F. O. JAQUES.

MICROMETER GAGE.

APPLICATION FILED MAY 19, 1908.

934,730. Patented Sept. 21, 1909.

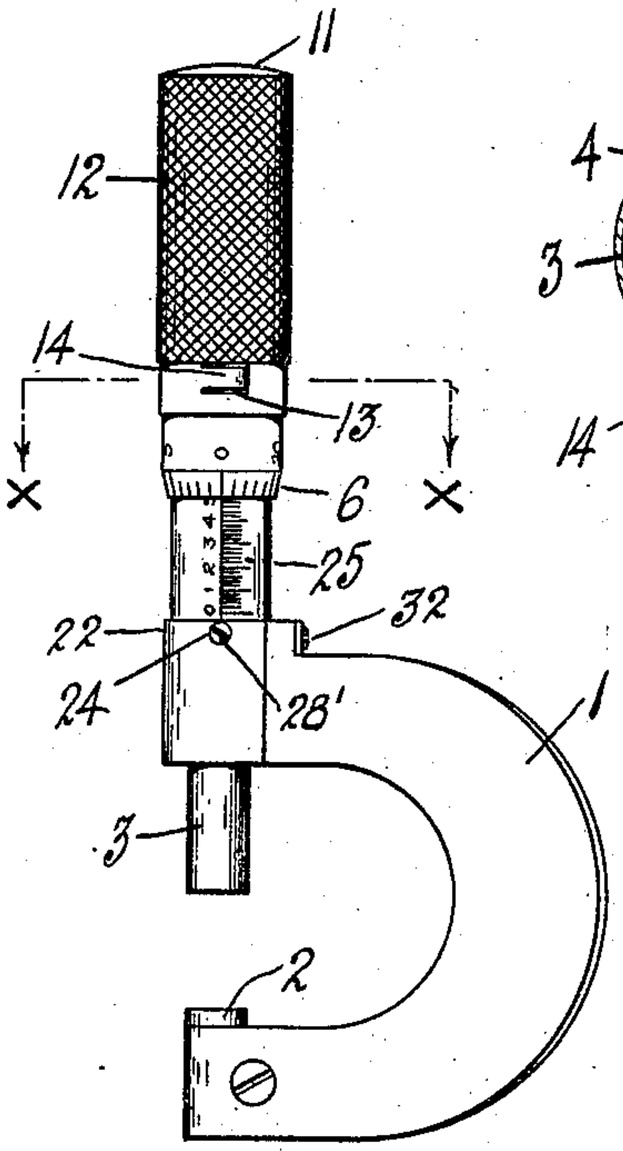

FIG. 1.

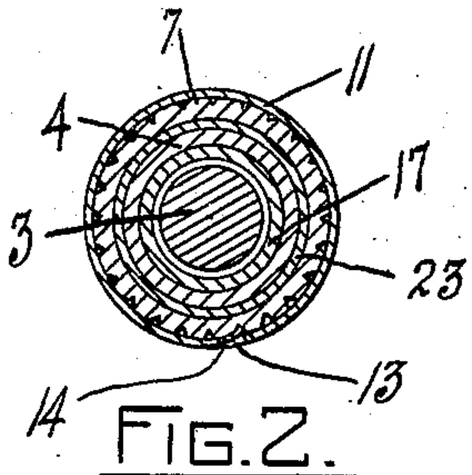

FIG. 2.

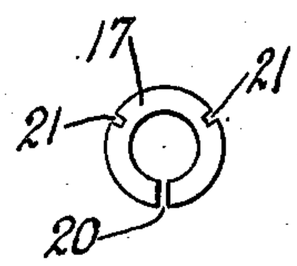

FIG. 4.

