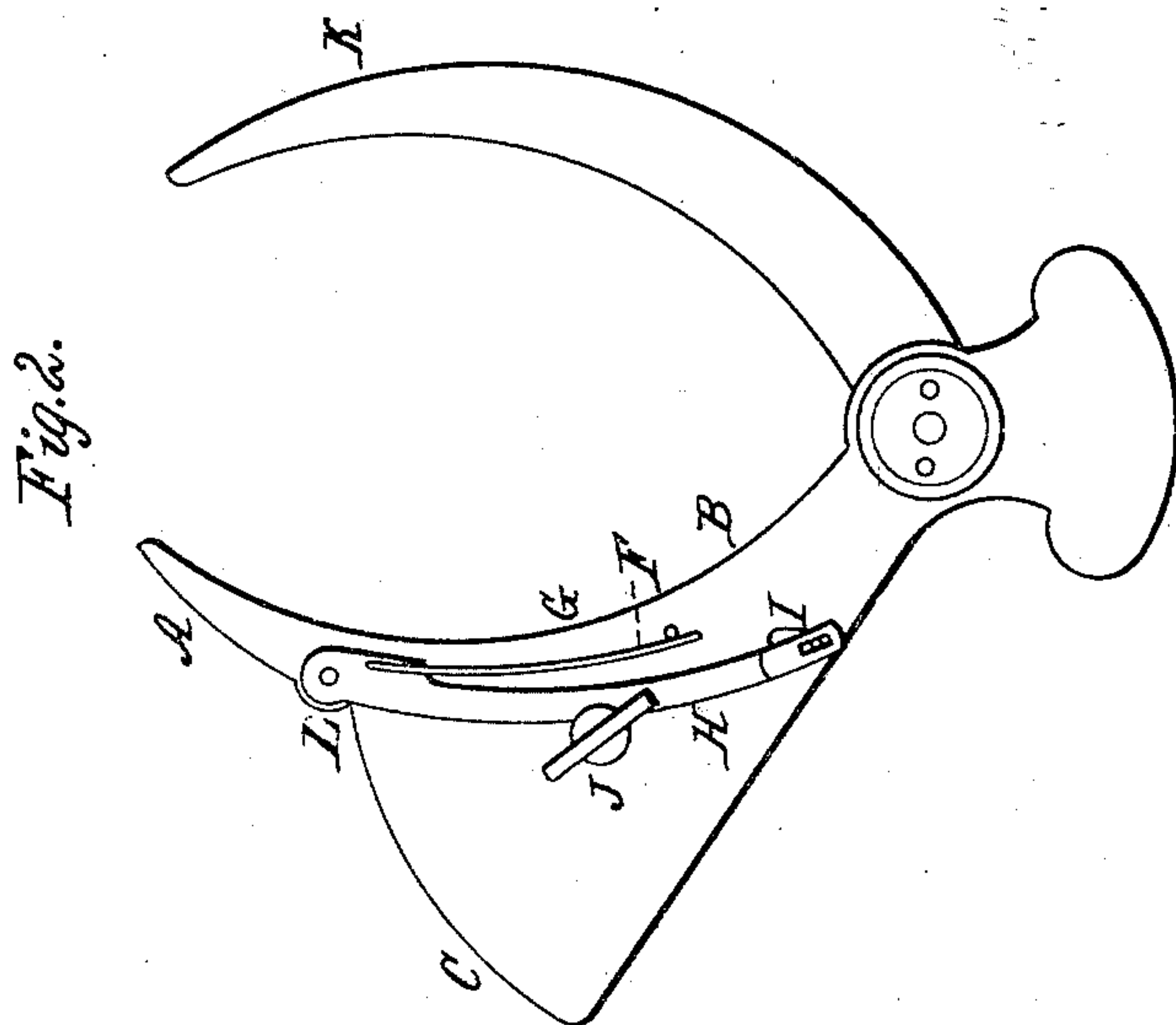
