

Nov. 8, 1938.

T. B. TIEFENBACHER

2,136,091

TOOL HOLDER

Filed Aug. 24, 1937

2 Sheets-Sheet 1

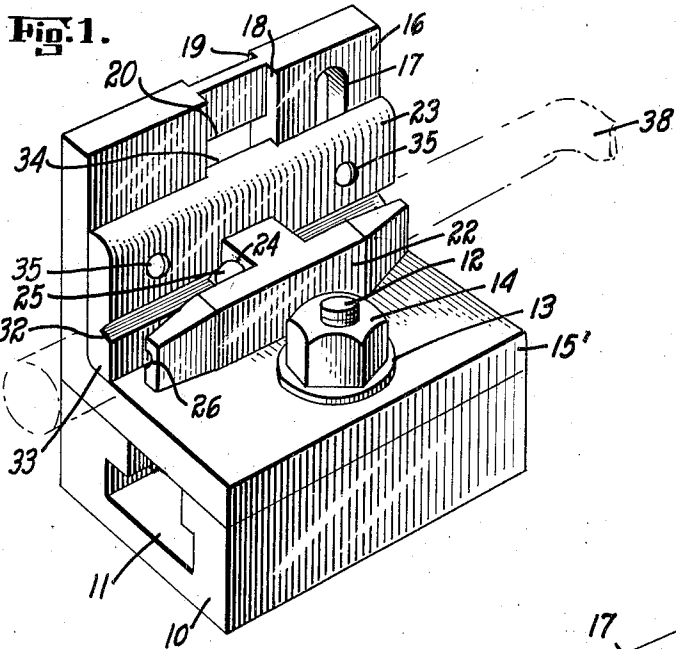


Fig. 2.

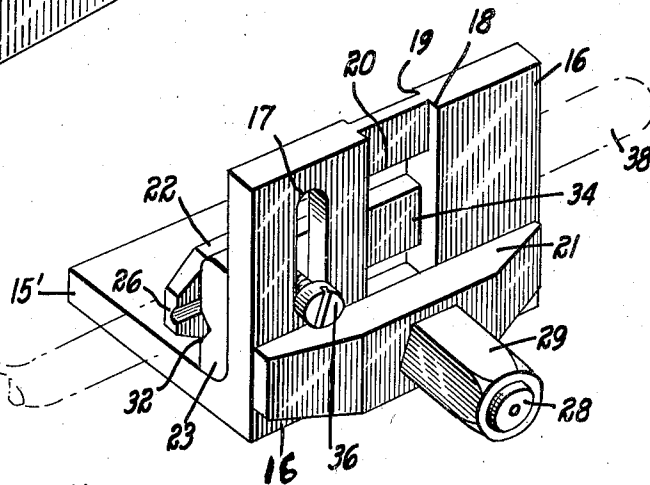
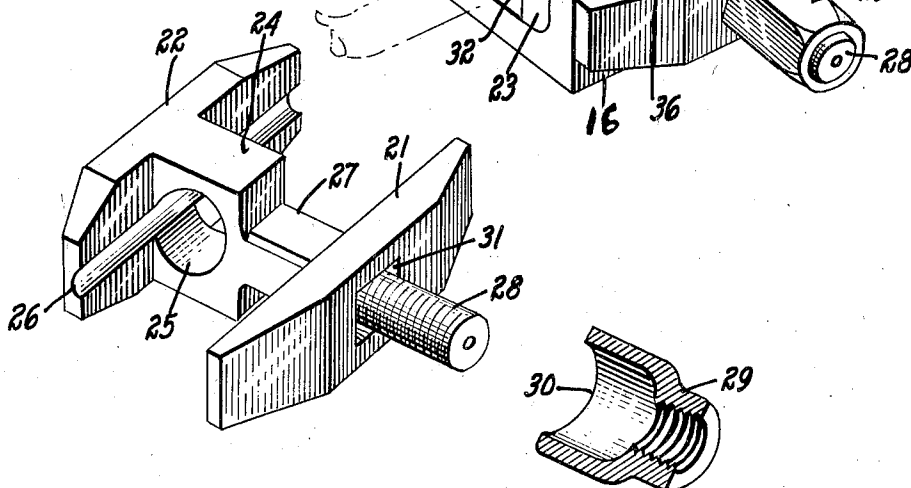


Fig. 3.



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Fig. 4.

