(No Model.)

J. GEDDES.

MICROMETER DEPTH GAGE.

No. 459,107. Patented Sept. 8, 1891.

Fig. 1.

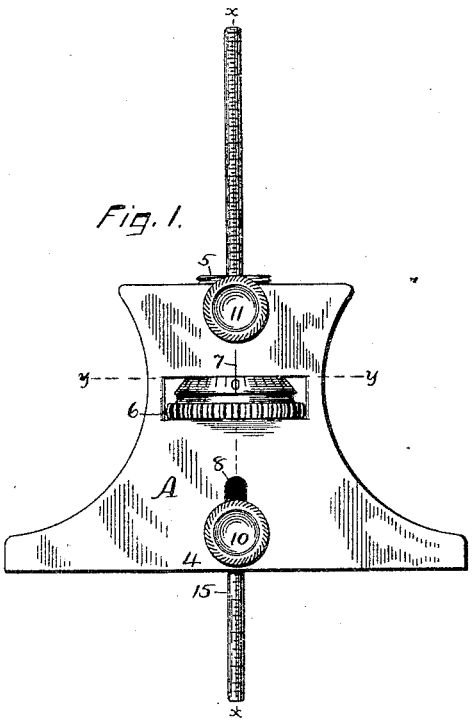


Fig. 2.

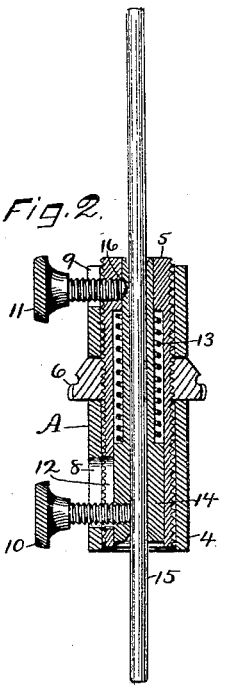
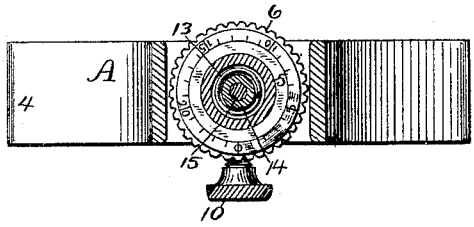


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MICROMETER DEPTH-GAGE.

SPECIFICATION forming part of Letters Patent No. 459,107, dated September 8, 1891.

Application filed March 4, 1891. Serial No. 383,784. (No model.)

To all whom it may concern:

Be it known that I, JAMES GEDDES, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Micrometer Depth-Gages, of which the following is a specification.

My invention relates to improvements in micrometer depth-gages; and the chief object of my improvement is to provide an adjustable depth-gage with a micrometer attachment for measuring the projection of the gage.

In the accompanying drawings, Figure 1 is a side elevation of my depth-gage. Fig. 2 is a central vertical section thereof on line *x x* of Fig. 1, the central member and set-screws being shown in elevation; and Fig. 3 is a transverse section on line *y y* of Fig. 1.

A designates the frame or gage-block, having a base 4 for spanning a die-cavity or other recess, with the ends of the base resting upon the surface on opposite sides of said recess. This frame A is bored of a size to receive and let slide longitudinally through it the screw-shell 5. It is also slotted transversely near its middle to receive the adjusting-nut 6, that is screwed upon said screw-shell and is held against longitudinal movement by fitting the walls of its slot or recess in the frame. The upper face of this nut may be beveled off and provided with any desired graduation or scale with appropriate numbers—for instance, as illustrated in Figs. 1 and 3. The frame A should also be provided with a suitable index-mark, as at 7, Fig. 1. The lower end of the frame upon one side is provided with a slot 8 and at the upper part with a slot 9, Fig. 2, to permit of the passage and operation of the set-screws 10 and 11, hereinafter described. The screw-shell 5 is also provided with a long slot 12, Fig. 2, that is immediately inside of the slot 8. The screw-shell 5 is bored out on two different diameters, the larger bore extending from the bottom to a point near the upper end and the smaller bore extending upwardly therefrom through said upper end. The screw-shell is bored diametrically near its upper end and the hole threaded to receive the set-screw 11, that is screwed into said shell, with its shank or body passing through the slot 9 in the frame. Within the screw-shell 5 I arrange the spring 13 and plunger 14, the respective ends of which plunger are fitted to the large and small bores of the screw-shell, the smaller part of the plunger being made proportionally longer to form a chamber for said spring 13, as shown in Fig. 2. The plunger is also bored diametrically near its lower end and screw-threaded to receive the set-screw 10, that extends through the slots 8 and 12 of the frame and screw-shell, respectively, and into the threaded hole in said plunger, as shown in Fig. 2. Said plunger is also bored longitudinally to receive the adjustable gage-rod 15, which may be provided with a scale to indicate inches and fractions thereof, as shown in Fig. 1. The upper end of the plunger is provided with a socket or screw-seat 16, into which the end of the set-screw 11 may be forced to lock the plunger within the screw-shell, with its upper end even with the upper end of said screw-shell, as shown in Fig. 2; but this seat or socket should not be deep enough to allow the pressure of the set-screw 11 to pinch the gage-rod.

