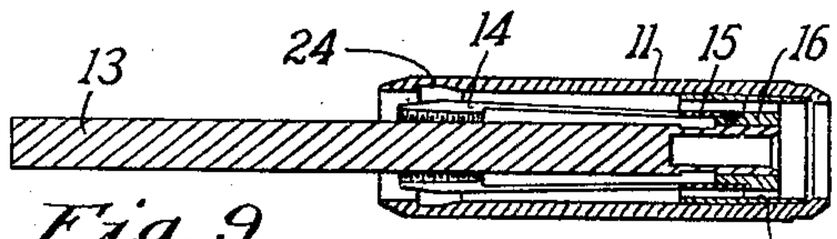


Fig. 9.

FIG. 4.

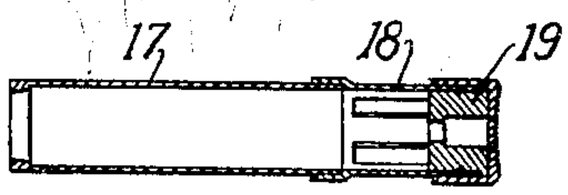
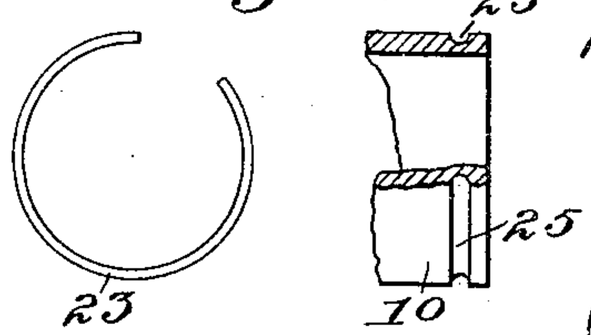


FIG. 5.



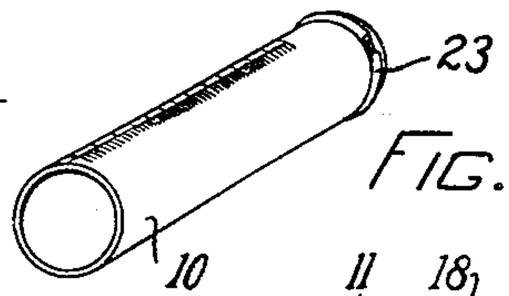


FIG. 6.

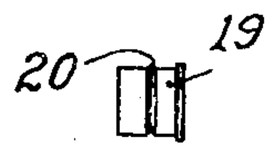


FIG. 8.

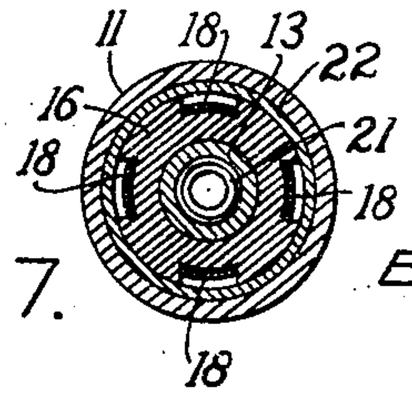


FIG. 7.

WITNESSES

A. T. Palmer

H. W. Ladd

INVENTORS

Leroy S. Starrett,

John A. Adell,

BY A. S. McNeece

ATT'Y.

UNITED STATES PATENT OFFICE.

LAROY S. STARRETT AND JOHN A. ADELL, OF ATHOL, MASSACHUSETTS, ASSIGNORS TO THE L. S. STARRETT COMPANY, OF ATHOL, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

QUICK-ADJUSTING MICROMETER.

No. 809,272. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed May 25, 1905. Serial No. 262,149.

To all whom it may concern:

Be it known that we, LAROY S. STARRETT and JOHN A. ADELL, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Quick-Adjusting Micrometers, of which the following is a specification.

The object of this invention is to provide an absolutely accurate micrometer for determining by rotation of parts having a screw-threaded engagement the external dimensions of articles down to a fraction of the thousandth part of an inch, and yet, by a sliding movement of such parts when disengaged, to permit instant approximate adjustment over relatively wide distances forward and backward, with adaptation of the instrument to then resume exact slower adjustment by rotation. The instrument has the full capacity of ordinary micrometers for measurements and rotary adjustment and the additional advantage of speed in changing from one extreme position to the other.