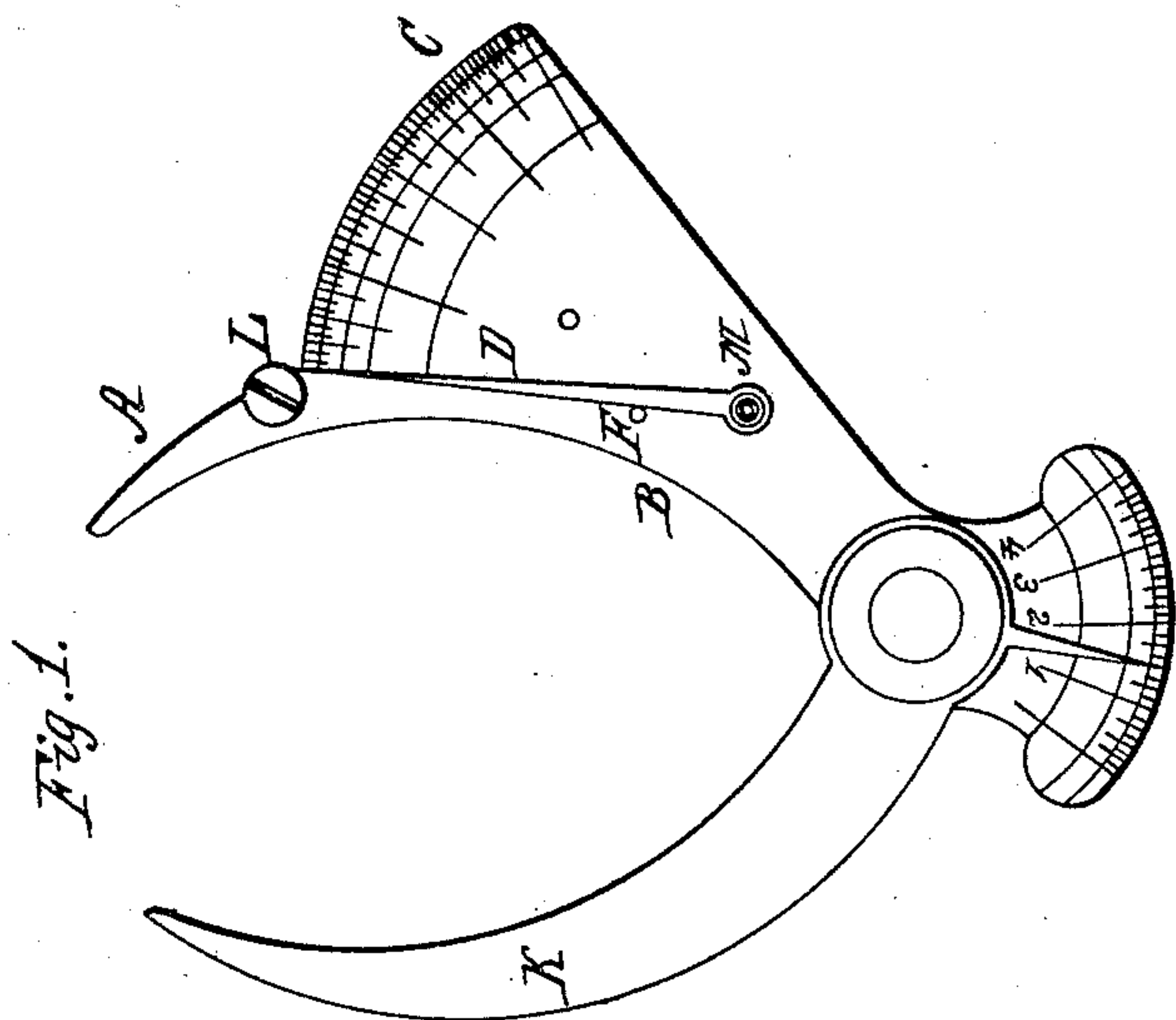


