March 21, 1950 G. C. WEIS 2,501,148

UNIVERSAL CHECKING PLATE DEVICE

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FIG. 1

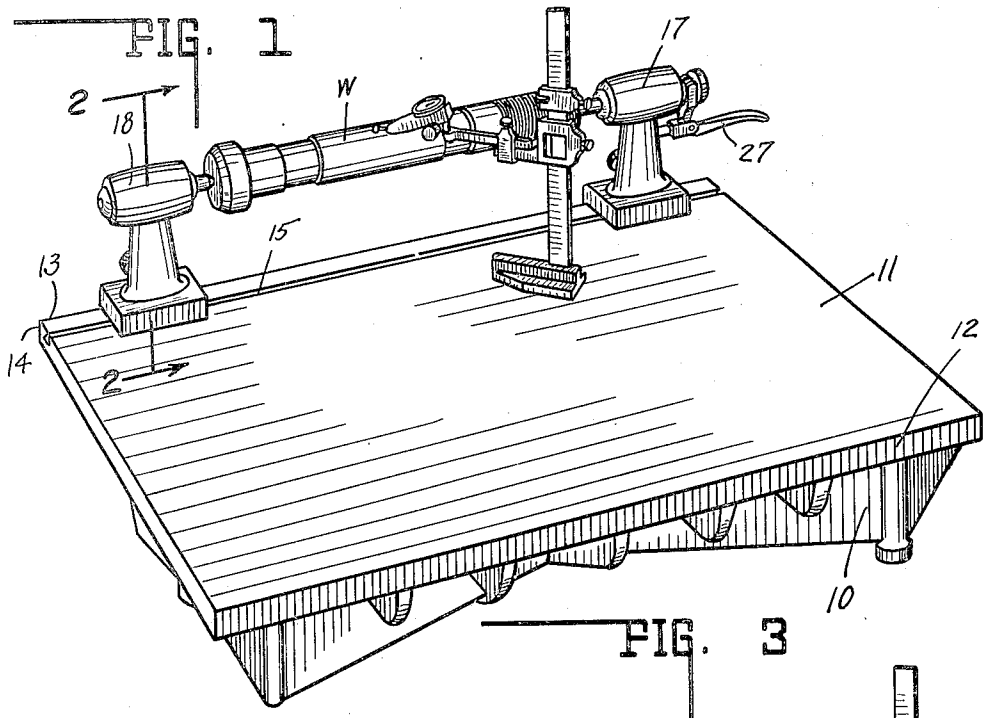

FIG. 3

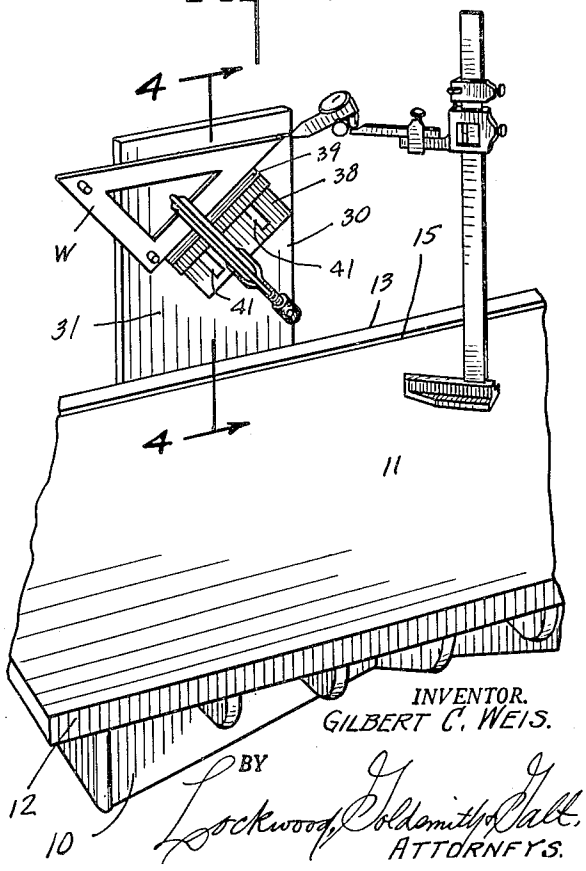

FIG. 2

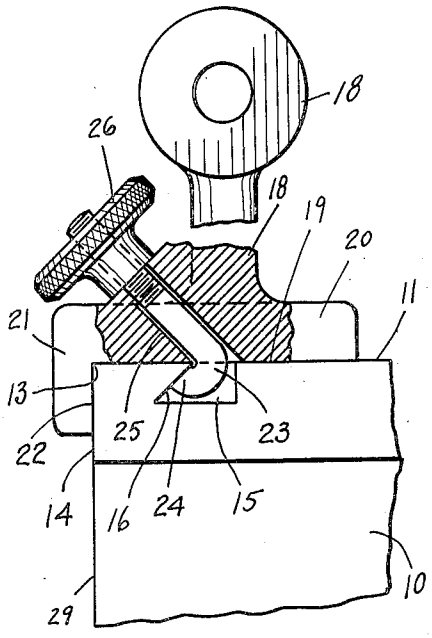

