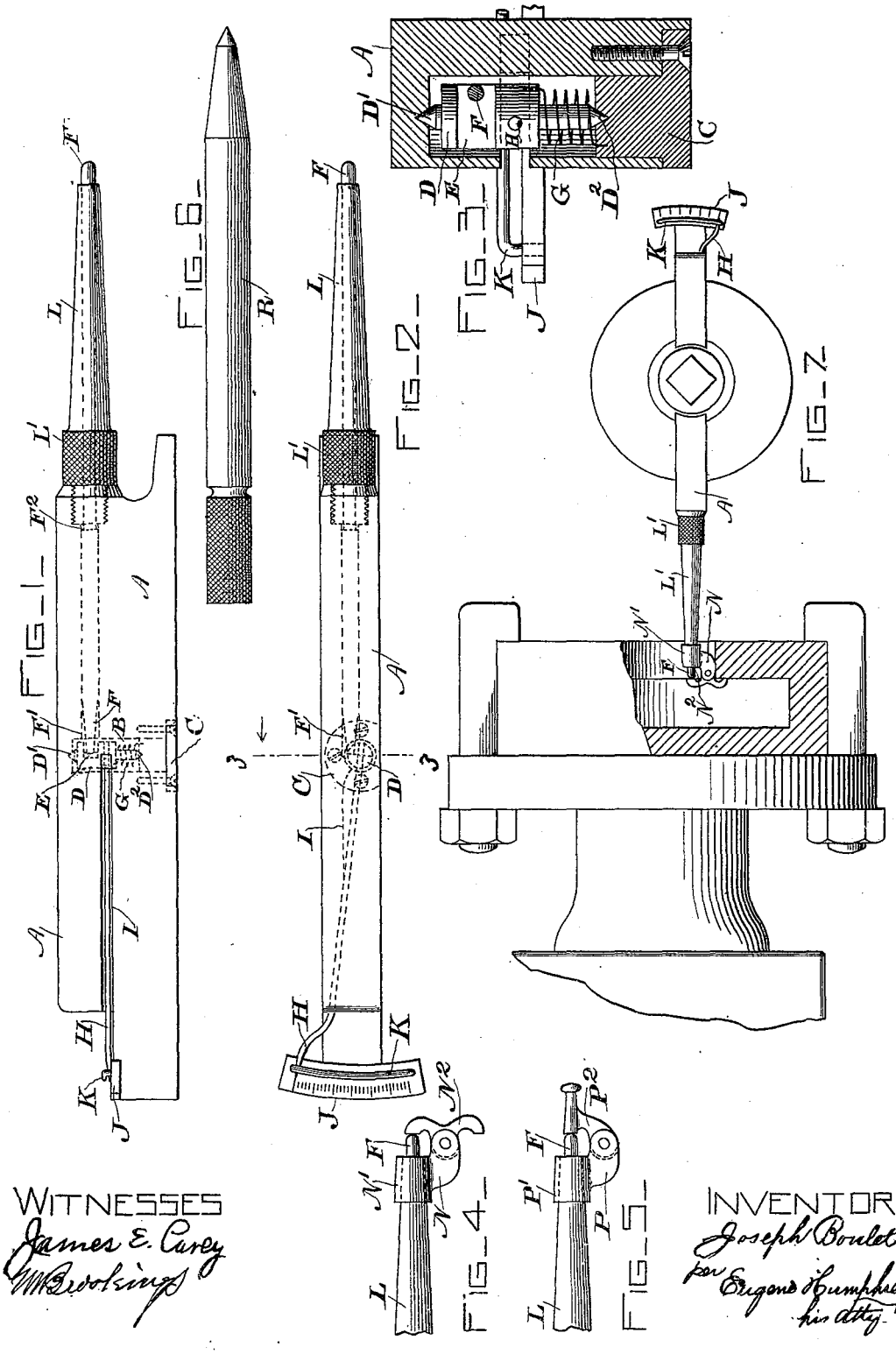
No. 659,048. Patented Oct. 2, 1900.

J. BOULET.

MICROMETER INDICATOR.

(Application filed Jan. 12, 1900.)

(No Model.) 2 Sheets—Sheet 1.



WITNESSES
James E. Carey
W. Brooking

INVENTOR
Joseph Boulet
per Eugene Humphrey
his atty

No. 659,048. Patented Oct. 2, 1900.

J. BOULET.

MICROMETER INDICATOR.

(Application filed Jan. 12, 1900.)

(No Model.) 2 Sheets—Sheet 2.

