Dec. 8, 1959 N. H. ANDREASEN 2,915,799

CLAMPING UNITS

Filed Oct. 4, 1956

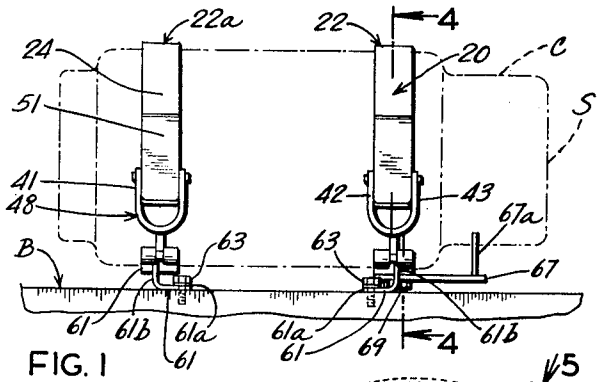


FIG. 1

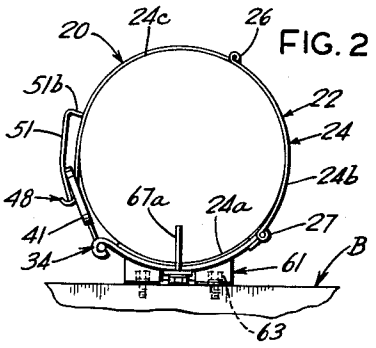


FIG. 2

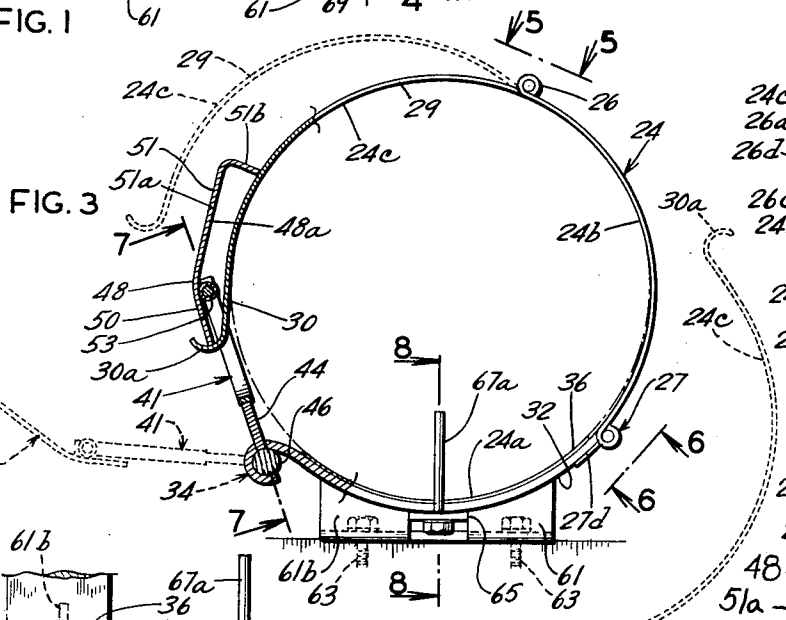


FIG. 3

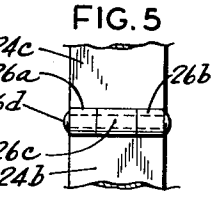


FIG. 5

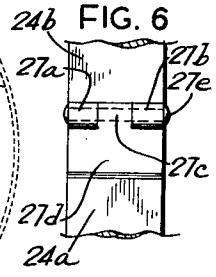


FIG. 6

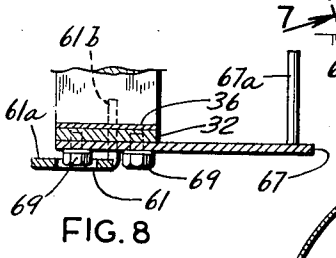


FIG. 8

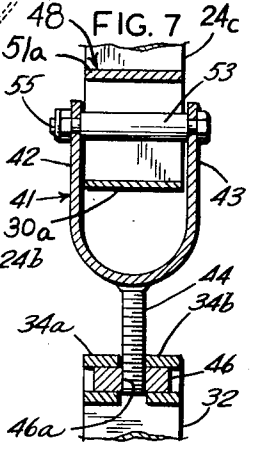


FIG. 7

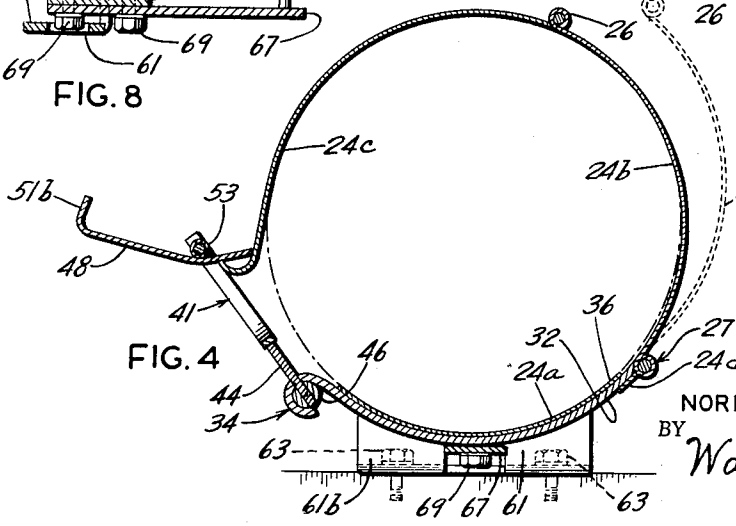


FIG. 4

INVENTOR.
NORMAN H. ANDREASEN
BY Wallace and Cannon
ATTORNEYS

United States Patent Office 2,915,799 Patented Dec. 8, 1959

2,915,799

CLAMPING UNITS

Norman H. Andreasen, Evanston, Ill., assignor to Clipper Industries, Inc., Evanston, Ill., a corporation of Illinois

Application October 4, 1956, Serial No. 613,902

3 Claims. (Cl. 24—270)

This invention relates to clamping units and, more specifically, to clamping units which are particularly well adapted for use in holding gas cylinders on vehicles which use propane, butane, and the like, for fuel.

It is a primary object of my invention to afford a novel clamping unit which is particularly well adapted for holding propane, or butane gas cylinders, and the like, on vehicles using such gas for fuel.

Other clamping units of the general type to which my novel invention pertains have been heretofore known in the art. However, such other clamping units as have been heretofore known have had several inherent disadvantages such as, for example, being difficult to open and close; being unreliable or inefficient in operation; being complicated in construction and operation; being expensive to manufacture; producing undesirable wear on tanks being held thereby, or the like. It is an important object of my invention to overcome such disadvantages in clamping units of the aforementioned type.

Another object of my invention is to afford a novel clamping unit which may be quickly and easily secured to a gas cylinder, or the like, and which may also be quickly and easily released therefrom.

A further object of my invention is to afford a novel clamping unit of the aforementioned type which, when secured to such a tank, is efficient and reliable in operation and will effectively hold the tank in proper position on the vehicle, or the like.

