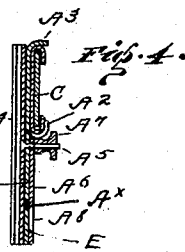
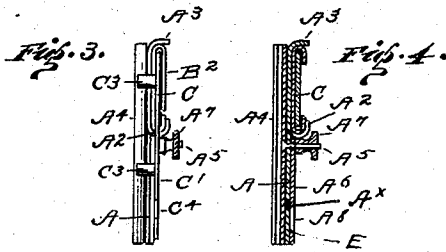
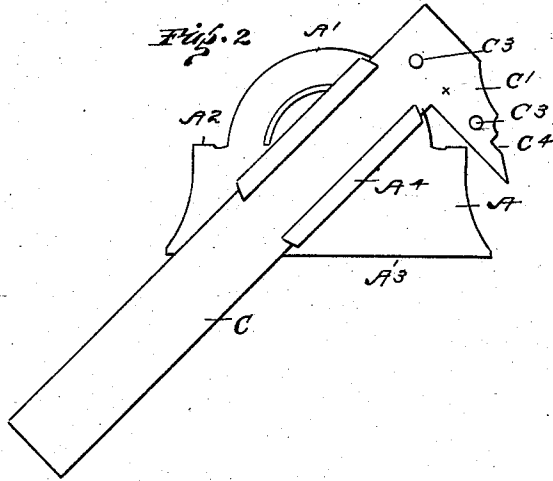
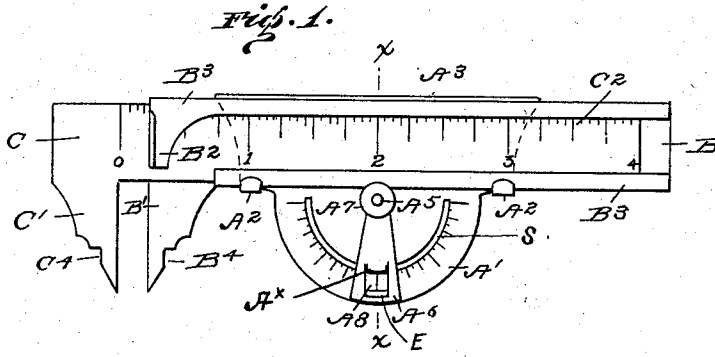


No. 785,245.

PATENTED MAR. 21, 1905.

E. WIET.  
COMBINATION GAGE TOOL.  
APPLICATION FILED JAN. 19, 1904.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## COMBINATION GAGE-TOOL.

SPECIFICATION forming part of Letters Patent No. 785,245, dated March 21, 1905.

Application filed January 19, 1904. Serial No. 189,735.

To all whom it may concern:

Be it known that I, EUGENE WIET, with post-office address and residence at 2500 Q street, in the city of Sacramento, county of Sacramento, and State of California, have invented certain new and useful Improvements in Combination Gage-Tools; and I do hereby declare the following to be a full, clear, and exact description of the said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in combination gage-tools, and particularly to the novel arrangement and construction of the various parts.

The object of the invention is to construct, arrange, and combine in a convenient form a number of tools of analogous uses.

Broadly, the invention consists of arranging in compact combination the following instruments: outside calipers, inside calipers, dividers, straight-edge, depth-gage, surface-gage, angle-gage, angle-protractor, adjustable T-square, and center-gage.

In the drawings, Figure 1 is a front elevation of a tool constructed and arranged in accordance with this invention. Fig. 2 is a rear elevation of the protractor-base with the graduated gage in position, illustrating the use of this combination as an adjustable T or try square, the caliper-sheath being removed. Fig. 3 is an end elevation of the complete tool looking toward the head. Fig. 4 is a similar view in cross-section on the line *x x*.

In detail the construction consists of the base A, which includes the graduated protractor A<sup>1</sup>, the detention-clips A<sup>2</sup>, and the overhanging angle-flange A<sup>3</sup>, formed integrally therewith. The swinging sheath A<sup>4</sup> is attached to the base by the bolt A<sup>5</sup>, the head of which is countersunk flush with the bottom of the sheath A<sup>4</sup>, and the bolt is extended through the base A, the head of the swinging index A<sup>6</sup>, and is threaded in the thumb-nut A<sup>7</sup>. The index A<sup>6</sup> is perforated at A<sup>8</sup>, and through said perforation the graduations of the protractor are visible, whereby they may be brought into

register with the indicating-bevel E. The metal struck out to form the perforation A<sup>8</sup> is bent downward at A<sup>x</sup> and set into a slit S in the body of the protractor A<sup>1</sup>, said slit forming a guide for the index as it swings with the sheath A<sup>4</sup>, whereby the index will indicate the angle of its inclination on the protractor. All the mechanisms described in this paragraph may be considered as fixtures on the base A.

