

A. NIELSEN.
MICROMETER.
APPLICATION FILED NOV. 2, 1908.

923,880.

Patented June 8, 1909.

Fig. 1.

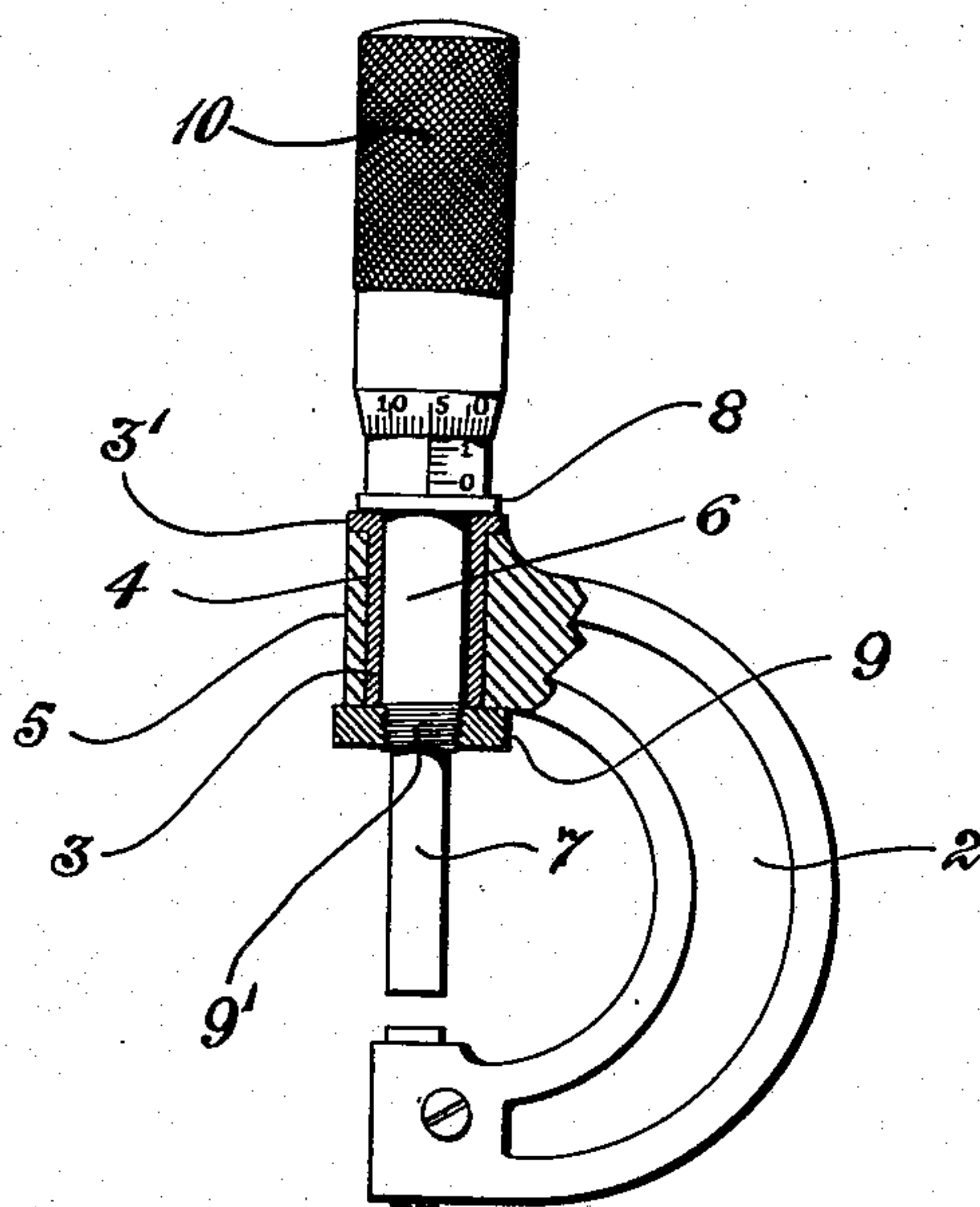


Fig. 2.

