Aug. 25, 1931. L. LEYES 1,820,667

WORK HOLDING CLAMP

Filed Jan. 20, 1930

Fig. 1.

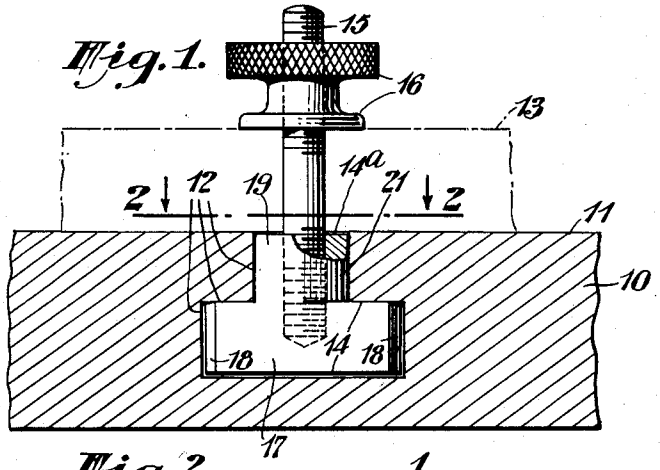


Fig. 2.

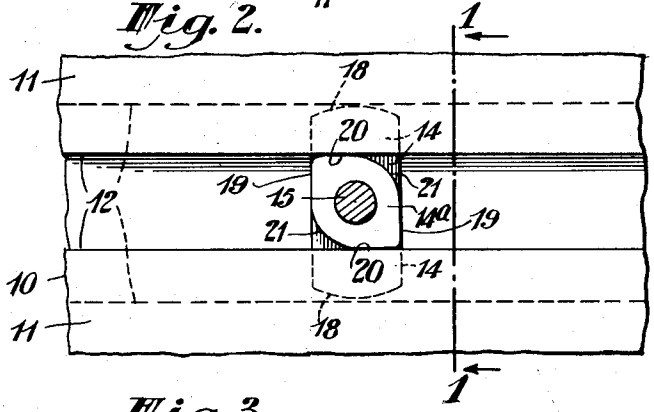


Fig. 3

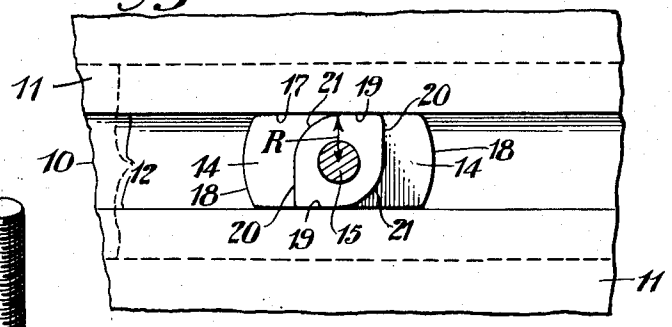
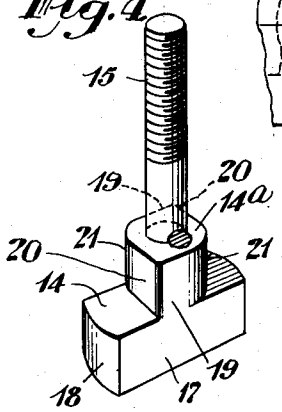


Fig. 4.



INVENTOR
LOUIS LEYES
BY
his ATTORNEYS

Patented Aug. 25, 1931 1,820,667

UNITED STATES PATENT OFFICE

LOUIS LEYES, OF CITY ISLAND, NEW YORK

WORK HOLDING CLAMP

Application filed January 20, 1930. Serial No. 422,079.

This invention relates to improvements in work holding clamps, and has for its principal objects to provide a simple and efficient work holding means for machine tools and the like; and to provide a simple and efficient clamping means readily adjustable on and readily attachable to and detachable from a work table. Other objects and advantages of the invention will appear from the following detailed description of the illustrative embodiments of the invention shown in the annexed drawings.

