Feb. 13, 1951 J. J. NEFF 2,541,535

HEIGHT GAUGE

Filed March 1, 1946

Fig. 3

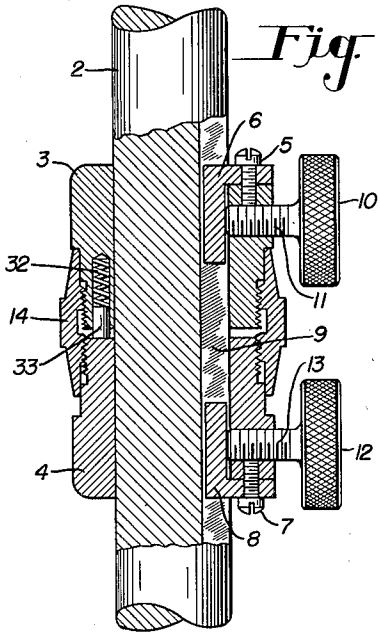


Fig. 1

Fig. 4

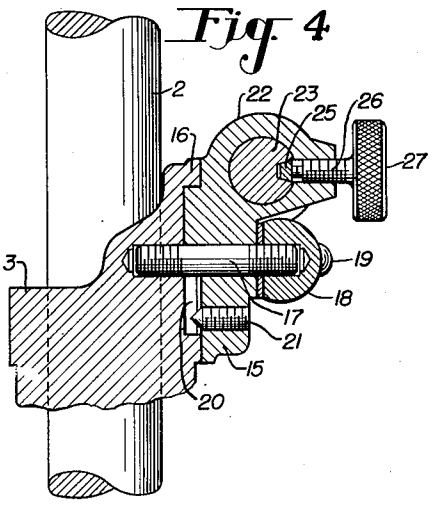


Fig. 2

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HEIGHT GAUGE

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4 Claims. (Cl. 33—169)

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This invention relates in general to adjustable supports and more particularly to improvements in electronic gauge head supporting stands of the type disclosed in United States Patent No. 2,509,986 of Joseph J. Neff for Electronic Height Gauge, filed August 6, 1945.

One of the primary objects of the invention is to provide in such a support, in the form of a collar that is adjustable on a standard, a differential adjustment means for maintaining the collar against slippage on the standard while adjusting it longitudinally thereon.

Another object is to provide such a differential adjustment means that may be manually operable by one hand.

A further object is to provide such a differential adjustment means that comprises one single adjustment means to coact with two members either one of which may be separately clamped to the standard while the other is selectively relatively adjustable in either direction in accordance with the single adjustable means.

A further object is to provide such a differential adjustment means that will provide for extremely fine vernier precision adjustments of the collar on the standard.

A further object is to provide the collar with further adjustable devices for supporting the gauge head that will provide for angular and pivotal adjustments of the gauge head with respect to the supporting collar.

With the foregoing and other objects in view the invention resides in the combination of parts and in the details of construction set forth in the following specification and appended claims, certain embodiments thereof being shown in the accompanying drawings, in which:

Figure 1 is a view in elevation of the assembly including the standard, the adjustable collar thereon and the gauge head adjustably supported by supports that are adjustable on the collar;

Figure 2 is a fragmentary view in elevation taken from the opposite side of Figure 1 partially showing the standard and gauge supporting rod and showing the two clamping hand knobs for the differential adjusting means for the adjustable collar;

Figure 3 is a view in section taken along line 3—3 of Figure 2, showing the differential adjusting device and the two clamping devices for the two parts of the differential adjusting device; and

Figure 4 is a view in section taken along line 4—4 of Figure 1.

Referring more particularly to the drawings, the gauge stand includes a base 1 and an upright standard 2. Slidably arranged on the standard is a two-part collar assembly including an upper collar 3 and a separate lower collar 4. Secured to the upper end of the upper collar by a set screw 5 is an angular clamping key 6 and to the lower end of the lower collar by a set screw 7 is an angular clamping key 8. These two keys 6 and 8 extend interiorly of their respective collars 3 and 4 engaging a vertical slot 9 in the standard. The hand knob 10 carries a screw shank 11 that extends through collar 3 for abutment with key 6 and the hand knob 12 carries a screw shank 13 that extends through collar 4 for abutment with key 8.

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The lower portion of the upper collar 3 and the adjacent upper portion of the lower collar 4 are externally screw threaded to respectively receive the spaced two upper and lower sets of internal screw threads of a hand adustment nut 14. The engagement of the screw threads is such that a rotation of hand nut 14 in one direction draws the adjacent ends of collars 3 and 4 toward each other and a rotation of nut 14 in the other direction forces the two collars apart. The two collars are prevented from rotation by the engagement of keys 6 and 8 with the vertical slot 9 in the standard so that their movement is limited to sliding on the standard. Tightening of knobs 10 and 12 forces a clamping engagement of keys 6 and 8 in the groove 9 and set screws 5 and 7 hold keys 6 and 8 in place.

Carried by the upper collar 3 is a swivel member 15 fitting in a shoulder 16 of the collar 3. The member 15 swivels about a pin 17 whose ends are screw threaded into the collar 3 and the hub 18 of a clamping lever 19. The swivel 15 is provided with a radial slot 20 in the under portion that fits within collar shoulder 16. A set screw 21 extends through the swivel and the slot to expand the swivel to a comfortable fit within the shoulder to make for proper swivel movement. The threads of pin 17 are such that a rotation of lock lever 19 in one direction causes pin 17 to move to the right to loosen the swivel to permit manual rotation of the swivel. A rotation of lock lever 19 in the opposite direction causes pin 17 to move to the left to tighten and lock the swivel in the desired adjusted position.