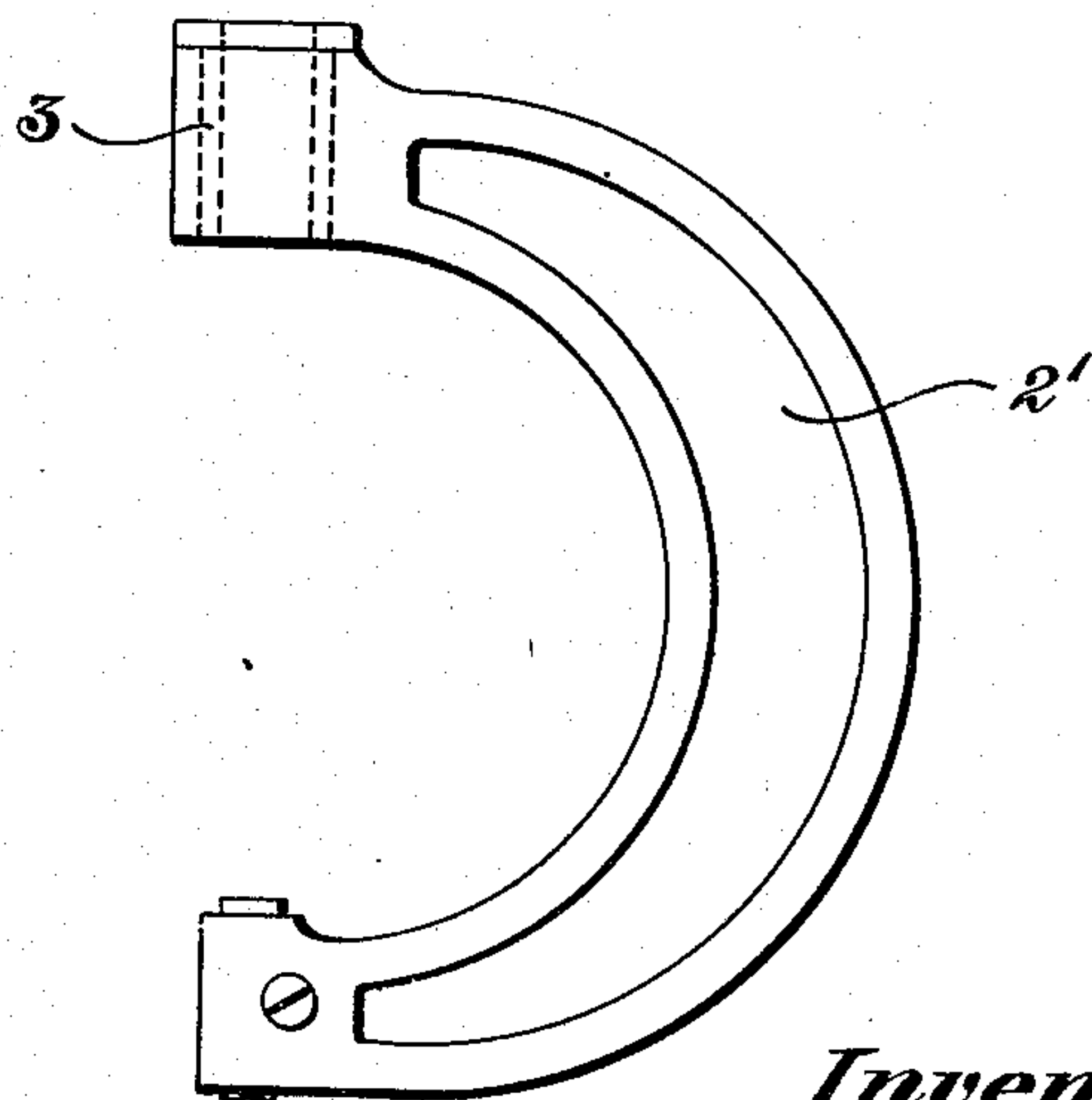


Fig. 3.

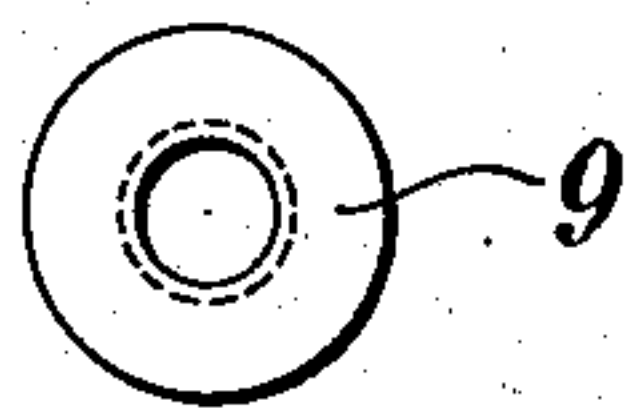


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

ANDREAS NIELSEN, OF HARTFORD, CONNECTICUT.

MICROMETER.

No. 923,880.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDREAS NIELSEN, a subject of the Emperor of Germany, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Micrometers, of which the following is a specification.

This invention relates to micrometers and also to an attachment therefor.

In machine shops and similar places where micrometers are employed it is the custom to carry a set of such instruments and the number in such sets varies, sometimes being as high as twelve. A micrometer of the type in which my invention resides involves in its construction a bowed frame and in a set such as that to which allusion has been made the number of these frames will correspond with that of the set. Ordinarily each frame has its own or individual spindle or screw so that for instance when there are twelve micrometers in a set there will be an equal number of spindles. I provide an attachment which may be interchangeably used with any of the frames of a set and this attachment may be made and used as an article of manufacture for application to any of the usual micrometer frames. With my invention therefore a set of twelve bowed frames would require only one attachment and this could be applied to any one of the said twelve frames which as will be apparent vary as to size to adapt them to different classes of work. I have mentioned a set as including twelve micrometers or frames; this number may be varied. There might be only two in a set or the number might be greater than twelve the latter being cited merely as an illustration. Then again I might make the micrometer with the present attachment as an article of manufacture. Said attachment is simple in construction, effective in operation, accurate, and can be inexpensively made.

