June 19, 1923. 1,459,500

F. B. CADY

MICROMETER CALIPER HEIGHT AND SURFACE GAUGE

Filed June 12, 1919

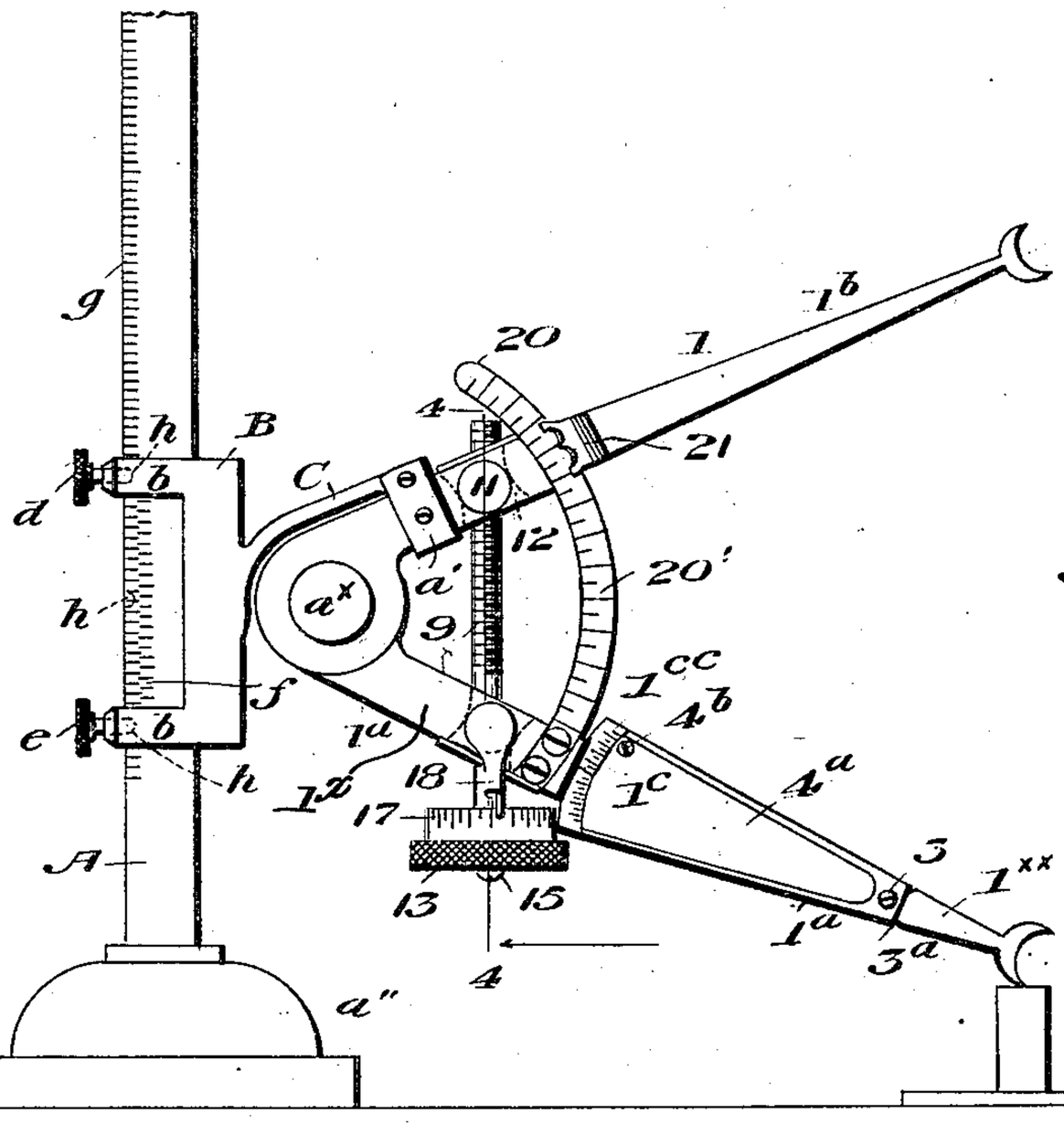


Fig. 1.

