(Model.)

C. W. WESSMAN.

CALIPERS.

No. 306,123. Patented Oct. 7, 1884.

Fig. 2.

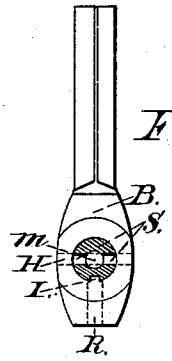


Fig. 1.

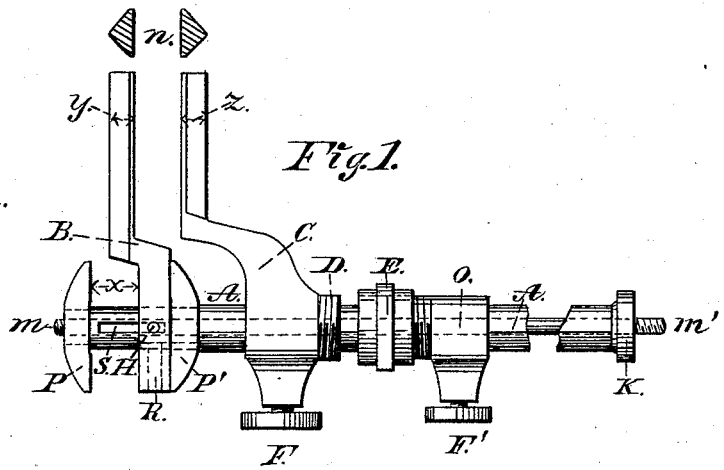


Fig. 3.

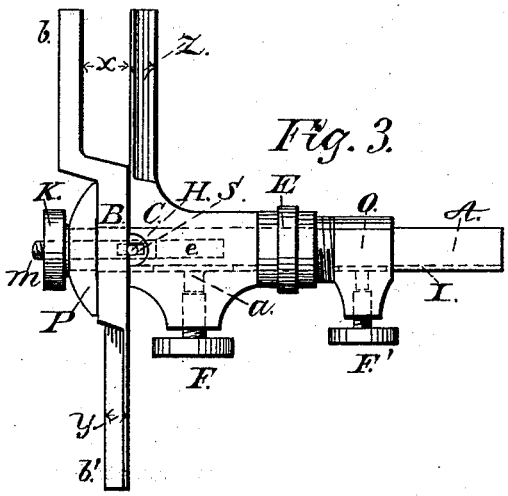
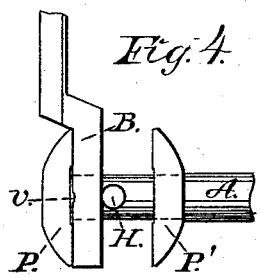


Fig. 4.



Witnesses:

A. J. Frank

Bernhard Rojene.

Inventor:

C. Wichelm Wessman

UNITED STATES PATENT OFFICE.

C. WILHELM WESSMAN, OF CHICAGO, ILLINOIS.

CALIPERS.

SPECIFICATION forming part of Letters Patent No. 306,123, dated October 7, 1884.

Application filed March 27, 1884. (Model.)

To all whom it may concern:

Be it known that I, C. WILHELM WESSMAN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Calipers, of which the following is a specification.

My invention relates to improvements in a class of tools used in machine-shops for measuring, called "calipers."

In order that the object of my invention may be properly understood, I deem it proper to mention that when an "outside" measure has to be converted into an "inside" one, or vice versa, the practice generally is to use two pair of calipers, the one to be set by the other. The instrument subject to this specification is capable of giving the two corresponding measures, outside and inside, correctly by a simple manipulation. Such calipers I want to accomplish in the way hereinafter described.

In the accompanying drawings one form of the instrument is illustrated by Figures 1 and 2, a second by Fig. 3, Fig. 4 being a modification of these two.

Similar letters refer to similar parts where they occur.

In Fig. 1, which is a side view of the tool, A is a rod, which is represented to be round, but may also have either square or rectangular section, if desired. This rod has a central hole through its whole length to receive a finer rod, *m m'*, having threads on both its ends.

At the end of the rod A two plates or disks, P P', are fastened on rigidly. Two pieces, B and C, which I may call "jaws," provided with a hole to fit the rod A, are both movable on the same. The jaw C may be slid from the plate P' out to the end *m'* and secured at any place desired by the set-screw F. The travel of the jaw B is limited by the two plates P and P'. The distance between these two plates must be such that the space marked *x* will be equal to the thicknesses *y* and *z* of the two jaws together. The shape of the plates, as well as of that part of the jaw B that surrounds the rod, being the same, is seen in the front view, Fig. 2. The faces of this jaw must bear well on the inner sides of their respective plates; consequently they have to be made true and parallel before the jaw is put on the rod, and the plates turned off after they have been fastened, it being of advantage to make them slightly hollow near to the rod, as shown in the figures.

To secure the jaw firmly at the plates, the rod A has a diametrical slot, S, which extends nearly up to the plates. Through the jaw B and the rod *m m'* is a hole, H, of the same size as the width of the slot, where a pin is driven in, which thus connects the jaw with the rod *m m'*. The slot S furnishes a passage for the pin; consequently the jaw is free to move between its plates, and when up to either one of them it is secured by tightening the thumb-nut K at the corresponding end of the rod. To cause the jaws to move in the same plane when sliding on the rod, this latter has a longitudinal groove, I, on its bottom side, which extends over the whole length of the rod. A T-shaped piece, *a*, (shown at Fig. 3,) has a round part that fits into the same hole as the set-screw F, its remaining part being made to fit in the groove, which piece prevents the jaw from turning sidewise, and transmits the pressure of the set-screw without bruising the rod. The same arrangement is used in Fig. 3, where it is plainly shown.

