

(No Model.)

F. E. LAKE.
MICROMETER CALIPERS.

No. 551,591.

Patented Dec. 17, 1895.

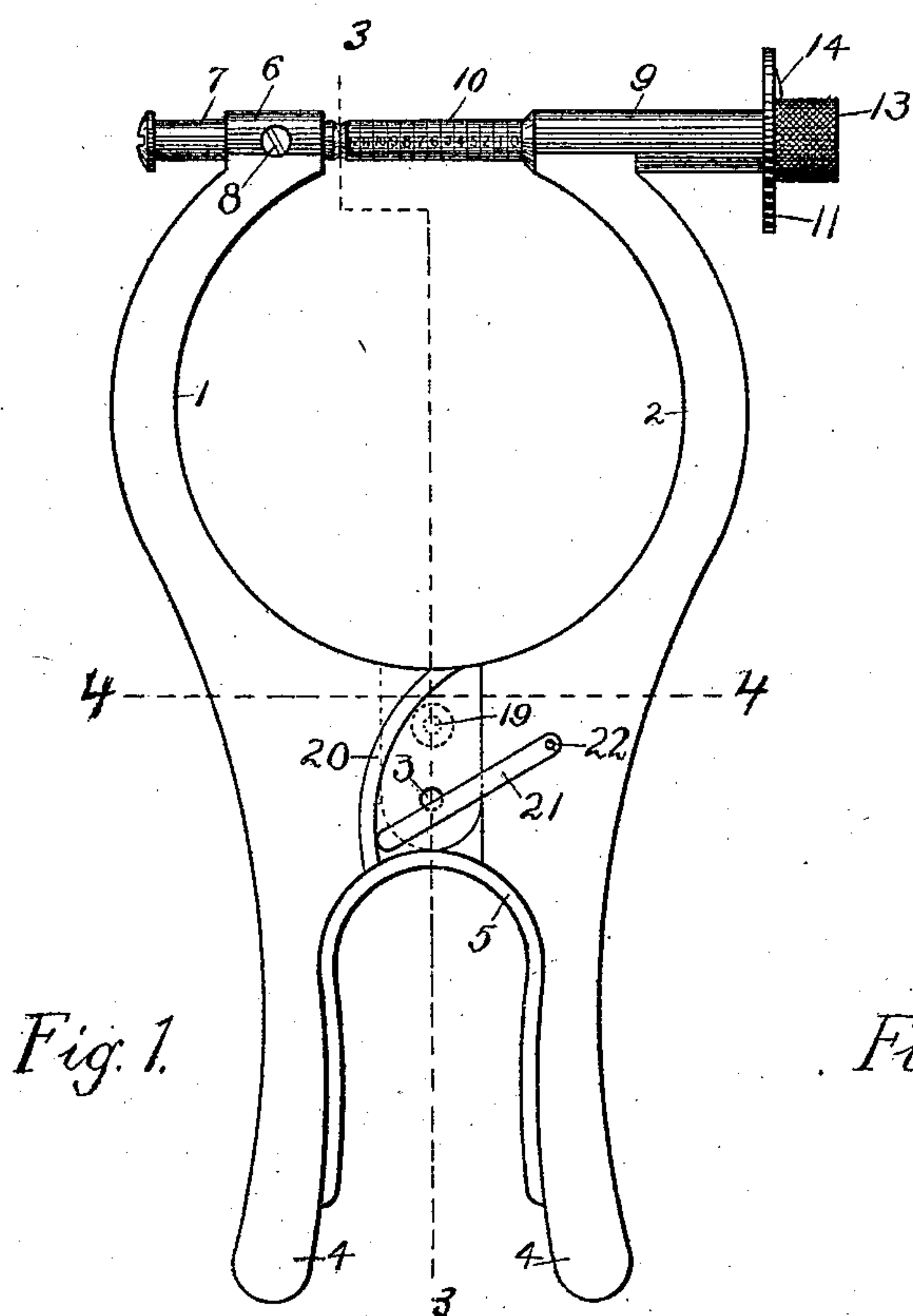


Fig. 1.

