No. 797,745. PATENTED AUG. 22, 1905.

C. W. PITMAN.

MICROMETER GAGE.

APPLICATION FILED DEC. 23, 1903.

Fig. 1.

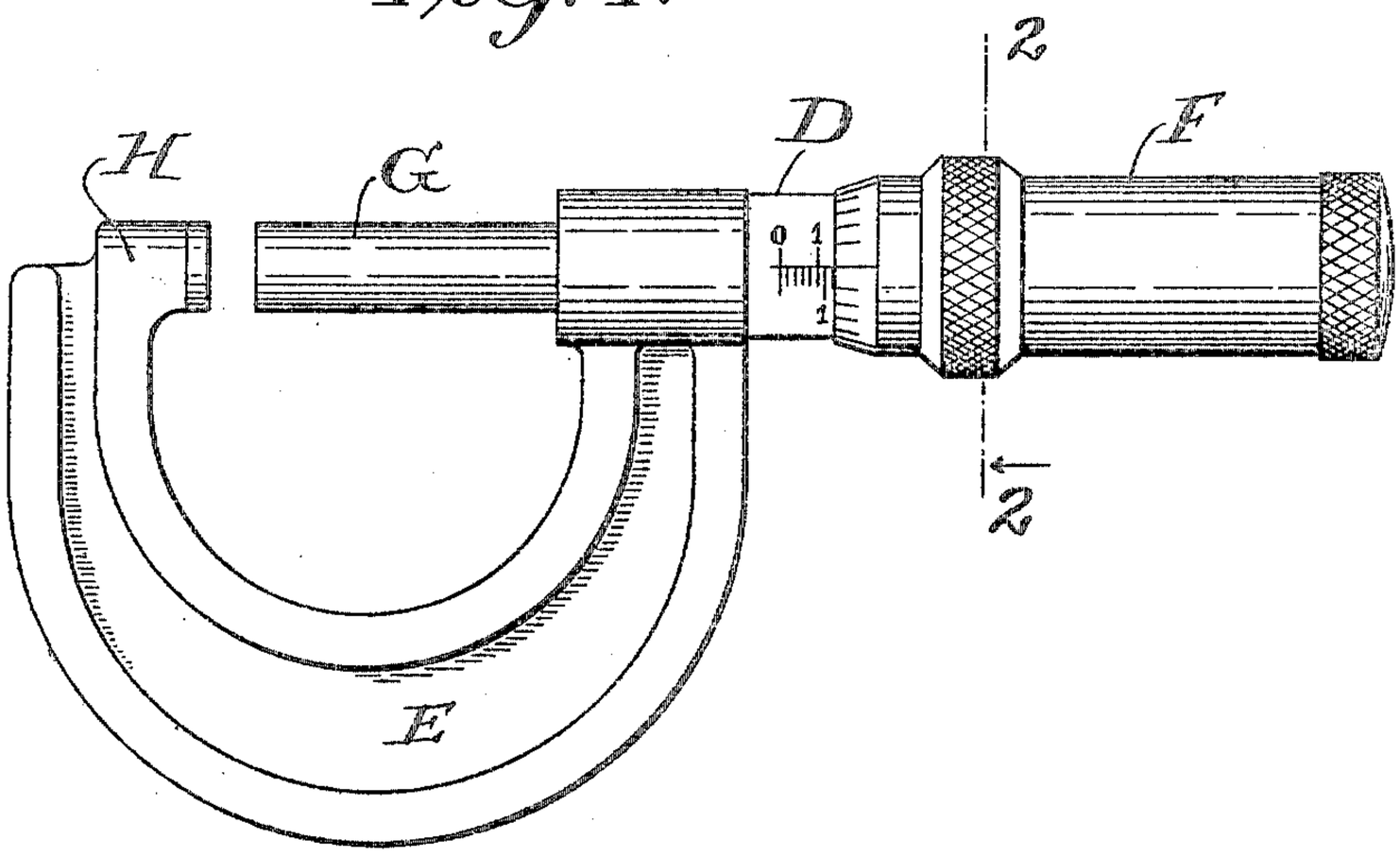


Fig. 3.

