Sept. 8, 1936. N. M. LUDWIG 2,053,569

MITER BOX

Filed Oct. 1, 1934 3 Sheets-Sheet 1

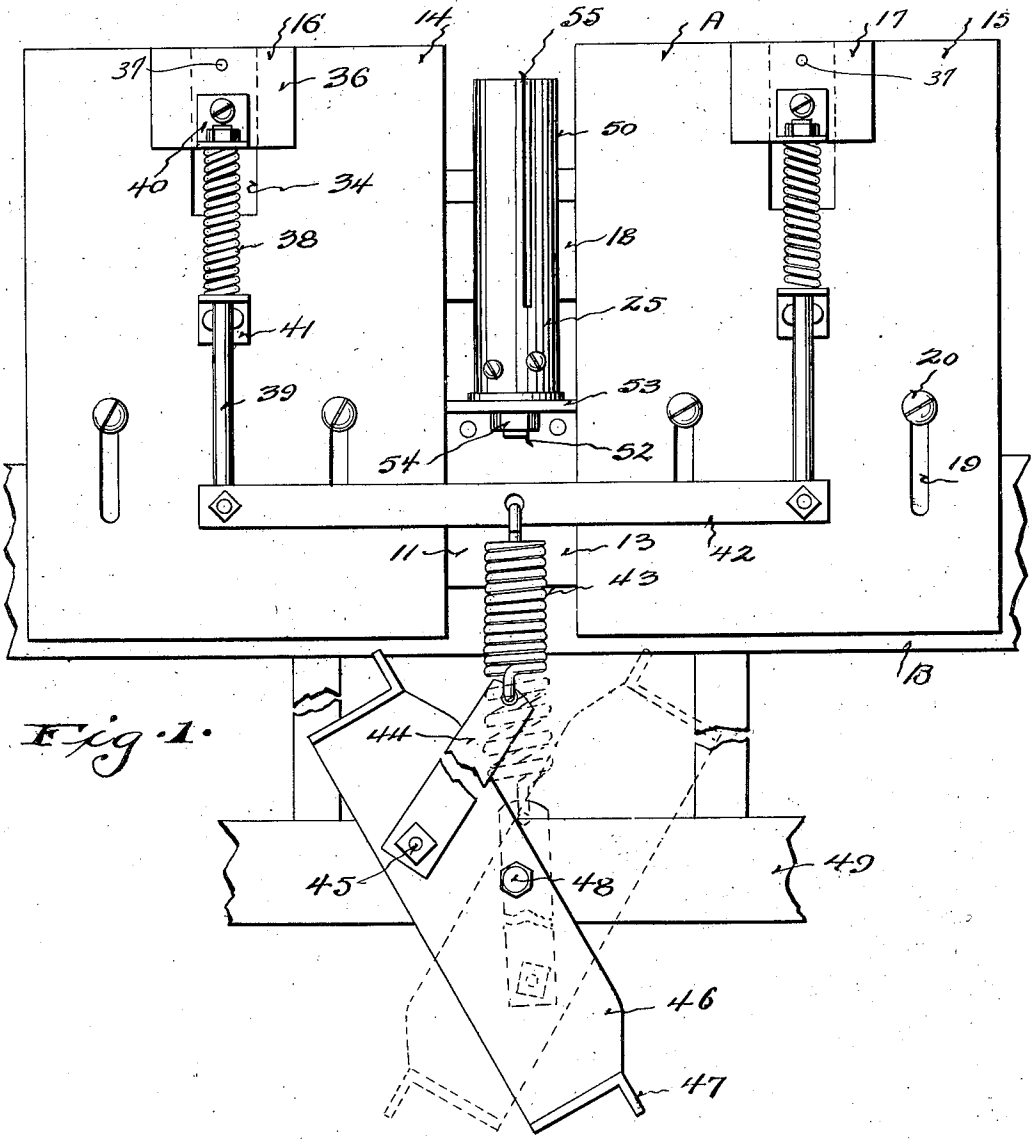


Fig. 1.

