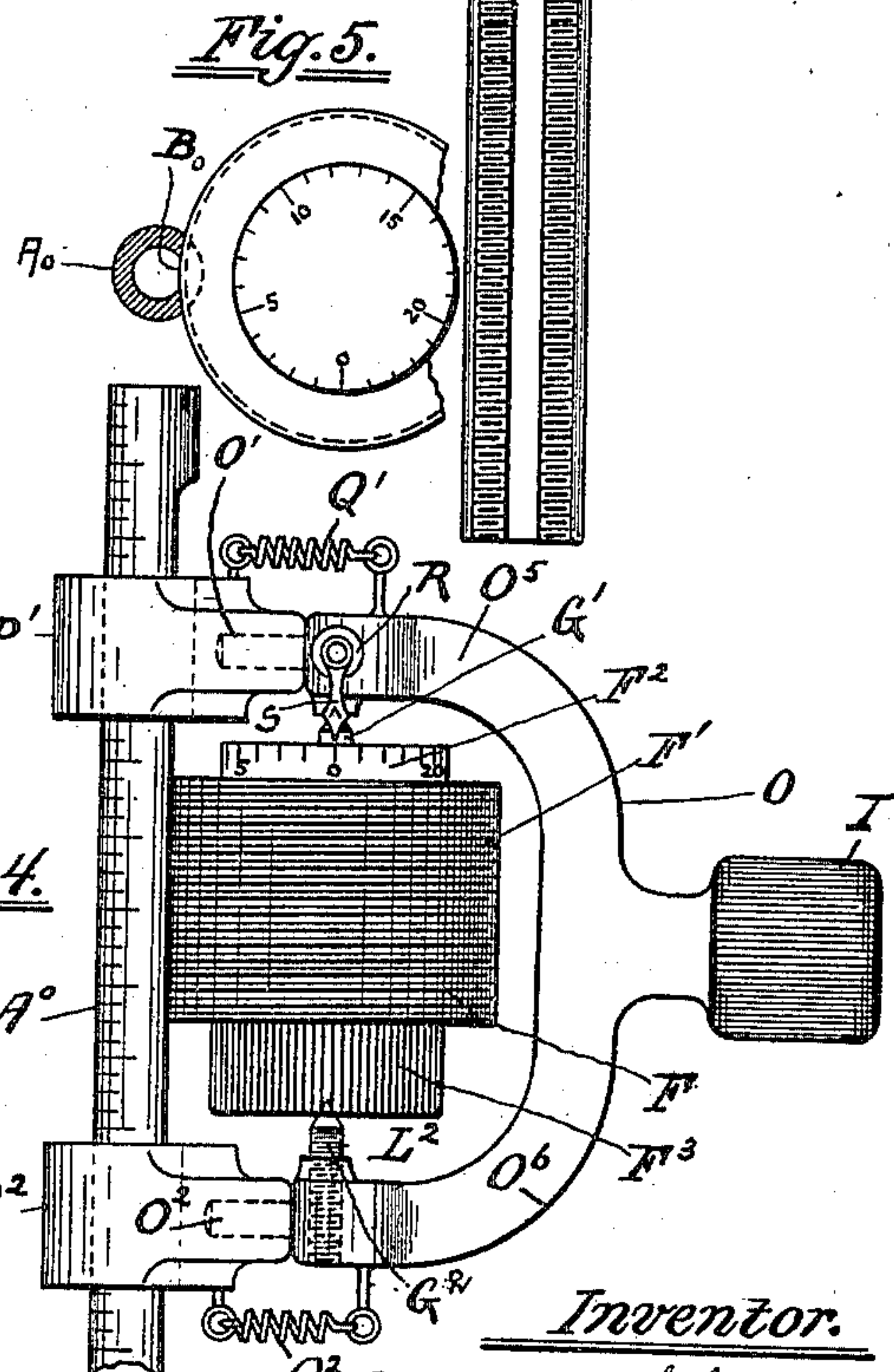
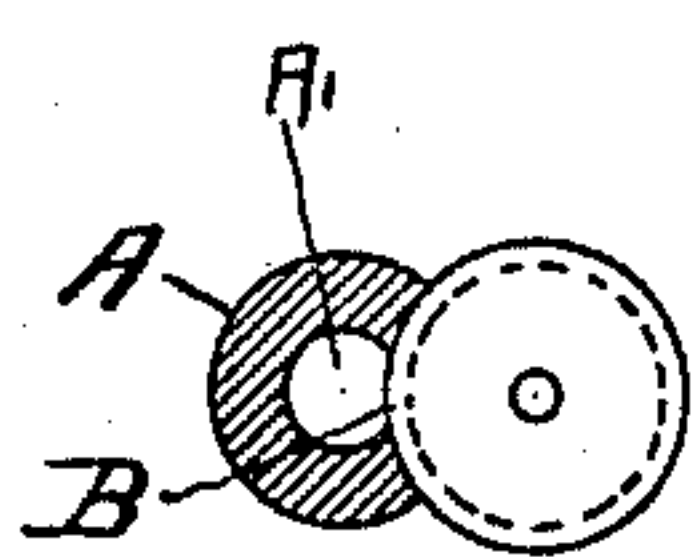
