

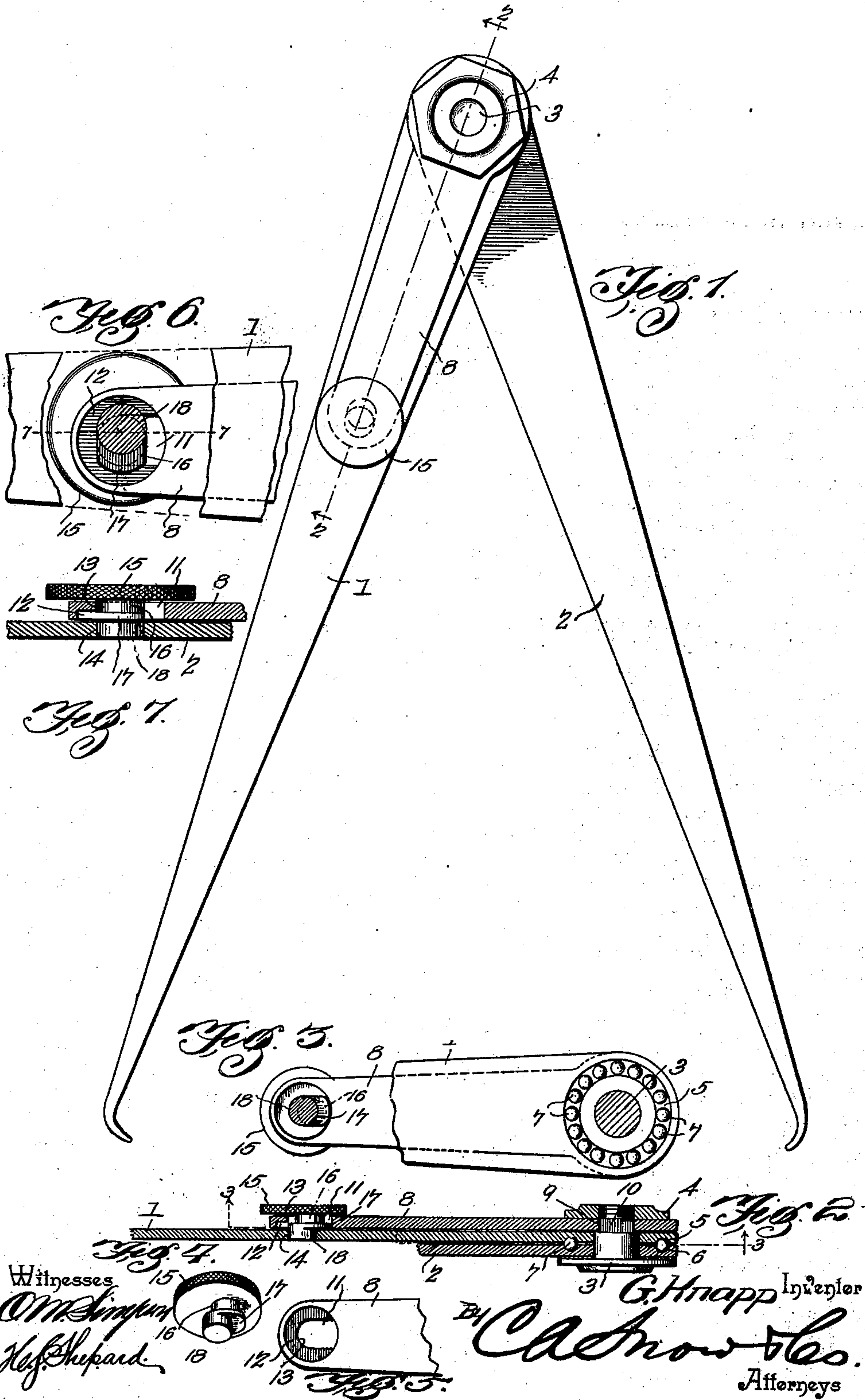
No. 695,565.