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FIG. 4

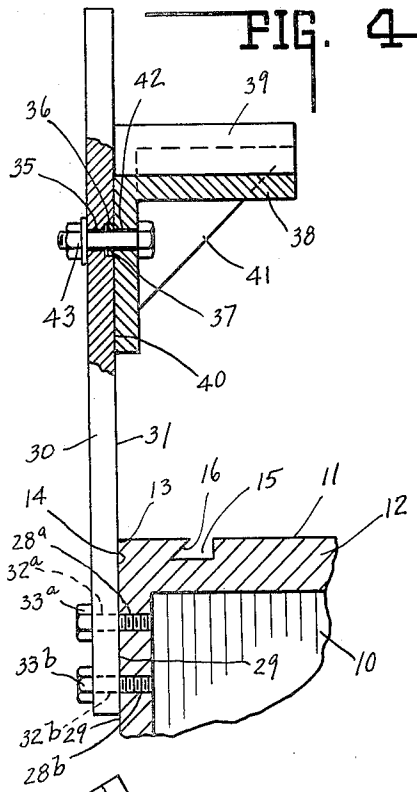
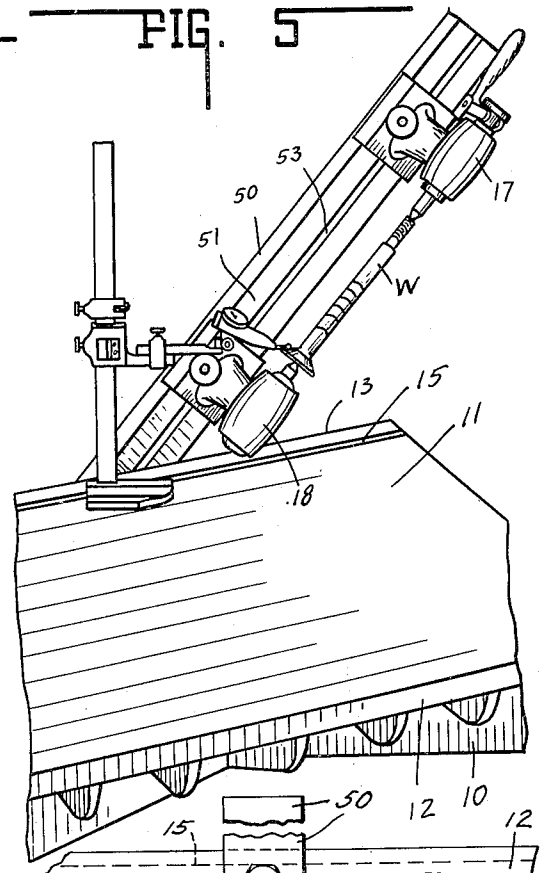


FIG. 5



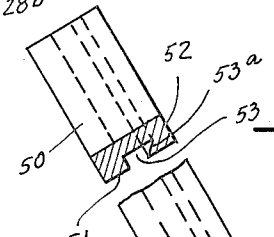


FIG. 6A

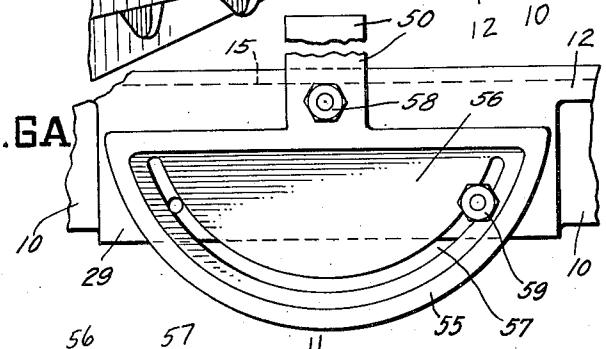


FIG. 6.

