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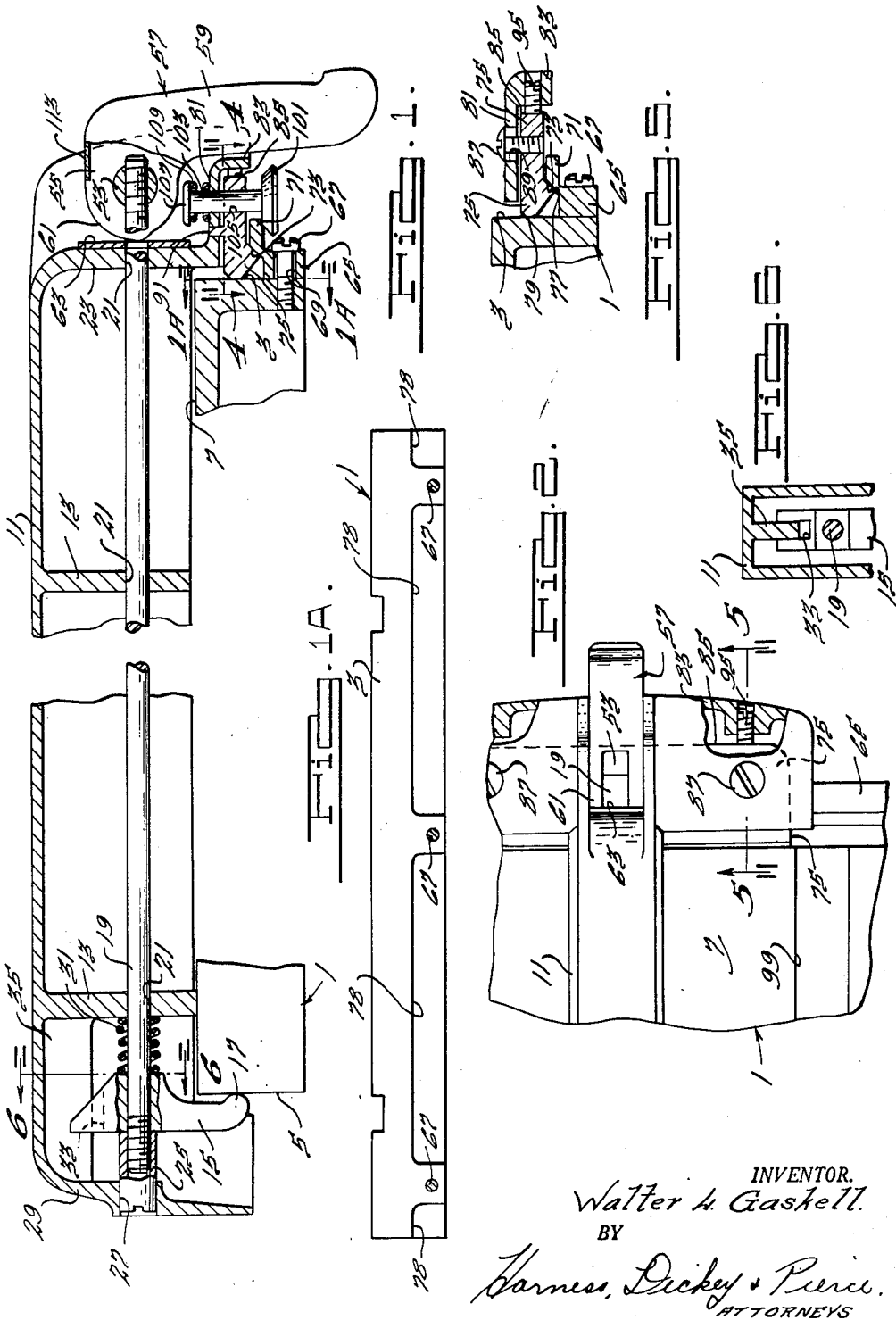
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2,677,400

