Jan. 29, 1957 D. E. HOUGHTON 2,779,616

CAM CLOSURE

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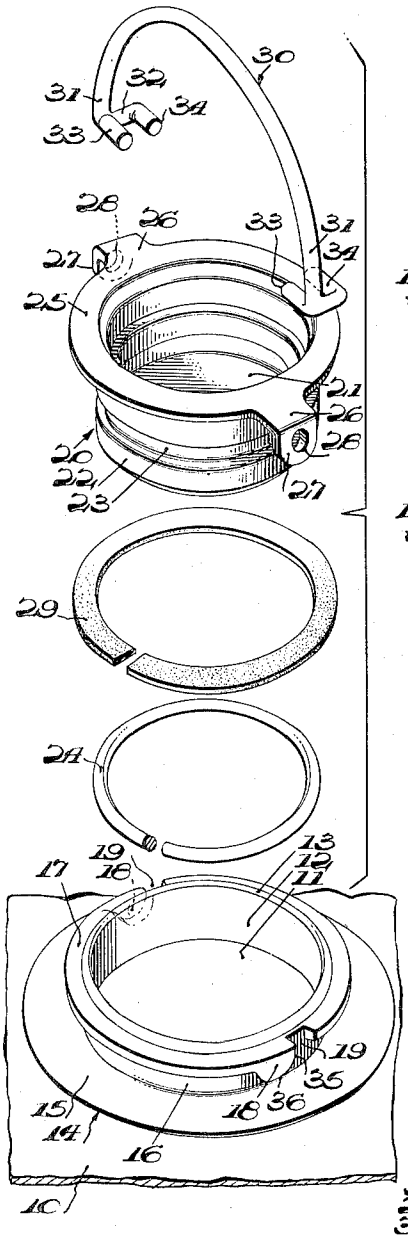


FIG. 1.

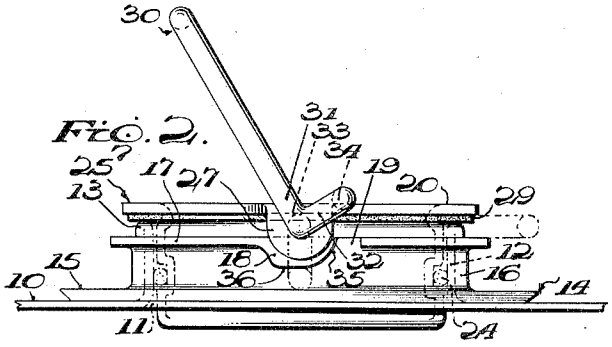


FIG. 2.

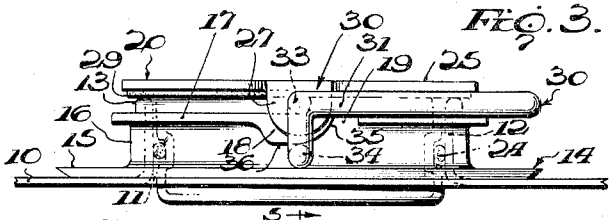


FIG. 3.

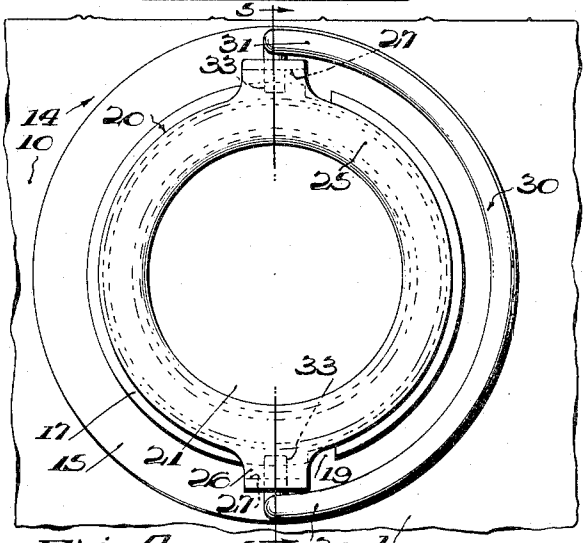


FIG. 4.

