Dec. 20, 1949 E. P. JENSEN 2,491,612

HEIGHT GAUGE SCRIBER

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FIG. 2

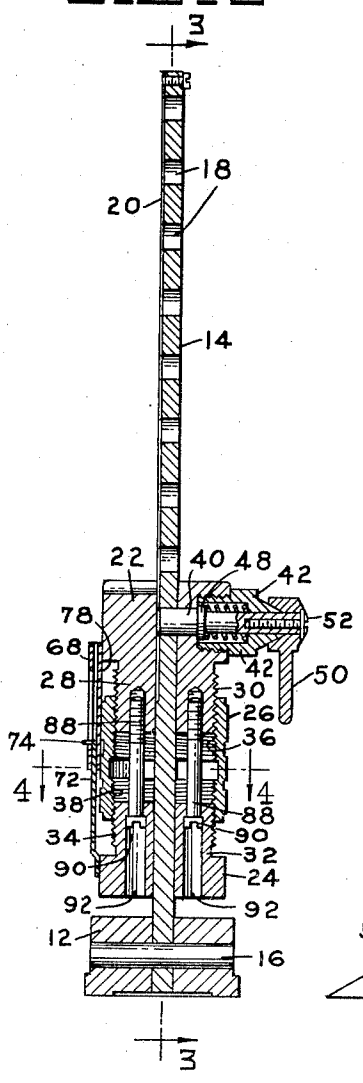

FIG. 1

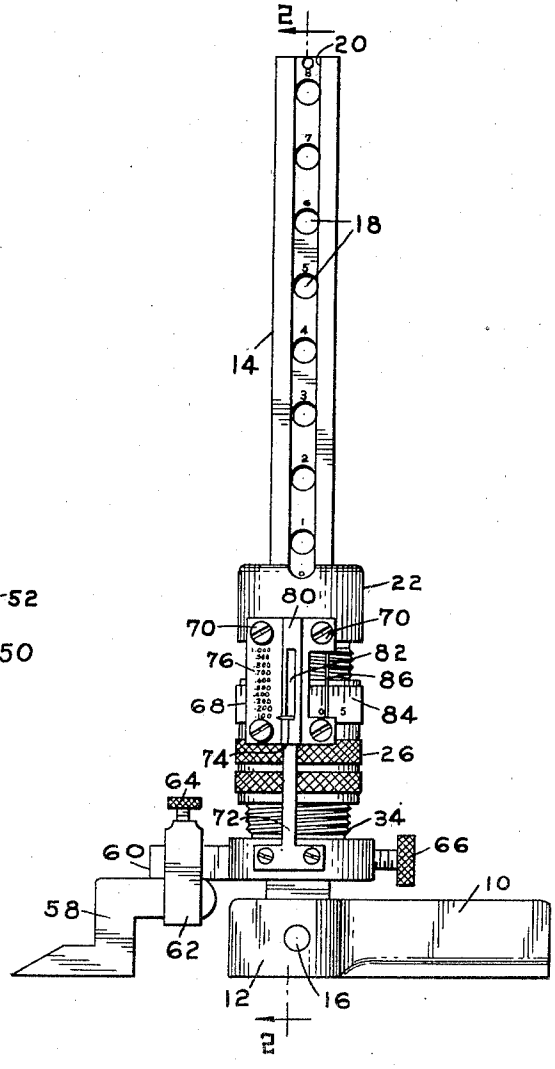

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FIG. 3

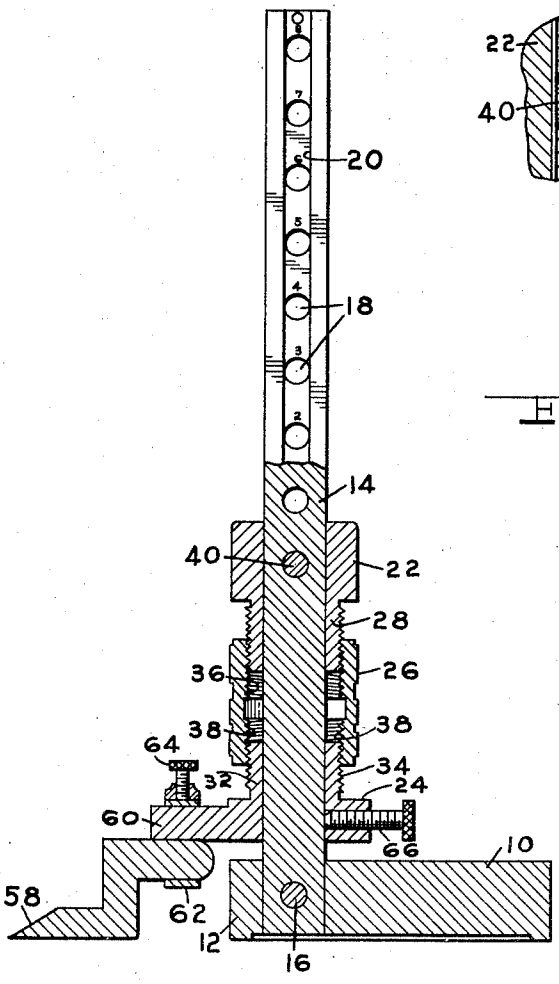


FIG. 5

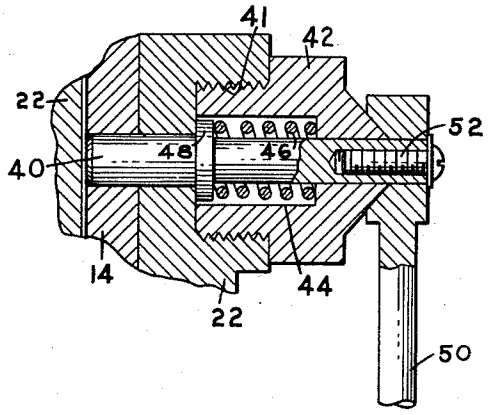


FIG. 4

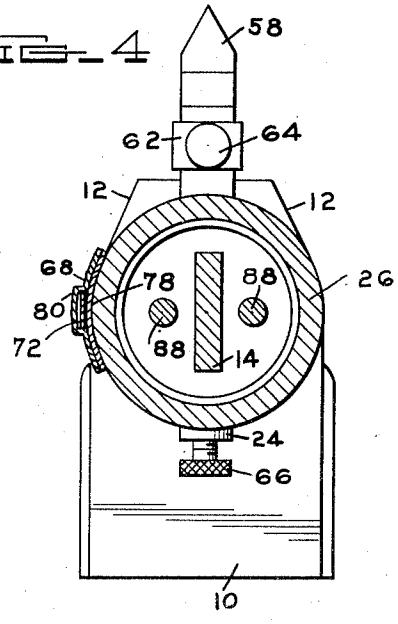
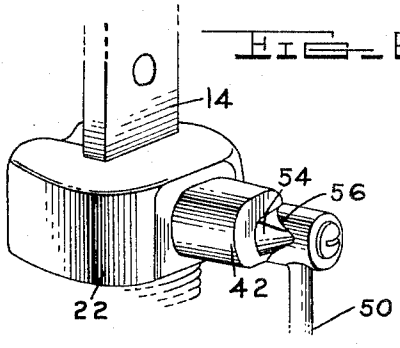


FIG. 6



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HEIGHT GAUGE SCRIBER

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7 Claims. (Cl. 33—169)

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This invention relates to tools and particularly to height gages and height gage scribers.

Heretofore, the standard practice of scribing lines on machine parts, templates, and the like has been by height gages which if precision made would give a high degree of accuracy. However, such gages were costly to manufacture and slow to use and therefore unsatisfactory for many jobs. It has also been the practice to use standard surface or combination square gages for this kind of work, but the operating procedure has been clumsy and unstable and not highly accurate.

An important object of this invention is to provide an improved tool of this character for making layouts on machine parts, templates, castings, et cetera, which is stable and highly accurate in use, consists of few parts, and is capable of being manufactured at comparatively low cost. Another important object of this invention is to provide an improved height gage scriber of which the parts are sturdy in construction and so assembled and related to one another that when the gage is set at the desired height or measuring distance the parts are immovably held in position for accurate use. A further important object of this invention is to provide an improved device of this character which is quickly and conveniently operable and easy to read.

