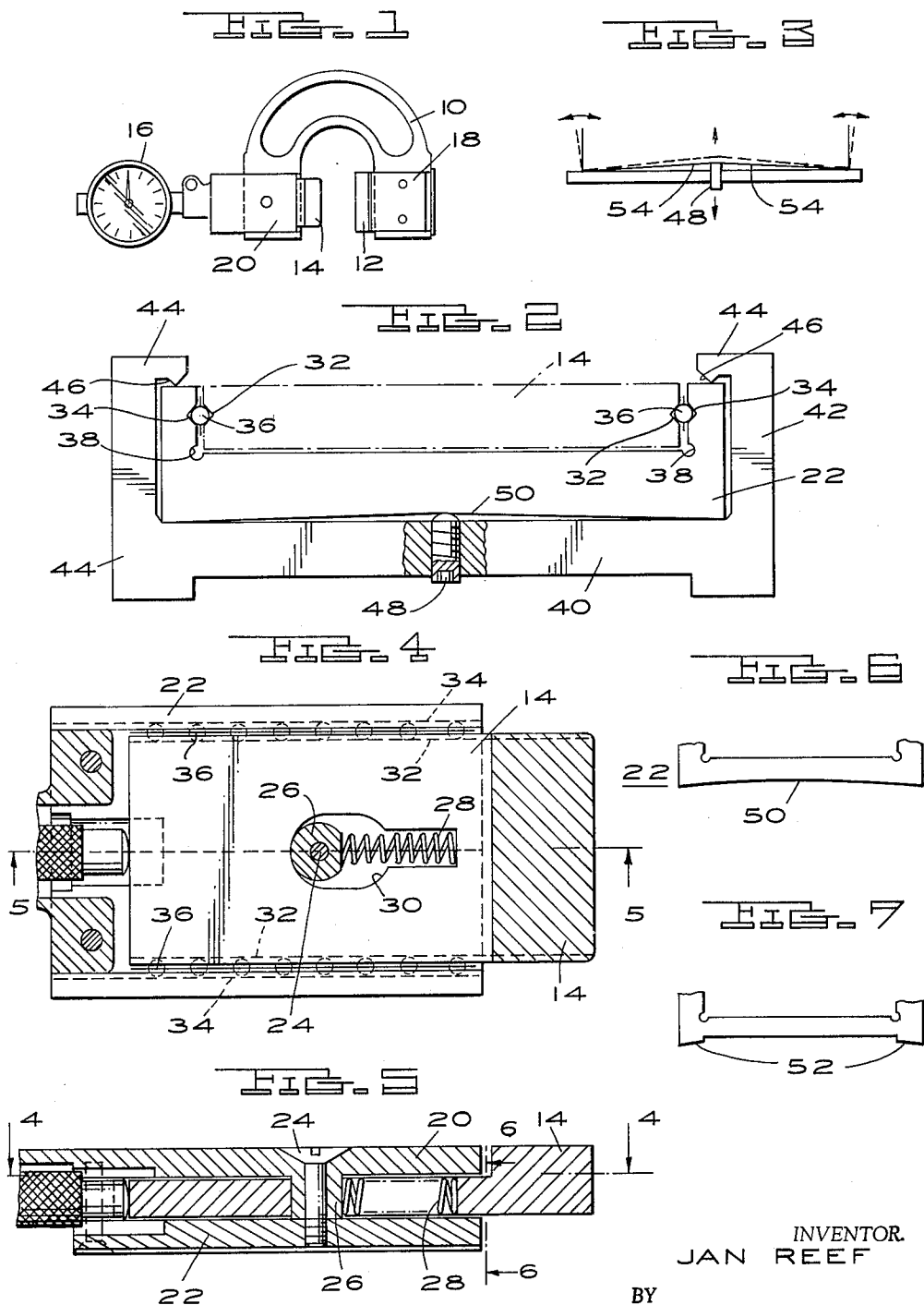


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METHOD OF ASSEMBLING A SLIDABLE BLADE  
AND BALL BEARINGS WITHIN A GUIDE  
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**METHOD OF ASSEMBLING A SLIDABLE BLADE  
AND BALL BEARINGS WITHIN A GUIDE**  
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This invention relates to an improved process of and an improved fixture for assembling a gauge which comprises a slideable blade having a ball bearing mounting within a channel shaped guide.

An object is to provide an improved process whereby a gauge as hereinabove defined may be quickly and accurately assembled, and where the construction is such that the side walls of the guide channel are tensioned toward the blade and exert a pressure upon the opposite edges of the blade through the ball bearings.