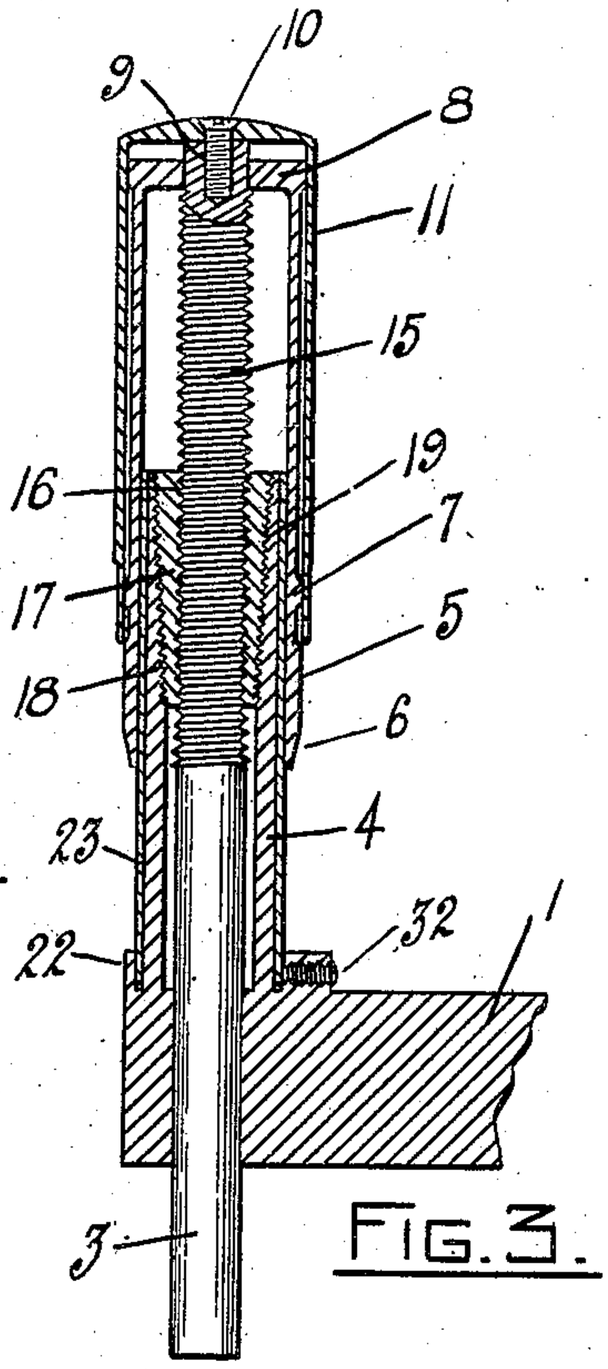

FIG. 3.

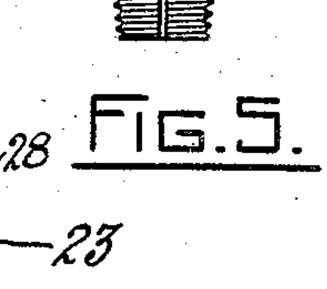

FIG. 5.

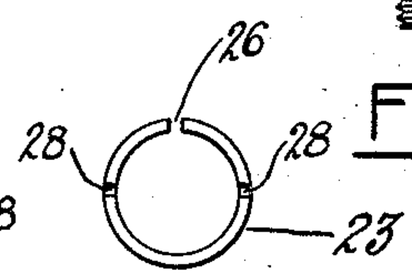

FIG. 6.

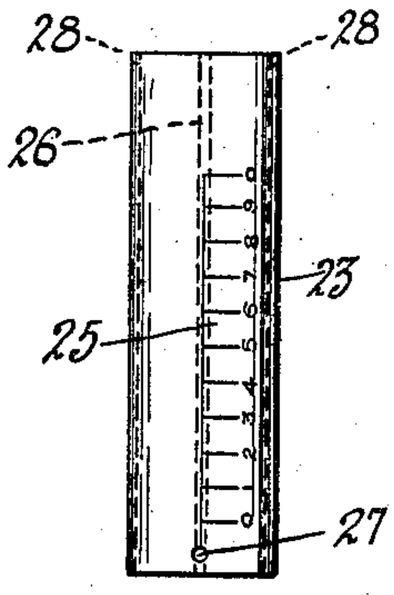

FIG. 7.

