J. F. GARBIN.

MICROMETER.

APPLICATION FILED JUNE 3, 1918.

1,307,816.

Patented June 24, 1919.

Fig. 1.

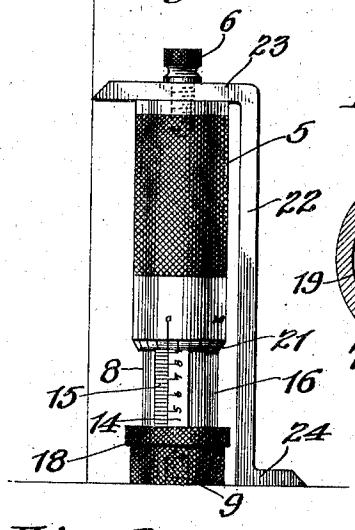


Fig. 3.

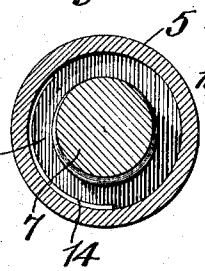


Fig. 2.

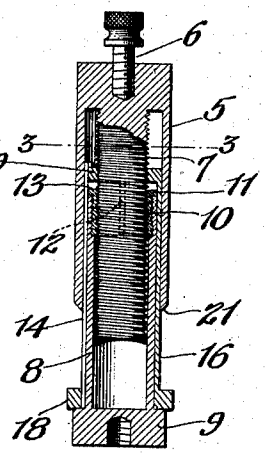


Fig. 5.

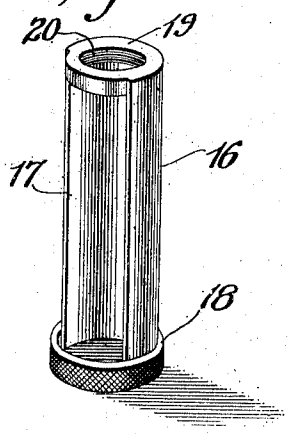


Fig. 4.

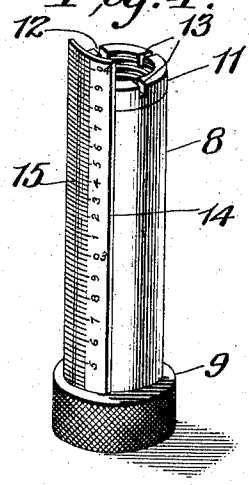


Fig. 6.

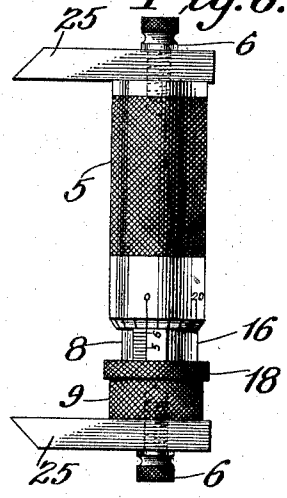


Fig. 8.

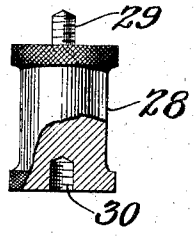
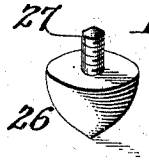


Fig. 7.



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MICROMETER.

1,307,816. Specification of Letters Patent. Patented June 24, 1919.

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To all whom it may concern:

Be it known that I, JULES F. GARBIN, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Micrometers, of which the following is a specification.

This invention relates to micrometers, and has for its primary object to provide an instrument of this character adapted to external or internal use, which will be very accurate and reliable, simple and compact in the arrangement of its several parts, and capable of easy and quick adjustment.

It is another and more particular object of my invention to provide very novel and effective means for safely locking the movable element of the micrometer against casual movement from its adjusted position.

It is also an important object of the invention to provide a micrometer, which is of such construction that it can also be conveniently used as a height gage, a sizing block or a caliper gage.

With the above and other objects in view, the invention consists in the improved combination, construction and relative arrangement of the several parts as will be hereinafter more fully described, subsequently claimed, and illustrated in the accompanying drawing, in which similar reference characters designate corresponding parts throughout the several views, and wherein—

Figure 1 is a side elevation, showing my improved micrometer adapted for use as a height gage;

Fig. 2 is a longitudinal sectional view;

Fig. 3 is an enlarged horizontal section taken on the line 3—3 of Fig. 2;

Fig. 4 is a detail perspective view of the internal member;

Fig. 5 is a similar view of the locking member;

Fig. 6 is a side elevation showing the device adapted for use as a caliper gage;

Fig. 7 is a detail perspective view of an auxiliary attachment for use in taking inside measurements; and

Fig. 8 is a side elevation, partly in section, of a detachable extension for the micrometer, whereby it may be lengthened.