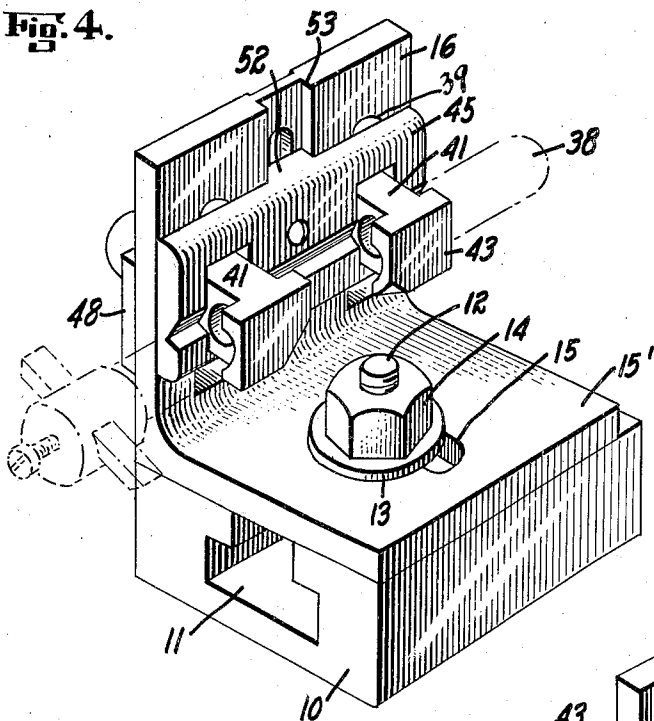


Fig. 5.

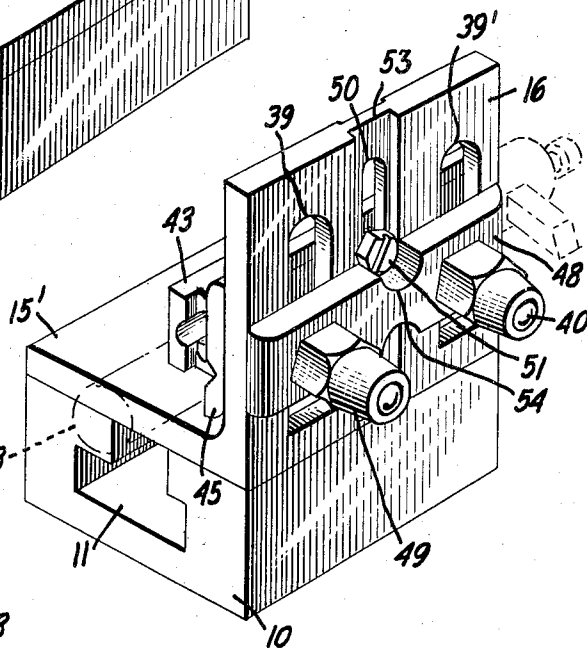
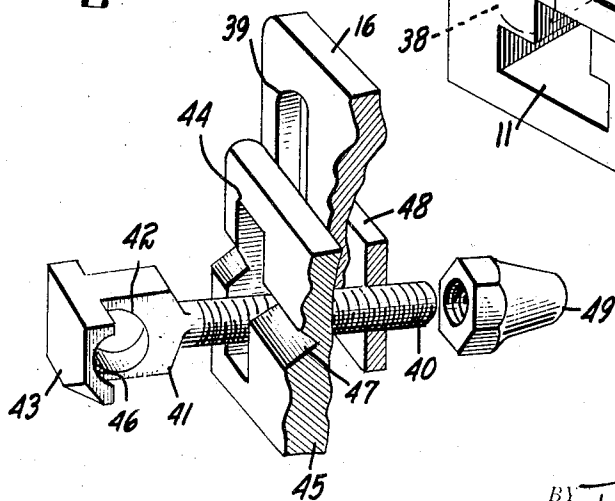


Fig. 6.



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2,136,091

TOOL HOLDER

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Application August 24, 1937, Serial No. 160,573

7 Claims. (Cl. 82-37)

This invention has for its general object the production of a tool-holder or tool-post for employment, for instance, in a lathe and which shall be adapted to firmly and rigidly clamp a boring tool in operative and working position therein. Any suitable type of tool and any conventional type of lathe or other machine may be employed in conjunction with the invention.

The principal object of the invention is the production of a tool-holder or tool-post of the above character, the main body of which shall comprise an ordinary L-bar or right-angled bar of any standard size and construction.

