# United States Patent [19]

**Blatt**

[11] **3,792,853**

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[54] **TOGGLE CLAMP WITH DETENT OPEN GUIDED ARM**


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**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 292,877, Sept. 28, 1972.

[52] **U.S. Cl.** ..... **269/228**

[51] **Int. Cl.** ..... **B25b 5/12**

[58] **Field of Search** ..... 269/91, 94, 127, 134, 135, 269/201, 203, 205, 207, 228



[56] **References Cited**

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| 2,972,476 | 2/1961 | Blatt | 269/228 X |
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*Assistant Examiner*—Mark S. Bicks
*Attorney, Agent, or Firm*—Cullen, Settle, Sloman & Cantor



[57] **ABSTRACT**

A toggle clamp comprises a pivot base mountable upon a support with a pair of side plates adjustably mounted upon said pivot base in a pre-selected angular position and guidably receiving therebetween a pivot arm pivotally mounted upon said plates and terminating in a work piece engaging clamp arm. A U-shaped handle link with a laterally extending handle is pivotally mounted over and upon the guide plates and pivotally mounts interiorly a pair of arm links at their one ends, with the other ends of said arm links pivotally connected to the handle link. A yieldable latch is positioned between the arm links and pivotally connected thereto and adapted to interlock with a latch plate spanning said guide plates when the handle has been moved to a release position. A latch release rod with handle is connected to said latch for disengaging from the latch plate permitting return movement of the handle to work piece securing position.


