

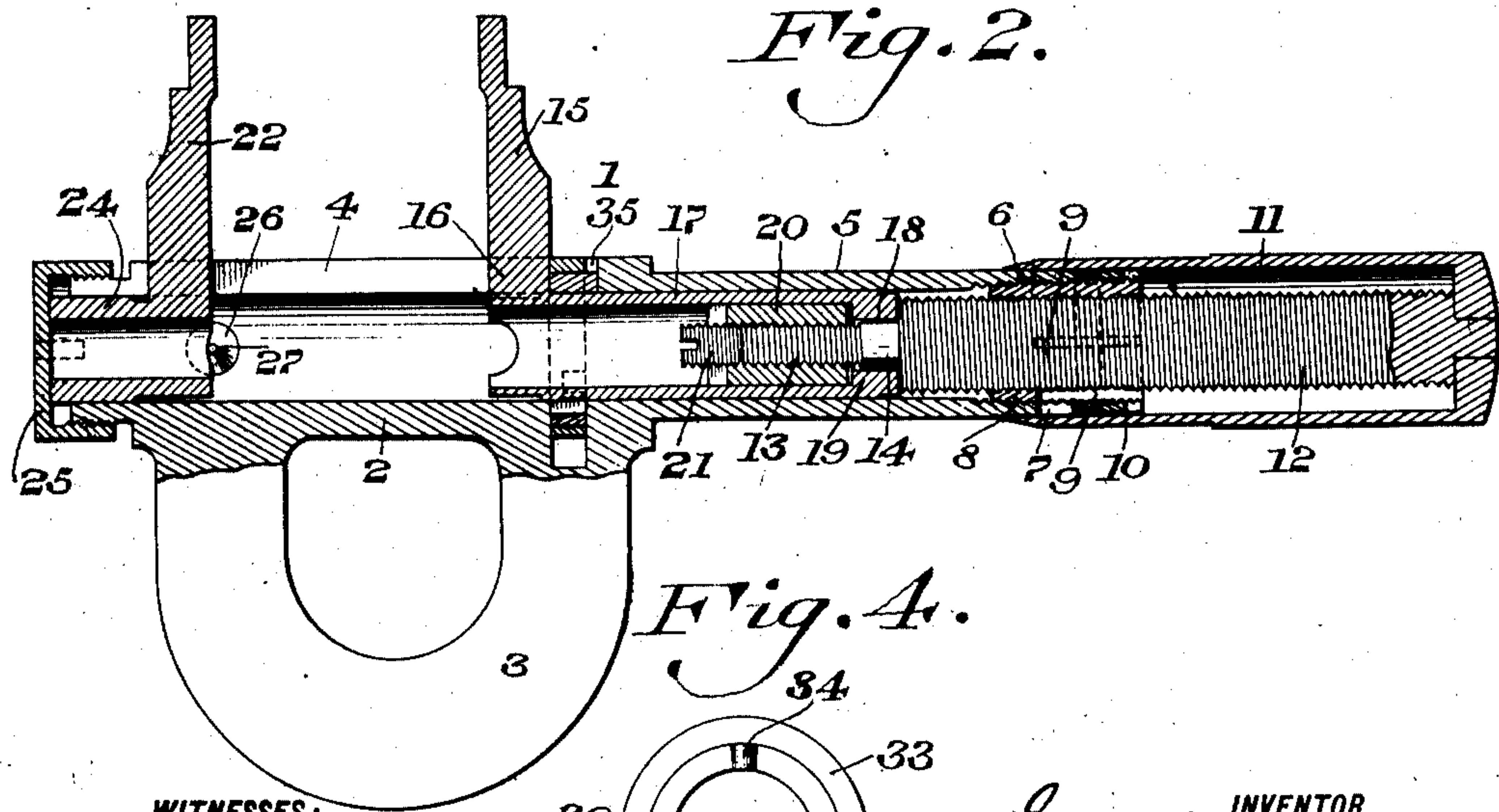
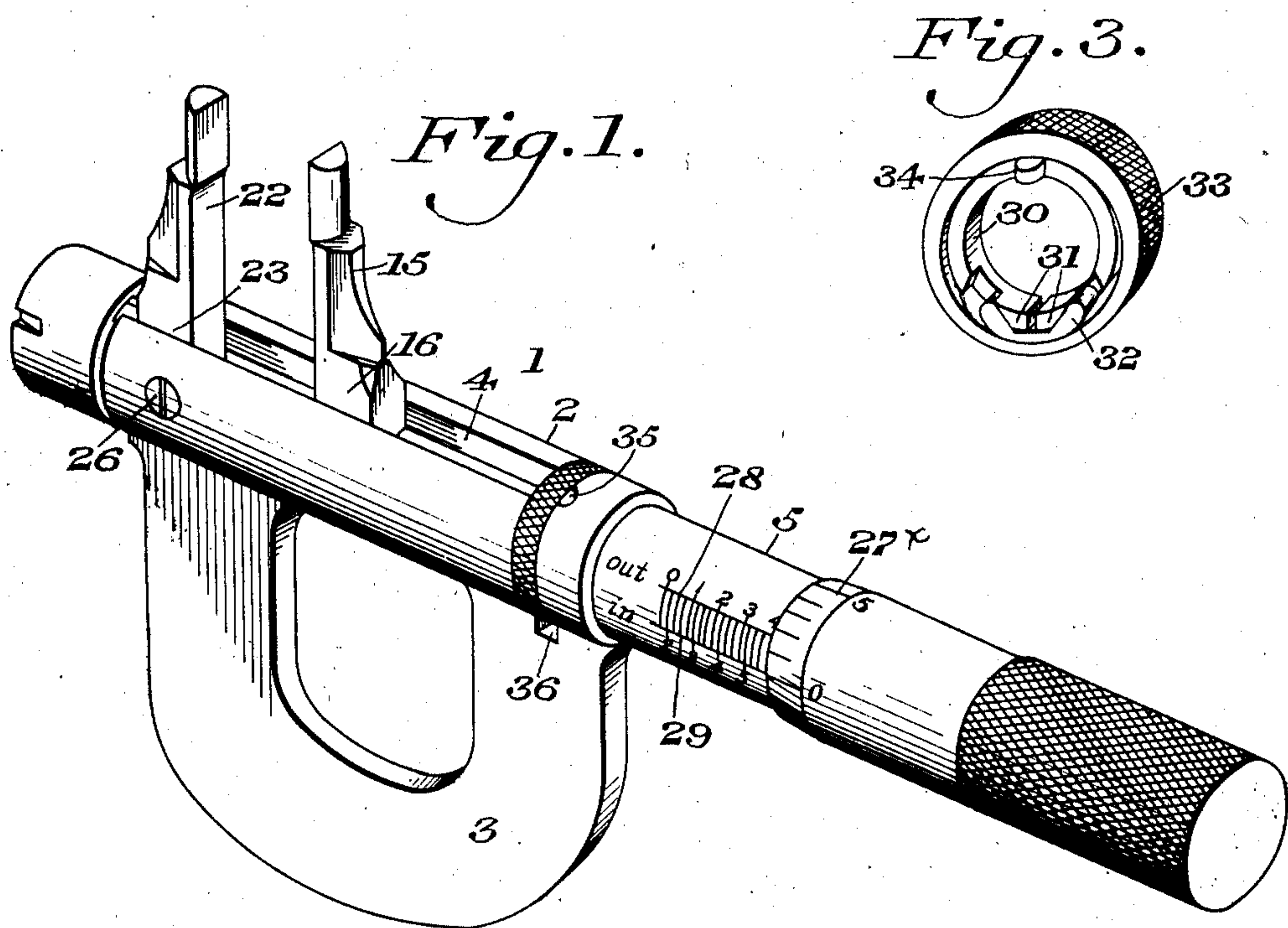
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PATENTED DEC. 17, 1907.

