

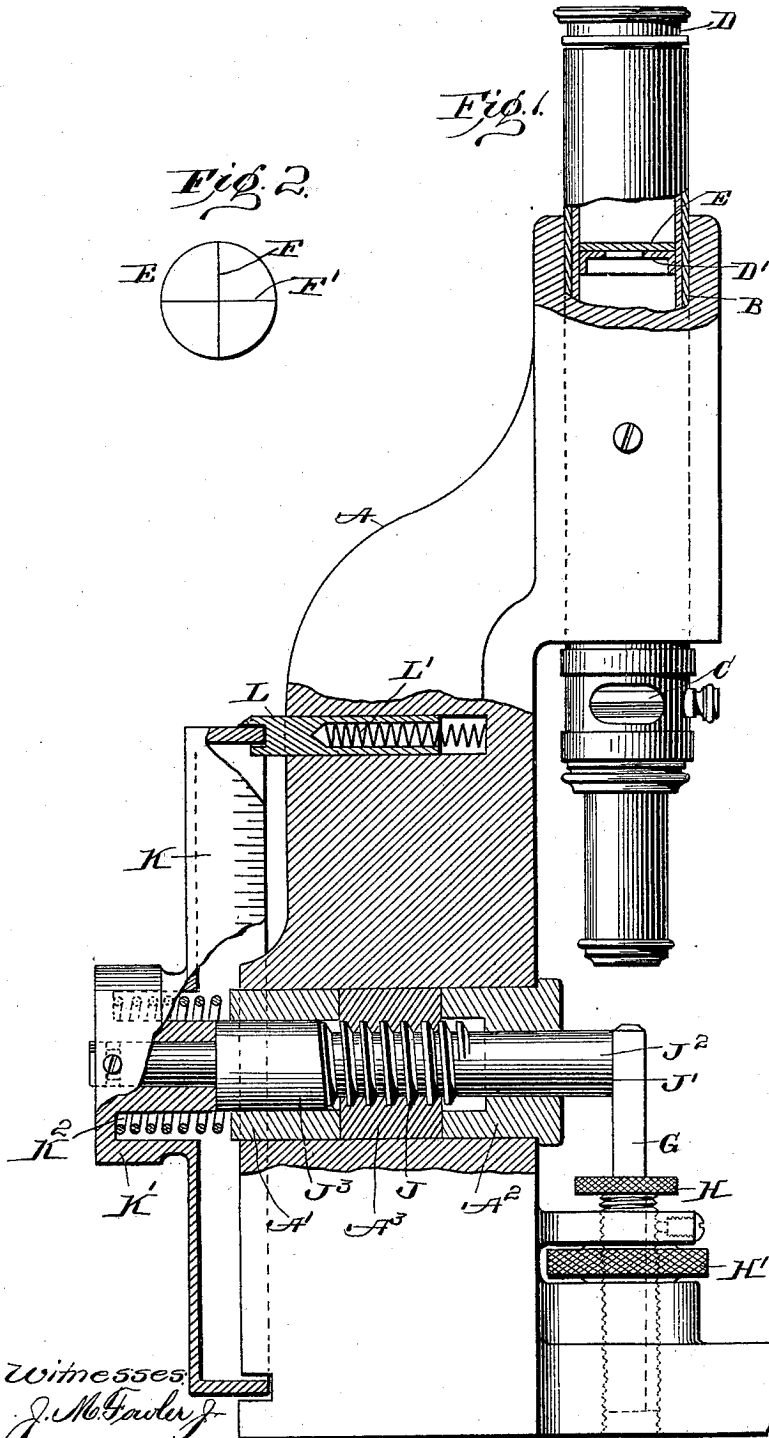
No. 679,779.

Patented Aug. 6, 1901.

F. H. PIERPONT.
MICROMETER.

(Application filed June 5, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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MICROMETER.

SPECIFICATION forming part of Letters Patent No. 679,779, dated August 6, 1901.

Application filed June 5, 1901. Serial No. 63,282. (No model.)

To all whom it may concern:

Be it known that I, FRANK HINMAN PIERPONT, a citizen of the United States, residing at Horley, in the county of Surrey, England, have invented certain new and useful Improvements in Micrometers or Measuring Instruments; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to a new or improved micrometer, and has for its object to provide a micrometrical instrument which shall combine simplicity and compactness of construction with ease and efficiency in operation and in which the sources of error common to such devices are reduced to a minimum. Although not confined to this purpose, this apparatus is more especially designed for the measurement of type, of matrices employed in type-casting machines, or of dies employed to stamp such matrices.