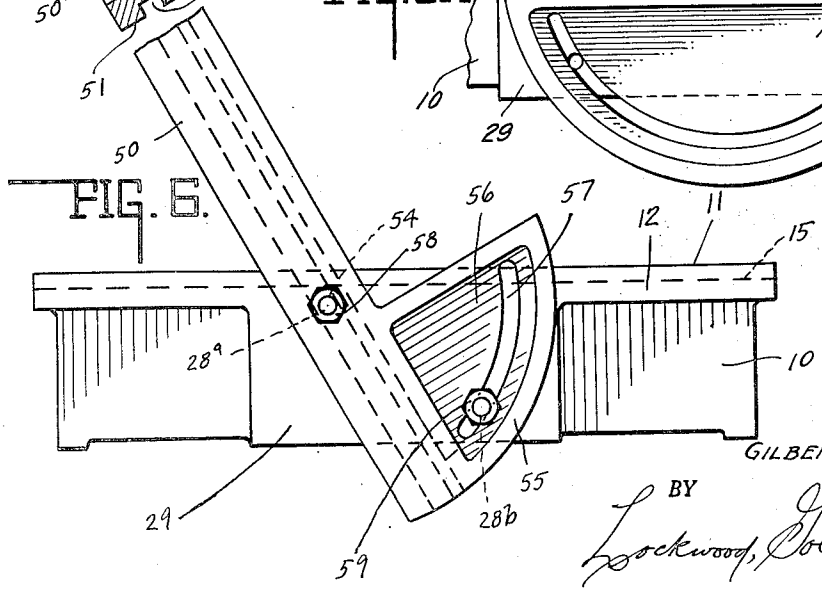


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FIG. 7

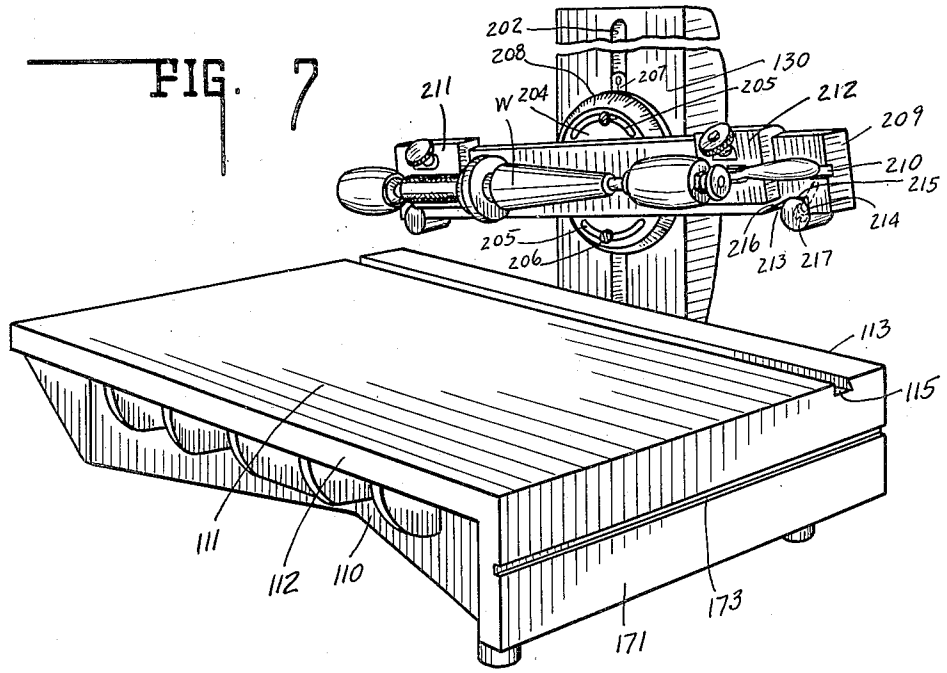
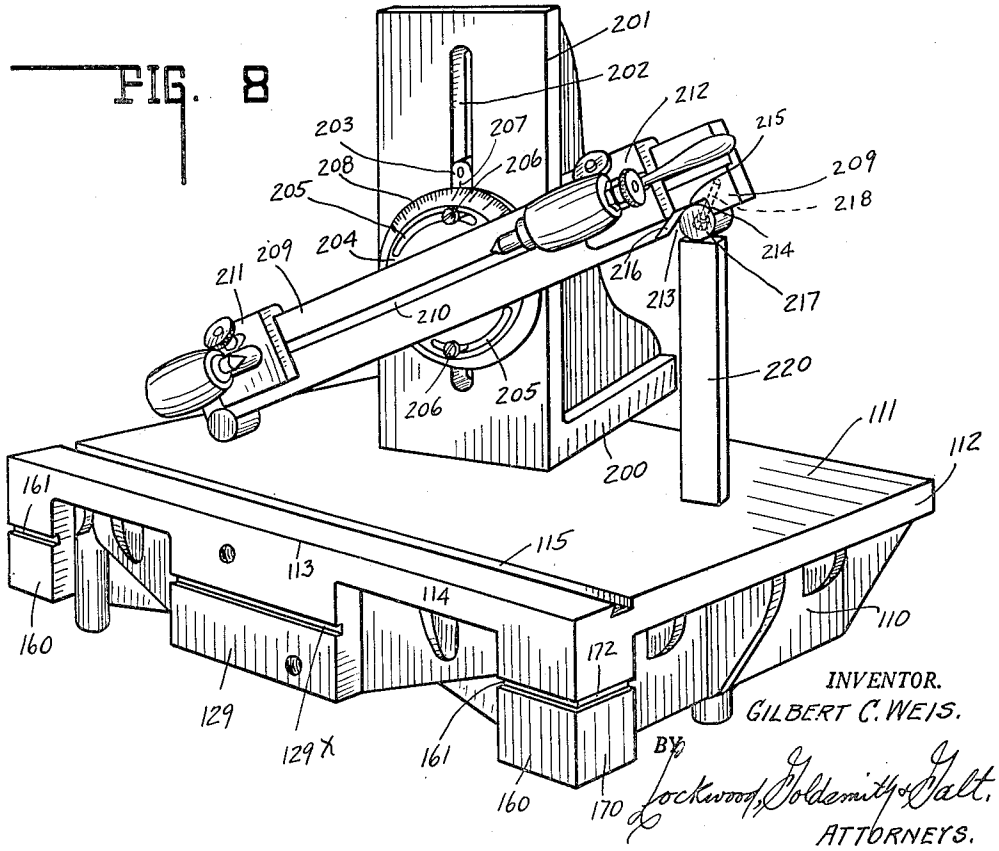


FIG. 8



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UNIVERSAL CHECKING PLATE DEVICE

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Application August 17, 1944, Serial No. 549,895

1 Claim. (Cl. 33—174)

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This invention relates to a surface or checking plate structure.

The chief object of the present invention is to provide such a structure which is adapted for substantially universal use, eliminates excessive wear and make available substantially the entire surface area of the plate proper for work reception.

One chief feature of the invention resides in providing an undercut anchoring channel or groove in the plate in juxtaposition and parallel to a side face exactly transverse to the work supporting face of said plate.

Another chief feature of the invention resides in providing a side face on said plate exactly transverse to the work supporting face thereof and arranging said side face for riser plate and like mounting thereon and at any desired inclination.

Still another feature of this invention resides in the tail and head stock centering units to be supported by said plate in coaxial alignment.

A further feature of this invention resides in the adjustable center bar.

Still a further feature of this invention resides in the angle plate and its mounting.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claim.

In the drawings:

Fig. 1 is a perspective view of the plate proper and aligned centering bearings applied thereto.

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1 and in the direction of the arrows.

Fig. 3 is a perspective view of the plate proper, a riser plate applied thereto, and an angle plate adjustably mounted upon the riser plate and inclined to the plate proper.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 3 in the direction of the arrows.

Fig. 5 is a perspective view of the plate proper, a center bar adjustably mounted thereon and inclined to the plate proper, and the aligned bearings mounted upon said center bar.

Fig. 6 is a rear elevational view of the center bar and plate proper connection.

Fig. 6A is a similar view of a semi-circular type of center bar.

