Sept. 13, 1960 R. W. BURGESS ET AL 2,952,077

MICROMETER GAGES

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Fig. 1.

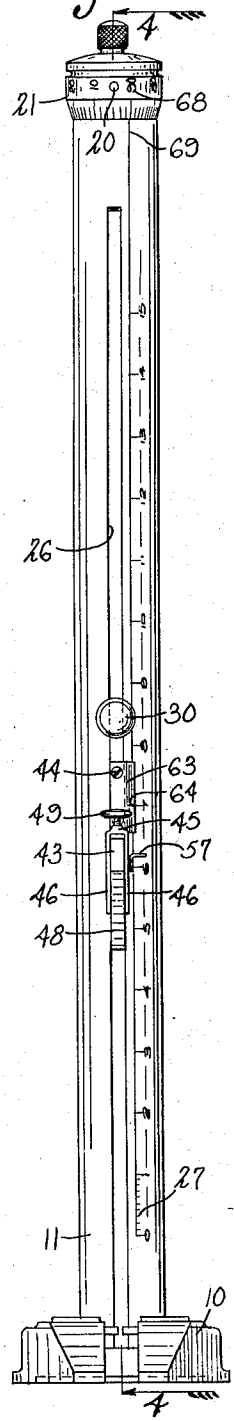


Fig. 2.

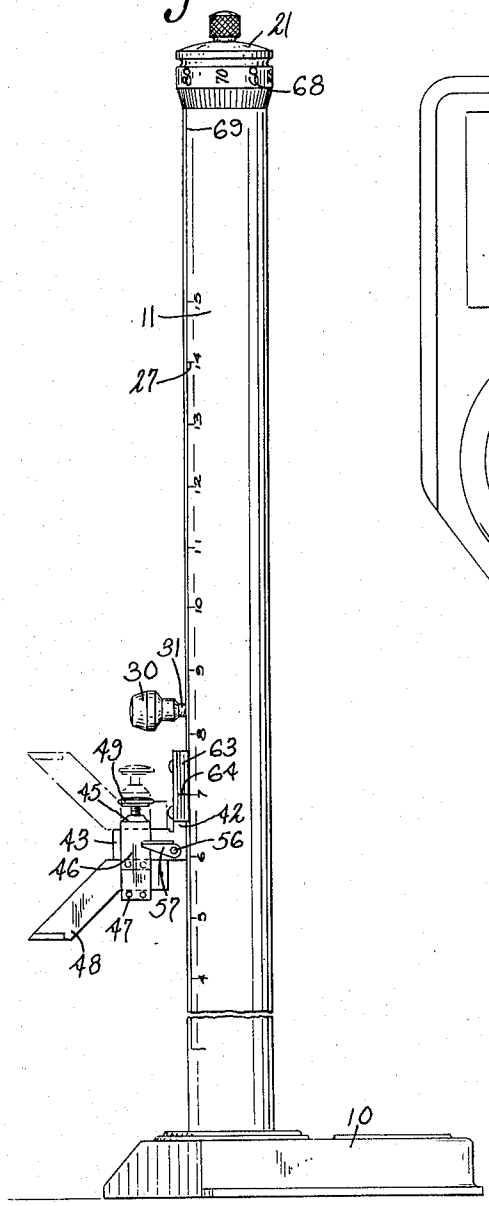


Fig. 3.

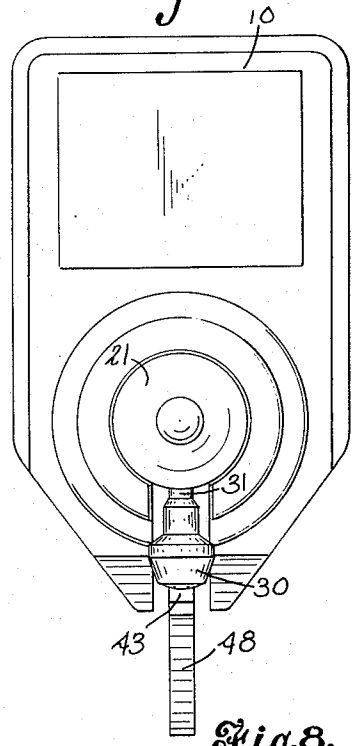
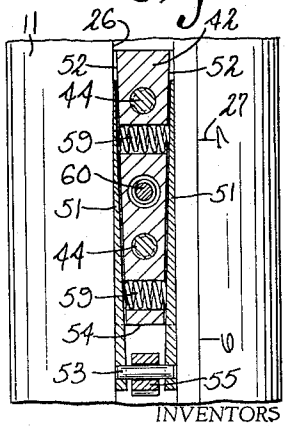


