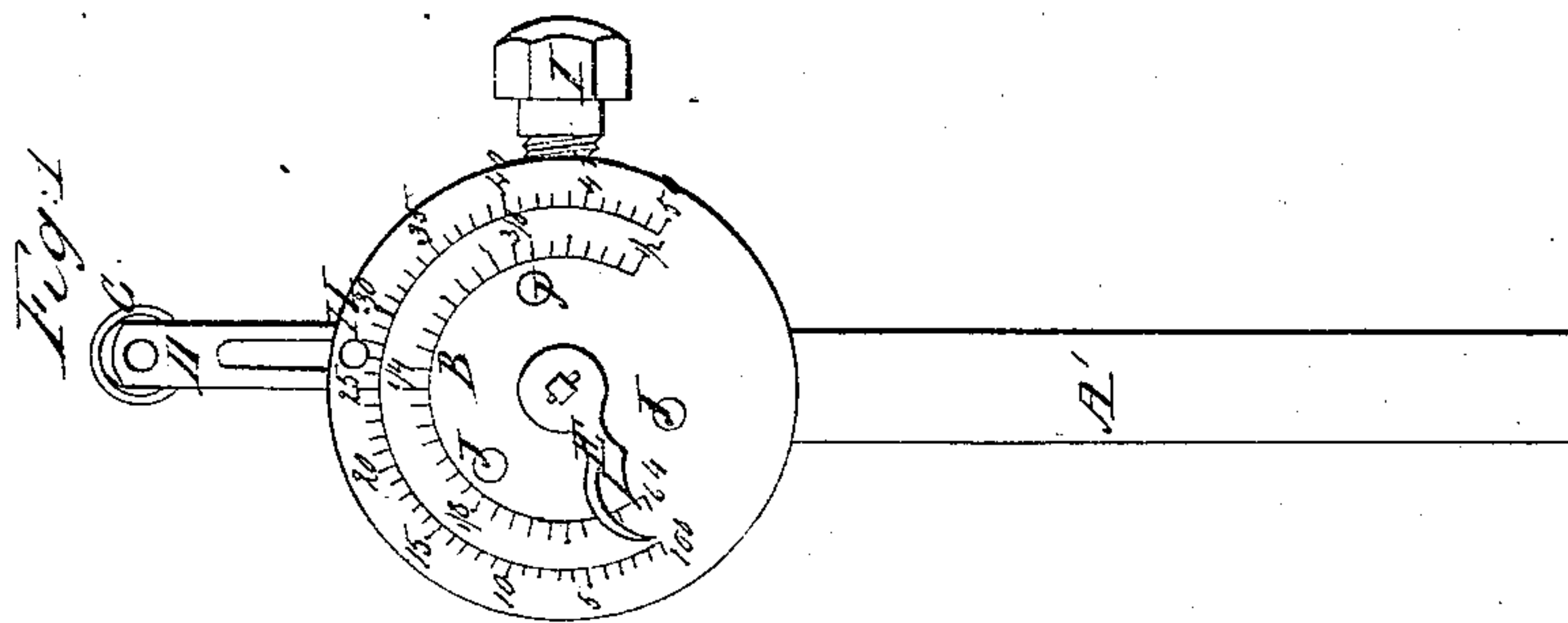
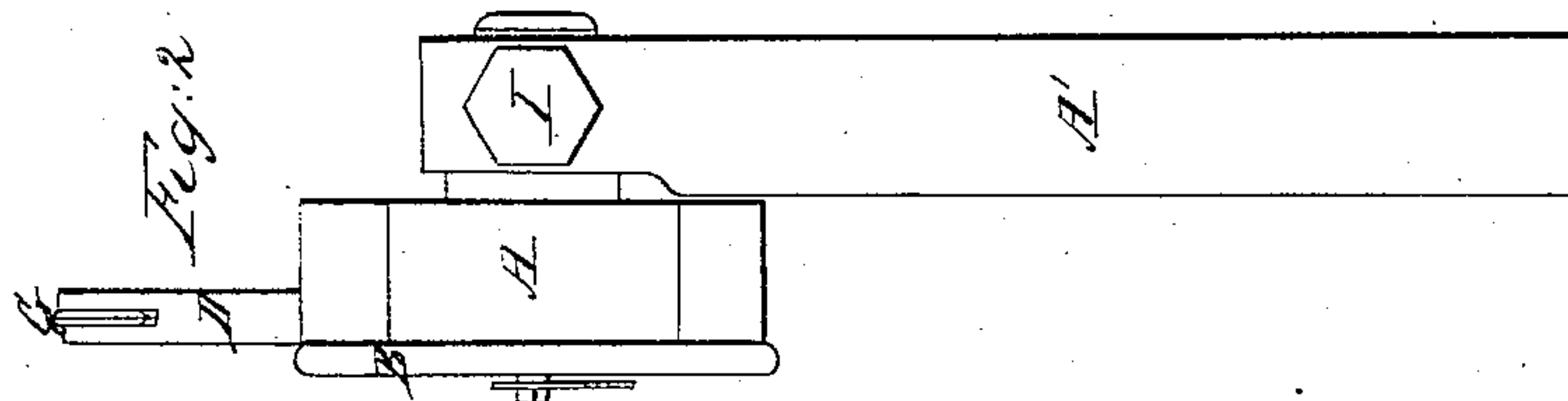
