

July 7, 1942.

W. J. PARSONS

2,289,142

MITER BOX

Filed June 1, 1939

2 Sheets-Sheet 1

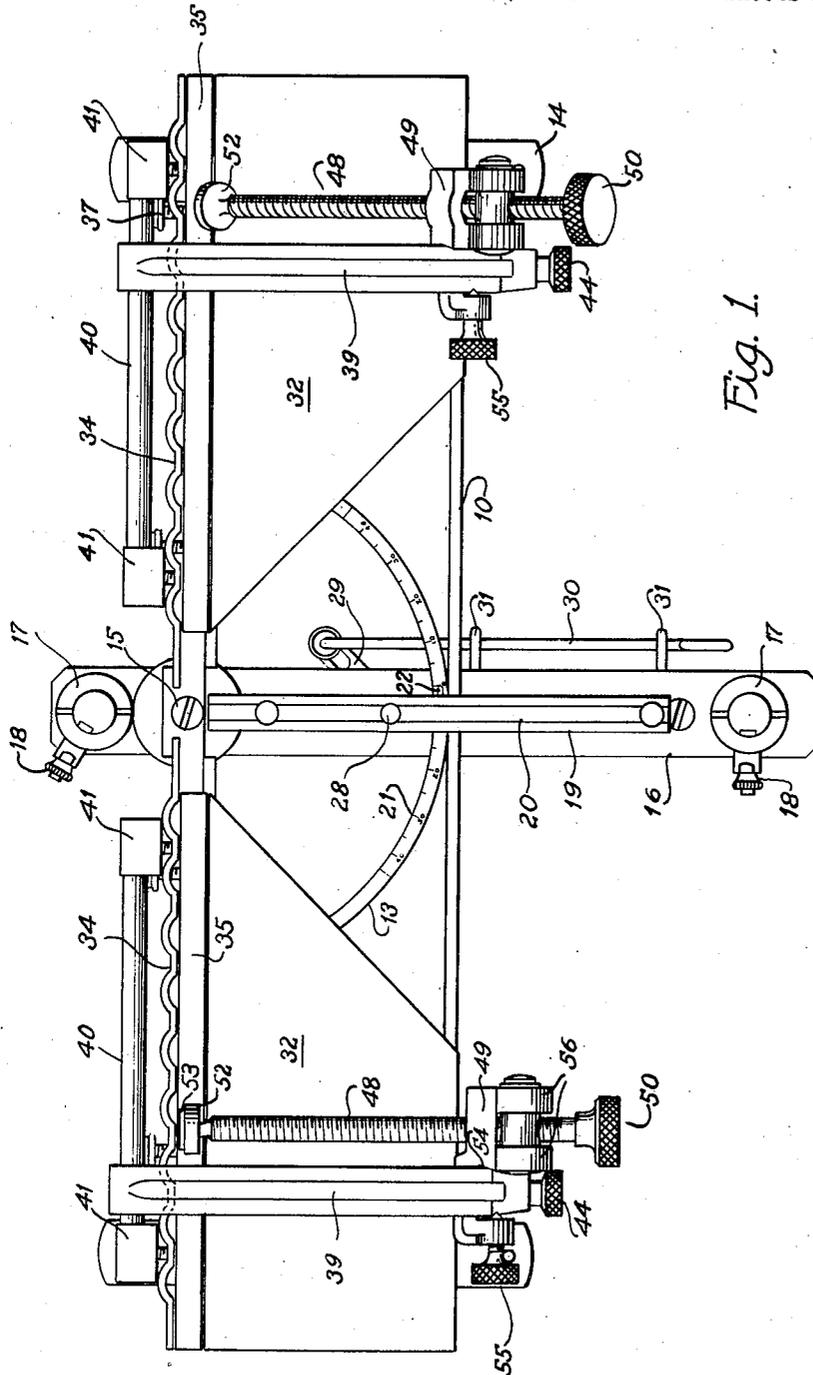


Fig. 1.

