

C. JORIOT.
SCREW MICROMETER.
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3 SHEETS—SHEET 1.

Fig.1.

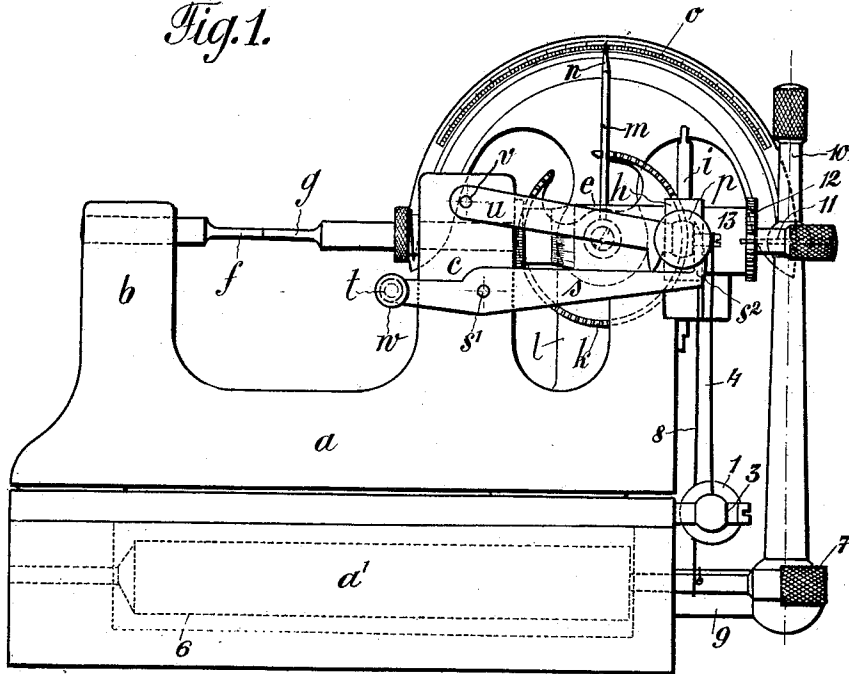
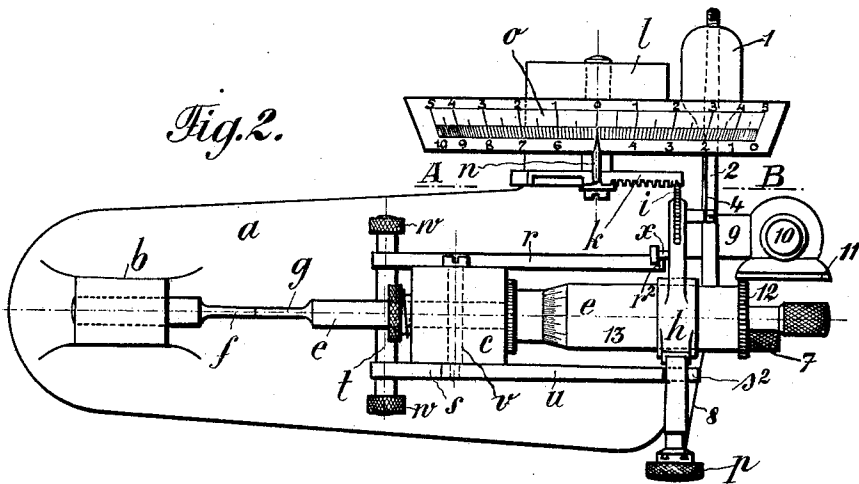


Fig.2.



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1,108,993.

3 SHEETS--SHEET 2.

[illegible]

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SCREW-MICROMETER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CAMILLE JORiot, a citizen of the French Republic, residing at Villers-de-Lac, in the Department of Doubs, France, have invented certain new and useful Improvements in Screw-Micrometers, of which the following is a specification.

