

Nov. 29, 1960

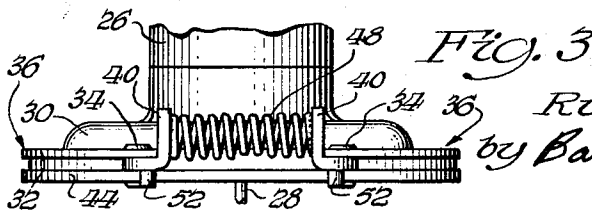
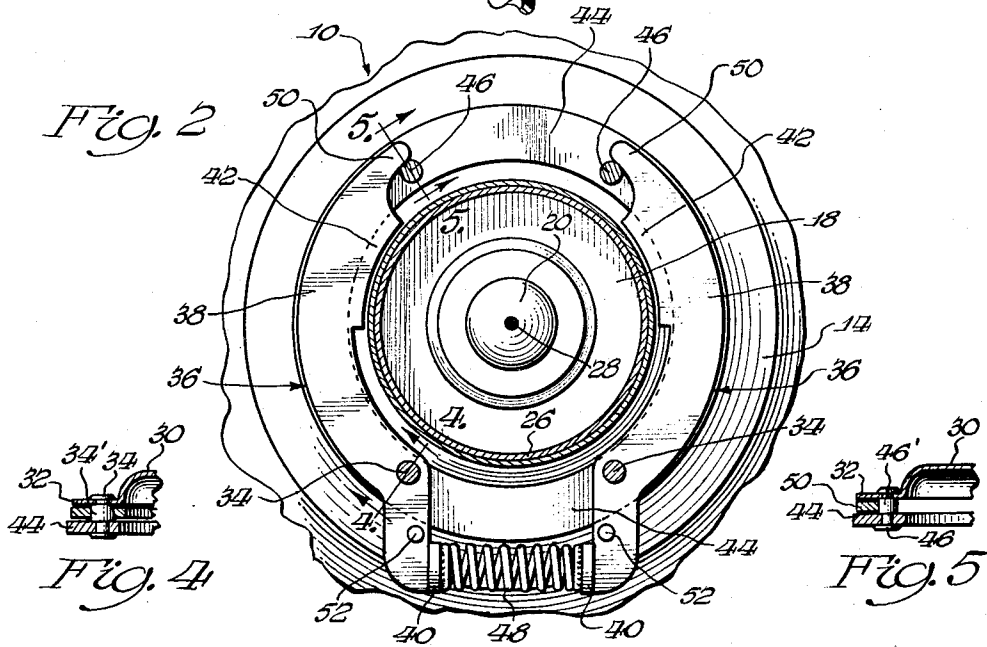
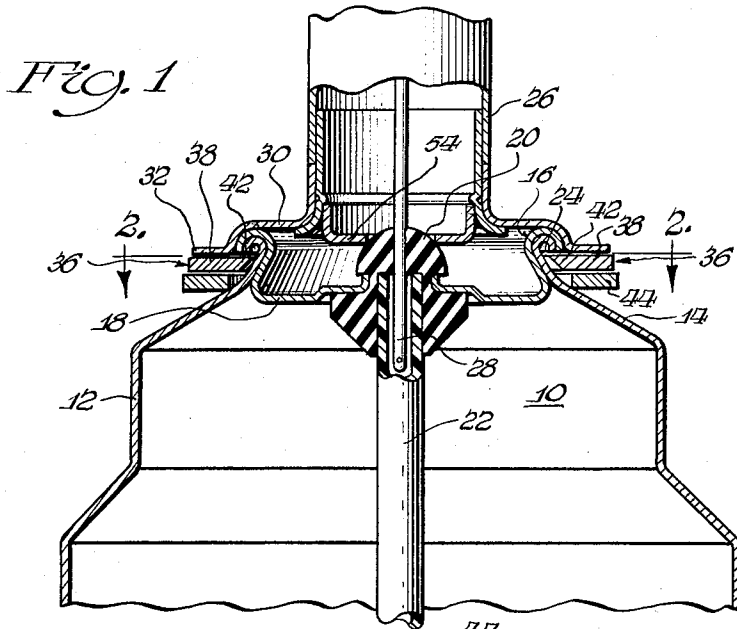
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2,962,307