In the drawings:

Fig. 1 is a sectional view on the line 1—1 of Fig. 2, showing the clamping means in operative work-holding position;

Fig. 2 a section on the line 2—2 of Fig. 1;

Fig. 3 a view similar to Fig. 2, showing the adjustable and removable work-holding means positioned for lifting out of the work table slot; and

Fig. 4 a view showing a slightly modified construction.

Referring to the drawings by reference characters, 10 is a support such as the usual work table of a machine tool having its flat work-engaging face 11 provided with the usual T-slots or undercut grooves 12, one of which is shown. The work or article clamped to face 11 is indicated at 13, and it will be understood that it may be held to table 10 by as many of the improved adjustable and detachable clamping devices as desired, only one of these devices being shown.

The adjustable and detachable clamping device comprises an adjustable post-carrier or slide 14 engaged in the wider or bottom portion of slot 12, a post 15 attached at one end to the slide and having its other end provided with an external screw thread, and a work-engaging clamping nut 16 threaded on the last mentioned end of the post. The axial line of the post passes through the elongated main flat body portion of the slide at a point midway between the ends of said portion and also midway between the sides of said portion.

The post rises vertically from the centrally located raised portion or boss 14^a of the slide 14, which raised portion is engaged in the narrower or mouth portion of slot 12. Post 15 may be formed integrally with the slide, as in the construction shown in Fig. 4, or its lower end may be threaded into the slide as shown in the embodiment illustrated in Figs. 1, 2, and 3, or attached in any other manner to the slide to move therewith.

The main elongated portion of the slide or head for the post 15 has a flat top and bottom and is of slightly less thickness from top to bottom than the depth of the wider portion of slot 12. It also has flat parallel side faces 17 connected by rounded end faces 18, the width of said elongated portion of the slide being slightly less than that of the narrower portion or mouth of slot 12 and the maximum length of said portion being slightly less than the width of the wider portion of slot 12. By providing flat side faces 17 spaced as described and rounded end faces 18 curved about the axis of the post 15 and equidistant from said axis, as shown, the elongated portion of the head may be passed through the mouth of the slot as shown in Fig. 3 and then rotated through a quarter turn into the position shown in Figs. 1 and 2 in which it extends at a right angle to the slot or directly transversely of the slot and across substantially the full width of the wider bottom portion of the slot.

The raised portion or boss 14^a of the slide projects up into the narrow mouth portion of the slot when the main portion of the slide is seated in the wider portion of the slot, and said boss is preferably of such height that its upper end lies below the work-engaging face 11 of the table 10, as shown. Boss 14^a has a pair of parallel flat side faces 19 and a second pair of parallel flat side faces 20 extending at right angles to side faces 19 which are parallel with and in the same vertical planes as the flat side faces 17 of the elongated main portion of the slide 14. Diagonally opposite corners of the boss 14^a are each rounded off in an arc of the same radius R struck from the axis of the post and boss, this radius being one-half the width of the mouth of the slot, to afford curved faces 21 adapted to turn in the mouth of the slot and each connecting one face 19 with one face 20.

Faces 19 and 20 are tangent to a circle having the radius R so that faces 19 will squarely abut the opposite side walls of the mouth of slot 12 when the clamping nut carrier is rotated in one direction, and so that faces 20 will squarely abut said side walls of the slot mouth when the carrier is rotated in the opposite direction. Faces 19 arrest rotation of the carrier with the elongated portion of slide 14 extending directly lengthwise of the slot, so that it may be readily lifted out of the slot, while faces 20 arrest rotation of the carrier with said elongated portion directly across the slot. The flat side faces 19 of the boss also slidably coact with the side walls of the mouth of the slot to slidably guide the elongated portion out of the slot in detaching the holding device from the table, while flat side faces 20 slidably coact with said side walls to guide the adjustable holding device during adjustments over the table while interlocked with the table.

The insertion, removal and adjustment of the holding device is greatly facilitated by the novel construction thereof shown and described, and it will be obvious that the invention provides a simple and efficient clamping or holding device which may be readily attached to and removed from a slotted work table at any point along the length of a T-slot of the table.