The jaw B is held in position simply by the pin R, Fig. 2, which, driven through the hole in the jaw, fits in the slot I. This arrangement is of course needed only when the rod is round. If square or rectangular, the jaws have no chance to turn.

To adjust the jaw C, I use a sleeve, O, having threads of fine pitch at one end and a projecting part to receive a set-screw, F', and a T-shaped piece similar to the one used for the jaw. That part of the jaw marked D has also threads of the same pitch as those on the sleeve, but running in opposite direction. The sleeve and the jaw are connected by the nut E, having threads corresponding with those on the jaw and the sleeve.

I may here remark that I do not intend to use threads on the jaw, as now described, always, it being sufficient merely to let the end of the nut O push against the jaw, which is shown in Fig. 3. That part of the jaws that is to come in contact with the object to be measured should have a V-shaped cross-section, (shown at *n*,) so that when measuring a hole only a thin edge of their outer sides can touch, and this part should be hardened. In

Fig. 1 the jaws are shown to be bent toward the end *m* of the rod. This may be of advantage, but is not necessary.

The instrument of the form now described will give a true result with either bent or straight jaws if the principle is observed which underlies this and the following forms of my invention, which is, that the travel of the jaw B must be exactly equal to the thicknesses of the two jaws together, as explained above.

The setting of these calipers for inside or outside measurement is very simple. If the size of the hole, for instance, is to be taken, the jaw B is held in contact with the plate P′, as shown in Fig. 1, and the jaw C is adjusted and secured by the set-screw F. To get the corresponding outside measure, the nut K is unscrewed, the jaw B pushed over to plate P, and there tightened by the nut at the opposite end of the rod. The space between the inner sides or faces of the jaws is then the corresponding diameter of a shaft.

The main difference between the form of the tool now described and the one represented by Fig. 3 consists in the shape of the jaw-piece B. The upper part of this is bent, as seen in the figure, so as to form the space *x* with the other jaw C, and extends below the rod A straight and in a direction parallel with the straight part above the bend, terminating at equal distance from the rod as the upper end. The space *x* (which is formed as seen in the figure when jaw C has such a position that its inner face coincides with the lower or straight part of the jaw B, if its inner face is imagined to be extended upward) must be exactly equal to the thicknesses at *y* and *z* of the two jaws together. When setting this jaw for inside or outside measurement, it is revolved or swung round half a turn, as will be explained below. That part of the jaw below the rod which is intended to touch the object to be measured should have a V-shaped cross-section, so also the jaw C, but the part of B above the rod a rectangular one. It is secured at the plate P in a nearly similar way, as explained in Figs. 1 and 2; but here the rod *m* reaches into the central hole of the rod A only far enough to allow for a hole through said rod *m*, where a pin, H, is inserted tight, a slot, S, being previously cut through the rod A. This pin H, thus fast in the small rod *m*, projects through the slot S far enough to strike the face of the jaw B where it surrounds the rod. This face has a recess—such as *v* in Fig. 4—where the pin gets embedded when the rod *m* is tightened by the thumb-nut K, thus preventing the jaw from turning, and is at the same time held firmly against the plate P.

The pin H may have a rectangular cross-section instead of round, whereby it gets more strength. A circular groove is seen on the jaw C to give clearance for the pin.

The object of the space *e*, formed between the end of the rod *m* and the bottom of the hole, where it is inserted, is to inclose a spiral spring that will hold the pin H against the jaw when the thumb-nut is loosened.

The position of the jaw B, as represented in the figure, is used when an outside measurement is required. To get the corresponding inside one, the nut K is unscrewed a few threads, so as to get the pin out of its recess in the jaw, when this latter is revolved half a turn and again tightened by the nut.

Another mode of securing the jaw B to its plates or plate is applicable to both the forms of the tool above described. This is illustrated by Fig. 4, where B may represent the jaw either in Fig. 1 or Fig. 3. P P′ are its plates. Diametrical through the rod A, and exactly at the middle between its plates, is a hole slightly tapered or conical. The size of this hole and the thickness of that part of the jaw that surrounds the rod are such that when a conical pin is inserted in the hole it will, like a wedge, act upon the faces of the jaw, which, having recesses for the pin on both sides, will thereby assume a firm and true position.

For briefness the expression "measuring-edges" is used in the following claims, which, to avoid confusion, should be defined. By this is meant that part of the jaws which is intended to be in contact with the object to be measured.

In order to avoid iterations in the foregoing, it is spared until now to remark that these measuring-edges always should be straight and parallel to each other. In some cases, still, a slight curvature nearest to the end may be of advantage.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in calipers, of a rod with two movable jaws thereon, the travel of one being limited by the plates P P′ to a distance equal to the thicknesses of the two jaws together at their measuring-edges, the central rod, *m*, pin H, and thumb-nut K, all substantially as set forth.

2. The combination, in calipers, of a rod with two jaws thereon, one movable along the rod, the other revolving around the same, this latter being bent so that the space formed between the jaws, as shown in the drawings, is equal to the thicknesses of the two jaws together at their measuring-edges, the plate P, rod *m*, pin H, and thumb-nut K, all substantially as described.

C. WILHELM WESSMAN.

Witnesses:
A. J. FRANK,
BERNHARD ROZIENE.