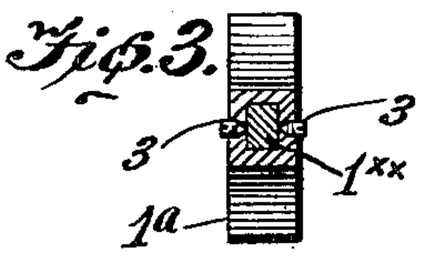


Fig. 3.

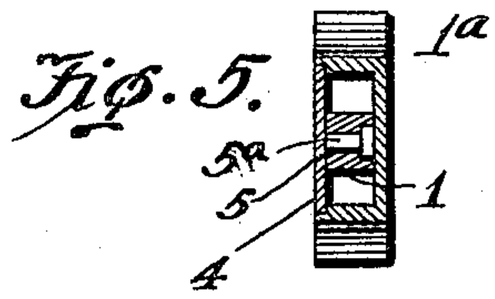


Fig. 5.

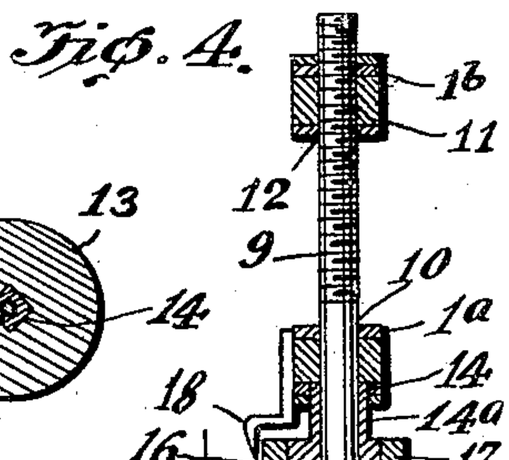


Fig. 4.

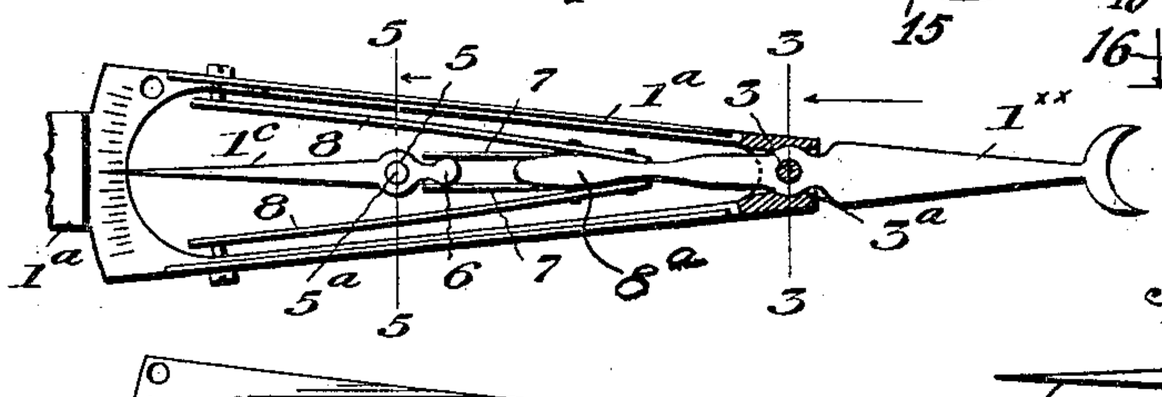
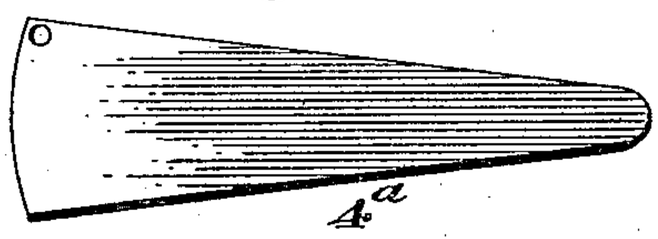
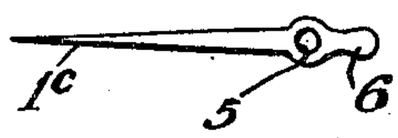


Fig. 6.

