F. O. JAQUES.

HEIGHT GAGE.

APPLICATION FILED MAY 22, 1908.

924,668.

Patented June 15, 1909.

2 SHEETS—SHEET 1.

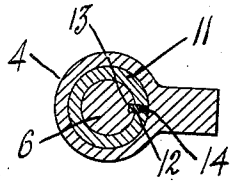


FIG. 3.

FIG. 1.

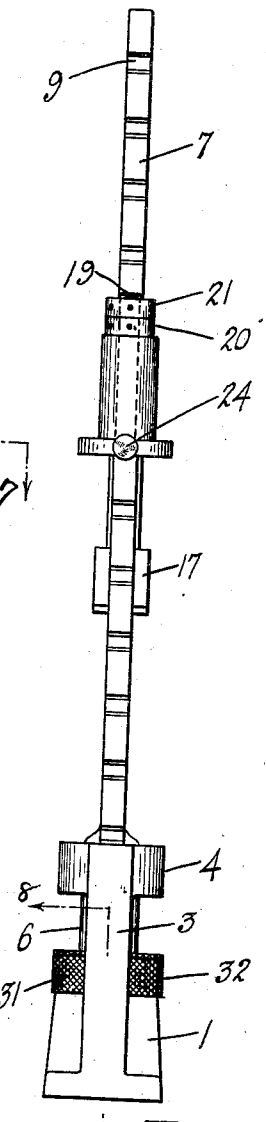


FIG. 2.

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2 SHEETS—SHEET 2.

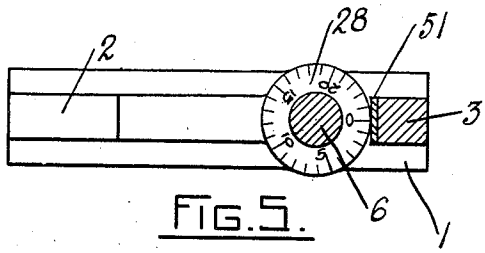


FIG. 5.

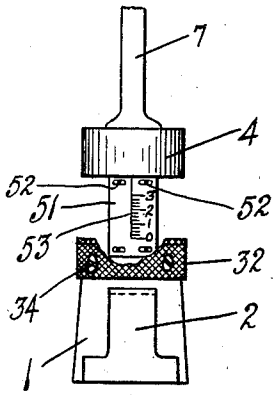


FIG. 4.

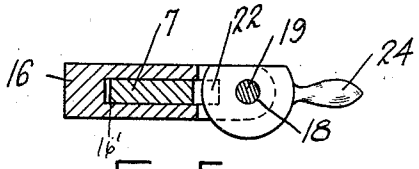


FIG. 6.

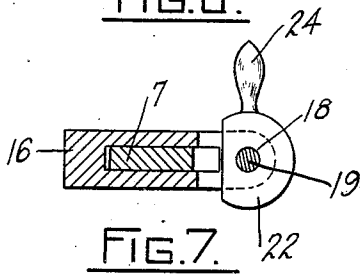


FIG. 7.

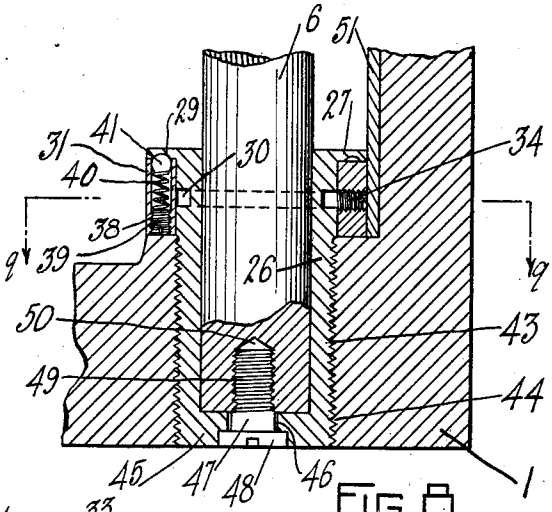


FIG. 8.

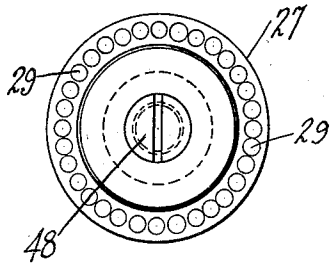


FIG. 10.

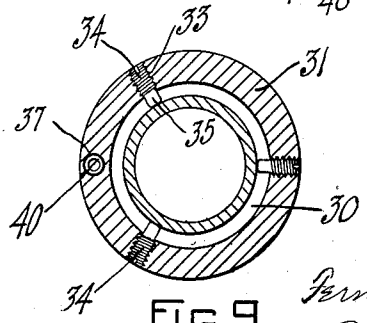


FIG. 9.

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HEIGHT-GAGE.

No. 924,668. Specification of Letters Patent. Patented June 15, 1909.

Application filed May 22, 1908. Serial No. 434,287.

To all whom it may concern:

Be it known that I, FERNANDO O. JAQUES, a citizen of the United States, residing at Cranston, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Height-Gages, of which the following is a specification.