COUPLING FOR GAS APPLIANCE

Filed Sept. 4, 1956

2 Sheets-Sheet 1



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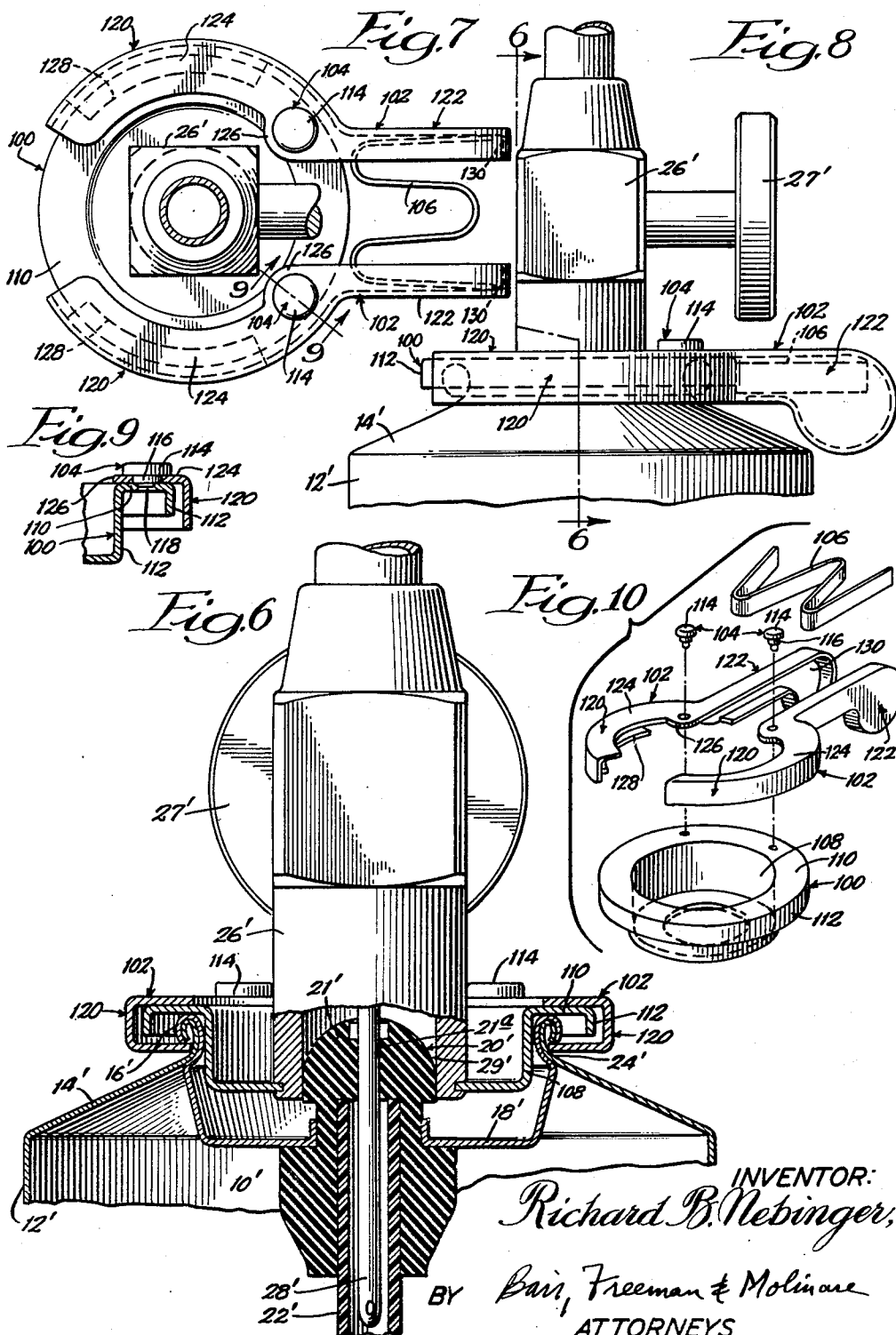
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2 Sheets-Sheet 2