E. HEYM.

MICROMETER CALIPERS.

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MICROMETER-CALIPERS.

No. 874,197.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed November 22, 1906. Serial No. 344,530.

To all whom it may concern:

Be it known that I, ERNEST HEYM, a subject of the Emperor of Germany, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Micrometer-Calipers, of which the following is a specification.

My invention relates to a new and useful micrometer caliper and consists of means whereby inside and outside measurements may be taken.

It further consists of a novel lock for the parts.

It further consists of novel means for adjusting the parts.

It further consists of novel details of construction, all as will be hereinafter fully set forth.

Figure 1 represents a perspective view of a micrometer caliper, embodying my invention. Fig. 2 represents a longitudinal sectional view thereof with the parts in different positions from that shown in Fig. 1. Fig. 3 represents a perspective view of the locking means. Fig. 4 represents a front elevation of the lock employed.

Similar numerals of reference indicate corresponding parts in the figures.

As my invention is constructed by means of a single scale having two lines for taking readings measurements can be made of the inside or outside by a single instrument and correct readings thereof taken to any fineness and I provide further a lock for the jaws when it is necessary to make a plurality of measurements of the same reading.

I have shown in the drawings one form of carrying out my invention, but it will be understood that I do not desire to be limited in every instance to what I have shown and described, as other instrumentalities may be employed for carrying out the invention with the same results.

1 designates a micrometer caliper having a body 2 with a yoke 3, upon which I may place any suitable notations or scales, which may be useful in making calculations and which I have not shown in the drawings, as any suitable matter may be placed thereon. In a suitable portion of said body I provide a slot 4 and one end of said body is open. 5 designates a tubular extension on said body which may be integral therewith or suitably mounted thereto; the inner wall of said extension having the threads 6 thereon at a suitable point and being split as at 7.

8 designates an exteriorly and interiorly threaded bushing which is exteriorly tapered and is adapted to engage with the threads 6 on the extension 5, said bushing being split at 9 and being adapted to receive on its split end the threaded ring 10 which is exteriorly tapered, said ring serving by proper manipulation to suitably open or close the split end of said bushing.

11 designates a sleeve which fits over the extension 5 and to which is connected, or may form part thereof, a spindle 12 which is threaded to engage with the interior threads of the bushing 8, it being understood that by the rotation of sleeve 11 the spindle 12 is moved inwardly or outwardly and carries with it the sleeve 11 and that by the proper manipulation of the said ring 10 the inner threads on the bushing are caused to properly engage with the spindle 12 and prevent any improper sidewise movements. Carried by the spindle or forming part thereof is the threaded pin 13 between which and said spindle is the neck 14 which is free from threads.

15 designates the movable jaw of the micrometer caliper, which is provided with a suitable angular portion 16 adapted to fit and move in the slot 4 of the casing, said jaw having a tubular portion 17 which is adapted to fit the bore of the body 2, it being noted that said portion is passed into the bore from the open end of the body and at the same time the jaw enters the slot 4. The end of the tubular portion is provided with a suitable opening 18 formed by the intumed flange 19, which also forms outside and inside shoulders, and through said opening the pin 13 is passed, so that the end of the spindle 12 bears against the outside of the flange, while the neck 14 is seated in the opening or bore 18.

20 designates an interiorly threaded bushing which fits loosely within the tubular portion 17 in the jaw 15 and the threads of which are engaged by the threads on the pin 13 so that it is held tightly thereon, and said bushing 20 being situated on the said pin, in such a manner, that a slight space is formed between the same and the inner shoulder of the flange 19. The outer end of the pin 13 is some distance from the outer end of the bushing 20 and I provide a screw 21 which is screwed into the bushing until its end abuts the end of the pin 13, so that the bushing 20 and pin 13 are locked and will rotate

together, so that it will be seen that as the spindle is moved inwardly and outwardly the tubular portion 17 and jaw 15 will move therewith.

22 designates the stationary jaw which may be adjusted in the body and which is provided with the angular portion 23 which is situated in the slot 4 of the body, the said jaw 22 having a tubular portion 24 which is adapted to fit the bore of the body and the end of the latter being provided with threads which are adapted to be engaged by the threads upon a cap 25, which latter bears against the end of the tubular portion 24 and the jaw 22 and between which and the set screws 26 the said jaw is adjusted and held in said adjusted position, it being noted that the set screws 26 pass through the body 2 and are provided with the conical portions 27 and that there is a screw 26 on each side of the body so that the jaw 22 will be properly held. In order to adjust said jaw 22 to the proper position, it is first necessary to bring the movable jaw 15 in contact therewith by rotating the sleeve 11. When the said jaws are in contact it is necessary that the 0 of the scale 27 \times , on the sleeve 11, will register with the 0 on the line 28 of the scale on the extension 5, said line 28 of the scale being adapted to give readings for the outside measurement, while a second line 29 of the scale on said extension 5 serves the similar purpose for inside measurements. If it is found that the jaws are not properly situated, when the scales are in proper register, the said jaw 22 can be adjusted, for example, if it is necessary to move the same inwardly, by slightly unscrewing the screws 26 and turning the cap 25, the said jaw 22 is moved slightly inwardly, this movement being permitted by the conical face 27 of the screws. This adjustment can be continued until the jaws are in proper position. The movable jaw can also be adjusted in order that the two jaws will properly measure inside measurements, and this adjustment can be made by screwing the bushing 20 slightly farther on or off the pin 13 and then locking the same together again by the screw 21, it being understood that by this means the position of the movable jaw with respect to the sleeve 11 can be changed. If desired in order to be positive that the jaws are properly set, I may employ a gage, such as a ring, the inside measurement of which is one half an inch, then by inserting the jaws within the ring, the 0 of the scale 27 \times should register with the 5 on the line 29 of the scale if the jaws are correctly set up if the said 0 is slightly to one side or the other of the 5, the jaws are not correctly set and, it will be necessary to adjust the movable jaw as described, until the proper register occurs, when the parts will be properly set. As it often occurs that it is