Inventor
Nicholas M. Ludwig
By
Attorneys

Sept. 8, 1936. N. M. LUDWIG 2,053,569

MITER BOX

Filed Oct. 1, 1934 3 Sheets-Sheet 2

Fig. 2

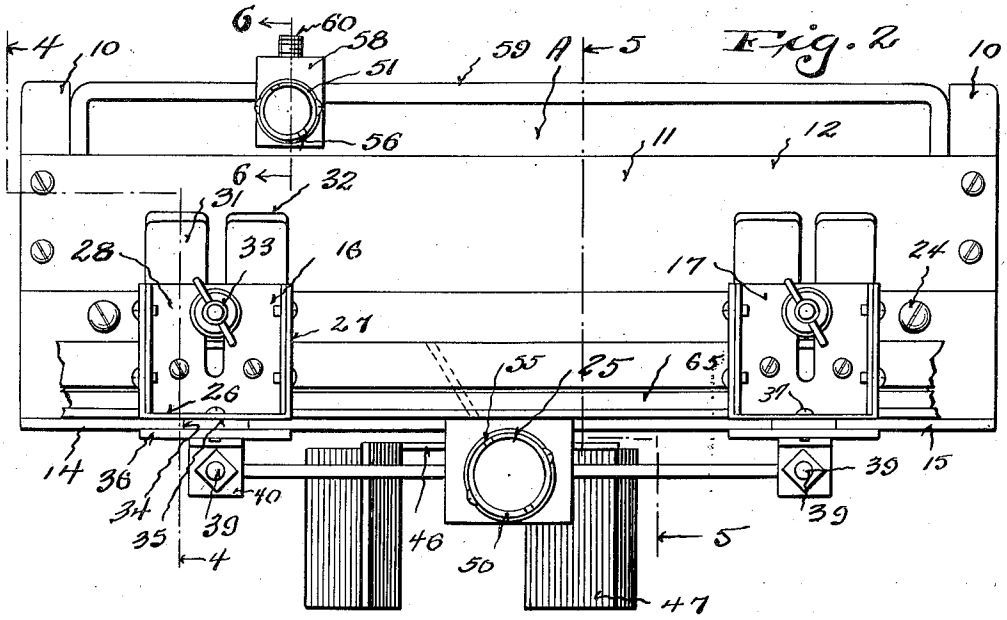
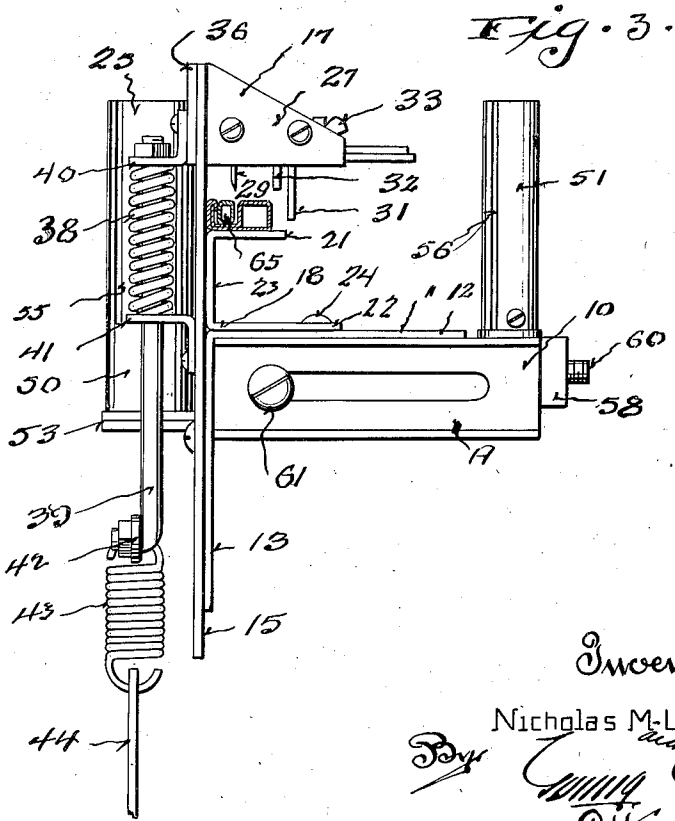


Fig. 3.



Inventor

Nicholas M. Ludwig

By Cushman Cushman

Attorneys

Sept. 8, 1936. N. M. LUDWIG 2,053,569

MITER BOX

Filed Oct. 1, 1934 3 Sheets-Sheet 3

Fig. 4.

