(No Model.)

# R. B. HAINES, Jr.

## MICROMETER GAGE.

No. 468,519. Patented Feb. 9, 1892.

FIG. 1.

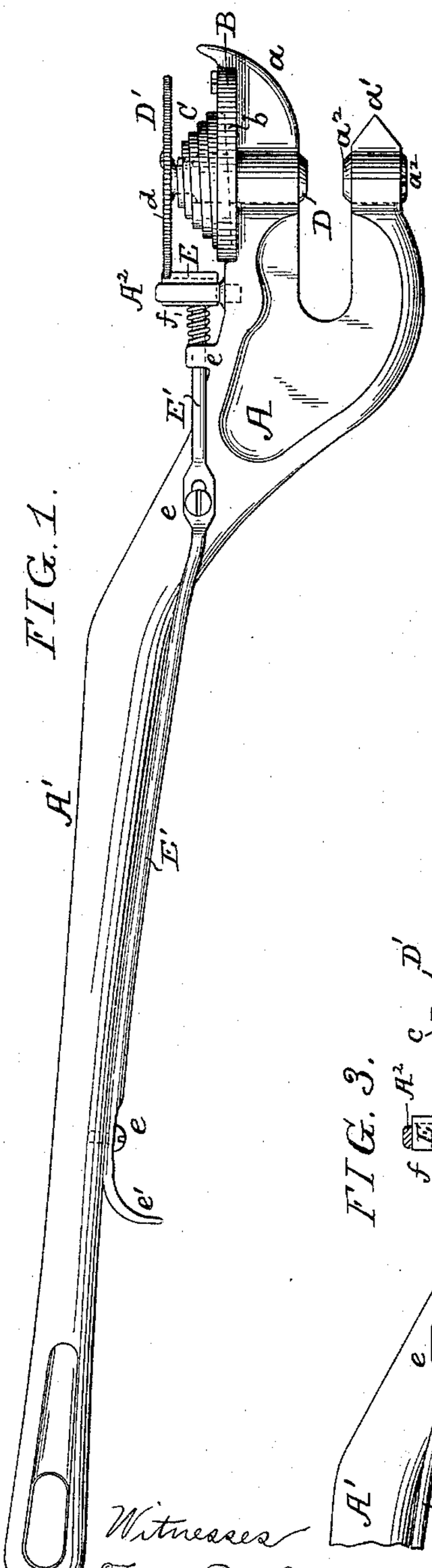


FIG. 2.

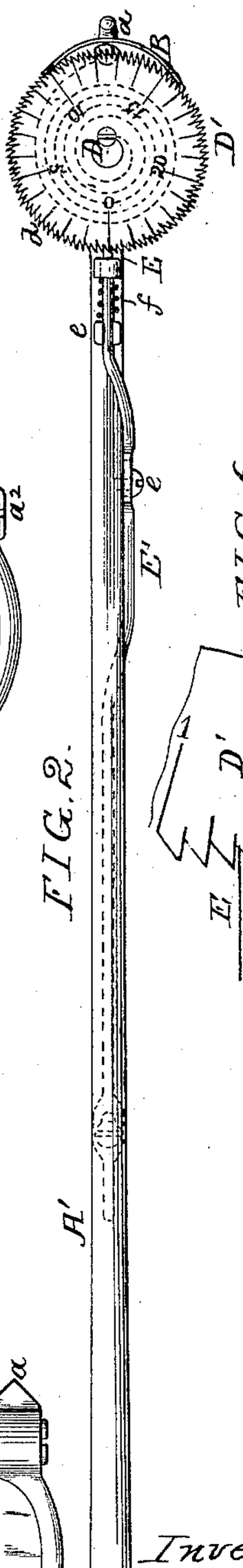


FIG. 3.