**7 Claims, 2 Drawing Figures**

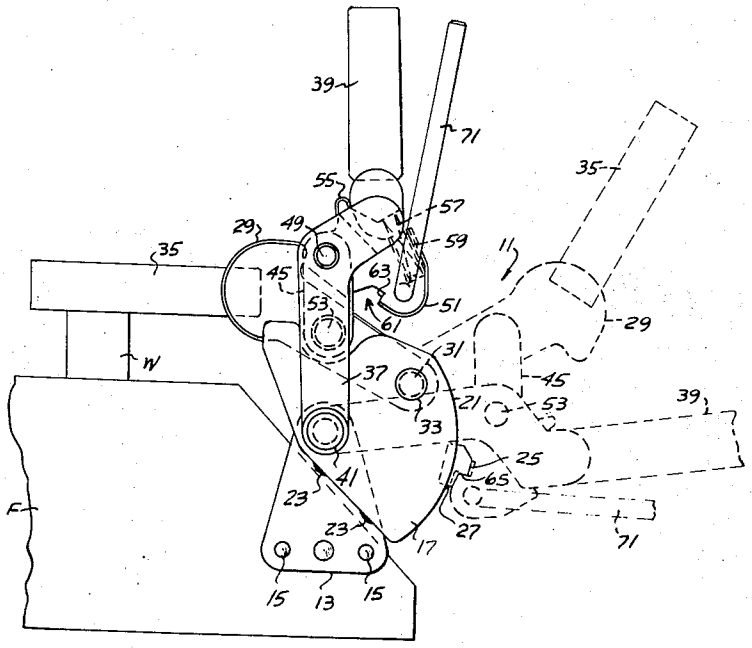


FIG. 1

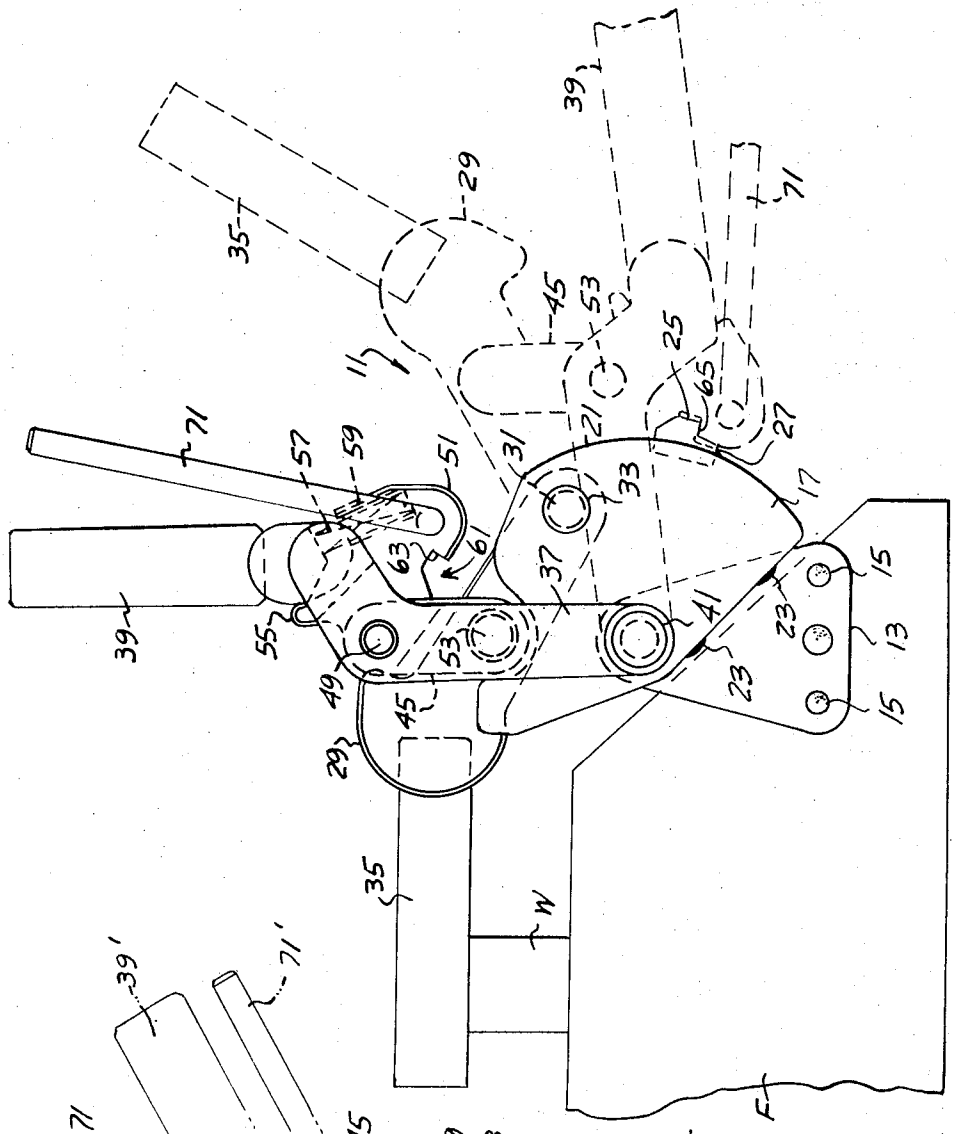
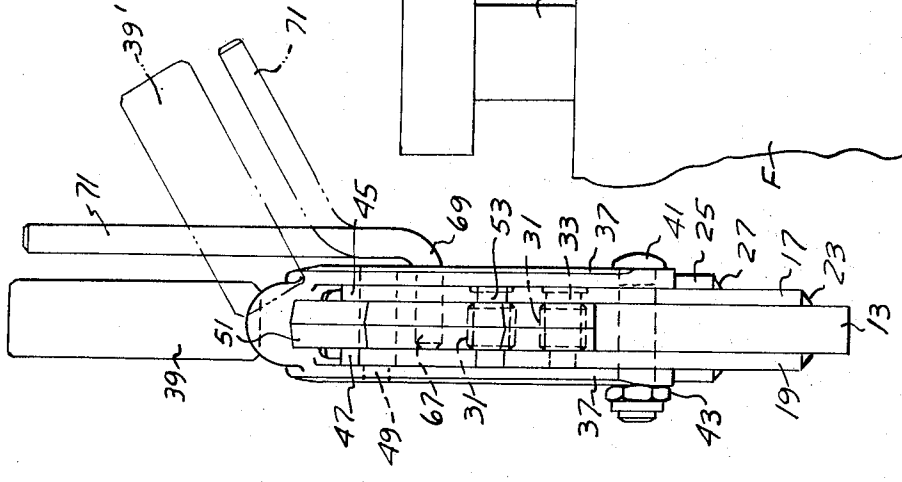

39'
71
29
35
11
45
53
25
65
27
21
31
33
17
15
13
23
41
37
63
61
57
59
51
55
49
W
F

FIG. 2


39'
71'
71
45
69
53
31
33
37
41
25
27
17
23
13
51
39
47
49
67
31
37
43
19

# TOGGLE CLAMP WITH DETENT OPEN GUIDED ARM

## RELATED APPLICATION

This application is a continuation in part of my co-pending patent application, Ser. no. 292,877 filed Sept. 28, 1972 entitled TOGGLE CLAMP WITH DETENT OPEN GUIDED ARM.

## BACKGROUND OF THE INVENTION

Toggle clamps are known to include upon a base a pivotal clamp arm with a suitable handle link pivotally mounted upon a base with additional linkage which pivotally engages the clamp arm for moving the same from work piece securing position to a retracted work piece release position.

