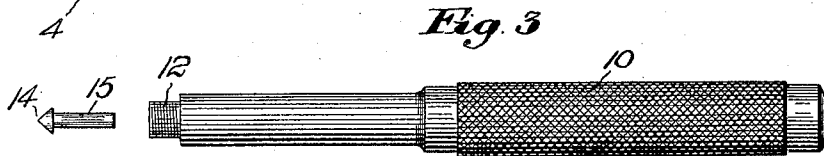
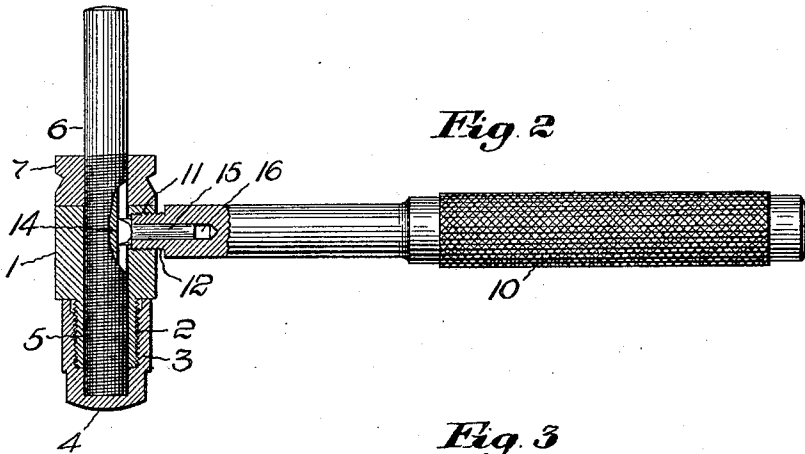
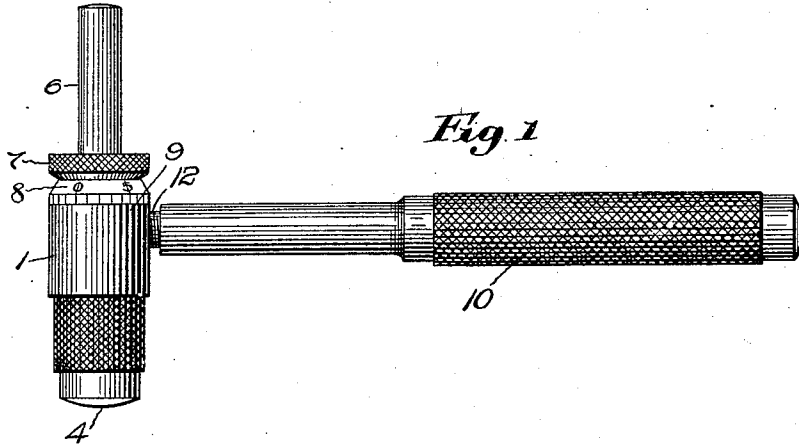


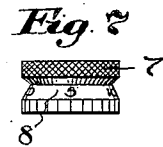
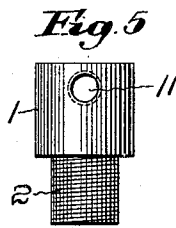
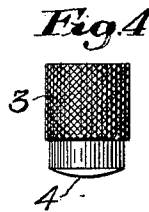
H. S. PLANT.  
MICROMETER GAGE.  
APPLICATION FILED MAY 27, 1908.

934,692.

Patented Sept. 21, 1909.



*Fig. 6*



*Witnesses:*  
Horace A. Crossman  
Robert H. Kammler.

*Inventor:*  
Henry S. Plant.  
by Emory + Booth.  
Attys

# UNITED STATES PATENT OFFICE.

HENRY S. PLANT, OF BOSTON, MASSACHUSETTS.

## MICROMETER-GAGE.

934,692.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed May 27, 1908. Serial No. 435,234.

*To all whom it may concern:*

Be it known that I, HENRY S. PLANT, a citizen of the United States, residing at Boston, county of Suffolk, Commonwealth of Massachusetts, have invented an Improvement in Micrometer-Gages, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to micrometer gages, particularly adapted for interior measurements, the object of the invention being to provide a gage exceedingly simple in construction and of few parts, and yet one by which a wide range of measurements may be effected.

