Dec. 4, 1951 C. C. MOOREHEAD 2,577,029

TOGGLE CLAMP WITH AN ADJUSTABLE PIVOT

Filed April 12, 1948 2 SHEETS—SHEET 1

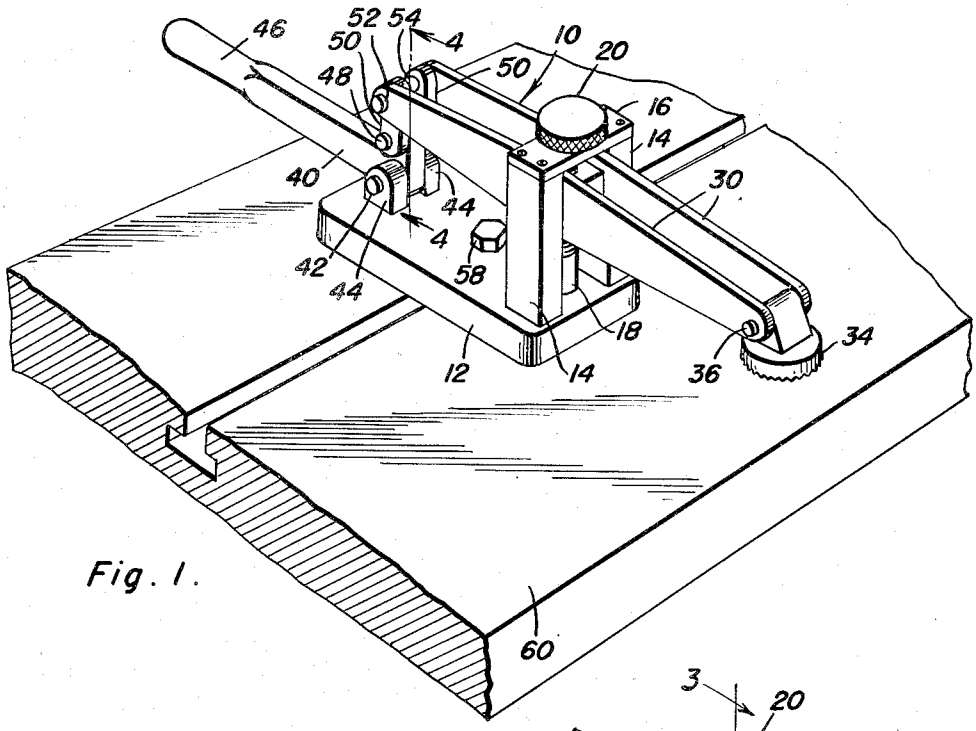


Fig. 1.

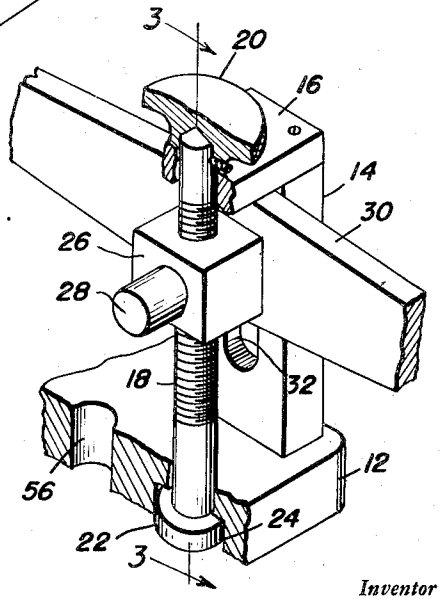
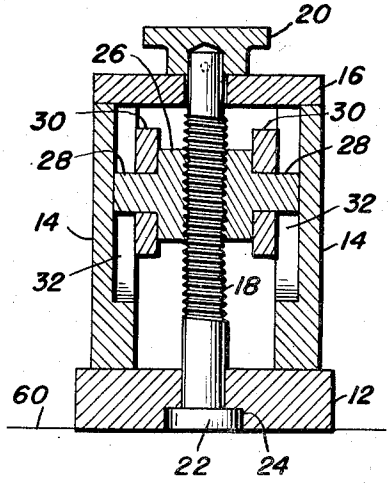


Fig. 2.

Fig. 3.



Inventor

Clyde C. Moorehead

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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Fig. 5.