P. SOPER.

Calipers.

No. 57,588.

Patented Aug. 28, 1866.



Witnesses:

J. B. Livingston
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UNITED STATES PATENT OFFICE.

PHILO SOPER, OF BUFFALO, NEW YORK.

IMPROVEMENT IN CALIPERS.

Specification forming part of Letters Patent No. 57,588, dated August 28, 1866.

To all whom it may concern:

Be it known that I, PHILO SOPER, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Calipers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a face view of a calipers made according to my invention. Fig. 2 represents the obverse side thereof.

Similar letters of reference indicate like parts.

This invention consists in a novel construction of a self-registering calipers, whereby any excess over the measure or under the measure for which the instrument is set is indicated by a supplementary index. One of the points or feet of the instrument is made yielding, so that when applied to an object it will be moved outwardly if the measure to which the calipers is set is exceeded, its motion causing an index to move over a graduated table, and so indicating to the workmen the degree of excess in the measurement.

The letters K B designate the legs of a calipers, at whose head is an ordinary graduated table, an index attached to one of the legs being made to move over it to indicate inches and eighths of an inch. The point or foot of the leg K is rigid; but that of the other leg, B, is jointed to its leg at L, so as to be capable of outward motion to a certain extent. The leg B is made wide from the joint outward, to allow a graduated table, C, to be formed on it, on the face of which table an index, D, traverses, as hereinafter explained. The yielding foot A is elongated into an arm, H, which extends along the obverse side of the calipers, nearly to its center, its end being slotted longitudinally to receive a pin from a crank, I, whose shaft M goes through to the opposite side of the leg, where the head of the index D is fixed upon it, so as to move therewith. The arm H lies close to the obverse side of the leg B, excepting at its end, where it is raised a little to allow the crank I to play between it and leg B.

To the inner edge of arm H, I attach a spring,

G, whose free end comes against a stud, F, that passes through leg B, not far from its inner edge, and projects also above the face of the leg, as seen in Fig. 1. The office of this spring is to force the arm backward against a stop formed by the body of a thumb set-screw, J, thereby restoring the hinged foot A to its normal position.

The thumb set-screw J has a circular plate, which extends over the outer edge of arm H when the foot A is in its normal position, so as to enable the workman, when he wants both points of the calipers to be rigid, to fix the point A in its proper position. This is effected by advancing the screw J until the circular plate confines the arm between it and leg B. The foot here shown is intended to yield $\frac{1}{32}$ of an inch, and the index works fifty-four times that distance, so that with graduations of $\frac{1}{32}$ of an inch, as in this case, it will read off the $\frac{1}{1728}$ of an inch. If the index be read at half the distance between its graduations it will show the $\frac{1}{3456}$ of an inch.

The advantages afforded by my improvement will be readily seen by those who use these instruments. It will be useful in the hands of workmen who have not a fine touch, and consequently cannot feel for a very fine measurement with ordinary calipers, and also in the hands of apprentices who have not skill enough to make accurate fits. My improvement is designed to aid them, as well as the good workman, because the poorest workman can, by noticing the index D, measure as accurately as the best. Besides, by my improvement, I provide a means for making work uniform, even in the hands of different workmen, since the same adjustment will produce the same fit accurately in whose hands soever the instrument is placed.

Two or more sizes can be measured with the same adjustment if the difference of diameters does not exceed the play of the foot. In measuring axles for car-wheels, which are required to be larger than the bore, the wheels being forced on by pressure, the workman can see exactly what he is doing and know how much he is allowing for hard as well as soft iron wheels, the latter of which require a larger size of axle than the former for the same bore.

By the aid of the thumb set-screw J the foot A can be fixed rigid like the foot of leg K,

with the index D against the stud F, or at any of the graduations, if the size to be finished is less than the size to which it is adjusted. When the proper adjustment is obtained the set-screw J is released, and the index will then rest against the stud F. Should the required size be less than the adjustment the index will travel toward the stud from the point indicated when set; but if greater, the reading will be of course toward the outside.

I claim as new and desire to secure by Letters Patent—

1. Placing a yielding foot on one of the legs of a calipers, substantially as above set forth.

2. The supplementary index D, for indicating the movements of the yielding foot, substantially as described.

3. The combination of the yielding foot A, its arm H, and the thumb set-screw J, substantially as set forth.

4. The combination of the graduated table C, the index D, and the yielding foot A, substantially as shown.

PHILO SOPER.

Witnesses:

GEORGE ROBINSON,
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