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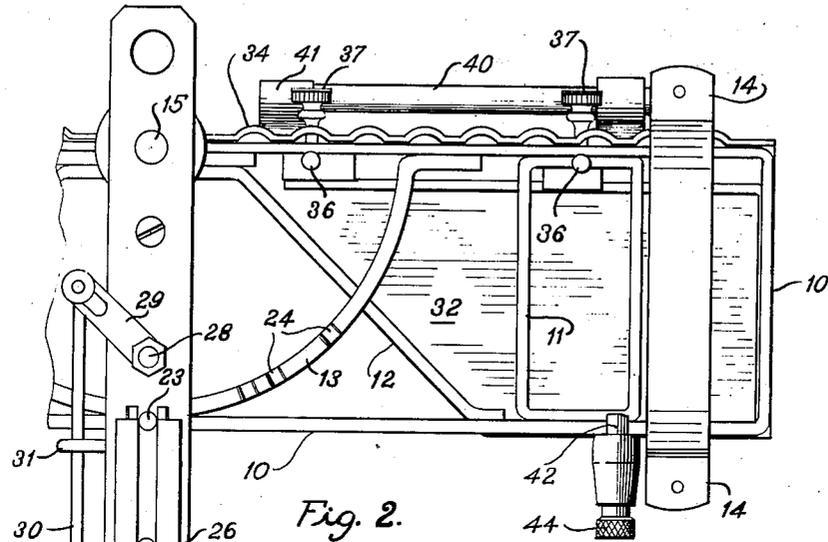


Fig. 2.

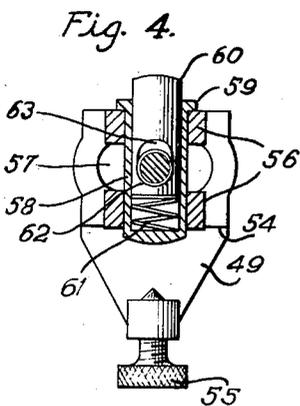


Fig. 4.

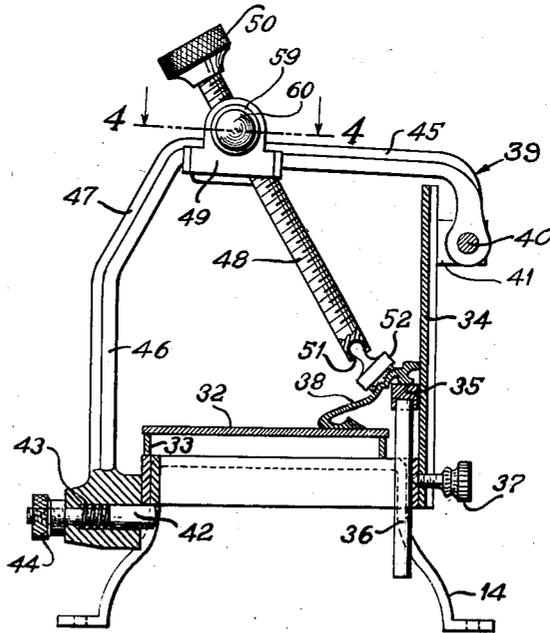


Fig. 3.

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2,289,142

MITER BOX

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Application June 1, 1939, Serial No. 276,755

14 Claims. (Cl. 143—87)

This invention relates to miter boxes, and more particularly to improvements in the means for clamping in miter boxes the material to be sawed.

One object of the invention is to provide an improved form of clamp screw unit which can be adjusted readily and efficiently.

Another object is to provide improved means for clamping moldings and similar irregularly shaped material in a miter box.

A further object is to provide an improved type of clamp arm for a miter box.

Other objects and advantages will in part appear and will in part be pointed out in the course of the following description of one embodiment of the invention, which is given as a non-limiting example in connection with the accompanying drawings, in which

Figure 1 is a plan view of a miter box embodying the improvements of the invention;

Figure 2 is a partial bottom view of the miter box shown in Fig. 1;

Figure 3 is a side elevation partially in section of the same miter box and showing a piece of molding clamped therein; and

Figure 4 is a detail view partly in section on approximately the line 4—4 in Fig. 3.

The general framework of the miter box shown in the drawings is substantially conventional. It includes the rectangular metal frame 10, rectangular braces 11, diagonal braces 12 and the arcuate locking and gauge bar 13. These members may be secured together by any suitable means as by welding, and the assembled structure is supported on four legs 14.