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COUPLING FOR GAS APPLIANCE

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4 Claims. (Cl. 285—317)

This invention relates to a coupling for a gas appliance and more particularly to a coupling for connection to a source of fuel contained in a crown-type can. This application is a continuation-in-part of my copending application, Serial No. 578,533, filed April 16, 1956, and now abandoned in favor of this application.

There has been, recently, an increased popularity of liquid petroleum gas appliances, such as stoves, torches and lanterns wherein the source of fuel is contained in a lightweight disposable container, such as a crown-type can. One of the features of such appliances is that after the fuel of one container has been exhausted, the container may be discarded and a fresh container of fuel may be attached to the appliance. One of the earliest U.S. patents to show the general concept of a fuel burning appliance in combination with a replaceable fuel cartridge is Anderson 1,721,844.

The instant invention is directed to new and improved means for detachably coupling the liquid petroleum gas appliance to the disposable fuel container.

One of the requirements of such a coupling is that it be very simple to operate. Another requirement of such a coupling is that it be effective for insuring a non-leak coupling between the appliance and the fuel container. Still another requirement of such a coupling is that it be arranged for cooperation with the existing features of crown-type cans, within which containers fuel has been effectively packaged.

Thus, one object of this invention is to provide a coupling which meets the aforementioned requirements and which provides an arrangement of parts which effects a positive gripping cooperation with existing parts of a crown-type can.

One feature of this invention is that it takes advantage of the existing construction features of crown-type cans. In existing crown-type cans, the crown is so arranged relative to the top of the can that an annular portion of said crown overhangs a portion of the top of the can and thereby cooperates to define an outwardly opening annular groove, or recess, between said overhanging portion of the crown and the top of the can. The instant invention provides a coupling which cooperates with these existing construction features by providing portions thereof which may enter said outwardly opening annular groove defined beneath the crown of the can, and which portions engage and cooperate with the annular crown to resist separation of the coupling from the crown can.

Thus, another object of this invention is to provide a coupling for a gas appliance for use with a crown-type can, which coupling is particularly adapted to take advantage of existing construction features of crown-type cans to effect a simple means of connection between the coupling and the crown can.

A further object of this invention is to provide a coupling for connection with a crown-type can which is characterized by its simplicity and inexpensiveness of construction and by its effectiveness of operation.

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Further objects and advantages of this invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

A preferred embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a fragmentary cross-section view of one form of coupling of this invention connected to a crown-type can;

Figure 2 is a cross-section view taken on line 2—2 of Figure 1;

Figure 3 is an elevation view taken on line 3—3 of Figure 2;

Figures 4 and 5 are fragmentary cross-section views taken respectively on lines 4—4 and 5—5 of Figure 2;

Figure 6 is an enlarged fragmentary cross-section view of a modified form of coupling, showing its connection to a crown-type can;

Figure 7 is a top plan view of the coupling of Figure 6;

Figure 8 is a side elevation view of the coupling of Figure 6;

Figure 9 is a cross-section view taken on line 9—9 of Figure 7; and

Figure 10 is an exploded perspective view of the modified form of coupling.

The device of Figures 1—5

Referring now to the drawings there is shown, in the form of this invention disclosed in Figures 1—5, a crown-type can, or container, 10 adapted for containing liquid-petroleum-gas fuel for use with a gas burning appliance. The crown-can includes an upright cylindrical surface 12, a frusto-conical top portion 14, an annular crown or bead 16 at the upper end of top portion 14, and a cup-shaped, depressed central top portion 18. The central top portion 18 carries a normally sealed, but pierceable rubber seal 20 centrally thereof.

