March 22, 1927. 1,621,490

T. BOVEY ET AL

CLAMPING DEVICE

Filed Dec. 10, 1925

Fig. 1

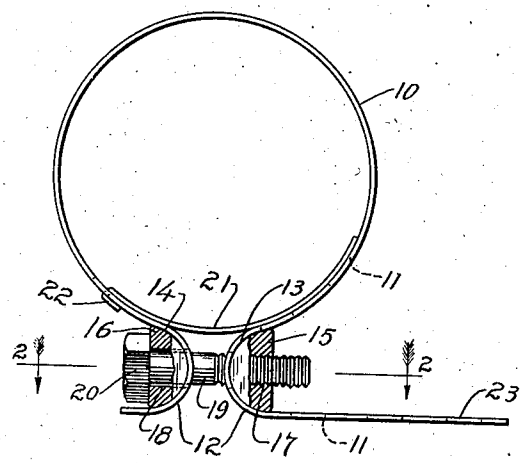


Fig. 3

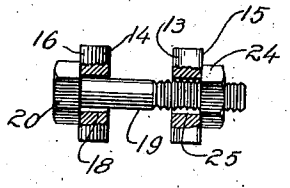


Fig. 7

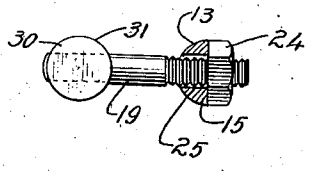


Fig. 2

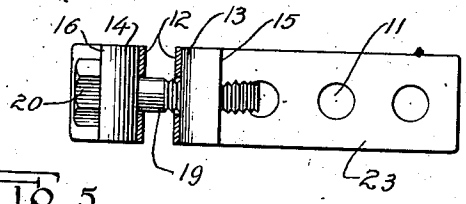


Fig. 5

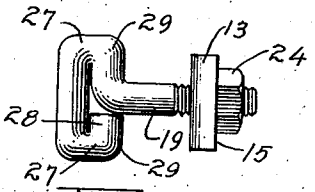


Fig. 4

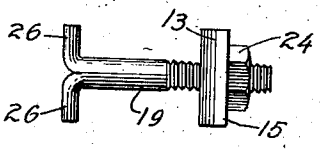
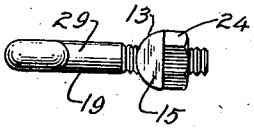


Fig. 6



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Atty's

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UNITED STATES PATENT OFFICE.

THOMAS BOVEY AND SIDNEY J. V. BOVEY, OF CHICAGO, ILLINOIS; SAID SIDNEY J. V. BOVEY ASSIGNOR TO SAID THOMAS BOVEY.

CLAMPING DEVICE.

Application filed December 10, 1925. Serial No. 74,661.

Our present invention relates to clamps wherein a band, strap, or the like is provided for the purpose of encircling an object, and the ends of the band are drawn towards each other to securely tighten or constrict the same upon the article and prevent accidental displacement thereon or therefrom.

In structures of this nature the ends of the annulus or band are usually provided with lugs or ears that are bent laterally to the body portion thereof and means are provided to draw lugs or ears towards each other to tighten the band. The tightening means consist of a bolt or the like that is passed through apertures in said lugs and when the nut is secured onto the bolt said nut and the head of the bolt will engage the outer surface of the lugs and move the latter towards each other thus reducing the diameter of the annulus to the desired extent. The angular corners usually formed by bending the lugs out abruptly from the body of the annulus of course weakens the metal at these points causing the same to rupture under too great a strain, and said corners also have a tendency to cut or bite the outer surface of the article that is encircled by the annulus thus distorting the latter. With the present structure the inherent objections to the above-mentioned device are successfully overcome, and we have been able to provide a clamp in which the co-action between the lugs and tightening means is such that the circularity of the annulus is maintained under the pulling-up action and the engaging surfaces of the respective portions of the lugs and tightening means is such that they constantly accommodate themselves to the divers positions in which they may be forced. The clamp which we have designed is both novel and simple in construction and is dependable in use, and is easy to install.

We prefer to carry out our invention and to accomplish the several objects thereof in substantially the manner hereinafter fully described, and as more particularly pointed out in the claims, reference being made to the accompanying drawings that form a part of this specification.

In the drawings:—

Figure 1 is a side or edge view of the clamping annulus with portions of the clamping means in section.

Figure 2 is a section thereof on line 2—2, Figure 1.

Figure 3 is a detached view of the pull-up or tightening elements as viewed in Figure 2 and partly in section.

Figure 4 is a side view of a slightly modified design of the tightening construction elements.

Figures 5 and 6 are respective side and edge views of another modification of the tightening or constricting members.

Figure 7 is an edge view of a still further modified tightening or constricting device.