Pivotaly mounted on frame 10 at 15 is bar 16 which carries the conventional saw guide posts 17 equipped with spring locking pegs 18. Bolted on bar 16 is guide bar 19 which helps to support material being sawed and has a longitudinal channel 20 in its upper side to provide clearance for the saw blade. Bar 16 with its saw guide assembly may be rotated about pivot 15 through a distance of about 90°. A scale 21 for measuring this movement is mounted on bar 13, and guide bar 19 carries a peg 22 adjacent the scale 21 to serve as a pointer for the divisions on said scale.

Bar 16 may be locked in any selected angular position by means of locking pin 23, which is slidably mounted therein and fits into a series of notches 24 in the under side of bar 13. Pin 23 is controlled by lever 25 rockingly mounted on pin 26 in bolt 27. A coil spring, not shown, inserted between bar 16 and the front end of lever 25 normally urges the latter downward and so forces pin 23 upward into locking position. When

lever 25 is rocked on its fulcrum 26 and its front end raised against the pressure of this spring, it acts to pull pin 23 downward out of its locking position and thus permits bar 16 to be moved. This construction is shown and described in more detail in my co-pending application, Serial No. 141,884, filed May 11, 1937, issued June 18, 1940 as Patent No. 2,205,019.

Further means for locking the saw guide assembly in position are shown in Figs. 1 and 2, as well as in my above mentioned co-pending application. Bolt 28 is journaled in bar 16 and its upper end threaded into guide bar 19. It may be rotated in either direction by means of slotted link member 29, which is controlled by rod 30 slidably mounted in eyes 31. Turning bolt 28 in one direction will tighten it in guide bar 19, thus drawing the latter downward and clamping it against the top of bar 13, while rotation in the opposite direction produces a releasing action. No claim to any of this saw guide mechanism is made in this application, which is particularly directed to the clamping mechanism and co-operating leveling blocks described hereinafter.

The main part of the work-supporting bed is composed of the conventionally shaped plates 32, mounted on frame members 33 above frame 10 and bolted or otherwise secured thereto. The back of the miter box is composed of corrugated back plates 34 secured in any suitable manner to frame 10. In accordance with the invention, there is added to this conventional construction a pair of leveling blocks 35 which cooperate with bed plates 32. Each leveling block is adjustably mounted in the frame by means of a pair of slidable legs 36 controlled by set screws 37. Normally the upper surfaces of leveling blocks 35 are flush with those of bed plates 32, but each block may be raised to a different level in order to provide additional support for an irregularly shaped piece of material, such as the piece of molding 38 shown in Fig. 3. This is an aid to achieving accuracy of cutting as well as in facilitating speed in handling such material.

The novel construction of clamp arms 39 is shown most clearly in Figs. 1 and 3. The back end of each arm is mounted slidably lengthwise of the miter box on a rod 40, these rods being mounted in brackets 41, which are bolted or otherwise secured to back plates 34. The front ends of arms 39 are formed into housings for locking pins 42 and their controlling springs 43. Knurled nuts 44 are threaded on the reduced forward ends of pins 42 as handles therefor. As is shown in Fig. 3, pins 42 are normally forced

by springs 43 to fit under frame 10 and thus lock the clamp arms in place. It will be seen that this construction makes it very easy to release either arm quickly and swing it clear of the work bed while material is adjusted in position for sawing.

As is shown in Fig. 3, clamp arms 39 are preferably bent to form three sections, a substantially horizontal top section 45, which may slope upward towards the front of the box, as shown in Fig. 3, a vertical front section 46, and a diagonal middle section 47. The advantage of this construction will appear as the description proceeds.

The clamp screw construction shown in Figs. 1, 3 and 4 is particularly novel and useful. Each clamp screw 48 and its mounting bracket 49 form a complete unit. Screws 48 are threaded throughout their length and are provided with knurled heads 50. At the inner end each is provided, as by a ball and socket connection 51, with a clamp foot 52 fitted with a friction pad 53. of leather or other suitable material.

Each mounting bracket 49 is partially grooved at 54 to fit one side of clamp arms 39, and cooperating therewith is a set screw 55 for quickly and firmly securing the bracket in any desired position along the arm. As is shown in Figs. 1 and 3, this permits rapid adjustment of the bracket along any of the three sections of clamp arms 39 and thus greatly simplifies the problem of adequately clamping irregularly shaped material in the miter box.