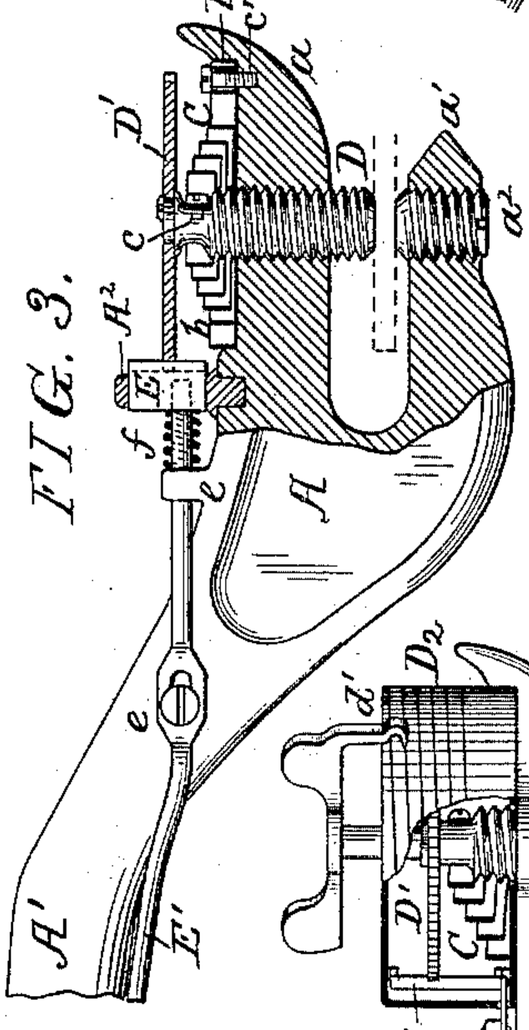


FIG. 4.

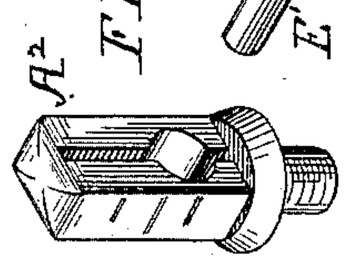


FIG. 5.

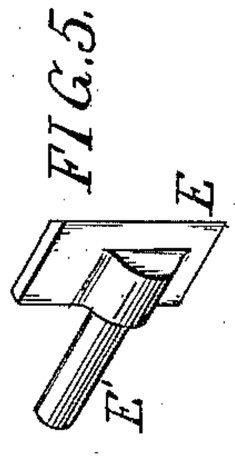


FIG. 6.

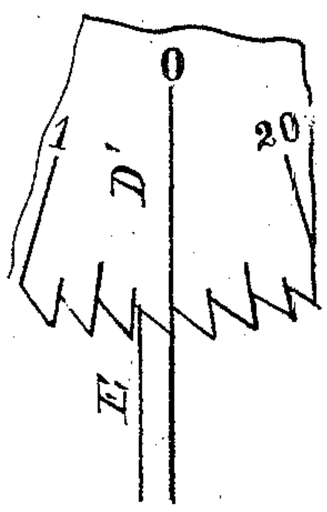


FIG. 7.

