

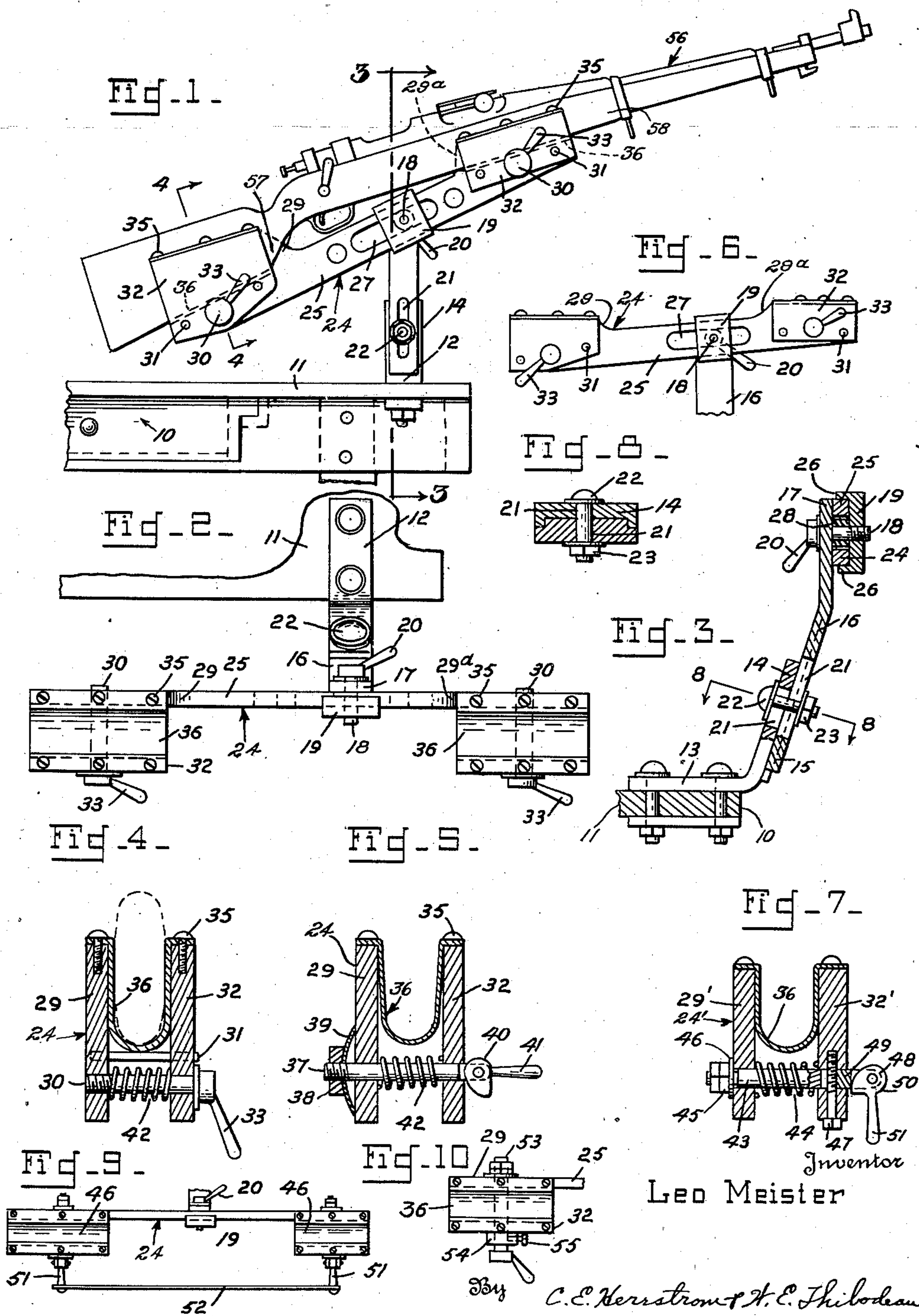
Sept. 16, 1947.

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2,427,365

GUNSMITH'S VISE

Filed March 17, 1944



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## UNITED STATES PATENT OFFICE

2,427,365

## GUNSMITH'S VISE

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Application March 17, 1944, Serial No. 526,953

2 Claims. (Cl. 81—38)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The invention relates to work holders and particularly to devices in the nature of vises.

