D. H. LEHIGH.

MICROMETER AND HEIGHT GAGE.

APPLICATION FILED MAR. 19, 1919.

1,335,004.

Patented Mar. 30, 1920.

3 SHEETS—SHEET 1.

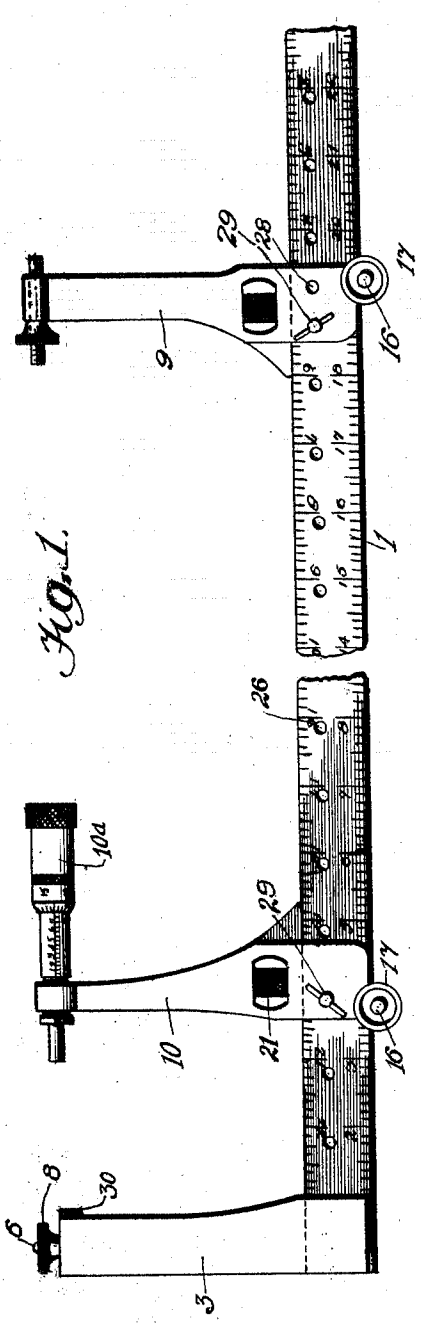


Fig. 1.

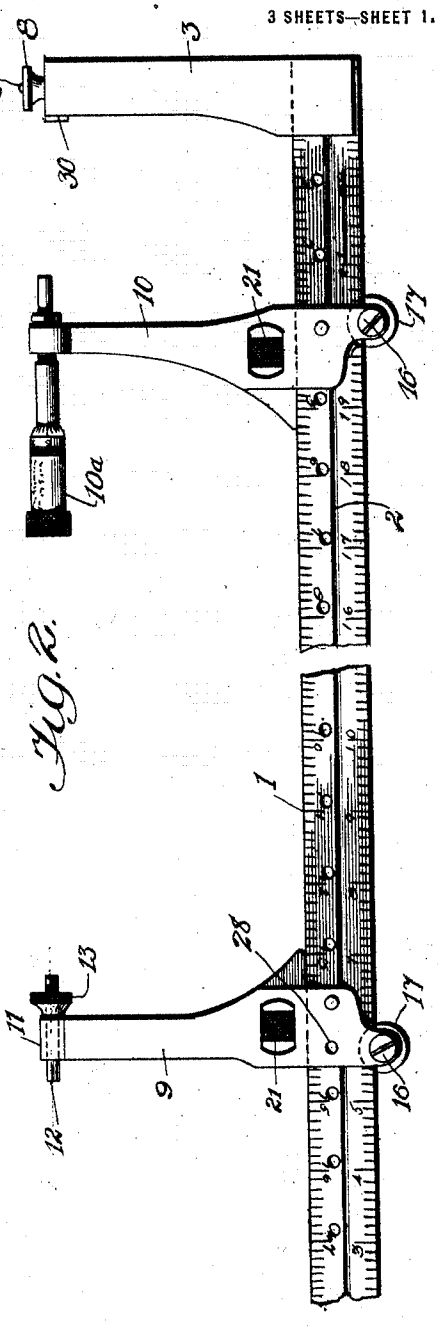


Fig. 2.