SLIDABLE RIP FENCE MOUNTING

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2 Sheets-Sheet 1



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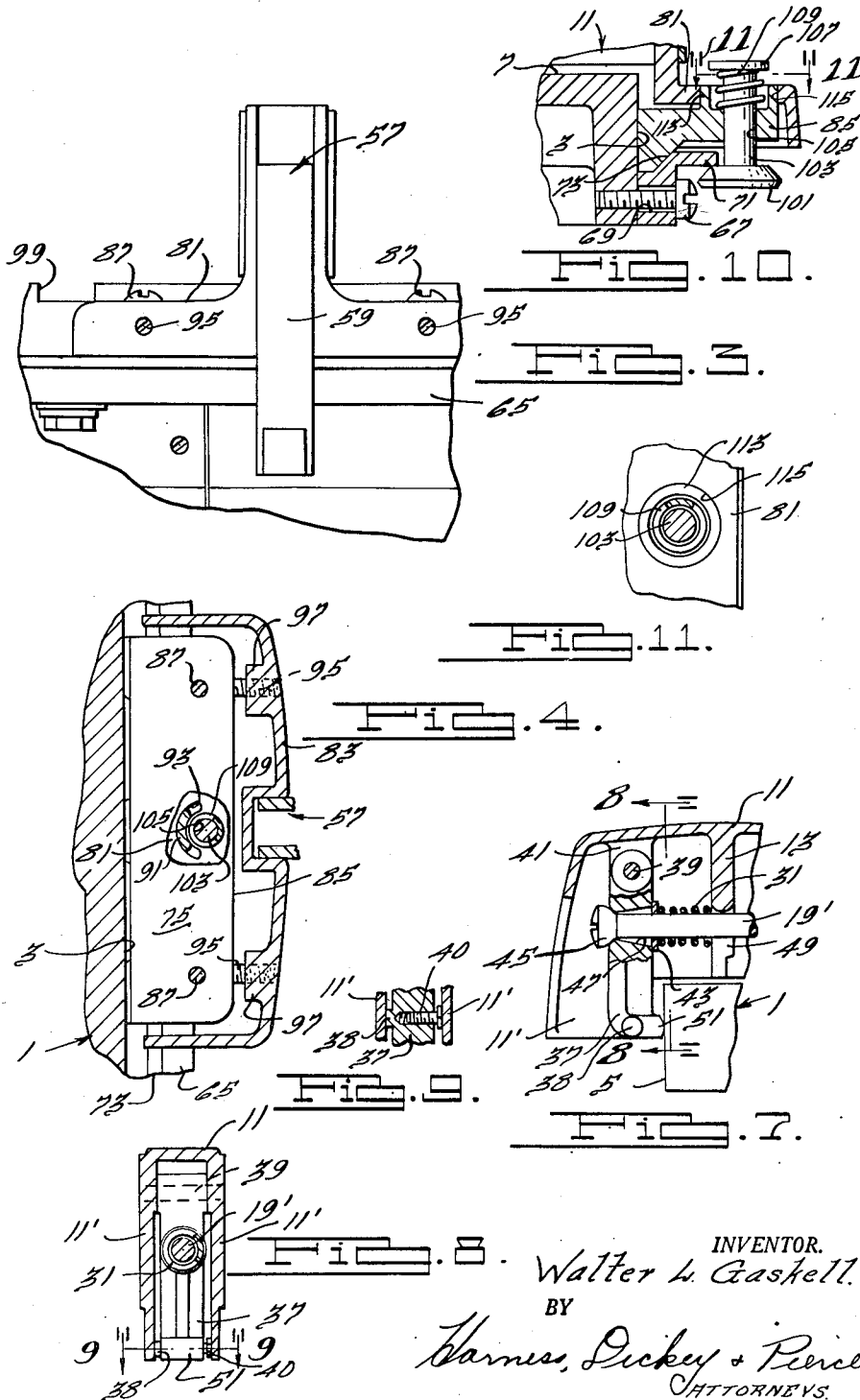
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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SLIDABLE RIP FENCE MOUNTING

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This invention relates to fence constructions of the type used with machine tools such as arbor saws, band saws, and the like.

