Aug. 3, 1943. O. M. KIRLIN 2,325,613

TOGGLE C CLAMP

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Fig. 3

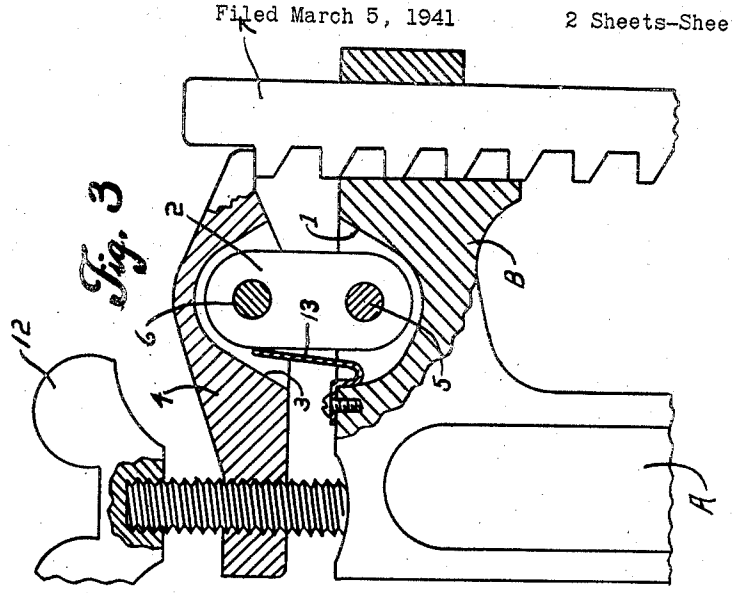


Fig. 2

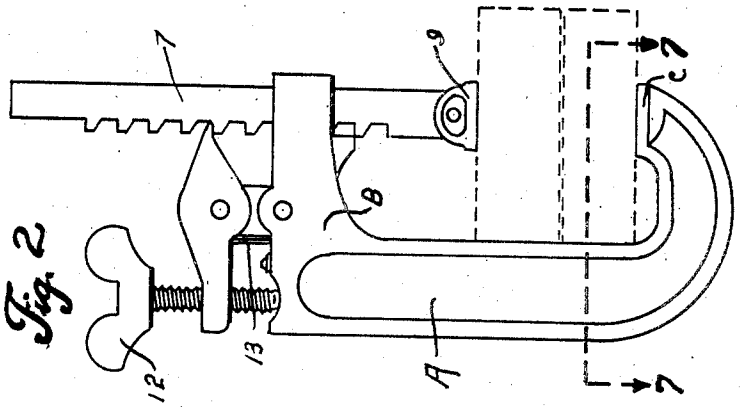
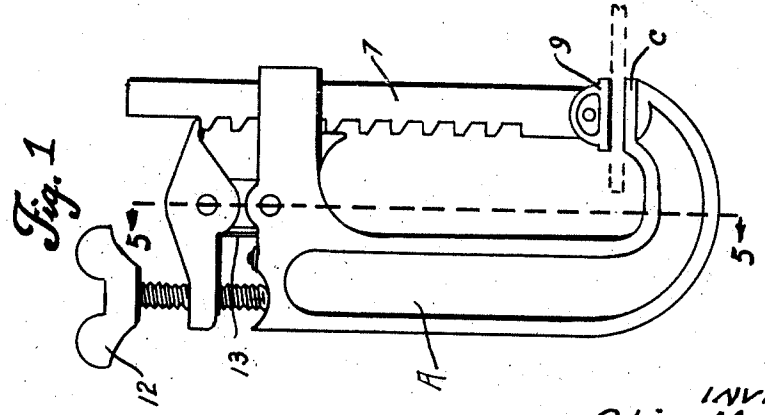