Fig. 8.



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Fig. 4.

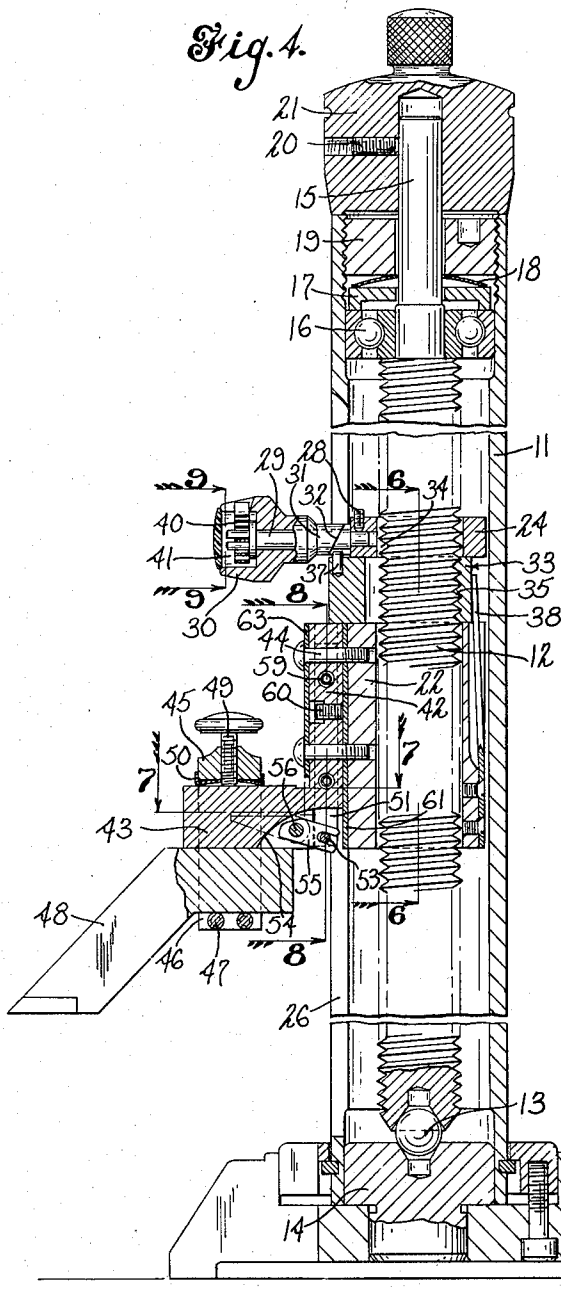


Fig. 5.

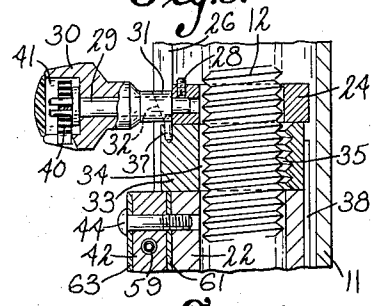


Fig. 6.