Fig. 2.





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UNITED STATES PATENT OFFICE.

FRED B. CADY, OF UTICA, NEW YORK.

MICROMETER CALIPER HEIGHT AND SURFACE GAUGE.

Application filed June 12, 1919. Serial No. 303,587.

To all whom it may concern:

Be it known that I, FRED B. CADY, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Micrometer Caliper Height and Surface Gauges; 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.

This invention relates to improvements in calipers of that type combining a micrometer.

The invention has for its object to provide automatically against the occurrence of lost motion in the operation of the device.

A further object is to provide for automatically centralizing the position especially of the micrometer indicating hand in making its return movement.

A still further object is to show variations of sizes of work as registered on the indicator scale.

Other objects will be apparent and appreciated as the nature and purposes of the invention may be disclosed in the following description, and the accompanying illustrations.

The invention consists therefore of certain instrumentalities and features of construction substantially as hereinafter more fully disclosed and pointed out by the appended claims.

In the accompanying drawings is illustraed the preferred embodiment of my invention wherein it will be understood that various changes and modifications as relate to the detailed construction and arrangement of parts may be made without departing from the spirit or scope of the claims.

In the drawings:

Figure 1 is a side elevation of my invention.

Figure 2 is a fragmental detailed sectional view, showing particularly the automatically centralizing or return controlling springs of the micrometer, and the springs thereof for guarding against lost motion.

Figure 3 is a cross section on line 3—3 of Fig. 2.

Figure 4 is an enlarged detailed fragmental sectional view taken on the line 4—4 of Figure 1.

Figure 5 is an enlarged detailed sectional view taken on the line 5—5 of Figure 2.

Figure 6 is an enlarged detailed view of the indicator needle.

In carrying out my invention I form the caliper, designated generally as 1, with legs or limbs 1^a and 1^b having a common pivotal point of connection, as at a^x, as usual, at their inner terminals, the structural details and arrangement of which will be later described. The caliper is preferably positioned or supported at the inner pivoted terminals of its legs upon an upright member or standard A, connection therebetween being effected by means of a bracket B, said standard being suitably secured in a base a'' or otherwise, for its retention. The bracket B is slidable upon the standard A and has a preferably integral arm C provided with a loop a' adapted to receive, and to which is secured, the leg 1^b, particularly as seen in Figure 1. The bracket B is provided with end-laterally extended loops b in continuation thereof, which loops are provided with preferably knurled headed set or binding screws d and e respectively. Said bracket carries a graduated member or vernier f paralleling, and for cooperation with a graduated member g fixedly associated with the standard A, the set or binding screws d and e of the loops b cooperating with said graduated members f and g in effecting the requisite adjustment of the caliper-legs to the work, in accordance with said graduations or indicia which mark off said members f and g in required inches and fractions thereof, thus providing for taking the measurements of the work.

The standard A is provided at given intervals along its indicia or graduated edge, with sockets or apertures h for facility of engagement therewith of the set screws d and e, in effecting the vertical movement or adjustment of the caliper thereon with respect to the work.

The leg 1^a of the caliper is in two sections, one section 1^x being preferably angular or square in transverse section for a suitable portion of its length, commencing at the pivot a^x, and thence laterally extended and tapered towards its opposite terminal which is stubbed, said extended and tapered portion being hollow or chambered, the chamber opening out through said terminal, one side of said chamber also being open with a removable closure 4^a applied thereover and in practice having a preferably screw-attached pin 4^b for its convenient removal. The other section 1^{xx} of the leg 1^a, is separate from, and independently movable of the section 1^x and is shouldered as at 3^a, to work against the stubbed terminal of the latter, said section 1^{xx} being tapered in conformity with the taper of the section 1^x and terminating in a preferably crescent-shaped bifurcation. The leg-section 1^{xx} extends some distance, at its inner end, into the chamber of the leg-section 1^x and has pivotal connection therewith. This connection is effected by threading laterally through the walls of the chamber of the leg-section 1^x, from the exterior, opposite tapered pivots 3, 3 with their tapering terminals received as set screws bearing against the inwardly extending portion of the leg-section 1^{xx} thereby affording a sensitive bearing for said leg-section and facility in indicating variations in the different sizes of work by the indicator.