In order that the principles of my invention may be clearly understood, I have disclosed a single type or embodiment thereof in the accompanying drawings, wherein—

Figure 1 is a side elevation of a micrometer gage embodying my invention; Fig. 2 is a view partly in central vertical section and partly in side elevation of the gage shown in Fig. 1; Fig. 3 is a side elevation of the preferred form of gage manipulating handle detached with the portions thereof separated; Fig. 4 is a side elevation of an adjustable cap that may be employed in connection with the gage embodying my invention; Fig. 5 is a side elevation of the distance pin receiving member of the gage; Fig. 6 is a side elevation of a distance pin employed in connection with my invention; Fig. 7 is a side elevation of the nut for adjusting the same; and Fig. 8 is a cross section on the line 8—8 of Fig. 6.

The parts herein represented are substantially double the size that in practice I have found to be convenient, although it is to be understood that they may be of any desired size and proportion.

Referring more particularly to that single type or embodiment of my invention herein selected for illustration, the distance pin receiving member is represented at 1, it being of any suitable shape and material and preferably having a reduced lower exteriorly screw threaded open end 2 receiving thereon an interiorly threaded cap 3. The construction of thread is such that the cap may be firmly held in any adjusted position. The adjustment of the cap is primarily intended to compensate for the slight wear of the end of the distance pin and of the cap that may

occur in practice. Said cap is herein represented as having a broad, somewhat convexed, closed end 4 adapted to contact with a portion whose distance from another is to be ascertained. The distance pin receiving member 1 is provided with a longitudinally disposed socket or recess 5, herein represented as extending entirely through the said member. Preferably loosely mounted in said socket or recess is a distance pin 6 screw threaded throughout the desired portion of its length and receiving thereon a nut 7 whose lower surface rests in contact with the adjacent end of the member 1 in the adjustment and use of the gage. It is apparent that different lengths of distance pins may be employed, the shortest length of pin being available for measurements exceeding the length of the member 1 and nut 7 up to any desired maximum, other distance pins being employed for measurements exceeding such limit. The nut 7 has graduations 8 thereon, the peripheral surface of the member 1 near the upper edge thereof being provided with a mark 9 with which the zero mark upon the nut should be brought into register at the commencement of the measuring operation.

In order particularly to adapt the gage for interior measurements, I have provided a laterally extending gage manipulating handle 10 of suitable length, herein represented as detachably and adjustably connected to the member 1. While this may be accomplished in any suitable manner, in the present type of the invention the said member 1 is provided with a laterally screw threaded opening 11 extending inward to the longitudinal opening 5 therein, the inner end of the handle 10 being screw threaded as represented at 12 and received within said opening 11. In the present embodiment of my invention the handle 10 is adapted to engage with the distance pin 6 when the same has been moved into adjustable position to hold the same from movement. While this result may be accomplished in various ways, herein I have represented the distance pin 6 as provided with a peripheral longitudinally disposed groove 13 tapered in cross section, within which groove is received the wedge shaped end 14 of a pin 15 removably mounted in the socket 16 formed in the inner end of the handle 10. By reason of the tapered formation of the point of the pin 15, it may be forced into binding relation with the distance pin 6 notwithstanding any wear that

may occur. If, however, said pin should become excessively worn, another pin may be readily and at slight expense substituted therefor.

- 5 If desired, the pin 6 may be provided upon its periphery at any desired point, as in the groove 13, with marks 17 suitably spaced apart. For example, the distance between adjacent marks is one tenth of an inch. A  
10 single turn of the nut 7 protrudes the distance pin 6 a known distance, as, for example, twenty-five thousandths of an inch.

