May 6, 1947. R. F. CLUTTER 2,420,165

WORK CLAMP

Filed July 24, 1944

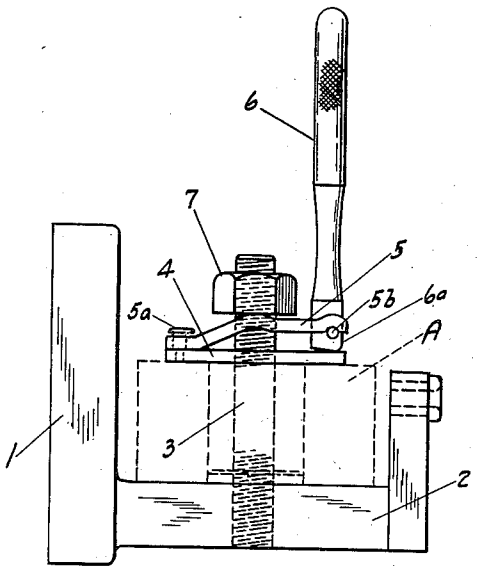


FIG. 1.

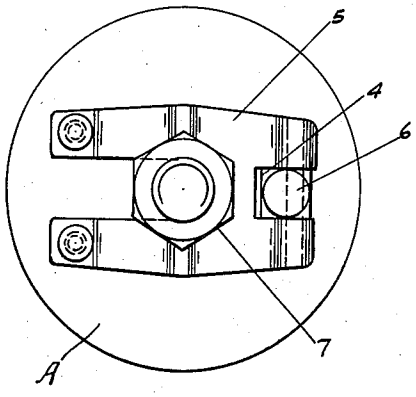


FIG. 2.

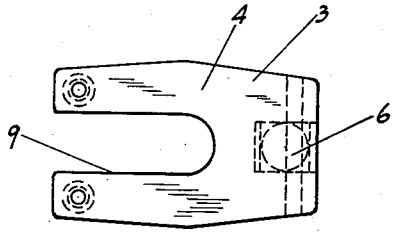


FIG. 4.

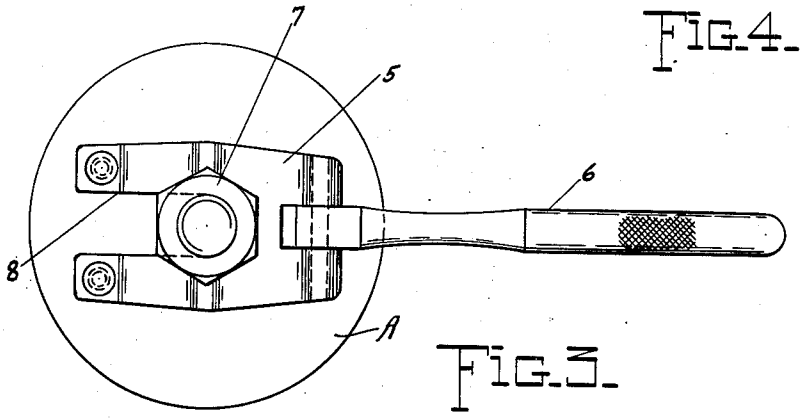


FIG. 3.

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WORK CLAMP

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4 Claims. (Cl. 90—59)

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The object of the present invention has been to devise a simple and handy form of clamping device for use in holding work in position in connection with machines such as drill jigs and milling machines, shapers, and lathes, as well as other types of machines requiring the quick emplacement in position of assembly work.

According to my invention the clamp device employed by me is one which may be very quickly positioned for engagement with the work and with the nut of a clamp bolt, and may be just as quickly removed after the work has been operated on when clamped in position. The primary advantage of my invention is that my clamp device is made in a unit which is quickly positionable, or emplaced in clamping relation with the work, and quickly removable as a unit from such position. Likewise an especial advantage of my invention is its utility in being employable in conjunction with different kinds of machines, as indicated above.

For a full understanding of my invention reference is to be had to the following specification and to the accompanying drawings, in which:

Figure 1 is a view in elevation showing the practical application of my clamp device in conjunction with work to be held thereby, the clamping lever being disposed in its clamping position.

Figure 2 is a top plan view of the clamping device of my invention as when engaged with the work and showing the parts generally as they are seen in Figure 1.

Figure 3 is a view similar to Figure 2, but showing the clamp lever depressed as when to lower the relatively movable non-clamping member for clamping effect.

Figure 4 is a bottom plan view of the clamp device, dotted lines showing certain parts, including the clamp lever, the latter in clamping position as in Figure 1.

Referring to the drawings, it is noted that similar reference characters are used in the following description and in said drawings, and the preferred embodiment of my invention will now be specifically described.

In the drawings, 1 designates the side member of a suitable base 2 on which the work designated A is disposed and this work is required to be clamped in position. In the present invention the illustration of the work A comprises a showing of a hollow or tubular body which is to be operated upon.