In the drawings, Figure 1 is a plan of the tool complete. Fig. 2 is a sectional view, much enlarged, showing internal construction with parts engaged for adjustment by rotation. Fig. 3 is a similar view with parts held in position for the sliding adjustment. Fig. 4 is a longitudinal section of the spindle, the split nut, and the external sleeve. Fig. 5 is a like view of the sliding tube or collar and its end cap which actuates the split nut. Fig. 6 shows in perspective the fixed graduated barrel with terminal stop for the sliding sleeve and spindle. Fig. 7 is a transverse section on line 7 7 of Fig. 2. Fig. 8 is a detail. Fig. 9 illustrates the terminal catch which prevents dismemberment of the tool.

The rigid frame 8 has the usual U-shaped neck portion with an integral tubular extension 9. Outside of this extension and secured to frame 8 is the tubular barrel 10, and surrounding this barrel is the rotatable sleeve or shell 11. Within these parts and secured at one end to the frame is the hollow screw 12, within which the spindle 13 has its rotary and sliding movement, carrying with it the self-opening split nut 14, which engages with and disengages from said screw, as will be explained. The elastic prongs of nut 14 are integral with the unslitted end portion of tube 15 from which they are formed.

The inner end of the spindle has fixed upon it a shouldered cap 16, having two diameters, the tubular end 15 of nut 14 being secured upon the smaller part, while the larger part carries the rotatable outer shell 11, as seen in Figs. 2, 3, and 4. The threaded prongs 14 of the split nut are externally beveled at tips and spring normally out of contact with the screw 12, as in Figs. 3 and 4, but are controlled and made to engage therewith by a sliding collar or tube 17, having an internal beveled terminal portion. (See Figs. 3 and 5.) This nut-collar immediately surrounds the nut-prongs 14, as in Figs. 2 and 3, and has a slotted extension 18, composed of prongs which project outwardly through recesses in the larger portion of the spindle-cap 16. (See Figs. 5 and 7.) The prongs or slotted outer portion of this extension after passing through the recesses of the spindle-cap 16 are secured between the body and ferrule of a sliding head 19, by which the nut-collar may be moved lengthwise far enough to cause the nut-prongs 14 to engage with and disengage from the hollow screw 12. (See Figs. 2 and 3.) The prongs 18 are indented into groove 20, Fig. 8. This slight endwise movement is limited in the manner indicated by comparison of Figs. 2 and 3. Spindle 13 is recessed axially at its inner end to receive a coiled spring 21, compressed within the spindle-recess. This spring normally holds the head 19 extended, as in Figs. 1 and 2, so that the nut-prongs 14 are held by the tubular collar 17 in mesh with the hollow screw 12 for ordinary adjustment by rotation; but inward pressure on head 19 compresses spring 21 and moves the inner beveled portion of nut-collar 17 off from the tips of the nut-prongs, allowing them to spring outwardly and disengage the screw 12, as in Fig. 3. While head 19 is thus held compressed by the operator's finger, the spindle and connected parts are free to reciprocate without rotary movement, thus giving the quick adjustment over wide distances which characterizes this invention. Fig. 1, as compared with Fig. 2, shows the position instantly attained by this sliding movement, retracting the spindle 13 and outer sleeve 11 and exposing the fixed graduated barrel 10. From this it will be observed that the reciprocating nut-collar 17 performs two essential functions—first, when pressed outwardly by the concealed spring 21 it closes the split nut and

holds the threaded parts engaged for the rotary adjustment; second, when pressed inwardly by the operator's finger on end cap 19 it manually releases the self-opening nut-prongs and permits the automatic disengagement of the threaded parts for the quick sliding adjustment of the spindle. Both these pressures are applied axially without any disfiguring devices therefor to destroy the symmetry of the instrument.