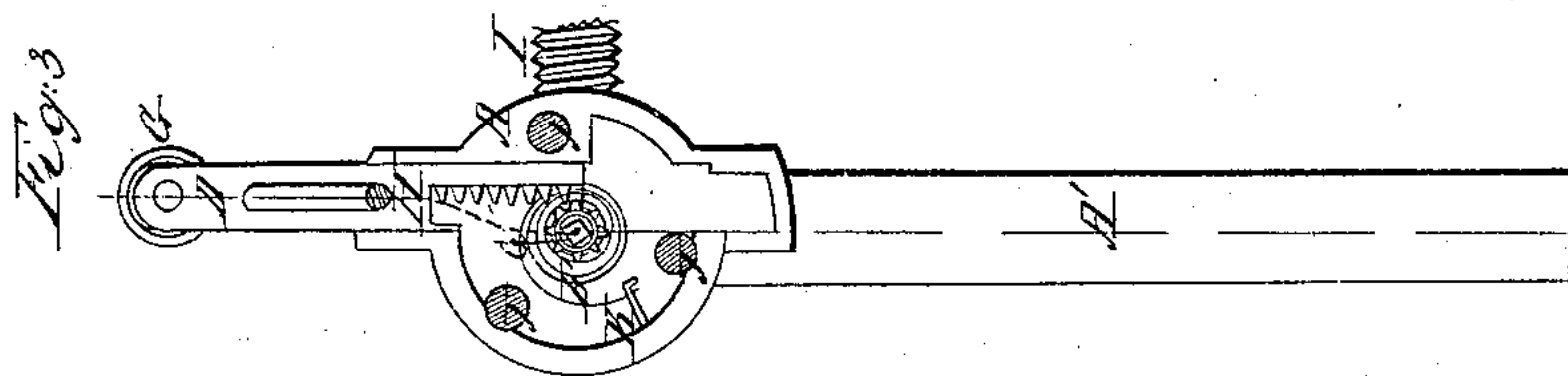
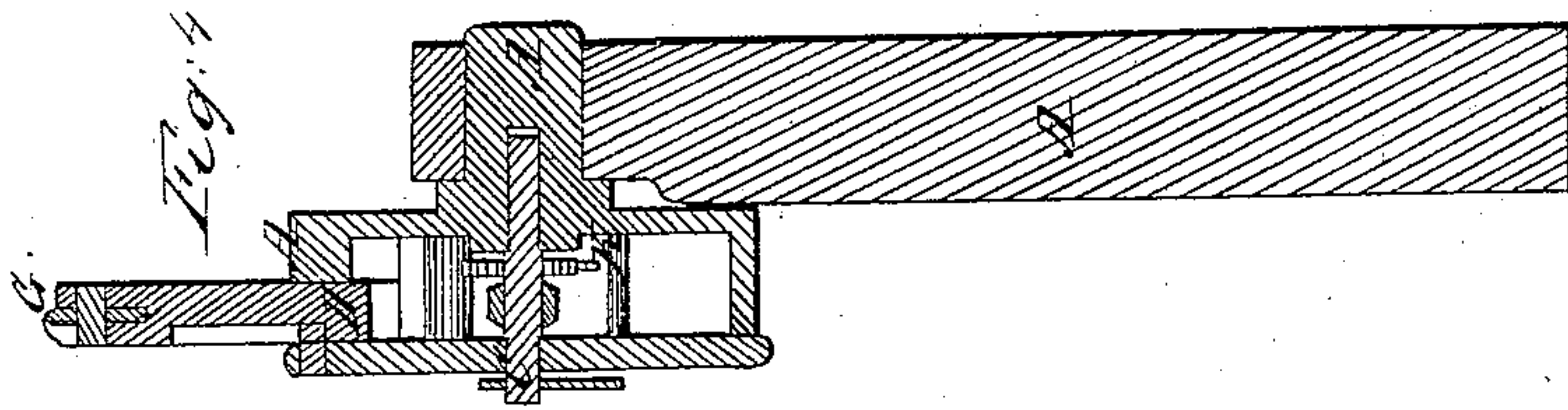