Another object of my invention is to afford a novel clamping unit of the aforementioned type wherein the parts thereof are constituted and arranged in such a manner as to effect distribution of the clamping forces around the tank being held in a novel and expeditious manner.

Yet another object of my invention is to afford substantially straight line pull on the parts of the clamping band holding a gas cylinder or tank.

Another object of my invention is to afford a novel clamping unit of the aforementioned type wherein the parts are constituted and arranged in a novel and expeditious manner so as to afford a novel and effective resilient clamping of such a cylinder or tank.

Another object of my invention is to afford a novel clamping unit of the aforementioned general type which is reliable and efficient in operation and which may be readily and economically produced commercially.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings, which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof and what I now consider to be the best mode in which I have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of a clamping unit embodying the principles of my invention, showing a gas cylinder being held thereby;

Fig. 2 is an end elevational view of the clamping unit shown in Fig. 1;

Fig. 3 is a detail elevational view similar to Fig. 2, but with certain parts broken away to show underlying structure;

Fig. 4 is a detail sectional view taken substantially along the line 4—4 in Fig. 1;

Fig. 5 is a detail plan view looking in the direction of the arrows 5—5 in Fig. 3;

Fig. 6 is a detail plan view looking in the direction of the arrow 6—6 in Fig. 3;

Fig. 7 is a detail sectional view taken substantially along the line 7—7 in Fig. 3; and

Fig. 8 is a detail sectional view taken substantially along the line 8—8 in Fig. 3.

To illustrate the preferred embodiment of my invention, a clamping unit 20 embodying the principles of my invention is shown in the drawings. The clamping unit 20 embodies, in general, two clamping devices 22 ind 22*a* mounted on a suitable base B such as, for example, the hood of an automotive vehicle, or the like.