Examples of such toggle clamps are shown in my U.S. Pat. Nos. 3,009,694, 2,972,476, 3,010,171, 3,035,831.

## BRIEF DESCRIPTION OF THE INVENTION

The present invention is directed to an improved toggle clamp construction which includes a yieldable latch mounted upon the handle link assembly adapted for interlocking relation with respect to a stationary latch plate for yieldably holding the handle link and handle in interlocked clamp release position.

It is another object to provide an improved toggle clamp construction involving first, second, third and fourth pivot points by which a pair of guide plates are pivotally adjusted at a first pivot point to the desired position of angular adjustment and fixedly secured to the pivot base mountable upon a support to which a work piece is to be clamped.

The handle link pivotally mounted at said first pivot point is by a toggle linkage pivotally connected at third and fourth pivot points respectively to a clamping arm which is pivoted between and upon the guide plates at a second pivot point.

It is a further object to provide upon the guide plates opposed outer edge surfaces which are arcuate and equi-distance from the first pivot point, and a latch plate is selectively positioned thereto to span said guide plates and secured therein to receive the yieldable handle mounted latch for anchoring the handle in retracted release position.

It is another object to provide a manual release handle for said latch.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawing.

In the drawing:

FIG. 1 is a fragmentary side elevational view of the present toggle clamp with the release position of the handle and clamp arm and associated parts shown in dash lines;

FIG. 2 is a left end elevational view thereof, with alternate location of the handle link, handle and latch release handle shown in dash lines.

The above drawing illustrates a preferred embodiment of the invention. Other embodiments are contemplated within the scope of the claims hereafter set forth.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawing, the present toggle clamp **11** includes a pivot base **13** anchored by fasteners **15** to a



suitable support F or fixture or mounting surface as fragmentarily shown, FIG. **1**, and supporting work piece W.

A pair of upright opposed and spaced guide plates **17** and **19** each having corresponding arcuate end faces **21** is pivotally mounted initially by pivot pin **41** or bolt upon opposite sides of the base **13** and affixed thereto in the desired position of angular adjustment by the welds **23.**

Transversely arranged latch plate **25** is selectively positioned across plates **17** and **19** at the desired angle and secured in position by the welds **27.**

In the illustrative embodiment, the latch plate has been located so as to yieldably retain the handle assembly when it has been moved to the retracted release position shown in dotted lines.

Pivot arm **29** is guidably and movably positioned between plates **17** and **19** and pivotally mounted thereon upon the pivot pin **33** with bushing **31** interposed and nested within an end portion of said pivot arm.

The pivot arm extends laterally outward from said guide plates and terminates in the elongated clamp arm **35** shown in operative clamping position with respect to work piece W upon the support F.

The inverted U-shaped handle link **37** is guidably positioned over opposite outer surfaces of the plates **17** and **19** and at their lower ends, pivotally mounted upon the bolt **41** which is hereafter referred to as a first pivot point.

The pivotal mounting of the pivot arm **29** as at **33** is referred to as a second pivot point.

The upper or free end of the handle link **37** terminates in the upright first handle **39** as it would normally be positioned with the clamp arm **35** in work piece securing position. If desired said handle may be arranged transversely of the plane of movement of said handle on opposite sides thereof in the range of **0** to **60** degrees, as shown in dash lines, FIG. **2.**

The bolt **41** which serves as the first pivot point is anchored upon the guide plates **17** and **19** with a suitable nut **43,** FIG. **2.**

A pair of spaced arm links **45, 47** are arranged upon the interior of the handle link coplaner with the respective guide plates **17** and **19** and pivotally connected to the handle link by transverse pin **49.** Latch **51** is interposed between said arm links at their upper ends and pivotally mounted on the same pivot pin **49.** This is the third pivot point.

The lower ends of the arm links engage opposite sides of the pivot arm **29** and are pivotally connected thereto by the transverse pin **53,** referred to as the fourth pivot point.

Latch **51** upon one side has a lateral projection or stop **55** adapted to bear against a portion of the handle link **37** under the bias of the coil spring **57.** The latter is nested within socket **59** in said latch and at its opposite end bears against a portion of the handle link, FIG. **1.**

The transverse notch **61** formed in the outer surface of the latch has a rear angle face **63.** Upon retraction of the handle **39** to clamp arm release position, the latch slot **61** is adapted for selective registry with latch plate **25.** Said latch plate has a front angle face **65** adapted for cooperative registry with latch rear angle face **63,** for a snap interlock therewith.