My invention relates to depth gages and has for its objects the measurement of the height of projections from a plane surface; to obtain such measurements with micrometric accuracy; to provide an improved means for vertically adjusting the graduated bar; means for readjustment of the worn parts; improved means for adjusting the movable jaw upon the graduated bar, and to provide a ratchet stop operative in both directions.

To the above ends essentially my invention consists in the novel construction of parts hereinafter set forth and illustrated in the accompanying drawings, wherein—

Figures 1 and 2 are side and rear views respectively of my novel gage. Fig. 3, a section of the same on line 3—3 of Fig. 1. Fig. 4, a front elevation of the lower part of the same. Fig. 5, a section on line 5—5 of Fig. 1. Figs. 6 and 7, sections on line 6—7 of Fig. 1, showing the lever in engaged and disengaged positions respectively. Fig. 8, a vertical section on line 8—8 of Fig. 2. Fig. 9, a transverse section on line 9—9 of Fig. 8, and Fig. 10, a bottom plan view of the nut.

Like reference characters indicate like parts throughout the views.

My device comprises a base portion, 1, and an extension, 2, which, together constitute the lower or base jaw. Integral with the rear end of the jaw is a guide arm comprising a vertical portion, 3, and a horizontal portion, 4, through which slides the cylindrical lower portion, 6, of a flat bar, 7, provided with marginal graduation of inches and fractions of inches, 8. Upon the rear margin the bar, 7, is provided with a series of cavities, 9, located at intervals of one-half an inch, and preferably having converging or inclined edges, 10. In this instance, a tapering bushing, 11, Figs. 1 and 3 is located in the arm, 4, around the base, 6, of the measuring bar, 7, in which is a spline, 12, entering a groove, 13, in the base, as shown in Fig. 3. The spline is held to the bushing 11 by a screw, 14. The purpose of the bushing is for adjusting to take up the wear but may be omitted without departing from the spirit of my invention. If the bushing is omitted, the spline may obviously be located in the arm, 4.

The base, 16, of a movable jaw, 17, is slidable upon the bar, 7, through an opening, 16′ Fig. 6 in its intermediate portion, and is provided in its rear portion with a vertical cylindrical opening, 18, through which passes a rotatable pin or shaft, 19, projecting above the base, 16, supported by a nut, 20, and a check nut, 21. Fixed to or integral with the lower end of the pin, 19, is a segmental disk, 22, having preferably inclined upper and lower faces to fit the openings, 9, and provided upon its periphery with an operating handle, 24. By means of this disk, the movable jaw may be fixed at various half inch intervals upon the bar, 7. The nuts, 20 and 21, permit compensation for wear upon the engaging parts.

Mounted in the base, 1, is a measuring sleeve, 26, Fig. 8 provided upon its upper face with an integral horizontal annular flanged portion, 27, having a graduated surface or dial, 28, as shown in Fig. 5, showing graduations in fractions of thousandths of an inch. The under surface of the flange is provided with an annular series of curved cavities, 29, as shown in Fig. 10. The sleeve, 26, is also provided in its side with an annular channel, 30. Rotatably mounted upon the sleeve is a ring, 31, having a milled exterior portion, 32, and provided with a plurality of threaded openings, 33, through its side to receive screws, 34, having smooth ends, 35, Fig. 9 projecting into the channel, 30. The ring, 31, is provided with a vertical orifice, 37, having threads, 38, Fig. 8 in its lower portion to receive an adjusting screw, 39, upon which rests a helical spring, 40, supporting a metal ball or sphere, 41, adapted to seat itself in any one of the cavities, 29. The described ring and its connected parts constitute a ratchet stop device, whose functions will be hereinafter detailed.

The exterior of the measuring sleeve below the ring, 31, is provided with threads, 43, adapted to slidingly engage threads, 44, in the base. If desired, a threaded tapering split bushing intended for taking up the wear upon the sleeve threads, may be interposed between sleeve, 26, and the base. The closed end or base, 45, of the sleeve is provided with an opening, 46, through which

loosely passes a screw, 47, whose flat head, 48, rests against the outside of the base, 45, and whose shank, 49, is threaded to tightly engage in a threaded orifice, 50, in the end of the cylindrical portion, 6, of the measuring bar. The loose relation of the screw, 47, to the base, 45, permits the free rotation of the sleeve, 26, independently of both the screw and rod.

Upon the portion, 3, of the bearing arm, or upon a plate, 51, fixed thereto by screws, 52, or otherwise, is a vertical graduated micrometric scale, 53, whose reading line coöperates with the readings of the graduations, 28, Fig. 5 to indicate the number of complete rotations of the latter.

By reason of the key, 12, Fig. 3 the graduated bar does not rotate, but has only rectilinear movement as the measuring sleeve 26 is rotated. This sleeve is manually operated through the milled ring, 31, which is normally engaged with the sleeve by the ball, 41. When, however, the movable jaw, 17, contacts with the work and the operator accidentally continues to exert force upon the ring, 31, such force causes the ball to become unseated and the ring to override, thus performing one of the functions of a ratchet stop. While a ratchet stop is sufficient for a micrometer, such a stop is inadequate for a height gage because in the latter the movable jaw may approach the work from either of two directions. The described device being rotatable and operative in both directions fulfils this requirement.