Extending upwardly from the base 2 is a common form of clamp bolt 3 equipped at its upper end with the adjustable nut 7.

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The clamping unit of my invention comprises the relatively stationary clamp plate 4 and the relatively movable clamp plate 5. The clamp plates 4 and 5 are connected together at one end by means of studs 5a having heads at their upper ends and riveted or otherwise attached to the stationary clamp member 4. Openings in the clamp member 5 through which the studs 5a pass permit of a slight upward and downward relative movement of the plate 5 in relation to the plate 4. The plate 5 is curved upwardly from the studs 5a to its central portion and at the free end of the plate is carried a pivot member 5b which may be welded or otherwise permanently attached to said plate. The pivot member 5b spans a bifurcated end portion at the free end of the plate 5 and carries pivotally thereon the clamping lever 6. The clamping lever 6 is formed at its lower end with a cam portion 6a, said lower end being generally of curved form, at the cam, and otherwise rectangular.

The cam portion 6a of the lever 6 is cooperative with the upper surface of the free end portion of the stationary clamp plate 4, and by swinging the lever upwardly from its position of Figure 3, the camming member 6a will raise the free end of the movable plate 5 and enable it to perform its clamping function.

The connected end portions of the clamping members 4 and 5 are formed with slots seen at 8 and 9, designations, respectively, for the slots in the plate 5 and plate 4.

The members 4, 5, 5a, 5b, and the lever 6 constitute a clamping unit bodily engageable or detachable in respect to the work.

The manner of use of my invention will be readily apparent upon reference to Figure 1 of the drawings, wherein it will be seen that in the use of my clamp unit I dispose the work A in a suitable position upon the base 2 with the opening in the work around the clamping bolt 3. The clamping unit is then engaged by sidewise movement with the work A while the lever 6 is horizontal by end movement of the plates 4 and 5 so that the slots 8 and 9 of the plate straddle the clamp bolt 3 and the middle portion of the upper clamp member 5 is disposed beneath the adjustable nut 7. In adjusting the clamping unit in connection with the work as described, the plates 4 and 5 are near together as permitted by reason of the formation of the cam lever 6, said lever being disposed in the upright position shown in Figure 1 when effecting its clamping operation.

With the parts arranged as seen in Figure 3 it is only necessary for the operator to grasp the lever 6 at its handle portion and swing the lever upwardly into an approximately vertical position as indicated in Figure 1. This action causes the cam 6a by engagement with the upper surface of the free end portion of the plate 4 to push upwardly upon the plate 5 and cause the latter to impinge or engage the under side of the nut 7, thereby effecting the necessary clamping pressure upon the work A by reason of the cooperation of the lower plate 4 with the upper surface of said work.

The facility with which my invention may be used in engaging the same and disengaging the same with the work will be readily apparent, since the position of the slots 8 and 9 enables the clamping plates 4 and 5 to be readily moved endwise either toward the bolt 3 or away from the bolt, the latter action in order to disengage the clamping device as a unit from the work and enable the latter to be readily removed from its position on the base 2.

By reason of the simple construction of my clamping unit, utilizing primarily three essential main parts only, it is evident that the same be manufactured very cheaply and may be used advantageously on different kinds of machines for holding different kinds of work in position thereon.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a force applying unit, in combination, a relatively stationary plate, a relatively movable plate disposed substantially parallel with the stationary plate, studs connecting adjacent end portions of the plates for limited movement, a cam lever mounted on the opposite end portion of one of the plates and having its cam cooperative with the other plate for causing spreading action of the plates, said plates being formed with slots extending inwardly from the ends thereof connected by said studs.

2. In combination, a base, a clamping bolt for work carried by the base, a nut on the bolt and a clamping unit cooperable with said base and bolt to hold work on the base and comprising a stationary plate to rest on the base, a clamping plate movably connected at one end with the stationary plate and engageable at its upper surface with the under side of the nut, and a cam lever carried by one of said plates and coacting with the other to separate the plates and cause clamping engagement of the upper surface of the movable plate with the nut for effecting holding action of the stationary plate against work on the base.

3. The combination of parts claimed in claim 2, in which the plates are slotted inwardly from one end to provide a bifurcation to receive and straddle the bolt, and in which the cam lever is mounted on one of the plates at their opposite ends to coact with the other plate in clamping operation.

4. A force applying unit, comprising a relatively stationary plate, a relatively movable plate having one end secured to an adjacent corresponding end of the stationary plate for limited movement relative thereto and its other end free to move toward and from the other end of the stationary plate, the plates having longitudinal slots extending inwardly thereof from the secured ends thereof, and a cam lever mounted on the free unsecured end of one of said plates and having its cam movable to engage the adjacent end of the other plate to spread apart the unsecured ends of the said plates to effect a spreading force.

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