The rotatable outer sleeve 11 is secured upon the recessed periphery of the spindle-cap 16 by means of an outwardly-tapering bushing 22 introduced between them, (see Fig. 7,) such bushing constituting an annular wedge, fitting within the decreasing bore of the sleeve at that point, as in Figs. 2 and 3.

The fixed barrel 10 (shown detached in Fig. 6) has a line of graduations corresponding to the pitch of the hollow screw, say forty to the inch. The rotatable outer sleeve 11 is beveled and graduated around its inner end as heretofore, preferably in twenty-five equal subdivisions. (See Fig. 1.)

To guard against dismemberment of the instrument by too great a sliding movement of the parts, the inner end of the fixed barrel 10, Fig. 6, is formed with a suitable terminal catch arranged to engage in a recess 24 within the rotatable barrel 11, Figs. 2, 3, and 4. The preferred form of catch (shown in Figs. 6 and 9) is a severed ring 23, sprung into an annular groove 25 near the end of barrel 11, such ring extending, for part of its cross-section, peripherally into said recess 24, when the proper limit of movement is reached.

We claim as our joint invention—

1. A micrometer-gage comprising a frame or body, a self-opening split nut, a micrometer-screw extending through said nut, and means for automatically compressing said nut to engage it with the screw, and for manually releasing the nut-prongs from such compression and engagement, by direct endwise pressure applied axially, for the purpose set forth.

2. A micrometer-gage, comprising a frame or body, a self-opening split nut, a micrometer-screw extending through said nut, and means for automatically compressing said nut to engage it with the screw, and for manually releasing the nut-prongs from such compression and engagement, to permit free reciprocation, the surfaces of the frame, fixed barrel and rotary sleeve being symmetrical and free from any apparent adjusting devices, substantially as set forth.

3. A micrometer comprising a frame or body and a spindle and rotatable sleeve secured to each other and to parts having a threaded engagement with a fixed part of the instrument, in combination with means for interrupting such threaded engagement and for imparting a free sliding movement to said spindle and sleeve with relation to the frame and parts fixed thereon, and with an inclosed terminal catch limiting such sliding movement and preventing accidental dismemberment, for the purpose set forth.

4. A micrometer comprising a frame or body and parts fixed thereon including a long hollow screw, in combination with a spindle within said screw, a rotatable sleeve concentric therewith and an intermediate threaded part adapted to engage the threads of said screw for adjustment by rotation, and with means for interrupting such threaded engagement and imparting a sliding movement to said spindle and sleeve, and a concealed stop device adapted to engage a recess within said sleeve to properly limit such sliding movement, for the purpose set forth.

5. A quick-adjusting micrometer, comprising four rigid parts connected together, and consisting of the frame or body at one end of the instrument, an integral tubular extension thereof, a longitudinally-graduated cylindrical barrel and an inclosed hollow screw, in combination with four movable parts united together at the other end of the instrument and comprising the axial spindle, the inclosing rotatable sleeve, the intermediate split nut surrounding said screw and an actuating-collar for said nut, these four parts adapted for adjustment by rotation under threaded engagement and for quick, sliding adjustment when threads are disengaged, substantially as set forth.

6. A quick-adjusting micrometer comprising the frame or body, the graduated cylindrical barrel fixed thereon, and the elongated hollow screw projecting rigidly from the frame, in combination with the axial spindle within said screw, the rotatable sleeve, the intermediate split nut surrounding said screw and the adjustable nut-actuating collar with terminal head and spring, serving to disengage and reëngage said nut and screw, substantially as set forth.

7. The improved micrometer described, embodying the frame 8, the hollow screw 12 projecting rigidly therefrom, and the rigid, longitudinally-graduated, cylindrical barrel 10 concentric therewith, in combination with the axial spindle 13, the shouldered terminal cap 16 fixed thereon, the outer rotatable sleeve secured to the periphery of said cap and the split nut 14 held by its tubular end upon a reduced shoulder of said cap, and with the nut-collar 17 having extensions 18 projecting through recesses in said cap and connected to the head 19, for the purpose set forth.

In testimony whereof we have affixed our signatures in presence of two witnesses.

LAROY S. STARRETT.
JOHN A. ADELL.

Witnesses:
FRANK E. WING,
FLORENCE E. BOYCE.