Another object is the provision of a process as hereinabove described wherein the gauge when assembled is such that the side walls of the channel guide maintain such a pressure upon the blade through the ball bearings, which are interposed between the side walls of the guide and opposite edges of the blade, that the blade is supported for free slideable movement but is held against undesirable play or wobble.

Another object is the provision of a fixture to carry out the process set forth, which fixture comprises a body which is channel shaped in cross section to receive within the channel shape of the body a channel shaped guide, and wherein said fixture includes means operable to spread the side walls of the guide apart sufficiently to permit insertion of ball bearings between said guide side walls and adjacent edges of a blade slideably supported within the guide between such side walls, and which means may then be released to permit the side walls of the guide to return to their original position to exert a pressure upon the ball bearings urging them against the opposite edges of the slideable blade.

A meritorious feature resides in the provision of a fixture body, as hereinabove stated, wherein the two side walls of the channel shaped body are provided with inwardly projecting flange portions at their free edges, which flange portions overhang the outer edges of the side walls of a channel guide mounted within the body.

A further meritorious feature is the provision means in the form of a screw element which extends through the base of the channel body and is operable to exert a pressure upon the base of the channel guide to spread the side walls of the guide channel outwardly to permit insertion of ball bearing elements between the side walls of the guide channel and the slideable gauge blade mounted within the channel guide.

Other objects, advantages and meritorious features will more fully appear from the following specification claims and accompanying drawings wherein:

FIG. 1 is a plan of a gauge adapted to be assembled by the process and upon the fixture herein described;

FIG. 2 is a side elevation partly broken away of a fixture body within which a channel guide and a slideable gauge blade are mounted in the assembled relation;

FIG. 3 is a schematic illustration of a carrying out of the process of assembly herein described, showing the bottom of the channel guide beveled on its underside;

FIG. 4 is a cross sectional view taken on the line 4-4 of FIG. 5;

FIG. 5 is a cross sectional view on the line 5-5 of FIG. 4;

FIG. 6 is an end elevation of a channel guide with the underside of the bottom of the guide formed on a radius; and

FIG. 7 is an end elevation of a channel guide with its bottom undercut as shown.

The guide itself shown in FIG. 1 is more particularly described in my copending application Serial Number 369,253 filed May 21, 1964. This gauge comprises a U-shaped frame 10. Opposite ends of the two arms of the frame are provided, as more specifically illustrated in the companion case, with channel guideways within which blades 12 and 14 are mounted in opposition to each other. Blade 12 is adjustably supported within its mounting for adjustment to various fixed positions. Blade 14 is slidably adjustably supported within its mounting and is coupled with a dial indicator 16. The movement of the slideable blade 14 within its channel guide is registered on the dial indicator. Both blades are protected by cover plates. A cover plate 18 extends over the blade 12. Cover plate 20 extends over the blade 14.

This case is directed solely to the fixture within which the parts of the gauge are assembled and to the process of such assembly, but for purposes of clarification it is noted that blade 14 is carried by a channel guide 22. The cover plate 20 which protects blade 14 is held by a screw 24 as shown in FIG. 5. This screw extends through such cover plate and through a boss 26 formed on the cover plate and into the base of the channel guide 22. This screw is shown as extending through the boss on the cover plate in FIGS. 4 and 5.

A spring 28 is illustrated as bearing against a flattened side of the boss in FIG. 4 and as disposed within a cut-out 30 of the blade. This cut-out is of a keyhole shape to accommodate the spring and also the boss as shown.

The opposite edges of the blade 14 are provided with grooves 32 indicated by dotted lines in FIG. 4 and the inner faces of the side walls of channel guide are indicated in the same figure as complementary grooves indicated by numeral 34. The ball bearings which are mounted between such grooves are indicated by the numeral 36. These features are all more particularly disclosed in my copending application hereinabove referred to which is directed to the gauge itself.

The channel guide within which the blade 14 is mounted is shown as having a bottom portion and side wall portions. These two portions are separated by cut-out channels 38 as shown in FIG. 2, so as to increase the flexibility of the side walls. The gauge is formed of resilient material, such as suitable steel, which will permit the side walls in the initial formation of the guide channel to be tensioned to a desired determined position. The position is such that when ball bearings 36 are interposed between the side walls and the adjacent edges of the blade, the blade will be held against any undesirable play but will be permitted slideable movement within the channel guide. The amount of movement is very small, probably .0002 of an inch is all the adjustment that would be required.

In installing the slideable blade within the guide channel it has been found suitable to provide a fixture of the character shown in FIG. 2, which feature comprises a base portion 40 having opposite side walls 42 and 44. The free margins of these side walls are provided with inwardly projecting flange portions 44 which overhang the interior of the channel between the side walls as shown in FIG. 2. Each of these overhanging flange portions has a ridge 46 projecting downwardly and extending linearly of the portion.

