Feb. 2, 1954

L. R. PISTOLES

2,667,700

GAUGE

Filed Oct. 19, 1946

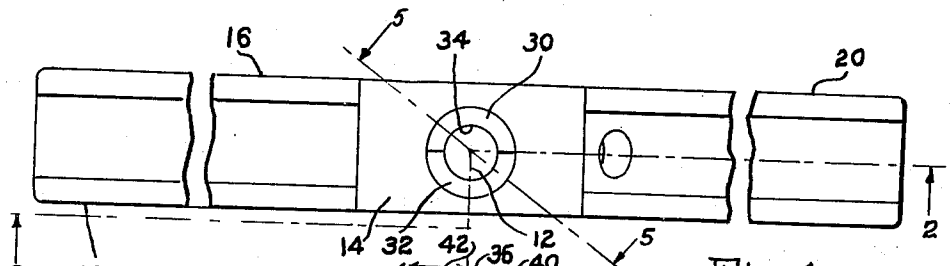


Fig 1

Fig 2

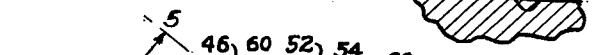


Fig 3

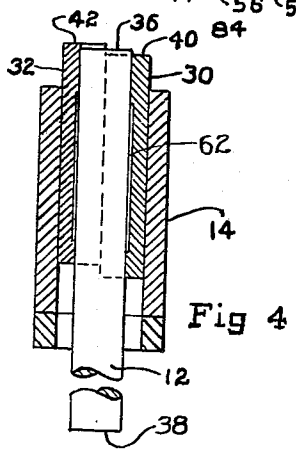


Fig 4

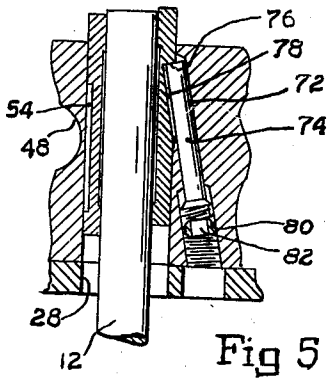


Fig 5

INVENTOR:
LAMBERT R. PISTOLES

BY J. P. Keiper

ATTORNEY

Patented Feb. 2, 1954

2,667,700

UNITED STATES PATENT OFFICE

2,667,700

GAUGE

Lambert R. Pistoles, Wilmington, Del.

Application October 19, 1946, Serial No. 704,347

10 Claims. (Cl. 33—169)

1

This invention relates to flush pin gages, and more particularly to a gage adapted to be reset from time to time to render it adaptable to change in work pieces requiring gaging, or a change in the permissible tolerance, or both.

Heretofore, in flush-pin gages of the general type referred to, it has been the practice to prepare a new gage for each new dimension requiring gaging, and to discard the gage upon any change, either in the gaged dimension or a change in tolerance.

It is, accordingly, an object of this invention to provide a flush-pin gage, which may be readily set to provide any desired tolerance, and dimension to be gaged, and which may be readily varied, but securely locked, once set.

Another object of the invention is to provide a suitable flush-pin gage which is easily constructed, of light weight, and capable of withstanding the wear and tear of long usage.

Still another object of the invention is to provide a gage which is rugged, and in which fine gradual adjustment may be readily effected and subsequently securely locked.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood, however, that the drawings are for illustrative purposes only and are not designed as a definition of the invention, reference being had to the appended claims for this purpose.

In the drawing, wherein like reference characters indicate like parts,

Figure 1 is a top plan view of a gage constructed in accordance with the invention.

Fig. 2 is a side elevation, with a portion thereof shown in section, the section being taken on the line 2—2 of Fig. 1.

Fig. 3 is a partial section taken substantially on the broken line 3—3 of Fig. 2.

Fig. 4 is a section taken substantially on the line 4—4 of Fig. 2; and

Fig. 5 is a section taken on the lines 5—5 of either Fig. 3 or 1.

Referring to the drawings and more particularly to Figs. 1 and 2, there is illustrated a gage having a main frame member 10, having a slidable gage pin 12 mounted therein. The frame member may be of any suitable length, depending on the type of work to which the gage is to be applied. As shown, however, the frame comprises a central pin holding portion 14, with extending arms 16 and 20. The under face of the

2

frame is finished in a plane hardened surface 24, and if it be desirable to form the frame of light metal such as Duraloy, a hardened steel plate 26 may be affixed to the under side to provide a work engaging plane surface. The arm portions are channeled as at 25 to render the frame light the channeling being effected by milling or any other suitable method.