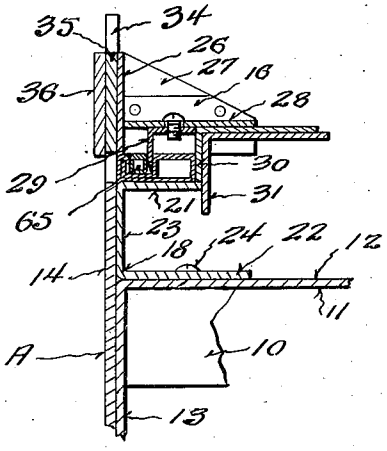


Fig. 6.

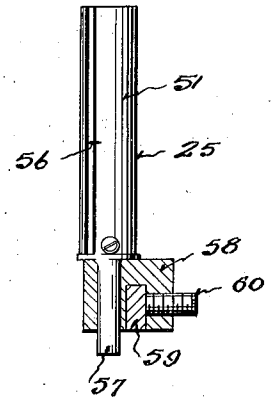
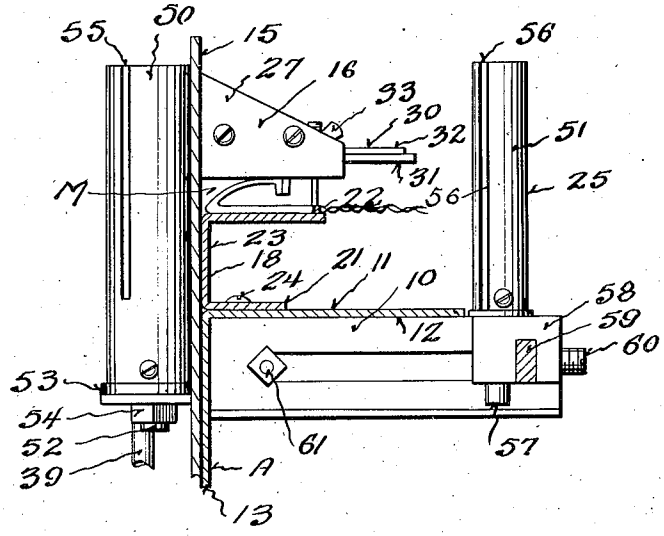


Fig. 5.



Inventor

Nicholas M. Ludwig

By

Attorneys

Patented Sept. 8, 1936 2,053,569

UNITED STATES PATENT OFFICE

2,053,569

MITER BOX

Nicholas M. Ludwig, Racine, Wis.

Application October 1, 1934, Serial No. 746,398

11 Claims. (Cl. 143—86)

This invention appertains to devices for facilitating the cutting of corner beads, moldings, and other metal strips, transversely on various angles, and is an improvement on my prior Patent No. 1,718,791, issued to me June 25, 1929.

One of the salient objects of my invention is to generally improve my above mentioned patent, whereby pieces or strips of various sizes and shapes can be conveniently held and clamped during the sawing operation, and to provide novel means for guiding the saw blade during such operation.

Another important object of my invention is the provision of novel means for adjusting the work support and for initially adjusting the position of the work holding clamps relative to the work support, whereby various sizes and shapes of metal pieces can be received and held in the box.

A further object of my invention is to provide novel means for constructing the work clamps themselves, whereby various characters, shapes, and sizes of work can be firmly held on the work support, whereby movement thereof will be prevented during the sawing operation, irrespective of at what angle the same are being cut.

A further object of my invention is the provision of a miter box, particularly adapted for sawing metal pieces embodying a work support, and an adjustable saw guide with work clamping jaws disposed on opposite sides of the guide and with novel means for simultaneously urging the jaws into and out of work engaging position.

A further object of my invention is to provide a pair of yielding work clamps with novel means for equalizing the pressure on the clamps, whereby the work will be firmly held, irrespective of the contour and characteristics thereof.

A further object of my invention is the provision of foot treadle actuated means for simultaneously operating the jaws, said foot pedal being so arranged as to lock the jaws in work gripping position when the pedal is in one position, and for holding the jaws raised when the pedal is in another position.

A further important object of my invention is the provision of a novel device for cutting metal frame-pieces for window screens and their screen clamping strips, the jaws being so constructed as to simultaneously grip the frame-piece and the clamping strip, whereby both pieces can be cut simultaneously and on the same angle.

