Dec. 12, 1967 G. FLYNN 3,357,698

C-CLAMP

Filed Sept. 20, 1965

Fig. 1.

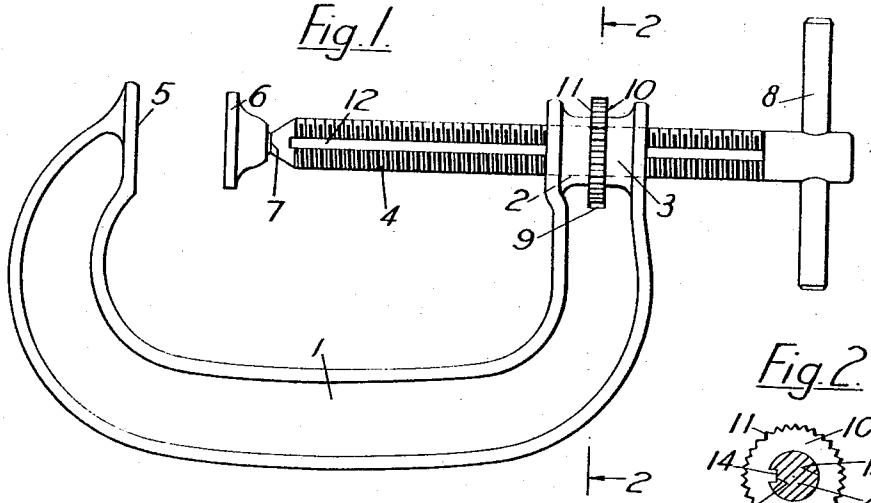


Fig. 2.

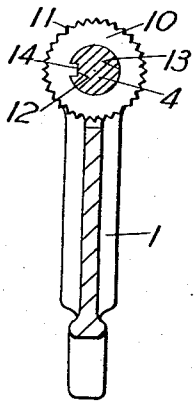


Fig. 3.

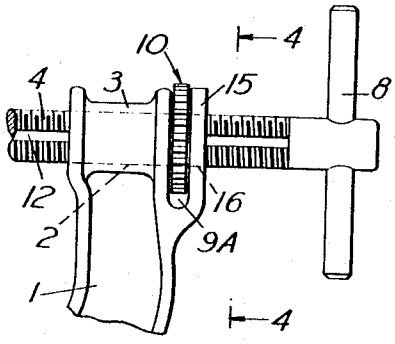


Fig. 4.

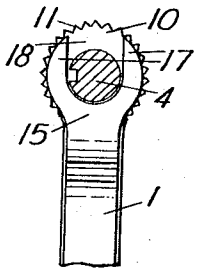


Fig. 5.

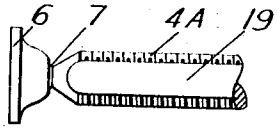


Fig. 6.

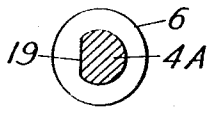
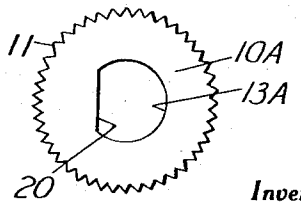


Fig. 7.



Inventor

George Flynn

By

Watson, Cole, Grindle + Watson

Attorney

United States Patent Office 3,357,698 Patented Dec. 12, 1967

3,357,698

C-CLAMP

George Flynn, Durham City, England, assignor to C. & J. Hampton Limited

Filed Sept. 20, 1965, Ser. No. 488,605
3 Claims. (Cl. 269—221)

This invention relates to a C-clamp. Although it is frequently required to hold two or more workpieces in a specific relationship in such a clamp, the functionally necessary form of the clamp strongback makes it difficult to hold the workpieces manually in their required relationship and hold the clamp while its screw is being tightened, because one hand is occupied largely in holding the clamp itself, while the other hand has to be applied to the butterfly wing or tommy bar provided at the end of the screw remote from the workpieces.

The object of the present invention is to provide an improved C-clamp wherein means are provided to eliminate or minimise this difficulty.

According to the present invention, a C-clamp is formed with a slot at the internally-threaded portion of its strongback in which the screw meshes, the slot being transverse to the screw axis and serving to receive a wheel with an aperture through which the screw passes, the screw having a longitudinal relief of its circular profile and the aperture in the wheel presenting means to engage the relief, whereby the screw may be rotated by means of the wheel.

The location of the wheel in the slot in the threaded end of the strongback itself enables the wheel to be rotated by the application of the thumb and one finger of a hand holding the strongback, so that the screw can be advanced through the threaded end by that hand to an extent sufficient to effect initial clamping of workpieces positioned by the other hand, after which final tightening can be effected by transferring one hand to the tommy bar or other terminal fitting of the screw.

The longitudinal relief of the screw profile may be formed as a key way, when the aperture in the wheel has a corresponding key projection. Another example of longitudinal relief is a lengthwise flat, when the aperture in the wheel has a corresponding D-shape.

