Nov. 10, 1925. 1,560,748

C. G. WILDERSON

WORK CLAMP FOR WOODWORKING MACHINES

Filed May 29, 1924 2 Sheets-Sheet 1

Fig. 1.

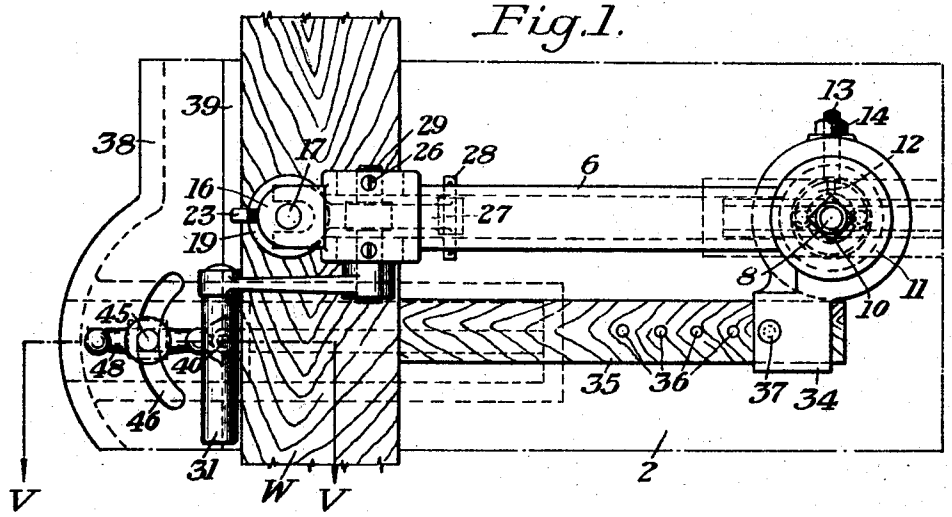
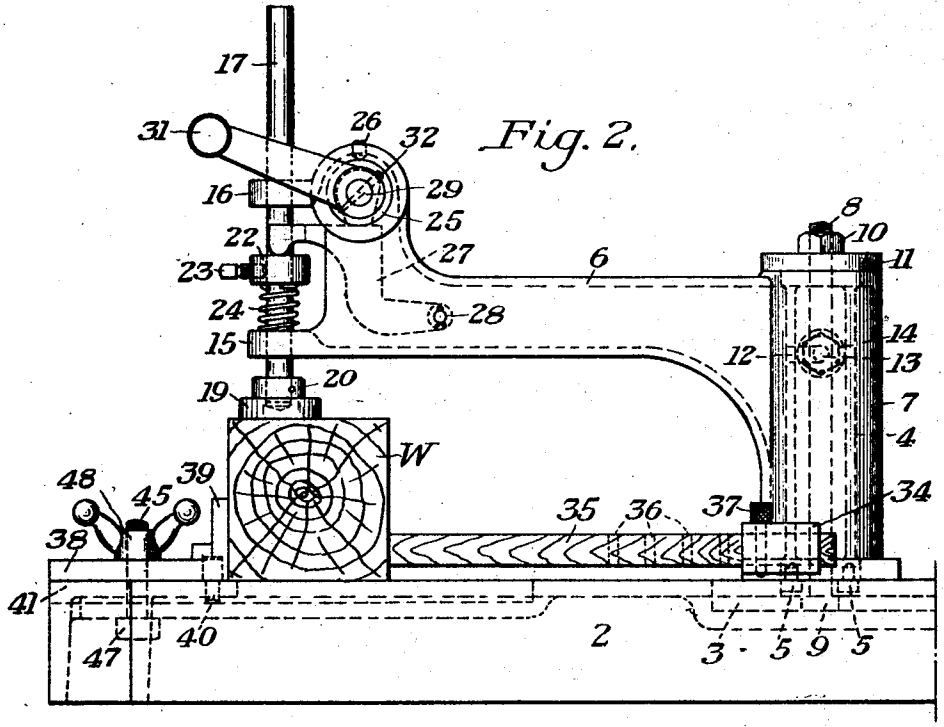


Fig. 2.



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Fig. 3.