Further objects of the invention are the production of a tool-holder or tool-post which shall comprise few parts and which may be economically constructed and furthermore which shall be so constructed as to adapt it to hold and firmly clamp tools of various sizes and diameters and to retain firmly said tools in perfect and accurate horizontal position when in use.

To the above ends my invention consists in the novel tool-holder or tool-post and parts thereof hereinafter more particularly described and then specified in the claims.

A practical embodiment of the invention is illustrated in the accompanying drawings in which:

Fig. 1 is a perspective view of my improved tool-holder or tool-post looking at the forward or front portion thereof and showing it mounted either on the carriage or the cross-slide carried by said carriage or on an upper-slide mounted on the cross-slide of a conventional type of lathe.

Fig. 2 is a perspective view of the rear or back of said tool-holder or post.

Fig. 3 is a perspective view of the clamping portion of the device which is adapted to be detachably attached to the body portion of said holder or post.

Fig. 4 is a modification of the invention, its construction permitting it to be adapted for heavy-duty work and which possesses strength appreciably greater than the device of the preferred form of the invention.

Fig. 5 is a perspective view of the rear or back of the tool-holder or post of the modification illustrated in Fig. 4 and,

Fig. 6 is a perspective, fragmentary view of the clamp and associated parts of the modified construction of the device.

Referring in detail to the accompanying drawings:

The reference numeral 10 indicates a portion of a carriage, or of a cross-slide carried by a

carriage, or of an upper or compound slide carried by the cross-slide, all for any conventional form of lathe forming no part of my invention and which element I may term generically as a "support". Said support is provided with a T-slot 11 which slidably receives the head (not shown) of a bolt 12 carrying a washer 13 and receiving a nut 14, the shank of said bolt passing through a slot 15 (not shown in Fig. 1 but shown in Fig. 4) with which the horizontal leg 15' of a conventional L-bar or right-angled bar of standard size and construction and forming the body of the holder is provided, the vertical member of said body being indicated at 16.

The vertical member 16 of the body of the holder is provided adjacent an end thereof with a slot 17, as indicated, the opposite side of which vertical member may be similarly slotted, if so desired, and as is obvious. The opposite faces of said vertical member 16 of the body are provided with grooves 18 and 19 respectively forming shouldered guideways in alignment with each other and the vertical member 16 is also slotted, preferably centrally thereof, and as indicated at 20, said slot being squared and intersecting said grooves 18 and 19 as illustrated.

The clamp of the tool-holder comprises an inner clamping plate 21, an outer clamping plate 22 and an intermediate clamping plate 23. The outer clamping plate 22 is provided with a squared body 24 extending laterally therefrom and which is preferably integral with said plate, said body 24 being provided with a bore or rounded opening 25 for receiving the tool to be clamped. A rounded groove 26 or a groove of any other configuration merging with the bore 25 is also provided in the plate 22. The squared body 24 of said plate 22 has a squared member 27 extending therefrom, and preferably integral therewith, and terminating in the rounded screw-threaded shank 28. The squared body 24 of said plate 22 and the squared extension 27 are adapted to interfit with and to be slidably received by the slot 20 in the vertical member 16 of the clamp and it also interfits with the vertically extending opposite walls of the shouldered grooves 18 and 19. A nut 29 is also provided to be screwed on the screw-threaded shank 28, the inner end of said nut being counterbored as at 30 so that the inner end of said nut will move unobstructedly over the squared extension 27 when the nut is screwed "home".

The inner clamping plate 21 is provided with a squared opening 31 for receiving the screw-threaded shank 28 and the extension 27 of the

outer clamping plate with which extension it interfits whereby relative rotation of one member with respect to the other is prevented. A tightening of the nut 29 against the flat face of said plate 21 will result in the three members comprising the clamp being drawn together.

The intermediate clamping plate 23 is provided with a V-groove 32 on one of its faces adapted to co-operate with the rounded groove 26 in the clamping plate 22 in order to firmly grip the tool to be clamped when the parts have been forced into clamping position by screwing the nut 29 tightly on the screw-threaded shank 28. The lower side or edge of the intermediate clamping plate 23 is rounded as at 33 so that, when in lower position, it will interfit with the rounded wall forming the connection between the horizontal member 15 and vertical member 16 of the body of the clamp which rounded wall is inherently present in standard forms of L-bars. The intermediate clamping plate 23 is also provided with a squared extension or lug 34 adapted to slidably interfit with either of the shouldered guideways 18 and 19 so that the plate 22 with its connected elements 24, 27 and 28 and carrying the intermediate plate 23, may be mounted at will on either side of the vertical member 16 of the body of the tool-holder.