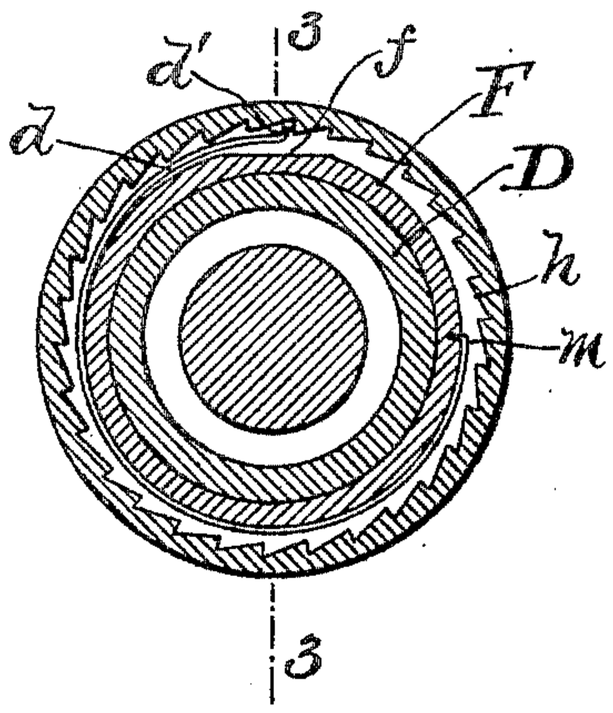
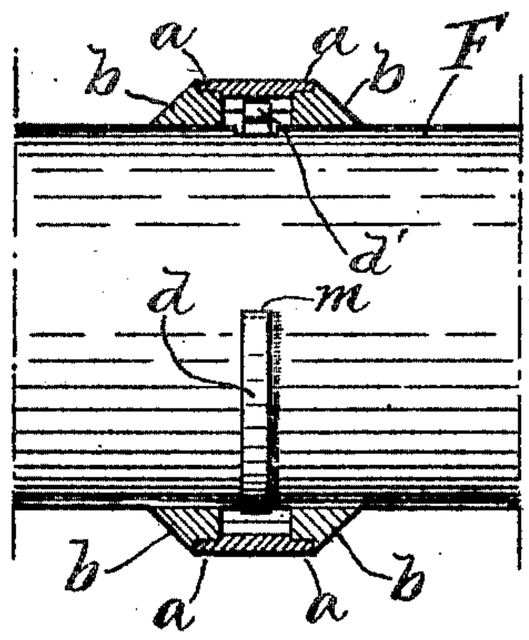


Fig. 2.



WITNESSES:

W. H. Leahy

H. H. Gamble.

INVENTOR

Charles W. Pitman

BY

A. H. Hutton

ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES W. PITMAN, OF PHILADELPHIA, PENNSYLVANIA.

MICROMETER-GAGE.

No. 797,745. Specification of Letters Patent. Patented Aug. 22, 1905.

Application filed December 23, 1903. Serial No. 186,269.

To all whom it may concern:

Be it known that I, CHARLES W. PITMAN, a citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Micrometer-Gages, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to micrometer-gages, and has for its object to provide a sensitive feed therefor. In the accompanying drawings I have shown my improvement applied to a micrometer of the type and character shown and described in Letters Patent No. 559,820 to J. T. Slocomb, dated May 12, 1896, in which there is essentially a micrometer-spindle with micrometer-screw, a barrel-frame, a hollow screw-nut arranged sleeve-like over the upper end of the micrometer-screw, and an outside actuating thimble or sleeve. In such devices as heretofore made the forward feed of the micrometer-screw through the rotation of the actuating-thimble could not be stopped at exactly that degree of contact pressure of the screw against the object to be measured to insure absolute accuracy of measurement, because the natural tendency on the part of the operator is to force the screw forward until the actuating sleeve or thimble can no longer be rotated. This frequently distorts the normal relation of the screw to the anvil or other support for the object to be measured, destroying the usefulness of the instrument for accurate work. I have found that if the forward movement of the spindle be effected, controlled, and regulated by a spring-controlled interiorly-serrated collar surrounding the thimble and constituting what I call a "sensitive feed" and which is such, in fact, that the rotation of the actuating-thimble and the consequent forward feed of the micrometer-spindle can be and will be automatically stopped at a point of contact with the object to be measured, which is a perfect contact and yet not involving any endwise straining pressure.