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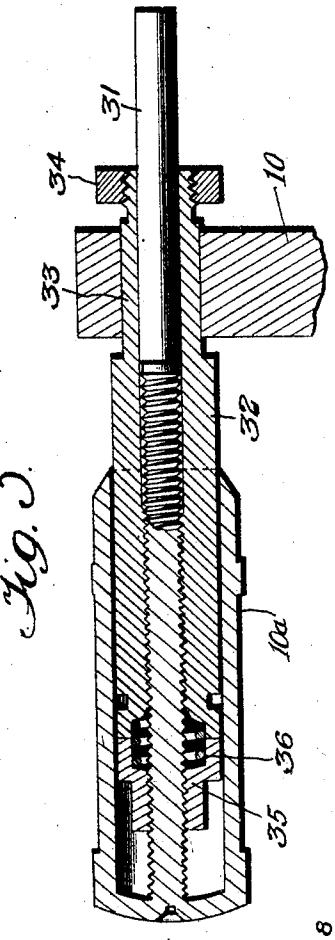


Fig. 3.

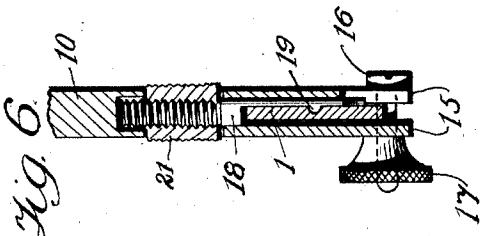


Fig. 6.

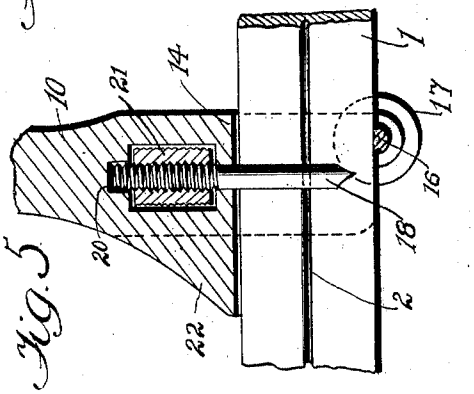


Fig. 5.

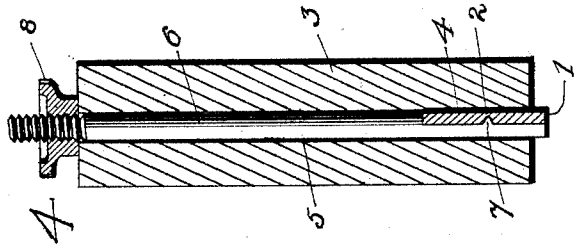


Fig. 4.

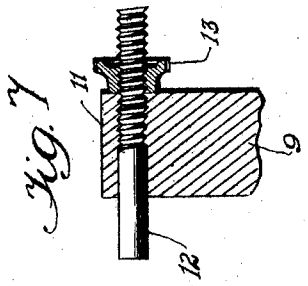


Fig. 7.

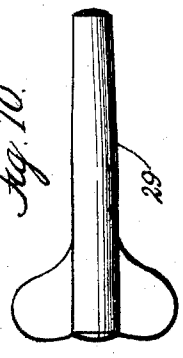


Fig. 10.

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3 SHEETS—SHEET 3.