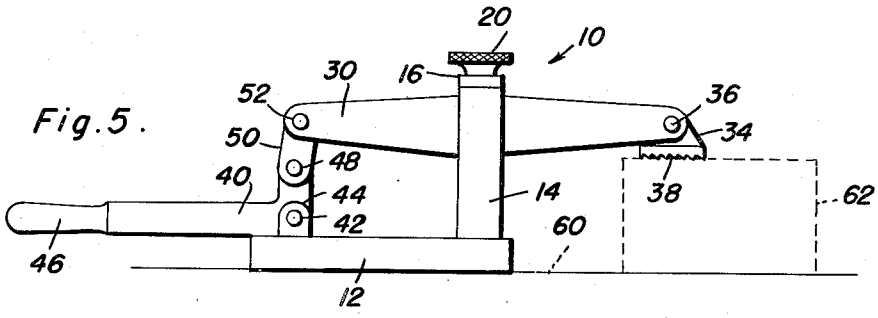


Fig. 6.

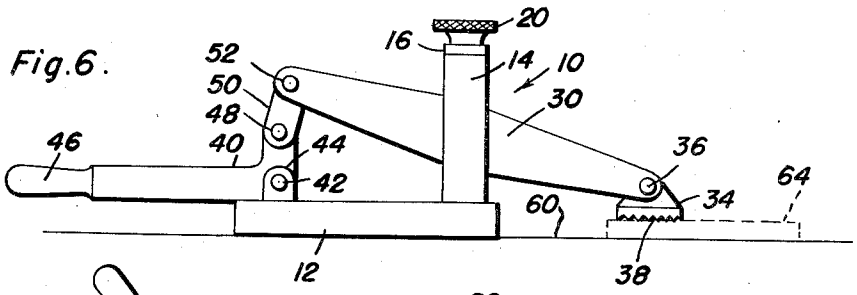


Fig. 7.

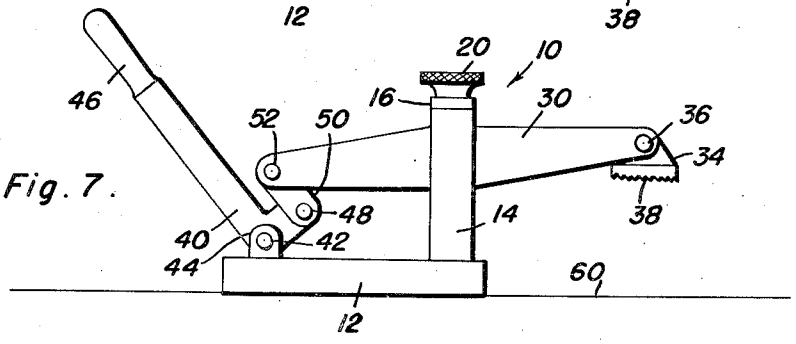
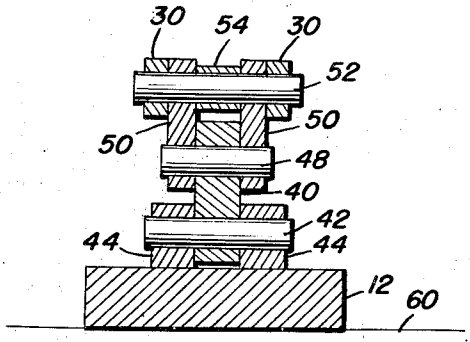


Fig. 4.



Inventor

Clyde C. Moorehead

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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TOGGLE CLAMP WITH AN ADJUSTABLE PIVOT

Clyde C. Moorehead, Waco, Tex.

Application April 12, 1948, Serial No. 20,539

1 Claim. (Cl. 144—290)

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This invention relates to new and useful improvements and structural refinements in toggle clamps, that is, clamps such as are commonly employed by tool makers or the like, for securely fastening the work to the work bed, and the principal object of the invention is to facilitate adjustment of the clamp in accordance with the thickness of the work material.

This object is achieved by the provision of a toggle clamp including a fulcrumed clamping arm, the fulcrum of which may be raised or lowered with respect to the base of the clamp, so as to accommodate work of varying thickness.

An important feature of the invention lies in its simplicity of construction, ease and convenience of manipulation, and in its adaptability to economical manufacture.