Depending from said rubber seal 20 centrally thereof is a tubular fuel conduit 22. The connection of rubber seal 20 to top portion 18 of the can is generally shown, as the details of such connection form no portion of this invention. However, it is to be noted that the rubber seal 20 extends upwardly above the top portion 18, and this feature is taken advantage of in this invention, as will be hereinafter described.

The annular crown 16 on the can is so constructed and arranged that a portion thereof defines an outwardly-extending, annular, overhanging-portion which overlies a portion of the can top 14 so as to define an annular groove, or recess, 24 between said overhanging-annular portion and the top 14 of the can. This annular groove, or annular recess 24 has a minimum diameter which is less than the maximum diameter of the crown, that is, the maximum diameter of the annular, outwardly-extending, overhanging-portion of the crown 16. This feature of the overhanging-portion of the annular crown 16 cooperating with the top 14 of the can 10 to define an annular groove 24 therebetween is not novel, although the existence of that feature is taken advantage of in this invention, in a manner as will be hereinafter described.

Now, the appliance to which the container of fuel is to be attached may be any liquid-petroleum-gas burning appliance such as a stove, lantern or torch. Regardless of the nature of the appliance, fuel conduit means are provided between the appliance and the fuel containing can 10. Said fuel conduit means includes a stem, or tubular member, 26 which carries a fuel-bleeding, apertured, hollow needle 28 which is adapted to pierce the rubber seal 20 and to enter into the bore of the fuel con-

duit 22, so as to establish a passageway for the fuel from tube 22, through the apertured hollow needle 28, to the gas burning appliance.

The novel coupling means between tubular member 26 and the fuel can 10 will now be described. Said coupling comprises an annular abutment member, or frame member, 30 that is carried by tubular member 26 and which is shaped and arranged to overlie and engage the annular crown 16 of the can 10, in the manner as shown. Furthermore, the abutment member 30 is of such a dimension that it extends outwardly of the annular crown 16, thereby defining an annular flange 32 located outwardly of the crown 16. Said annular flange 32 carries thereon a pair of pivot pins 34 which extend from flange 32 in the direction toward the container top 14. Pivotaly mounted on each of the pivot pins 34 is a jaw member generally designated at 36. Each jaw member 36 is so shaped and arranged as to define a coupling portion 38, and a control portion 40 therefor.

It will be seen that the coupling portions 38 of the jaw members 36 are pivotable on the pivot pins 34 so that they may be swung toward or away from each other. Furthermore, when the abutment member 30 is properly seated against crown 16 of the container, the coupling portions 38 are disposed so as to lie in a plane, and to be movable in said plane, in which the annular groove 24 is located. Said coupling portions 38 have inwardly extending flanges, or coupling elements, 42 defined thereon, which flanges 42 are adapted to move under the overhanging-portion of the annular crown 16 and to engage the underside of said overhanging-portion of the crown 16 so as to resist separation of the coupling from the container.

While the flanges 42 are shown to be arcuate and of a specific length, it is to be understood that their length can be increased or decreased as desired, and their shape may also be varied within limits, and additional flanges 42 can be added at various points along the length of the coupling portions 38 to provide any desirable number of points of contact between the coupling and the crown 16 of the container. It will further be understood that when the coupling members 38 are swung away from each other the flanges 42 are moved outwardly beyond the overhanging-portions of the annular crown 16, and when in this condition the coupling may be separated from the container.

