

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

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

[58] **Field of Search**..... 269/134, 135, 201,
269/228

[56] **References Cited**

UNITED STATES PATENTS

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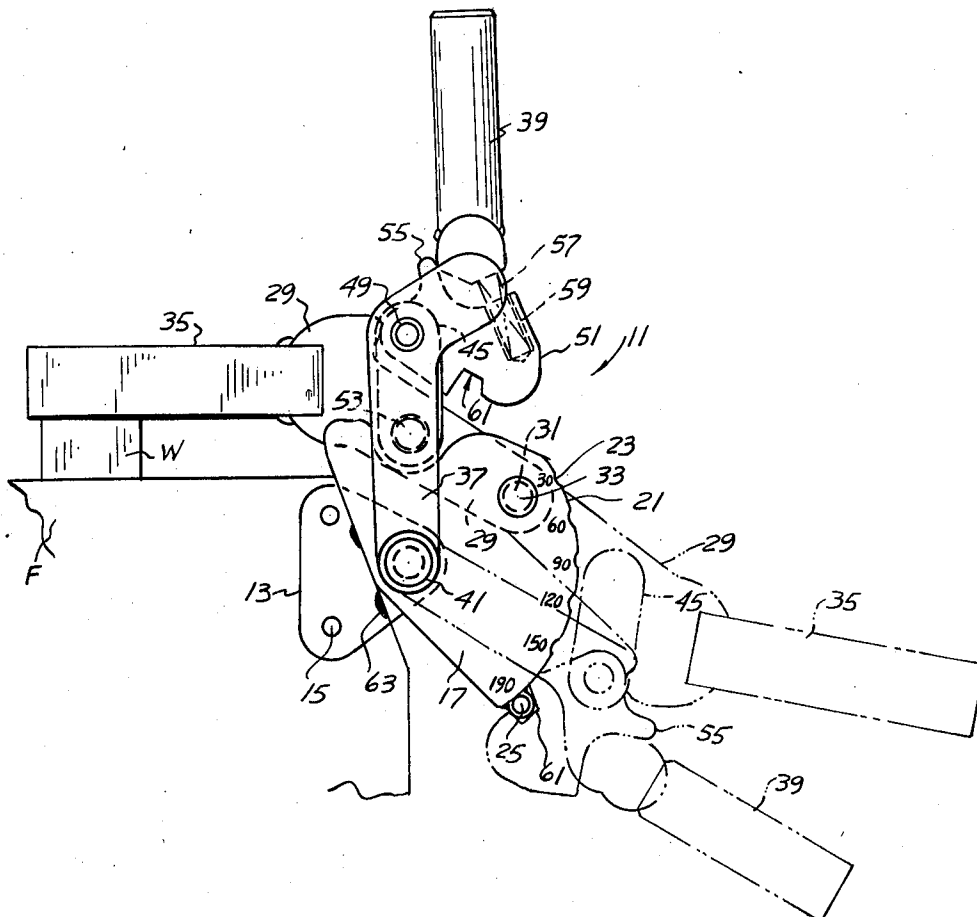
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[57] **ABSTRACT**

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 pin spanning said guide plates when the handle has been moved to a release position.