Fig. 7 is a perspective view of another embodiment of the bed or base plate with riser plate and aligned bearing structures applied thereto.

Fig. 8 is a similar view of the same base plate

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from the opposite direction and with an angle plate and angle bar applied thereto.

In each of the figures of the drawings 10 indicates the base of a checking plate having the substantially perfect plane surface 11 on top 12. One edge 13 defines the upper end of side face 14 exactly at right angles to surface 11.

Parallel to face 14 and herein fairly close to edge 13 there is formed in the top 11 a channel or groove 15 which has one side undercut as at 16. This may take many forms, and if desired, said opposite side may be undercut, so the channel is keystone sectioned or T-shaped as desired.

A head stock bearing 17 and tail stock bearing 18 may be associated with the aforesaid as illustrated in Fig. 1 and more particularly in Fig. 2 wherein 19 indicates the plate face of base 20 having at right angles thereto side flange 21 with face 22 transverse to face 19. This stock is seated on plate portion top 11 with faces 22 and 14 abutting and faces 19 and 11 abutting.

For stock retention a clamping hook 23, having angular end 24 seated in the undercut groove, extends through angular bore 25 and the threaded outer end of said hook mounts nut 26. Tightening down on the nut draws the stock so the four surfaces abut as described and such hook and nut rigidly clamps the stock to the plate.

Obviously the simplest form is to have such undercut groove coextensive with the surface 11 and thus the two stocks can be mounted from opposite ends of the groove. The axial distance therebetween is adjusted as desired or required and the clamp nuts turned down. Since flange 21 prevents turning but one clamp is required for retaining each stock bearing. The work in Fig. 1 is indicated by letter W. One of the clamps (18) may be of fixed center type and the other (17) may be quick axial adjustable type, see part 27.

From Fig. 1 it is obvious that substantially all the area of surface 11 is available for use and only the back edge portion is utilized for stock mounting purposes.

In Fig. 3 the plate proper has projecting upwardly from surface 11 a riser plate 30 with surface 31 exactly transverse to surface 11. The base 10 includes mounting face 29 transverse to surface 11 and the face includes diagonally opposite threaded holes 28*a* and 28*b* therein (see also Fig. 4).

Riser plate 30 includes matching openings 32*a* and 32*b* therethrough. Bolts 33*a* and 33*b* extend through the respective riser plate openings and thread into the respective base openings to

secure the riser plate to the base and with the two surfaces exactly transverse to each other. Work may be clamped to the riser plate and checked with reference to the surface 11.

Herein, however, for purposes of illustration, the riser plate is centrally apertured at 35, see Fig. 4, and same, on surface 31, is countersunk or bored as at 36 to form a seat to receive boss 37 on angle plate 38 having two transverse faces 39 and 40 and a pair of reenforcing webs or flanges 41.

Coaxial with the boss 37 is the aperture 42 and same registers with aperture 35 when the boss is bore seated. The boss and seat are circularly shaped so that the angle plate may be positioned with face 39 at any desired inclination to surface 11. Means 43 extending through both apertures clamp the riser plate and angle plate together in adjusted relation. To the angle plate the work W again can be clamped.

Reference will now be had to Figs. 5 and 6 where, for purposes of illustration only, the coaxial bearing application is repeated. However, herein these bearing units are similarly secured to an adjusting bar 50 having formed thereon two angular (90°) faces 51 and 52 with groove 53 therein undercut as at 53*a*. Face 51 abuts face 29 on base 10. Bar 50 may be used alone with the bearings when desired by merely resting same on plate surface 11.

For angular adjustment bar 50 includes aperture 54 and quadrant portion 55 recessed at 56 for lightening the bar. This quadrant has arcuate slot 57 therein coaxial with aperture 54. Means 58 and 59, extending through aperture 54 and slot 57, are threaded into apertures 28*a* and 28*b*, respectively, and clamp the bar in the inclined position desired, the bar pivoting on anchorage 58.

Naturally if the bar is to have tilting movement to left, opposite to that shown in Figs. 5 and 6, the quadrant will extend oppositely. If it is desired that the bar be capable of adjustment either to the right or left, the quarter circle portion, instead of being approximately 90° will be replaced by a semi-circular portion of approximately 180°, and the coaxial arcuate slot will be correspondingly elongated and naturally extend through or across bar 50 at the mounting end thereof and as shown in Fig. 6A.