A still further object of my invention is to provide novel means for constructing the frame of the box, whereby the same will be durable and efficient in use, and whereby the same can be placed upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a front elevation of my improved miter box showing the same attached to a fragment of a work bench or table, the foot treadle being shown in full lines in one position and in dotted lines in its other position;

Figure 2 is a top plan view of my improved device;

Figure 3 is an end elevation of the same.

Figure 4 is a transverse section through my improved miter box taken on the line 4—4 of Figure 2, illustrating the novel construction of the jaws for engaging and holding the window frame strip and clamping strip;

Figure 5 is a detail cross section through the miter box taken on the line 5—5 of Figure 2, showing the position of the work holder reversed, and a jaw engaging a corner bead or molding;

Figure 6 is a detail section taken on the line 6—6 of Figure 2 showing the rear saw guide.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates my improved miter box, and B a work bench with which the same can be associated. The miter box A includes a pair of spaced transversely extending channel frame-pieces 10 to which is bolted, riveted, or spot-welded, the angle-shaped frame plate 11. This frame plate 11 includes a horizontally disposed flange 12 and a depending vertically disposed flange 13. The flange 12 overlies the top of the channel pieces 10, while the vertical flange 13 lies over the front ends of said frame pieces. These three members constitute a rugged frame on which the various elements of my device are mounted.

Adjustably secured to the front flange 13 are a pair of spaced face plates 14 and 15. These face plates 14 and 15 adjustably carry the novel work clamping jaws 16 nd 17. The jaws 16 and 17 are movable (by means, which will be later described) toward the work holder 18.

The face plates 14 and 15 are adjustable so that the initial position of the work engaging jaws 16 and 17 can be adjusted relative to the work holder 18.

Any preferred means can be provided for securing the face plates in position and, as shown, each face plate is provided with a pair of vertically extending slots 19 through which extend adjusting screws 20 carried by the vertical flange 13 of the frame plate. Thus, by loosening the screws 20 the face plates 16 and 17 can be raised and lowered carrying the clamping jaws therewith, and when the desired position is reached the screws can again be tightened.

The work holder 18 is also of a channel shape, and includes parallel flanges 21 and 22 and a connecting flange 23. The flange 22 is formed wider than the flange 21 so that different widths of work can be conveniently supported. Thus, when a narrow piece of work is being cut, as shown in Figure 3, the flange 21 is disposed uppermost, but when a relatively wide piece of work is being cut the flange 22 is disposed uppermost.

In all positions of the work holder the flange 23 is preferably placed in abutting relation to the face plates 14 and 15. Suitable removable screws 24 can be employed for holding the work holder in place, and these screws can be threaded through the desired flange 21 or 22 into the horizontal flange 12 of the frame plate 11.

The work to be operated upon is placed upon the work holder so that the portion to be cut lies between the face plates 14 and 15, after which the work is held by the clamps 16 and 17.

When the work is firmly clamped, the same is cut or sawed on the desired angle by a hacksaw S, and a novel guide 25 is provided therefor. This guide will be later described in detail.

Attention is now invited to the novel construction of the work clamping jaws 16 and 17, and it is to be noted that these jaws are identical in construction. Each of the jaws include a substantially U-shaped body in plan, including a front connecting body plate 26 and rearwardly extending legs 27. These legs 27 have rigidly secured thereto a bottom plate 28. This bottom plate has loosely mounted thereon a transversely extending wedge-shaped jaw 29, the purpose of which will be later set forth.

In rear of the loosely mounted wedge-shaped jaw 29 are a pair of adjustable jaw plates 30 and 31. Either one or both of the jaw plates can be used, and each jaw plate includes a depending work engaging wall 32, and this wall is adapted to lie in parallel relation to its face plate, and to engage the rear face of the work to be held. These jaws 30 and 31 are adjustable toward and away from the face plate, and are held in a preferred adjusted position by means of a headed bolt which extends through the bottom plate 28, and slots formed in the jaws 30 and 31. A winged nut 33 can be employed for holding the jaws 30 and 31 tightly in place.

