July 6, 1926. 1,591,740

J. BREWER

MICROMETER

Filed August 4, 1921

Fig.1.

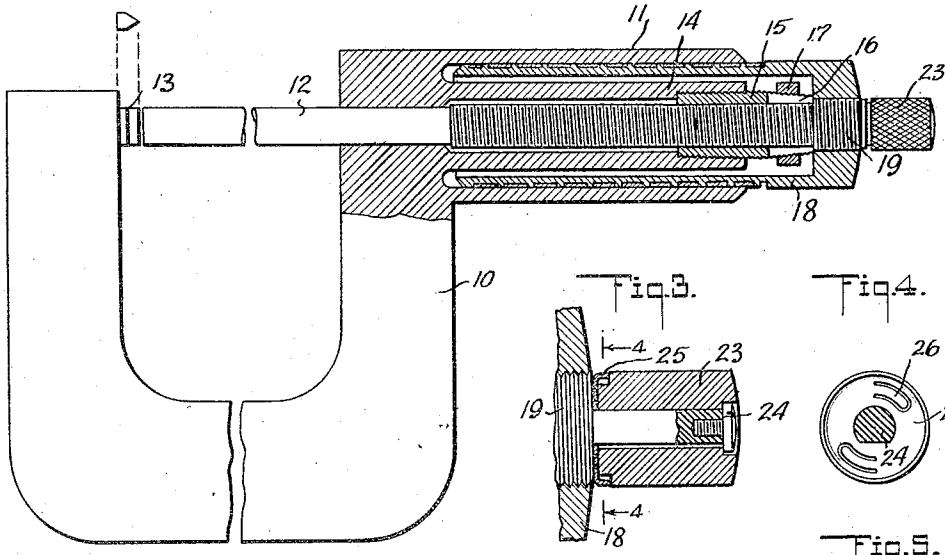


Fig.3.

Fig.4.

Fig.5.

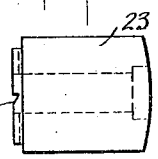


Fig.2.

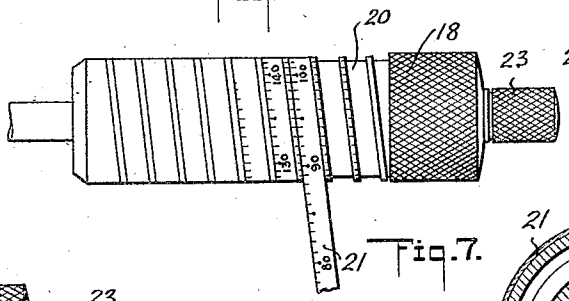


Fig.6.

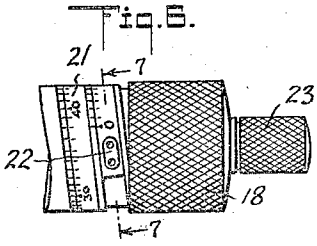


Fig.7.

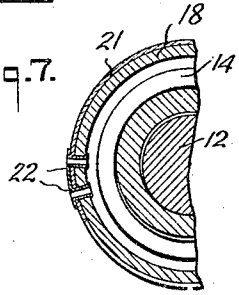
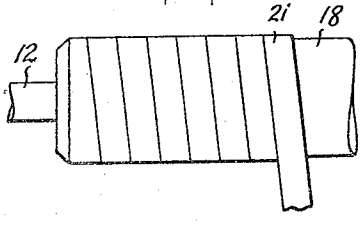


Fig.8.



WITNESSES

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UNITED STATES PATENT OFFICE.

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MICROMETER.

Application filed August 4, 1921. Serial No. 489,860.

My invention relates to a micrometer and means to produce certain new and useful improvements in a device of this character.

It is a well appreciated fact that a considerable difficulty has been experienced in the manufacture of a direct reading micrometer in that it has been necessary to engrave, imprint, or otherwise suitably associate indicating means with the barrel of the micrometer, which indicating means are in absolute register with the threads of the spindle which has been an extremely costly operation.