Fig. 1

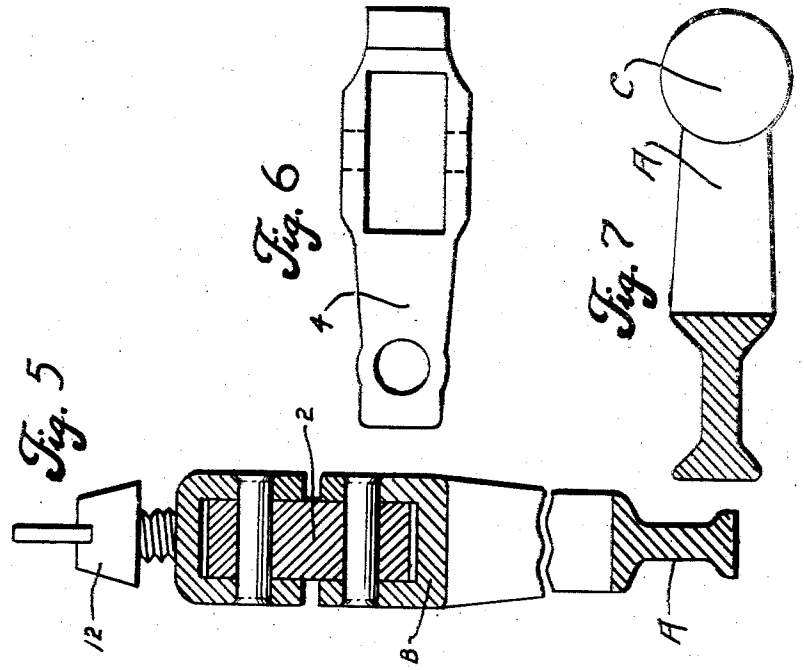


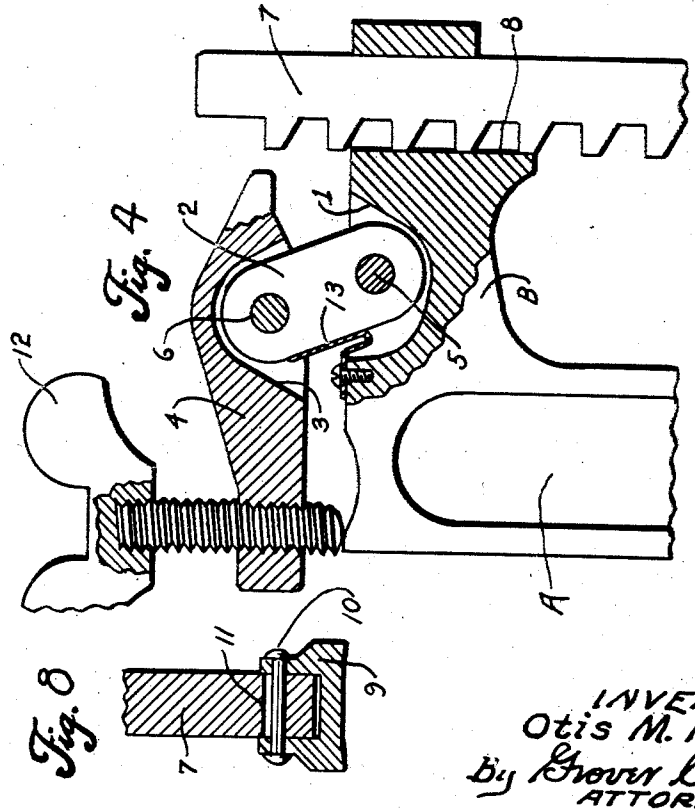
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2,325,613

UNITED STATES PATENT OFFICE

2,325,613

TOGGLE C CLAMP

Otis M. Kirlin, Detroit, Mich.

Application March 5, 1941, Serial No. 381,804

3 Claims. (Cl. 144—305)

The present invention relates to the art of adjustable clamps in general and provides a device of this character whereby any desired adjustment of the same may be very speedily accomplished without disturbing the arrangement of parts in the clamping process while the same are being machined.

While this clamp possesses almost unlimited use, it is particularly adapted for arc or gas welding operations.

In the old type of C clamp wherein the throat member is provided with an elongated screw having a pivotal shoe upon the lower end thereof, the rotating of the screw, in tightening, tends to disturb the position of clamped parts, and with this type of clamp and particularly in welding operations, it is common for splashing of hot metal to become embedded within the threads of the screw thus making it inoperative, and it is usually impossible to remove this splashed metal from the screw.

In the toggle C clamp herein disclosed, it is more easily to operate and to accurately retain the clamped objects in their proper relative position at all times, the toggle and rack serving as a rapid means for variable adjustment, and the tightening of the clamp does not tend to disturb the position of the clamped parts; and any splashed hot metal may be easily removed by grinding or filing.

With the foregoing in mind, it will become readily apparent that the invention possesses further advantages, all of which will become readily apparent during the course of the following detailed description, illustrated throughout the accompanying drawings, and more fully pointed out in the appended claims.

With reference to the drawings:

Figure 1 is a side elevation of the complete clamp showing the same being adjusted to a relatively thin piece of metal; and Figure 2 is a similar view showing the clamp being adjusted to objects of decidedly greater thickness.

Figure 3 is an enlarged sectional view exposing the toggle mechanism, and in normal position; and Figure 4 is a similar view showing the toggle mechanism disengaged from the rack.

Figure 5 is an enlarged sectional view taken upon line 5—5 of Figure 1.

Figure 6 is an enlarged bottom view of the toggle member.

Figure 7 is an enlarged section taken upon line 7—7 of Figure 2.