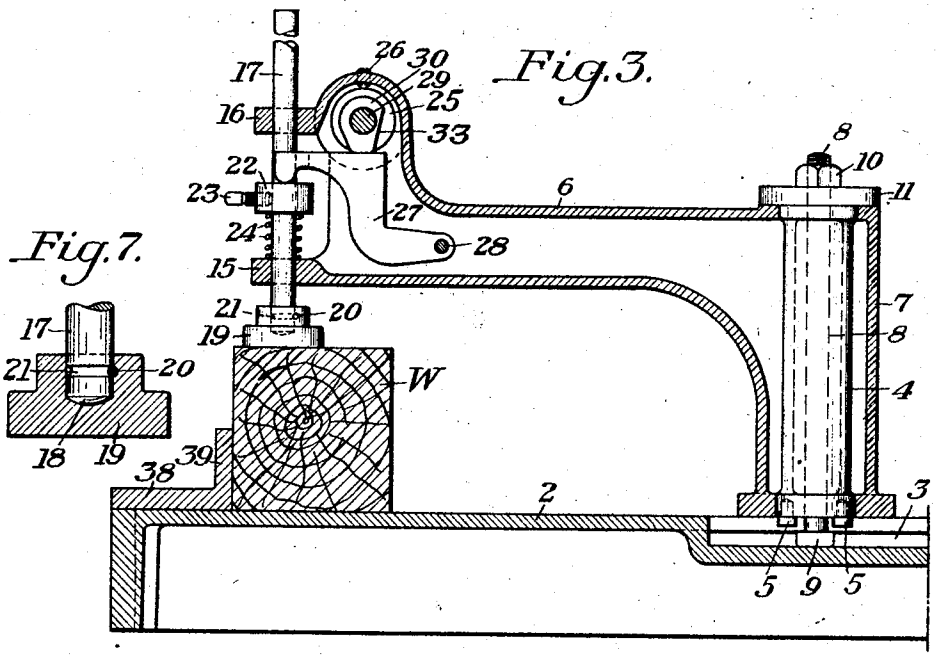


Fig. 7.

Fig. 4.

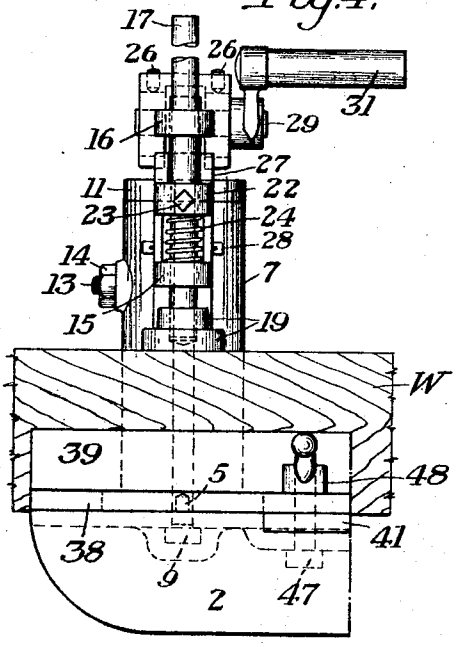


Fig. 6.

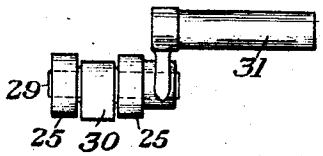
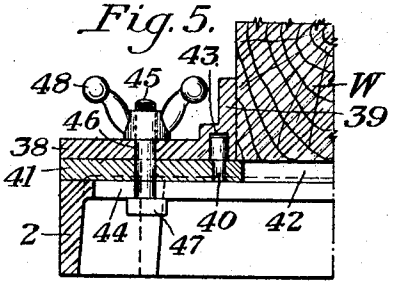


Fig. 5.



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Patented Nov. 10, 1925. 1,560,748

UNITED STATES PATENT OFFICE.

CLINTON G. WILDERSON, OF LEETONIA, OHIO, ASSIGNOR TO THE CRESCENT MACHINE COMPANY, OF LEETONIA, OHIO, A CORPORATION OF OHIO.

WORK CLAMP FOR WOODWORKING MACHINES.

Application filed May 29, 1924. Serial No. 716,629.