What I claim is:

1. A work clamping means comprising a work-support having oppositely facing surface portions and a slot with parallel side walls which extend from one surface portion to the other, a post projecting beyond the plane of one of said surface portions and having its projecting end provided with a screw thread, a removable and adjustable post-carrying slide having a main body portion elongated transversely of the post coactive with the oppositely facing surface portion of the support and having a raised portion intermediate its ends engaged in said slot, said raised portion having two pairs of parallel flat faces alternately engageable with the side walls of the slot to arrest rotation of the carrier after a quarter turn in opposite directions at either of two positions in one of which the elongated portion of the slide extends directly lengthwise of the slot and in the other of which said elongated portion extends directly crosswise of the slot, the maximum width of the elongated portion of the slide not exceeding that of the slot, and the said pairs of flat faces on the raised portion of the slide being joined by diagonally opposite rounded corner face portions, and a work clamping nut on said threaded end of the post.

2. A clamping means of the class set forth, comprising a work-holding table having an undercut groove in its work-engaging face, and an adjustable and detachable holding device for clamping the work to the table, said device comprising an elongated head insertable through the mouth of said groove and rotatable in the undercut portion of the groove to interlock the head with the table, an upstanding post held at one end to the head centrally of the head and externally threaded at its upper end, and a work-clamping nut on said threaded end of the post, said head having a central upstanding boss rotatable in the mouth portion of the undercut groove and having flat side face portions coactive with the side walls of the said mouth portion of the groove to arrest rotation of the head in the undercut groove in opposite directions in either of two positions, in one of which the head is positioned for lifting out of the groove and in the other of which the head straddles the mouth portion of the groove.

3. A clamping means as claimed in claim 1, wherein the lower end of the post is threaded into the head.

4. A clamping means as claimed in claim 2, wherein the post is separably held to the head.

5. A work-clamping nut carrier for slotted work-tables or the like, comprising an elongated post carrier having an upstanding centrally located boss on one face thereof provided with two pairs of flat stop faces alternatively engageable with the side walls of a table slot, one pair of said side faces being located in spaced planes parallel with the longitudinal center line of the post carrier and the other pair being disposed in planes spaced the same distance apart as the first mentioned planes extending crosswisely of the carrier at a right angle to the longitudinally center line, said boss having two diagonally opposite rounded corner faces each connecting two angularly disposed ones of said stop faces and extending around the center of the boss through an angle of at least ninety degrees, and a post rising centrally from the carrier at the face of the carrier from which the boss rises, said post being provided with an external screw thread for connection of a work-clamping nut therewith.

6. A work-clamping nut carrier as claimed in claim 5, wherein the nut-carrying post is screw thread coupled with the head at its lower end.

7. An adjustable and detachable anchoring means, comprising a post-carrying head having a boss on one face thereof and spaced longitudinally of the head from one end of the head, a post rising from the boss centrally of the boss and provided with an external screw thread beyond said boss, and a nut on the threaded portion of the post, said boss having two pairs of parallel flat faces connected by diagonally opposite convex faces, one pair of said flat faces lying in

planes intersecting the planes of the other pair, said pairs of flat faces being correlated with the head to position the head alternatively to bridge and to pass through a slideway in which said boss is slidably engaged and oscillatable between limits determined by said pairs of flat faces.

8. In an attaching means, in combination, means forming a slideway having parallel side walls, and a detachable and adjustable anchoring device coactive with said slideway forming means comprising a head shaped to pass through said slideway in one rotatably adjusted position of the device and to bridge the slideway in another rotatably adjusted position, said head having a boss normally engaged in the slideway having two pairs of flat faces, the faces of each pair being parallel and spaced apart to simultaneously abut the opposite side walls of the way, one pair of faces lying in planes intersecting the planes of the other pair of faces, one of said pairs of faces being coactive with the side walls of the way to arrest rotation of the device with the head positioned for passing through the way and the other pair of said faces being coactive with said side walls to arrest rotation of the device with the head positioned to bridge the slideway, said boss having two diagonally opposite convex surfaces uniting said pairs of flat faces, and a post connected with said head, said post rising from the boss and projecting beyond the slideway and having an external screw thread.

In testimony whereof I hereunto affix my signature.

LOUIS LEYES.