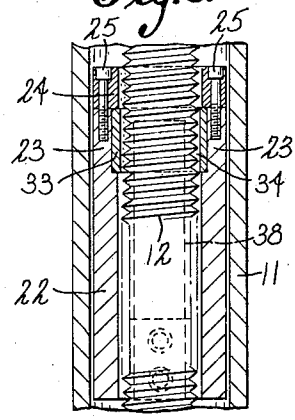
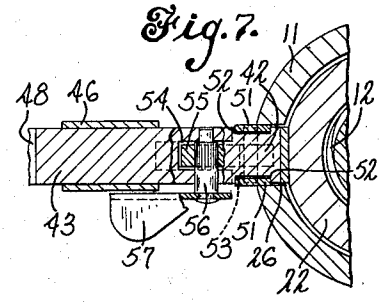


Fig. 7.



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Fig. 9.

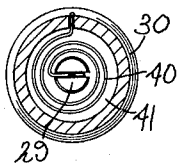


Fig. 10.

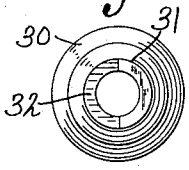


Fig. 11.

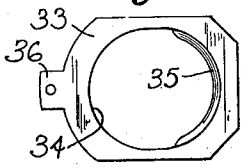


Fig. 12.

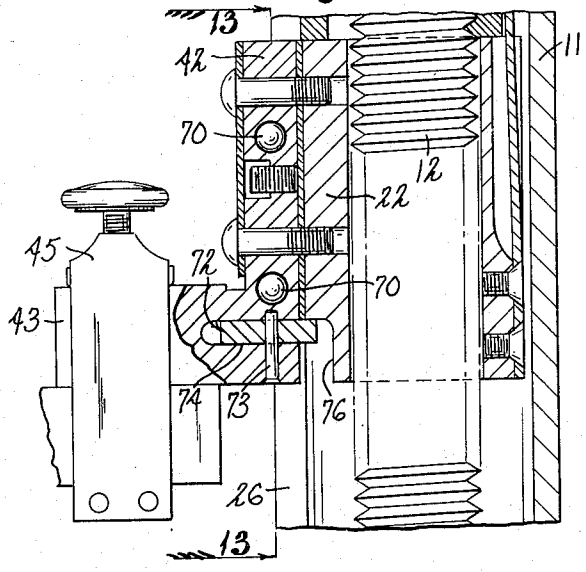


Fig. 13.

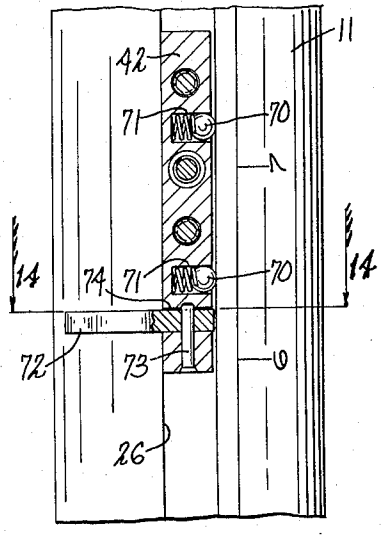
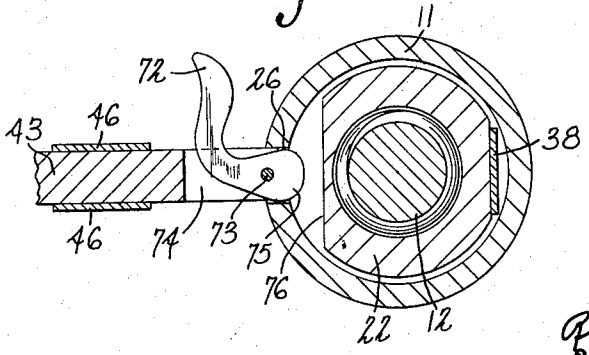


Fig. 14.



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United States Patent Office 2,952,077
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2,952,077

MICROMETER GAGES

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Filed Oct. 3, 1958, Ser. No. 765,165

2 Claims. (Cl. 33—170)

This invention relates to a height gage mechanism and more particularly to a device for supporting a height gage or similar tool above a support or surface in a manner in which the gage may be accurately adjusted vertically with respect to the supporting surface and locked in adjusted position.