It has for an object to present an appliance in which a work piece may be releasably secured and—while held or gripped in the device—turned to various positions and secured rigidly in such positions while tools are applied thereto or while the work is disassembled or assembled.

It is a special aim of the invention to offer a vise device which is specially adaptable to supporting small arms such as rifles, carbines, and the like, so that manufacturing assembly, or cleaning and repair operations, may be more rapidly and effectively carried out.

An important object is to evolve a novel rifle gripping device by which the weapon may be held with great rigidity and with a minimum liability of injury to the stock or finish, in contrast to the common practice of engaging the barrel or stock alternatively between the jaws of an ordinary vise, with protective wood or other material interposed between the weapon and the jaws. The latter practices involve liability of bending of the barrel or cleavage strains in the stock.

A paramount object of the invention is to enable a rapid mounting of a weapon rigidly and safely, and to enable its release with corresponding facility. In this procedure, contrary to that involved in the use of ordinary gripping devices, it is sought to obviate the need for manually holding and supporting the work in proper position for gripping while the gripping means is in course of application to the work, but rather, to permit the worker to simply lay the weapon in place and to release it there while a gripping device completes the necessary movement to secure the work rigidly therein.

A further important attainment in view is the provision of a plural grip device constructed to grip a weapon at parts spaced well from the location of the firing, trigger, and other mechanism frequently requiring attention, manipulation, or access for cleaning.

A correlated object is to enable ready access to all parts of the usual weapon where screws or fastenings are located and enable application of screw drivers and other tools thereto, while held in my device.

It is also an important purpose to construct the body of the vise frame so that there will be clearance unlimited both below and above the

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work when disposed in position with the vise frame horizontal or at substantial angles to the vertical. This is most important in work on modern small arms where access to the chamber and automatic mechanisms from both top and bottom sides of the weapon is desirable.

A further aim is to enable construction of vise elements inexpensively, yet with certain novel features of advantage.

Additional objects, advantages and features of invention reside in construction, arrangement and combination of parts involved in the embodiment of the invention, as will be understood from the following description and accompanying drawings, wherein

Fig. 1 is a front elevation of a work holder embodying my invention mounted on a bench and supporting a carbine;

Fig. 2 is a top view of the holder;

Fig. 3 is a vertical section of the pedestal taken on the line 3—3 of Fig. 1, but omitting the carbine;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a similar view of a modification;

Fig. 6 is a front elevation of the work grip frame unit alone;

Fig. 7 is a view similar to Fig. 5 of a preferred construction of the vise;

Fig. 8 is a section through the sliding joint of the pedestal;

Fig. 9 is a view similar to Fig. 6, showing means to operate the two vises simultaneously;

Fig. 10 is a detail of an adjusting device for the vise screw.

Referring to the drawings, there is shown a work bench 10 of conventional form including table boards 11. On the latter, at the front side of the bench there is bolted a foot bracket 12 consisting of a length of flat stock metal bent intermediately of its length to an angle of 113 degrees more or less so as to form a foot plate 13 suitably apertured for bolting to the table top, and an upstanding leg 14, forwardly flanged at the sides, and receiving between these flanges slidably a shank 15, of an upper pedestal section 16, the upper end part 17 of which is bent to extend either vertically or at such angle to the vertical as is best suited to the operations to be performed. For the average work bench and for work on guns the leg has been made slightly less than five inches long and the shank 15 approximately six inches long, the upper or head end 17 being much shorter, and being centrally apertured to receive therethrough a clamp screw 18 engaged in a centrally apertured and tapped



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clamp plate 19, the screw having a shouldered head and handle 20 engaged against the rear side of the head end 17.

The leg 14 and shank 15 have respective longitudinal slots 21 therein and a headed bolt 22 is engaged through both slots and secured by a nut 23, clamping these two parts together but adjustable to vary the height of the pedestal.

Held under the plate 19 against the head 17 there is a grip frame 24 made as a planiform steel plate approximately three eighths inch thick and approximately two feet in length for the present use, its medial part over a major part of its length being rectilinear bar 25 of uniform width slightly less than the width of the clamp plate 19, and the latter is provided with flanges 26 at opposite sides to receive the bar snugly and slidably therebetween. The bar has formed therein a longitudinal slot 27 considerably wider than the diameter of the clampscrew 18, and a washer 28 of a diameter slightly less than the width of the slot is fitted around the screw 18 in the slot, serving more or less as an antifriction bearing on which the frame is supported for sliding adjustment of the frame when the clampscrew 18 is released.