Patented Mar. 18, 1902.

G. KNAPP.
CALIPERS.

(Application filed Apr. 15, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

GEORGE KNAPP, OF DEFIANCE, OHIO.

CALIPERS.

SPECIFICATION forming part of Letters Patent No. 695,565, dated March 18, 1902.

Application filed April 15, 1901. Serial No. 55,970. (No model.)

To all whom it may concern:

Be it known that I, GEORGE KNAPP, a citizen of the United States, residing at Defiance, in the county of Defiance and State of Ohio, have invented new and useful Calipers, of which the following is a specification.

This invention relates to measuring implements, and has for its object to provide an improved pair of calipers, which instrument has an auxiliary adjustment for moving the legs thereof after the usual wide adjustment, so as to obtain a very fine and accurate adjustment of the device.

It is furthermore designed to have the present invention applicable to the ordinary forms of calipers and dividers and also to arrange the same so that the adjustment may be had in opposite directions and to permit of the legs of the instrument being reversed upon their pivotal connection, so as to form either outside or inside calipers.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a plan view of a pair of calipers equipped with the present invention. Fig. 2 is a detail longitudinal sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a detail sectional view taken on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of the rotatable adjusting finger-piece. Fig. 5 is a detail reverse plan view of the outer end of the supplemental adjusting-arm. Fig. 6 is a view similar to Fig. 3 and showing the adjusting device at one limit thereof. Fig. 7 is a sectional view taken on the line 7 7 of Fig. 6.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

Referring to the drawings, 1 and 2 designate, respectively, the opposite legs of a pair of calipers or dividers, which taper from the larger inner ends, as usual, and have such

inner ends pivotally connected by means of a headed pivot-pin 3, having a nut 4 applied to the projected screw-threaded end thereof and designed to be tightened to lock the legs against accidental movement after a measurement has been taken. The inner opposing faces of the legs are provided with the corresponding circular grooves 5 and 6, respectively, which are arranged concentrically with respect to the pivotal connection of the legs and are designed to form a race for the antifriction-balls 7, thereby providing a ball-bearing for the pivotal connection to permit of a quick and easy adjustment of the legs upon their pivotal connection.

To effect a slight and accurate final adjustment of the instrument, there is provided an arm 8, which is fixedly carried by the pivot-pin and lies parallel with one of the caliper-legs upon the outer side thereof—as, for instance, the leg indicated by the numeral 1—as the arm can be more readily applied to the nut end of the pivot-pin than to the head end thereof, there being an adjusting device carried by the arm for throwing the adjacent leg in opposite directions upon its pivot. The outer end of the arm is provided with a polygonal opening 9 for the snug reception of the corresponding polygonal portion 10 of the pivot-pin 3, whereby the arm lies between the leg 1 and the nut 4. In the inner end of the arm there is provided a longitudinal slot 11, which has rounded or arcuate opposite terminal edges, there being a circular socket or recess 12 formed in the inner face of the arm, with its inner edge coincident with the inner end of the slot, as plainly illustrated in Figs. 2 and 5 of the drawings, the outer edge of the socket being located outwardly beyond the outer end of the slot, whereby the walls of the latter form an inwardly-directed marginal flange 13, extending part way around the outer side of the socket. The adjacent leg 1 is provided with a circular opening 14, which coincides with the outer end of the slot 11.

The finger-piece for adjusting the leg 1 consists of a disk 15, having a milled peripheral edge, and a cylindrical pivot-stud 18, which has an intermediate lateral flange-like projection 17 and an intermediate laterally-offset cylindrical eccentric projection 16, located between the flange and the finger-piece and