The adjustable mounting for clamp screws 48 in brackets 49 is shown in detail in Fig. 4. Brackets 49 are cast with a pair of loops or ears 56 with a slotted opening 57 therebetween. Journalled in ears 56 is a cylindrical sleeve 58 closed at one end and provided with a pair of transverse opposite apertures large enough to permit sliding passage to clamp screws 48. Sleeves 58 are formed at their open ends with a flange 59 to hold them in place in ears 56. Slidably mounted in the open end of each sleeve is a solid piston 60 and a small coil spring 61. Piston 60 has an elliptical opening therethrough provided at its inner side 62 with half threads fitting the threads on clamp screws 48. Its outer side 63 is unthreaded and also wide enough to permit free sliding passage to the clamp screw. This mounting permits fast or slow adjustment of the clamp screws. Normally spring 61 will force the threads in piston 60 against the screw to permit slow rotation thereof. However, if piston 60 is pressed in against the spring, this will disengage the half-threads from the clamp screw and permit it to be slid rapidly in either direction. Thus when a piece of material is placed on the work bed, the clamp screws can first be slid rapidly into approximate clamping position, and then the final adjustment can be made by screwing the clamp screws tight.

It will be seen that the above-described mechanisms cooperate to provide substantially simplified and improved means for clamping material in a miter box. The shape of clamp arms 39 and their slidable mounting are important. The adjustable mounting means for clamp screws 48 is particularly advantageous in connection with the angled clamp arms, and this combined construction makes it possible to apply clamping force in and from any desired direction at any point on the work bed. The fast-slow device facilitates speed of adjustment, and it should also be noted that this mounting permits considerable

angular adjustment of the clamp screws in slot 57. Leveling blocks 35 lend further aid in the clamping of irregularly shaped material. The invention is designed in every way for better and quicker clamping action in a miter box than has been known heretofore.

From the foregoing detailed description, it will be understood that the invention is not limited, necessarily, to the specific details of the construction as are herein specifically illustrated and described, as it will be apparent that such details are subject to various modifications which will become apparent readily to one skilled in the art, without departing from the spirit of the invention; and it will be understood, therefore, that it is intended and desired to include within the scope of the invention such modification and changes as may be necessary to adapt it to varying conditions and uses.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a miter box having a work supporting bed and back plates, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section; means for securing the end of said arm adjacent said top section to one of said back plates and the other end to said work supporting bed; a clamp screw; a member having threaded engagement with said screw, means for adjustably mounting said member at any desired point on said arm; and means in said member permitting fast and slow adjustment of said clamp screw.

2. A clamp unit for use in a miter box, comprising a bracket member; releasable means for mounting said bracket on a clamp arm; a clamp screw; mounting means for said clamp screw comprising a sleeve journalled in said bracket and provided with a pair of opposite apertures of sufficient diameter to permit said clamp screw to slide therethrough; a piston reciprocable in said sleeve, said piston being provided with an elliptical aperture adapted to coincide with the apertures in said sleeve, said aperture being provided at one end with half threads adapted to fit the threads on said clamp screw, said clamp screw being slidable axially through the other end of said aperture; a spring normally forcing said piston in one direction to engage said half threads with the threads of said clamp screw; and finger engaging means for moving said piston in the opposite direction and thereby to disengage said half threads and permit said clamp screw to slide freely through said mounting.

3. In a miter box, means for clamping material to be sawed comprising in combination, a clamp arm, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, and mounting means for said clamp screw journalled in said bracket and thereby permitting angular adjustment of said clamp screw.

4. In a miter box, means for clamping material

to be sawed comprising in combination, a clamp arm, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, and mounting means for said clamp screw permitting fast and slow adjustment thereof, said mounting means being journaled in said bracket and thereby permitting angular adjustment of said clamp screw.