The operation of my device is as follows: By means of the disk, 22, the jaw, 17, is adjusted approximately below or above the article to be measured. The ring, 31, is then turned until the jaw, 17, actually contacts with the work at which time the micrometric readings may be taken from the scales, 28 and 53.

In the measurement of some articles and under some conditions, it is obvious that the auxiliary jaw may be removed from the bar or neglected, in which case the top end of the bar, 7, abuts against the under side of the article whose height is to be ascertained.

What I claim is,

1. In a height gage, the combination with a base jaw and guide arm upon the jaw, of a movable measuring bar mounted in the jaw and traversing the arm, a jaw mounted upon the bar, a graduated scale upon the arm, and means in the base jaw registering with the scale for moving the bar.

2. In a height gage, the combination with a base jaw and guide arm upon the base jaw, of a scale upon the arm, a rotatable sleeve mounted in the jaw, a dial upon the sleeve registering with the scale, and a measuring bar mounted in the sleeve and engaged by the arm.

3. In a height gage the combination with the base jaw, of a measuring bar provided with marginal cavities mounted in the jaw, a jaw slidably mounted upon the bar, a pivot pin mounted in the slidable jaw, and a disk upon the pin adapted to register in the cavities.

4. In a height gage, the combination with the base jaw, of a bar mounted in the jaw and provided with graduations and with cavities at regular intervals along the graduated surface, a jaw slidably mounted upon the bar, and adjusting means in the slidable jaw adapted to register in the cavities.

5. In a height gage, the combination with the base jaw, of a measuring bar provided with marginal cavities mounted in the jaw, a jaw slidably mounted upon the bar, a pivot pin mounted in the slidable jaw, a disk upon the pin adapted to register in the cavities, and means upon the pin for vertically adjusting the disk.

6. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a slidable measuring bar traversing the arm and entering the jaw, and means in the jaw connected with the bar for sliding the bar.

7. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a slidable measuring bar traversing the arm and entering the jaw, and rotatable means in the jaw connected with the bar for elevating the bar.

8. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a rotatable and longitudinally movable sleeve mounted in the jaw and a measuring bar loosely mounted in the sleeve and slidably traversing the arm.

9. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a rotatable and longitudinally movable sleeve mounted in the jaw, a measuring bar loosely mounted in the sleeve and slidably traversing the arm, and means in the arm for preventing rotary movement of the bar.

10. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a rotatable and longitudinally movable sleeve mounted in the jaw, a measuring bar loosely mounted in the sleeve, and slidably traversing the arm, and a spline and groove connection between the arm and bar.

11. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a longitudinally movable sleeve mounted in the jaw, a measuring bar mounted in the sleeve and slidably traversing the arm, and a tapered bushing in the arm around the bar.

12. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a rotatable and longitudinally movable sleeve mounted in the jaw, and provided with an aperture in its end, a measuring bar mounted in the sleeve and slidably traversing the arm, a screw tight in the bar and loose in the

aperture, and means in the arm for preventing rotary movement of the bar.

13. In a height gage, the combination with the base jaw, of a guide arm upon the jaw, a rotatable and longitudinally movable sleeve mounted in the jaw, a measuring bar loosely mounted in the sleeve and slidably traversing the arm, and a milled operating ring mounted upon the sleeve.

14. In a height gage, the combination with the jaw, of a rotatably and longitudinally movable sleeve mounted in the jaw, a measuring bar mounted in the sleeve, a milled operating ring slidably mounted upon the sleeve and rotatably movable thereon in opposite directions.

15. In a height gage, the combination with the jaw, of an axially and longitudinally movable sleeve mounted in the jaw, and provided with a series of cavities, a measuring bar mounted in the sleeve, an operating ring rotatably movable upon the sleeve and provided with an orifice, and a ball yieldingly mounted in the orifice and registering with one of the cavities.

16. In a height gage, the combination with the jaw provided with a threaded opening, of a sleeve mounted in the jaw and provided with exterior threads engaging the threads of the opening and provided with an orifice in its end, having also an external annular channel and a series of cavities, a measuring bar loosely mounted in the sleeve, a screw tight in the bar and loose in the orifice, an operating ring upon the sleeve also provided with an orifice, screws in the ring loosely extending into the annular channel, and a ball yieldingly mounted in the ring orifice and registering with one of the cavities.

17. In a height gage, the combination with the base jaw of a guide arm upon the jaw, a graduated scale upon the face of the arm, a rotatable and longitudinally movable sleeve mounted in the jaw and provided with a flange having a dial adapted to coöperate with the scale, a measuring bar mounted in the sleeve and slidably traversing the arm, an operating ring upon the sleeve, and means in the arm for preventing axial movement of the bar.

In testimony whereof I have affixed my signature in presence of two witnesses.

FERNANDO O. JAQUES.

Witnesses:
B. C. MORELTHROP,
A. E. MOWRY.