This invention has for its object to provide an improved screw micrometer. In the improved micrometer the micrometric screw is combined with an indicating hand adapted to be moved over a graduated arc by means of a member which is mounted in a freely movable manner on the micrometric screw but which can be fixed thereto by means of a set screw in such a manner as to compel the hand to move with the micrometric screw. A device is also provided by operating which the indicating hand, when it is independent of the movement of the micrometric screw, can be returned into a determined position relatively to its travel.

The improved micrometer allows of taking measurements with greater exactness and greater facility than can be done with existing micrometers; moreover it may be used with advantage as a limit gage.

An embodiment of this invention is illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a front or a side elevation of the improved micrometer. Fig. 2 is a plan thereof. Fig. 3 is an end elevation thereof showing certain parts in section. Fig. 4 is a vertical cross section on the line A—B of Fig. 2. Fig. 5 is a view similar to Fig. 1 but showing the apparatus in a different operative position. Fig. 6 is a plan corresponding to Fig. 5.

As shown in the example the improved micrometer comprises a framing *a* mounted on a base *a*¹ and having two fixed poppets *b* *c*. The poppet *c* carries a micrometric screw *e* of known construction. The poppet *b* carries a fixed contact member *f* located in the axis of the micrometric screw *e* opposite to the contact member *g* of the said screw. On the screw *e* there is mounted so as to be freely movable thereon a yoke *h* carrying a toothed sector *i* gearing with another sector *k* which is pivoted on a fixed support *l* so that it can oscillate in a plane

at right angles to the plane of oscillation of the sector *i*.

m is an indicating hand fixed to the sector *k*; its end is bent at right angles to form a pointer *n* which is adapted to move over an arc *o* graduated on the millimetric system.

The yoke *h* may be fixed to the micrometric screw *e* by means of a set screw *p* so as to cause it to move positively with the said screw *e*. When the set screw is loosened, the yoke *h* is independent of the micrometric screw *e* and the latter can then work freely. When however the set screw *p* is tightened the yoke *h* will be carried along by the micrometric screw when the latter is rotated and the indicating hand *m* will then be moved over the graduated arc *o*.

The yoke *h* is combined with an actuating device by operating which the indicating hand can be actuated when it is independent of the micrometric screw. This device comprises on either side of the poppet *c* two levers *r* *s* pivoted co-axially relatively to each other at *s*¹ on the poppet *c*. These levers are fixed to each other by a rod *t* which connects them only at one end while the other end of each of these levers terminates in a beak *r*² *s*² respectively. The center of gravity of each of the levers *r* *s* is situated between its pivot and its beak, so that these levers will have a constant tendency to assume the position shown in Figs. 1 and 2 where the lever *r* rests with its arm terminating in the beak *r*² upon the bracket *l*.

u is an arm pivoted at *v* to the poppet *c*; its free end rests upon the lever *s*. If pressure be applied to one of the knobs *w* the levers *r* and *s* will oscillate about their pivotal axis and the beak *s*², coöperating with the arm *u* will engage the yoke *h* and cause it to rock on the micrometric screw *e* until a stop *x* on the yoke *h* shall have encountered the beak *r*² of the lever *v*. In this position the yoke *h* is kept stationary (Figs. 1 and 2) by the coöperation of the levers *r* *s* and the arm *u*; and the hand *m* is stopped at the zero mark of the graduated arc *o*.

In the example shown the micrometric screw *e* allows of measuring in the usual way to one-hundredth of a millimeter. If now the set screw *p* be tightened it will be easy to note on the arc *o* one-thousandth of

a millimeter because the pointer *n* will move over ten divisions of the arc *o* during the time that the micrometric screw *e* is moving over one division. It is to be understood that the multiplying ratio between the movement of the micrometric screw *e* and that of the hand *m* may be varied.