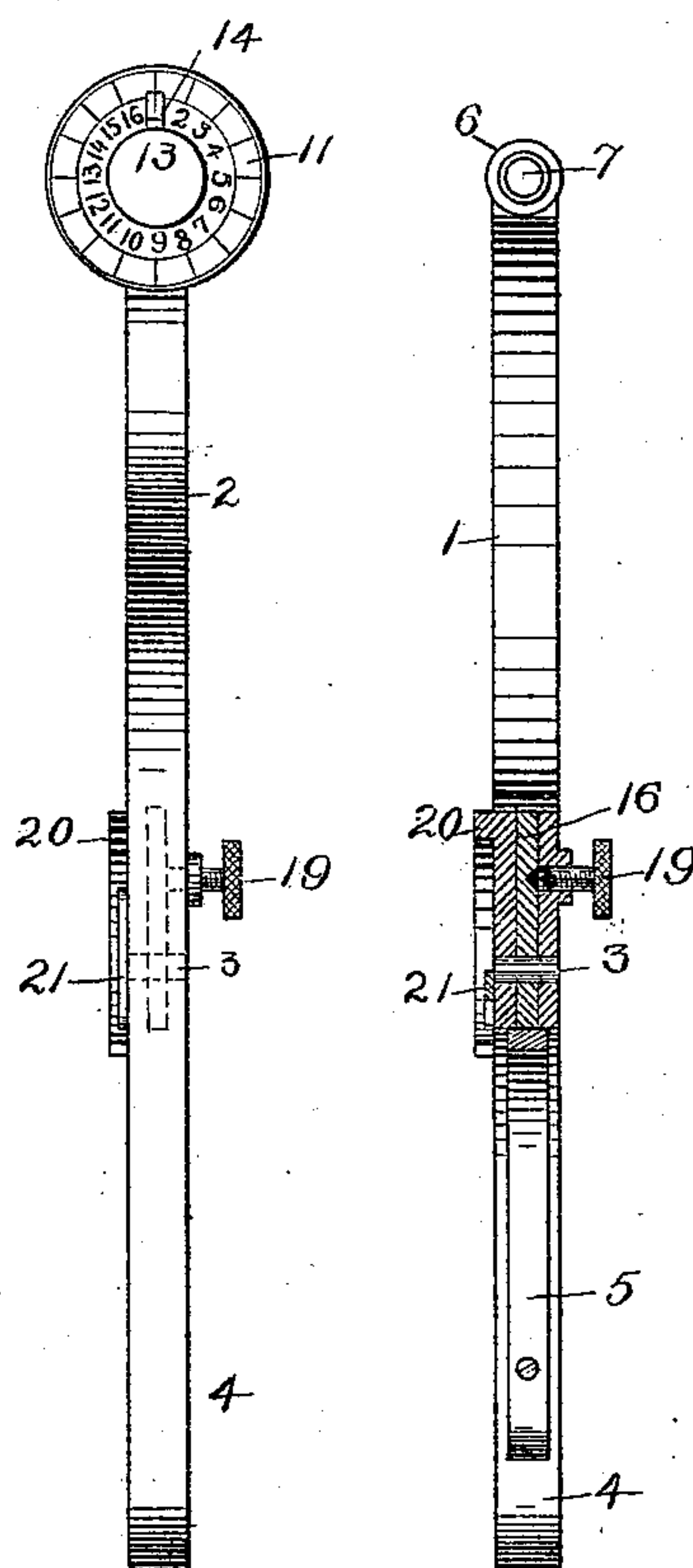


Fig. 2.

Fig. 3.