The clamping device 22 embodies a clamping ring 24 having a bottom portion 24*a*, an intermediate portion 24*b* and an upper portion 24*c* hingedly connected together by hinges 26 and 27, Fig. 3. The intermediate portion 24*b* and the upper portion 24*c* of the clamping ring 24 may be made of any suitable material such as, for example, spring steel, and the intermediate portion 24*b* is formed in the shape of a curve preferably having a radius equal to that of the tank or gas cylinder which is to be held by the clamping unit 20. The upper portion 24*c* has a main body portion 29 which is preferably formed to the same radius as the intermediate portion 24*b* The upper portion 24*c* also has a free end section 30 normally projecting in substantially a straight line from the adjacent end of the main body portion 29, the end section 30 having an arcuate outwardly projecting flange 30*a* on the normally free end thereof, Fig. 4.

The bottom portion 24*a* of the clamping ring 24 includes a base 32 which may also be made of any suitable material, such as, for example, spring steel and the main body portion of which is preferably curved to the same inside radius as that of the intermediate portion 24*b*. The base 32 has a bifurcated end portion 34, the bifurcations 34*a* and 34*b*, curving outwardly and downwardly from the main body portion of the base 32 to form the major portion of a circle, Figs. 1, 3 and 7. A pad 36 made of any suitable material such as, for example, canvas duck, is mounted on the inner face of the base 32 and is preferably adhesively secured thereto.

The hinge 26 includes two collars or eyes 26*a* and 26*b* integrally formed on the end of the upper portion 24*c* of the clamping ring 24 and an intermediate collar or eye 26*c* is integrally formed on the intermediate portion 24*b* and disposed between the eyes 26*a* and 26*b*, with a hinge pin 26*d* mounted in and extending through the eyes 26*a*—*c*, Figs. 3 and 5. The eyes 26*a*—*c* are preferably so formed on the portions 24*b* and 24*c* of the clamping ring 24 that when the portions 24*b* and 24*c* are disposed in closed position the inner faces of the adjacent ends thereof extend along the periphery of the same circle.

The hinge 27 includes two collars and eyes 27*a* and 27*b* with an intermediate collar or eye 27*c* disposed therebetween. The end eyes 27*a* and 27*b* are integrally formed on the lower end of the intermediate portion 24*b* of the clamping ring 24 and the intermediate eye 27*c* is integrally formed on the upper end portion of a hinge plate 27*d* mounted on and secured to the outer face of the base

32 by any suitable means such as, for example, welding, Figs. 4 and 6. A hinge pin 27*e* is mounted in and extends through the eyes 27*a*—*c*, and the eyes 27*a*—*c* are so disposed relative to each other that when the intermediate portion 24*b* is disposed in closed position the inner face thereof is disposed substantially along the same periphery as in the inner face of the base 32. The base 32 is preferably made of heavier material than are the intermediate portion 24*b* and the upper portion 24*c*.

A yoke 41, Figs. 1, 4 and 7, having two substantially parallel legs 42 and 43 disposed at one end thereof, and having a single stem or leg 44 disposed at the other end thereof, is mounted on and carried by the bifurcated end portion 34 of the lower portion 24*a* of the clamping ring 24. For this purpose, a substantially cylindrical shaped cross bar 46 is journalled in the bifurcations 34*a* and 34*b* of the end portions 34, Figs. 3 and 7, and has a tapped opening 46*a* extending transversely through substantially the longitudinal center portion thereof. The stem 44 is threaded on its outer peripheral surface and projects inwardly between the bifurcations 34*a* and 34*b* and is threadedly engaged with the threads in the cross bar 46.

A latching plate 48 is pivotally mounted on the free end portions of the legs 42 and 43 of the yoke 41, Figs. 3 and 7. The latching plate 48 embodies two oppositely disposed end legs 50 and 51, which are disposed at a normally inwardly opening oblique angle to each other. The latching plate 48 may be made of any suitable material such as, for example, sheet steel, and a sleeve 53 is disposed on the inner face 48*a* of the plate 48 and secured thereto by any suitable means such as, for example, welding, in transversely extending relation thereto, adjacent to and substantially parallel to the intersection of the legs 50 and 51, Figs. 3 and 7. The sleeve 53 is disposed between the free end portions of the legs 42 and 43 of the yoke 41, and a bolt 55 extends through the legs 42 and 43 and the sleeve 53 to thereby pivotally mount the latching plate 48 on the bifurcated end portion of the yoke 41. The leg 51 of the latching plate 48 is substantially L-shaped, having an elongated leg portion 51*a* and a shorter leg portion 51*b*, projecting substantially perpendicularly thereto, for a purpose which will be discussed in greater detail presently.