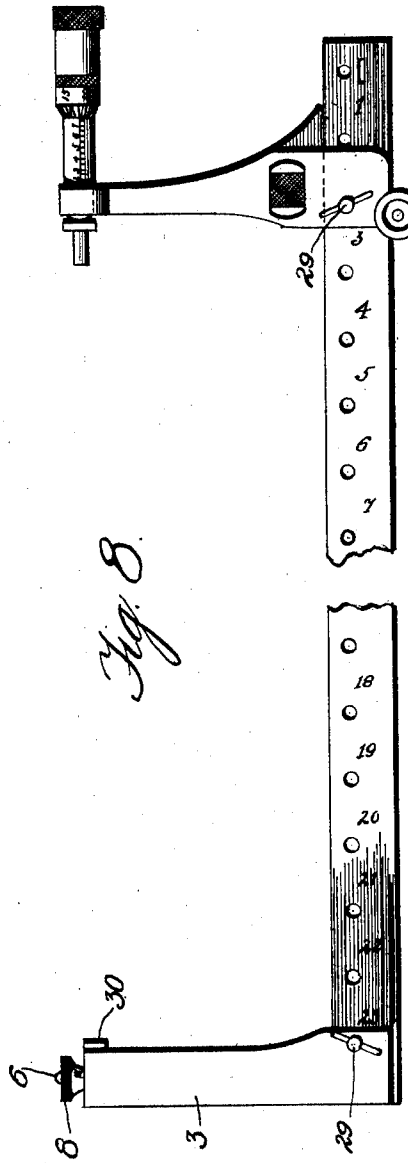


Fig. 8.

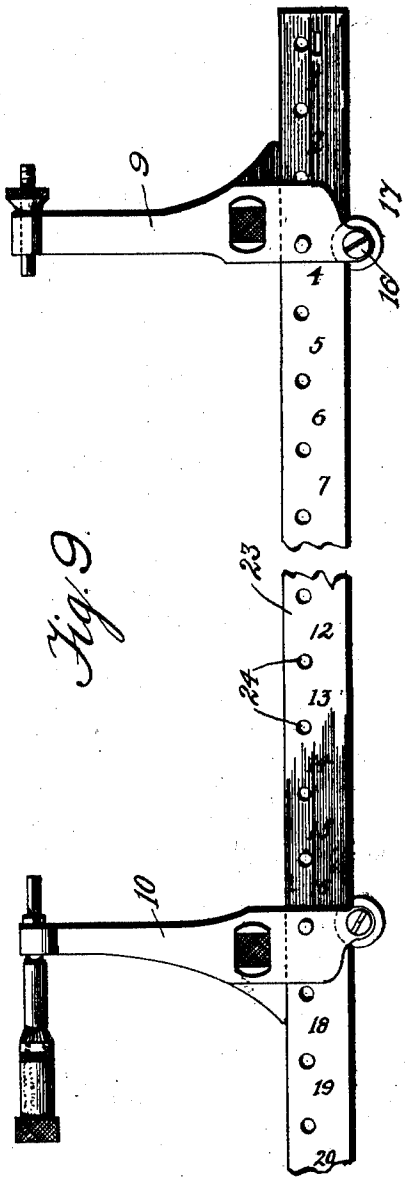


Fig. 9.

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UNITED STATES PATENT OFFICE.

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MICROMETER AND HEIGHT GAGE.

1,335,004. Specification of Letters Patent. **Patented Mar. 30, 1920.**

Application filed March 19, 1919. Serial No. 283,459.

To all whom it may concern:

Be it known that I, DAN. HENRY LEHIGH, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Micrometer and Height Gages, of which the following is a specification.

My invention is an improvement in tools for mechanics and has for its object to provide a tool of the character specified, having as an essential part thereof a micrometer, and so constructed that measurements ranging from one inch to twenty-four inches may be easily made.

In the drawings:—

Figure 1 is a side view of the improved tool showing the parts in one position,

Fig. 2 is a view looking at the opposite side from Fig. 1,

Fig. 3 is a longitudinal section of the micrometer,

Fig. 4 is a horizontal section through the base,

Fig. 5 is a horizontal section through one of the arms,

Fig. 6 is a section at right angles to that of Fig. 5,

Fig. 7 is a partial section of the anvil arm in the plane of the tool.