In using the gage, the nut 7 may be rotated until the lower end of the distance pin 6 is seated upon the cap 3. Then by rotating  
15 said nut to the right until the zero mark upon the nut registers with the mark 9 upon the member 1, the gage is set for a standard dimension. To obtain a measurement, the rotation of the nut to the right should be continued until the first line 17 in the groove  
20 upon the distance pin represented in Fig. 6 appears at the top of the nut. This indicates that, with the scale of measurements previously referred to, the dimension has been  
25 increased one tenth of an inch, four complete turns of the nut 7 having been made, or, in other words, 100/1000 of an inch. If the measurement desired be 125/1000 of an  
30 inch, another turn of the nut should be made and the required dimension is thus obtained. During this operation, a slight tension should be kept on the distance pin by turning the handle slightly to the right. When the desired  
35 measurement is obtained, the handle should be tightened by further movement in the same direction, and the micrometer gage thus becomes a set fixture and is ready for use in calipering the hole. The measurement  
40 may be ascertained from the exposed marks upon the distance pin 6 or from the number of turns of the nut 7, or both.

Having thus described one type or embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

50 Claims—

1. A micrometer gage comprising a member having a pin receiving socket or recess therein, a distance pin mounted in said socket or recess for longitudinal movement  
55 therein, said member and pin being adapted to contact with portions whose distance apart is to be measured, means to move said pin longitudinally and a gage manipulating handle having a length exceeding that of said member and independent of said pin moving means and having means to limit the movement of said pin.

2. A micrometer gage for interior measurements comprising a member having a pin  
65 receiving socket or recess therein, a screw

threaded distance pin mounted in said socket or recess, a nut mounted upon said pin to impart longitudinal movement thereto, and an elongated gage balancing and manipulating handle extending laterally from said member and having means to hold the pin from movement in either direction from the position to which it has been moved by said nut.

3. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a screw threaded distance pin mounted in said socket or recess, a nut located exteriorly of said member and upon one end thereof and positioned upon the protruding end of said distance pin, and an adjustable, laterally extending gage balancing and manipulating handle having means to limit the movement of said pin, the point of connection of the handle to said member being such that said nut and member and protruding pin substantially balance the gage in use.

4. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a screw threaded cap mounted upon one end of said member, a screw threaded pin mounted in said socket or recess and protruding therefrom, said cap and pin being adapted to contact with portions whose distance apart is to be ascertained, a nut mounted upon said pin to move the same longitudinally, and an elongated gage manipulating and balancing handle extending laterally from said member between said nut and cap, and having means to limit the movement of said pin.

5. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a screw threaded cap mounted upon one end of said member, a screw threaded pin mounted in said socket or recess and protruding from the end thereof opposite said cap, a nut mounted upon the protruding end of said pin and received upon the adjacent end of said member, and a laterally extending adjustable gage manipulating handle adapted to engage said pin and hold it in adjusted position.

6. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a screw threaded pin mounted in said socket or recess and protruding therefrom, a nut received upon the threaded part of said pin and by its movement upon such threaded part serving to project the same, an adjustable gage manipulating handle laterally extending from said member and a detachable pointed piece carried by said handle and adapted to engage said pin and hold it in adjusted position.

7. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a distance  
130

pin mounted in said socket or recess and protruding therefrom, means longitudinally to adjust said pin, a gage manipulating handle laterally extending from said member and adjustably secured thereto, the inner end of said handle being socketed, and a pin received in said handle socket and adapted to engage said distance pin and hold it in adjusted position.

10 8. A micrometer gage for interior measurements comprising a member having a pin receiving socket or recess therein, a screw threaded distance pin mounted in said socket or recess and protruding therefrom, said pin  
15 having a longitudinal groove tapered in cross-section, a nut to adjust said pin, and a gage manipulating handle laterally extending from said member and adjustably connected thereto, said handle having a wedge  
20 shaped part to enter said groove and hold the pin in adjusted position.

9. A micrometer gage for interior meas-

urements comprising a member having a pin receiving socket or recess therein, a screw threaded distance pin mounted in said socket or recess and protruding therefrom, said pin having a longitudinal groove tapered in cross section, a nut exterior to said member and mounted upon said distance pin to adjust the same, and a gage manipulating handle laterally extending from said member and adjustably connected thereto, said handle having a pin removably mounted in the inner end thereof, said pin having a wedge shaped part to enter said groove and hold  
35 the distance pin in adjusted position.

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

HENRY S. PLANT.

Witnesses:

IRVING U. TOWNSEND,  
EVERETT S. EMERY.