It is contemplated by the present invention to provide a gage comprising a hollow column suitably supported upon a base member, mounting a lead screw rotatably in the column, which lead screw may be connected to and disconnected from a slider or tool-supporting member so that, when disconnected from the lead screw, the slider may be moved freely to a desired position and thereafter may be accurately adjusted by the rotation of the screw.

To this end the device illustrated in the drawing comprises a sleevelike slider member loosely embracing the lead screw so as to be slidable therealong. Carried by this sleeve member in spaced relation thereto is a cap also slidably fitting the interior of the column, and between the cap and the body of the slider or sleevelike member is mounted an element which may be called a half nut. This element loosely embraces the screw but is movable with respect to the slider transversely of the column and screw so that the partial threads with which it is provided may engage the threads of the lead screw or be moved to a disengaging position. A stud is carried by the sleeve member (or in this instance by a cap secured to the sleeve member), and upon this stud which projects outwardly through a slot in the column is rotatably mounted a manually operable knob engaged by suitable means with the half nut element to move it to a disengaging position. A spring carried by the slider urges the threads of this element into engagement with those of the screw. By this means, when the knob is turned, the slider is disconnected from the lead screw and may be freely moved vertically within the column.

This provides a coarse adjustment and, when the half nut is engaged with the lead screw, the turning of the latter provides for a fine adjustment. Also means is provided for locking the sleeve and gage element or tool support connected thereto in any position to which it has been adjusted which means will be described hereinafter.

One object of the present invention is to provide a new and improved height gage mechanism which may be accurately set to adjusted positions so that the height or other dimension of a workpiece may be measured with great accuracy.

Still another object of the invention is to provide a height gage with provision for coarse adjustment for the gaging tool and also for fine adjustment of this tool so that it may be accurately set to a given position and the position accurately read.

Still another object of the invention is to provide a gage mechanism having a vertical column within which a lead screw is rotatably mounted and a gage-supporting

mechanism carried by a slider, which slider may be threadedly engaged with and disengaged from the lead screw.

Still another object of the invention is to provide a gage mechanism of the character described wherein the slider previously referred to carries a support for the tool or gage mechanism and means is provided for locking the slider and tool support in the position to which it has been adjusted.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a front elevational view of a gage mechanism embodying our invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a top plan view;

Fig. 4 is a sectional view on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional view similar to Fig. 4 showing the slider-releasing parts in another position;

Fig. 6 is a sectional view on line 6—6 of Fig. 4;

Fig. 7 is a sectional view on line 7—7 of Fig. 4;

Fig. 8 is a sectional view on line 8—8 of Fig. 4;

Fig. 9 is a sectional view through the releasing knob on line 9—9 of Fig. 4;

Fig. 10 is an elevational view of the releasing knob taken from the inner end thereof;

Fig. 11 is a top plan view of the half nut or element which effects engagement and disengagement between the slider and the screw;

Fig. 12 is a partial sectional view similar to Fig. 4 but showing a modified form of the invention;

Fig. 13 is a sectional view on line 13—13 of Fig. 12; and

Fig. 14 is a transverse sectional view on line 14—14 of Fig. 13.

To illustrate a preferred embodiment of our invention, there is shown in the drawings a gage mechanism comprising a base 10 to which is fixed by any suitable means an upright hollow column 11. Within this column is rotatably mounted a threaded lead screw 12, which screw may be supported at its lower end by a ball bearing 13 carried upon a pad 14 supported in the base.

At its upper end the lead screw is provided with a reduced stem 15 embraced by the ball-bearing assembly 16 so that it may rotate freely and without friction in the column. This bearing may be held in place by a cap 17 against which is positioned a spring 18, and a screw plug 19 threadedly mounted in the column 11 bears upon this spring.

Secured to the free end of the stem 15 by a set screw 20 is a thimble 21 which may be manually rotated to rotate the screw 12.

Slidably mounted within the hollow column 11 and embracing the lead screw is a sleeve 22. This sleeve bears upon the screw but is not threadedly engaged therewith so it may slide freely up and down within the hollow column. Rising upwardly from opposite sides of the body of the sleeve 22 are arms 23 upon which is supported a cylindrical cap 24 which also slidably embraces the screw. The cap is secured to the arms 23 by screws 25 (Fig. 6).