To all whom it may concern:

Be it known that I, CLINTON G. WILDERSON, a citizen of the United States, residing at Leetonia, in the county of Columbiana and State of Ohio, have invented a new and useful Improvement in Work Clamps for Woodworking Machines, of which the following is a full, clear, and exact description.

The present invention relates broadly to work holding devices, and more particularly to work clamps for use with wood working machines such as saw tables, borers, mortisers and tenoning machines.

A preferred embodiment of the invention is shown in the accompanying drawings, in which,—

Figure 1 is a plan view of the work clamp, a portion of the base being broken away;

Figures 2, 3 and 4 are, respectively, a side elevation, a longitudinal vertical section, and an end elevation thereof, the right hand portion of the base being broken away in the latter view;

Figure 5 is a fragmentary sectional view taken approximately on the line V—V of Figure 1;

Figure 6 is a detail view of the cam device for operating the clamping foot, and

Figure 7 is a detail view illustrating the manner of mounting the clamping foot on its stem.

The work clamp comprises a base 2 having in one end portion thereof an inverted T-shaped slot 3 extending longitudinally of the base. Mounted upon the base is a hollow vertical post 4 having a pair of pins 5 projecting from its lower end into the narrow portion of the T slot, whereby the post is prevented from turning, but may be adjusted longitudinally of the base.

A horizontally extending hollow arm 6, adapted to overlie the work W to be clamped, has at one end thereof a vertical hub portion 7 journaled upon the post 4. A bolt 8 extends vertically through the post and has a square head 9 at its lower end positioned in the wide portion of the T slot, the head engaging the sides of the slot to prevent the bolt from turning. The upper end of the bolt is screw threaded and has a nut 10 mounted thereon, and interposed between the nut and the top of the post and the top of the hub portion 7 of the arm 6 is a washer 11. The hollow post has a horizontal slot 12 therein and a set screw 13 is mounted in the hub portion 7 and has its inner end normally positioned in the slot 12, whereby swinging movements of the arm 6 are limited. A lock nut 14 is mounted on the set screw 13 for locking it in adjusted position. When it is desired not to limit the swinging movements of the arm 6, the set screw 13 may be adjusted outwardly so as to remove its inner end from the slot 12.

The other end of the hollow arm 6 is provided with vertically spaced lugs 15 and 16 in which a vertical stem 17 is slidably mounted. The lower end of the stem is rounded, as shown at 18 in Figure 7, and a clamping foot 19 for engagement with the work has a vertical bore extending from its upper surface for receiving the lower end portion of the stem, the rounded lower end 18 of the stem engaging the bottom of such bore. A pin 20 is mounted in the clamping foot and engages loosely in a peripheral groove 21 in the lower end portion of the stem, whereby the clamping foot is held upon the stem but is permitted to revolve about the stem as an axis and also to turn about the pin 20 as an axis. The clamping foot is thus enabled to adjust itself to the surface of the work to be clamped.

A collar 22 is adjustably mounted upon the stem between the lugs 15 and 16 and is held in adjusted position by a set screw 23. Surrounding the stem and interposed between the lug 15 and collar 22 is a coil spring 24 which tends to elevate the clamping foot. Mounted in aligned openings in opposite sides of the hollow arm 6 is a pair of bushings 25, these bushings being removably held in said openings by means of set screws 26. A lever 27 is arranged within the hollow arm and pivoted at one end upon a pin 28 mounted in said arm. The other end of the lever is bifurcated to straddle the stem 17 and said bifurcated end engages the upper side of the adjustable collar 22. A shaft 29 is journaled in the bushings 25 and has a cam portion 30 engaging the upper side of the lever 27. An operating handle 31 is mounted upon one end of the shaft 29 and held thereon by means of a pin 32. When the cam portion is turned into the position

shown in Figure 3, the lever 27 is depressed and the clamping foot moved into engagement with the work and positively held in such position. When the cam portion is turned into a position to bring its flat surface 33 parallel to the upper side of the lever 27, the spring 24 is permitted to raise the clamping foot out of engagement with the work. It will be apparent that the adjustable collar 22 enables the position of the clamping foot to be adjusted in accordance with the thickness of the work to be clamped, whereby the cam 30 will exert the proper clamping pressure thereon. When either of the bushings 25 is removed from its opening, the shaft 29 and its cam portion 30 can be removed from the arm 6 through such opening.