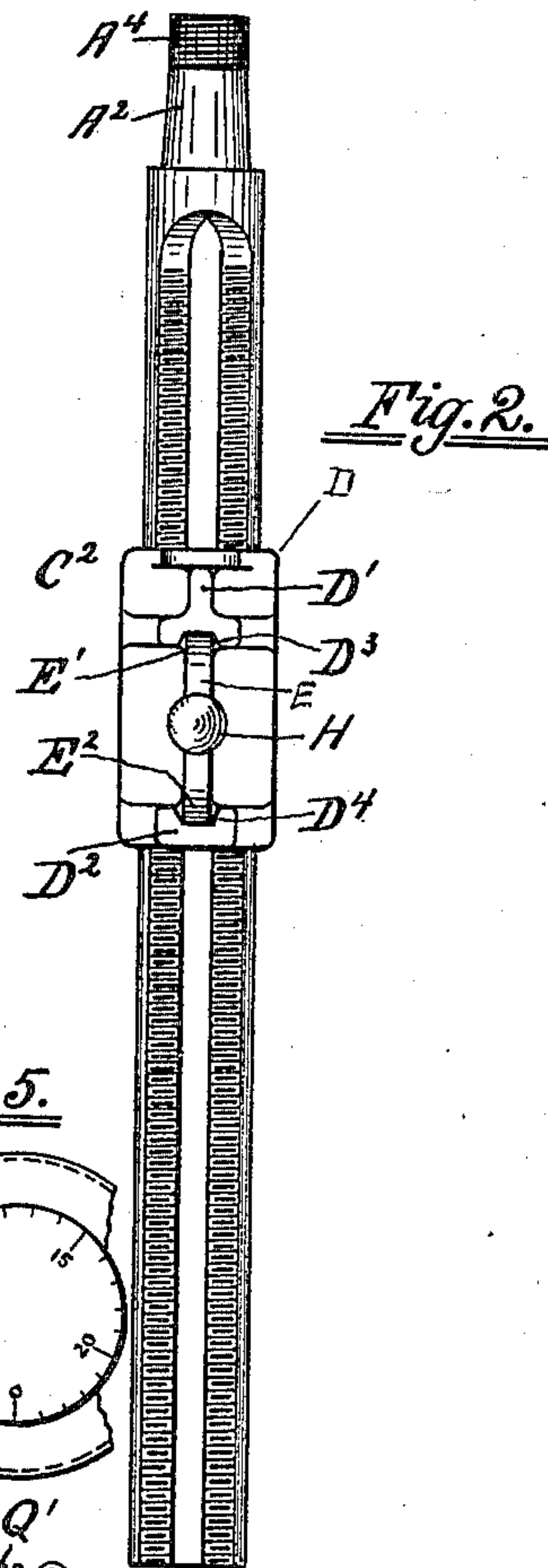
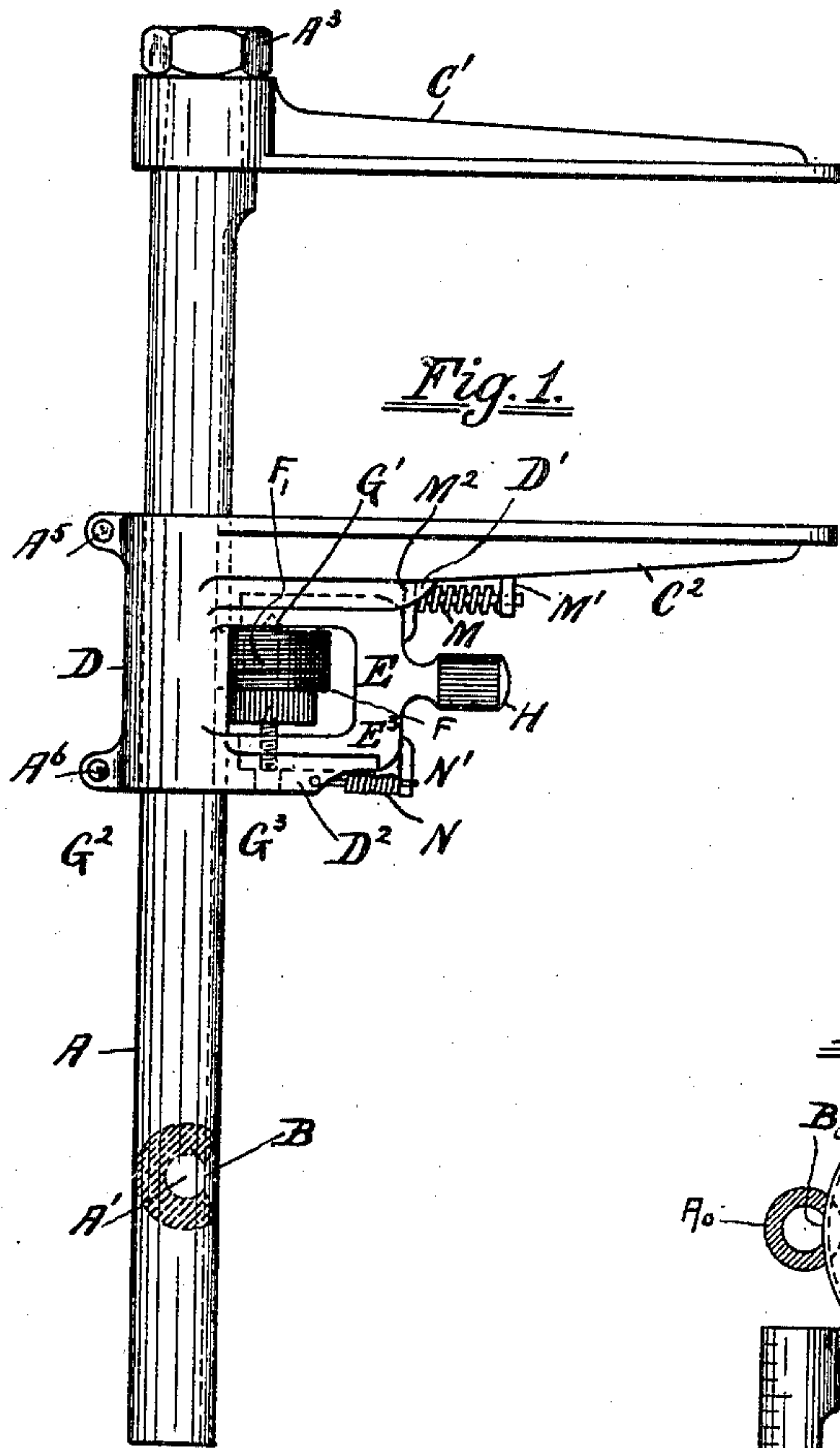