These ridges are adapted to bear against the edges of the side walls of a guide channel mounted within the fixture which guide channel element is identified as 22. An adjustment screw 48 extends through the base of the fixture 40 and is adjustable to bear against the underside of the bottom of the channel guide 22 as shown in FIG. 2. In FIG.

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2 the underside of the bottom of the channel guide 22 is illustrated as formed on a radius 50. Such is shown in FIGS. 2 and 6. In FIG. 7 the underside of such channel guide is parallel to the top side but is undercut as will be noted by the projecting portions 52 at its sides.

In FIG. 3 the underside of this channel guide is formed on a bevel as indicated at 54. There are two beveled faces which intersect along the center line of the bottom of the guide and the dotted line shows the deflection, in substantial exaggeration, that would result from adjusting the screw 48 to exert an upper pressure on the underside of the bottom of the channel guide. It is apparent that the free margins of the side walls of the channel guide 22 would have to move slideably outwardly over the ridges 46 of the overhanging flanges 44 of the fixture body and such ridges therefore should not dig into the free edges of the guide channel but be formed to exert downward pressure thereupon.

In utilizing the fixture and carrying out the claimed process, a channel guide element 22 provided with a slideable blade element 14 is mounted within the channel shaped body of the fixture. The spacing between the side walls of the channel guide and the slideable blade of the gauge is such that it is too close for free insertion of the ball bearings, because it is desired that when the ball bearings are inserted the opposite side walls of the channel guide would exert a pressure thereupon sufficient to overcome any undesirable movement while permitting slideable movement of the blade in the functioning of the gauge.

To insert the ball bearings, the screw 48 is activated to exert a pressure upward on the bottom of the underside of the channel guide as shown in FIG. 2. This spreads the side walls of the channel guide slightly outwardly as shown in FIG. 3 and permits the ball bearings 36 to be inserted; upon the insertion of these ball bearings the screw 48 is backed off, the side walls of the guide channel under their normal tension move inwardly to take up for the spreading which had been imposed upon them and exert a pressure on the ball bearings holding them against the slideable blade. The guide channel 22 with its retained gauge blade now held in place by ball bearings is then removed from the fixture and ready for installing upon the gauge frame.

What I claim is:

1. That process of assembling a slideable blade and ball bearing mountings within a channel shaped guide for slideable movement thereon comprising, in combination, providing a channel shaped guide having inwardly tensioned side walls, mounting a blade within the guide channel between the side walls, spreading the free margins of the side walls apart, inserting ball bearings between opposed edges of the blade and the adjacent spread apart side walls, and following said insertion releasing the side walls to urge the ball bearings toward opposite edges of the blade.

2. That process of assembling a slideable blade and ball

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bearing mountings within a channel shaped guide for slideable movement thereon comprising, in combination, providing a channel shaped guide having inwardly tensioned side walls, mounting a blade within the guide channel between said side walls, spreading said side walls outwardly away from the adjacent opposed edges of the blade, inserting ball bearings between the spread apart side walls and the opposite adjacent edges of the blade, and following said insertion releasing said side wall from its spread apart position to hold the ball bearings toward opposite edges of the blade.

3. That process of assembling a slideable blade and ball bearing mountings within a channel shaped guide for slideable movement therein as defined in claim 1 characterized in that the side walls of the guide are so normally tensioned inwardly as to prevent free insertion of the ball bearings between said side walls and the opposite edges of the slideable blade, deflecting the side walls against the normal tension sufficiently to permit insertion of the ball bearing mountings between said side walls and opposed edges of the blade, and following such insertion, releasing such side walls from such deflecting pressure, so that their normal tension holds the ball bearing mountings against opposite side edges of the blade in such manner as to prevent undesired play while permitting slideable movement of the blade within the channel guide.

4. That process of assembling a slideable blade and ball bearing mountings within a channel shaped guide for slideable movement therein as defined in claim 1 comprising spreading the free margins of the channel shaped guide outwardly away from the opposed adjacent edges of the blade by exerting a pressure upwardly along the longitudinal median line against the bottom of the guide tensioning said bottom upwardly inwardly of the channel and thereby spreading the two opposite side walls of the channel apart and away from the adjacent margins of the blade sufficiently to permit insertion of the ball bearing mountings between said side walls and the opposite edges of the blade, releasing the upward pressure exerted against the bottom of the guide permitting the side walls to move toward each other under their normal tension holding the ball bearings mounted against opposite side edges of the blade in such a manner as to prevent undesired play while permitting slideable movement of the blade within the channel guide.

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