The drawings are, in a sense, merely schematic for the purpose of illustrating typical or preferred embodiments of this clamp, and throughout the views we have employed similar reference characters to designate like parts wherever the same appear.

Referring first to Figures 1 and 2, it will be seen the device preferably comprises an annulus or encircling strap, band or the like designated as 10 that is provided with longitudinally disposed holes or recesses 11. The annulus is made from a strip of flexible metal formed into a ring of the desired diameter and contour, and outside the circumference of the ring the metal strip is given reverse bends to provide outwardly extending loops 12, 12, that are spaced apart and have their convex portions opposite each other as shown in Figure 1. The curvature of the loops is such as to conform to the curvature of the convexly curved surfaces 13 and 14 of the respective blocks 15 and 16 that are positioned in these loops. The blocks just mentioned are elongated half-cylinders, that are transversely bored as at 17 and 18 respectively, the former bore being preferably threaded and the latter being smooth. A bolt 19 or the like, with a suitable head 20, has its shank passed through the bore of block 16, the opposite or alining apertures 11 in the loops, and is screwed into the threaded bore 17 of the block 15, and it will be understood that the farther the bolt is screwed into the block 15 the closer the facing surfaces of the loops will approach each other and the tighter the annulus will be drawn together or constricted around the article being clamped. In order to prevent bulging of the article between the loops in the event it is a flexible pipe, or rubber hose, or the like, a segmen-

tally curved shield or guard may be placed over the open space that separates the loops, and for convenience as well as to prevent accidental dislodgement, said shield may be provided at one end with a hook 22 that is inserted into one of the apertures 11 in the portion of the metal strip that forms the annulus or ring 10. In some cases it is found desirable to provide an extension 23 to the clamp and this is accomplished by forming one of the bends for the loops at a distance back of the respective end of the metal, so that thereby the clamp may be used as a pipe-hanger by nailing or otherwise attaching this extension to a floor-joist, a rafter, or other supporting element.

Numerous modifications of the structure just described are possible, the gist of the invention residing in providing the annulus with curved loops that are engaged by the rounded surfaces of blocks or other members that form a part of the means for drawing the loops towards each other. Several of such modifications are herein illustrated, that in Figure 3 comprising substantially of the same elements that have been described in connection with Figures 1 and 2, with the exception that the bolt is provided with a tightening nut 24 that screws up against the outer flat surface of the block 15 and the latter has a smooth bore 25 instead of being threaded as in Figure 1.

In Figures 4 and 5 and 7 the block 14 is dispensed with, as well as the conventional polygonal head of the bolt 19, and in lieu thereof the ends of the bolts, shown in the respective views are formed with lateral members that present convex surfaces to the inner surfaces of the loops 12. In Figure 4 the unthreaded end of the bolt is slitted or bifurcated longitudinally and the metal on each side of the slit is bent laterally to provide oppositely projecting arms 26. In Figures 5 and 6, the unthreaded end of the bolt is elongated and said elongated portion is first bent laterally and then given two oppositely disposed reverse bends 27, 27, and the end 28 is turned towards the shank in alinement with the portion extending from the first bend, so that convex faces are presented to the surfaces of the loop with which the same are engaged. In Figure 7 the unthreaded portion of the bolt 19 is passed transversely through a cross bar 30 that may be a short length of circular or round bar-metal and the shank secured therein in any suitable manner, which of course provides a transverse member having the desired convexity of engaging surface. In all of these modified types the opposing block 15 has an unthreaded bore and the tightening nut 24 is employed upon the threaded portion of the bolt member 19 in the same manner as detailed in Figure 3.

With all the structures heretofore described, the convex surfaces of the transverse elements will engage with the curved portions of the loops 12 and when the clamp is being tightened the parts will accommodate themselves to the relative changes of position that take place. Also it will be seen that the block 16 interposed between the bend of the bolt and the adjacent loop the block will space the head from the restricted space close into the loop and will thereby permit a wrench or other tool being used to rotate the bolt. The same is true with respect to the modified structures disclosed in Figures 3 to 7 where the block 15 is provided with an unthreaded bore and the tightening is done by the nut 24 that will engage the block.

What we claim is:—

1. A clamping device comprising an encircling strap, lugs adjacent the ends of said strap and having concave surfaces, elongated element that is passed through said lugs, separated transverse members at opposite ends of said element each having a convex face engaged with the respective surfaces of said lugs, and a rotatable element engaged with one of said members and adapted to move said members towards each other.

2. A clamping device comprising an encircling strap, curved lugs adjacent the ends thereof, transverse bored blocks having curved surfaces fitting said lugs, a headed spindle passed through said blocks and lugs, the head of said spindle engaged with a flat surface of one of said blocks, and cam means for causing a relative movement of said blocks upon said spindle.

Signed at Chicago, in the county of Cook, and State of Illinois, this 20th day of November, 1925.

THOMAS BOVEY.
SIDNEY J. V. BOVEY.