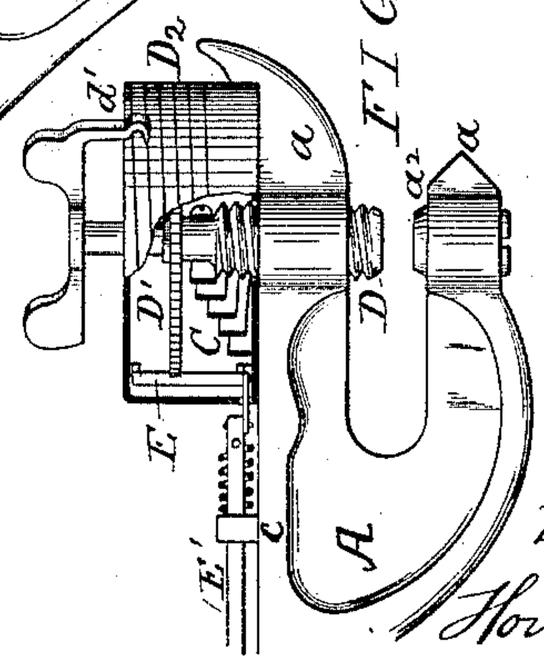
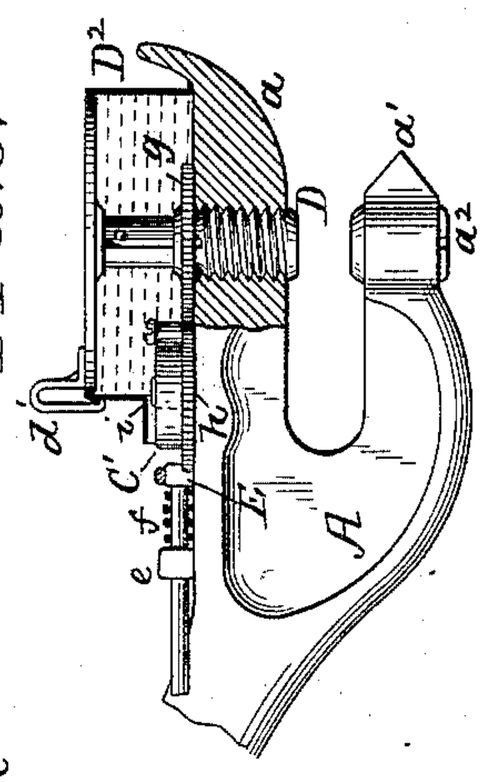


FIG. 8.



Witnesses
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# UNITED STATES PATENT OFFICE.

ROBERT B. HAINES, JR., OF COATESVILLE, PENNSYLVANIA.

## MICROMETER-GAGE.

SPECIFICATION forming part of Letters Patent No. 468,519, dated February 9, 1892.

Application filed October 27, 1891. Serial No. 410,036. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT B. HAINES, Jr., a citizen of the United States, and a resident of Coatesville, Chester county, Pennsylvania, have invented certain Improvements in Gages, of which the following is a specification.

The object of my invention is to so construct a micrometer-gage that material—for instance, hot plates in a rolling-mill—can be measured without the measurer coming close to the plates. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of one form of my improved gage. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a side view, partly in section, of sufficient of the gage to illustrate my invention. Figs. 4, 5, and 6 are detailed perspective views of parts of the device; and Figs. 7 and 8 are views of modifications of my invention.

A is the body of the gage, having two jaws *a a'* and a handle A'. In the jaw *a'* is preferably an adjustable point $a^2$ in the form of a screw, which can be raised or lowered, as required, by applying a screw-driver to the head, which is clearly shown in Fig. 3. In the jaw *a* is the micrometer-screw D, having a disk D', on which are the graduations and figures, preferably as shown in Fig. 2. This disk D' has a serrated edge forming a series of teeth *d*, which are made as shown in Fig. 6. Adapted to these teeth is a detent E, having a knife-edge. The teeth are slightly undercut on one side, so that as the detent is forced by its spring into the teeth, as shown in Fig. 6, it will not turn the wheel so as to force the screw onto the plate to be measured, but will have a tendency to back the screw, so that the gage can be readily drawn from the plate. The detent is adapted to a post $A^2$, secured to the body A. This post is slotted, as clearly shown in Fig. 4, for the reception of said detent, which is connected to a rod E', adapted to guides *e e*, and has at its extreme end a hand-hold *e'*. Between the lower bearing and the detent is a spring *f*, which tends to force the detent into engagement with the teeth D. By pulling upon the rod E' the detent is withdrawn from the disk and the disk can turn, but as soon as the rod is released the detent engages with the disk and locks it. The screw D is acted upon by a spring C, and, as shown in Fig. 3, one end of this spring is adapted to the shank of the screw at *c*, and the opposite end of the spring is attached to the jaw *a* at *c'*, in the present instance by means of a screw. I preferably mount between the jaw *a* and the spring a projecting shield B, having a flange *b*. This shield affords protection for the spring. The shield may have an asbestus lining, if necessary, or may be composed of suitable non-conducting material.