No. 679,258.

Patented July 23, 1901.

E. GIEBELER.
MICROMETER CALIPERS.
(Application filed Jan. 25, 1900.)

(No Model.)



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MICROMETER-CALIPERS.

SPECIFICATION forming part of Letters Patent No. 679,258, dated July 23, 1901.

Application filed January 25, 1900. Serial No. 2,719. (No model.)

To all whom it may concern:

Be it known that I, EDUARD GIEBELER, a citizen of the United States, residing in Brooklyn, State of New York, have invented certain new and useful Improvements in Micrometer-Calipers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to micrometers, and is a measuring means whereby a fractional part of any predetermined scale standard can be obtained in relation to a rod having said standard measure inscribed thereon, my improved means for obtaining such results being attached slidably up and down the rod, an adjustable part coöperating to that effect with the rod when the above fractional parts are desired. The coöperative means between the adjustable part and the rod are the old and well-known screw means, my invention residing in the particular way in which the adjustable fraction-measuring part is constructed and the particular manner in which the rod is screw-cut, so as to be recipient of screw action from said adjustable fraction-measuring part. To demonstrate the practical use of my invention, I apply it to micrometer-calipers, whereby I prove that a larger measurement—say, for instance, one foot and decimal fractions of an inch—can be obtained, in addition to which one-hundredth and one-thousandth parts of said decimal divisions of the inch can be had by the same instrument “in the same total measurement.”