projected in the same direction as the flange, but terminated short of the outer end thereof. In applying the finger-piece the outer end of the pivot-pin 18 is first entered through the slot in the arm and finally seated in the corresponding circular perforation in the leg 1, with the flange 17 lying in the socket in the inner side of the arm. It will be observed that as the pivot fits rotatably within the perforation there is no laterally-slidable movement to the finger-piece when it is rotated upon the pivot-pin 18, and during such rotation the eccentric will move in an arc of a circle upon the relatively fixed pivot-stud 18 as a center, and as the eccentric works in the slot in the arm the leg 1 will be moved laterally in one direction or the other with respect to the arm, and upon the pivotal connection of the legs the opposite leg 2 remains unaffected. Upon reference to Fig. 6 it will be seen that the swing of the eccentric is limited by the outer end portion of the slot 11, which is longer than the eccentric, so that when the eccentric strikes the outer end wall of the slot 11 the finger-piece will be locked against further rotation in one direction, and a reverse movement of the finger-piece will produce a reverse movement of the caliper-leg. Furthermore, the caliper-legs may be reversed or crossed upon their mutual pivotal connection without affecting the adjusting device, whereby the latter is operable in either position of the legs. The purpose of the lateral flange 17 is to underlie the flange 13 or outer end of the socket, and thereby prevent endwise displacement of the finger-piece, and the opening 11 is in the form of a slot, so as to permit of the flange being entered into the socket. Thus the finger-piece is held in place without the aid of separate fastenings and may be readily applied and removed.

From the foregoing description it will be apparent that the present adjusting means may be applied to any ordinary calipers or dividers without material change thereto and when applied does not interfere with the ordinary adjustment or use of the instrument and is also operable in the opposite or reversed positions of the legs of the instrument.

It will be observed that the adjusting finger-piece is rotatably mounted upon one of the members (the caliper-leg 1) and has a radial projection 16, provided with a pivotal and slidable connection with the other member, (the fixed arm,) whereby the leg is swung laterally with respect to the arm by a rotation of the finger-piece.

What is claimed is—

1. A pair of calipers having one of its legs provided with an opening, an arm rigidly secured to the pivot-pin of the leg and having its free end provided with a slot and a circular socket or recess arranged eccentric to the

slot, and a disk carrying a concentric end bearing to engage the said opening, an intermediate eccentric bearing to engage the slot, and a lateral projection to engage the recess.

2. A measuring instrument, comprising a pair of pivotally-connected members, one of which has a circular opening formed therein, an arm rigidly carried by the pivotal connection, and provided with a slot, the outer end of which corresponds to the outer side of the opening in one of the members, the inner side of the arm also having a socket corresponding to the slot and projecting at opposite sides and at the outer end thereof, and a finger-piece, having a pivot-stud within the opening in the member, a lateral flange within the socket, and an eccentric working frictionally in the slot in the arm.

3. A measuring device having a plurality of pivotally-connected members, one of which has a circular opening formed therein, an arm rigidly carried by the pivotal connection and overlapping the opening in the said member, the arm having a slot therein adjacent to the opening in the member, and a socket in the inner side of the arm corresponding to the slot thereof and extending outwardly beyond the same, and a pivotal finger-piece, having a pivot-stud mounted in the opening in the member, and an eccentric frictionally working in the slot in the arm, the eccentric normally lying in the intermediate portion of the slot, and the outer end wall of the latter forming a stop for engagement with the eccentric to limit the movement thereof in opposite directions.

4. A measuring instrument, comprising a pair of members, corresponding terminals of which have concentric circular openings, and the inner faces having corresponding circular grooves arranged concentrically with respect to the openings, antifriction devices loosely mounted in the corresponding grooves, a headed pivot-pin having a cylindrical portion passing through the openings in the members, the outer extremity of the pin being screw-threaded, and the portion between the screw-threaded terminal and the adjacent member being polygonal, an arm having a polygonal opening snugly fitting the polygonal portion of the pin and lying parallel with the adjacent member, a nut applied to the screw-threaded portion of the pin, and a rotatable adjusting device having a pivot-stud mounted in an opening in one of the members, and an eccentric working frictionally in an opening in the arm.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE KNAPP.

Witnesses:

JOHN D. LAMB,
C. E. MAXWELL.