Various other object, advantages and meritorious features will become more fully apparent from the following specification, appended claims and accompanying drawings wherein:

Figure 1 is a side elevation of a tool device embodying the invention,

Figure 2 is a vertical sectional view through the device along line 2—2 of Figure 1,

Figure 3 is a vertical sectional view through the device along line 3—3 of Figure 2,

Figure 4 is a horizontal cross sectional view taken along line 4—4 of Figure 2,

Figure 5 is an enlarged vertical sectional view through the releasable locking means of the device showing the parts in locked position, and

Figure 6 is a perspective view of the locking means of Figure 5.

In the drawings, the invention is illustrated as applied to a height gage scriber. The illustrated embodiment of the invention comprises a base 10 which may be shaped at one end with converging side wall sections 12—12 as shown in Fig. 4. Supported by the base is an upright member or column in the form of a blade 14 of substantially rectangular cross sectional formation as shown in Fig. 4. The blade may be supported in any desirable way from the base 10 and as shown herein the base may be provided with a vertical rectangular aperture of a size to slidably receive the lower end of the blade and a cross pin 16 may be employed to lock the blade in the base. Throughout the major portion of its length the column or blade 14 is provided with a series of recesses or holes 18 which are equally spaced apart, and in the present embodiment of the invention have their axes spaced one inch apart. One side of the blade may be provided with a shallow groove 20 running centrally the length thereof into which the holes 18 open. Inch designation may be etched or otherwise formed on the bottom of the groove for indicating an initial setting in inches of the marking implement above the bottom of the base 10.

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Movable on the blade 14 is a scribing implement which is capable of fine adjustment to a desired distance or height with respect to the bottom surface of the base 10. This implement comprises an upper member or collar 22 encircling the blade, a lower member or collar 24 similarly encircling the blade and a coupling sleeve 26 likewise encircling the blade which extends between the two members and adjustably secures the same together for joint or independent movement on the blade 14. The collar members are slidably but non-rotatably mounted on the blade. In order to form a stable accurate operating device, this is preferably accomplished by providing both collar members with an axial or central passage of a rectangular shape and size to slidably receive the blade. The tolerances provided by the sliding fit are such that the collar members have only their axial movement along the blade, being held against any movement or play rotatably or angular with respect to the blade members.

The collar members and the sleeve are so operatively coupled together that rotation of the latter will either draw the two members together or move them further apart depending on the direction of rotation of the sleeve. This is accomplished in a novel manner by providing the upper collar 22 with a downwardly projecting reduced end section 28 which is externally threaded as shown at 30. Similarly, the lower collar 24 is provided with an upwardly projecting reduced end section 32 which is externally threaded as shown at 34. The coupling sleeve 26 is provided with an internally threaded upper portion 36 which engages the threads 30 on the upper collar and an internally threaded lower portion 38

which engages the threads 34 of the lower collar. The externally threaded portions 30 and 34 on the two collar members are reversely threaded with respect to one another. That is to say, one may be provided with right hand threads and the other with left hand threads. The internally threaded portions 36 and 38 of the sleeve will be threaded in a direction to cooperate with the threads on the collar and cause the same to draw toward one another when rotated in one direction and to separate away from one another when rotated in the opposite direction.

The upper collar 22 carries means which will lock the collar to the column or blade 14. This means comprises a spring actuated plunger 40 shown best in Figure 5 which is engageable in the recesses or holes 18. The plunger 40 is mounted in a bore in the upper widened body portion of the collar 22 for reciprocating movement toward and away from the blade and is of a size to slidably fit the apertures 18 so that the collar is locked against movement. The bore in which the plunger 40 is received is widened toward its outer end and internally threaded as at 41 to receive a sleeve or nipple 42 in which a cylindrical passage or chamber 44 is located. The passage 44 is oversize with a portion of the plunger 40 extending therethrough. A coil spring 46 encircles the plunger in the chamber 44 and is seated at one end against the outer wall of the passage 44 and at the other end against a circular flange 48 carried on the inner end section of the plunger. The outer end of the plunger projects through the nipple and is provided with a swingable finger operated handle 50 which may be secured in any suitable way to the plunger 40 such as by the screw member 52. The handle and the nipple member are provided with cooperating cam surfaces which upon rotation of the handle which retracts the inner end of the plunger 40 against the resistance of the spring 46.