The yoke *h* may be actuated alone or together with the micrometric screw *e* by operating the set screw *p*. In order to render the actuation more sensitive, the combination of the yoke *h*, the sector *k* and the micrometric screw (when the latter is fixed to the yoke *h*) is subjected to the action of a counter weight 1 straddling the free end of a lever 2 pivoted at 3 to the base *a*¹. The lever 2 is connected to the sector *i* by means of a rod 4 so that the counter weight 1 will have a constant tendency to cause the yoke *h* to move in the direction of the arrow 5 shown in Fig. 3. The action of the counter weight 1 upon the yoke *h* is approximately neutralized by the opposing action of a cylinder 6 of determined weight which is pivoted in a recess provided in the base *a*¹. One of the journals of the cylinder 6 is extended outward and ends in an operating knob 7. To this end of the journal of the cylinder 6 there is attached a cord 8 which is attached at its other end to the set screw *p* of the yoke *h*.

Owing to the inertia of the cylinder 6 and to the possibility of adjusting the position of the counter weight 1 on the lever 2 the yoke *h* may be balanced in such a manner that its actuation will be extremely sensitive. In this case the actuation of the yoke *h* is effected by rotating the cylinder 6 by means of the knob 7.

10 is a lever which is pivoted at *g* and carries a knife edged part 11 located opposite a disk 12 keyed on a sleeve 13 of the micrometric screw. This disk is provided at its periphery with fifty notches corresponding to the fifty divisions of the sleeve 13 giving hundredths of a millimeter. After having set the micrometric screw, the lever 10 is moved toward the disk 12 so as to allow the knife edged member 11 to enter one of the notches of the disk. This allows of blocking the micrometric screw while the operator proceeds to fix the yoke *h*.

The improved micrometer may be used in the following manner:—If it is desired to determine the diameter of the axle of a wheel of a clock movement, the said axle is placed between the contact members *f*, *g*; the set screw *p* having been first loosened. The result is immediately given to one hundredth of a millimeter by the micrometric screw. If however it is desired to take a more exact measurement, that is while the article to be measured is engaged between the contact members, the micrometric screw is first blocked or locked by means of

the lever 10 and then the operator presses one of the knobs *w* so as to bring the hand *m* back to zero. He then tightens the set screw *p*, after which the micrometric screw is unlocked and the article to be measured is withdrawn from between the contact members. The micrometric screw is then screwed until the contact members *f* and *g* come into contact with each other, and the result of this operation can then be indicated to one-thousandth of a millimeter by the position of the hand *m*.

The improved micrometer is particularly suitable for use when it is desired to verify a large series of parts as regards one or more dimensions. As a certain variation or tolerance of a few hundredths of a millimeter is generally allowed it will be easy to appreciate from the position of the hand *m* the difference between the actual measured dimensions of an article to be measured and the prescribed dimensions.

What I claim is:

1. In a screw micrometer, the combination with the micrometric screw, of a member normally uncoupled from the micrometric screw, a graduated arc, an indicating hand movable over said arc by said member, means for coupling said member to the micrometric screw when it is desired that it shall be moved by the micrometric screw, and means for setting said indicating hand to any desired point of its course when said member is uncoupled from the micrometric screw.
2. In a screw micrometer, the combination with the micrometric screw, of a yoke normally uncoupled from the micrometric screw, a graduated arc, an indicating hand movable over said arc by said yoke, means for coupling said yoke to the micrometric screw when it is desired that it shall be moved by the micrometric screw, and means comprising two levers and an arm coöperating therewith for moving said yoke when said yoke is uncoupled from the micrometric screw for setting said indicating hand to any desired point of its course, and for keeping it stationary at said point during the coupling of said yoke to the micrometric screw.
3. In a screw micrometer, the combination with the micrometric screw, of a member normally uncoupled therefrom, a graduated arc graduated to fractions of the indications of the micrometric screw, an indicating hand movable over said arc by said member, means for coupling said member to the micrometric screw when it is desired that it shall be moved by the micrometric screw, means for moving said indicating hand to any desired point of its course when the said member is uncoupled from the micrometric screw, means for keeping said indicating hand at said point

during the coupling of said member to the micrometric screw, and multiplying connections between the micrometric screw and said indicating hand whereby the motion
5 of the latter is caused to indicate submultiples of the indications of the micrometric screw.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CAMILLE JORROT.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."