Both of the above indicated forms of relief, together with two possible positions of the slot to receive the wheel, are shown in the embodiments appearing in the accompanying drawings, in which:

FIGURE 1 is a side elevation of one embodiment of C-clamp;

FIGURE 2 is a section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary view, corresponding to the right-hand side of FIGURE 1, showing another embodiment;

FIGURE 4 is a section taken on the line 4—4 of FIGURE 3, but showing a possible variation;

FIGURES 5 and 6 are a side elevation of part of an alternative form of screw and a section of the screw respectively; and

FIGURE 7 is a face view of a knurled wheel for use with the screw of FIGURES 5 and 6.

In FIGURES 1 and 2, the strongback 1 (conveniently a malleable iron casting) forming the frame of a C-clamp is screwthreaded at 2 at one end 3 to receive a steel screw 4 directed towards an anvil 5 to enable work to be clamped between the anvil and a steel shoe 6, e.g., a malleable casting or a turned part swivel mounted on an integral ball-end 7 of the screw. At its end remote from the shoe, the screw 4 is provided with a tommy bar 8, here shown fixed, but equally a loose fitting bar, with ball-ends, could be used, or the screw could end in a butterfly wing.

The end 3 of the frame 1 has a slot 9 transverse to the axis of the screw 4, the slot being open at 10 for the insertion of a wheel 10 having peripheral knurling 11, the thickness of the wheel substantially equally the width of the slot. The screw 4 has a lengthwise key way 12 and the wheel 10 has an aperture 13 (FIGURE 2) allowing for free endwise passage of the screw, but with the projecting key 14 to engage the key way. Rotation of the wheel 10 thus rotates the screw 4, but the screw 4 is free to move through the wheel as its own rotation impels it in one direction or the other by engagement of its threads with the screwthreads 2 in the end 3. The periphery 11 of the wheel 10 projects sufficiently for it to be engaged easily by the thumb and finger.

With the frame 1 held in the palm of one hand, using the second to fourth fingers of that hand, while the other hand positions work, e.g., two or more workpieces to be held in correct relative location, the thumb and finger of the first hand can reach the wheel 10 and rotate it so as to bring the shoe 6 into bearing with the work and clamp it sufficiently to the anvil 5 for the relative location to be maintained as the hand previously holding the work is transferred to the tommy bar 8 to effect final tightening of the screw.

A slight clearance between the thickness of the wheel 10 and the ends of the slot 9 enables the wheel to be rotated freely until the work becomes nipped between the anvil 5 and the shoe 6.

The slot 9 is shown midway along the end 3, but it could be located at any position along the length of the end, without affecting the length of screwthread engagement between the screw and the frame.

The knurled wheel 10 may be machined from suitable metal stock, but advantageously it is formed as a sintered metal product, with the knurling moulded in the compact to be sintered. It could also be an injection moulding of hard plastics material.

In FIGURE 3, the slot 9A for the wheel 10 is removed to the outside of the screwthreaded end of the frame 1, by providing an integral rib 15 on the frame, with a clearance hole 16 for the screw. In FIGURE 4, a like rib 15 is bifurcated to form two torques 17 having a slot 18 between them, providing clearance over the screw 4. The rib 15, in either of its two forms, serves to retain the wheel 10 between itself and the end 3, but need have no threads to mesh with the screw 4, since the meshing engagement is provided in the end 3.

In FIGURES 5 and 6, the screw 4A has a lengthwise flat 19, and the wheel 10A (FIGURE 7) to be used with it has an aperture 13A of D-shape, the flat side 20 of which engages the flat 19 of the screw, so that rotation of the wheel rotates the screw. This form of screw and wheel engagement may, of course, be used in place of the key way and key construction shown in FIGURES 1 to 4.

The clamp provided with the wheel 10 also enables rapid or convenient adjustment of the screw to provide space between the anvil and the shoe of the screw for receiving workpieces of a variety of thicknesses within the capacity of the clamp.

What I claim is:

1. A C-clamp comprising a strongback, an anvil provided at one end of said strongback, an internally screw-threaded portion provided at the other end of said strongback, a screw associated with said threaded portion, said portion being provided with a slot transverse to the screw axis, a wheel received in said slot, said wheel being provided with an aperture through which said screw passes, said screw having a longitudinal relief of its circular profile and means presented by said aperture in said wheel to engage said relief.

2. A C-clamp comprising a strongback, an anvil provided at one end of said strongback, an internally screw-

threaded portion provided at the other end of said strongback, a screw associated with said threaded portion, said portion being provided with a slot transverse to the screw axis, a wheel received in said slot, said wheel being provided with an aperture through which said screw passes, said screw having a key way and a corresponding key presented by said aperture in said wheel to engage said key way.

3. A C-clamp comprising a strongback, an anvil provided at one end of said strongback, an internally screw-threaded portion provided at the other end of said strongback, a screw associated with said threaded portion, said portion being provided with a slot transverse to the screw axis, a wheel received in said slot, said wheel being provided with an aperture through which said screw passes, said screw having a lengthwise flat and said aperture having a corresponding D-shape, to engage said flat.

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ROBERT C. RIORDON, *Primary Examiner.*

DAVID R. MELTON, *Assistant Examiner.*