As heretofore intimated, the jaws 16 and 17 in their entirety are movable toward and away from the work support 18, and consequently these jaws 16 and 17 are slidable on the face plates 14 and 15. These face plates 14 and 15 are provided with vertical slots 34 in which are slidably mounted slide plates 35. On the outer surface of the face plates 14 and 15 are arranged holding plates 36, and the slide plates 35, the holding plates 36 and the bodies of the jaws 16 and 17 are united by means of fastening elements or the like 37. The jaws 16 and 17 are normally held in a raised position by means of springs 38 which are coiled about guide rods 39. The guide rods 39 are connected at their upper ends to angle plates 40 rigidly secured to the holding plates 36. These rods 39 are guided in their sliding movement by means of brackets 41 through which the rods extend. The brackets 41 are rigidly connected with the face plates 14 and 15. Thus, the opposite ends of the springs 38 bear respectively against the brackets 40 and 41.

Novel means is provided for simultaneously moving the jaws 16 and 17 against the tension of their springs 38 to a work gripping position, and this means includes a longitudinally extending equalizing bar 42, which lies in front of the face plates 14 and 15.

The opposite ends of the equalizing bar 42 have pivotally connected thereto the lower terminals of the guide rods 39.

Connected to the transverse center of the equalizing bar 42 by means of a relatively heavy contractile coil spring 43 is an operating link 44. The lower end of the operating link 44 is pivotally connected as at 45 to an actuating foot treadle 46. The foot treadle 46 has formed on its opposite ends foot pedals 47, and the foot treadle 46 is pivotally connected at a point equidistant its ends, as at 48, to a bottom rail 49 which can form a part of the work bench or table.

The operating link 44 can be made adjustable as to length, as shown, so that the device can be utilized and connected with work benches of different heights.

I lay particular stress on the use of the equalizing bar 42, in that by the use of this bar I am enabled to equalize the pressure on the work clamps 16 and 17, and thus the clamps will be firmly and simultaneously drawn into engagement with the work, irrespective of the contour or peculiarities thereof.

In Figure 1, the foot pedal is shown in its raised position and consequently the clamps 16 and 17 are held in their raised position. However, when the work is placed on the holder or support 18, the foot pedal 47 on the left hand side is pressed downwardly. This movement through the medium of the link 44 and the spring 43 will draw down on the equalizing bar 42 and move the clamps 16 and 17 to their work engaging position. This movement of the foot pedal will throw the operating link off center and consequently the clamps 16 and 17 will be automatically locked in their work gripping position.

I also lay particular stress on the means 25 for guiding the saw S during the cutting of the work. The saw guide 25 includes a front tubular guide sleeve 50 and a rear tubular guide sleeve 51. The front tubular guide sleeve 50 is secured to a stud 52 which extends through an angle bracket 53 rigidly connected to the frame plate 11 between the face plates 14 and 15. The stud 52 is held in position by means of a lock nut 54. A diametrically extending saw blade slot 55 is formed in the tubular guide sleeve and the guide sleeve can be turned so as to position the guide slot at the desired angle relative to the work by loosening the nut 54.

The rear tubular guide sleeve 51 is constructed similar to the front guide sleeve 50 and the same is also provided with a diametrically extending saw blade guide slot 56. The lower end of the guide sleeve 51 carries a stud 57 which is freely rotatably mounted in an adjustable block 58. The adjustable block is slidably mounted on a U-shaped frame bar 59, and is held in any preferred set position on the frame bar by means of a set screw 60. The legs of the U-shaped frame bar 59 are slidably received by the channel pieces 10 of the frame, so that the frame-piece 59 can be moved toward and away from the work support 18 and the front tubular guide 50. An adjusting screw 61 is employed for holding the frame-piece 59 in its adjusted position. The blade 62 of the saw is received directly within the slots 55 and 56 of the guide sleeves, and thus the blade itself is guided during the reciprocation of the saw. Obviously, by adjusting the sleeves 50 and 51, the saw can be held at any angle so that the work can be cut.

In Figure 3 I have shown the device used for holding a metal frame strip of a window screen, and it is to be noted that the sides of the clamps 16 and 17 engage on top of this strip, while the jaw 30 engages the rear edge of the strip. Consequently, the strip is held firmly against movement.

As shown, the strip carries the clamping bead 65 in its grooves, and in accordance with my invention, this bead is firmly gripped and held in place so that the same and the strip can be simultaneously cut. Thus, the loosely mounted wedge-shaped jaw 29 rides into the groove of the strip against the bead and firmly holds the same in place. By having the wedge jaw 29 loosely mounted, the same will readily work its way into the groove for engagement with the bead.

