

No. 679,779.

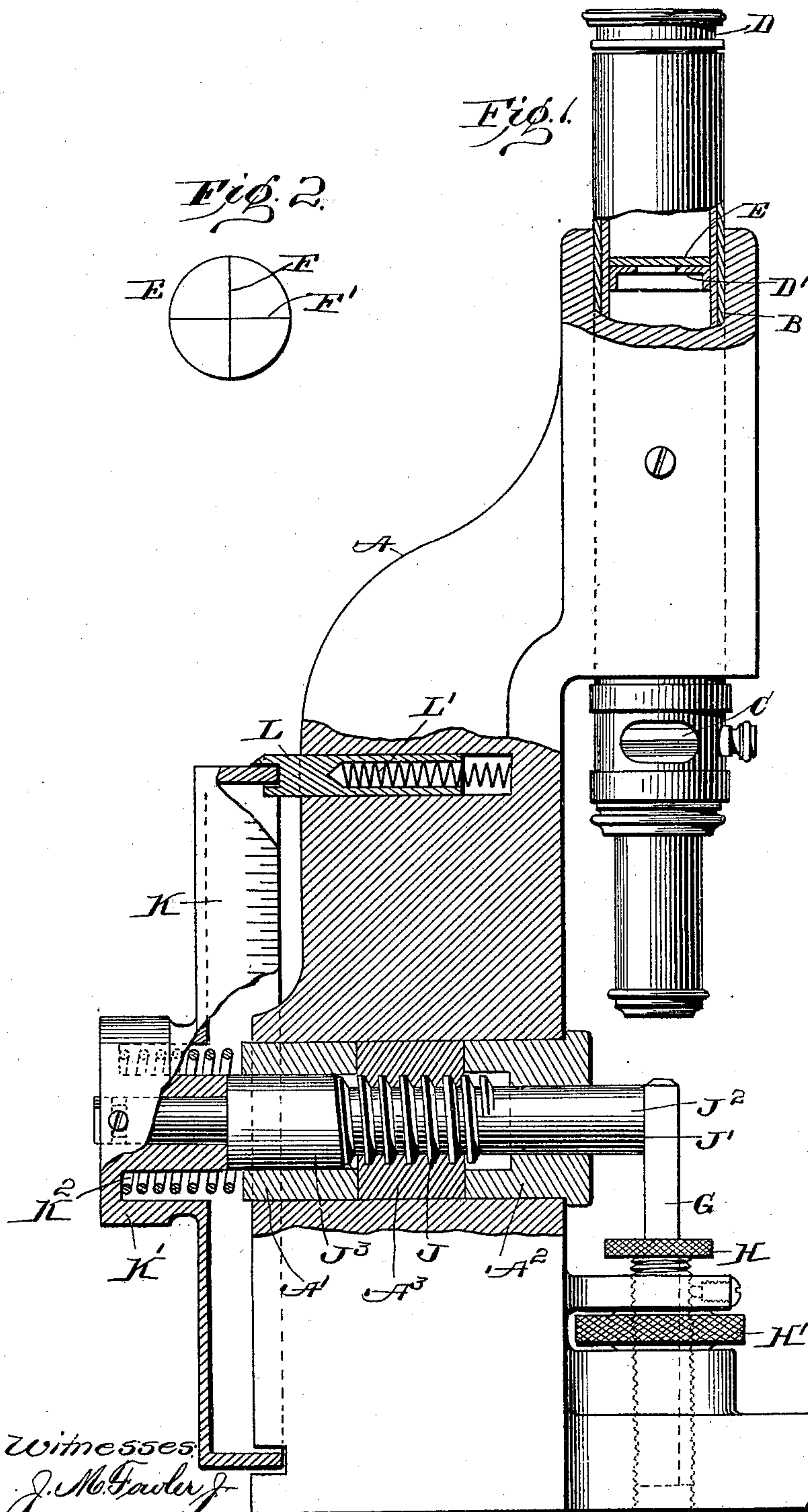
Patented Aug. 6, 1901.

F. H. PIERPONT.

MICROMETER.

(Application filed June 5, 1901.)

(No Model.)



Witnesses:
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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 PIER-
PONT, a citizen of the United States, residing
at Horley, in the county of Surrey, England,
5 have invented certain new and useful Im-
provements in Micrometers or Measuring In-
struments; and I do hereby declare the fol-
lowing to be a full, clear, and exact descrip-
tion of the same, reference being had to the
10 accompanying drawings, forming a part of
this specification, and to the letters of refer-
ence marked thereon.

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

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

30 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.
35 Within the ocular D, resting on or conven-
iently secured to the diaphragm D', is a trans-
parent 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
40 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 an-
gles to the microscope B. The micrometer-
45 screw comprises a central screw-threaded por-
tion J, with hardened ends J² J³. The por-
tion J engages a thread, preferably formed
in a nut A³, placed between hardened bush-
ings A' A², forming bearings for the ends J³ J²,

respectively, and fixed in the frame A, so 50
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- 55
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 60
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 65
has an annular recess to receive one end of a
coiled spring K², the other end of which
presses against the bushing A'. The pres-
sure of this spring causes the wear of the
micrometer-screw to take place on one side 70
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 elimi- 75
nated 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 80
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 85
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 the 90
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 di- 95
rectly from the scale of the graduated wheel
K. The pitch of the screw and the gradua-
tions 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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Witnesses:

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