In order to set the gage for a given depth, the adjusting-nut is turned to bring the zero-mark opposite the index, as illustrated in Fig. 1. The set-screw 11 is tightened to lock the plunger within the screw-shell and hold its upper end even therewith. The base of the frame is then placed upon some flat surface, the set-screw 10 loosened, and the gage-rod 15 pushed upwardly until its lower end is just even with the base. The set-screw 10 is tightened to hold the gage-rod firmly within the plunger and the set-screw 11 loosened so as to permit the plunger 14 to be under the influence of the spring 13, the device being still held on said flat surface. The operator then should notice whether or not the upper ends of the plunger and screw-shell are exactly even. If they are, the gage-rod is properly set within the plunger, and if they are not even it is improperly set, and the operation should be repeated until upon releasing the set-screw 12 the upper ends of the plunger and screw-shell will come even when the gage-rod is pressed back, with its end and the base of the frame both resting on a flat surface.

The adjusting-nut is then turned to make the gage-rod project the desired distance.

As shown in the drawings, the graduations indicate thousandths of an inch. In working a die-cavity or boring a hole to a certain depth the gage-rod is placed in the bottom of the cavity and the base pressed down to the surface of the die or other object in which the cavity is made. If the cavity is not of the desired depth, the spring 13 will yield and permit the base to be brought down to the surface, and the upper end of the plunger will project above the upper end of the screw-shell a distance equal to the further depth that the cavity is to be sunk, the measuring being repeated until the upper ends of the plunger and screw-shell come even, care being taken not to work the cavity too deep. If it is worked too deep, when the gage is applied the upper end of the plunger will sink below instead of project above the upper end of the screw-shell.

In the foregoing illustration of using the device only a short projection of the gage-rod was contemplated. If, however, a depth of projection is desired to be measured that exceeds the range of motion given to the screw-shell within the frame, the same can be measured by first carefully projecting the rod beyond the base a given distance by means of the scale on the rod or by measuring the projection in any ordinary way, say, for a half-inch or an inch, or any other simple division, and then when so set the thousandths of an inch or less fractions may be measured by turning the adjusting-nut in the frame, as before described. It is also evident that the gage may be used, if desired, without bringing into action the spring 13 and the sliding action of the plunger within the screw-shell by tightening the screw 11 and permitting it to remain tightened, while the lower end of the gage-rod is set flush with the base or at any given measurement therefrom, and then the further projection may be effected and measured by turning the adjusting-nut, and, if desired, using the gage as a rigid one.

I claim as my invention—

1. The herein-described depth-gage, consisting of the frame having a base, the screw-shell arranged to move longitudinally therein, the adjusting-nut for moving said screw-shell longitudinally, a plunger and spring within said screw-shell, the gage-rod 15 within said plunger, and the set-screw 10 for securing said gage-rod and plunger together, substantially as described, and for the purpose specified.

2. The combination of the frame A, having base 4, slots 8 and 9, a longitudinal bore and middle nut-recess, the screw-shell 5, fitted to said slide in said longitudinal bore and having the longitudinal bore, slot 12, and at its upper end the threaded set-screw hole, the screw 11, passing through the slot 9 into said threaded hole, the adjusting-nut 6 on said screw-shell, the spring 13, the plunger 14, having a longitudinal bore, the sliding gage-rod 15, fitted within the bore of said plunger, and the set-screw 10, passing through the slots 8 and 12 into a threaded hole in the plunger for securing said gage-rod therein, substantially as described, and for the purpose specified.

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