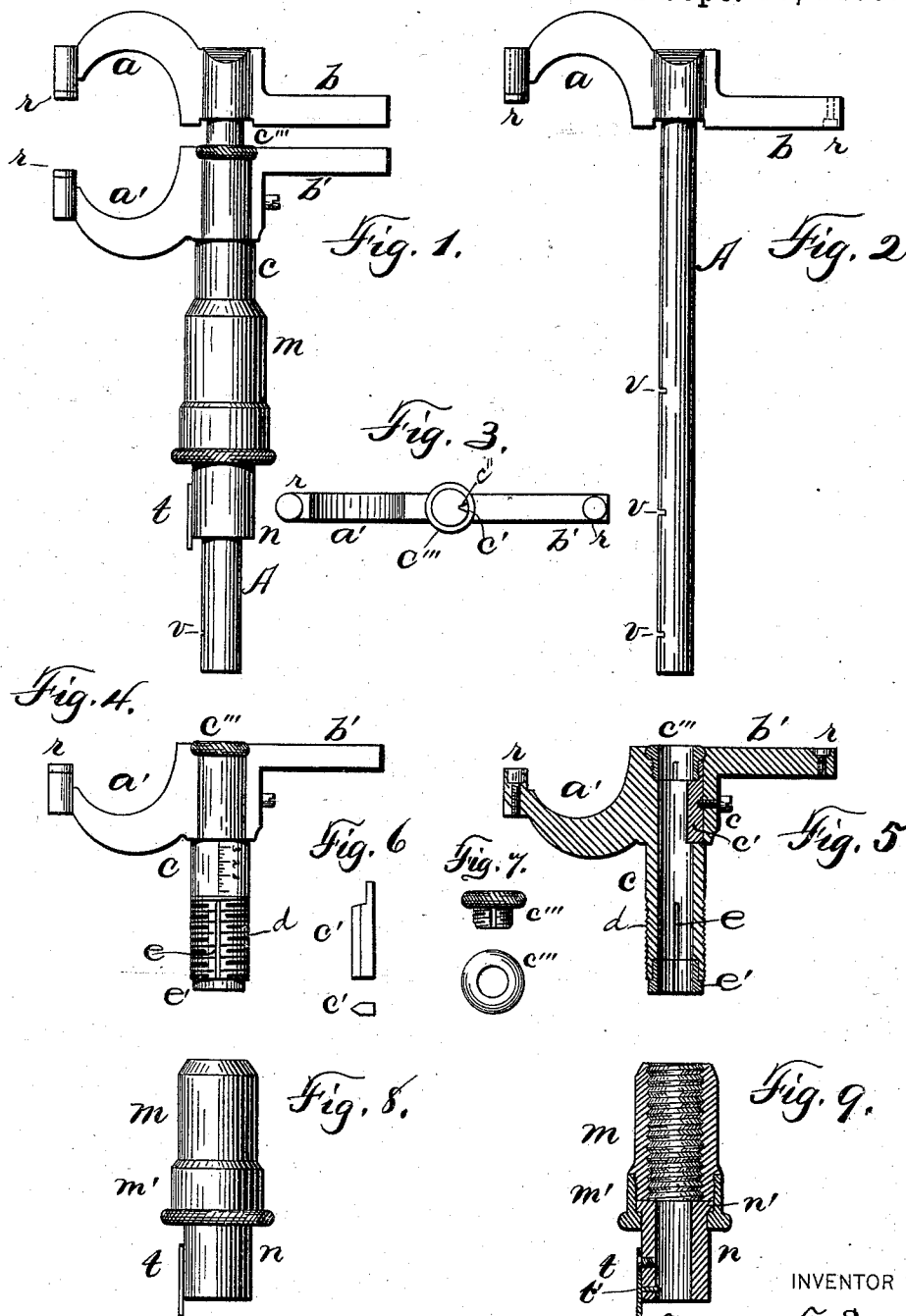


(No Model.)

F. F. ELLIS,
MICROMETER CALIPERS.

No. 546,094.

Patented Sept. 10, 1895.



WITNESSES:
Charles W. Marvin.
Jessie E. Murray.

INVENTOR
F. F. Ellis
BY
Smith & Benson
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FERRAND F. ELLIS, OF ONEIDA, NEW YORK.

MICROMETER-CALIPERS.