Referring in detail to the drawing, 5 designates the outer tubular member of the micrometer, which is open at one end, and at its other end is formed with an axially extending threaded socket to receive a clamping screw 6, the purpose of which will be presently explained. A screw 7 is integrally formed at one of its ends with the closed end of the member 5, and extends axially through said member in spaced concentric relation to the annular wall thereof and projects beyond its open end. This screw may have any desired predetermined number of threads to the inch in accordance with the fineness of the adjustment which may be desired.

8 designates the annular tubular member of the micrometer, which also has a solid end 9 formed with a threaded socket to receive a second clamping screw corresponding to the clamping screw 6. At its other end the member 8 is interiorly threaded to receive a cylindrical exteriorly threaded bushing 10, said bushing having a flange 11 formed on one end to extend over the end edge of the member 8. The engaging threads on this bushing and the member 8 are of saw-tooth type, as shown in Fig. 2, and the bushing is longitudinally split as at 12. The bushing 10 is further provided with interior screw threads with which the threads on the screw 7 co-act. The end face of the flange 11 is provided with spaced notches or recesses 13 to receive a suitable wrench whereby the bushing may be turned and screwed into the end of the member 8. When this bushing has been screwed home, by further turning the same, the faces of the saw-tooth threads on the outer surface of said bushing ride against the threaded surfaces on the end of the member 8, and exert a wedging action which tends to contract the split tubular bushing. In this manner, therefore, it will be apparent that the frictional pressure of the interior threads on the nut with the threads of the screw 7 may be properly regulated and wear upon the bushing threads compensated for.

The member 8 has an internal diameter which is appreciably less than the internal diameter of the member 5, and upon one side of the member 8 a longitudinally extending plate 14 is suitably secured. This plate is transversely curved in concentric relation to the member 8, and has its outer convex face properly graduated as indicated at 15.

The locking member 16, which is also of tubular form fits snugly upon the member 8, and said locking member on one side is longitudinally cut away as at 17. The mem-

ber 16 at one end is formed with an exterior flange or collar 18 the outer face of which is suitably knurled. The locking member is further provided at its opposite end with an interior annular collar or flange 19, and said flange is interiorly threaded as at 20, the threads on said flange corresponding in diameter and pitch with the threads on the screw 7. It will, of course, be understood that when the parts are assembled, the graduated plate 14 on the member 8 extends longitudinally through the cut-away side 17 of the locking member 16, and beyond the interiorly threaded collar 19 formed in said member as clearly seen in Fig. 4. When this locking member is rotated to dispose the edge of its body portion at one side of the opening 17 in contact with the graduated edge of the plate 14, the screw 7 can be readily turned through the threaded flange 19 on the locking member and the part 5 of the micrometer adjusted upon the member 8 and over the graduated surface of the plate 14. One end of the adjustable member 5 is beveled to a knife edge as at 21, and suitably graduated as shown in Fig. 1, which graduations are read in conjunction with the indicative numerals on the graduated face of the plate 14.

When the member 5 has been adjusted to the desired point, the locking member 16 is rotated in one direction, such rotation causing the threads 20 to bind tightly upon the threads of screw 7, and thereby locking the member 5 against rotation or longitudinal movement from its adjusted position. In this manner it will be seen that the micrometer may be very easily and quickly adjusted and after being securely locked by means of the member 16, the instrument can be freely handled without danger of changing the adjustment of the member 5 with respect to the graduated surface 15.

In Fig. 1 of the drawing, I have shown the micrometer used as a height gage. In such case, the bar 22 is employed, said bar being of predetermined length, and provided upon one end with an angularly disposed arm 23 and at its opposite end with a foot 24 for engagement with the work supporting base. The member 5 is securely fixed to the underside of the arm 23 by means of the screw 6, and after releasing the locking member 16, the member 9 is turned until it engages the surface of the base upon which the work is supported. A further adjustment of the member 8 moves the member 5 and the bar 22 upwardly, and by observing the graduated surface 15 the operator can, by rotating the member 16 securely lock the member 5 in the proper adjusted position, and then by moving the micrometer relative to the work, an indicating line or mark may be made upon the surface of the work by the end of the arm 23.

In Fig. 6 of the drawing I have shown the device used as a caliper gage in which case an arm 25 is secured to each end of the micrometer by means of the corresponding screw 6, the said arms projecting from the said side of the instrument. By then adjusting the members 5 and 8 relative to each other, the arms 25 can be disposed at any desired predetermined distance from each other.

In using the micrometer for taking inside measurements, as, for instance, in measuring the bore of a tubular part, one of the conical heads 26 shown in Fig. 7 is attached to each of the relatively opposite ends of the members 5 and 9, each head having an axially projecting threaded stud 27 for engagement in the threaded socket of the micrometer. The points of these conical members will engage the diametrically opposite sides of the bore when the parts of the micrometer are properly adjusted, the said parts being then locked by means of the member 16, and the micrometer removed.