It will be understood that the inner clamping plate 21 is always mounted on the side of said vertical member 16 of the body of the tool-holder opposite to the side on which the clamping plates 22 and 23 are mounted when the parts are in proper and clamping position. The intermediate clamping plate 23 is provided with screw-threaded openings 35 either of which is adapted to register with the slot 17 in the vertical member 16 depending on which side of the tool-holder the intermediate plate 23 is mounted. The head 36 of a screw is adapted to span the slot 17 and its shank 37 extends loosely through said slot and is screwed through the threaded opening 35 in plate 23 to hold the parts in properly adjusted vertical position before they are tightened into clamping position by means of the nut 29 and before insertion of the tool in the holder.

In operation, it will be understood that all three of the clamping members are movable in unison with the outer clamping plate 22, that is, the integral parts thereof comprising members 24 and 27, carrying the intermediate clamping plate 23 and outer clamping plate 21 respectively. When using the device, the proper vertical elevation of the clamp per se is first determined and the parts thereof initially are held in that desired position by means of the screw 36 which, when tightened, clamps the intermediate plate 23 against the face of the vertical member 16 of the body of the holder, the outer clamping plate 22 and the inner clamping plate 21 being movable with said intermediate plate, as is obvious, so that all three of the clamping plates will bear the same relative position to one another irrespective of the final vertical position of the said plates which has first been determined and found necessary for the work to be performed.

In operation, the tool (shown in dotted lines) and which I have designated as 38 is inserted through the bore 25 in proper longitudinal position with respect thereto and the nut 29 is thereupon tightened on the screw-threaded shank 28. This results in a very tight clamping of the tool in the holder due to the co-operative clamping action of the plates 21, 22, 23 as well as the co-operative clamping action of the rounded groove

26 in the plate 22 and the V-groove 32 in the intermediate clamping plate 23 which grooves engage with a clamping action against the surfaces of said clamping tool 38.

It will be understood that in some cases I may modify the constructions of the intermediate clamping plate 23 and the vertical member 16 of the body of the tool-holder by substituting squared lugs or projections for the grooves 18 and 19 in the vertical member 16 and substituting a groove in the intermediate plate 23 for the projection or lug 34 with which it is now provided. In this case the projection on the vertical member 16 would enter and slidably interfit with the groove in the intermediate plate member 23.

In principle, the operation of the apparatus of the modification illustrated in Figs. 4 to 6 inclusive is very similar to that of the preferred form of the invention. The construction of the modified device, however, is superior in strength to that of the preferred form of device so that it (the modified form) is better adapted for use in heavy-duty work.

In the modification, the vertical member 16 of the tool-holder is provided with two slots 39 and 39' for the reception of screw-threaded bolts 40, each of which is provided with a squared body 41 integral therewith and having a bore or rounded opening 42 for the reception of the tool 38. Each of said heads 41 is provided with an outer clamping plate 43. The heads 41 are adapted to enter and interfit with squared slots 44 in an intermediate clamping plate 45 and are also adapted to slidably interfit with the slots 39 and 39' in the vertical leg or member 16 of the tool-holder. The clamping plates 43 are provided with rounded or other clamping grooves or opening 46 and the intermediate plate 45 is provided with a V-shaped or other groove 47, as in the preferred form of the invention, said rounded grooves and V-shaped groove co-operating with each other for producing a clamping action against the tool to be clamped in the device.

The inner clamping plate is indicated at 48 and is provided with suitable openings for reception of the screw-threaded shanks 40, nuts 49 also being provided to be screwed on said shanks 40 for tightening the elements making up the clamp per se into clamping action and in their predetermined adjusted vertical position as in the preferred form of the invention.

The vertical member 16 is also provided with a slot 50 centrally thereof loosely receiving the screw-threaded shank of a bolt 51 which is screwed to the intermediate clamping plate 45 to secure the properly adjusted vertical position of the elements of the clamp per se as in the preferred form of the invention. The head of the bolt 51 spans the slot 50, as illustrated, to prevent the bolt from passing through the slot when it is tightened. The intermediate plate 48 is also provided with a squared extension 52 adapted to be slidably received within guideways 53 formed in the vertical member 16. To obviate interference with the proper tightening or untightening of the bolt 51, the inner clamping plate 48 is provided with a rounded groove 54 adapted to loosely receive the head of the bolt 51.