5 Claims, 2 Drawing Figures



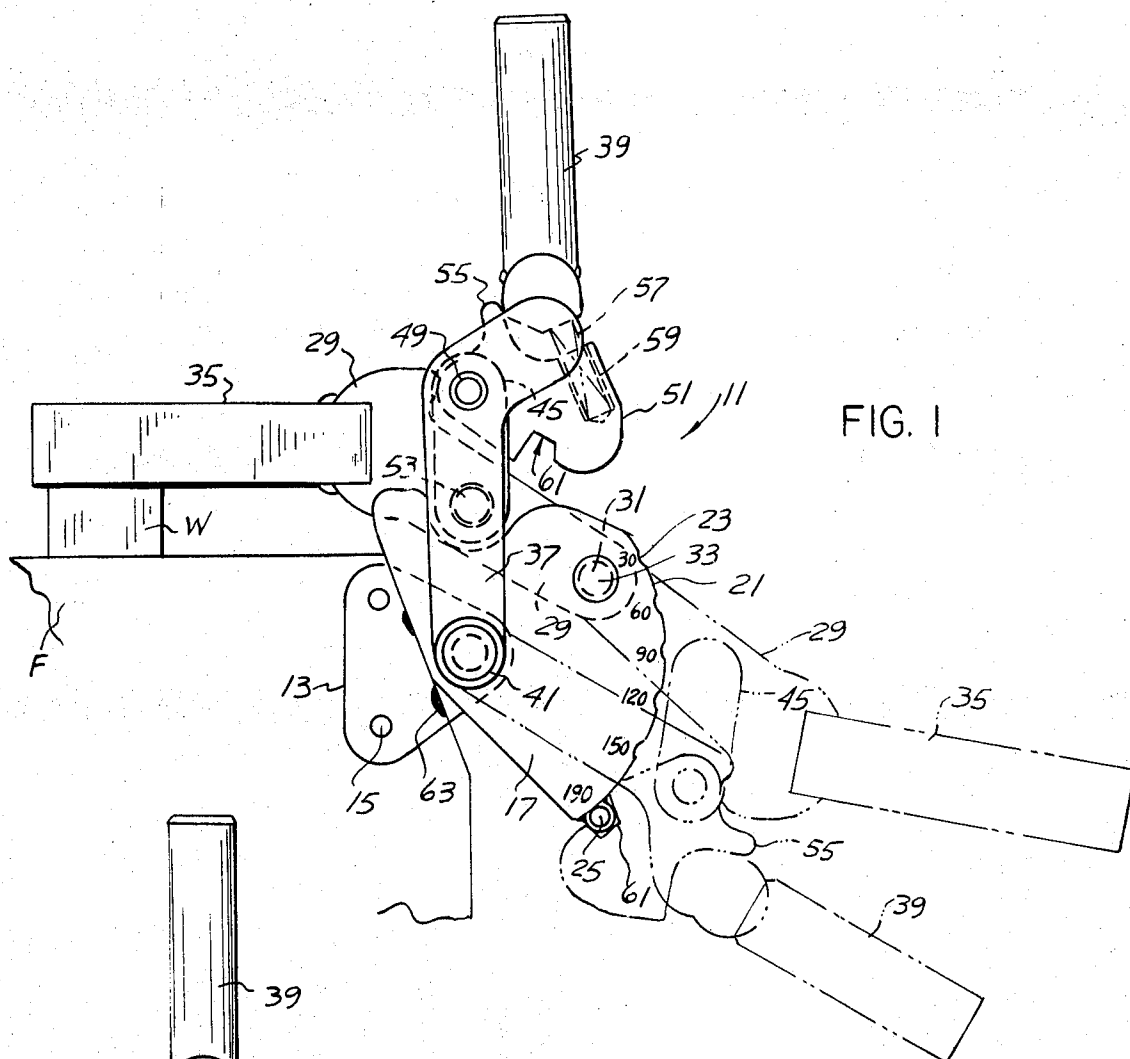


FIG. 1

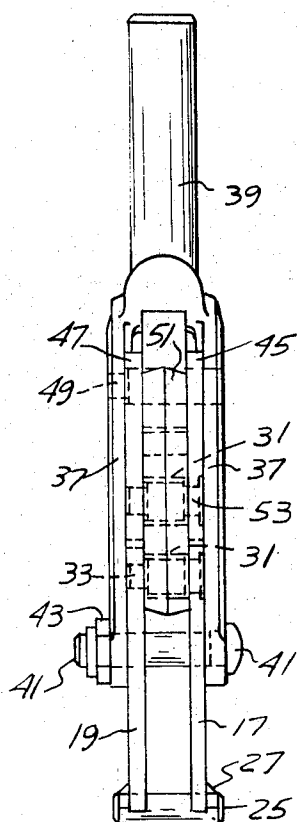


FIG. 2

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 links pivotally mounting additional linkage which pivotally engages a 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 3,010,171 183,035,831.