Integral with the lower end portion of the hub portion 7 of the arm 6 is a horizontal sleeve 34. This sleeve receives a bar 35, which may be of wood or any other suitable material, having a series of spaced holes 36 therein. The sleeve 34 carries a pin 37 adapted to engage in any one of said holes and thereby hold the bar in adjusted position. This bar is adapted to abut at one end against a side of the work W.

A work guide is mounted upon the end portion of the base opposite that which carries the post 4. This work guide is in the form of a plate 38 having a vertical flange 39 at one edge thereof for engagement with the side of the work W opposite the side engaged by the end of the bar 35. The plate 38 is pivoted at the longitudinal center thereof upon a pin 40. This pin is carried by a filler plate 41 slidably mounted in a slot 42 extending from the end of the base longitudinally thereof. The pin projects upwardly from the filler plate into a recess 43 in the under side of the plate 38 adjacent the flange 39. The base has a longitudinal slot 44 therein beneath the filler plate and in line with the pivot pin 40. A bolt 45 extends vertically through this slot, through the filler plate and through an arcuate slot 46 in the plate 38, the said arcuate slot having its center coincident with the center of the pivot pin 40. The lower end of the bolt 45 has a head 47 engaging the under side of the base, and the upper end of the bolt is screw threaded and has mounted thereon a wing nut 48, whereby the guide plate 38 may be clamped in any desired angular position, the plate being adapted to be swung about the center of the pivot pin 40 as an axis. It will also be seen that the guide plate 38 may be shifted bodily longitudinally of the table by loosening the wing nut and shifting the filler plate 41 in the slot 42, the longitudinal movement of the filler plate being limited only by the length of the slot 44. Obviously this slot may be made any desired length.

In using this work clamp, the collar 22 will be adjusted on the stem 17 into a position such that when the flat side 33 of the cam 30 is parallel to the upper surface of the lever 27, the coil spring 24 will elevate the clamping foot 19 to a position slightly above the upper surface of the piece of work to be clamped. The arm 6 is adapted to be swung about the post 4 into any desired angular position to suit the angle at which it is desired that the work be positioned on the base. When the arm 6 is swung into such angular position, the bar 35 moves with it, so that when the arm 6 is adjusted into the desired position, the bar 35 may be adjusted so as to engage the side of the work. The guide plate 38 may then be adjusted into the desired angular position and shifted longitudinally of the table so as to engage its flange 39 with the opposite side of the work, whereupon the wing nut may be tightened to clamp the guide plate in this adjusted position. When this has been done, the handle 31 may be operated to move the clamp 30 into the position shown in Figure 3, in which position the clamping foot is held in clamping engagement with the work.

While I have shown and described the preferred embodiment of my invention, it will be understood that changes may be made in the details of construction without departing from the spirit of the invention or scope of the appended claims.

I claim:

1. A work clamp, comprising a support, a vertical stem slidably mounted in said support, a clamping foot carried by the lower end of said stem, a coil spring surrounding said stem and engaging at its lower end a fixed portion of the support and at its upper end a collar adjustably mounted on said stem, and means engageable with said collar for moving said foot to and positively holding it in clamping engagement with the work, substantially as described.

2. A work clamp, comprising an arm arranged to overlie the work to be clamped, a vertical stem slidably mounted in said arm, a clamping foot carried by the lower end of said stem, a coil spring surrounding said stem and engaging a fixed support on the arm at its lower end and at its upper end a collar adjustably mounted on said stem, a lever pivoted to said arm and engaging the upper side of said collar, a cam journaled in said arm and engaging the upper side of said lever for moving said foot to and holding it in clamping engagement with the work, and means for operating said cam, substantially as described.

3. A work clamp, comprising a hollow arm arranged to overlie the work to be clamped, a vertical stem slidably mounted in said arm, a clamping foot carried by the

lower end of said stem, a coil spring surrounding said stem and engaging a fixed support on the arm at its lower end and at its upper end a collar adjustably mounted on said stem, a lever pivoted in said arm and having a bifurcated end straddling said stem and engaging the upper side of said collar, a shaft journaled in the sides of said arm and having a cam portion engaging the upper side of said lever for moving said clamping foot to and holding it in clamping engagement with the work, and means for operating said cam portion, substantially as described.