In addition to the foregoing structure, the coupling member also includes a washer, or annular member, 44 which has an internal diameter that is greater than the maximum diameter of the crown 16 so as to permit entrance of the crown through the annular member 44 when the coupling is being assembled onto the container 10. The annular member 44 is carried by the abutment member 30 in spaced relation thereto. This is accomplished by means of the pins 34 and a second set of pins 46 which interconnect the abutment member 30 and the annular member 44. Said pins 34 and 46 are so shaped as to define enlarged central portions 34' and 46' respectively thereon, which enlarged central portions serve as spacers between annular member 44 and abutment member 30. In the case of enlargement 34', said enlargement also serves as a journal surface upon which the jaw members 36 are pivoted. The pins 34 and 46 have turned over heads as shown in Figures 4 and 5 which serve to clamp the annular member 44 and abutment member 30 in spaced relation relative to each other.

The dimension of jaw member 36 is so selected that the coupling portions 38 thereof are sandwiched in the space between the annular member 44 and the abutment member 30 to permit of reciprocal swinging of the coupling portions 38 without any binding against either abutment member 30 or annular member 44.

The coupling portions 38 are normally biased in a direction toward each other by means of a compression spring 48 that is positioned between the control portions

40 of the jaw members 36. The spring 48 may be maintained in position, as shown, in any convenient way, such as by brazing or welding the ends thereof to the control portions 40. The control portions 40 of jaw members 36 are merely upwardly extending flanges which are adapted to be grasped by an individual, between thumb and forefinger, to be forced toward each other against the bias of spring 48, to effect swinging of the coupling portions 38 away from each other so as to effect a separation of the coupling from the container 10.

The coupling is also provided with stop means for limiting the swinging of the coupling members 38 both toward and away from each other. The first of these stop means is positioned for cooperation with the jaw members 36 for limiting movement of the coupling portions 38 toward each other. Said first stop means includes the enlarged portions 46' of the pins 46 which are positioned to be engaged by the reduced extended ends 50 of the coupling portions 38, in the manner as best seen in Figures 2 and 5. The abutment of the extended ends 50 of the coupling portions 38 against the enlarged portions 46' of pins 46 serves to limit the movement of the coupling portions 38 toward each other.

The second of said stop means comprises pins 52 which are carried by the jaw members 36 and which extend downwardly therefrom as shown in Figure 3, and which are positioned so as to abut against the annular member 44 to limit pivoting of the coupling portions 38 of the jaw members 36 away from each other.

In order to further insure a non-leak coupling between the gas appliance and the container 10 to which the gas appliance is connected, there is provided means for engaging a portion of the upwardly extending portion of the rubber seal 20 to form a sealing engagement therewith. These means include the centrally located annular member 54 carried by the tubular member 26 and which is so arranged as to engage an annular portion of the upwardly extending rubber seal 20 to effect a seal at the point of engagement, as is best seen in Figure 1.

The device of Figures 6-10

In Figures 6-10, there is shown a modified form of coupling. The container shown herein is similar to the container shown in Figures 1 and 2, and similar portions are designated by the same number with a prime mark (') added. Thus, there is shown in the device of Figures 6-10 a crown-type container, generally indicated at 10' having an upright cylindrical surface 12', a frusto-conical top portion 14', an annular groove, or bead 16' at the upper end of top portion 14', and a cup-shaped depressed central top portion 18'. The central top portion 18' carries a normally sealed but pierceable rubber seal 20' centrally thereof.

Depending from the rubber seal 20' is a tubular fuel conduit 22'. The rubber seal 20' extends upwardly above the central depressed wall 18'. The annular crown or bead 16' is so constructed and arranged as to overhang a part of the top portion 14', and so as to define an annular groove, or recess, 24' which opens outwardly. The foregoing construction is not novel. However, the details of construction of the container thus described are taken advantage of by the structure of the connector which will hereinafter be described.

Before describing the modified form of connector, it is to be noted that the connector herein is particularly for connecting fuel conduit means to a container which has liquefied petroleum gases therein. Such fuel conduit means preferably include a valve body member 26' which carries a fuel bleeding hollow needle 28' which needle is adapted to pierce the pierceable member 20' and extend downwardly into the fuel conduit 22' as shown. The valve body 26' carries a manually rotatable valve control member 27'. The valve body is internally recessed at 29' to a dimension slightly less than the dimension of the upper portion of seal member 20', so that when the

valve body is properly positioned on container 10', with the top portion 21' of seal 20' positioned within the annular valve body 26' as shown, then a gas-tight seal is effected between top portion 21' and valve body 26'. At the same time, there is some compression of top portion 21' which also serves to increase the sealing engagement between seal 20' and the outer wall of hollow needle 28' along the surface 21a.