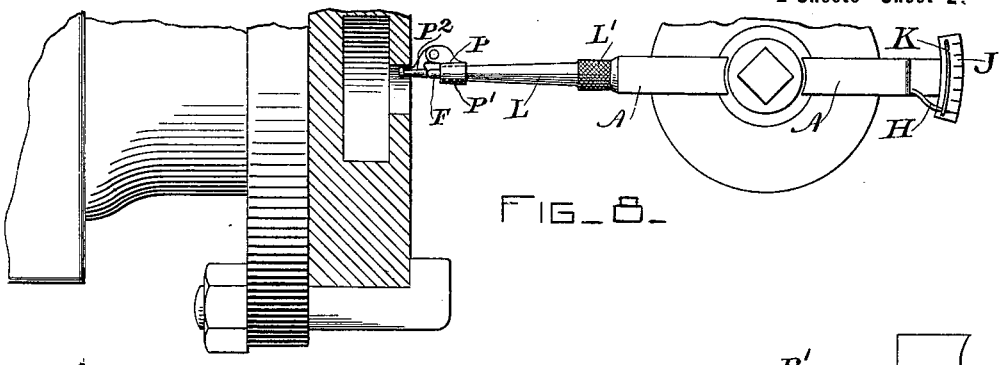


FIG. 8.

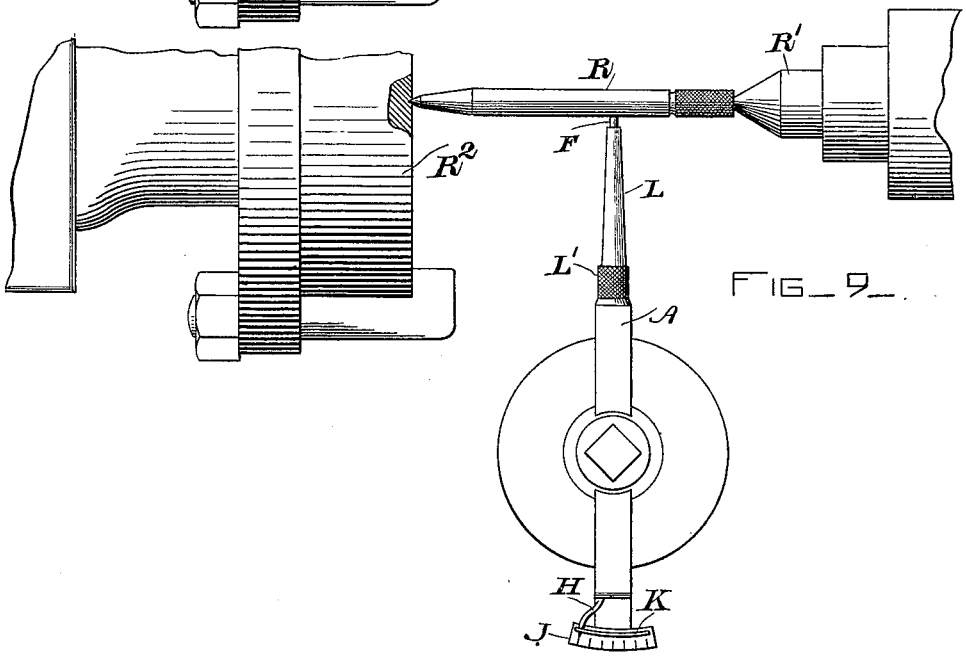


FIG. 9.

WITNESSES

James E. Carey

W. M. Brodrick

INVENTOR

Joseph Boulet

per Eugene Humphrey

his atty.

UNITED STATES PATENT OFFICE.

JOSEPH BOULET, OF BEVERLY, MASSACHUSETTS.

MICROMETER-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 659,048, dated October 2, 1900.

Application filed January 12, 1900. Serial No. 1,216. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BOULET, a citizen of Canada, and a subject of the Queen of Great Britain, residing at Beverly, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Micrometer-Indicators, of which the following is a specification.

My invention relates to improvements in micrometer-indicators for machinists' use, and has for its object to provide a compact and convenient indicator adapted to a variety of uses and readily adjustable in the usual tool-post of a lathe and movable with the carriage thereof; and my said object is attained in the tool and its auxiliary attachments illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved micrometer-indicator. Fig. 2 is a top view of the same. Fig. 3 is a cross-section, as on line 3 3, Fig. 2, viewed from the right of said line. Figs. 4 and 5 are views of auxiliary attachments or detachable tips for use for special purposes on the end of the needle which actuates the indicating-lever. Fig. 6 is an auxiliary part used in the lathe in conjunction with the indicator for special purposes. Figs. 7, 8, and 9 are illustrations of the manner of practically using the indicator in conjunction with the several auxiliary parts for various purposes.