SPECIFICATION forming part of Letters Patent No. 546,094, dated September 10, 1895.

Application filed April 22, 1895. Serial No. 546,590. (No model.)

To all whom it may concern:

Be it known that I, FERRAND F. ELLIS, of Oneida, in the county of Madison, in the State of New York, have invented new and useful
5 Improvements in Correlative Micrometer-Calipers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to calipers of the type
10 known as "inside and outside combined" and which are adapted to be adjusted or measured micrometrically.

My object is to produce an improved caliper in which one of the measuring-jaws for
15 outside work and arm for inside work is adjusted by means of a nut and micrometer combined for close work, comprising a shaft, a jaw, and arm thereon, a sleeve upon the shaft, and a duplicate jaw and arm thereon, a
20 micrometer-nut screwed onto said sleeve and engaging with a collar adjustably mounted upon said shaft.

My invention consists in the several novel features of construction and operation hereinafter described and which are specifically
25 set forth in the claim hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the calipers
30 complete. Fig. 2 is a side elevation of the solid jaw and shaft, detached. Fig. 3 is an end elevation of the movable jaws. Fig. 4 is an elevation of the movable sleeve and jaws thereon detached. Fig. 5 is a section thereof
35 showing the guide, its locking-nut, and the expansion-nut. Fig. 6 is a side elevation and view of the guide. Fig. 7 shows like views of the guide-locking nut. Fig. 8 is a side
40 elevation of the micrometer-nut, the collar upon the shaft, and the spring-pin by which the collar is adjustably locked. Fig. 9 is a longitudinal section of the same parts shown in Fig. 8.

A is a shaft graduated upon any scale desired, upon which a jaw *a* and an arm *b* is
45 secured. A sleeve *c* fits loosely upon said shaft and is provided with an inward guide *c'*, which fits into and slides in the groove *c''* in the shaft and prevents the sleeve from
50 twisting or turning, and *c'''* is a tubular split and expansible nut screwed into the front of

the sleeve and engaging with said guide to lock it and also to frictionally bear upon the shaft to prevent its slipping, said guide being cut away substantially as shown. Upon this
55 sleeve a jaw *a'* and an arm *b'* are secured, the jaws *a a'* constituting the outside calipers and the arms *b b'* the inside calipers, and each measure the same. Each of the jaws and arms is usually provided with hardened
60 contact-points *r* to make them more durable. The sleeve *c* is exteriorly threaded, as at *d*, and split longitudinally, as at *e*, and interiorly recessed and threaded to receive the tubular expansion-nut *e'*. A tubular micrometer-
65 nut *m* is interiorly threaded and screwed onto said sleeve and engaging with the collar *n*, adjustably secured upon the shaft and provided with a shoulder *n'*, by means of a
70 tubular and interiorly-threaded and shouldered nut *m'*, so that as the nut *m* is rotated the sleeve is traversed upon the shaft and the space between the jaws is varied. In
the collar a spring-pin *t* is mounted, having a point *t'*, which is adapted to engage with a
75 notch *v* in the shaft, and whereby the jaws are roughly adjusted. An ordinary scale is usually provided upon the sleeve and the beveled end of the micrometer-nut is usually graduated in the ordinary manner for close
80 measurements. The nut *e'* is adjusted to regulate the tension of the micrometer-nut upon the sleeve and prevent accidental slipping. The jaws are set by said collar at approximately the desired distance, and their
85 fine close adjustment is effected by the micrometer-nut. It will be seen that the jaws can be caused to bear strongly against the exterior or interior of the article to be measured, then the micrometer-nut turned back a
90 predetermined distance to loosen the jaws for removal, and then said nut turned forward the same distance, and thus the accurate tight measurements of the article will be
95 obtained for the closest kind of work.

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

In an inside and an outside caliper, a pair of stationary jaws upon a shaft, a pair of
100 movable jaws upon a split sleeve adapted to be reciprocated upon the shaft, a guide in

said sleeve engaging with said shaft and means to secure it; an expansion nut screwed into said sleeve, a micrometer-nut screwed onto said sleeve, a collar upon said shaft connected to said micrometer-nut, and means to adjustably lock said collar upon said shaft, in combination.

In witness whereof I have hereunto set my hand on this 4th day of April, 1895.

FERRAND F. ELLIS.

In presence of—

C. W. SMITH,
HOWARD P. DENISON.