April 15, 1952 D. E. STAINTON 2,592,758

WEDGE PARALLEL GAUGE

Filed Feb. 24, 1948 2 SHEETS—SHEET 1

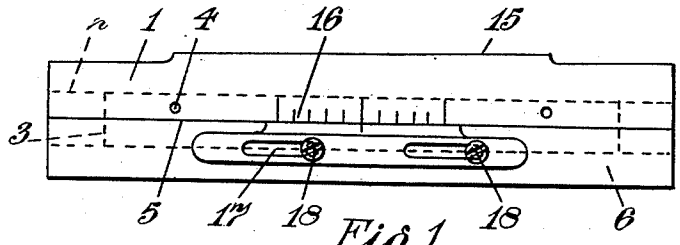


Fig. 1.

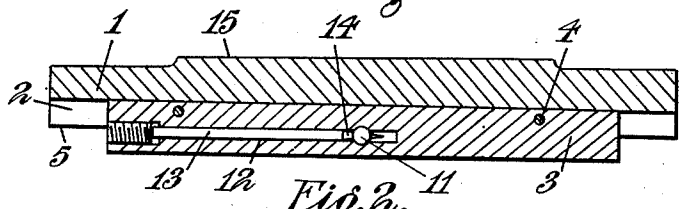


Fig. 2.

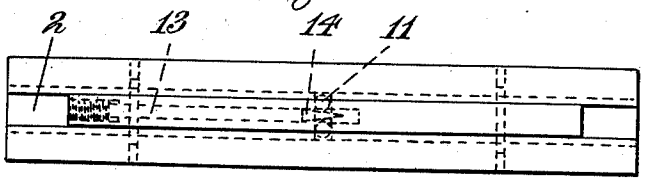


Fig. 3.

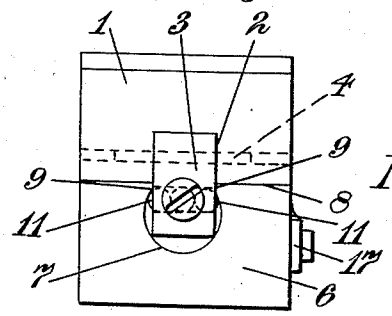


Fig. 4.

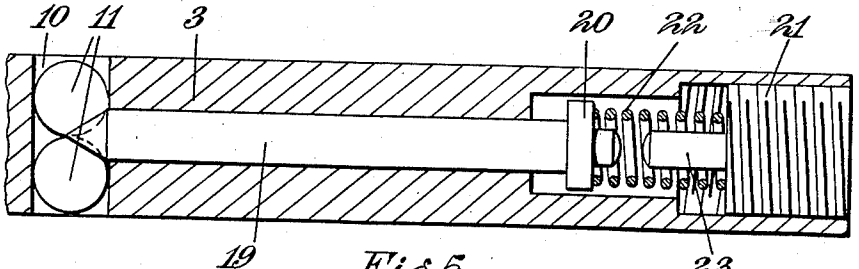


Fig. 5.

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WEDGE PARALLEL GAUGE

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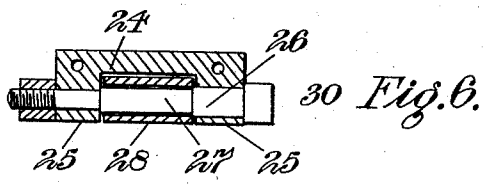


Fig. 6.

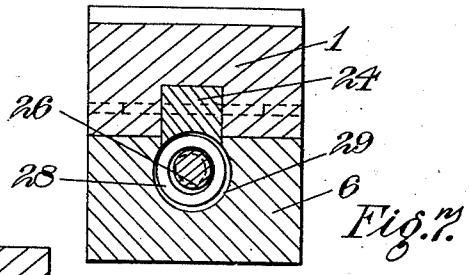


Fig. 7.

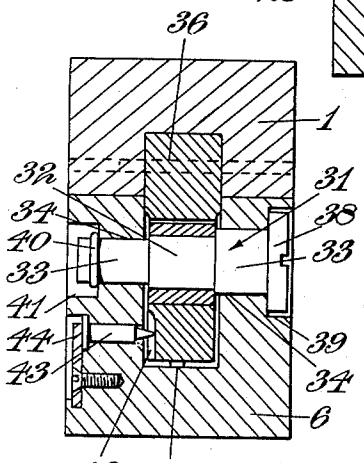


Fig. 8.

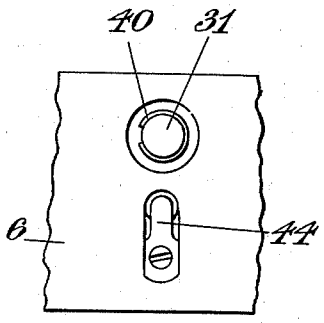


Fig. 9.