Various modifications may be resorted to without departing from the invention as set forth in the appended claims.

The invention claimed is:

1. A tool-holder comprising an upright member having a slot therein, supporting means extending through said slot, an outer clamping

plate, an intermediate clamping plate and an inner clamping plate all carried by said supporting means whereby all of said clamping plates are movable simultaneously to secure a predetermined horizontal position thereof, means carried by one of said plates for holding the tool to be clamped, means extending through said upright member for non-rotatably holding all of said plates in a predetermined, adjusted vertical position and means for clamping said plates together and said tool in said adjusted and working position.

2. A tool-holder comprising a vertically extending member having a slot with a flat wall extending therethrough, an outer clamping plate and an inner clamping plate on opposite sides of said member, a head connected to one of said plates and having a flat side adapted to slidably engage the flat side of the aforesaid slot, said head non-rotatably carrying the other of said plates, means associated with one of said plates for receiving and holding the tool to be clamped and means for drawing the plates and tool into clamping position.

3. A tool-holder comprising a vertically extending member provided with a slot therein, an adjustable member slidable on said vertically extending member, one of said members having a groove registering with said slot and the other of said members being provided with a lug or projection slidably interfitting with said groove, means engaging said vertically extending member and said adjustable member for adjusting the horizontal position of the latter, outer and inner clamping plates on opposite sides of said vertically extending member, means extending through said slot and carrying said plates and means for forcing said plates towards the vertically extending member and into clamping position.

4. A tool-holder comprising a vertically extending member having a slot therein, supporting means extending through said slot, an outer clamping plate and an inner clamping plate carried respectively on said supporting means at opposite sides of said extending member and an adjustable member interposed between one of said plates and said vertically extending member for adjusting the horizontal position of said plates, said adjustable member being also carried by said supporting means, means extending through said vertically extending member and connected with said adjustable member for adjusting the position of said last-named member and means also carried by said supporting means for moving said plates towards each other into clamping position.

5. A tool-holder comprising a vertically extending member provided with a slot therein, supporting means extending through said slot, an adjustable plate slidable on said vertically extending member and also provided with a slot receiving said supporting means, one of said

members having a groove registering with said slot and the other of said members being provided with a lug or projection slidably interfitting with said groove, means extending through said vertically extending member and connected with said adjustable plate for adjusting the horizontal position of the latter, outer and inner clamping plates on opposite sides of said vertically extending member and carried by said supporting means, tool-receiving means associated with said supporting means for receiving the tool to be clamped, tool-clamping means on said adjustable plate and tool-clamping means on one of said clamping plates, both said tool-clamping means being adapted to co-operate with each other to clamp a tool in clamping position and means for moving said clamping plates towards each other and holding them in clamping position.

6. A tool-holder comprising a vertically extending plate having a slot therein and with a groove in alignment with said slot, an outer clamping plate, a squared body integral with said plate and provided with means for receiving the tool to be clamped, a squared member integral with said body and slidably interfitting with said slot, a screw-threaded shank integral with said squared member, an outer clamping plate provided with an opening slidably receiving said squared extension, an intermediate clamping plate provided with a squared opening slidably receiving said squared body, a lug or projection on said intermediate plate slidably interfitting with the groove in said vertically extending member, means extending through said vertically extending member and connected to said intermediate plate for holding the same in any desired position of horizontal adjustment and a nut threading over said screw-threaded shank for drawing the aforesaid plates together and into clamping position.

7. A tool-holder comprising an upright main supporting plate having a slot therein, an outer clamping plate and an inner clamping plate on opposite sides of said main supporting plate, one of said plates extending transversely across said main supporting plate, means on one of said plates for holding the tool to be clamped, means connected to one of said inner and outer plates and projecting through said slot and carrying both of said plates, an intermediate clamping plate provided with a slot receiving said projecting means and positioned intermediate one of said inner and outer plates and said main supporting plate and freely slidable thereon whereby said outer, inner and intermediate plates are movable simultaneously in a vertical direction, and means carried by said projecting means for clamping said tool and drawing said inner, outer and intermediate plates towards said main supporting plate and into clamping position.

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