Left and right diagonal upward extensions 29—29<sup>a</sup> are formed at respective ends of the bar 25, which extend vertically when the bar is inclined upwardly from left to right at an angle approximating 15 degrees, as in Fig. 6, these constituting fixed jaws of the work clamps to be described.

In the lower parts of the plate midway of the lengths of the jaw extensions 29—29<sup>a</sup>, there are tapped holes in which there are engaged respective vise screws 30, and dowels 31 may also be set in this plate within the lengths of the jaws 29—29<sup>a</sup>. Movable jaws 32 are provided of the same general form and thickness as the extensions 29, and are apertured to receive the dowels 31 slidably therethrough. The screws 30, as in Fig. 4, are engaged revolvably through the jaws 32 and may have shouldered heads before the jaws 32, and operating arms or levers 33 thereon. The extensions 29—29<sup>a</sup> and the movable jaws 32, respectively, constitute rear and front vise elements.

The top edges of the jaw extensions 29—29<sup>a</sup> and of the movable jaws are in planes normal to the end edges of the jaws, and are drilled and tapped to receive screws 35 by which flexible leather work saddles 36 are secured. These saddles consist of broad strips or bands of leather in the form of pendent loops between the jaws, the upper edges being secured at the tops of the jaws by an adequate number of the screws. With the jaws opened sufficiently to receive the forward stock and rear stock portions of a gun, the loops hang just above the screws 30, and the dowels 31 are also arranged to lie sufficiently below such engaged portions of a gun. The loop part of the saddle is inclined in the rear vise element to approximate the inclination of the lower edge of the rear stock between the grip and butt when the barrel of the weapon is in a plane parallel to the top edges of the forward jaws; and the loop in the front vise is somewhat less inclined, so as to fit the lower side of the forward portion of a gun stock, adjusted as stated. In order to attain this accommodation of the saddle to the contour, the length of the band is progressively varied from one side to the other.

In Fig. 5 there is illustrated a modification

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of the jaw operating means, in which an eye bolt 37 is engaged slidably through both jaws, an adjusting nut 38 being engaged on its rear end, and a Belleville spring 39 being fitted around the bolt loosely, its convex side next the nut and its concave side toward the frame 24. The eye of the bolt has a cam 40 pivoted thereon to rotate on an axis parallel to the jaw 32, this cam having a low part to engage the jaw 32 when the vise is open, and a high part to press the jaw rearwardly. An operating arm 41 is fixed on the cam adjacent its high part which is below the low part of the cam when against the jaw 32, the arm then extending generally downward.

A helical compression spring 42 around the bolt is confined between the jaws 32 and 29, so as to hold the vise yieldably open.

In the modification of Fig. 7, the frame and stationary jaw 29' may be as before described as to general shape but instead of a tapped hole for the clamping bolt, a larger smooth bore is made, and a thicker plate material used in the movable jaw. The latter is also smooth bored coaxially within the bore in the stationary jaw, and a smooth bodied large diameter slide bolt 43, engaged slidably through both jaws in these holes, a helical compression spring 44 being engaged around the bolt and confined between the jaws. The rear end of the bolt is tenoned and threaded to receive nut and lock nut at 45 by which the bolt is anchored, and adjusted. A simple washer 46 is disposed between the stationary jaw 29' and the nuts, but a Belleville spring may be used as in Fig. 5, if desired. The forward end of the bolt is diametrically slotted through the extremity of the bolt from a point inwardly of the jaw 32' when the vise is in open position.

The jaw 32' is bored vertically from its lower edge and diametrically beyond and above the hole for the bolt 43, its upper part at least being tapped and an abutment bolt 47 screwed thereinto, extending through the slot at the end of the slide bolt.