The calipers instrument consists of the sheath B, punched and bent from a single piece of metal, and comprises the head B<sup>1</sup>, the beveled extension B<sup>2</sup>, and the inturned flanges B<sup>3</sup>, comprising the sheath. The beveled extension B<sup>2</sup> is formed with one flange B<sup>3</sup>, while the bottom of sheath B is extended adjacent the end of the other flange to form the head B<sup>1</sup>. The blade C of the calipers has the head C<sup>1</sup> formed thereon and carries the graduations C<sup>2</sup>, registering with the extension B<sup>2</sup>, the head C<sup>1</sup> opposing with the head B<sup>1</sup> of the sheath, both of said heads being provided with pointed extremities. The reverse side of the head C<sup>1</sup> has two studs C<sup>3</sup> fixed thereon, spaced equidistant from and on opposite sides of the line of the inner edge of the blade.

In Fig. 1 blade C is shown as mounted in sheath B, while in Fig. 2 the same is shown as mounted in sheath A<sup>4</sup>, said blade being free to be interchanged from one sheath to another and also capable of independent use.

The tool is preferably constructed of sheet German silver or any suitable non-tarnishable metal, compactness and durability being considerations.

The operation of the various instruments in the combination is as follows:

As outside calipers: The blade C is pushed from the sheath B until the heads B<sup>1</sup> and C<sup>1</sup> inclose the object of measurement, the graduations C<sup>2</sup> and extensions B<sup>2</sup> registering the dimension.

As inside calipers: The same operation as with the outside calipers except that the outside of the heads at B<sup>1</sup> and C<sup>1</sup> are set within the space to be measured. This necessitates the allowance of one-quarter of an inch for

the thickness of the heads at this point in reading the dimension.

As dividers: The points on the respective heads B' C' may be used in pointing off distances or even as a scratch-compass in making circles.

As a straight-edge: The blade C, with its graduations make an excellent straight-edge for linear measurements.

10 As a depth-gage: The instrument is used as shown in Fig. 2. The angle-flange A<sup>3</sup> on the base being taken as the plane-line and the end of the blade extended into the depth to be measured will register the depth by noting  
15 the graduations C<sup>2</sup>, coincident with the plane-line.

As a surface-gage: Taken that points of common level are wanted on an object at several points thereon, the object and the angle-flange A<sup>3</sup> are set on an even-surface base. The point on the head C' is set at the known point on the object, after which the gage can be applied in like manner to any portion of the object and the level noted on the object.

25 As as angle-gage or try-square: The angle to be determined is taken between the blade C and the angle-flange A<sup>3</sup> and the angularity marked on the work in hand. The angle of protraction can be noted on the protractor.

30 As an adjustable T-square for small work: The angle-flange A<sup>3</sup> is set against the base edge of the work and the blade C used in an obvious manner.

As a center-gage: To determine the center  
35 of a circle, such as the end of a shaft or disk, set the two studs C<sup>3</sup> against the periphery and scratch a line along the inner edge of the blade C. Then move to a point approximately at right angles to the first position  
40 and scratch another line. The junction of the two lines is the center of the circle.

Having thus described this invention, what is claimed, and desired to be secured by Letters Patent, is—

45 1. A combination-tool comprising a base having a protractor thereon, a sheath supported thereby, a second sheath pivotally

mounted on said base, and a sliding blade adapted to work in either of said sheaths.

2. A combination-tool comprising a sheath 50 formed of a single piece of metal having its edges bent to form flanges, one of said flanges being provided with an index, the bottom of said sheath being extended laterally adjacent one end of the other flange to form a head, 55 and a blade slidingly mounted in said sheath and provided with a head opposing the head of said sheath both of said heads being provided with pointed extremities.

3. A combination-tool comprising a base 60 having a protractor formed thereon, said base being provided with clips and an angle-flange, a sheath supported between said clips and said angle-flange, a second sheath pivotally mounted on said base, and a sliding blade adapted 65 to work in either of said sheaths.

4. A combination-tool comprising a base having a protractor thereon, a sheath supported thereby, a second sheath pivotally mounted on said base, an index for said protractor adapted to swing with said pivoted sheath, and a sliding blade adapted to work in either of said sheaths.

5. A combination-tool comprising a base having a protractor thereon, a sheath supported thereby and formed of a single piece of metal having its edges bent to form flanges, one of said flanges being provided with an angular extension, a caliper-blade slidingly mounted in said sheath, and a second sheath 80 pivoted to said base and adapted to receive said blade.

6. A combination-tool comprising a base having a protractor thereon, a sheath removably held in said base, a second sheath pivoted to said base, and a sliding blade adapted to work in either of said sheaths.

In testimony whereof I have hereunto set my hand this 15th day of December, 1903.

EUGENE WIET.

Witnesses:

H. J. GOETHE,  
CHAS. B. BRIER