In Figure 5 I have shown the position of the work support 18 reversed for receiving a piece of molding or corner bead M. In this figure, the manner in which the jaws grip the molding is clearly shown.

I lay particular stress on the fact that the saw guide sleeves 50 and 51 receive and guide the saw blade itself, and these sleeves are formed from hardened material, so that the cuts therein will not be enlarged incident to the constant use of the saw.

From the foregoing description, it can be seen that I have provided an especially simple and durable form of miter box, in which novel means is provided for clamping the work, in which novel means is provided for operating the clamp, and in which novel means is provided for guiding the saw blade.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. A miter box of the character set forth comprising a supporting frame, a work support clamping jaws movable toward and away from the work support, a saw guide, and means for moving the jaws toward and away from the work support, each of said jaws including horizontal work engaging faces and vertically disposed work engaging faces, said vertical work engaging faces being adjustable in a horizontal plane on the horizontal work-engaging faces.

2. A miter box comprising a supporting frame, a work support, a saw guide, clamping jaws on the frame disposed on each side of the saw guide and movable toward and away from the work support, resilient means normally holding the jaws in an elevated position away from the work support, and yieldable means for simultaneously urging the jaws toward the work support and into work clamping position, said means including an equalizing bar having its opposite ends operatively connected to the jaws, a contractile coil spring connected to the transverse center of the bar, and an operating link connected with the spring.

3. A miter box comprising a work support, a saw guide, clamping jaws disposed on opposite sides of the saw guide and movable toward and away from the work support, depending guide rods connected with the clamping jaws, expansion springs coiled about the rods normally urging the jaws into an elevating position, an equalizing bar, means pivotally connecting the guide rods to the opposite ends of the equalizing bar, an operating link pivotally connected with the transverse center of the bar, a double ended foot treadle rockably mounted equidistant its ends, and means pivotally connecting the link to the foot treadle of one side of its pivot point.

4. A miter box comprising a frame, a work support on the frame, a pair of spaced face plates, a saw guide arranged between said face plates, slidable clamping jaws on the face plates mounted above the work support, means for simultaneously actuating the clamping jaws, and means adjustably securing the face plates to the frame, whereby the jaws can be initially adjusted relative to the work support.

5. A miter box comprising a frame, clamping jaws on the frame, means for simultaneously operating the clamping jaws, a saw guide, a work support on the frame disposed below the jaws, said work support including a channel-shaped strip having horizontally disposed flanges, and a connecting vertical flange, the horizontal flanges being of different widths for selective engagement with the frame, and means detachably securing the flange engaging the frame to said frame.

6. A miter box comprising a supporting frame, a work support on the supporting frame, a pair of spaced clamping jaws, movable towards and away from the work support, means for operating said jaws, and a saw guide, said saw guide including front and rear rotatable sleeves having saw blade receiving kerfs therein, a U-shaped supporting bar movable towards and away from the work support means adjustably securing the bar in a selected position, a block slidably mounted longitudinally on the bar, and means connecting the rear sleeve with said block.

7. A miter box comprising a frame including a pair of spaced channel bars, an angle plate including a horizontal and a vertically disposed flange, means connecting the channel bars with the lower face of the horizontal flange, a reversible work support detachably connected with the horizontal flange, face plates connected with the vertical flange, a saw guide, and adjustable yielding jaws carried by the face plates and movable towards and away from the work support.

8. In a miter box of the character described, a work support, a clamp movable towards and away from the work support having a work-engaging face, and a depending wedge-shaped gripping jaw on the clamp, said jaw being loosely mounted and disposed substantially at right angles to said face.

9. In a miter box, a work support, a clamp movable towards and away from the work support including a horizontally disposed work-gripping face, and adjustable vertical jaws slidably mounted on said face.

10. In a miter box, a work support, a clamp movable towards and away from the work support having a work-gripping face, a loosely mounted wedge-shaped jaw depending from said face, and adjustable jaws having vertically disposed clamping faces mounted on said clamp.

11. A miter box comprising a frame including a pair of spaced channel bars, an angle plate including a horizontally and a vertically disposed flange, means connecting the channel bars with the lower face of the horizontal flange, a work support connected with the angle plate, a saw guide, and adjustable yieldable jaws carried by the face plates and movable toward and away from the work support.

NICHOLAS M. LUDWIG.