The column is provided with a longitudinally extending slot 26 in the wall thereof (Fig. 1) and along this slot are indicia 27 to indicate the height of the gage or other tool carried by the mechanism. Secured to the cap 24 by the set screw 28 and projecting outwardly through this slot is a stud 29, and rotatably mounted upon this stud is a knob 30 having a reduced portion 31 at one end, which portion is cut away (Fig. 4) to provide a beveled or cam-shaped inner end portion 32.

Means are provided to threadedly engage the sleeve member **22** with the lead screw, which means, as illustrated, takes the form of a half nut element **33** shown in plain view in Fig. 11. This half nut is provided with an opening **34** by means of which it embraces the lead screw and at the rear end of this opening, which is somewhat oblong in shape, are provided partial threads **35** adapted to engage the threads of the lead screw. This member is also provided with a forwardly extending lug **36** which projects into the slot **26** of the column and a pin **37** (Figs. 4 and 5) secured to the upper surface of this lug extends upwardly to be engaged by the cam edge **32** of the knob **30**.

A spring **38** is secured at its lower end to the sleeve **22**, and this spring normally urges the half nut element **33** toward the front of the column so that the thread elements **35** engage the threads of the column, as shown in Fig. 4. It will be apparent, however, from this figure that when the knob **30** is rotated in a clockwise direction looking from the left of Fig. 4, the cam surface **32** will engage the projecting end of the pin **37** and move the nut element **33** rearwardly in the column to the position shown in Fig. 5 wherein the thread elements **35** are disengaged from the threads of the lead screw and the slider and associated parts may slide freely in a vertical direction along the lead screw. A torsion spring **40** is mounted within a recess **41** in the knob **30** (Figs. 4 and 9), the ends of this torsion spring being engaged with the knob **30** and stud **29** respectively so that, when the knob is released, this spring will return it to the position shown in Fig. 4, thus permitting, upon release of the knob, the spring **38** to move the element **33** to a position in which it is engaged with the threads of the lead screw so that rotation of the latter will move the slider vertically in the column.

Secured to the forward portion of the sleeve **22** is an L-shaped tool support comprising a vertical arm **42** and a horizontal arm **43**. Screws **44** through the vertical arm secure this member to the sleeve, and this vertical arm rides up and down in the slot **26** when the sleeve moves vertically within the column. Mounted upon the horizontal arm of the sleeve is a yoke **45** embracing the member **43** by two spaced depending arms **46**. Pins **47** extend between the ends of these arms and between these pins and the lower surface of the portion **43** of the tool support may be slidably supported a scriber or other tool **48**. This tool is held in place by means of a screw **49** threadedly mounted in the yoke **45**, and a spring **50** is mounted between the yoke and the arm **43** of the support to support the yoke evenly thereon.

It may here be stated that, as shown in dotted lines in Fig. 2, the tool may be mounted either above or below the horizontal arm **43** of the support, in which case the spring **50** and screw **49** would bear upon the tool instead of upon the support.

It will be found desirable to lock the tool support in any position at which it may be adjusted so that it may not be inadvertently moved from such position. To this end a pair of wedge members **51** (Figs. 4 and 7) are slidably mounted in recesses **52** in the side edges of the vertical arm **42** of the tool support so that these members lie between this arm and the sides of the slot **26**. The lower ends of these members are connected by a pin **53** which extends across a recess **54** in the horizontal arm **43** of the tool support. This pin is embraced by the bifurcated end of an arm **55** secured to a pin **56** rotatably mounted in the arm **43**. A finger piece **57** is secured to the pin **56** so that when this finger piece is depressed or rocked about its axis, the pin **56** and arm **55** will be rotated, thus moving the wedge members upwardly from the positions shown in Fig. 4. As illustrated in Fig. 8, this will wedge the member **42** of the tool support tightly between the edges of the slot **26** and prevent its movement. The wedge members **51** may be urged outwardly

to expanded position by springs **59**. It may also be noted that the slots **52** in the member **42** taper in depth to complement the tapered thickness of the wedge members **51**.