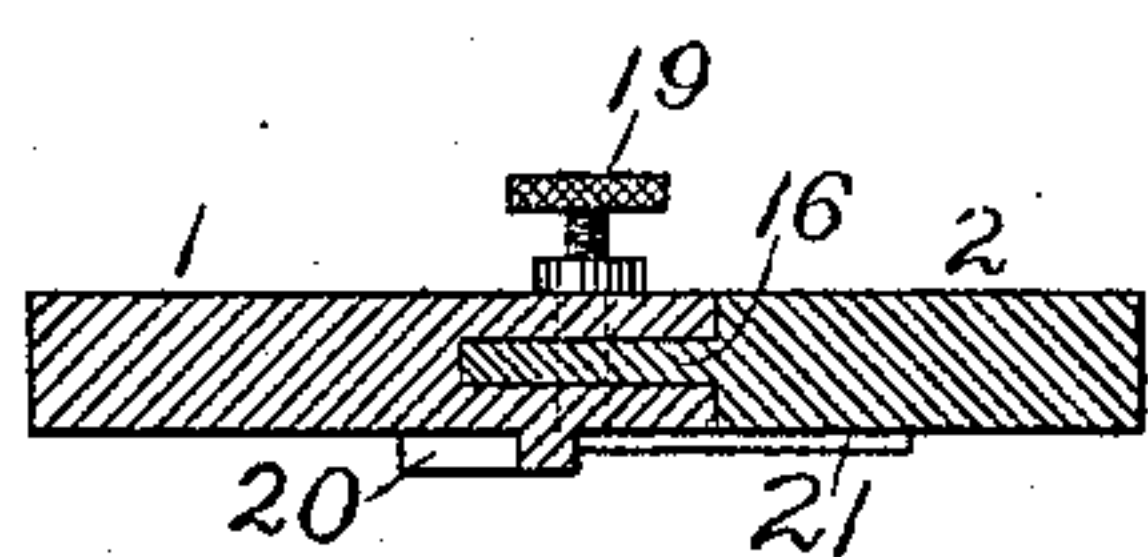


Fig. 4.

Fig. 5.