necessary to make a number of measurements of the same record, I have provided a lock for movable jaw 15 which consists of a split ring 30 provided with lugs 31 over which I place a plate 32 and around said ring and plates 32 I place an internal cam ring 33. The split ring 30 is provided with the lug 34 which is adapted to enter a recess 35 in the body 2, it being understood that a suitable cut away portion 36 is made in the body 2 for the reception of the split ring 30 and internal cam ring 33 and by reason of the engagement of the lug 34 in the recess 35, rotation of the split ring is prevented, but that when the outer internal cam ring 33 is rotated the cam face thereon will move inwardly the plate 32 which will cause the split ring 31 to be compressed and causes the same to bite the cylindrical portion 17 of the jaw 15 which passes through said rings, and prevent accidental movement thereof.

It will be understood from the construction above described, that by reason of the single scale having two reading lines, on the cylindrical extension 5, inside and outside measurements can be made with the same micrometer caliper, it only being necessary to adjust the jaws 15 and 22 properly in order that the scales register correctly, it being understood that the 0 on the scale 27 \times must register with the 0 on the line 28 of the scale and from this line, readings of the outside measurements are made. When inside measurements are to be made, the 0 is caused to register with the first division on the line 29 of the scale for inside measurements, and readings for said inside measurements, must be taken entirely on the lower line of the scale, it being noted that the movement of the 0 line in the scale 27 \times from the outer to the inner scale is permitted, by reason of the slight space left between the bushing 20 and the flange 19 on the extension 17.

It will be understood that the inside readings are taken in the usual manner but that the two reading lines which I have provided on my lines are provided, by reason of the lost motion which must occur in the gage by reason of the slight space which must be left in the internal mechanism, as otherwise if the space were not there the parts would be so tight that they would not be operated. It will be seen therefore that when the jaws are in contact and the 0 on the scale 27 \times is in register with the 0 on the line 28 of the scale that as soon as the sleeve is turned there will be a slight movement permitted before the jaws are moved, this distance being indicated by the distance between the two lines 28 and 29 on the scale. In other words, this allows for the lost motion and the readings for the inside measurements are, as before stated taken on the line 29.

The operation of the device is apparent

from the above description and the means for adjusting the stationary jaw has already been described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, a body, a movable jaw, a stationary jaw, a single scale having two reading lines on the body, and a rotative sleeve connected with said movable jaw having a suitable scale thereon which is adapted to register at the proper time with either of said reading lines, whereby inside or outside measurements may be taken.

2. In a device of the character described, a body portion, a bushing in one end thereof, a sleeve sliding on said body, a spindle in threaded engagement with said bushing and carried by said sleeve, a movable jaw actuated by said spindle and connected therewith, a stationary jaw mounted in said body, and means for adjusting said stationary jaw to any degree of fineness.

3. In a device of the character described, a body portion, a bushing in one end thereof, a spindle in threaded engagement with said bushing, a movable jaw actuated by said spindle and connected therewith, a stationary jaw mounted in said body, and means for adjusting said stationary jaw to any degree of fineness.

4. In a device of the character described, a body, a stationary jaw, a spindle in threaded engagement with said body, a pin carried by said spindle, a movable jaw carried by said body, and a bushing in engagement with said pin and serving to connect the jaw with said spindle.

5. In a device of the character described, a body, a stationary jaw, a spindle in threaded engagement with said body, a pin carried by said spindle, a movable jaw mounted in said body, a bushing in engagement with said pin and serving to connect the jaw with said spindle and means for locking said pin and bushing together.

6. In a device of the character described, a body portion, a stationary jaw, means for adjusting said stationary jaw, a movable jaw having an extension, a spindle having a portion thereof engaging said extension and having a portion projecting within said extension and adjustable means engaging with said spindle and situated within said extension for holding the parts in proper position.

7. In a device of the character described, a body, a stationary jaw, a movable jaw, means for actuating the same, a split ring through which said jaw passes, and an internal cam collar adapted to suitably compress said ring.