Figure 8 is a section of the rack shoe and lower portion of the rack; the elongated slot within said rack being clearly visible.

In carrying out my invention, let it be understood herewith that all portions of the device being associated therewith and not a part thereof will be designated by consecutively arranged alphabetical letters, while the invention proper will be characterized by the customary reference numerals.

In further carrying out my invention I employ C clamp frame A, and referring more particularly to Figures 3 and 4 it is seen that the upper portion of said frame is enlarged as at B, and having pocket 1 therein so as to accommodate the free action of one end portion of link 2, while the opposite end portion of said link being similarly disposed in pocket 3 of arm 4, said link being pivoted to frame A as at 5, and being likewise pivoted to arm 4 as at 6.

Referring now to Figures 1 to 4 inclusive, it is observed that rack 7 is provided, and that by virtue of the toggle mechanism and the slidable motion of rack 7 quick or instant adjustment is made with this clamp whereas in the old type of C clamp wherein the screw is used, by changing the adjustment of this type, the screw must be backed off the work in a slow manner and consistent with the time required for this purpose.

Toggle screw 12 is provided and threadedly engages arm 4, and it is readily seen that in Figure 3 the toggle arm 4 is held upon rack 7 by spring 13 when the device is in a clamping position, and in Figure 4 it is very clear how the toggle is pulled over so as to disengage rack 7 and thereby releasing the same.

Toggle screw 12 contacts at its lower end a concave portion of frame A, this concave portion tending to force and retain the other end of arm 4 into proper and accurate engagement with rack 7 when the clamp is tightened by the screwing down of toggle screw 12.

Shoe 9 is loosely attached to the end of rack 7 to permit of its more accurate contact with the surface of parts clamped.

In conclusion, let it be understood that the complete disclosure herewith is merely illustrative of the general principle of the invention sought to be protected by Letters Patent, and it will be readily understood by those skilled in the art to which the same pertains that various changes in detail may be made to suit any particular or peculiar requirement without departing from the spirit of the invention as defined in the appended claims.

Having thus fully described my invention, what I claim as new is:

1. In a clamp, the combination with a C-shaped frame, the inner end thereof terminating in a fixed work engaging jaw, the outer opposite end being provided with an opening, a rack bar freely slidable through said opening, a coacting work engaging jaw mounted on the inner end of the slidable rack bar, an arm disposed adjacent the outer end portion of the frame, a link pivotally connecting the intermediate portion of the arm to the outer end portion of the frame, a locking dog formed on the inner end of the arm, and means for normally holding the dog in locking engagement with the teeth of the rack bar for locking the latter and its jaw against sliding movement in one direction, said means comprising a leaf spring secured at one end on the frame, the free end of said leaf spring bearing against the outer side edge of the link.

2. In a clamp, the combination with a C-shaped frame, the inner end thereof terminating in a fixed work engaging jaw, the outer opposite end being provided with an opening, a rack bar freely slidable through said opening, a coacting work engaging jaw mounted on the inner end of the slidable rack bar, an arm disposed adjacent the outer end portion of the frame, a link pivotally connecting the intermediate portion of the arm to the outer end portion of the frame, a locking dog formed on the inner end of the arm, means for normally holding the dog in locking engagement with the teeth of the rack bar for locking the latter and its jaw against sliding movement in one direction, said means comprising a leaf spring secured at one end on the frame, the free end of said leaf spring bearing against the outer side edge of the link, and a thumb screw threaded through the outer end of the arm and having its inner end bearing against the adjacent portion of the frame, said thumb screw forming a handle for shifting the arm and the link away from the rack bar and dispose the locking dog in an inoperative position, to permit the free sliding movement of the rack bar and its jaw in either direction.

3. In a clamp, the combination with a C-shaped frame, the inner end thereof terminating in a work engaging jaw, the outer opposite end being provided with a non-circular opening, a rack bar of the same cross sectional shape as the opening slidable therethrough, a coacting work engaging jaw mounted on the inner end of the rack bar, an arm disposed adjacent the outer end of the frame, a link pivotally connecting the intermediate portion of the arm to the outer end portion of the frame, a locking dog formed on the inner end of the farm, means for normally holding the locking dog in locking engagement with the teeth of the rack bar for locking the rack bar and the jaw carried thereby against sliding movement in one direction, and a thumb screw threaded through the outer end portion of the arm for manually shifting the latter outwardly to disposed the locking dog in an inoperative position and permit the free sliding movement of the rack bar and its jaw in either direction, the portion of the frame against which the inner end of the thumb screw normally bears being concaved to form a seat for said thumb screw, said thumb screw coacting with said seat to cause the dog to move the rack bar into a clamping position when the thumb screw is turned in one direction.

OTIS M. KIRLIN.