A substantially L-shaped mounting bracket 61 having a horizontally disposed leg 61*a* and an upright substantially vertically disposed leg 61*b* is mounted under the clamping ring 24 and affords the base thereof by which the clamping ring 24 may be mounted on a suitable supporting base such as the aforementioned base B. The upper edge portion of the leg 61*b* of the mounting bracket 61 is curved to fit the outer face of the base 32 of the lower portion 24*a* of the clamping ring 24, and is secured thereto by any suitable means such as, for example, welding. The lower leg 61*a* of the mounting bracket 61 may be secured to a suitable supporting member such as the base B by suitable means such as bolts 63, Figs. 1 and 4.

A slot 65 is formed in the upright leg 61*b* of the mounting bracket 61, substantially centrally between the ends thereof. An elongated mounting plate 67 has one end portion secured to the lower face of the base 32 of the clamping ring 24, Figs. 4 and 8, by bolts 69 extending through the mounting plate 67 and threadedly engaged in the base 32 below the pad 36, Figs. 3 and 8. The mounting plate 67 projects forwardly through the opening 65 in the leg 61*b* of the mounting bracket 61 and a pin 67*a* projects upwardly from the free end portion of the plate 67.

As will be appreciated by those skilled in the art, gas cylinders or gas tanks normally used on vehicles, and the like, for supplying propane or butane gas for use as fuel, such as the cylinder C shown in the drawings, normally have a sleeve S projecting forwardly therefrom which has an opening, not shown, in the periphery thereof. The pin 67*a* is so disposed on the mounting plate 67 that when a cylinder such as the cylinder C is mounted in normal position on the clamping device 22, the pin 67*a* projects upwardly through the aforementioned opening in the sleeve S to thereby afford a centering device and holding device for the cylinder C.

The clamping device 22*a* embodies the same parts as the clamping device 22 except that the mounting plate 67 and the pin 67*a* are eliminated therefrom, and the parts of the clamping device 22*a* shown in the drawings are indicated by the same reference numerals as the corresponding parts of the clamping device 22.

In the operation of my novel clamping unit 20, the clamping devices 22 and 22*a* may be secured to a suitable base B in substantially parallel relation as shown in Fig. 1. With the yoke 41 and the latching plates 48 disposed in outwardly projecting position, as shown in broken lines in Fig. 3, and with the upper portions 24*c* of the intermediate portions 24*b* disposed in outwardly projecting or open position as shown in broken lines in Fig. 4, a tank or gas cylinder such as the gas cylinder C may be disposed on the lower portions 24*a* of the clamping devices 22 and 22*a*, with the pin 67*a* projecting upwardly through the aforementioned opening, not shown, in the sleeve S on the cylinder C.

The upper portions 24*c* and the intermediate portions 24*b* of the clamping rings 24 may then be swung inwardly into the position shown in solid lines in Fig. 4 wherein they rest against the outer peripheral surface of the main body portion of the cylinder C. It will be noted that when the upper portions 24*c* of the clamping rings 24 are disposed in this latter position, the main body portions 29 thereof preferably are disposed in juxtaposition to the side wall of the cylinder C, and the end sections 30 of the respective rings 24 project outwardly from the cylinder C along planes which are substantially tangential to the outer surface of the cylinder C, so that the free end section of each of the end sections 30 is spaced from the cylinder C, as shown in Fig. 4. With the intermediate portions 24*b* of the upper portions 24*c* of the clamping rings 24 disposed in this latter position, the yokes 41 may be swung upwardly from the position shown in broken lines in Fig. 3 to the position shown in solid lines in Fig. 4. During this upward movement of the yokes 41 the latching plates 48 therein are disposed in such position that the legs 50 thereof swing into position above the flange 30*a* on the upper portion 24*c* of the respective clamping rings 24, as shown in solid lines in Fig. 4.