5. In a miter box, means for clamping material to be sawed comprising in combination, a clamp arm, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, mounting means for said clamp screw comprising a sleeve journaled in said bracket and provided with a pair of opposite apertures of sufficient diameter to permit said clamp screw to slide therethrough, a piston reciprocable in said sleeve, said piston being provided with an elliptical aperture adapted to coincide with the apertures in said sleeve, said aperture being provided at one end with half threads adapted to fit the threads on said clamp screw, said clamp screw being slidable axially through the other end of said aperture, and means for manually reciprocating said piston to change the position of said clamp screw in said aperture and so to permit slow or fast adjustment thereof.

6. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, and mounting means for said clamp screw journaled in said bracket and thereby permitting angular adjustment of said clamp screw.

7. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, and mounting means for said clamp screw permitting fast and slow adjustment thereof, said mounting means being journaled in said bracket and thereby permitting angular adjustment of said clamp screw.

8. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed

thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, mounting means for said clamp screw comprising a sleeve journaled in said bracket and provided with a pair of opposite apertures of sufficient diameter to permit said clamp screw to slide therethrough, a piston reciprocable in said sleeve, said piston being provided with an elliptical aperture adapted to coincide with the apertures in said sleeve, said aperture being provided at one end with half threads adapted to fit the threads on said clamp screw, said clamp screw being slidable axially through the other end of said aperture, and finger engageable means for manually moving said piston to change the position of said clamp screw in said aperture and so to permit slow or fast adjustment thereof.

9. In a miter box having a work bed and rear wall, means for clamping material to be sawed, comprising in combination, a curved arm, means for securing one end of said arm to the top of said rear wall and the other end of said arm to the forward edge of said bed, a clamp screw, adjustable means for adjustably mounting said clamp screw at different positions on said arm, means in said mounting means permitting fast and slow adjustment of said clamp screw, a leveling block normally flush with said work bed, and adjustable mounting means for regulating the height of said leveling block.

10. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section; means for securing each end of said arm to said miter box; a clamp screw; means for adjustably mounting said clamp screw on said arm; means in said mounting means permitting fast and slow adjustment of said clamp screw, a leveling block normally flush with the work bed of said miter box and adjustable mounting means for regulating the height of said leveling block.

11. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm, means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof, means for releasably securing the other end of said arm to said miter box, a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, mounting means for said clamp screw journaled in said bracket and thereby permitting angular adjustment of said clamp screw, a leveling block normally flush with the work bed of said miter box, and adjustable mounting means for regulating the height of said leveling block.

12. In a miter box, means for clamping material to be sawed, comprising in combination, a clamp arm bent to form a substantially horizontal top section, a substantially vertical front section and a diagonal middle section; means for pivotally mounting one end of said arm on said miter box whereby said arm may be swung clear of the bed thereof; means for releasably securing the other end of said arm to said miter box; a bracket member adjustably mounted on said arm, releasable means for securing said bracket on said arm, a clamp screw, mounting means for said clamp screw permitting fast and slow adjustment thereof, said mounting means being journaled in

said bracket and thereby permitting angular adjustment of said clamp screw, a leveling block normally flush with the work bed of said miter box, and adjustable mounting means for regulating the height of said leveling block.

13. A clamp unit for use in a miter box, comprising a bracket member; releasable means for mounting said bracket on a clamp arm; a clamp screw; mounting means for said clamp screw comprising a sleeve journaled in said bracket and provided with a pair of opposite apertures of sufficient diameter to permit said clamp screw to slide therethrough; a piston reciprocable in said sleeve, said piston being provided with an elliptical aperture adapted to coincide with the apertures in said sleeve, said aperture being provided at one end with half threads adapted to fit the threads on said clamp screw, said clamp screw being slidable axially through the other end of said aperture; and resilient means for urging said

piston in a direction to engage the threads of said clamp screw, whereby said piston may be left in engagement with said threads or may be moved in the other direction against the pressure of said resilient means, so that the position of said clamp screw in said aperture may be changed with slow or fast adjustment thereof.

14. In a miter box having a work bed and rear wall, means for clamping material to be sawed, comprising in combination, a clamp arm mounted so as to substantially subtend the angle formed by said bed and rear wall, adjustable clamping means adjustably mounted on said arm so as to permit the application of a clamping force at any angle within said angle formed by said bed and rear wall, a leveling block normally flush with said bed, and adjustable mounting means for regulating the height of said leveling block.

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