The central pin holding portion of the frame is provided with a central bore 28, into which are positioned a pair of half sleeves 30 and 32, forming a central aperture 34 within which the round gage pin 12 is free to move. The upper end 36 of the gage pin is provided with a transverse finished surface perpendicular to the axis of the pin, and the lower end is finished with a work engaging surface 38, likewise perpendicular to the pin axis. Each of the half sleeves 30 and 32 are provided at their upper ends with flat finished surfaces 40 and 42 respectively, arranged perpendicular to the axis of the gage pin. By arranging the surfaces 40 and 42 in stepped relation to each other with an axial offset equal to the tolerance desired to be maintained and by employing a pin of a length such that its upper end surface 36 lies midway between such stepped surfaces, when the gage pin rests on an accurately fabricated work piece, the gage operator can quickly ascertain by "feel" either by finger touch or finger nail, the mid position of the pin end 36, between the stepped surfaces 40 and 42. The operator can likewise readily determine, with respect to work pieces fabricated within the tolerance limit, as to whether the pin end lies between a position flush with one or the other of the stepped surfaces, by feel.

In order to render such a gage adaptable for gaging differing work pieces, the half sleeves are adjustable in the bore 28, and rigidly held in any adjusted position by the locking bushing and nut 44 and 46, respectively, riding in a transverse bore 48, intersecting bore 28. Such locking elements are cylindrical and each is provided with a wedge surface 50 and 52 adapted to bear against a flat 54 in the side of each half sleeve. The wedges are clamped by a machine screw 56 with its head seated upon a shoulder 58 in the bushing, and having its screw threaded shank threaded in a corresponding threaded aperture 60 in the locking nut.

The half sleeves may be formed from steel tube cut lengthwise into halves and may be subsequently ground to size and true circular bore while the finished cut faces of each half are brazed together. Thereafter, the halves may be

separated by fusing the brazing bond. The bore 34 will be such as to provide sufficient sliding clearance for the pin, and the innner walls of the half sleeves may be undercut as at 62 to provide a minimum of friction to movement of the pin.

The movement of the pin is restricted to any desired range by milling or otherwise providing a transverse slot 64 in the side thereof, for engagement with the tip end of a set or guide screw 66 angularly inserted in the frame. The half sleeves are likewise limited in their movement within the bore by the length of the recesses 68 and 70 in the mating edges of the half sleeves, on the side opposed to the wedge flats 54.

In order to assist in the adjustment of the half sleeves and to hold them in adjusted position momentarily prior to wedging action of the blocks, a screw and pin arrangement extending through inclined bores 72 in the frame, extending into the bore 28 are provided. The pins 74 bear against a shoulder 76 formed in each half sleeve at the end of an inclined groove 78. By adjustment of the screw 80 which may have a hexagonal wrench receiving recess 82, the pin will be caused to accurately position its respective sleeve pending wedging and final securing.

In operation, it will be appreciated that a range of adjustment of the pin is provided by the length of the slot 64, and that several pins of varying length may be provided for facilitating gaging of widely differing work pieces. To set the gage, a standard work piece may be employed, the gage frame faces placed against surfaces A, A of the work piece and the pin allowed to bear against the recess surface B of the work piece. The half sleeves are then positioned with their surfaces 40 and 42 in stepped relation, the height of the step being determined by the tolerance to be allowed, with the pin surface midway between. After the parts are so positioned, such adjustments being facilitated by the adjustment of screws 80 and pins 74, the locking bushing and nut 44 and 46 are tightened and then the gage is ready for use. Once the gage is set for a certain gage dimension, a plate 84, bearing indicia showing the gage setting engraved thereon, may be screwed in place upon the side face of the center portion of the frame and covering the locking screw 56, to prevent alteration of the gage setting so long as the plate remains so affixed.

While a simple form of gage has been illustrated which is adapted to gage depth in work pieces of considerable breadth, the gage being sufficiently rigid, when extended to a length of 24 inches, or more, it will appear that the frame may take other shapes, as may be required by the shape of the work pieces requiring gaging, and the surfaces between which contact may be established.

Although a single embodiment of the invention has been illustrated and described, it is to be understood that the invention may be embodied in various arrangements. Various changes may be made, without departing from the spirit of the invention as will be apparent to those skilled in the art and reference should therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In a flush-pin gage, a frame having a work engaging face, an aperture in the frame extending perpendicular to said face, a pair of semi-cylinder sleeve members positioned in said aperture, and each having a finished end surface perpendicular to the common sleeve axis, means for gradually moving each of said members axially of said aperture, a gage pin reciprocable within the sleeve formed by said semi members, and having a work engaging end at one end and a finished end face at the other end adapted for flush comparison with said sleeve member end faces, means for limiting the free movement of said pin within said sleeve, and transverse wedge means for locking said sleeve members in fixed position with the finished ends of said sleeve members in stepped relation to each other, the axial length of the step being equal to the tolerance desired, and in stepped relation to the end of said pin with the pin end midway between said sleeve member ends, when the pin is in accurate gaging position.