Fig. 8 is a side view of another embodiment of the invention, showing the parts in one position,

Fig. 9 is a similar view showing the parts in another position.

Fig. 10 is a perspective view of the tapering pin.

In the present embodiment of the invention, a staff or standard 1 is provided, of metal of suitable cross section, and this staff has upon one face a longitudinally extending V-shaped groove 2, the said groove extending the full length of the staff. The staff is also provided on its opposite faces with scales, the scales being similar but reversely numbered, and one being arranged adjacent to each edge of each face.

A base 3 is provided, the said base having a vertical notch 4 at one end for receiving the standard, and the base also has a longitudinally extending opening 5 for receiving a rod 6. This rod 6 has a flattened portion at one end provided with a transverse rib 7 which is shaped to fit within the groove 2 of the staff or standard, the flattened portion being of a length corresponding to the width of the staff or standard, so that the end of the rod 6 is flush with the outer edge of the standard. The opposite end of the rod is threaded, and is engaged by a thumb nut 8.

The staff also has connected therewith an anvil arm 9 and a micrometer head arm 10. The arm 9 has at one end a transverse bearing 11, through which is passed a pin 12, one end of the pin being plain and the other being threaded, and engaged by a thumb nut 13 on the face of the arm for locking the pin 12 with respect to the arm. The micrometer head arm carries a standard micrometer head 10^a, and both arms as shown more particularly in Figs. 5 and 6 are slotted or recessed vertically at one end as indicated at 14 to receive the staff 1.

Lugs 15 extend beyond the standard when it is in place in the recess 14, and a screw 16 is passed through registering openings in the lugs, the screw being flattened as shown to engage smoothly the edge of the standard, and to prevent turning of the screw when so engaged.

A thumb nut 17 is threaded onto the screw, and it will be evident that by means of the thumb nut the opposite walls of the recess may be clamped on the staff. A lock rod 18 is held in an opening in the arm, and this rod has a flattened portion at one end which fits upon the grooved face of the staff, transversely thereof, and has a transverse rib 19 for engaging the groove 2 of the standard.

Each arm has a transverse opening intersecting the recess 20 for the rod, and within this opening is arranged a thumb nut 21. The thumb nut is of greater diameter than the thickness of the arm, and extends slightly beyond the same, to permit it to be easily grasped between the thumb and finger, and the rod 18 has a threaded portion with which the nut engages.

The parts may be arranged as shown in Fig. 1, and in Fig. 2, and in many other variations. As for instance, in Fig. 1 the micrometer head is arranged adjacent to the base, and micrometer measurements may be made with this arrangement in lengths of one inch or more. Also inside micrometer measurements may be made with this ar-

rangement or if desired, the base may be removed, leaving the micrometer head and anvil arms only connected to the standard.

By reversing the arrangement shown in Fig. 1, that is, arranging the arm 10 on the opposite side of the arm 9, outside micrometer measurements are provided for. In adjusting the arms, the thumb nuts 17 and 21 are loosened. When so loosened, the arms may slide freely on the staff or standard. To lock the parts in adjusted position, the thumb nut 21 is first tightened, the arms being at the position desired.

This draws the edge of the standard up tightly against the bottom of the recess 14, and the arm into a position exactly at right angles to the standard. Now by means of the thumb nut 17, the opposite sides of the recess 14 may be clamped upon the standard to tightly hold the parts in position. It will be noticed that each arm has an extension 22 at one edge thereof, which is adapted to engage the edge of the standard, to provide a broader bearing surface for the arm, and to eliminate any danger of rocking. The base is fixed on the standard by means of the thumb nut 8.

In the embodiment of the invention shown in Figs. 8 and 9 the standard shown in Figs. 1 and 2 is replaced by a staff 23 which may be of any desired length, as for instance, two feet, and it is preferably graduated into inches, by means of openings 24, the said openings being exactly one inch from center to center. Each plate of the staff also carries numerals 25 indicating the distance of each graduation from the base end.