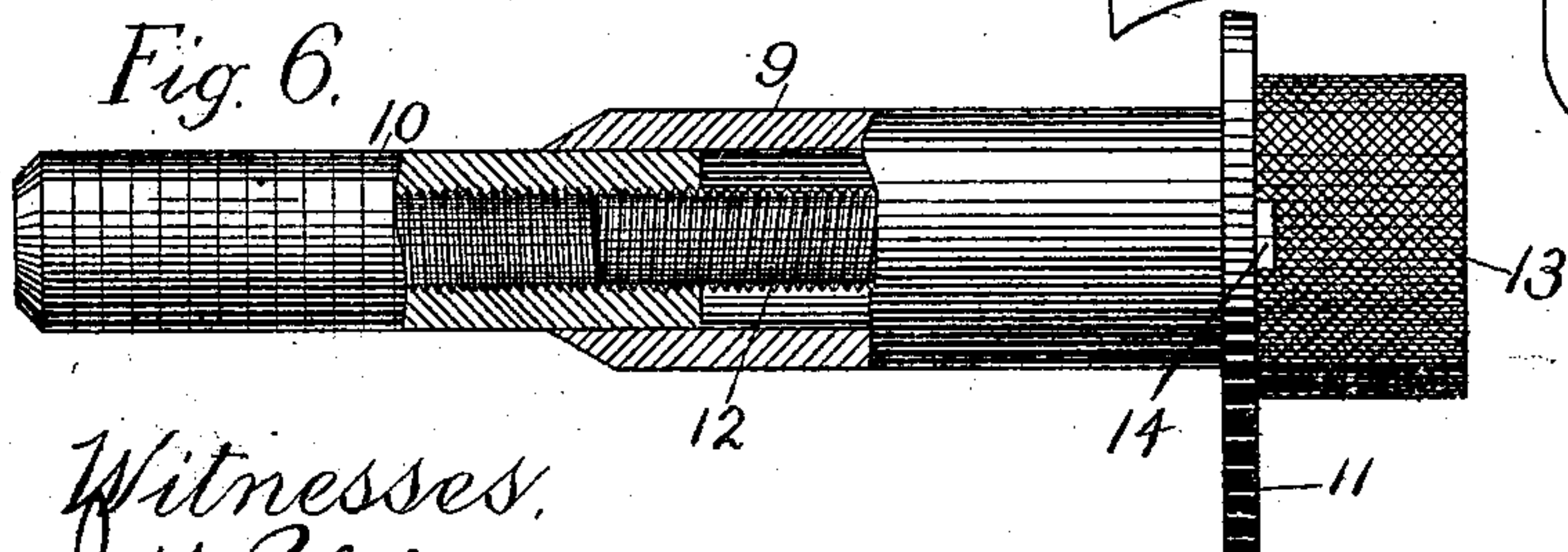
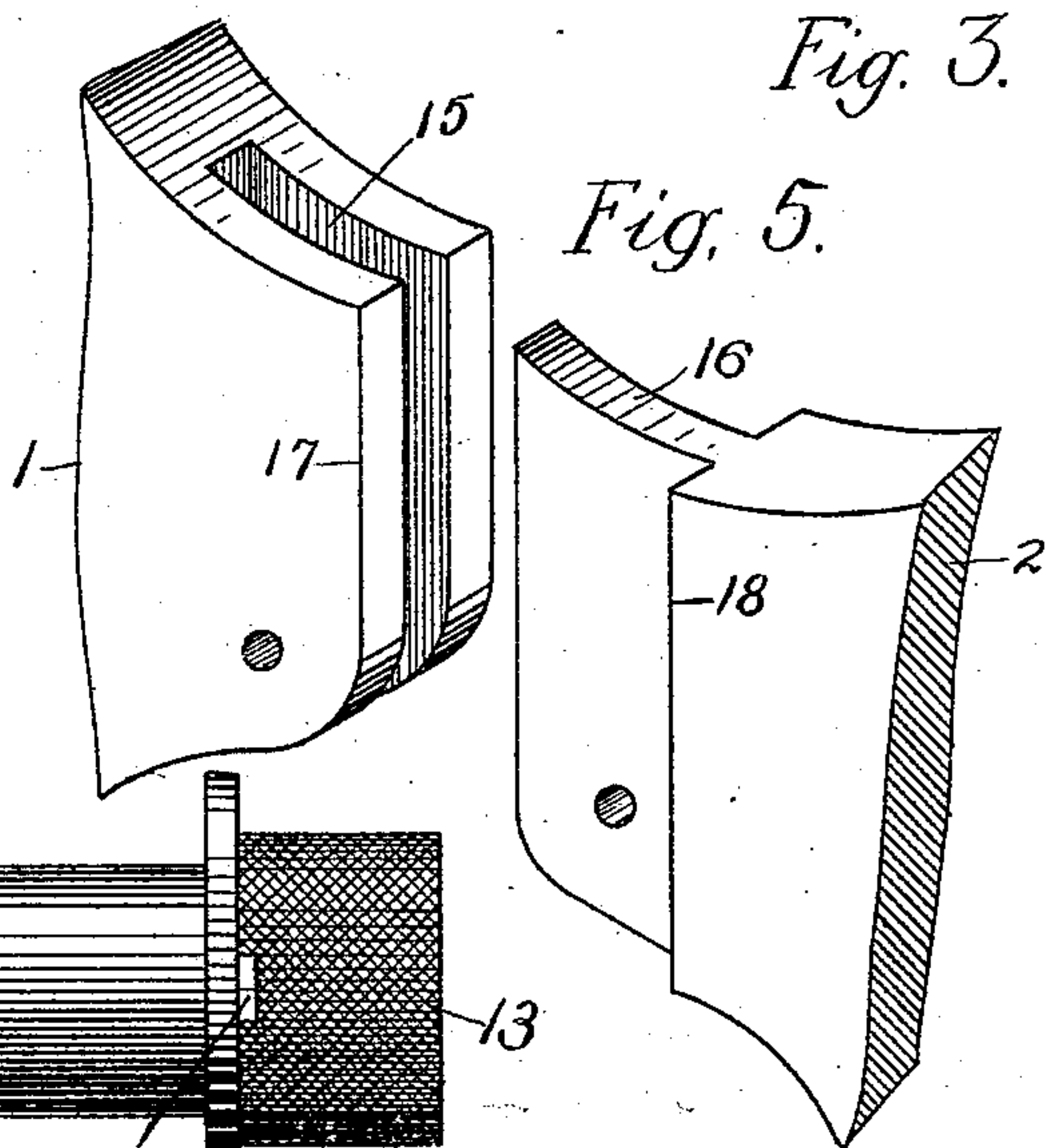