The micrometer indicator or needle 1^c, playing over a graduated segment 1^{cc} of 1000th inch, has a somewhat enlarged terminal which is provided with an aperture or orifice 5 receiving a stub 5^a integral with one side-wall of the chamber of the leg 1^a. This end of the indicator or needle 1^c has also a rounded elongation 6, and secured to the inwardly extending terminal pivotal member 8^a of the leg-section 1^{xx} is a pair of preferably attenuated resilient members 7, forming springs and engaging opposite sides of the rounded elongation 6 of the indicator or needle 1^c for providing against lost motion. A second pair of similar members or springs 8 are secured at the outer ends of the springs to the inwardly extending terminal of an elongated pivotal member 8^a of the leg-section 1^{xx}, adjacent the corresponding ends of the springs 7, their inner ends being set-screw-held to the inner surface of the leg-section 1^x, these serving to automatically centralize the position of the needle or indicator upon making its return movement.

A finely threaded screw 9 for manipulating the device has its unthreaded portion passed freely through an elongated opening 10 in the leg-member 1^a and threaded transversely through an axis or pivot 11 positioned within an elongated opening 12 of the leg-member, 1^b, with its ends pivoted in said latter member to provide for the cooperative action thereof with the leg-member 1^b and the screw 9, as in accommodating the differential action resulting from the two movements of these. The screw 9 is provided with a preferably knurled or roughened head 13 which has a fixed tubular shank 14, a portion thereof being circular in cross-section as at 14^a to receive the correspondingly contoured unthreaded portion of the screw. The exterior of the outer end of said shank is angular in cross-section, Fig. 4 and adapted to enter a correspondingly contoured aperture of the head, the two being secured together preferably by means of an ordinary "round-headed" screw 15 inserted through said head and turned into screw-threaded engagement with the interior of said tubular shank.

Fitted quite tightly, but so as to be turned by hand, to the head 13, upon a circular shoulder or extension 16 projecting centrally from the inner face of the head, is an annular member 17 havng indicia upon its circumferential surface in required graduations of fractions of inches, as shown, cooperating with which is an indicator 18 fixedly carried by the caliper leg 1^a, it being observed that the annular graduated head 13 is also capable of being separatively manipulated for adjustment as above stated.

The caliper leg 1^a is suitably provided with a quadrant 20 graduated in inches and fractions thereof, and which graduated quadrant or scale is positioned and guided and having movement as at 21 upon the caliper-leg 1^b, one member of the guide upon said caliper-leg serving also as an indicator for cooperation with scale 20′ as seen particularly in Figure 1.

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

1. Calipers of the type described, comprising pivoted together leg-members, one leg-member being in sections, one section 1^{xx} being partially housed and pivoted within the other leg section, a micrometer-member or needle pivoted within one of the leg sections, and a member 8^a forming an elongation of the pivoted end of the other leg-section, said elongated leg-section member being provided with pairs of resilent members, one pair of the latter being adapted to function with the micrometer-needle and the other pair of said resilient members adapted to function with said leg-member elongation for the purpose set forth.

2. Calipers of the type described, comprising pivoted-together leg members, one leg-member being in sections and one section 1^{xx} being partially housed and pivoted within the other leg-section, the pivotal connection between said leg-sections being effected by tapered pivots projecting from one leg-

section and received by corresponding sockets in the other leg-section, a micrometer member or needle pivoted within one of the leg-sections, and a member forming an elongation of the other leg-section, said elongated leg-section member being provided with pairs of resilient members, one pair of the latter being adapted to function with the micrometer-needle and the other pair of said resilient members adapted to function with said leg-member elongation, as set forth.

In testimony whereof, I affix my signature.

FRED B. CADY.