Furthermore, it has been customary that a structure has been presented in which the parts were incapable of being adjustable with respect to each other after being affixed together, so that in the event of the parts becoming worn it has been virtually incumbent upon the operator to purchase a new micrometer unless he resorts to the expedient of returning the same to the factory and having it entirely disassembled, "trued up," and re-assembled. Also, in this connection it is well understood that the parts are often strained incident to the fact that the spindle is forced with too great a pressure against the anvil and a few repetitions of this operation will quickly result in the micrometer being incapable of effecting a true reading.

Aside from the foregoing, it is understood by those conversant in the art that objections have been noted in connection with the measuring of screw threads and with these and other objects in mind my present invention aims to provide a micrometer which shall primarily be constructed in such a manner that the indicating marks or graduations upon the barrel thereof may be applied to this portion of micrometer in the simplest manner possible and with a minimum of expense.

A further object of my invention is the construction of a generally improved micrometer in which the parts may be capable of being adjusted with respect to each other to an extent sufficient to compensate for wear.

Still another object of this invention is the provision of a device of the character specified in which a safety device of improved construction will be presented which will prevent any undue strain being placed upon the parts even although the operator may be extremely careless in manipulating the same.

Among further objects of my invention are the construction of an anvil for a micrometer which shall be of such a nature as to permit of the device readily being utilized in connection with the measuring of screw threads, and still other objects of this invention will appear in the annexed specification taken in connection with the drawings, which latter present one practical embodiment of invention, and in which—

Figure 1 is a partly sectional side view of a micrometer embodying my improved construction;

Figure 2 is a side view of the barrel of the micrometer as illustrated in Figure 1;

Figure 3 is a sectional side view of a certain detail of construction;

Figure 4 is a transverse sectional view taken along the lines 4—4 in the direction of the arrows indicated in Figure 3;

Figure 5 is a side elevation showing clearly the construction involved in one of the details illustrated in Figures 3 and 4;

Figure 6 is a fragmentary side elevation of the outer end of the barrel shown in Figure 1;

Figure 7 is an enlarged sectional end view taken along the line 7—7 and in the direction of the arrows in Figure 6;

Figure 8 is a view similar to Figure 2 but showing a slightly different type of barrel.

Referring now more particularly to Figure 1, it will be seen that the reference numeral 10 indicates the body or frame of the micrometer which may be entirely of conventional structure and the body is extended to form a hollow arm 11 as is customary in reading a micrometer. A spindle 12 extends within this arm and beyond the same is adapted to cooperate with the anvil 13 hereinafter more fully described.

Further in accordance with conventional construction it will be noted that the sleeve 14 of the arm 11 has an interiorly and exteriorly threaded tube 15 associated with its outer end and it is through this member that the spindle 12 extends, the screw threads of these elements engaging with each other. Also, with a view of compensating for any wear between these threads, it will be noted that the end of the tube 15

is preferably split as at 16 and a nut 17 cooperates therewith so that the threads of the spindle and tube may be caused at all times to engage properly with each other.

To now effect the prime object of my invention, to wit, the provision of a direct reading micrometer in which the graduation marks may be associated with those parts desired in such a manner as to reduce the cost of this operation, it will be noted that in the embodiment illustrated, the graduations form a part of the barrel 18 and this latter member is normally fixedly secured to the spindle 12 by the provision of tightly fitting screw threads 19. Also, the barrel 18 is formed with a spirally extending channel 20, the pitch of which corresponds to the pitch of the screw threads forming a part of the spindle. The essence of this feature of my invention consists in the utilization of a tape 21 formed with suitable graduations, which tape may obviously be manufactured by a semi-automatic machine at a nominal cost and this tape is preferably disposed within the channel 20 of the barrel 18 and placed exactly in the position desired, subsequent to which the same is preferably secured in this position by means of rivets 22 (Figures 6 and 7).