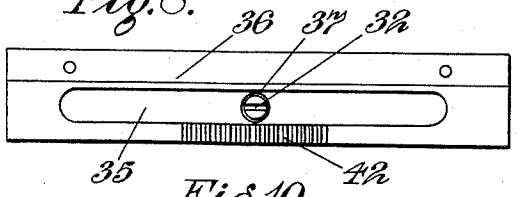


Fig. 10.

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UNITED STATES PATENT OFFICE

2,592,758

WEDGE PARALLEL GAUGE

Dudley Ernest Stainton, Rickmansworth, England

Application February 24, 1948, Serial No. 10,327
In Great Britain February 8, 1944

Section 1, Public Law 690, August 8, 1946
Patent expires February 8, 1964

3 Claims. (Cl. 33—162)

1

This invention relates to adjustable measuring and/or gauge blocks and adjustable parallels and/or adjustable laps (hereinafter referred to as gauges) or like devices of the type comprising a pair of elements having parallel gauging faces and co-operating surfaces inclined to said parallel faces whereby relative movement of the elements along the inclined surfaces causes variations in the distance between the parallel faces.

An object of the present invention is to provide improved adjustable gauges of the type above set forth whereby the elements may be locked in their adjusted positions.

According to the invention in a gauge or like device of the type set forth, means are provided for creating a force adapted to draw the elements together whereby a frictional locking effect between the inclined surfaces is produced adapted to maintain and/or lock the elements in their adjusted positions.

It is preferred to provide the elements with tongue and groove aligning means, the tongue being utilised to support the locking means.

The locking means may comprise wedge means adapted to cause the force producing the friction lock.

The wedge means may comprise balls located in a transverse groove in the tongue and engaging inclined surfaces of the groove, means such as a coned rod being provided for separating the balls to set up the locking effect.

According to an alternative arrangement the wedge means may comprise an eccentric which may be movable about an axis arranged longitudinally or transversely of the elements.

In the accompanying drawings:

Figure 1 is an outside view of a gauge according to the invention,

Figure 2 is a longitudinal section of the upper element and tongue showing one form of locking and/or retaining means,

Figure 3 is an inverted plan of Figure 2,

Figure 4 is an end view of the gauge to a larger scale,

Figure 5 is a view of a modification of the locking and/or retaining means,

Figure 6 is a longitudinal section of an eccentric form of locking means,

Figure 7 being a cross section of Figure 6,

Figure 8 is a cross section of a modified form of the eccentric locking means,

Figure 9 is a part outside view of the gauge according to Figure 8, and

Figure 10 is a longitudinal view of the tongue according to Figure 8.

In carrying the invention into effect according to one convenient mode by way of example,

2

see Figures 1 to 4, the upper element 1 is provided with a centrally located groove 2 in which a tongue 3 is secured by pins 4 or other suitable fastening means. The tongue 3 projects beyond the inclined face 5 and is somewhat shorter than the element 1.

The lower element 6 is provided with a centrally located groove 7 in its inclined face 8. This groove 7 in cross section may be of truncated circular form as shown, or may be of dovetailed or undercut shape located to provide bearing surfaces 9, for a sliding fit engagement of the tongue 3 of the upper element. Such engagement of the tongue and surfaces 9 maintains the elements in alignment.

The lower part of the tongue is free of the surface of the groove 7.

At a convenient position in its length the projecting part of the tongue 3 is provided with a transverse hole 10 in which two balls 11 are located. A longitudinal bore 12 is provided in the tongue 3 and extends into the hole 10. The axis of the bore may be somewhat above the axis of the hole 10. The bore 12 is adapted to receive a cone pointed plunger 13, the cone point 14 seating between the balls 11. The outer end of the plunger is enlarged and threaded to engage a tapped bore in the tongue. By manipulation of the plunger 13 by a screw driver or the like the balls 11 may be moved outwardly to press on the walls of the circular or other shaped recess and provide a locking effect. In their locking action the balls 11 tend to ride along the inclined faces of the recess and set up a force which draws the elements together providing a frictional lock.

On slacking the plunger 13 the elements may be moved relatively to one another.

The provision of the co-operating tongue and groove formations maintain the elements of the gauge in longitudinal alignment, while the lock provided by the engagement of the balls with the groove, retain the elements in their adjusted relation, prevent their separation and their movement from the adjusted position.

The upper element 1 may be provided with a lapped facet 15 and is provided with a scale 16 appropriate to the nominal height of the gauge. Co-operating with the scale is an adjustable zero plate 17 on the lower element, such plate being marked with a zero line or end zero lines or with a vernier scale. The plate 17 is slotted for adjustment by screws 18 to compensate for wear of the surfaces of the elements.

The scale 16 may be on the lower element and the adjustable zero plate mounted on the upper element.

