

T. SHAW.
MICROMETER GAGE.
APPLICATION FILED AUG. 13, 1919.

1,350,185.

Patented Aug. 17, 1920.

Fig. 1.

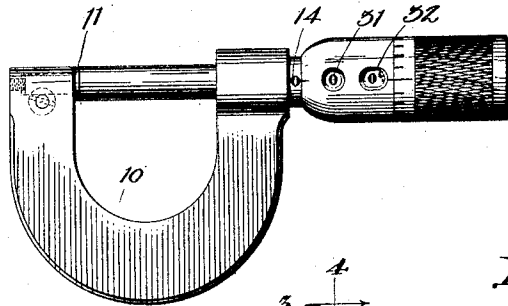


Fig. 2.

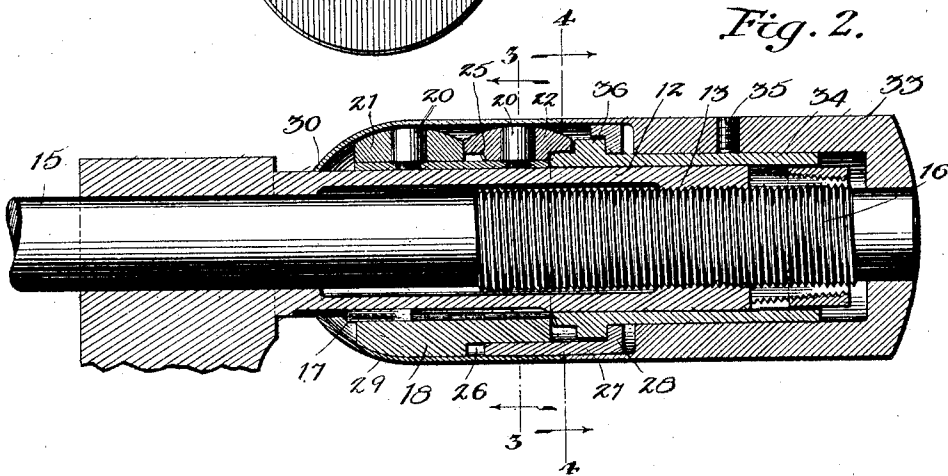


Fig. 3.

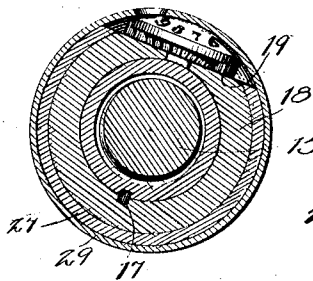


Fig. 5.

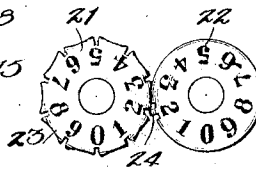
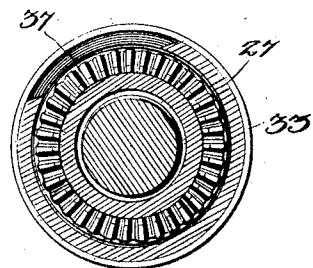


Fig. 4.



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MICROMETER-GAGE.

1,350,185.

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To all whom it may concern:

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

This invention relates to measuring instruments, particularly to micrometer gages, and has for its object the provision of a micrometer gage embodying in its construction indicating wheels moved by rotary movement of the handle and carrying indicia visible through sight openings, these indicia indicating the dimensions of an object being measured directly and without the troublesome use of a vernier scale.

An important object is the provision of a device of this character in which the casing within which the intermeshing indicator wheels are mounted, is stationary with respect to the frame of the device in which the indicator wheels are moved by engagement with each other and by engagement by one of them with a crown gear carried by and rotatable with the rotary handle.

Another object is the provision of a device of this character which is simple and inexpensive in manufacture, which will be efficient and accurate in use, a great time and labor saver, and a general improvement in the art.