Fig. 6.

Witnesses.
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UNITED STATES PATENT OFFICE.

FRANK E. LAKE, OF BOSTON, MASSACHUSETTS.

MICROMETER-CALIPERS.

SPECIFICATION forming part of Letters Patent No. 551,591, dated December 17, 1895.

Application filed January 7, 1895. Serial No. 534,124. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. LAKE, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Micrometer-Calipers, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to improved micrometer-calipers; and it consists, essentially, as hereinafter more fully described, in attaching suitably graduated and adjustable measuring devices to the coinciding free ends of two pivotally-connected curved arms arranged in the form of calipers, said arms being extended beyond the pivotal point to form handles, which, when pressed together, will open the opposite or measuring ends, and upon the removal of such pressure the last-mentioned ends will close by the action of a spring, as hereinafter set forth.

My invention also contains other mechanical devices, the construction and operation of which will be hereinafter described.

The objects of my invention are to provide micrometer-calipers suitable for all the purposes for which such instruments as heretofore constructed are employed, and which will also afford a convenient means for measuring the thickness of objects the position or location of which renders such measurement practically impossible by the micrometers now in use—as, for example, the bottom of a hollow vessel. I accomplish these objects by constructing my improved calipers as shown in the accompanying drawings, in which—

Figure 1 is a plan view of a micrometer-calipers embodying my invention. Fig. 2 is an edge view of the same. Fig. 3 is a sectional view of the same, taken on the line 3 3, Fig. 1. Fig. 4 is a sectional view of the joint, taken on the line 4 4, Fig. 1. Fig. 5 is an isometrical view of the joint; and Fig. 6 is an enlarged detail, partly in section, showing the construction of the micrometer-screw.

In the several views like numerals refer to like parts.

Referring to the drawings, 1 2 are two curved arms which form substantially a circle. These arms are pivoted together at 3. The construction of the joint will be hereinafter more

fully described. Each of these arms is extended to form a handle 4, and between these handles is placed a spring 5 which acts to force the handles apart and thus keep the arms closed. The end 6 of the arm 1 is bored out to receive the pin 7, which forms one of the measuring-surfaces and which is held in position by the screw 8. Upon the corresponding end of the arm 2 is a barrel 9 through which moves the gage-pin 10. The construction of this part of the mechanism is more clearly shown in Fig. 6. Upon the end of the barrel is a graduated disk 11, which is stationary with the barrel. Running through this disk and barrel is a screw 12 which is free to turn, but is prevented from moving longitudinally by any suitable means. This screw engages an internal thread in the pin 10, and thus moves the pin into or out of the barrel. The screw is turned by means of the knurled head 13, to which is attached an indicating-arm 14, which moves over the graduated disk 11. On the pin 10 are graduations, as shown in Fig. 1. These graduations are determined by the number of threads on the screw 12—as, for example, if there are sixteen threads to the inch on the screw one revolution of the screw would draw the pin into the barrel one-sixteenth of an inch, or to the line 1, Fig. 1. The disk is shown as being divided into sixteen parts, each one of which would, in this case, indicate a sixteenth of a sixteenth, or one two-hundred-and-fifty-sixth of an inch. Any other division may be used, and the instrument be made to measure as fine as may be desired.