A preferred construction of a measuring instrument according to this invention will now be described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation with a portion of the frame broken away. Fig. 2 is a plan view of the ocular disk.

A is the frame, preferably formed in one piece, carrying a microscope B, provided with a vertical illuminator C of any known type. Within the ocular D, resting on or conveniently secured to the diaphragm D', is a transparent disk E, upon which are engraved two diametrical lines at right angles to each other, as shown at F F', Fig. 2. The object to be observed, which in the figures is a die G for use in a matrix-stamping machine, is held against the end surface J' of a micrometer-screw mounted in the frame A at right angles to the microscope B. The micrometer-screw comprises a central screw-threaded portion J, with hardened ends J² J³. The portion J engages a thread, preferably formed in a nut A³, placed between hardened bushings A' A², forming bearings for the ends J² J³,

respectively, and fixed in the frame A, so that the surface J' of the end J², with which the object to be measured is held in contact, lies in the same vertical plane as the line F' of the ocular-disk E or in a plane parallel thereto. On the end J³ of the micrometer-screw is mounted a wheel or flanged disk K, the rim of which is graduated. A pointer L is provided. A convenient form is that shown in the figures, in which the pointer, the front end of which is slotted to embrace the edge of the wheel-rim, is held in a recess in the frame A and kept in constant contact with the wheel-rim by the pressure of a spring L'. The wheel is provided with a boss K', which serves as a handle to rotate the same and has an annular recess to receive one end of a coiled spring K², the other end of which presses against the bushing A'. The pressure of this spring causes the wear of the micrometer-screw to take place on one side only of the thread, and preferably the thread is provided with one straight side and one inclined side, the thrust and wear coming on the straight side. All possibility of error arising from slackness of the screw is eliminated by the action of this spring, together with the pressure against the end of the screw of the object being measured.

Desirably a focusing-table H is provided adapted to be adjusted vertically by rotating a nut H'. This table forms a convenient gage for quickly bringing objects of the same length into focus.

The operation is as follows: The object to be measured is pressed by the hand against the surface J' of the micrometer-screw. As the cross-line F in the ocular is stationary and is always in focus, it has the appearance of resting on the surface under observation. By manipulating the micrometer-screw object thus held against the surface J' is caused to traverse laterally of the microscope, while the cross-line F has the appearance of moving across the surface to be measured, the amount of this movement being read directly from the scale of the graduated wheel K. The pitch of the screw and the graduations of the scale may vary according to the

use for which the instrument is designed. To facilitate reading, a convenient arrangement is to give the micrometer-screw a ten-pitch thread, and the wheel is provided with a thousand graduations.

The line F' at right angles to the measuring-line F is not essential for the purposes of this instrument, but is convenient for locating points on the surface to be measured.

By employing the vertical illuminator those surfaces that are visible to the eye are at right angles to the optical axis and the light falling on other surfaces is either reflected outside of the instrument or is absorbed in the walls of the microscope itself. A type-die or type-matrix thus observed has the appearance of a bright character on a dull background. The sloping sides of the matrix or die are not visible, and there is therefore a distinct demarcation between the face of the character and the surrounding surfaces.

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

1. In a measuring instrument such as described, the combination with a supporting-frame, of a microscope provided with an index-line and a gage movable in a plane perpendicular to the axis of the microscope and having its contact-surface in a plane parallel to said index-line, as and for the purpose set forth.

2. In a measuring instrument, such as described, the combination with a microscope fitted within a vertical illuminator and an index-line, of a micrometer-gage supported to move in a plane at right angles to the optical axis of the microscope and provided with an engaging or contacting face in a plane par-

allel with the index-line, as and for the purpose specified.

3. In a measuring instrument such as described, the combination with a frame provided with two openings at right angles, of a microscope having an index-line at its ocular diaphragm occupying one of said openings, and a micrometer-screw with an end surface against which the object to be measured is directly held, said end surface and the index-line lying in parallel vertical planes, as set forth.

4. In a measuring instrument such as described, the combination with a microscope provided with a vertical illuminator and index-line, of a focusing-table and a micrometer-gage, the latter movable in a plane transverse to the optical axis of the microscope and provided with a contact-surface lying in a plane parallel to the said index-line, as and for the purpose set forth.

5. In a measuring instrument such as described, the combination with a frame or standard and a microscope mounted therein, of a micrometer side gage mounted in an opening or bearing in the frame and comprising a screw-shaft provided with cylindrical end portions, two sleeves each engaging one end of the shaft and forming a bearing therefor, a nut intermediate said sleeves, a graduated wheel secured to the rear end of said screw-shaft, and a spring interposed between said wheel and the contiguous sleeve; substantially as described.

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