With the above more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention consists essentially of the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of the invention in position on a work bed;

Figure 2 is a fragmentary perspective detail of the invention;

Figure 3 is a cross-sectional view, taken substantially in the plane of the line 3—3 in Figure 2;

Figure 4 is a cross-sectional view, taken substantially in the plane of the line 4—4 in Figure 1;

Figure 5 is a side elevational view showing the invention in a clamping position on a relatively thick piece of work;

Figure 6 is an elevational view, similar to that shown in Figure 5, but illustrating the invention in its clamping position on a relatively thin piece of work, and

Figure 7 is an elevational view of the invention in its unclamped or released position.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the invention consists of a toggle clamp designated generally by the reference character 10, the same embodying in its construction a suitable base plate 12 which is provided at one end portion thereof with a support including a pair of spaced parallel, substantially upright members 14 connected together at their upper ends by means of a cross-member 16, as will be clearly apparent.

An adjusting screw 18 is rotatably mounted in

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the cross-member 16 and in the base 12, the upper end of this screw carrying a convenient, knurled knob 20, while the lower end of the screw is formed integrally with an enlarged head 22 which is freely rotatable in a counterbore 24 with which the base 12 is provided. It will be apparent that in this manner, the screw 18 is prevented from being withdrawn upwardly, but it should, of course, be understood that the adjusting screw is freely rotatable.

An internally screw-threaded block 26 is positioned on the screw 18 and is equipped with a pair of laterally projecting trunnions 28 which pivotally engage suitable apertures formed in intermediate portions of a pair of spaced parallel arm members 30. It is to be also noted that the trunnions 28 slidably engage a pair of opposed guides assuming the form of elongated recesses or slots 32 formed in the aforementioned support members 14.

A suitable pressure pad 34, intended to engage the work, is pivoted to one end of the arm members 30 as at 36, the pad 34 being formed with a rough work engaging surface 38 for obvious reasons.

An angulated lever 40 is pivoted intermediately of its length as at 42 to a pair of spaced brackets or lugs 44 provided on the base plate 12, one end portion of this lever constituting an actuating handle 46, while its remaining end portion is pivoted as at 48 to a pair of spaced parallel toggle links 50.

These links are, in turn, pivoted as at 52 to the remaining ends of the arm members 30, a suitable, tubular spacer 54 being interposed on the pivot pin 52 between the links 50, as is best shown in Figure 4.

The base 12 is formed with a suitable aperture 56 to accommodate a screw 58 whereby the entire clamp may be firmly secured to a work bed 60, and when the invention is placed in use, as indicated in Figure 5, the work 62 which is to be clamped in position is simply placed under the pressure pad 34 and the handle 46 of the lever 40 is swung downwardly to the position shown, so that the pressure pad 34 is brought in firm, frictional contact with the work.

Needless to say, the arrangement of the lever 40 and of the link 50 is such that when the handle 46 is swung downwardly, the pivot 48 passes beyond the "dead center" of the pivot 42, 48, 52, so that the required "toggle" action is present to retain the clamp in its locked position, until such time as the handle 46 is raised to unlock the clamp, as shown in Figure 7.

The essence of novelty in the invention resides in the ability of the clamp to be adjusted in accordance with work of different thicknesses, as is exemplified in Figure 6, wherein the piece of work **64** is relatively thinner with respect to the aforementioned work piece **62**.

In this instance, it is only necessary to rotate the adjusting screw **18** by means of the knob **20**, so as to lower the fulcrum of the arm members **30** with respect to the base **12**, and when the required adjustment has been effected, the clamp may be locked by simply depressing the handle **46**, as has been already described.

It is believed that the advantages and use of the invention will be clearly apparent from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

Having described the invention what is claimed as new is:

In a toggle clamp, the combination of a base, a pair of spaced uprights provided on said base and having opposing vertical slots provided therein, a cross-member connecting upper ends of said uprights, a vertical adjusting screw rotatably but non-slidably journaled in said base and said cross-member between said supports, an internally screw-threaded fulcrum block threaded on said screw for vertical movement when the screw is rotated, a pair of coaxial trunnions projecting to opposite sides from said block and slidable in the respective slots, an arm comprising a pair of transversely spaced members having intermediate portions thereof pivotally mounted on the respective trunnions between said block and the respective uprights, a work engaging pad pivotally mounted between said members at one end of said arm, an actuating lever pivoted to said base, and toggle linkage operatively connecting said lever to the other end of said arm.

CLYDE C. MOOREHEAD.

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