The modified form of the coupling between the valve body 20' and the container 10' will now be described. As best seen in Figure 10, the coupling comprises six parts: an annular abutment, or frame, member 100, a pair of opposed jaw members 102, a pair of pivot pins 104 for connecting the jaw members to the frame member 100, and a spring member 106.

More specifically, the frame member 100 is generally cup-shaped and has a central depressed portion 108 which is of smaller dimension than the inner dimension of the container's bead 16'. This permits of insertion of the central depressed portion 108 through annular bead 16' and serves to position the connector centrally with respect to the container 10'. The central depressed portion 108 of the frame 100 merges into an annular laterally extending flange 110, and then terminates in a downwardly extending edge flange 112. The provision of the edge flange 112 serves to rigidify the entire frame member 100.

The jaw members 102 are pivotally secured on the frame member 100 by means of the rivets 104 which connect to the laterally extending flange 110 of said frame member. More specifically, the rivets 104 comprise a head portion 114, a journal, or shoulder, portion 116 of preselected axial length, and a connecting upset portion 118. The axial length of journal portion 116 is so selected with respect to the thickness of material of jaw members 102, that the jaw members may pivot without binding on the journal portion 116, after the rivets 104 are upset. The connecting, or upset, portions 118 of the rivets are countersunk in the lower side of the laterally extending flange 110, so as to provide a smooth connection, and to eliminate any interference between the rivets 104 and the bead 16' against which the flange 110 is adapted to abut.

Each jaw member 102 includes an arcuate coupling portion 120 and a control portion 122. The arcuate coupling portion is of generally channel-shaped cross section and is arranged so that the legs of the channel of one jaw member 102 extend toward the opposite jaw member 102. The upper leg 124 of the channel shaped coupling portion 120 is adapted to be connected to the laterally extending flange 110 of the frame member 100. The leg 124 is shaped to define an ear, or enlargement, 126 to accommodate the rivet 104. The upper leg 124 of the channel is thus arranged to overlie the laterally extending flange 110, as best seen in the figures.

The lower leg 126 of the channel-shaped portion 120 is adapted to move under the overhanging annular bead 16' and into the annular, outwardly-opening recess 24' so as to be positioned to engage the bead 16' to resist separation of the coupling from the container. The arcuate length of the lower leg 128 is less than the arcuate length of the upper leg 124 so as to provide for the necessary clearance between the bead 16' and the leg 128 to permit of assembly and disassembly of the coupling and the container.

The control portion 122 of each jaw member 102 extends outwardly relative to the frame member 100, as best seen in Figures 7, 8 and 10. The jaw members 102 are so arranged that the control portions 122 are disposed in opposing, spaced relation, and so that when said control portions 122 are moved toward each other, the coupling portions 120 are spread apart to afford disconnecting the coupling from the container.

The spring 106 is a compression spring and is generally W-shaped, as best seen in Figure 10. The spring

106 is disposed between the opposed control portions 122 so as to normally bias the control portions 122 apart, and to correspondingly bias the connecting portions 120 toward each other. The control portions 122 are so shaped as to define recesses 130 into which the terminal portions of the spring 106 are positioned. The walls of the recesses 130 cooperate with the spring 106 to assist in retaining the spring 106 in assembled relation with respect to said control portions 130.