In some cases, the part to be measured may be of such size that the adjustment of the parts of the micrometer, as provided, is not sufficient in order to enable the instrument to be used. In such case, I employ an extension member 28 having a threaded axially projecting stud 29 on one end and a threaded socket 30 in its other end. Any desired number of these members may be used, and they may be attached either to the member 5 or the member 9 of the instrument. The auxiliary members 28 are, of course, of predetermined length, so that, by reading the graduated plate 14 and then adding to such reading the length of the member or members 28 which may be employed, the total height or diameter of the part may be accurately determined.

From the foregoing description, taken in connection with the accompanying drawing, it will be seen that I have devised a very simple as well as serviceable and reliable instrument which can be readily adapted to a variety of uses. The relatively adjustable parts of the micrometer can be quickly and securely locked by a relatively slight rotative movement of the member 16, and the use of set screws or other clamping or holding means which are liable to become loosened, is avoided. Such parts are also liable to be lost, and constitute obstructions such as, in many cases, will prevent the proper application and use of the instrument. The present invention provides a very compact assemblage or arrangement of the several elements, and the adjusting means and locking means being entirely inclosed within the outer tubular part of the micrometer, metal dust or other foreign matter cannot collect thereon and interfere with its proper operation. By also providing the adjustable split

bushing in which the adjusting screw is threaded, wear upon the threads is taken up or compensated for, so that the usefulness of the instrument will not be affected. The micrometer can, of course, be constructed in various sizes and provision made for any desired range of adjustment. It will also be observed that the several parts are of comparatively simple construction so that the device can be manufactured at relatively small manufacturing cost.

While I have herein shown and described the preferred construction and arrangement of the various elements, it is to be understood that the same are susceptible of considerable modification, and I therefore reserve the privilege of adopting such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim is:—

1. A micrometer including tubular telescopically engaged complementary members, one of said members having a threaded rod extending within the other member, and an adjustable element carried by the latter member adapted for binding engagement with the threads of said rod to lock said members in their adjusted positions.

2. A micrometer including tubular telescopically engaged complementary members, one of said members having a threaded rod extending within the other member, and a sleeve mounted upon the latter member and extending within the other member, said sleeve being adapted for relative rotation on said member and having means at one end for binding engagement with the threads on said rod to lock the members in their adjusted positions.

3. A micrometer including telescopically-engaged tubular members, one of said members having a part engaged within the other member, a sleeve mounted upon the latter member for limited rotation relative thereto and extending within the first-named member, and said sleeve having means at one of its ends adapted for binding engagement with said part upon the rotation of the sleeve in one direction to lock said members against relative movement from their adjusted positions.

4. A micrometer including telescopically engaged complementary members, the outer member having a threaded rod extending axially therethrough, said rod having a threaded engagement in the end of the inner member, and a sleeve mounted upon the inner member and having a threaded collar in which said rod is engaged, said sleeve being adapted for rotation upon the inner member to cause the threads of said collar to bind upon the threads on said rod and thereby lock the members in their adjusted positions against casual rotation.

5. A micrometer including telescopically engaged complementary members, the outer member having a threaded rod extending axially therethrough, said rod having a threaded engagement in the end of the inner member, a sleeve rotatably mounted upon the inner member and having a threaded collar at one end, the threads on said collar being adapted to bind upon the threads on said rod when the sleeve is rotated in one direction to lock said members against relative rotation, and means to limit the rotation of said sleeve in the opposite direction to position the threads of said collar whereby the rod may be adjusted through the collar.

6. A micrometer including complementary telescopically engaged members, a split bushing adjustable in the end of said inner member and having interior screw threads, said outer member being provided with an axially extending threaded rod engaged in said bushing, said bushing and the inner member having co-acting means whereby the bushing is contracted when rotated to compensate for wear upon the threads thereof, and manually adjustable means mounted within said outer member and co-acting with said threaded rod to lock the inner and outer members against relative rotation.

7. A micrometer including telescopically-engaged tubular members, one of said members having a threaded rod extending within the other member, and an element rotatable upon the latter member to effect binding engagement of said element upon its rotation in one direction upon the threads of said rod whereby said members are locked in their adjusted positions.

8. A micrometer including relatively adjustable members, and means for locking said members in their adjusted positions consisting of a single element rotatably mounted upon one of said members, whereby said element, when rotated in one direction, has frictional binding engagement with the other member.

9. A micrometer including relatively adjustable members, one of said members having a threaded part operatively connected to the other member, and a locking element rotatably engaged upon the latter member and having threaded engagement with said part, rotation of said element in one direction relative to said members effecting its frictional locking co-action with said part to retain said members in their adjusted positions.

In testimony whereof I affix my signature.

JULES F. GARBIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."