

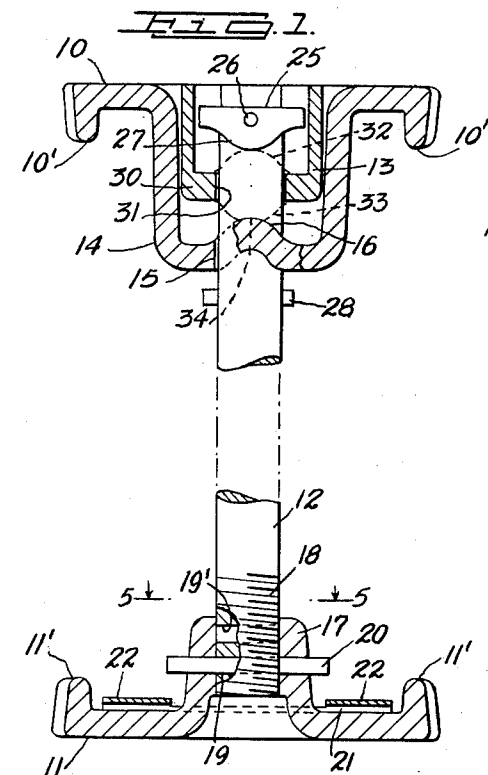
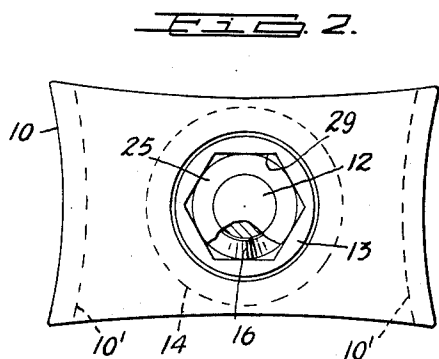
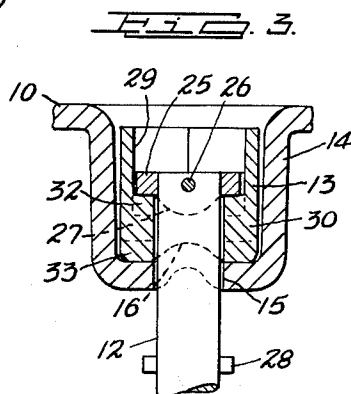
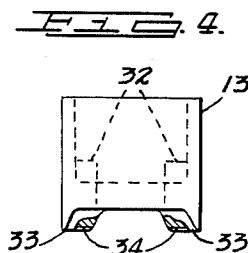
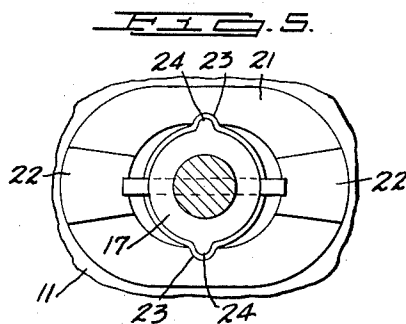
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CLAMP UNIT WITH HOUSED ACTUATING CAM

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CLAMP UNIT WITH HOUSED ACTUATING CAM

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7 Claims. (Cl. 24—81)

This invention relates to clamp units employing a pair of flanged clamp plates drawn by a rod-like member, wherein one of the clamp plates includes a housing portion, within boundaries of which is arranged and operated an actuating cam element rotatable about said rod in movement of the plates into operative and inoperative positions.

More particularly, the invention deals in a structure of the character described wherein one of the plates is adjustably fixed on the rod, and the other plate and said rod include camming surfaces operatively engaged by the cam element in actuation of the clamp.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

Fig. 1 is a sectional view through a clamp unit made according to my invention, illustrating the same in operative position, parts of the construction being broken away and parts shown in elevation.

Fig. 2 is a top plan view of the structure shown in Fig. 1, with part of the construction broken away.

Fig. 3 is a view of part of the construction shown in Fig. 1, with the part shown in a different position.

Fig. 4 is a side view of the cam element detached and with parts of the construction broken away and in section; and

Fig. 5 is a section on the line 5—5 of Fig. 1, with part of the construction broken away.

My improved clamp unit comprises four primary basic parts; namely, a top plate 10, a bottom plate 11, a coupling rod or member 12, and an actuating cam element 13.

Both plates 10 and 11 are generally of the contour illustrated in Fig. 2 of the drawing and have curved end flanges 10' and 11' respectively, flanges 10' and 11' being directed toward each other, as noted in Fig. 1, in establishing clamping engagement with flanged ends of drums or other articles to be coupled together by the unit. Representations of the articles are not indicated as clamps of the type and kind under consideration are well known in the art.

The plate 10 has centrally thereof a deep housing 14 which is contracted downwardly to a slight extent, the bottom wall of the housing having an aperture 15 in which the rod 12 is freely disposed. The upper surface of the bottom wall of the housing has on opposed sides raised cam portions, one of which is illustrated in section at 16 in the broken section, Fig. 1.