It will further be seen that the construction of the modified form lends itself very easily to simple production, since the frame member 100 may be stamped from sheet metal, and similarly the two jaws members 102 may be stamped from sheet metal, and the spring 106 may be formed from sheet metal. By preforming the rivets 104 as hereinabove disclosed, it is very simple to connect the jaw members 102 to the frame member 100 without any binding of parts, and thus a very simplified form of connector has been provided. If necessary or desirable, the spring 106 can be further secured in position with respect to the control portions 130 by spot welding, or the like.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention and, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. A coupling for connection to a container having an annular bead which overhangs an outwardly opening annular groove; said coupling comprising a generally cup-shaped frame member having a central depressed portion which merges into an annular laterally extending flange and then terminates in a downwardly extending edge flange, said central depressed portion being of smaller dimension than the inner dimension of said annular bead, a pair of jaw members pivotally mounted on the annular laterally extending flange of said frame member for movement toward and away from each other, said jaw members being of generally channel-shaped cross section and arranged so that the legs of the channel of each jaw member extend toward the other jaw member, a portion of one leg of each channel overlying said laterally extending flange, and the other leg of the channel being adapted to move under said overhanging annular bead and to engage said bead to resist separation of the coupling from the container.

2. A coupling for connection to a container having an annular bead which overhangs an outwardly opening annular groove; said coupling comprising a generally cup-shaped frame member having a central depressed portion which merges into an annular laterally extending flange and then terminates in a downwardly extending edge flange, said central depressed portion being of smaller dimension than the inner dimension of said annular bead, a pair of jaw members pivotally mounted on the annular laterally extending flange of said frame member for movement toward and away from each other, said jaw members being of generally channel-shaped cross section and being arranged so that the legs of the channel of each jaw member extend toward the other jaw member, a portion of one leg of each channel overlying said laterally extending flange, the other leg of the channel being adapted to move under said overhanging annular bead and to engage said bead to resist separation of the coupling from the container, resilient means engaging said jaw members and normally biasing said jaw members toward each other, and manually engageable means carried by said jaw members for actuating jaw members to move same apart to permit separating the coupling from the container.

3. A coupling for connection to a container having an annular bead which overhangs an outwardly opening an-

nular groove; said coupling comprising a generally cup-shaped frame member having a central depressed portion which merges into an annular laterally extending flange and then terminates in a downwardly extending edge flange, said central depressed portion being of smaller dimension than the inner dimension of said annular bead, a pair of jaw members pivotally mounted on the annular laterally extending flange of said frame member for movement toward and away from each other, said jaw members being of generally channel-shaped cross section and being arranged so that the legs of the channel of each jaw member extend toward the other jaw member, a portion of one leg of each channel overlying said laterally extending flange, the other leg of the channel being adapted to move under said overhanging annular bead and to engage said bead to resist separation of the coupling from the container, a control member carried by each jaw member and extending outwardly relative to the frame member, said control members being arranged in opposing, spaced relation so that when they are moved toward each other the jaw members are spread apart to afford disconnecting the coupling from the container, and a compression spring disposed between said control members and normally biasing said control members apart.

4. A coupling for connection to a container having an annular bead which overhangs an outwardly opening annular groove; said coupling comprising a generally cup-shaped frame member having a central depressed portion which merges into an annular laterally extending flange and then terminates in a downwardly extending edge flange, said central depressed portion being of smaller dimension than the inner dimension of said annular bead, a pair of jaw members pivotally mounted on the annular

laterally extending flange of said frame member for movement toward and away from each other, said jaw members being of generally channel-shaped cross section and being arranged so that the legs of the channel of each jaw member extend toward the other jaw member, a portion of one leg of each channel overlying said laterally extending flange, the other leg of the channel being adapted to move under said overhanging annular bead and to engage said bead to resist separation of the coupling from the container, a control member carried by each jaw member and extending outwardly relative to the frame member, said control members being arranged in opposing, spaced relation so that when they are moved toward each other the jaw members are spread apart to afford disconnecting the coupling from the container, and a compression spring disposed between said control members and normally biasing said control members apart, and said control members having recessed portions into which portions of said spring are positioned to assist in retaining said spring in assembled relation to said control members.

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