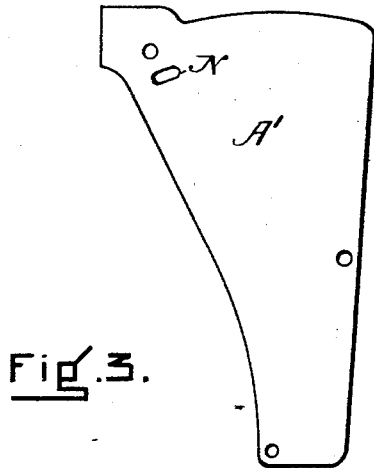
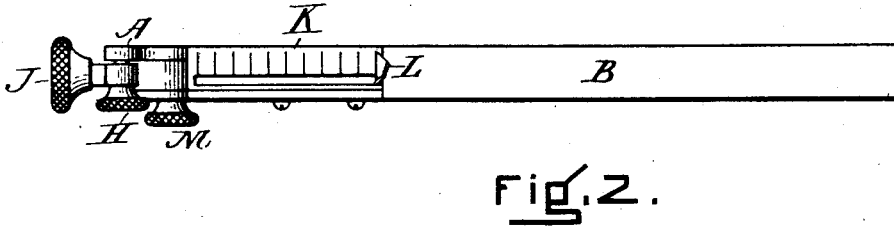
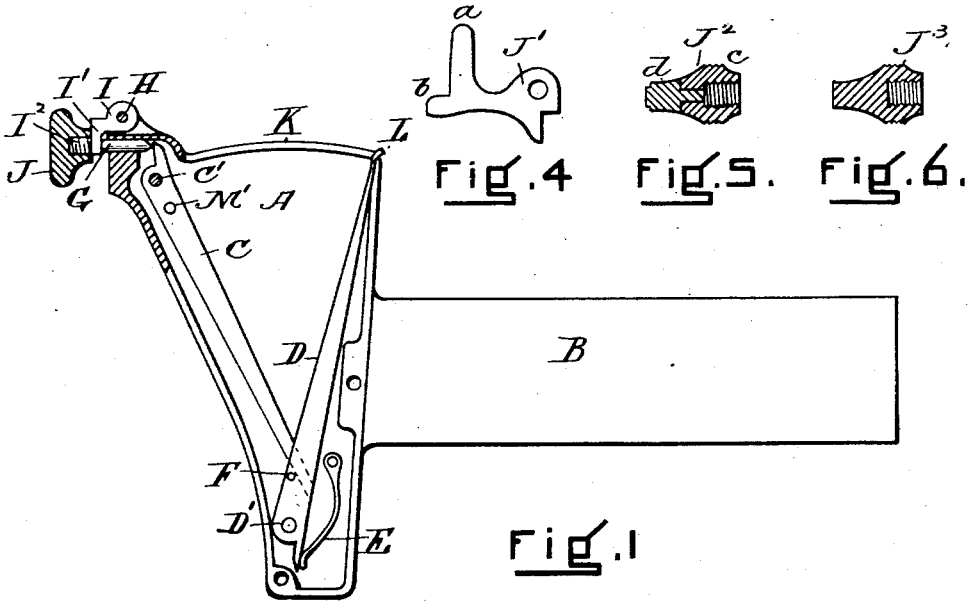


(No Model.)

J. BATH.  
MICROMETER INDICATOR.

No. 520,201.

Patented May 22, 1894.



WITNESSES  
*John Q. Adams*  
*Ralph W. E. Hopper*

INVENTOR  
*John Bath*  
*per Eugene Humphrey*  
*his atty.*

# UNITED STATES PATENT OFFICE.

JOHN BATH, OF HYDE PARK, MASSACHUSETTS.

## MICROMETER-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 520,201, dated May 22, 1894.

Application filed June 10, 1893. Serial No. 477,157. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BATH, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Micrometer-Indicators, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claim.

My invention relates to a tool known among machinists as an indicator, or a micrometer indicator; and has for its object the production of a simple, compact and convenient tool of that kind which is adapted to the use in connection therewith, and interchangeably, of various attachments for different purposes; and the invention consists in the novel features thereof hereinafter fully described and pointed out in the appended claim.