The indicator consists of a bar of metal suitably formed into a body A, adapted to be properly held in the usual tool-post of a lathe. A hole B is bored into the under side of body A and nearly through the same and also counterbored to receive the headed plug C, which is secured in hole B by screws, as shown. Before plug C is inserted in hole B a pivot-block D is placed therein, having bearing-points D′ and D^2, which are centered one in the body at the top of hole B and the other in the plug C, as shown clearly in Figs. 1 and 3. The pivot-block D has a diametrical slot E milled therein, against the inner face of which a needle E eccentrically presses to turn the block on its pivotal points D′ and D^2 against the resistance of the spring G, coiled around a diminished portion of the block, while one end of the spring is secured in the larger portion of the block and the other end in the plug C, as clearly shown in Fig. 3. One end of an indexical arm H is inserted in D, so as to be turned therewith on its centers, and extends outward therefrom through a passage I, milled in the side of the body A to the proper depth and form to allow the requisite swing of the arm. The upper corner of one end of body A is cut away above passage I for a short distance to afford room to conspicuously mount thereon a scale J, over the graduations upon which the outer point or end of the indicating-arm H sweeps under the limiting-guard K thereon. This arm is held when at rest in the position shown against the end of guard K by force of said torsional spring G. Into the opposite end of body A is threaded a tapering extension-arm L, formed with a hub L′, which abuts against the end of body A, as shown in Figs. 1 and 2. A central longitudinal hole is drilled through arm L and coincides lineally with a hole F′ in body A, of slightly-larger diameter, that leads into hole B, opposite the slot in pivot-block D. Into and through these holes in arm L and body A extends a needle F. (Shown in dotted lines in Figs. 1 and 2 and in cross-section in Fig. 3.) This needle when idle is thrust out of the end of arm L by the turning of pivot-block D against the inner end thereof, which movement of the pivot-block is caused by spring G and simultaneously carries arm H and needle F into the positions shown in Fig. 2. To prevent needle F from accidentally dropping out of the passage through arm L and body A, in which it is fitted to work, the needle is made of slightly-larger diameter in that portion which fits into body A, and thus forms a shoulder F^2 where it is diminished to fit the hole in arm L, and this shoulder prevents its passing out through extension-arm L. Before the arm L is screwed into body A the larger portion of the needle is inserted in the body and the arm L slipped on over the smaller portion and then threaded into the body A, as shown. When the parts are constructed and united as described, the indicator is complete, the bearing of the end of needle F against the pivot-block D being eccentric in such proportion to the length of the indicating-arm H as to make an endwise movement of the needle F to the extent of one-

thousandth of an inch produce a swing of the pointer H to the extent of one of the divisions marked on scale J.

In Figs. 4 and 5 are shown two auxiliary attachments, which are adapted to be removably attached to the end of arm L and to operate in conjunction with the end of needle F to indicate variations in interior measurements, as illustrated in Figs. 7 and 8. Attachment N (shown in Fig. 4) consists of a sleeve N′, fitted to the end of the taper-arm L, and a pivoted contact branch N^2, one part of which bears against the end of needle F, while the other part bears against the article being tested and through needle F micrometically indicates on scale J the variations of the surface tested from its true form. This use of the micrometer is illustrated in Fig. 7 as applied to an interior surface at right angles to the axis of needle F. Attachment P (shown in Fig. 5) consists of a sleeve P′, adapted to fit the end of arm L and having a pivoted contact branch P^2, one part of which bears against the end of needle F, while another part extends outward from the needle and in line therewith and bears against the article being tested and through needle F micrometically indicates on scale J the variation of the surface being thereby tested from its true form. This use of the micrometer is illustrated in Fig. 8 as applied to an interior surface parallel with the axis of needle F.

For tests of exterior surfaces, which face toward the end of the needle, the attachments N and P are not required. The plain needle F is all that is necessary; but the use of the indicator is greatly extended by the employment of the attachments working in conjunction with the needle.

When a piece of work is to be drilled and it is desired to accurately center the same, the work is secured to the face-plate of the lathe and approximately centered thereon, and a centering-piece R, having a truly-turned body, is placed between the lathe-center R′ and the work R^2 in the face-plate, as illustrated in Fig. 10. Now by placing the indicator in the tool-post and moving the carriage so as to bring the end of the needle F to bear against the piece R and then moving the carriage along so as to keep the indicator in contact with the piece R while turning the face-plate and the work attached to it the degree of variation of the work from the true center will be indicated by the micrometer, and by moving the work on the face-plate under such micrometric test the true center can be conveniently and readily found. Thus the micrometer serves the various purposes indicated upon a variety of work and in a convenient and accurate manner.

I claim—

1. A micrometer-indicator embodying the following parts constructed, arranged, and operating together as described, namely: a body A; extension-arm L; pivot-block D; plug C; arm H; needle F; spring G; and scale J; all combined as and for the purposes specified.

2. A micrometer-indicator comprising a body A; an extension-arm L; a pivot-block D; a plug C; an arm H; a needle F; a spring G; and a scale J, arranged as described, in combination with a detachable contact-piece supported by arm L, and formed and arranged to act upon the end of needle F, while the attachment is in contact with the work being tested, and thereby actuating the needle and through it indicating the variations in the work in the manner specified.

JOSEPH BOULET.

Witnesses:
JAMES E. CAREY,
EUGENE HUMPHREY.