The anvil arm 9 and the micrometer head arm 10 shown in Figs. 1 and 2 are connected with this staff by means of the thumb nut 17, Fig. 10 and it will be obvious that the standard might have the groove corresponding to the groove 2 if desired, such groove however, not being shown in the present instance.

Referring to Figs. 1, 2, and 5, it will be noted that the end of the rod 18 remote from the thumb nut 21 is beveled on opposite sides to form an indicator, and that this said end extends far enough beyond the arm to be visible, coöperating with the scale on the standard to permit the arm to be exactly placed. A portion of the arm is cut away to make the indicator visible.

In the construction of Figs. 1 and 2 the staff is also provided with openings 26, and these openings 26 as well as the openings 24 are adapted to register with openings in the micrometer head arm and in the base, and with openings 28 in the anvil arm to receive a tapered pin 29 for positively locking the arms to the staff or standard.

The staff shown in Figs. 8 and 9 may be of any desired length, and it will be obvious that whatever the length, micrometer measurements may be obtained. The base has the usual elevated portion or anvil 30, for engaging one face of the object to be measured.

In use the base is used only at the extreme end of the standard when used as a height gage. Measurements are taken from the base to any number of inches required, and the base serves only to hold the standard in an upright position.

The micrometer head shown in Fig. 3 has a spindle 31 in axial alinement with the pin 12, the spindle being integral with the shell 10^a and axially arranged with respect thereto. This spindle is threaded over a portion of its length and over that portion adjacent to the shell and the threaded portion engages within a sleeve 32 which has a reducing portion 33 engaging an opening in the micrometer arm 10. A nut 34 is threaded on to the end of the reduced portion, and the spindle 31 has threaded engagement over a portion of its length with the sleeve. A nut 35 is threaded on to the spindle between the sleeve and the shell and the adjacent ends of the nut and the sleeve are recessed, as shown, to receive a coil spring 36 which acts normally to press them apart. It will be evident that by turning the shell 10^a the spindle may be adjusted with respect to the sleeve 32.

I claim:—

1. A device of the character specified, comprising a staff or standard provided with a longitudinally extending central groove on one face, a base, a micrometer head and an anvil arm, each of the said elements having a notch for receiving the staff or standard, a locking rod arranged in each of the said elements, each rod having a transverse rib engaging the groove, a thumb nut threaded onto each rod and rotatable with respect to the element to draw the element tight against the staff or standard and at right angles thereto, and means for clamping the opposite sides of the notch or recess on the standard, the standard having a scale, the locking rod having a pointed end forming an indicator for coöperating with the scale.

2. A device of the character specified, comprising a staff or standard provided with a longitudinally extending central groove on one face, a base, a micrometer head and an anvil arm, each of the said elements having a notch for receiving the staff or standard, a locking rod arranged in each of the said elements, each rod having a transverse rib engaging the groove, a thumb nut threaded onto each rod and rotatable with respect to the element to draw the element tight against the staff or standard and at right angles thereto, and means for clamping the opposite sides of the

notch or recess on the standard, said standard having transverse openings spaced apart a predetermined distance between centers, and the three elements having openings adapted to register with the openings of the staff or standard, and a tapering pin for engaging the registering openings.

3. A device of the character specified, comprising a staff or standard provided with a longitudinally extending central groove on one face, a base, a micrometer head and an anvil arm, each of the said elements having a notch for receiving the staff or standard, a locking rod arranged in each of the said elements, each rod having a transverse rib engaging said groove, a thumb nut threaded onto each rod and rotatable with respect to the element to draw the element tight against the staff or standard and at right angles thereto, said rod being pointed at the end adjacent to the standard and the standard having a scale with which the pointed end of the rod cooperates.

4. A device of the character specified comprising a staff or standard, a micrometer head arm, an anvil arm, and a base, said arms and base having means for connecting them to the standard at right angles to the standard and at any desired point on the standard to permit the arms to be interchanged or either to be used with the base.

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Witnesses:
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