2. In a flush-pin gage, a frame, having a work engaging face, an aperture in the frame extending perpendicular to said face, a pair of semi-cylinder sleeve members positioned in said aperture and each having a finished end surface perpendicular to the common sleeve axis, a gage pin reciprocable within said sleeves, and having a work engaging end and a finished end face at the other end adapted for flush comparison with said sleeve end faces, means for limiting the free movement of said pin within said sleeves, and means for securing said sleeves within said frame, in fixed position with the finished ends of said sleeves in stepped relation to each other, the axial length of the step being equal to the tolerance desired, and in stepped relation to the end of said pin, with the pin end midway between said sleeve ends, when the pin is in accurate gaging position.

3. In a flush-pin gage, a frame having a work engaging face, an aperture in the frame extending perpendicular to said face, sleeve means freely slidable within said aperture, a pin slidable in said sleeve means, flush-pin gage faces on the end of said pin and sleeve means, means for at will locking said sleeve means against movement in said frame, screw threaded means within said frame adapted to gradually shift said sleeve means within said frame, and means to limit the movement of said pin to a range in the order of the diameter of the pin.

4. In a flush-pin gage, a frame having a work engaging face, an aperture in the frame extending perpendicular to said face, sleeve means freely slidable within said aperture, a pin slidable within said sleeve means, flush-pin gage faces on the end of said pin and sleeve means, transverse wedge means arranged in said frame for at will locking said sleeve means against movement in said frame, and means to limit the movement of said pin to a range in the order of the pin diameter.

5. In a flush-pin gage, a frame having a work engaging face, an aperture in the frame extending perpendicular to said face, sleeve means freely slidable within said aperture, a gage pin slidable within said sleeve means, flush-pin gage faces on the end of said pin and sleeve means, and transverse wedge means arranged in said frame for at will locking said sleeve means against movement in said frame.

6. In a pin gage, a frame having an aperture therein and a gaging face, semi sleeves arranged in said aperture having gage flats on one end, a gage pin slidably mounted within said semi sleeves, and having a flat indicating surface on one end adapted to cooperate with said gage flats, means for securing said semi sleeves with their

flats axially spaced by a desired tolerance dimension and with the mid plane between said flats flush with said pin end when the pin is in gaging dimension position.

7. A flush pin gage comprising a frame, having an aperture therein, three relatively movable members in said aperture having end faces adapted for flush comparison with one another, two of said members being adapted to be fixed with respect to said frame with their end faces in stepped relation in accordance with a tolerance dimension and with the intermediate plane midway between said stepped end face aligned with the plane assumed by the end face of the third member when positioned at the gaging dimension.

8. In a flush-pin gage, a frame, a gage surface thereon, an aperture in said frame, half sleeve elements in said aperture, a gage pin slidable within said half sleeve elements, means for limiting movement of said pin and sleeves to retain said elements and pin within said frame, flush-pin gaging surfaces on the ends of said pin and elements, means for gradually moving either of said elements relative to the other to create a step relation between the ends of said elements equal to the gage tolerance desired, and transverse wedge locking means for securing said elements rigidly in place.

9. In a flush-pin gage, a frame, a gage surface thereon, an aperture in said frame, half sleeve elements in said aperture, a gage pin slidable within said half sleeve elements, means for limiting movement of said pin and sleeves to retain said elements and pin within said frame, flush-pin gaging surfaces on the ends of said pin and elements, means for gradually moving either of said elements relative to the other to create a step relation between the ends of said elements equal to the gage tolerance desired, transverse

wedge locking means including a screw threaded part for securing said elements rigidly in place, and means adapted to bear indicia for indicating the gage setting secured to said frame in a position blocking access to said threaded part.

10. A flush pin gage comprising a frame, having an aperture therein, three relatively movable members in said aperture, two of said members having end faces adapted for comparison with a gaging face of the third, said two of said members being adapted to be fixed with respect to said frame, with their end faces in stepped relation in accordance with a tolerance dimension and with the intermediate plane midway between said stepped end face aligned with the plane assumed by the gaging face of the third member when positioned at the gaging dimension.

LAMBERT R. PISTOLES.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,253,680	Giern et al.	Jan. 15, 1918
1,287,885	Clark	Dec. 17, 1918
1,414,750	Roberts	May 2, 1922
1,555,632	Brown	Sept. 29, 1925
1,602,645	Buckingham	Oct. 12, 1926
1,667,809	Kershaw	May 1, 1928
2,363,165	Vierling	Nov. 21, 1944
2,401,085	La Valley	May 28, 1946
2,466,185	Stoothoff	Apr. 5, 1949

FOREIGN PATENTS

Number	Country	Date
74,645	Switzerland	Mar. 16, 1917.

OTHER REFERENCES

Publ: Machinery, page 911, July 1926.