As shown in Fig. 4, a set screw **60** threaded into the arm **42** of the tool support bears against a spacer plate **61** carried by the sleeve **22**. As the screws **44** fit somewhat loosely through the openings in the arm **42**, one of these screws may be loosened and, by turning the screw **60** inwardly, the tool-supporting arm may be tilted slightly with respect to the sleeve. Also a cover plate **63** is mounted upon the arm **42**, and this cover plate bears a mark **64** designed to cooperate with the indicia **27** upon the column adjacent the slot **26**. The thimble **24** is also provided with indicia **68** with which cooperates a mark **69** upon the exterior of the column.

With the above construction it will be seen that with the parts in the position shown in Fig. 4 the knob **30** may be rotated to the position shown in Fig. 5 so as to cam the nut element **33** inwardly and release the partial threads **35** from the lead screw. The sleeve, together with the cap **24**, the tool-supporting arm and tool **48**, may then be freely moved vertically as there is no engagement between these parts and the lead screw. When they have been moved to a desired position for rough adjustment, the knob **30** is released and the spring **40** will return the knob from the position shown in Fig. 5 to that shown in Fig. 4, wherein the pin **47** is no longer cammed inwardly by the cam surface **32**. Thereupon the spring **38** will move the half nut element **33** outwardly to the position shown in Fig. 4 where the threads **35** are in engagement with those of the lead screw.

With the parts in this position the thimble **21** may be rotated to secure fine adjustment of the tool to any given position, which position may be read from the indicia **68** on the line **69** in cooperation with the indicia **27** opposite the mark **64**. When fine adjustment of the tool support has been made, it may then be locked in this position by moving the finger piece **57** downwardly from the position shown in Fig. 2 which will move the wedges **51** upwardly and frictionally lock the sleeve and tool support in this position.

In Figs. 12, 13 and 14 of the drawings we have shown a slightly modified form of our invention in that the tool support is locked in its adjusted position by different means. In this instance the wedges **51** have been omitted and spring-pressed ball bearing members **70** are provided in recesses **71** of the arm **42** of the tool support, which balls bear against one edge of the slot **26** so that the tool support will be slidably guided in this slot. A finger lever (Fig. 14) **72** is pivoted at **73** within a recess or slot **74** in the horizontal arm **43** of the tool support. The inner end of this lever is cam shaped as shown at **75** so that it may engage one side of the slot **26** in the column and thus frictionally bind the tool-supporting arm in the position to which it may be moved. The lower part of the sleeve member **22** may be cut away, as shown at **76**, to accommodate the cam-shaped end **75** of the lever **72**. In other respects the modification shown in Figs. 12, 13 and 14 is like that shown in the previous figures of the drawing.

While we have shown and described some embodiments of our invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the sprit of the invention and within the scope of the claims.

What we claim is:

1. A gage comprising an upstanding hollow column having a longitudinal slot in the wall thereof, a threaded lead screw mounted in the column, a slider in the column carrying a tool support in a position projecting through said slot, means carried by said slider to threadedly connect it to and disconnect it from said screw, means for operating said screw, means for locking said slider against

movement in the column, said means comprising a wedging member movably carried by the tool support and vertically slidable to wedging position between it and the wall of the slot in the column, and a lever carried by the tool support to actuate said wedging member.

2. A gage comprising an upstanding hollow column having a longitudinal slot in the wall thereof, a threaded lead screw mounted in the column, a slider in the column carrying a tool support in a position projecting through said slot, means carried by said slider to threadedly connect it to and disconnect it from said screw, means for operating said screw, means for locking said slider against movement in the column, said means comprising wedge members slidably carried by the tool support, one on each side thereof, between it and the sides of the slot, and a lever pivotally mounted on the tool support and connected with said wedge members to move them to wedging position.

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