It is the purpose of the invention to provide a fence construction that is especially adapted for use with machine tools of the type found in the home workshop, that is, a fence construction which can be inexpensively manufactured on a mass production basis and yet which properly serves its functional purpose of accurately positioning workpieces.

The invention accomplishes this objective by the use of parts which can be readily die cast or otherwise inexpensively produced and which are connected together in such a fashion that they can be adjusted relative to each other even though operatively assembled together. Thus, a fine final adjustment insuring absolute accuracy of alignment can be made after the fence construction has been mounted on the machine tool. The invention also provides a novel slide construction which prevents canting and binding of the fence when it is moved on the table.

Objects and features of the invention are shown in the accompanying drawings which illustrate preferred embodiments of the invention and wherein:

Figure 1 is a longitudinal section through a fence embodying the invention, parts thereof being broken away;

Fig. 1A is a section taken on line 1A—1A of Fig. 1 to show sawdust escape reliefs in the front of the table;

Fig. 2 is a plan view of the actuating end of the fence construction with parts broken away;

Fig. 3 is an elevation of the actuating end of the fence construction as taken from the right-hand side of Fig. 1;

Fig. 4 is a cross section taken on line 4—4 of Fig. 1;

Fig. 5 (Sheet 1) is a cross section taken on line 5—5 of Fig. 2;

Fig. 6 is a cross section taken on line 6—6 of Fig. 1;

Fig. 7 (Sheet 2) is a view of a modified form of the rear end of the fence construction and is similar to the left-hand end of Fig. 1;

Fig. 8 is a cross section taken on the line 8—8 of Fig. 7;

Fig. 9 is a cross section taken on the line 9—9 of Fig. 8;

Fig. 10 is a cross section through a portion of the slide showing a different type of structural interconnection; and

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Fig. 11 is a section taken on line 11—11 of Fig. 10.

A table top 1, such as may be used with circular saws, band saws, and various other machine tools, is shown in the drawings to illustrate the mode of attachment of the present fence construction. The table 1 has a vertical front edge 3 and a vertical rear edge 5 and a top surface 7 on which the workpieces would be laid.

The fence construction includes the elongated fence bar or rip gauge 11 which is preferably a hollow casting having a closed top and closed vertical sides joined by transverse ribs 13. The rearmost rib extends a slight distance out of the open bottom to rest on the surface 7 of the table and support the fence thereon and, with the front support, gives a slight clearance between the main body of the bar and table to permit easy sliding. Mounted within the bar and also on the front end of the bar 11 are elements for clamping it in a desired position on the table 1 and for insuring its proper alignment with the front of the table and preventing lagging of one end of the fence bar during adjustment of the bar.

A structure for accomplishing the purposes just mentioned includes a shoe 15 that has a rounded toe 17 engaging the rear face 5 of the table 1. The shoe 15 is slidably mounted on a longitudinal rod 19 which slides in suitable apertures 21 formed in the ribs 13 and in the closed front end 23 of the bar 11. The rear end of the rod 19 is threaded in and supported by an adjusting nut 25 which, in turn, slides in an aperture 27 formed in the closed rear end 29 of the bar 11. The shoe 15 is pressed against the front face of the nut 25 by a spring 31 mounted on the rod 19 which is confined between the rear face of a web 13 and the front face of the shoe 15. It is evident that axial adjustments of the shoe 15 relative to the rod 19 can be obtained by turning the nut 25. The shoe 15 is prevented from rotating on the rod 19 by virtue of a fork or slot 33 formed therein which slidably receives a vertical rib 35 formed within the bar 11. See Fig. 6.