The joint of my improved calipers forms an important part of my invention, and is clearly illustrated in Fig. 5. The side 1 is grooved out at 15 and the bottom of the walls of the groove rounded off to allow free movement around the pivot 3. The side 2 is provided with a tongue 16, which fits into the groove 15. When properly made, this construction makes a firm joint, and one in which there is no side play—a very important point in an instrument of this class. The pivot 3 being near the bottom of the joint allows long bearing-shoulders 17 18 and consequently greater accuracy than could be obtained with any other kind of joint.

Upon the back of the calipers, near the top

of the joint, I place a screw 19 having a pointed end which will engage a recess in the tongue 16, and thus lock the calipers in closed position. When locked in this way, the instrument can be used as an ordinary micrometer.

If desired, a projection 20 in the form of an arc of a circle may be placed on the front over the joint, and on the opposite handle may be placed an arm 21, pivoted at 22 eccentric to the curved projection 20. When the arms are open, by moving this arm up into contact with the projection 20 the arms will be held open in any desired position. When used in this way, they form an ordinary outside calipers, with the advantage over the present construction that they can be adjusted with one hand.

If it is desired to measure any surface which is surrounded by a raised edge—as, for example, the bottom of a hollow vessel—the handles 4 4 are compressed, thus opening the arms 1 2 till they can be passed over the raised edge, when the spring will close the arms. By turning the knurled head 13 the thickness of the bottom of the vessel which is between the pins 7 and 10 can be obtained, when the arms are again opened and the calipers removed and the reading taken. This cannot be done by any ordinary micrometer, as the reading must be taken before the work is removed, and in some cases the work covers up the scale so that this cannot be done. All these disadvantages are overcome by my improved construction.

It will be seen that by constructing the instrument as herein described the measuring-surfaces may be readily placed as near the object to be measured, when such object is located beyond a projection or raised part, as when no such projection intervenes, and no delay is caused by operating the screw or otherwise changing the instrument for that purpose—a result which cannot be attained by the use of such instruments as heretofore constructed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A micrometer calipers consisting of two

arms 1 2 hinged together, stops 17 18 to limit the inward movement of the arms to leave a space between their ends, and a micrometer screw for measuring distances in the said space comprising the barrel 9 on the end of one of the arms, screw 12 rotatable in said barrel but immovable longitudinally therein, and the screw threaded measuring pin 10 engaged by screw 12, substantially as shown and described.

2. A micrometer measuring device consisting of an arm having an anvil or stationary part 7, another arm having the barrel 9, screw 12 rotatable in the barrel but immovable longitudinally therein and having head 13 with an index 14, the indicator disk 11 on the barrel, and the measuring pin 10 threaded so as to be engaged and moved by the screw 12, substantially as shown and described.

3. The combination with the two members of a calipers, of a curved projection upon the face of one of said members near the point where the members are pivoted together, and an arm pivoted to the face of the other member and eccentric to the curved projection, substantially as, and for the purposes specified.

4. In a micrometer calipers, the combination of the two curved arms 1 2 pivoted together at 3, the fixed pin 7 on the end of one of said arms, the barrel 9 fixed on the end of the other arm, the measuring pin 10 sliding in said barrel, the micrometer screw 12 turning in said barrel and engaging said pin 10, the graduated disk 11 on the end of said barrel, the head 13 on said screw, the indicating arm 14 on said head and moving over the graduations on said disk, the locking screw 19; the handles 4 4, the spring 5 operating to open said handles, the curved projection 20 on the face of one member of said calipers and the arm 21 pivoted to the other member eccentric to said projection, all substantially as shown and described.

In testimony whereof I have hereunto subscribed my name this 4th day of January, A. D. 1895.

FRANK E. LAKE.

Witnesses:

CHAS. A. KELLOGG,
HENRY C. RADFORD.