To measure a plate I turn the screw through the medium of the disk D to the position shown in Fig. 1, thus winding up the spring. The disk is then held in the raised position by the detent E, which engages with the teeth of the disk, and when a plate is to be measured—for instance, after passing through the rolls and while still hot—the measurer places the gage on the plate so that its edge will pass between the jaws of the gage, the detent is withdrawn, and the spring will turn the screw down upon the plate. The detent is then released and engages with the disk. The gage is then removed and the thickness of the plate is indicated by the marks on the disk D, and in order to facilitate the reading of the indicator I may mark the post $A^2$ with a series of lines, as shown in Fig. 4, in order to indicate a certain distance of travel of the screw. This, taken in connection with the marks on the disk D', enables the measurer to readily tell the thickness of the plate. After the plate has passed through the rolls again for a still further reduction the gage need not be again adjusted, but can be placed upon the plate, the detent released, and the spring will turn the screw until it comes in contact with the plate, when the detent can be again released, engaging the disk, and the thickness of the plate can be read on the dial, as before. This operation can be repeated until the plate has reached the proper thickness. When a fresh plate is to be measured, the screw is turned back to its original position and the same operation repeated. Thus it is not necessary to

set the gage before each measurement. The gage is also adapted for measuring easily and quickly cold flat plates.

In Fig. 7 I have shown a modification of my improved gage. Instead of the indicating-marks being on the disk they may be on a cylinder $D^2$ and the pointer $d'$ carried by the screw. I have shown the disk D′ within the cylinder on the screw and a pivoted detent.

In Fig. 8 I have shown still another form, using the cylinder D′ and pointer $d'$, and instead of placing the spring directly upon the screw, as shown in Figs. 3 and 7, it may be geared to the screw, as shown in Fig. 8. The spring C′ is adapted to a post $i$, projecting from the body A, and its opposite end is secured to a gear-wheel $h$, meshing with the gear-wheel $g$, splined to the screw D, so that while the screw will turn with the gear-wheel it will slide therein, as clearly shown in Fig. 8. In this instance the spring is protected by the cylinder $D^2$ and an extension of the cylinder covers the spring. The detent E, instead of acting upon the toothed disk, acts upon teeth of the gear-wheel $h$, or may act upon a disk having finer teeth.

I claim as my invention—

1. The combination of the gage, the body having two jaws between which the article to be measured is placed, a screw adapted to one of said jaws, and a spring for turning the screw, with the detent for locking the screw at a given point, substantially as described.

2. The combination of the body, the two jaws, a screw adapted to one of said jaws, a spring for turning the screw, a disk, a detent engaging with said disk, adapted to retain the screw at a given point, and a rod connected to the detent, so that upon moving the rod the detent will be withdrawn from the disk, substantially as described.

3. The combination of the body, the two jaws, the screw adapted to one of said jaws, an indicator for indicating the distance between the screw and the opposite jaw, and a spring for turning the screw toward the fixed jaw, with a detent for locking the screw at a given point, substantially as described.

4. The combination of the body, two jaws, a screw adapted to one of said jaws, a spring having one end secured to the screw and the opposite end secured to the jaw, a disk on the screw, said disk having teeth on its periphery, and a detent engaging with the teeth on the disk, substantially as described.

5. The combination of the body A, the two jaws, a screw adapted to one of said jaws, a spring mounted around the screw, having one end secured thereto and the other end secured to the jaw, a disk mounted on the screw, graduations on said disk, and teeth on the periphery thereof, with a detent and a spring to throw the detent into gear with the teeth on the disk, with a rod for withdrawing the detent, substantially as described.

6. The combination of the body A, having two jaws and the long handle, with a screw adapted to one of said jaws, a spring acting to turn the screw, a disk carried by the screw, a detent engaging with said disk, a spring acting on said detent, and a long rod extending along the handle and having a finger-hold, substantially as and for the purpose set forth.

7. The combination of the body having two jaws, a screw, a spring for turning said screw, and a detent for locking the screw at certain points, with a shield mounted under the spring to protect it from the heat of the plate to be measured, substantially as described.

8. The combination, in a gage, of the jaws, the screw, a detent, and toothed disk, the teeth being undercut on one side, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT B. HAINES, JR.

Witnesses:

HENRY HOWSON,

EUGENE ELTERICH.