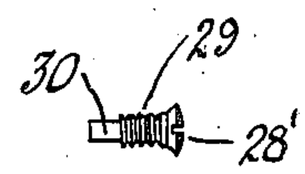

FIG. 8.

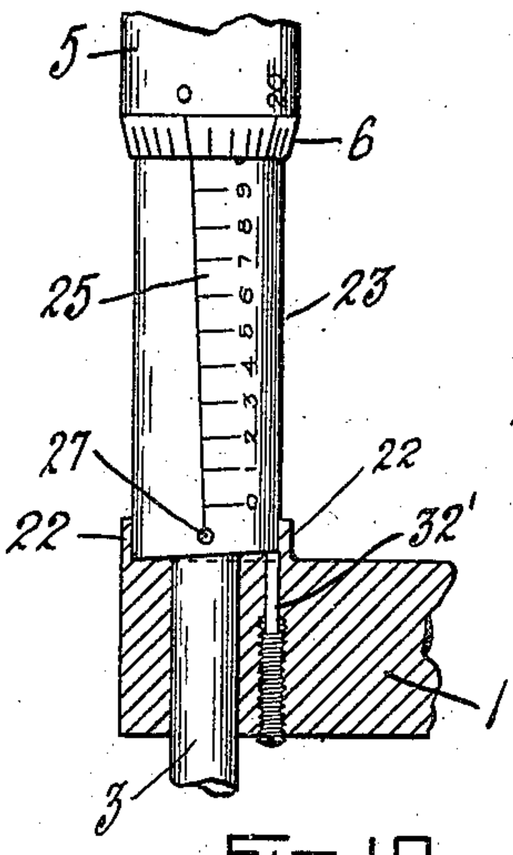

FIG. 10.

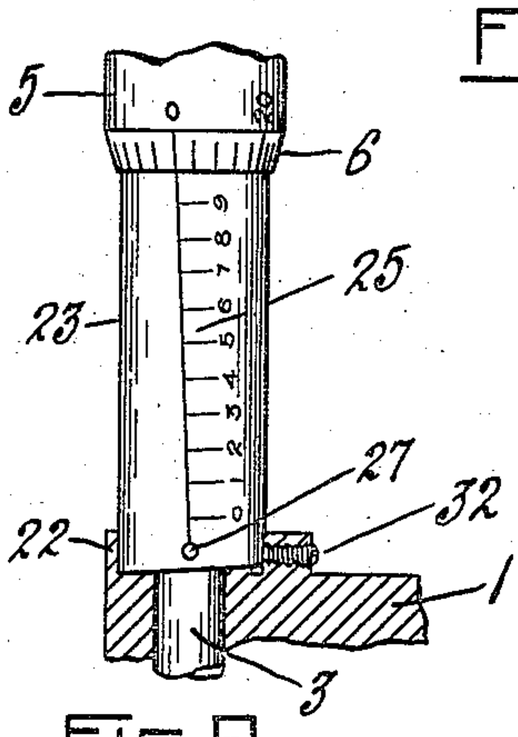

FIG. 9.

WITNESSES.

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MICROMETER-GAGE.

934,730. Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed May 19, 1908. Serial No. 433,656.

To all whom it may concern:

Be it known that I, FERNANDO O. JAQUES, a citizen of the United States, residing at Cranston, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Micrometer-Gages, of which the following is a specification.

My invention relates to micrometer gages and has for its objects the ends commonly sought in this class of structures, but more particularly a convenient means for manipulating the operating sleeve with one hand and avoiding strain upon the spindle threads; means for taking up the back lash of the spindle threads; and means for accommodating the reading line to the graduations of the sleeve to compensate for wear or other derangement. At present, whenever by reason of wear or otherwise, the graduations of the reading sleeve fail to coincide with the reading line, the instrument is worthless, as no means is known for correcting the fault.

To the end essentially of attaining the enumerated objects in a cheap, simple, and accurate structure, my invention consists in providing a novel operating sleeve and connections therefor; in providing a reading line adjustable with relation to the graduated sleeve; and in providing an auxiliary yielding, tapering, bushing for taking up the back lash of the spindle threads.