Hence my invention consists in such a sensitive-feed ring or collar for the actuating-thimble in micrometer-gages as hereinafter described.

In the drawings, Figure 1 is a side elevation of a micrometer-gage embodying my sensitive-feed ring. Fig. 2 is an elevation, partly in section, of a detached portion of the thimble and sensitive-feed ring; and Fig. 3 is a section through the same on the line 2 2 of Fig. 1 looking from the thimble end toward the micrometer-spindle.

The bow or frame of the tool is indicated at E, and it is preferably formed integral with the barrel D, which has a cylindrical bore extending throughout its length concentric with the micrometer-spindle G and parallel with it. The anvil H is formed on the bow-frame. The spindle is formed with micrometer spindle and screw, as usual, and an external actuating sleeve or thimble F. The instrument is also to be provided with a main sleeve-nut screw-threaded and is otherwise constructed in respect of essentials as stated in above reference to said Slocomb patent, No. 559,820; but my invention is equally applicable to micrometer-gages which have no anvil nor any other parts than those which I have specifically mentioned in the first paragraph hereof.

In the use of such devices as above described in the Slocomb patent, for example, the object to be measured being placed against the anvil H or other support, the actuating sleeve or thimble F is then manually rotated to feed forward the micrometer-spindle G. Obviously it should be fed forward to make only a perfect contact with the object to be measured; but the natural tendency, especially in the hands of an unskilled operator, is to force it forward as far as hand-power applied through the thimble to the micrometer-screw will permit. This results in distorting the relative position of the micrometer-spindle to the anvil or other fixed parts, and in any event makes the measurement inaccurate or liable to be so.

My invention consists in means for rotatingly operating the actuating sleeve or thimble F through an annular external ring or collar constructed as hereinafter described and arranged relatively to the actuating sleeve or thimble F in order that the said actuating-ring may retain its normal hold on the thimble (causing the latter to be rotated with it) until the micrometer-spindle comes into physical contact with the thing to be measured, when the endwise pressure which would otherwise be created by a continued feeding forward of the said spindle effected by continued rotation of the actuating sleeve or thimble is checked and absolutely prevented through the instrumentality of

means within the ring and between it and the actuating sleeve or thimble which causes the ring to release its hold on the thimble on the creation of pressure on and at the forward end of the micrometer-spindle.

The invention, therefore, resides in the combination, with the actuating sleeve or thimble, of an externally-arranged annular feed-collar, with spring-pawl between the same, the spring-pawl being fixedly secured at one of its ends at a point on the periphery of the actuating-sleeve or of the feed-collar and with its free end normally projecting into a recess provided by forming serrations in the periphery of the opposite member.

My invention is shown embodied in a device in which the collar or ring A is preferably supplied with flanges *a a*, thus providing a space on either side between such flanges and the periphery of the thimble for the insertion of an oppositely-arranged pair of retaining-rings *b b*. The inner face of the collar A is serrated, the teeth *h* pointing away from the direction in which the actuating thimble or sleeve F moves to rotate it to move forward the micrometer-spindle.