Set slidably between the ears 48 formed by the slot in the bolt 43 there is a wear block 49 of bronze or other suitable material fitted slidably in the slot of the bolt and also in the hole for the slide bolt and resting against the abutment bolt 47. A cam 50 of hard steel, preferably, is pivoted between the ears 48 outwardly of the block 49 and drawn thereagainst by the spring 44. The cam has an operating handle 51 extended upwardly beside the jaw 32' when the low part of the cam is against the block 49 the high part of the cam being below at that time and adjacent to the outer side of the handle, so that when the handle is pressed down the higher parts of the cam press on the wear block 49 as in Fig. 7 and cause the jaw 32' to be pressed inwardly.

Owing to this movement of the lever 51 for clamping and upward movement for release of work, at both vises, I am able as in Fig. 9 to attach a rigid bar 52 to and between the ends of the levers 51, so that after laying a gun in the saddles of the vises, a downward pressure on this bar will operate both vises and simultaneously secure both ends of the work in the device.

When the gun is thus secured, the frame and vises are preferably in a position with the tops of the jaws level, and after so securing the weapon, the clamp lever 20 is turned to lessen the clamping force of the plate 19, and the vises and work as a unit, on the frame 24, may be rotated



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through any desired angle, the work being held well forward of the bench by the offset form of the pedestal. Thus, the gun may be inverted and secured in that position by again tightening the clamp lever 20, or may be disposed at such angle as shown in Fig. 1, which is a common one preferable for many jobs. For work on the Springfield rifle and the U. S. rifle calibre 30, M1, a rearward inclination of the head 17 may be preferred and the angle of bend between the head and shank of the upper section of the pedestal may be varied accordingly.

For other pieces or other work, a different or an opposite inclination may be imparted to the head.

The securement of a weapon by the use of the clamp screws of Figures 4 and 5 will be understood from the foregoing description since the first corresponds to conventional vises and the latter operates the same as the device of Fig. 7.

The device of Fig. 5 can be adjusted to thinner work or to compensate for compaction of the leather saddle material by screwing up the nut 38, and the device of Fig. 7 similarly adjusted by the nuts at 45.

It is an advantage of the device of Fig. 7 that the engagement of the abutment bolt 47 through the slot in the draw bolt 43 prevents the latter from rotating, and so the operating lever always moves in a vertical plane.

In Fig. 10, the clamp bolt 53 corresponding to the screw 30 before described, is made somewhat longer, and a thick collar 54 engaged slidably thereon before the movable jaw. A set screw 55 is engaged radially therein to impinge on the bolt 53 to hold the collar at adjusted positions longitudinally of the bolt, for adjusting the vise to thicker or thinner work or for other reasons.

While my invention may be applied to the clamping of various shapes, in its present embodiment it is especially adapted to holding shoulder arms, the conventional form of which is represented at 56 in Fig. 1. In this special application it may be seen that the top of the bar 25 coincides with a line close under the trigger guard from the bottom of the pistol grip 57 of the stock to the forestock 58 which is a forward hand rest portion of the stock, and the jaws 29—29a extend above this line a distance slightly more than equal to the mid-height of the respective parts of the stock engaged thereat when in firing position. This midheight corresponds to the level at which opposite surface portions of the stock are parallel, and so are adapted to be securely and safely clamped between the jaws of the respective clamps.

By making the bar 25 rectilinear and close to the line mentioned, rotative adjustment of the frame and work on the bolt 18 will not displace the center of gravity of the work and frame excessively from a vertical through the bolt 18, and it will be practicable to tool the work in various parts without excessive swaying or vibration of the work. The use of the slot 27 enables the point

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of support of the frame 24 to be brought near the action or the sight, as need may be.

I claim:

1. A gunsmith's vise comprising a substantially rectilinear base piece having at one end a stock butt clamp and at the other a forestock clamp, said clamps each comprising relatively movable jaws and means to move them relatively for clamping and release of a gun, the jaws in each clamp having tops in a plane convergent toward the medial line of the base piece in the direction of the muzzle end of the device, a flexible work supporting and surface protecting saddle piece of cushion material secured at respective ends to the tops of the jaws in each clamp, each saddle piece of a length equal to the transverse superficial lower surface measurement of the stock between medial parallel surface parts of the stock, said saddle piece being yieldable to stock parts under gravity to conform to the contours of the stock.

2. The structure of claim 1 in which said saddles are graduated in length from rear to front edges thereof whereby a loop is formed in each, the bight of which is inclined with respect to the tops of the clamps so as to accommodate itself to a respective relative longitudinal inclination of an engaged stock part.

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