8. In a device of the character described, a movable jaw, means for actuating the

same, a stationary jaw, a cap bearing upon said jaw on one side, and adjustable stops against which said stationary jaw abuts.

9. In a device of the character described, a movable jaw, means for actuating the same, a stationary jaw, a cap bearing upon said jaw, and screws having conical points and against which said stationary jaw abuts whereby the position of the same may be adjusted.

10. In a device of the character described, a body, a stationary jaw, means for adjusting said stationary jaw, a movable jaw, means for engaging therewith for moving the same in one direction and means engaging therewith for moving the same in the opposite direction, a space being formed between the engaging means and the points of engagement said means being situated within said body.

11. In a device of the character described, a body, a stationary jaw, means for adjusting said stationary jaw, a movable jaw, means for moving the same in one direction and adapted to be adjusted for outside measurements and means for moving the same in the opposite direction and adapted to be adjusted for inside measurements said means being situated within said body.

12. In a device of the character described, a hollow body, a stationary jaw, a movable jaw having a tubular extension, a spindle having a portion thereof engaging said extension and having a portion projecting within said extension and means engaging with said spindle and situated within said tubular extension for holding the parts in proper position.

13. In a device of the character described, a body, a stationary jaw, a spindle in threaded engagement with said body, a movable jaw having a portion thereof situated within said body and engaged by said spindle for moving the jaw in one direction and means actuated by said spindle and engaging with said jaw for moving the latter in the opposite direction, a slight play being provided between the points of engagements of said jaw and said spindle and means.

14. In a device of the character described, a body, a stationary jaw, a spindle in threaded engagement with said body, a movable jaw having a portion thereof situated within said body and engaged by said spindle for moving the jaw in one direction, and a bushing actuated by said spindle and engaging said movable jaw for actuating the latter in the opposite direction.

15. In a device of the character described, a hollow body, a stationary jaw, a movable jaw having a tubular extension, a spindle having a portion thereof engaging said extension and having a portion projecting within said extension and adjustable means en-

gaging with said spindle and situated within said tubular extension for holding the parts in proper position.

16. In a device of the character described, 5 a hollow body, a stationary jaw, a movable jaw guided in said body and having an extension movable therein, a spindle in threaded engagement with said body and movable therein, a projection on said spindle adapted 10 to be seated within the extension on said movable jaw and means for holding the parts in proper position.

17. In a device of the character described, 15 a hollow body, a stationary jaw, a movable jaw guided in said body, and having an extension movable therein, a spindle in threaded engagement with said body and movable therein, a projection on said spindle adapted 20 to be seated within the extension on said movable jaw and a bushing for holding the parts in proper position.

18. In a device of the character described, 25 a hollow body, a stationary jaw, a movable jaw guided in said body and having an extension movable therein, a spindle in threaded engagement with said body and movable therein, a projection on said spindle adapted 30 to be seated within the extension on said movable jaw, a bushing for holding the parts in proper position and a nut for holding said bushing in position.

19. In a device of the character described, 35 a body, a stationary jaw, a spindle in threaded engagement with said body, a movable jaw having a portion thereof engaged by said spindle for moving the same in one direction, a bushing actuated by said spindle and engaging said movable jaw for actuating the 40 latter in the opposite direction and means for locking said bushing in position.

20. In a device of the character described, a body, a movable jaw, means for actuating

the same, a stationary jaw, a cap adapted to hold said stationary jaw in engagement with said body, and screws having conical points 45 projecting from opposite sides of said body and against which said stationary jaw abuts, whereby the same is held in position between said cap and said screws and may be ad- 50 justed therebetween.

21. In a device of the character described, a body, a stationary jaw, a movable jaw, 55 separate means situated within said body for adjusting said jaws, a single scale having two reading lines on the body and a rotative sleeve connected with said movable jaw and having a scale thereon which is adapted to 60 register at the proper time with either of said reading lines, whereby inside or outside measurements may be taken.

22. In a device of the character described, a body, a stationary jaw, a movable jaw hav- 65 ing an extension, a spindle having a portion thereof engaging said extension upon one side and adjustable means situated within said extension and engaging the spindle upon 70 the opposite side for holding the parts in proper position.

23. In a device of the character described, a hollow body, a stationary jaw, a movable 75 jaw having an extension, a spindle having a portion thereof engaging said extension, adjustable means engaging with said spindle and with said extension for holding the parts in proper position, a sleeve connected with 80 said spindle and rotative about said body and a single scale having two reading lines with which the scale carried by said sleeve is adapted to register.

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Witnesses:

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