In the drawings which constitute a part of this application Figure 1 is a side elevation of a micrometer gage embodying my improvements. Fig. 2, a section of the same on line *x*—*x* of Fig. 1. Fig. 3, a central longitudinal section of the body of the gage. Figs. 4 and 5, plan and side elevations respectively of the bushing. Figs. 6 and 7, like elevations respectively of the adjustable reading sleeve. Fig. 8, a detail view of the pivot screw. Fig. 9, a side view partially in section of the reading sleeve and adjacent parts, and Fig. 10, a modified form sleeve adjusting means.

Like reference characters indicate like parts throughout the views.

My device comprises the usual yoke 1, anvil 2, spindle 3, barrel 4, measuring or rotary sleeve 5, provided with the usual beveled graduated end or dial 6. The exterior of the sleeve 5 is provided below its central portion with an annular row of ratchet teeth, 7. The sleeve, 5, has a closed outer end, 8, in which the end portion of the spindle, 3, is concentrically fixed. The spindle end is bored longitudinally as at 9, to receive a pivot member, in this instance a screw, 10, upon which is loosely mounted an operating or auxiliary sleeve, 11, provided with a milled exterior, as at 12, and extending downwardly and nearly to the end of the sleeve, 5. The sleeve, 11, is provided with a segmental opening, 13, and an integral spring tongue, 14, which extends into the opening and engages the teeth, 7, which register in said opening.

The spindle, 3, is provided with threads, 15, which slidingly engage the interior horizontal threads, 16, of a conical bushing, 17, provided with exterior inclined threads, 18, which engage threads, 19, upon an inclined portion of the interior of the barrel, 4. The bushing is longitudinally split as at 20, and has preferably one or more exterior longitudinal channels, 21, to supplement the yielding character of the bushing. The inclined threads, 18, and 19, frictionally retain the bushing, 17, and sleeve or tube, 4, in a definite relation with each other, while the threads, 15, of the spindle permit free longitudinal travel of the latter. After continued wear the backlash of the spindle threads may be taken up by turning the bushing, 17, whose inclined side and yielding character results in a closer engagement with the spindle as the bushing is advanced.

The yoke 1, is provided with an integral annular flange or wall, 22, which forms a seat for the lower end of a longitudinally split sleeve, 23, which surrounds the barrel, 4, and is provided with a threaded opening, 24. The sleeve, 23, is provided with the usual graduated micrometric reading line, 25, parallel with sleeve axis. Opposite this line occurs the longitudinal slot, 26, extending the length of the sleeve, and normally parallel with the reading line. An opening or cavity 27 in the sleeve in alinement with the reading line is adapted to register with the threaded opening, 24, in the flange or ring, 22. Upon the upper margin of the sleeve, 23, are slots, or cavities, 28, adapted to receive a spanner wrench or other tool. These slots may, however, be omitted without departing from the spirit of my invention. The sleeve, 23, is a sliding fit upon the

tube, 4, and has one end inclosed by the end of the reading sleeve, 5, which freely rotates thereupon. The sleeve, 23, is retained in its seat by a pin or screw, 28′, having a threaded portion, 29, adapted to engage in the threaded opening, 24, of the flange, 22, and a smooth end portion, 30, loosely fitting into the opening, 27, of the sleeve, 23. In the flange, 22, is a binding or set screw, 32, whose end is adapted to frictionally contact with the exterior surface of the sleeve, 23.

Referring to the operation of the gage, the rotary sleeve, 11, with its spring tongue, 14, acting in conjunction with the teeth, 7, upon the rotary sleeve, 5, constitutes the ratchet stop mechanism whereby the excessive pressure of the spindle against the work is avoided. The exposed position of the tongue, 14, makes it readily accessible for inspection, and its integral character makes it cheap, and avoids all danger of derangement and dislocation.