Instead of a positive thrust by the plunger, a

resilient thrust may be provided. Thus the plunger 19 (Figure 5) may be provided with a collar 20 between which and a grub screw 21 a spring 22 is located so that by screwing up the grub screw the tension of the spring 22 is increased to provide the resilient locking effect. The grub screw 21 may be provided with a pin 23 adapted to engage the end of the plunger should a positive locking effect be required.

Where a resilient locking is provided, a release plunger may be provided in a bore extending the other side of the balls and adapted to engage the end of the cone point or a pin extending therefrom.

According to a modified arrangement the wedging action may be obtained by eccentric means. Thus referring to Figures 6 and 7 the tongue 24 is provided with spaced apertured bosses 25, forming bearings for a longitudinally extending spindle 26 having an eccentric boss 27 on which a roller 28 is mounted.

The roller 28 is located in the circular groove 29 in the lower element with a slight clearance.

The spindle 26 is provided with a head 30 having a slot in line with the maximum throw of the eccentric 27 whereby the spindle may be turned by a screw driver.

The end of the spindle 26 is threaded to receive a blind or other suitable retaining nut. When using a blind nut such may be provided with a slot for a screw driver so that the eccentric may be operated from either end of the spindle.

On rotation of the eccentric 27 the roller 28 is engaged with the upper surface of the groove 29 thus drawing the upper element 1 on to the lower element and causing frictional locking of the elements.

According to a further modification, see Figures 8, 9 and 10, the spindle 31 having the eccentric boss 32 is located transversely of the gauge and has bearing portions 33 seated in apertures 34 in the lower element 6. The spindle 31 extends through a longitudinal slot 35 in the tongue 36 and carries the roller or bush 37. The spindle is provided with a flat head 38 seating in a recess 39 in the element 6, such head being provided with a cross slot for engagement by a screw driver. The spindle is retained in position by a circlet 40 engaging a groove in the end of the spindle which projects into a recess 41 in the element 6.

On rotation of the eccentric 32 the bush 37 engages the lower face of the slot 35 and thus draws the elements 1 and 6 together producing a friction lock.

Instead of a bush or roller 37 an elongated element or shoe may be provided affording an extended surface contact with the surface of the slot 35. A flat spring element may be located between the shoe and the surface of the slot 35.

Instead of a slot in the head 38, the head may be shaped to provide a lever element for operating the eccentric 32.

The lower face of the tongue 36 may engage a projection or facet 36a on the adjacent wall of the groove to prevent springing of the tongue when clamping.

While the locking and retaining means according to the invention is of particular advantage to a gauge in which no means are provided for positively locating the elements in their adjusted position, the invention may be applied to a gauge having locating means of the character described in my British specification No. 564,065.

Thus referring to Figures 8 and 10, on the side

(or other position) of the tongue 36 a series of regularly spaced teeth or serrations 42 may be provided which conform to regular increments or divisions of the nominal height of the gauge. The teeth 42 are adapted for co-operation by a spring-pressed locating pin 43 which slides in an aperture in the lower element 6. The spring 44 which engages the head of the pin 43 is located in a recess in the face of the element 6.

According to a modification of the form shown in Figure 8, the tongue 36 may be provided with a pair of side grooves extending lengthwise thereof and adapted to be engaged by claws formed integrally on the element which seat on the eccentric.

In all forms of the invention an adjustable zero or vernier plate may be provided on one element co-operating with a scale on the other element.

The various faces of the parts may be hardened and ground and lapped as may be necessary and the inclined faces of the elements may be provided with air break grooves.

I claim:

1. A precision adjustable slip gauge comprising a pair of elements of wedge shape cooperating to provide parallel gauging faces and relatively slidable on their inclined face to vary the distance between said parallel faces, one element having a longitudinal aligning tongue projecting from its inclined face said tongue having parallel side faces, the other element having a longitudinal groove extending throughout its inclined face, said tongue being located in said groove and slidably engaging faces of said groove, said groove having transversely inclined surfaces, said tongue having a transverse hole, and a longitudinal bore intersecting said hole, and locking means for locking the elements against relative movement comprising a pair of balls located in said hole and engaging said inclined surfaces, a rod located in said bore and having a coned end located between and engaging said balls and means for adjusting the rod longitudinally in said bore to cause separation of the balls and movement thereof down said inclined surfaces of said bore.

2. A precision adjustable slip gauge as claimed in claim 1, and having a screwed pin plug aligned with said rod said plug being mounted in a threaded recess in the tongue, a coiled spring located between the plug and the rod and adapted on being compressed by an adjustment of the plug to permit said pin to engage said rod and cause the coned end of the rod to separate the balls and provide the locking effect.

3. A precision adjustable slip gauge as claimed in claim 1, wherein said groove is circular in cross section and the balls are located to engage the upper parts of the circular groove.

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