My improvement as attached to micrometer-calipers is by means of an improved graduated cylinder mounted in a slidable jaw-prong which has a certain circumferential graduation made proportionate to a certain length of screw-thread on this cylinder, said cylinder-thread coöperating with a screw-thread on the graduated rod on which the sliding jaw-prong moves. This constitutes the principle of my invention.

In describing my improved micrometer I shall call attention to the accompanying drawings, where like letters of reference in-

dicate corresponding parts in the different views.

Figure 1 shows a side view of my improvement; Fig. 2, a front end view of parts shown in Fig. 1 with the exception of the graduated cylinder; Fig. 3, a sectional top view of parts shown in Fig. 1 on a line X X of Fig. 1, notably of the screw action between the rod and the cylinder. Fig. 4 is an enlarged view in detail of the main parts of my invention irrespective of their attachment to micrometer-calipers, simply showing them as applicable to any rod having a standard measure inserted thereon, whereof the fractional parts of the fractional divisions of the inch on the rod are desired; and Fig. 5 is a sectional view of the rod and a top view of the cylinder in their relation to each other corresponding to the view in Fig. 3.

In Fig. 1, A indicates a hollow shank or rod having a slot B cut through to the hole A', running through the rod A. The top of the rod A is cone-shaped, at the base of which cone is an offset. Resting on this offset is a prong C', being one of the two prongs C' and C², forming the measuring-jaw. This fixed prong C' is secured to the conical part A² by means of a nut A³, attached to the screw-cut part A⁴. C² is the second prong of the jaw and is slidably attached to the rod A. By means of the screws A⁵ and A⁶ its grip on the rod can be loosened or tightened at pleasure. This prong C² is constructed as follows: A bush D clasps the rod A and has, as previously stated, necessary tightening means to give it a snug tight-fitting action on the rod. An arm D' protruding from the bush at the top furnishes the measuring-prong, such arm being T-shaped in section, as observed in Fig. 1. Protruding from the lower part of the bush is a shorter arm D², each of which arms are furnished with a V-shaped groove, respectively, D³ and D⁴. Moving in these grooves is the fractional screw-cylinder support E, having V-shaped tongues E' and E² fitting the corresponding grooves. Pivoted in this support E is my improved fraction screw-cylinder F. (Best observed in detail in Figs. 4 and 5.) Examining these figures it will be seen that the rod A⁰ is constructed similar to the rod A in the micrometer-calipers, the rod A⁰ having likewise a

screw-cut slot B^0 similar to the screw-cut slot B in A . The cylinder F is here supported in a frame O , such frame being supported by pins O' and O^2 , forming a part of O and secured in corresponding apertures in the bushes P' and P^2 . Between the bushes P' and P^2 and the arms O^5 and O^6 contraction-springs Q' and Q^2 are fixed, so as to pull the support O back again whenever said support is pulled out by the manipulation of the knurled knob I . Secured to a lug R on the arm O^5 is an indicator, point S , which point protrudes out over the circumference of the graduated part F^2 of the cylinder F , so as to enable the manipulator of the cylinder to count off the degrees from zero to twenty-five inscribed on the edge of such part F^2 . The cylinder F has further on its largest diameter (indicated by reference-letter F') a screw-thread, which for the sake of a clear understanding of my construction I describe as having forty threads to one inch. The upper part F^2 has, as previously described, its circumference divided into twenty-five equal parts. The lower and third part of F (indicated by F^3) is knurled, so as to afford a firm grip whereby to rotate it. The pivotal action of the cylinder F in the support O is afforded by means of the pivoted point G' , forming an integral part of the cylinder and fitting into a thereunto and for such purpose adapted hole in the support O , and a screw-cut pivot-point G^2 , which fits into a similarly-screw-cut hole in the arm O^6 . The operation of these described parts is consequently as follows: The knurled knob I is pulled outward from the rod A^0 , the bushes P' and P^2 being thus able to slide up and down the said rod until some desired point has been reached where the additional fractions of the subdivisions of the inch on the rod A^0 are desired, when the hold on the knob I is relaxed and the cylinder consequently is permitted to move inward again toward the rod A^0 , coming thus in contact with the screw-cut slot B^0 , with which it gears, the manipulator thereupon by his action upon the knurled part F^3 moving the cylinder up or down until the desired degree is found on the graduated part F^2 . The latter movement of the cylinder toward the rod A^0 is of course due to the action of the contraction-springs Q' and Q^2 .