It is contemplated that the latch plate may be selectively positioned along the arcuate edges of the guide

plates and affixed thereto for stabilizing the assembly and spacing between the plates **17** and **19**, and for yieldably retaining the handle assembly when the clamp arm has been moved to a release position shown in dash lines in FIG. **1**.

In the solid line work securing position, pivot point **3** at **49** has moved across dead center with respect to pivot points **1** and **4**; namely, the pivots **41** and **53** of FIG. **1** when the clamp arm **35** is in its work piece securing position.

The angular movement of retraction of the clamp arm can be set at **75** to **150** degrees, depending upon the location of latch plate **25** and its securing to guide plates **17** and **19**.

Since the latch notch **61** includes rear angle face **63** adapted for snug interlock with respect to front angle face **65** of the latch plate **25**, there is a positive securing or snubbing action as the first handle **39** is moved from the solid line position shown in FIG. **1** to the dash line release position. Here the latch **51** is hooked onto the latch plate **25**, serving two purposes. It acts as a snubbing action when the handle has been moved to open position, and after latching, maintains zero play between rear angle face **63** of the latch and front angle face **65** of the latch plate to, thus, maintain a tight hooking contact.

In order to release the latch from the latch plate, there is provided within the transverse bore **67** in said latch the release rod **69** secured thereto and which terminates in the angularly related release second handle **71**, FIGS. **1** and **2**.

A simple manual rotation of the second handle **71** in a counterclockwise direction will disengage said latch from the latch plate and will, thus, permit continued manual retracting movement of the handle **39** from the dash line release position shown to the solid line work piece securing position of FIG. **1**.

In the event that handle **39** should be secured at a lateral angle such as shown at **39'**, FIG. **2**, with respect to the plane of movement of the handle link, it is contemplated that the latch release handle **71** will be similarly inclined as at **71'**, so as to be parallel spaced with respect to first handle **39'**, as shown in dash lines.

In view of the spring bias and pivotal mounting of the latch **51**, on full retracting movement of the handle **39** to the dash line release position shown, there will be an automatic engagement of the latch with latch plate **25**.

Having described my invention, reference should now be hand to the following claims.

I claim:

**1.** A toggle clamp comprising a pivot base mountable upon a support;

a pair of upright parallel spaced guide plates secured upon said pivot base in a pre-selected angular position;

a pivot arm guidably positioned between said plates and at one end pivotally mounted upon said plate and terminating in a clamp arm adapted to retainingly engage a work piece on said support;

a U-shaped handle link overlying said guide plates and at its free ends, pivotally mounted upon said side plates;

said handle links terminating in a first handle;

a pair of spaced arm links at their one ends pivotally mounted upon said handle link coplaner with said guide plates, and at their lower ends engaging opposite sides of and pivotally connected to said pivot arm;

a latch between said arm links at their upper ends and pivotally mounted upon said handle link;

said latch having a transverse detent notch;

a latch plate transversely spanning and connected to the outer side edges of said guide plates;

said latch notch on retracting movement of said handle yieldably receiving said latch plate anchoring the handle in a retracted release position;

and a latch release rod secured to said latch and terminating in a second handle extending along and parallel to said first handle, adapted for manual rotation of the latch to disengage it from said latch plate and for movement of said first handle towards work piece securing position.

**2.** In the toggle clamp of claim **1**, resilient means biasing said latch against said handle link.

**3.** In the toggle clamp of claim **1**, said guide plates being pivotally adjusted initially at a first pivot point upon said base; the mounting of said pivot arm being at a second pivot point upon said plates; the mounting of said handle link upon said side plates being at said first pivot point; the mounting of said arm links at their one ends being at a third pivot point upon said handle link, and the connection at their other ends to said pivot arm being at a fourth pivot point; the latch mounting being at said third pivot point.

**4.** In the toggle clamp of claim **3**, said guide plate outer side edges being arcuate at a fixed radius to said first pivot point; said latch plate being selectively positioned along said outer side edges and secured thereto depending upon the desired arc of release retraction of said first handle.

**5.** In the toggle clamp of claim **3**, said third pivot point passing dead center with respect to said first and fourth pivot points when said first handle has moved the clamp arm to work piece securing position.

**6.** In the toggle clamp of claim **1**, said latch plate having an undercut front angle face; said latch notch including a rear angle face for cooperative interlock therewith.

**7.** In the toggle clamp of claim **1**, said first handle being inclined laterally at an acute angle with respect to the plane of movement of said handle link in the range of 0° to 60° upon opposite sides thereof; said second handle being similarly inclined and parallel thereto.

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