As shown in Fig. 6, the outer end of the nipple is shaped with a V-shaped cam 54 which normally projects into V-shaped slots 56 on opposite sides of the handle connection to the plunger. Normally the position of the parts is that shown in Fig. 6 wherein the surfaces of the cams 54 and 56 are in substantially contiguous relationship. It is obvious that upon rotation of the handle 50 that the cam 56 thereof will ride up the cam surfaces 54 and retract the plunger from the recesses 18. The plunger 40 is self-operable to enter any of the recesses 18 and thereby expedites the seating of the gage for use. All that is necessary for the operator to do is to retract the plunger by the handle 50 and shift the entire assembly of collar members and the sleeve to the approximately desired height and upon releasing pressure upon the handle the plunger will be self-actuated into any one of the recesses 18 following further shiftable movement of the assembly on the blade.

The lower collar member 24 is provided on one side with a lateral projecting marking implement or scriber 58. This scriber element may be detachably secured to the lower collar member by providing a tongue 60 projecting therefrom as shown in Figs. 1 and 3, and securing the rear end of the scriber to the tongue by a clamp 62 which is removably secured to the tongue 60 by a set screw 64. The opposite side of the collar member 24 is provided with means for locking this member to the collar or blade 14. This means comprises a screw member 66 which when threaded inwardly will engage the blade 14 as

shown in Fig. 3 to hold the collar against movement. When making the final adjustments of the gage, the screw member 66 is retracted to allow the lower collar 24 to move relative to the upper collar 22.

In order to accurately measure the height or distance that the scriber 58 subtends to the bottom surface of the base 10, novel means is employed cooperating with the two collars 22 and 24 and the coupling sleeve 26. Referring particularly to Fig. 1, the collar 22 is provided with a plate 68 which is secured thereto by a pair of screws 70. This plate projects downwardly in overlapping relationship to the coupling sleeve 26. Secured to the lower collar 24 is an upwardly projecting arm 72 which overlaps upon the plate 68 and is provided with a pointer 74. The pointer 74 is adapted to sweep a vertical scale indicated at 76 carried by the plate 68.

Preferably the plate is constructed as shown in Figs. 2 and 4 of two plates mounted in parallel planes. One of these plates is the outer plate 68 previously described. The other plate is indicated at 78 and is located inwardly of the plate 68 and normally is not visible unless the plates are viewed from the top or side. The plate 68 is further provided with a dished out channel section 80 running vertically of the gage and cooperating with the inner plate 78 to form a vertical passage through which the arm 72 is guided as shown in Fig. 4. The dished out channel portion is cut away for the major portion of its length opposite to the scale 76 to form a vertical elongated slot 82 through which the pointer 74 previously described projects in the manner shown in Fig. 1.

Indicia or markings on the scale 76 represent a distance of travel of one collar member relative to the other collar member for one revolution of the sleeve 26. If the spacing of the recesses 18 are one inch apart as previously described, the scale 76 may be subdivided into ten increments so as to give readings in hundredths of an inch. Thus rotation of the sleeve 26 will either raise or lower the scriber carrying collar 24 and the distance of travel is measured by the pointer 74 and the cooperating scale 76. To further accurately measure the distance of travel of one collar member relative to the other, a second scale is employed which is mounted on a peripheral portion of the coupling sleeve 26. Referring to Fig. 1, scale 84 is shown encircling the coupling sleeve and preferably subdivided into one hundred increments so as to give readings of .001 inch. A reference point carried by the plate 68 cooperates with the scale 84 to measure the variation in height of the scriber when the sleeve 26 is rotatably adjusted. This means comprises a wire 86 supported by the plate 68 so as to extend parallel to the axis of the column or blade 14 and to expose the scale markings to view on both sides thereof.

The two collar members 22 and 24 are secured together against complete separation but within the limit of their maximum separation, they are adjustable toward and away from one another by the sleeve 26. The means preventing complete separation of the two collar members preferably comprises a pair of bolt members 88—88 which have their upper threaded extremities adjustably engaged in the upper collar 22 and their heads 90—90 received in passages 92—92 of the lower collar 24 as shown in Fig. 2. The passages 92—92 open out through the bottom side of the collar 24 and are reduced in size before opening out through the upper side of

the collar. The reduced portion of each passage forms a shoulder with which the head 90 of the bolt therein will abut and thereby limit further separation of the two collar members. Preferably, the bolts 88—88 are threadedly adjusted so that the heads thereof abut the shoulders formed by the reduced portions of the passages when the pointer 74 reaches or passes slightly beyond the zero reading on the scale 76. This condition is shown in Figs. 1 and 2.