With the above and other objects and advantages in view the invention consists in the details of construction to be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the device,
Fig. 2 is a longitudinal sectional view through the essential portion thereof,

Fig. 3 is a cross sectional view on the line 3—3 of Fig. 2,

Fig. 4 is a cross sectional view on the line 4—4 of Fig. 2, and

Fig. 5 is a detail view showing intermeshing indicator wheels.

Referring more particularly to the drawing, the numeral 10 designates the frame of the instrument which is of the usual semi-circular shape and which has one of its arms provided with an adjustably mounted member 11 with which coöperates another member for determining the dimensions of an object placed between the members. Secured to or formed integrally upon the

other arm of the frame 10 is a tubular extension 12 which has the outer portion of its bore threaded, as shown at 13. At one side, the tubular member 12 is provided with a series of graduations 14 ranging from zero to any suitable number. Slidably and rotatably mounted through the bore of the tubular member 12 is a stem 15, the end of which coöperates with the stationary member 11. Throughout a portion of its length the stem 15 is threaded, as shown at 16, and this threaded portion is engaged within the threaded portion 13 of the bore of the tubular member 12.

Splined upon the tubular member 12 by means of a suitable key 17, is a sleeve 18 which has one side partially cut away, as shown at 19, to provide a flat bearing surface upon which are secured studs 20 upon which are journaled indicator wheels 21 and 22, each of which carries indicia ranging from zero to 9. The indicator wheel 21 has its periphery formed with ten teeth 23 and the wheel 22 has its periphery provided with a single tooth 24 engageable successively with the teeth 23. On its underside the wheel 22 is formed as a gear 25. It will be seen that the sleeve 18 is non-rotatable with respect to the tubular member 12 but may slide longitudinally thereon.

One end of the sleeve 18 is reduced, as shown at 26, and engaged about this reduced portion is a guide sleeve 27 having an inwardly extending flange 28. A shell 29 is secured upon the outside of the sleeve 18 and is so shaped as to have one end engaging upon the tubular member 12 and serving as a guide coöperating with the indicia 14 and adapted to uncover the successive indicia as the sleeve 18 is moved upon the tubular member 12. This shell has its other end engaging upon the guide member 27 so that the shell will be held against any possible wobbling. This shell is also provided with sight openings 31 and 32 through which the indicia on the wheels 21 and 22, respectively, may be seen.

Secured upon the outer end of the stem 15 is a cylindrical handle member 33 of the same diameter as the shell 29 and having its open end abuttingly engaging the open edge of the shell and bearing upon the guide sleeve 27. Disposed within this handle member 33 is a cylindrical sleeve 34 constrained to rotate with the handle member 33 by virtue of the set screw 35 threaded through the

handle member and engaging the sleeve 34. Formed on this sleeve 34 is an outwardly extending flange 36 which engages against the inturned flange 28 on the sleeve 27 for holding the handle member 33 against longitudinal movement with respect to the shell 29 and sleeve 18. Formed on the end of the sleeve 34 is a gear 37 which meshes with the gear 25 on the wheel 22.