Thereafter, the legs 51 of the latching plates 48 may be manually pressed upwardly and inwardly toward the cylinder C to thereby swing the legs 50 downwardly toward the position shown in Fig. 3, wherein it is disposed in outwardly spaced substantially parallel relation to a tangent of the outer surface of a cylinder C. During this latter movement of the legs 50 of the latching plates 48, the free edge portions thereof are engaged with the upwardly curved convex face of the flanges 30*a* and presses downwardly and inwardly thereon to thereby move the end sections 30 of the upper portions 24*c* of the clamping rings 24 inwardly against the outer face of the cylinder C. The leg portion 51*b* of the leg 51 of each of the latching plates 48 is of such length that as the leg 51 moves upwardly and inwardly, the free edge portion of the leg portion 51*b* engages the outer peripheral face of the upper portion 24*c* and the respective clamping ring 24 after the latching plate 48 is swung past dead-center position relative to the yoke 41. The leg portion 51*b* affords a spacing abutment member which is effective to hold the leg portion 51*a* of the leg 51 outwardly away from the upper portion 24*c* of the clamping ring 24 a sufficient distance that, when it is desired to open the respective clamping ring 24, the operator may readily grasp the leg portion 51*a* to swing the latching plate 48 in a counterclockwise direction to thereby release the clamping ring 24 when it is disposed in the closed position shown in solid lines in Fig. 3.

It will be seen that when the clamping ring 24 is dis-

posed in fully closed position as shown in solid lines in Fig. 3, the yoke **41** is disposed adjacent to but in outwardly spaced relation to the outer periphery of the cylinder C. Inasmuch as the latching plate **48** has sprung the end section **30** of the upper portion **24***c* of the clamping ring **24** inwardly, the resiliency of the end section **30** tends to urge the latter outwardly to thereby firmly secure the latching plate **48** in latching position and to insure that the latching plate **48** will not be accidently released from its latching position.

The yoke **41** may be adjusted longitudinally of the leg **44** thereof through the cross bar **46** to thereby adjust the tension of the latching plate **48** on the flange **30***a*.

With this construction, firm latching engagement of the latch **48** is assured, the resilient connection between the latch plate **48** and the free end portion **30***a* of the upper portion **24***c* of each ring **24** affording a "snap-action" which assures proper closing of the clamping ring **24** by an operator.

From the foregoing it will be seen that I have afforded a novel clamping unit which may be quickly and easily mounted on a gas cylinder or the like, and which may be quickly and easily released therefrom.

Also it will be seen that I have afforded a novel clamping unit which is effective and efficient in operation and which may be readily and economically produced commercially.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. A clamping unit for mounting a cylindrical tank or the like of given external radius, said clamping unit comprising an elongated articulated clamping member including at least two arcuate portions hingedly connected to each other in series to permit pivotal movement of said portions with respect to each other from an open position to an intermediate unstressed position in which said portions extend in a continuous arc approximately equal in radius to said external radius of said tank, the end of a first one of said clamping member portions at one end of said clamping member having a linear end section projecting therefrom approximately tangentially to said arc when said clamping member is in said intermediate position, and latching means mounted on the opposite end portion of said clamping member and engageable with said end section of said first end portion to clamp said end section in a closed position in which said end section is held in an arcuate configuration of substantially the same radius as said tank in which the curvature of the remainder of said clamping member remains substantially unchanged.

2. A clamping unit as defined in claim 1 and in which said linear end section of said first end portion terminates in an outwardly projecting flange and in which said latching means comprises an outwardly curved extension of said opposite end portion, a yoke journalled in said curved extension, and a latching plate pivotally mounted on said yoke in position to engage said flange and maintain said end section in said closed position.

3. A clamping unit as defined in claim 1 in which said linear end section of said first end portion includes an outwardly projecting flange and in which said latching means comprises a substantially arcuate bifurcated end extension extending outwardly of said opposite end portion, a substantially T-shaped coupling member including an elongated shank extending between the bifurcations of said extension and a cross head mounted on one end of said shank and journalled in said arcuate extension, a yoke mounted on the opposite end of said shank, and a latching plate pivotally mounted on said yoke in position to engage said flange and maintain said end section of said first clamping member end portion in said closed position, said latching plate being movable with respect to said yoke to disengage said latching plate from said flange and thereby release said end section from said closed position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,016,353	Morgan	Feb. 6, 1912
2,029,707	Dodelin	Feb. 4, 1936
2,086,674	Lodin	July 13, 1937
2,109,821	Dunica	Mar. 1, 1938
2,353,017	Denton	July 4, 1944