Further, it will be seen, reference being had to Figure 8, that it is not essential that the barrel must be formed with a channel but the tape may be simply spirally disposed thereon with the side edges of one convolution abutting against the side edges of the adjacent convolutions, so that any movement of this tape with respect to its mounting is effectually prevented. Thus, it will be understood that this object of my invention is accomplished in that the only care which must be exercised in the entire operation will be primarily associating the barrel with the spindle and in subsequently affixing the tape to the barrel, and obviously, this method of procedure will involve far less expense than the placing of indicating marks upon the barrel itself, it being also understood that any subsequent adjustment which may be necessary due to a wearing of the parts, may be effected by the structure provided for this purpose.

To now provide means which will effectually prevent a too intimate pressing of the end of the spindle against the anvil, which usually results in a slight distortion of the parts, it will be noted, reference being had to Figures 3, 4 and 5, that the knurled knob 23 of the spindle is a separate element and is rotatably mounted upon an extension 24 thereof. Furthermore, a preferably compressed spring washer 25 is interposed between the main body of the spindle and the knob 23 and is secured to the former as in Figure 4. Tongues 26 form a preferably integral part of the washer 25 and provide pawls which are adapted to cooperate with ratchet portions 27 of the said knob 23.

As in Figure 3 the parts are disposed into quite intimate contact with respect to each other and it will be seen normally that a turning of the knob 23 will immediately result in turning of the spindle 12. However, assuming that the end of the spindle is engaging an object to be measured with sufficient force to enable this operation to be accurately accomplished and that the operator carelessly continues to turn the knob 23, the same, being only held against the washer 25 by friction, will turn independent of the washer and the spindle, thereby preventing undue strain on the micrometer.

Finally, to provide means which will permit an operator to accurately measure the depth of the screw threads it will be seen in Figure 1 that the anvil 13 has also been shown in elevation and in this elevation it appears that the anvil includes a preferably longitudinal body, the upper edges of which are inclined toward each other to present an apex, suitable for introduction between the turns of the threads to be measured. This will obviously enable the operator to accomplish this measurement with far greater accuracy than has heretofore been considered possible and thus, it will be understood that all of the objects set forth in the preamble of the specification are accomplished and it will be further appreciated that numerous modifications of structure might readily be resorted to without departing from the scope of my claims, which are:

1. In a micrometer, a threaded spindle and a barrel therefor, and a graduated tape spirally encircling said barrel, the pitch of the spiral conforming to the pitch of the threads of the spindle.

2. A micrometer including a frame having a screw threaded bore, a spindle threaded in said bore, a barrel surrounding said spindle and carried thereby, and a graduated tape applied to said barrel, said tape being disposed in a helical groove the pitch of whose convolutions coincide with the pitch of the screw threads.

3. A micrometer including a frame, a spindle movably carried by said frame, means for moving the spindle for measuring operations, said means comprising a knob carried by the spindle for rotation with respect thereto, a device arranged between the spindle and the knob to obviate undue strain on the spindle, said device comprising a cup shaped washer arranged between the confronting faces of the spindle and knob, and circumferentially arranged resilient tongues on said washer frictionally engageable with the mentioned face of said knob and ratchet portions of the latter.

4. As an article of manufacture for a micrometer, a micrometer barrel, a screw-

threaded spindle mounting said barrel, said barrel being formed with a spiral channel, the pitch of which conforms to the pitch of the said spindle, and a graduated tape disposed in said channel.

5. As an article of manufacture, for a micrometer, a barrel, a screw-threaded spindle mounted in said barrel, a graduated tape spirally disposed upon the face of said barrel, the pitch of the convolutions of said tape corresponding with the pitch of the threads of said spindle, and means for securing said tape to said barrel.

JOSEPH BREWER.