In the drawings: Figure 1. is a sectional elevation of the tool with the face-plate removed to show the interior parts, and also showing in section one of the attachments in place as when used thereon. Fig. 2. is a top view of the same. Fig. 3. is a view of the detached face-plate. Figs. 4, 5 and 6 represent three attachments used interchangeably upon said indicator for different purposes; one being shown in side elevation and two in section.

The indicator is composed of a hollow body A, narrow at the bottom with a broader, overhanging top, and having a handle or shank B by which it may be conveniently held in the tool-post of a lathe. Within the hollow of the case or body are located a lever C pivoted at C' and a lever D pivoted at D'. There is also secured in the hollow a spring E the free end of which bears with elastic force against the short arm of lever D. Upon the back side of this lever is a pin F which projects therefrom into the hollow and against which the underlying end of lever C bears, as indicated in broken lines. In a hole in the prominent upper corner of the body a pin, or plunger, G is fitted to play horizontally back and forth and to act against the short arm of lever C. Upon a screw-stud H, located above said plunger, an attachment holder consisting of an angular lever I, is fitted to turn, while its downward projecting arm I' bears against the outer end of the plunger. There is also upon lever I a threaded projection I<sup>2</sup> extending outward

from arm I' to which are screwed the several interchangeable attachments before referred to which serve as contact points to engage the work in the practical use of the indicator, and one of which marked J is shown in place thereon in Fig. 1.

Upon the top of the tool back of the parts just described is an arched scale K, graduated to tenths of an inch, each of which divisions represents a lineal movement of the plunger G of one thousandth of an inch, the multiplying levers actuated thereby being proportioned to give that result. A pointer L upon the end of the long arm of lever D sweeps over said scale and indicates by its position thereon the extent of movement which takes place on the part of the attachment which moves the plunger while being practically employed. And thus the degree of eccentricity, variation or irregularity of a piece of work which is sought to be discovered by the use of the various attachments is correctly measured and indicated on scale K, where it is conveniently noted by the mechanic using the same.

The operation of the tool, briefly stated, is as follows: To ascertain, for instance, the eccentricity of a shaft being turned in a lathe, the shank B is secured in the tool post in the usual manner and the post placed in such position as to bring the face of the attachment J on the tool, into contact with the surface of the shaft being turned. Then the shaft being revolved in contact therewith will, if not perfectly round, cause the attachment to move off and on according to the irregularity of the work, and plunger G will be thereby correspondingly vibrated, and in turn will act on lever C, which will then move lever D through pin F and thereby cause pointer L to indicate on scale K the number of thousandths of an inch which attachment J has been so moved. The movements just described caused by the inward thrust of the plunger against lever C, are, of course, made against the resistance of spring E, which, when such pressure on the attachment is relaxed, will return the several parts to their normal positions of rest. When the face-plate A' is screwed on and the tool is thus complete, if it is desired for any reason to preserve the indication on scale K, the indicator may be locked in any position that the

pointer L assumes by means of the screw M, which is threaded into lever C at M' through a slot N in the face-plate, and by turning the screw head against the face-plate the parts will be securely locked thereby in any position which they may have then assumed in practical use.

The several contact pieces or attachments have various uses. J may be employed as just described; J' (Fig. 4) is adapted by its branches *a* and *b* to interior and exterior use; J<sup>2</sup> (Fig. 5) consists of a steel hub *c* and a renewable copper tip *d* inserted therein, which when worn out at its marking end may be renewed by driving the old one out of the hub and a new one in, and is employed for marking purposes well known to machinists and is novel in its construction; and J<sup>3</sup> is of steel and useful for many purposes. The attach-

ments J<sup>2</sup> and J<sup>3</sup> are each adapted to screw on to I<sup>2</sup> in place of J; but J' is adapted to be hung on to stud H in place of lever I; thus the parts are interchangeably used upon the indicator thereby affording great advantage in the use of the tool now fully described.

I claim—

The combination of body A; shank B, attached thereto; levers C and D and spring E, therein; scale K, on the top thereof; plunger G, projecting therefrom; and holder I, pivoted thereto and arranged to act on the plunger and through the same to operate the indicating levers; all substantially as specified.

JOHN BATH.

Witnesses:

EUGENE HUMPHREY,  
RALPH W. E. HOPPER.