Also integral with the swivel is a barrel 22 to slidably receive an angularly extending cross rod 23. The cross rod has a longitudinal slot 24 to receive the inner wedge end 25 of a lock screw 26 extending into the barrel 22 and manually operated by a hand knob 27 for clamping the

cross rod in the desired adjusted position in the barrel.

To the lower end of the cross rod is pivotally connected a gauge head 28 carrying a stylus 29. This pivotal connection is transverse and effected by any suitable means and suitably locked by a locking lever 30 in any desired adjusted position. The gauge head 28, its stylus 29 and electrical cable connection 31 is of the same type in construction and purpose of that disclosed in the United States Patent No. 2,509,986 of Joseph J. Neff for Electronic Height Gauge, filed August 6, 1945. Suffice it to say, in connection with the gauge head, the importance of precision and flexibility of fine adjustment for positioning the gauge head and its work engaging stylus for precision measurement is fully stressed in the above-mentioned patent. The present invention provides such precision adjustment means. With regard to the adjustment of the collar 3, and the adjustable gauge head supporting devices carried thereby, the two knobs 10 and 12 may be turned to loosen the clamping keys 6 and 8 and the collar assembly 3, 4 bodily moved together slidably vertical on the standard, as the engagement of the groove 9 by keys 6 and 8 prevents relative rotation between the collars and the standard. When the approximate desired adjustment has been determined, the hand knob 12 is tightened to cause key 8 to clamp collar 4 on the standard against sliding movement while collar 3 remains loose to permit sliding movement as the differential hand nut 14 is turned in either direction. Being clamped and anchored collar 4 is not affected as differential hand nut 14 is turned. Collar 3, on the other hand, being loose on the standard, is raised or lowered on the standard in response to and in accordance with the direction of hand rotation of the differential nut 14. This enables a more convenient and accurate positioning of the supporting collar 3 since collar 4 stabilizes the assembly while collar 3 is being adjusted. To further stabilize the position of the collars 3 and 4 on the standard the collar 3 may have a series of holes each to receive a compression coil spring 32 to urge a plunger 33 into abutment with the upper surface of collar 4. The swivel 15 and its set screw 21 enable the operator to obtain the properly stabilized swivel operation. The double screw thread ended pin 17 and the clamping hub 18 and lever 19 provide a pivot axis and an efficient means for locking the swivel in the desired adjusted position. This determines the angular disposition of barrel 22 and the cross rod 23 it supports, while the pivotal connection of the gauge head and the clamping lever 30 determine the angular position of the gauge head and the stylus with respect to the cross rod.

I claim:

1. For use in a device for measuring and indicating the height of a given article, said device having a gauge head and a work engaging stylus, an adjustable means for supporting said gauge head comprising a standard, a pair of screw-threaded collars slidably mounted thereon, a separate manual clamping member for each of said collars for independently clamping each of said collars, a single differential manually operable member in engagement with the adjacent end portions of said collars for relatively drawing said ends together and forcing them relatively apart in accordance with the direction of rotation of said manually operable member, said gauge head being supported by one of said collars, a swivel member carried by one of said collars, means for adjusting the pivotal clearance for said swivel, a rod slidably carried by said swivel, said gauge head pivotally connected to said rod, and clamping means for said pivotal connection.

2. For use in a device for measuring and indicating the height of a given article, said device having a gauge head and a work engaging stylus, an adjustable means for supporting said gauge head comprising a standard, a pair of screw-threaded collars slidably mounted thereon, a separate manual clamping member for each of said collars for independently clamping each of said collars, a single differential manually operable member in engagement with the adjacent end portions of said collars for relatively drawing said ends together and forcing them relatively apart in accordance with the direction of rotation of said manually operable member, said gauge head being supported by one of said collars, a swivel member carried by one of said collars, means for adjusting the pivotal clearance for said swivel and manually operable clamping means for said swivel, a rod slidably carried by said swivel, clamping means for clamping said cross rod in the desired adjusted position on said barrel, said gauge head being pivotally connected to said cross rod, and clamping means for said pivotal connection.

3. For use in a device for measuring and indicating the height of a given article, said device having a gauge head and a work engaging stylus, an adjustable means for supporting said gauge head comprising a standard, a pair of screw-threaded collars slidably mounted thereon, a separate manual clamping member for each of said collars for independently clamping each of said collars, a single differential manually operable member in engagement with the adjacent end portions of said collars for relatively drawing said ends together and forcing them relatively apart in accordance with the direction of rotation of said manually operable member, said gauge head being supported by one of said collars, a swivel member carried by one of said collars, manually operable clamping means for said swivel, a barrel carried by said swivel, a rod slidably mounted in said barrel, clamping means for clamping said cross rod in the desired adjusted position in said barrel, said gauge head being pivotally connected to said cross rod, and clamping means for said pivotal connection.

4. For use in a device for measuring and indicating the height of a given article, said device having a gauge head and a work engaging stylus, an adjustable means for supporting said gauge head comprising a standard, a pair of screw-threaded collars slidably mounted thereon, a separate manual clamping member for each of said collars for independently clamping each of said collars, a single differential manually operable member in engagement with the adjacent end portions of said collars for relatively drawing said ends together and forcing them relatively apart in accordance with the direction of rotation of said manually operable member, said gauge head being supported by one of said collars, a swivel member carried by one of said collars, means for adjusting the pivotal clearance for said swivel and manually operable clamping means for said swivel, a barrel carried by said swivel, an angular cross rod slidably mounted in said barrel, clamping means for clamping said cross rod in the desired adjusted position in said

barrel, said gauge head being pivotally connected to said cross rod, and clamping means for said pivotal connection.

JOSEPH J. NEFF.

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