10 In the operation of the device it will be seen that when the handle 33 is rotated in a counter-clockwise direction the stem 15 will be rotated and owing to the threaded engagement of the latter within the outer end 15 of the tubular member 12, the stem 15 will be moved away from the stationary member 11. When it is desired to measure an object, the handle 33 is rotated sufficiently that the end of the stem 15 will be disposed in spaced relation to the stationary member 11, after which the object to be measured is placed against the member 11 and the handle 33 is rotated in a clockwise direction until the stem 15 engages against the object. As this 20 handle 33 is rotated it of course progresses along the tubular member 12 in accordance with the movement of the stem 15 and carries with it the sleeve 18 and shell 29, though these latter parts do not turn but merely move longitudinally. As the sleeve 34 carried by the handle member is rotated, engagement of the gear 37 with the gear 25 will cause rotation of the indicator wheel 22 and when the indicator wheel 22 moves one complete revolution it moves the indicator wheel 21 one stop or tooth. When the end of the stem 15 is engaged against the object being measured and the handle member 33 has been rotated until this engagement is formed, the 40 operator inspects the indicia 14 and notes the highest one uncovered by the shell 29 which will give the rough measurement. He then looks through the sight opening 31 and notes the numeral visible therethrough which will give the main fraction and then also notes which numeral is visible through the sight opening 32 which gives the smaller fraction. In actual practice the indicia 14 would indicate say, for example tenths of an inch, those on the wheel 21 would indicate hundredths, and those on the wheel 22 would indicate thousandths. Any finer degree of measurement required might be determined by estimating in case a numeral on the wheel 22 did not happen to be squarely beneath the opening 32.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided an extremely simply constructed and readily operated micrometer gage by means of which very accurate readings may be obtained directly without any need for the use of a vernier scale. It will be observed that owing to the 65 simplicity of structure there is little likelihood of derangement and the device should therefore be durable and efficient in service.

While I have shown and described the preferred embodiment of my invention it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention I 75 claim:

1. A micrometer gage comprising a frame including spaced arms, an abutment member carried by one of said arms, a tubular extension on the other arm having the outer 80 end of its bore threaded, a stem slidable and rotatable through said extension and having a portion threaded for engagement within the threaded portion of said member, a sleeve splined upon said tubular extension and having a reduced portion and also having a portion cut away to provide a flat bearing surface, a guide sleeve engaged upon said reduced portion and having an inwardly extending annular flange, studs 90 mounted on said flat bearing surface, a pair of indicator wheels journaled on such studs and each bearing indicia ranging from zero to 9, the periphery of one of said wheels being provided with teeth and the periphery 95 of the other wheel being provided with a single tooth engaging said first named teeth successively, a gear formed on the underside of said second named wheel, a shell surrounding and secured to said sleeve and 100 forming a housing for said wheels, said shell being provided with sight openings through which said indicia are visible, the end of said shell adjacent the frame being curved into proximity with said extension, 105 and said extension being provided with graduations exposable upon longitudinal movement of said shell outwardly, a handle member secured upon the outer end of said stem and of the same diameter as said shell 110 and having its open end disposed against the other end of said shell, a sleeve secured within said handle member and having an outwardly extending flange engaging said inwardly extending flange, and a gear 115 formed on said last named sleeve and engaging said first named gear.

2. A micrometer gage comprising a frame including spaced arms, a tubular extension formed on one end of said arms and having 120 the outer end of its bore threaded, a sleeve splined upon said extension, a pair of indicator wheels rotatably mounted on the sleeve and carrying indicia, one wheel having its periphery provided with ten teeth 125 and the other having its periphery provided with a single tooth, gear teeth formed on said second named wheel, a shell secured to said sleeve and inclosing said wheels, said extension being provided with graduations 130

at one end of said shell being movable thereover, a stem slidable and rotatable through said extension and threaded for engagement within the threaded portion of the bore thereof, a handle member secured upon the outer end of said stem, means for preventing longitudinal movement of said handle member with respect to said sleeve, a sleeve within said handle member and movable therewith, and a gear formed on said last named sleeve meshing with the gear teeth on said second named indicator wheel.

3. A micrometer gage comprising a frame including spaced arms, a tubular extension on one arm of said frame and having a portion of its bore threaded, a stem slidable and rotatable within said extension and having threaded engagement with the threaded bore thereof, a member slidable and non-rotatable on said extension, a pair of intermeshing indicator wheels on said member, a shell secured to said member and inclosing said wheels and provided with sight openings, said extension being provided with graduations uncovered by longitudinal movement of said member outwardly, a handle member secured to the outer end of said stem, means for preventing longitudinal movement of said handle with respect to said first named member, a sleeve within and rotatable with said handle, and gear teeth carried by said sleeve and engaging one of said indicator wheels.

THOMAS SHAW.