The above description of the cylinder F applies of course equally to the micrometer-calipers illustrated in Fig. 1. When the two screw-cut parts F' and the hollow screw-cut part of the rod A meet, it will be obvious that an up or down motion will be given to the jaw-prong C^2 , and when, for instance, the measuring-standard on the rod A is inches, with a division of the inch into forty threads to an inch on the screw-cut part of the revolving cylinder F , then by means of the indicator S , opposite to any division-mark on the graduated part F^2 , the accurate measurement of a certain article to within the twenty-fifth part of the fortieth part of an inch will be obtained. The same

reactionary elements whereby the cylinder F is brought back into contact with the rod A^0 in the device in Fig. 4 are equally necessary in this case. Such means are the two springs M and N , attached between the support E , Fig. 1, and the lower part of the jaw-prong C^2 , the part D' having to that effect a lug M' , and the arm D^2 of said prong having one end of the contraction-spring N secured to it. The spring M , which acts by expansion, is secured between the aforesaid lug M' on C^2 and a lug M^2 on the support E , and the spring N , which acts by contraction, is pivoted in D^2 and in the lug N' , forming a part of the support E . The support E has further a knurled knob H , which forms an integral part of E and is the means whereby E is pulled out from screw contact with the rod A . This movement on the part of the support E is, as previously described, by the tongues E' and E^2 moving in the grooves D^3 and D^4 . When the support E , carrying the cylinder F , is permitted to have screw connection with the rod A , the fractional measurement takes place, as heretofore described.

In reference to the principle underlying the connection of the screw-thread on the cylinder F with its action on the screw-thread in the slot B on rod A , I will state that inasmuch as I have constructed the thread on the circumference of the part F' of the cylinder F as being forty threads to the inch, and inasmuch as I have further divided up the circumference of the part F^2 of the cylinder F into twenty-five parts, as indicated in the drawings, it will be perfectly clear that a turn of the cylinder from "0" to "1" will be one twenty-fifth part of the fortieth part of an inch, which is one-thousandth part of an inch, and that if I constructed the cylinder so as to have fifty threads to the inch and then divided the circumference on part F^2 into twenty parts I would still get thousandth parts of an inch. I use these thousandth parts of an inch in my divisions, as they are the fractions that are most frequently used. That these divisions of the circumference of the cylinder F of course can be subdivided so as to give a ten thousandth part of an inch is apparent, and that, further, any metrical system can be applied to the rod A^0 is equally obvious as long as a certain division of the standard measure is maintained—that is to say, as long as the standard unit on the rod is divided so as to have a proportionate number of threads on the cylinder to the divisions on the graduated part of the cylinder—that is, on part F^2 .

In conclusion it is of course understood that various minor and constructional details, such as already mentioned in connection with the in-and-out movement of the cylinder F in relation to the rod A or A^0 with their screw-cut slots, can be suggested and devised; but

What I broadly claim, and desire to secure protection for by Letters Patent, is—

1. The combination in a micrometer-cal-

pers of a hollow graduated cylindrical rod having a slot provided with screw-cut lips; with an externally-screw-cut graduated cylinder having its screw-threads and graduations proportioned to each other, and supported in means slidably attached to the said rod, the external screw means on the said cylinder and the internal screw-threads in the rod cooperating with each other substantially as and for the purposes described.

2. The combination in a micrometer-calipers of a hollow, cylindrical rod furnished with a slot having screw-threaded lips, a support consisting of a U-shaped frame, a sliding jaw slidably attached to the said cylindrical rod, having said U-shaped frame forming a part thereof, a cylinder, axially pivoted in said frame, consisting of three parts, a graduated part, an externally-screw-threaded part and a manipulating part substantially as described.

3. The combination in a micrometer-calipers of a cylindrical, hollow graduated rod having inverted screw-threads, a sliding jaw attached to the said cylindrical rod, a U-shaped frame forming a part of said sliding jaw, a cylinder, consisting of graduated, externally-

screw-threaded and manipulating parts, pivoted in the U-shaped frame of the said sliding jaw, the said external screw-threads of the cylinder consisting of a predetermined number of said threads to the inch proportioned to the said graduations substantially as and for the purposes described.

4. The combination in a micrometer-calipers of a hollow, graduated rod provided with a slot having screw-cut lips, an externally-screw-cut graduated cylinder whose threads cooperate with the screw-cut lips of said slot, a U-formed support having the said cylinder pivoted therein, a sliding jaw moving on the hollow graduated rod, of which jaw the U-formed support forms a part, an indicator attached to the U-formed support, and means furnished for giving a resilient inward and outward movement to the said support substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of December, A. D. 1899.

EDUARD GIEBELER.

Witnesses:

CHARLES BOERS,
AUGUST M. TRESCHOW.