The operation of the instrument is readily understandable from the previous description. When the gage is set at zero on all three readings, the marking end of the scriber 58 is in the same plane as the bottom of the base 10. The height of the scriber relative to the base may be initially roughly set by rotating the handle 50 to retract the locking plunger 40 and shifting the collar members together with the sleeve 26 to a height on the column approximating that desired. When the approximate height is reached, the operator may release his hold on the handle 50, and upon further shiftable movement of the collar assembly the plunger 40 will automatically enter the hole 18 opposite which it is brought to lock the upper collar 22 to the blade. By turning internally threaded sleeve 26 in one direction, the lower collar 24 will travel upwardly, advancing .100 of an inch per revolution. The pointer 74 travels with the collar indicating each revolution on the graduated scale 76. In the present embodiment, ten revolutions of the sleeve complete one inch adjustment of the scriber 58. The peripheral scale 84 will give readings of the height of the scriber to .001 of an inch. Both the readings on the plate 68 and the sleeve 26 are very clear and easily discernible.

What I claim is:

1. A height gage comprising, in combination, a column having one or more longitudinally extending flat sides and provided with a series of equally spaced apart recesses opening out on one side thereof, a collar member having a central aperture therethrough of a size to slidably but non-rotatably fit the column and having means for releasably engaging said recesses in the column to lock the member against movement on the column at a plurality of positions therealong, a second collar member having a central aperture therethrough of a size to slidably but non-rotatably fit the column and having a laterally projecting scriber element, said members having threaded portions thereon reversed in direction as to one another, an internally threaded coupling sleeve extending between said collar members and so threadedly engaged therewith that upon rotation of the sleeve in one direction the members are drawn toward one another and upon rotation of the sleeve in the opposite direction the members are separated apart from one another, a plate carried by one of said collar members and having a vertical scale, a pointer carried by the other of said collar members and adapted to sweep the scale and indicate the distance of travel of the members relative to one another, and a scale encircling the sleeve and cooperating with a reference on the plate to indicate the distance of travel of the members relative to one another when the sleeve is moved less than a complete revolution.

2. A height gage comprising, in combination, a column having one or more longitudinally extending flat sides and provided with a series of equally spaced apart recesses opening out on one side thereof, a collar member having a central aperture therethrough of a size to slidably but non-rotatably fit the column and having means for releasably engaging said recesses in the column to lock the member against movement on the column at a plurality of positions therealong, a second collar member having a central aperture therethrough of a size to slidably but non-rotatably fit the column and having a laterally projecting scriber element, said members having threaded portions thereon reversed in direction as to one another, an internally threaded coupling sleeve extending between said collar members and so threadedly engaged therewith that upon rotation of the sleeve in one direction the members are drawn toward one another and upon rotation of the sleeve in the opposite direction the members are separated apart from one another, a plate carried by one of said collar members and projecting toward the other collar member in overlapping relation to the coupling sleeve, said plate having a vertical scale calibrated to measure the distance of travel of the members relative to one another for each complete revolution of the sleeve, a pointer carried by said other collar member projecting toward the plate and positioned for indicating on the scale the distance of travel of the two members relative to one another, said sleeve having a circular scale extending therearound and positioned immediately adjacent to said plate, and a reference element on said plate cooperating with the scale on the sleeve for indicating the distance of travel of the two members relative to one another when the sleeve is angularly adjusted less than a complete revolution.

3. A height gage comprising, in combination, a standard of non-cylindrical cross-section, a base therefor having its under surface normal to the axis of the standard, a member encircling the standard and having a sliding but non-rotatable fit on the standard, means for fixing said member to the standard at equally spaced apart intervals therealong to hold the member against movement, a second member encircling the standard and having a sliding but non-rotatable fit on the standard, a scriber element projectionably carried by the second member, said members having threaded portions thereon reversed in direction as to one another, a rotatable sleeve encircling the standard and having threaded portions engaging the threaded portions on the two members, said threaded engaging portions adapted upon rotation of the sleeve in one direction to draw the two members together and upon rotation in the opposite direction to separate the members one from the other, one of said members carrying a graduated scale extending in parallel relation to the standard, a pointer carried by the other member adapted to sweep the scale as the two members move relative to one another, a graduated scale carried on the exterior surface of said sleeve and extending substantially therearound, and a reference point carried by one of said members adapted to sweep the scale on the sleeve as the latter is rotated.