The operation of the bushing, 17, has been already detailed. The adjustable reading sleeve, 23, as originally mounted has its reading line, 25, straight or in axial alinement with the inclosed parts, and registering with the lines of the dial, 6. When, for any reason, the dial lines overrun the reading line, 25, the error is corrected by twisting the upper end of the sleeve, 23, until the upper portion of the line, 25, is in alinement with the graduations, as shown in Fig. 9. Among the causes of the overthrow of the dial are the following. After continued use, and particularly when they are not frequently oiled, the sides of the threads of the spindle and of the other interengaging threaded parts of the micrometer become worn, thereby producing a looseness of parts which expresses itself in an increased circumferential advance of the screw. Other causes of overthrow are, wear upon the flat working faces of the anvil and spindle. The use of a spanner wrench in the slots, 28, is convenient, but not essential, for this torsional movement. The springy character of the steel or other metal composing the sleeve makes it essential to prevent the sleeve resuming its original position. This is done by maintaining in elevated position that portion of the lower margin of the sleeve which was raised by the torsional movement. In this instance, this retaining function is performed by the set screw, 32; but the margin may be retained in elevated position by any other convenient means, such, for instance, as by locating the screw, 32; vertically in the yoke in contact with the bottom of the sleeve. The pin, 28, performs a pivoting or fulcruming function in the adjusting operation. While the pin, 28, is shown in the flange, it is obvious that it might be integral with the barrel without departing from the spirit of my invention.

What I claim is,

1. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a reading sleeve pivotally mounted upon the barrel within the measuring sleeve.

2. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a slidable reading sleeve within the measuring sleeve and spirally adjustable upon the barrel.

3. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a slidable longitudinally split reading sleeve intermediate the barrel and measuring sleeve and spirally movable relatively to the measuring sleeve.

4. In a micrometer gage, the combination with the barrel, and the rotary measuring sleeve, of a reading sleeve mounted upon the barrel and capable of pivotal transverse adjustment within the measuring sleeve, and means for maintaining the reading sleeve in adjusted position.

5. In a micrometer gage, the combination with the barrel and the rotary measuring sleeve, of a longitudinally split reading sleeve transversely pivoted upon the barrel and within the measuring sleeve.

6. In a micrometer gage, the combination with the barrel and the rotary measuring sleeve, of a longitudinally split reading sleeve intermediate the barrel and measuring sleeve, and means engaging the reading sleeve for retaining one end only of the reading sleeve against circumferential movement.

7. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a longitudinally split reading sleeve intermediate the barrel and measuring sleeve, and means engaging one end only of the reading sleeve for pivotally retaining the end of the reading sleeve against circumferential movement.

8. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a longitudinally split reading sleeve intermediate the barrel and the measuring sleeve, and means adjacent the barrel and engaging the end of the sleeve for pivoting the sleeve.

9. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a fixed ring around one end of the barrel, a longitudinally split reading sleeve mounted between the barrel and ring and extending within the measuring sleeve and provided with an opening near its end, of a fulcruming member in the ring extending into the opening.

10. In a micrometer gage, the combination with the barrel, and measuring sleeve, of a split reading sleeve intermediate the barrel and measuring sleeve, and capable of circumferential adjustment, at one end

means for pivoting the other end of the sleeve, and means for maintaining the sleeve in adjusted position.

11. In a micrometer gage, the combination with the barrel and the measuring sleeve, of a fixed ring around one end of the barrel, a longitudinally split reading sleeve upon the barrel between the barrel and the ring and between the barrel and the measuring sleeve, pivoting means in the ring engaging the reading sleeve, and a binding screw in the ring and engaging the reading sleeve.

12. In a micrometer gage, the combination with the spindle and measuring sleeve fixed thereon, of ratchet teeth upon the exterior of the measuring sleeve, a milled sleeve rotatably mounted upon the spindle and inclosing the measuring sleeve, and a tongue integral with the lower portion of the milled sleeve adapted to engage the ratchet teeth.

In testimony whereof I have affixed my signature in presence of two witnesses.

FERNANDO O. JAQUES.

Witnesses:

GROVER D. JAQUES,

PERCY M. JAQUES.