In the drawings accompanying and forming part of the present specification I have illustrated one advantageous form of embodiment of the invention which to enable those skilled in the art to practice the same will be set forth at length in the following description while the novelty of the invention will be included in the claim succeeding said description.

Referring to said drawings, Figure 1 is a side elevation partly in section of a micrometer and attachment therefor comprising my invention. Fig. 2 is a side elevation of a

micrometer frame to which said attachment is applicable and of a larger size than that shown in said Fig. 1. Fig. 3 is a top plan view and Fig. 4 is an elevation of a holding nut.

Like characters refer to like parts throughout the several figures.

In said drawings I have shown two micrometer frames of different sizes the one illustrated in Fig. 1 being designated by 2 and the other by 2'. Except as to size they are the same in construction each being bowed or of arcuate shape; they may be of any suitable material. An attachment involving my invention is applicable to either of these frames or to others of substantially similar kind.

The attachment preferably includes in its make-up a sleeve or bushing as 3 which may be made from any suitable metal and said sleeve or bushing is adapted to be introduced into a bore as 4 extending through a hub as 5 at one end of the frame 2 or 2'. The bushing is shown connected with the frame 2' in Fig. 2 although no other parts of the attachment are represented as associated with said frame 2'. I prefer that the bushing be held in place in its receiving bore with a driving fit by reason of which it can be held sufficiently tightly therein as to secure all necessary accuracy while no independent or separate fastening means are necessary for such purpose. I might if desired make said bushing a permanent part of the bowed frame. From this it will be evident that the bushing is not limited to any particular connection with the frame of the instrument. Said bushing at its outer end is provided with an annular, external flange as 3' which fits solidly against the outer face of the hub 5.

As a part of the attachment I prefer to employ a barrel as 6 this barrel being internally threaded as is usual in this class of devices to receive the threaded portion of a spindle as 7. The barrel which acts as a feed nut is relatively fixed as will hereinafter appear and it therefore follows that when the spindle is turned it will be either advanced or retracted depending upon the direction in which the same is turned.

The bushing 3 is intended for the reception of said barrel 6 the latter being passed through the former until a circumferential shoulder as 8 finds a seat or bearing upon the bushing. In the present instance the shoulder 8 rests against the flange 3'. The fit be-

tween the barrel and the bushing is not preferably a very tight one by reason of which the barrel can be easily removed from or introduced into said bushing. In this case I
 5 therefore prefer to provide extraneous holding means for holding the barrel in assembled relation with the bushing and for this purpose I may employ a nut as 9 which is adapted to fit the externally threaded forward end 9' of said barrel. It will be assumed that the bushing 3 forms a permanent or substantially immovable part of the frame 2 and that the barrel 6 is not in position. To
 10 mount the barrel and cooperating spindle the barrel will be passed through the bushing until the shoulder 8 abuts against the flange 3' after which the nut 9 will be applied to the threaded portion 9' and turned home. This results in firmly drawing the shoulder 8
 15 against the flange 3' whereby the barrel 6 will be held against movement in a thoroughly stable and substantial manner. The nut 9 is preferably though not necessarily of circular form and its periphery is milled
 25 or knurled to facilitate the rotation of said nut. To remove the barrel it is simply necessary to take off said nut when the barrel with its cooperating spindle 7 can be slipped from out of said bushing.

30 I have shown as a part of the spindle 7 an adjusting sleeve 10 and their rigid connection may be after the usual manner. The sleeve 10 when turned causes the turning of the spindle 7 to either advance or retract the
 35 same. The sleeve and barrel are provided also with cooperating graduated surfaces as is also common in this class of devices.

The barrel 6, spindle 7 and adjusting sleeve when constructed and arranged as
 40 hereinbefore stated can be made and sold as an article of manufacture or such an article can be produced by associating therewith the

bushing 3 or equivalent part. The annular shoulder constitutes a stop for correctly positioning the barrel 6 so that precisionized
 45 results are secured.

The barrel 6, except for the bore there-through which receives the calipering spindle, is imperforate; it is not split. I therefore do not rely on any frictional means or spring-
 50 like action to retain the said barrel firmly in position. By the holding means provided I can hold the barrel against movement as substantially as though said barrel were an integral part of the frame of the instrument.
 55 Although the bushing 3 may be made of any suitable material it is preferably made of tool steel which permits of its being hardened and ground to receive the hardened and ground
 60 barrel 6 thereby greatly increasing the resistance to wear between the bearing surfaces of the two members.

What I claim is:

The combination of a bowed micrometer frame having a hub at one end, a bushing
 65 fitted in said hub the forward end of said bushing being substantially flush with the inner end of said hub and the outer end of said hub having a circular flange to fit
 70 against the outer end of said hub, a spindle-receiving barrel fitted in said bushing and provided with an external annular shoulder and also having a threaded portion forward
 75 of said shoulder, and a nut engaged with said threaded portion to draw said shoulder against said flange, said nut when set bearing against said hub and bushing.

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

ANDREAS NIELSEN.

Witnesses:

HEATH SUTHERLAND,
 F. E. ANDERSON.