In all of the foregoing embodiments, it will be observed that when the stocks, slotted bar, riser plate and angle plate are base plate mounted saving of "set up" time will result. Also, note that such assemblies leave the major portion of the base plate area available for working space. Also, note that because certain of the assemblies are of side mounting type, the wear on surface 11 of heavy parts is eliminated or materially reduced. The present invention also is substantially universally adaptable in character.

In Figs. 7 and 8 of the drawings the base plate 110 has the top portion 112 with top face or surface 111. The back includes central mounting pad 129 and two end coplanar pads 160. This plate has the rear surface 114, surfaces 114 and 111 having edge 113 therebetween. Parallel thereto is the undercut groove 115.

At each rear corner and exactly transverse to pads 160 and surface 111 are the transverse or side pads 170 and 171. The latter is coextensive with the side of the base plate.

Herein pads 160, central pad 129 and side pads 170 and 171 have coplanar grooves or horizontal key ways 161, 129*x*, 172 and 173, respectively,

for utilization in squaring a riser plate or similar adaptation to bring any duplicating application back to original position. The several pads may be drilled and tapped suitable for the application of bolts, bushings, pins or the like for application mounting. Same, however, except for the center pad holes are omitted herefrom for clearness.

When two riser plates, see Figs. 3 and 4, are corner mounted, the result is a true 90° angle therebetween which can be used in such cases where the work requires triple transverse plane reference.

In Fig. 8 there is illustrated an angle plate having base 200 resting upon surface 111. This plate has riser portion 201, slotted as at 202 to receive a base 203 vertically slidable in said slot and rigidly secured at the adjusted elevation. This base rotatably mounts the circular portion 204 having a pair of arcuate and coaxial slots 205 therein. Screws 206 carried by base 203 clampingly lock base portion 204 in the angularly adjusted position upon base 203.

The latter has indicator 207 (a line) to cooperate with the angle scale 208 on the beveled face of base 204. Rigid with said base is the elongated bar 209 similar to bar 50 except herein the quadrant or semi-circular adjustable anchorage is omitted. Mounted in groove 210 are the longitudinally aligned bearings 211 and 212 identical, if desired, to bearings 18 and 17 respectively, see Figs. 1 and 5.

Herein the lower face of said bar 209 has a pair of spaced notches 213 therein which have two transverse faces 214 and 215 and the sloping throat face 216. In each notch is secured a bearing cylinder 217 by means of a filister head or Allen cap screw 218 which extends through the cylinder into the bar and has its head countersunk in said cylinder. The longitudinal axis of this screw is at 45° to the faces 215 and 214 and intersects the vortex of the 90° angle formed thereby.

The depth of the notch 213 is approximately that of the radius of cylindrical bearing member 217. This positioning does not interfere with the utilization of said bearing member over a wide range of angle adjustment.

The two cylinders are equidistant from the central pivotal axis of bar 209, and spacing block or gauge 220 is equivalent to the sine of the desired angle when the lower cylinder rests upon surface 111 and the lower end of gauge block 220 also rests thereon and the upper cylinder rests upon the opposite end of said gauge block.

The foregoing constitutes a universal sine bar center which has angular adjustment of 45° in either direction with reference to the surface 111. This structure is particularly accurate and capable of rapid adjustment for concentricity and angular dimensioning and eliminates the necessity of using female gauges.

The key way can be so dimensioned that the universal sine bar center may be mounted therein instead of the angle plate 200—201 illustrated, provided the mounting pad keyway be slotted as the angle plate is slotted at 202. The groove 115 in the top 112 also may be slotted for the same purpose.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The invention claimed is:

A checking plate having a pair of transversely positioned faces, means abutting one face and projecting upwardly from the other face, and a plurality of clamping structures securing said means to that one face, said means at the end abutting said one face having a laterally projecting portion with an arcuate slot coaxial with one clamping structure and operatively associated with the other clamping structure, the said means further including a pair of transversely positioned faces and a groove in at least one of said last mentioned faces and parallel to the other of said last mentioned faces, the groove being undercut, means having two transverse surfaces arranged in reentrant formation for abutting engagement of the two last mentioned transverse faces, and a clamping structure having a portion seated in the undercut groove for clampingly securing the last mentioned means to the first mentioned means.

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