A modified form of shoe construction is shown in Figs. 7-9 wherein the shoe member 37 is pivoted by a pin 39 to a lug 41 formed on the bar 11. In this arrangement, the spring 31 bears upon a rib 13 and upon a wear plate 43 on the front face of the shoe 37 to urge a spherical seat on the shoe against the shoulder of a slotted spherical head 45 formed on the rear end of the rod 19'. The rod 19' extends through a tapered aperture 47 in the shoe and through a slot 49 in the rib

13. As will become evident hereinafter, the slotted head 45 enables the rod 19' to be rotated and by virtue of a threaded connection at its front end, this will cause the rod 19' to move axially relative to the pivot point 39 of the shoe 37 thus enabling the toe 51 of the shoe 37 to be relaxed or pressed harder against the rear face 5 of the table 1. The shoe 37 has a boss 38 formed on one side thereof and opposite to the boss is a screw 40 (Figs. 8 and 9) which threads into the shoe. The boss 38 and screw head 40 engage the side walls 11' of the fence bar and obviously slack or side sway can be eliminated by adjustment of the screw 40.

The front end of the rod 19 (or 19') is threaded into and carries a pivot pin 53 (Fig. 1) which therefore moves axially with the bar 19. Journalled on the ends of the pivot pin 53 are the bifurcations 55 of the operating lever 57, the lever 57 having a hand grip portion 59 extending substantially at right angles to the bifurcated portion 55. The rear ends of the bifurcations 55 constitute cam surfaces 61 having a maximum radius from the axis of the pin 53 when the hand grip portion 59 is in a substantially vertical position as shown in Fig. 1. It will be appreciated that the cam surfaces 61 therefore force the rod 19 to be withdrawn out of the front of the bar 11 to a maximum distance when the hand grip portion 59 is in the downward position shown in Fig. 1. This results in the front face of the nut 25 forcing the shoe 15 against the rear face 5 of the table 1. In the modified form shown in Figs. 7-9, the vertical position of the hand grip portion 59 of the operating lever 57 results in the shoulder of head 45 pivoting the shoe 37 tightly against the rear face 5 of the table 1. Thus, the fence is clamped to the table 1 when the lever is in the position shown in Fig. 1. When the lever 57 is lifted about its pivot pin 53, the spring 51 will act on the shoes 15 or 37 to urge the rod 19 rearwardly as the cam surfaces 61 of lesser radius engage wear plate 63 attached to the front of the rear side 23. This rearward movement of the rod 19 allows the pressure of the shoes on the rear face of the table 1 to be relaxed so that the fence is unclamped from the table.

The front end of the fence 11 is guided by and may be supported on the front face 3 of the table 1. For this purpose, a guide bar 65, which extends from side to side of the table and parallel to the direction of adjusting movement of the fence 11, is attached to the face 3 by screws 67 which thread into the table 1. The screws 67 pass through apertures 69 in the guide bar which, it will be observed, are larger than the stems of the screws so that a certain amount of adjustment of the bars can be made in assembly. The guide bar 65 has an upwardly and forwardly projecting lip 71 which defines an inclined way 73. A slide member 75 has a downwardly projecting nose with an inclined surface 77 that fits on and slides on the way 73. The rear end 79 of the slide 75 is flat and bears against the face 3 of the table 1. Thus, the slide 75 is confined between the front face 3 of the table and the way 73 of the guide bar 65. The slide 75 is, of course, of sufficient length to insure stability of the fence. It is evident that the taper of the surfaces 73 and 77 in conjunction with the oversized holes 69 permit adjustments to be made in assembly which insure a tight sliding fit of the member 75 on the front edge of the table. The reliefs 78 in the front edge 3 of the

table 1 prevent sawdust from accumulating on the guide bar 65 since it may pass through the reliefs and drop out from underneath the table top or be caught in a suitable trap (not shown).

The front end of the bar 11 is mounted on and carried by the slide 75. For this purpose, the front edge 23 is turned forward at a right angle at the bottom thereof to form a horizontal section 81 that lies above and may rest on the slide 75, the forward end of the section 81 being formed with a downwardly extending flange 83 which is spaced slightly to the front of the front face 25 of the slide 75. The section 81 of the fence bar 11 is secured to the slide 75 by screws 87 which thread into the slide 75. It will be observed that the screws 87 pass through oversized holes 89 in the section 81 so that adjustment of the fence bar relative to the slide can take place.