4. A work clamp, comprising a hollow arm arranged to overlie the work to be clamped, a vertical stem slidably mounted in said arm, a clamping foot carried by the lower end of said stem, a coil spring surrounding said stem and engaging a fixed support on the arm at its lower end and at its upper end a collar adjustably mounted on said stem, a lever pivoted on said arm and having a bifurcated end straddling said stem and engaging the upper side of said collar, bushings removably mounted in aligned openings in the sides of said arm, a shaft journaled in said bushings and having a cam portion engaging the upper side of said lever for moving said clamping foot to and holding it in clamping engagement with the work, said shaft and its cam portion being removable through one of said openings, and means for operating said cam portion, substantially as described.

5. A work clamp, comprising a base, an arm arranged to overlie the work to be clamped and mounted for swinging movement about a vertical axis, said axis being shiftable longitudinally of the base to enable bodily adjustment of the arm, a clamp device mounted in said arm for vertical movement, yielding means tending to elevate said clamp device, and means for moving said device to and holding it in clamping engagement with the work, substantially as described.

6. A work clamp, comprising an arm arranged to overlie the work to be clamped and mounted for swinging movement about a vertical axis, means for limiting the swinging movement of said arm about said axis, said means being adjustable to a position to permit unlimited swinging movement of said arm about said axis, a clamp device mounted in said arm for vertical movement, yielding means tending to elevate said clamp device, and means for moving said device to and holding it in clamping engagement with the work, substantially as described.

7. A work clamp, comprising a base, a vertical post mounted upon said base for bodily adjustment longitudinally thereof, means for holding said post in adjusted position, an arm arranged to overlie the work to be clamped and having a hub portion mounted on said post whereby said arm is adapted to be swung about said post as an axis, a clamp device mounted in said arm for vertical movement, yielding means tending to elevate said clamp device, and means for moving said device to and holding it in clamping engagement with the work, substantially as described.

8. A work clamp, comprising a base having an inverted T slot extending longitudinally thereof, a hollow post mounted on said base and having means projecting from its lower end into the narrow portion of said slot for preventing rotation of said post while permitting adjustment thereof longitudinally of said base, an arm arranged to overlie the work to be clamped and having a hub portion journaled on said post and through which the latter extends, a bolt extending through said post and having a head on its lower end positioned in the wide portion of said slot, said head engaging the sides of said slot to prevent turning of the bolt, removable means mounted on the upper end of said bolt and engaging the upper end of said post and overlying the upper end of said hub portion to prevent removal of the post and arm while permitting the arm to swing freely on said post, and work clamping means carried by said arm, substantially as described.

9. A work clamp, comprising a base having an inverted T slot extending longitudinally thereof, a hollow post mounted on said base and having means projecting from its lower end into the narrow portion of said slot for preventing rotation of said post while permitting adjustment thereof longitudinally of said base, an arm arranged to overlie the work to be clamped and having a hub portion journaled on said post, a bolt extending through said post and having a head on its lower end positioned in the wide portion of said slot, said head engaging the sides of said slot to prevent turning of the bolt, a nut mounted on the upper end of said bolt, a washer interposed between said nut and the upper end of said hub portion, and work clamping means carried by said arm, substantially as described.

10. A work clamp, comprising a base, a vertical post mounted on said base and having a horizontal slot therein, an arm arranged to overlie the work to be clamped and having a hub portion journaled on said post, a pin adjustably mounted in said hub portion and having its inner end normally positioned in said slot to limit swinging movements of said arm, and work clamping means carried by said arm, substantially as described.

11. A work clamp, comprising a base, a horizontally extending arm arranged to overlie the work to be clamped and having

a hub portion at one end thereof journaled upon a vertical support carried by the base, a horizontal guide carried by said hub portion adjacent said base, a bar mounted to slide in said guide and having a series of spaced openings therein, a pin mounted in said guide and adapted to be positioned in any of said openings, said bar being adapted to abut at one end against the work to be clamped, and work clamping means carried by said arm, substantially as described.

In testimony whereof I have hereunto set my hand.

CLINTON G. WILDERSON.