The plate 11 has an upwardly extended internally threaded bearing portion 17 for reception of the threaded end 18 of the rod, said end of the rod having spaced apertures 19, 19' to provide adjustable positioning of the plate 11 on the threaded end of the rod in controlling primary spacing of the plates 10 and 11.

In the construction shown a drive coupling pin 20

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is illustrated in the aperture 19, thus providing the widest spacing of the plates 10 and 11.

The pin 20 is made sufficiently long to retain an elliptical spring plate 21 against displacement from the inner surface of the plate 11. Rounded ends of the plate 21, note Fig. 5 of the drawing, have raised spring portions 22 which are shown in section in Fig. 1 of the drawing.

The inner surfaces of the sides of the spring 21 have rounded notches, as seen at 23 in Fig. 5 of the drawing, to engage downwardly projecting ribs 24 on the bearing portion 17 to key the spring 21 to the plate 11, thus preventing rotatable shifting of the spring thereon.

The upper end of the rod 12 has a cam portion 25 which in the construction seen is in the form of a ring pinned to the rod 12, as seen at 26. The lower surface of 25 has, on opposed sides and in alignment with the cams 16, depending cams, one of which is shown at 27 in Fig. 1 of the drawing. Also fixed to the rod 12, inwardly of the plate 10 or the housing 14 thereof, is another pin 28, which maintains the plate 10 in the environment of the element 13.

The element 13 is generally cup-shaped in form and the outer end portion of the large diameter bore 29 is in the form of a hexagon socket, as clearly noted in Fig. 2 of the drawing, the element, including the bottom wall 30, having a bore 31 therein to freely receive the rod 12.

The bottom wall 30 has, on opposed sides thereof, upwardly and downwardly extending cam portions 32 and 33, indicated in dotted lines in Fig. 1 of the drawing and shown in section in Fig. 3 of the drawing. The downwardly extending cam portions 33 are also clearly noted in Fig. 4 of the drawing, and the high points of the cams 33 have recesses as at 34, note Fig. 4 of the drawing, to engage the cam 16 in definitely retaining the clamp in the locked position of Fig. 1 of the drawing.

At this time it is pointed out that the particular contour of the cams 16, 27, 32 and 33 can be modified to provide the desired clamping action, and these cams can extend a greater circumferential degree than that diagrammatically illustrated in the drawing.

It will be understood that in the use of the clamp the flanged portions of supports will be positioned between the plates 10 and 11, inwardly of the flanges 10' and 11' thereof, with the plate 10 and element 13 in the position of Fig. 3, which would be the open position of the clamp, whereupon a suitable tool fitting the hexagon socket 29 is actuated to rotate the element 13, which results in moving the plate 10 in the direction of the plate 11 by downward action of the plate 10 along the rod 12, which rod, at the same time, is raised, drawing the plate 11 in the direction of the plate 10.

In removal of the clamp from the articles the clamp parts are returned to the position of Fig. 3 by again rotating the element 13. It will also be apparent that in the locked position of the clamp, the spring 21 serves to maintain the cam 16 in the notches or recesses 34.

It will appear from a consideration of Fig. 1 of the drawing that when the unit is in operative position the element 13 is contained within the housing, thus no part protrudes beyond the outer surface of the plate 10.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A clamp unit of the character described comprising two clamp plates having flanged end portions adapted to engage articles to be coupled by said unit, a rod one end of which is fixed to one plate, the other plate including a housing, the bottom wall of the housing being apertured to freely receive the other end of said rod which extends into the housing, said wall having on opposed sides inwardly extending cam portions, the second named end of the rod having cam portions directed to-

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ward the first named cam portions, and maintained in alignment therewith by engagement of the plates with the articles to be coupled, an actuating element, rotatably mounted on the rod within said housing, said element having an angular socket for tool rotation thereof, and said element having opposed upwardly and downwardly extending cam portions operatively engaging the cams of said housing and rod in movement of the plates toward each other into clamping engagement.

2. A unit as defined in claim 1, wherein yieldable means is employed for maintaining the unit in operative engagement with articles to be coupled in said unit.

3. A unit as defined in claim 1, wherein the attachment of the first named plate with said rod being adjustable.

4. A unit as defined in claim 1, wherein the cams of said rod comprise a ring fixed to the second named end of said rod.

5. A unit as defined in claim 1, wherein the rod in-

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cludes means maintaining the second named plate in the environment of said element.

6. A unit as defined in claim 1, wherein the first named plate has a threaded engagement with the rod, and the inner surface of said plate includes a spring engaged by the articles coupled together by said unit.

7. A unit as defined in claim 1, wherein means is provided between the cam portions of said housing and cam portions of said element for maintaining the unit in fixed operative position.

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