Such adjustment occurs about a predetermined axis and is regulated by adjustment means so that there is no slack in the connection between the bar 11 and the slide 75. The axis for this adjustment is the axis of a semi-circular projection 91 (Fig. 4) which is cast on the top surface of the slide 75 and slides in a semi-circular slot 93 formed in the section 81 of the fence bar. The adjustment about the axis of the projection 91 is regulated by screws 95, one of which is located on each side of the axis and threaded in suitable pads 97 formed on the flange 83 of the bar 11, the screws 95 bearing on the front face 85 of the slide 75. This adjustment about the axis of projection 91 enables the fence bar 11 to be squared with a typical mitre slot 99 in the table top or adjusted at an angle thereto.

Upward movement of the front end of the fence, such as might cause it to rise above the table is prevented by engagement of a small area of the roller 101 with the underside of the guide bar lip 71. The roller 101 has an upwardly extending stem 103 which is slidably and rotatably mounted in an aperture 105 in the slide 75 and which extends through an accommodating aperture of suitable size in the section 81 of the fence bar 11. The stem 103 has a head 107 formed on its top end which serves as a backing for the coil spring 109, the other end of which bears upon the surface of section 81 (or if the accommodating aperture is of sufficient size it bears on the surface of slide 25). It will be seen that the spring 109 urges the roller 101 upwardly into contact with the bottom of the lip 71. Since the roller is free to rotate, it does not interfere with transverse adjusting movement bodily of the fence 11.

In order to lift the fence from the table 1, the handle 57 is lifted. The roller 101 and its stem head 107 are located beneath the cam surface 61. Hence, lifting of the lever 57 will cause the surfaces 61 to press downwardly on the head 107 to compress spring 109 thus driving the roller 101 downwardly out of contact with the lip 71. This movement also releases the pressure on the rear shoe 15 as already described. Hence, by a slight tilting of the fence so that the rear end is raised above the front end, the fence construction 11 along with the connected slide 75 may be removed from the table and its attached guide bar 65. Flats 113 formed on the cam surfaces 61 will engage the wear plate 63 when the arm 57 is lifted to enable the spring 31 to hold the arm 57 in elevated position.

It will now be recognized that the invention provides a fence construction that is especially

well adapted to mass production techniques. The various parts can be readily die cast and the various adjustments eliminate the need for close dimensional tolerances in manufacture. At the same time, these adjustments permit a fine control of the alignment of the fence bar 11 about all three axes. Adjustment with screws 95 is about a vertical axis. Adjustment with screws 67 of the guide bar 65 is about a horizontal axis generally parallel to the axis of bar 19. Raising or lowering of the guide bar 65 by virtue of adjustment with the screws 87 as well as raising or lowering of the bar 11 with respect to the slide 25 through the medium of screws 87 permit adjustment about a horizontal axis which is at right angles to the axis of the rod 19, i. e., parallel to the front and rear edges 3. Furthermore, the oversize holes permit simple shifting of the various parts relative to each other.

Instead of the semi-circular projection 91, the slide 75 may have a circular boss 113 fitting in a circular hole 115 in the flange 81 as shown in Figs. 10 and 11. This arrangement obviously permits the slide to be adjusted angularly relative to the bar 11.

It will be evident that the structure described herein is disclosed by way of illustration, and that the invention may be embodied in modified forms. It will also be apparent that certain conventional expedients such as the use of washers or shims has been omitted from the above description for the sake of simplicity.

What is claimed is:

1. A fence construction for machine tool tables or the like comprising a guide bar for attachment to the table and adapted to extend parallel to the desired direction of movement of the fence, a slide mounted on the guide bar, a fence bar mounted on the slide, a rod slidably mounted in the fence bar and extending from front to rear thereof, a shoe mounted at the rear of the fence bar, means connecting said shoe to the rod whereby forward movement of the rod moves said shoe forwardly, spring means acting to press the shoe and rod rearwardly, the forward end of the rod projecting forwardly of the front face of the bar, an operating lever mounted on the forward end of the rod, said operating lever having a cam face engageable with the front end of the bar whereby movement of the lever about its mounting on the rod causes axial movement of the rod, said guide bar being open on top to receive said slide and having a tapered upwardly presenting face defining a way, said slide having a tapered face slidable on said way and a rear face adapted to engage the front face of the table on which the fence construction is mounted, the slide being confined between said front face and said way.