4. A height gage comprising, in combination, a standard of non-cylindrical cross-section, a base therefor having its under surface normal to the axis of the standard, a member encircling the standard and having a sliding but non-rotatable fit on the standard, means for fixing said member to the standard at equally spaced apart intervals therealong to hold the member against movement, a second member encircling the standard and having a sliding but non-rotatable

fit on the standard, a scriber element projectionably carried by the second member, said members having threaded portions thereon reversed in direction as to one another, a rotatable sleeve encircling the standard and having threaded potions engaging the threaded portions on the two members, said threaded engaging portions adapted upon rotation of the sleeve in one direction to draw the two members together and upon rotation in the opposite direction to separate the members one from the other, a plate carried by one of said members having a graduated scale thereof extending in parallel alignment with the axis of the standard, a pointer carried by the other member and adapted to sweep the scale as the two members move relative to one another, an exposed graduated scale carried by the sleeve and extending substantially therearound and around the axis of the standard, and a reference point carried by the plate adapted to sweep the scale on the sleeve when the latter is rotated.

5. A height gage comprising, in combination, a base, a blade of rectangular cross section supported in upright position on the base and provided with a series of equally spaced apart holes for a portion of its length, a pair of collar members encircling the blade having passages therethrough of rectangular cross section which slidably but non-rotatably fit the blade, means extending between the collar members connecting the two together but providing limited slidable movement of one member with respect to the other member, a scriber element projectionably carried by one of said collar members, a plunger carried by said other collar member normally yieldably urged toward said blade for engagement in the holes thereof to lock the collar member to the blade at a plurality of positions therealong opposite each hole thereof, manual control means for retracting said plunger from engagement with the holes of the blade, a sleeve encircling the blade and telescopically overlapping upon the two collar members, threaded portions on said sleeve and on said collar members engaging one another and so cooperatingly related to one another that upon rotation of the sleeve in one direction the collar members are drawn toward one another and upon rotation in the opposite direction the collar members are separated from one another, a plate carried by one of said collar members extending toward the other collar member over said sleeve and having an exposed graduated scale extending in parallel alignment with the axis of the blade, a pointer carried by the other of said collar members and adapted to sweep the scale upon relative movement of the collars toward and away from one another, an exposed graduated scale on the sleeve extending circularly around the axis of the blade, and a reference point carried by said plate adapted to sweep the scale of the sleeve when the latter is rotated.

6. In a height gage including a vertical column and a pair of members mounted on the column in encircling relation thereto and spaced vertically from one another, said members having threaded portions thereon reversed in direction as to one another, means for holding said members from rotation relative to the column and for locking one of said members to the column

against movement therealong, an internally threaded coupling sleeve extending between said members and so threadedly engaged therewith that upon rotation of the sleeve in one direction the members are drawn relatively toward one another and upon rotation of the sleeve in the opposite direction the members are drawn relatively away from one another, a plate carried by one of said members and projecting toward the other member in spaced overlapping relation to the coupling sleeve, said plate having a vertical scale calibrated to measure the vertical distance of travel of the members toward and away from one another, a pointer carried by the other member and positioned with respect to the scale on the plate so as to indicate on the scale the distance of travel of the two members toward and away from one another, an exposed circular scale extending around the sleeve, and a reference element carried by the plate and cooperating with the scale on the sleeve for indicating the distance of travel of the two members toward or away from one another when the sleeve is angularly adjusted less than a complete revolution.

7. In a height gage including a standard and a supporting base therefor, a member encircling the standard and movable therealong, means for fixing said member to the standard to hold the member against relative movement thereon, a second member encircling the standard and movable therealong, a scriber element projectionably carried by the second member, said members having threaded portions thereon reversed in direction to one another, a rotatable sleeve encircling the standard and having threaded portions engaging the threaded portions on the two members such that upon rotation of the sleeve in one direction the two members are drawn toward one another and upon rotation in the opposite direction the two members are separated from one another, one of said members carrying an exposed graduated scale extending in substantially parallel relation to the standard, a pointer carried by the other member adapted to sweep the scale upon movement of the members toward or away from one another, a graduated scale carried on an exterior surface portion of the sleeve and extending substantially therearound, and a reference point carried by one of said members adapted to sweep the scale on the sleeve as the latter is rotated.

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