At a point upon the periphery of the actuating sleeve or thimble F is secured fast the end of a spring *d*, operating as a spring-pawl relatively to the teeth *h* of the serrated surface of the collar. The extreme free end *d'* of the spring-pawl is bent to point outwardly and normally rests within the recesses formed by the serrated edge. A segment *f* of the periphery of the actuating-sleeve is preferably cut away to allow room for the free end of the spring-pawl when depressed by contact with the projecting edge of the serration, such depression taking place when endwise pressure on the spindle counteracts the frictional hold between the sleeve, spring-pawl, and feed-collar. The spring-pawl preferably extends more or less around the actuating-sleeve to increase its tension, and as one end of it is made fast to the sleeve F, as at *m*, with the other and free end resting in one of the recesses formed by the serrated periphery of the feed-collar, the normal frictional hold of the feed-collar on the actuating-sleeve will be maintained (until overcome by endwise pressure on the spindle) and the two will rotate together; but when the micrometer-spindle has been advanced (by the turning of the sleeve through the medium of the feed-collar and the spring-pawl) until it contacts with the anvil or the work held thereon and endwise pressure is created thereon then the projecting free end *d'* of the spring-pawl will be depressed out of its normal position in the serration of the feed-collar in such manner that a manual rotation of the latter will no longer aid the frictional hold of the feed-collar on the spindle to cause a rotation of the actuating-sleeve F and a consequent advancement of the micrometer-spindle. A continued rotation of the feed-collar with the spring-pawl thus depressed and its free end out of normal position in the serration of the sleeve will be insufficient to overcome the counteracting effect of endwise pressure created by physical contact of the spindle end with the thing to be measured, and hence the spindle will be no longer advanced. On a reverse movement of the feed-collar in the opposite direction the free end of the spring-pawl will effect a positive engagement with the peripheral serration of the sleeve, and consequently produce a rotation of the actuating-sleeve in like direction, whereby a withdrawal or rearward movement of the micrometer-spindle is effected.

As the essence of the invention resides in providing an externally-operated feed-collar with a spring-pawl between it and the spindle-actuating sleeve of the micrometer, the pawl normally maintaining the collar and sleeve in operative frictional engagement and automatically depressing the spring-pawl and releasing said parts from such engagement when the spindle cannot be advanced by its sleeve without creating endwise pressure on the spindle, I do not wish to be limited to serrating the collar instead of the sleeve, nor to fastening the fixed end of the spring-pawl to the sleeve instead of to the collar, nor to the employment of specifically a serrated edge on either as a holding-recess to coact with the spring-pawl, because it is obvious that in my device the serration or recess operates more as a cam-recess than as a positively-holding pawl bit or ratchet on the forward movement, and it is equally obvious that said spring-pawl and serration may be transposed relatively to the feed-collar and spindle-actuating sleeve and embody the principle of my invention as hereinabove defined.

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

1. In a micrometer-gage, the combination with the measuring-spindle and its directly-actuating sleeve, of an annular feed-collar encircling the sleeve, and a spring-pawl between the coinciding peripheral surfaces of said collar and sleeve, one of said elements being recessed on its periphery to receive the free end of the spring-pawl; whereby the collar and sleeve will be maintained in operative frictional engagement, in the absence of counteracting endwise pressure on the spindle.

2. In a micrometer-gage comprising a micrometer spindle and screw and an actuating-sleeve therefor, the latter being segmentally recessed, the combination therewith of an encircling feed-collar having an interior serrated edge, a spring-pawl upon the periphery of the actuating-sleeve, the free end of the spring-pawl being normally in engagement with the teeth of the serrated collar.

3. In a micrometer-gage, comprising a micrometer spindle and screw and a directly-actuating sleeve therefor, the combination therewith of an annular feed-collar frictionally engaging the sleeve, said sleeve having a recess and a curved spring-pawl coacting with said recess, arranged between the coinciding peripheral surfaces of the sleeve and collar, operating to increase the frictional hold of the collar upon the sleeve, and adapted to be automatically thrown out of action by counteracting endwise pressure on the spindle.

4. In a micrometer-gage, the combination with a micrometer spindle and screw and actuating-sleeve therefor, of a flanged feed-collar encircling the sleeve, a pair of retaining-rings between the flanges of the feed-collar and sleeve, said feed-collar being provided with a serration upon its inner peripheral surface, and a curved spring-pawl fixedly secured by one end to the periphery of the sleeve with its free end normally projecting into the serration upon the periphery of the feed-collar.

In testimony whereof I have hereunto affixed my signature this 12th day of December, A. D. 1903.

CHARLES W. PITMAN.

Witnesses:

HARVEY VOID,

ALBERT ZELLFEEDER.