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 pin for yieldably holding the handle link and handle in 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 to the guide plates at a second pivot point.

It is a further object to provide within the guide plates opposed outer edge surfaces which are arcuate and equal distance from the first pivot point and which have thereon opposed pairs of angularly spaced notches in the range of 30°, 60°, 90°, 120°, 150° and 190°, for example; and wherein, the latch pin is selectively positioned within one of the said pairs of notches and secured therein selectively to receive the yieldable handle mounted latch for anchoring the handle in a pre-selected release position.

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.

It will be understood that the above drawing illustrates merely a preferred embodiment of the invention, and that 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 63.

An opposed pair of notches 23 are in the illustrative embodiment arranged in an arc at the positions of 30°, 60°, 90°, 120°, 150° and 190°.

Transversely arranged latch pin 25 is selectively positioned within the desired corresponding pair of notches and secured in position by the welds 27.

In the illustrative embodiment, the pin has been located at the 190° notches so as to yieldably retain the handle assembly when it has been moved to the retracted release position shown in dotted lines, FIG. 1.

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.

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, FIG. 1.

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 handle 39 as it would normally be positioned with the clamp arm 35 in work piece securing position.

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

A pair of spaced arm links 45, 47 are arranged upon the interior of the handle link coplanar 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 nested within socket 59 in said latch and at its opposite end bears against a portion of the handle link.

The transverse notch 61 formed in the outer surface of the latch; upon retraction of the handle 39 to a clamp arm release position, is adapted for selective registry with the latch pin 25 which spans an opposed pair of edge notches 23 as shown in FIG. 1.

It is contemplated that the latch pin 25 could be selectively positioned with any one of the other angularly spaced notches 23 in pairs and affixed to the guide plates for not only stabilizing the structure and spacing between the plates 17 and 19, but serving as a means of yieldably retaining the handle assembly when the clamp arm has been moved to a release position, such as 190° position shown in dash lines in FIG. 1.

In the work securing position shown in FIG. 1, 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 effective work piece securing position.

It is noted furthermore, that upon retraction of the handle 39 to the dash line position shown, the clamp arm has retracted 190° to the dash line position shown in FIG. 1.

This angular movement of retraction of the clamp arm can be set at 150° or 120° or any of the other angles designated in the drawing, depending upon the pre-selection of the location of the latch pin 25 and its securing to and spanning the guide plates 17 and 19.

Having described my invention, reference should be had 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 plates 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 link terminating in a handle;
 - a pair of spaced arm links at their one ends pivotally mounted upon said handle link coplanar with said guide plate, 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 thereon;
 - said latch having a transverse detent notch;
 - and a latch pin 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 pin anchoring the handle in a release position.
2. In the toggle clamp of claim 1, resilient means biasing said latch against said handle link.
3. A toggle clamp comprising a pivot base mountable

upon a support;

a pair of upright parallel spaced guide plates pivotally adjusted at a first pivot point adjacent one side edge upon said base and secured in a pre-selected angular position thereon;

a pivot arm guidably positioned between and engaging said plates and at one end pivotally mounted at a second pivot point upon said plates adjacent their opposite side edges, 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 at said first pivot point;

said handle link terminating in a handle;

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

a latch between said arm links at their one ends and pivotally mounted thereon and upon said handle link at said third pivot point;

said latch having a transverse detent notch;

a latch pin transversely spanning and connected to the outer side edges of said guide plates; and a resilient means biasing said latch against said handle link;

said latch notch on retracting movement of said handle yieldably receiving said pin anchoring the handle in a release position.

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; there being a series of opposed pairs of angularly spaced notches in said outer side edges; said latch pin being selectively nested and secured within one of said pairs of notches depending upon the desired arc of release retraction of said 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 handle has moved the clamp arm to work piece securing position.

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