*M. Bowker.*

*Conical Turning Gauge.*

*N<sup>o</sup> 49,073.*

*Patented Aug. 1, 1865.*



*Witnesses*

*C. B. Snow*

*Sylvanus Sawyer*

*Inventor*

*Milton Bowker*

# UNITED STATES PATENT OFFICE.

MILTON BOWKER, OF FITCHBURG, MASSACHUSETTS.

## IMPROVED CONICAL-TURNING GAGE.

Specification forming part of Letters Patent No. 49,073, dated August 1, 1865.

*To all whom it may concern:*

Be it known that I, MILTON BOWKER, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful tool, which I term a "Conical-Turning Gage," for enabling an operator to adjust a piece of iron or other material in an engine-lathe at the desired angle, so as to give the exact amount of taper required to a certain number of inches in length in a cone or conic section without making any calculations or experiments; and I do hereby declare that the following is a clear and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon, in which—

Figure 1 is a front view; Fig. 2, a side view; Fig. 3, a front view with the dial-plate removed; Fig. 4, a sectional side view cut through the center, as indicated by red line in Fig. 3.

The process of turning iron or other metal conical or tapering in an engine-lathe is one that requires considerable calculation, care, and repeated trials, especially when the taper is to be made to fit a corresponding socket or hole. In order to obviate this difficulty I have endeavored to construct a tool in such a manner that the taper may be determined and turned without any calculation and very little, if any, experimenting or trials.

Having thus far premised, I will now proceed to describe the construction and operation of my invention, in order that others skilled in the art may be able to make and use the same.

In the drawings, A is the stock or body of the tool, with a shank, A', to be inserted in the tool-stock of an engine-lathe.

B is what I term the "dial-plate" or "index," having two circular graduated lines, one within another, both being nearly concentric with the circumference of the dial-plate, the outer one divided into one-hundredths and the inner one into sixty-fourths parts of an inch, either circle being susceptible of more minute divisions, if necessary.

C is a small arbor or shaft carrying a pinion, into which the rack of the self-adjusting bar D plays, so as to cause it to rotate back and forth as the bar is moved in and out of the stock, as will be hereinafter more fully described.

E is a hand with two pointers, attached to the outer end of the arbor C in such a manner as to register minutely upon the graduated circles the exact distance that the self-adjusting bar is moved in and out as the friction-roller G in the end of the self-adjusting bar D is traversed back and forth upon a straight shaft, the same being placed upon the center-points of a lathe and set over to an angle that shall represent the taper to be turned.

F is a scroll-spring attached to the pinion C, and also to a pin in the stock, as shown at K in Figs. 3 and 4, to keep the self-adjusting bar D constantly thrown out.

G is a small friction-roller with either a concave, convex, or flat periphery, which is designed to travel against the surface of a straight shaft adjusted upon the center-points of a lathe at such an angle as shall represent the taper which it is desired to obtain.

H is a check-pin placed in the aperture in the stock A, through which the self-adjusting bar D plays, and passing up into a slot in the self-adjusting bar D, so as to prevent its being thrown out too far by the action of the spring F.

Having thus fully described my invention, I will now proceed to explain its use and application.

When it is necessary to find any taper to a certain number of inches in length the shank of the gage or tool is inserted in the tool-stock of the lathe. A straight shaft or arbor with a uniform diameter is then adjusted upon the center-points of the lathe. The tail-stock carrying the dead-center is then set over, either to or from the tool, as the case may require, so that when the tool is traversed back and forth upon the surface of the shaft or arbor the distance to which the taper is to be turned by moving the slide-rest of the lathe it shall force in the self-adjusting bar D, thereby rotating the shaft C, carrying the hand with the pointers E sufficiently to indicate the exact taper required. Then the shaft or arbor is removed from the center-points of the lathe and the iron or any other metal or material upon which the taper is to be turned is affixed in its place. The operator may then proceed to turn the taper, which will be found sufficiently exact so that it may be readily brought to a perfect fit with the file.



What I claim as my invention, and desire to secure by Letters Patent, is—

A combination composed of the self-adjusting bar D, the pinion and arbor C, the friction-roller G, the scroll-spring F, the check-pin H, the hand E, and the dial-plate B, the whole being arranged substantially in the manner

and for the purpose herein described and set forth.

MILTON BOWKER.

Witnesses:

C. H. B. SNOW,  
SYLVANUS SAUZER.