2. The invention set forth in claim 1 wherein said guide bar has a forwardly projecting lip located outwardly of said tapered face and said slide and bar including a retaining member engaging said lip to retain the fence and bar on said guide bar.

3. The invention set forth in claim 2 wherein said retaining member is operatively connected to said operating lever and moved thereby away from said lip whereby the member may be disconnected from said lip by actuation of the lever.

4. The invention set forth in claim 3 wherein said retaining member comprises a roller engaging said lip and slidably and rotatably mounted on said slide and spring means urging said retaining member into contact with said lip.

5. A fence construction for machine tools or

the like having a table comprising a guide bar having attaching holes therein, screws of lesser size than said holes extending therethrough and threaded into the table for adjustably securing the guide bar to the table, a slide mounted on the top of said guide bar, said slide and guide bar having an inclined surface extending downwardly and inwardly from the top of the guide bar to provide a wedge interconnection whereby the slide is pressed snugly against the front of the table, a fence construction including a bar extending from front to rear of the table and transversely to the guide bar and having a flange section overlying the slide, a cylindrical segment formed on the slide and projecting into a cylindrical surface formed in said fence section to provide a vertical axis of adjustment of the fence relative to the slide, and screws on either side of said axis and bar extending through oversized holes in said flange section and threaded into the slide.

6. The invention set forth in claim 5 including a flange depending from said fence section and spaced adjacent to the front face of said slide, screws threaded in said flange on opposite sides of said pivotal axis and bearing on the front face of the slide to maintain a selected relative position of the bar and slide about said axis.

7. In a fence construction for a table having a vertical face, the combination of a horizontally extending guide bar secured to said vertical face and having an inclined surface extending upwardly and away from said face, said face and surface defining an upwardly opening guideway, a fence construction including a bar extending substantially normally to said face and a slide portion extending horizontally on opposite sides of the front end of said fence construction and of the bar, said slide portion carrying the weight having a tapered surface and a vertical surface slidably engaging said guide bar inclined surface and said vertical face and transferring said weight thereto.

8. In a fence construction for a table having a vertical edge and a horizontal working surface, the combination of means providing a horizontal guideway at one edge of said surface, said guideway being wedge-shaped and defined by a vertical face extending perpendicularly to said working surface and by an inclined face extending upwardly away from said vertical face, said guideway being open on top, said guideway being located on the side of said table opposite to said vertical edge and being parallel thereto, a fence bar extending across said table surface and having a downwardly projecting section at one end abutting only said vertical edge, the other end of said fence bar having a downwardly projecting section simultaneously movably resting against both said vertical and inclined faces, and means for selectively moving said fence sections toward each other to clamp them against said vertical edge and vertical face.

9. In a fence construction for a table having a vertical face, the combination of a horizontally extending guide bar secured to said vertical face and having an inclined surface extending upwardly and away from said face, said face and surface defining an upwardly opening guideway, a fence construction including a bar extending substantially normally to said face and a slide portion extending horizontally on opposite sides of the bar, said slide portion carrying the weight of the front end of said fence construction and having a tapered surface and a vertical surface

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slidably engaging said guide bar inclined surface and said vertical face and transferring said weight thereto, said guide bar having a horizontal lip projecting outwardly from said inclined surface, and a retainer carried by said slide and rotatable about a vertical axis and engaging the bottom of said lip to hold the slide in said guide-way.

10. The invention set forth in claim 7 wherein said guide bar has apertures therein, screws of smaller diameter than said apertures extending therethrough and threaded into the vertical face of the table.

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