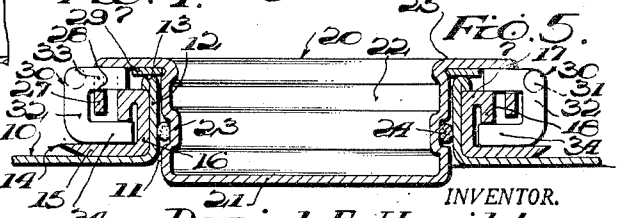


FIG. 5.

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CAM CLOSURE

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5 Claims. (Cl. 292—241)

My invention relates to cam closures for containers of the type wherein means carried by a closure is engageable with means carried by the container upon relative movement of said means whereby to cam the closure into sealed engagement with the container. Specifically, the invention contemplates improvements in the closures of the type disclosed in the U. S. patents to Gardes, No. 2,364,206, dated December 5, 1944 and Grice, No. 2,365,695, dated December 26, 1944.

In those and analogous closures, sheet metal bails are pivoted to the closures and have side flanges formed with inwardly directed cams for engaging fixed cam lugs on the container. Such sheet metal bails and their necessary appurtenances aforesaid are relatively elaborate and must be fabricated by relatively elaborate tools whereby they are more expensive than is warranted by the type of closure in question.

With the foregoing in view, it is an object of the invention to provide an improved cam closure wherein the cams are fixed and are engaged by swinging cam lugs.

A further object is to provide in such a structure, a wire bail having a pair of inwardly directed studs pivotally connecting it to the container or to the closure and a second pair of inwardly directed studs comprising cam lugs which operatively engage or disengage fixed cams carried by either the closure or the container.

Other objects and advantages reside in the particular structure of the invention, the structure of the several elements thereof, combinations and subcombinations of such elements, all of which will be readily apparent to those skilled in the art upon reference to the attached drawing in connection with the following specification wherein the invention is shown, described, and claimed.

In the drawing:

Fig. 1 is an exploded perspective view of a closure according to the invention together with that portion of the container to which it is applied;

Fig. 2 is a side elevational view showing the parts in the released position;

Fig. 3 is a like view showing the parts in the container sealing position;

Fig. 4 is a plan view of the closure in the position of Fig. 3; and

Fig. 5 is a transverse sectional view taken substantially on the plane of the line 5—5 of Fig. 4.

Referring specifically to the drawings, wherein like reference characters designate like parts in all views, **10** designates a wall of a container having an opening **11** formed therethrough which is defined by an upstanding neck **12**, the upper edge of which is formed to provide a bead **13** which fixedly clamps a sput **14** about the neck **12**. The sput **14** includes the usual horizontal flange **15** flatly seating atop the wall **10** and an upstanding neck **16** which embraces the container neck **12** below the bead **13**. The upper edge of the neck **16** is outwardly directed to provide an upper flange **17**. Oppositely disposed portions of the flange **17** are formed to provide downwardly extending fixed cams **18** which may be radially outwardly

spaced from the neck **16**. The flange **17** is cut away as at **19** immediately adjacent the cams **18** to provide access thereto.

The closure according to the invention is generally indicated at **20** and is a plug which may be cup shaped in configuration to provide a floor **21** and a cylindrical side wall **22**. The side wall **22** may be formed with an external peripheral groove **23** which is oversized in vertical directions with respect to an O-ring **24** seated therein for relative vertical movement. The upper edge of the side wall **22** is radially outwardly directed to provide an annular flange **25**. Opposite portions of the flange **25** are radially extended as at **26** and then downwardly directed to provide bail ears **27** which are formed with circular holes **28** therethrough. Any suitable sealing gasket **29** is secured to the underside of the flange **25**.

The operating device for the closure **20** comprises a bail **30** which includes substantially parallel opposite ends providing legs **31** terminating in angularly directed feet **32** which are coplanar with at least said legs **31**. Radially inwardly directed studs **33** are integral with said bail **30** and may be conveniently located at the intersections of the legs **31** with the feet **32**. The feet **32** are formed with radially inwardly directed and aligned free ends providing cam lug studs **34** which are preferably disposed in parallel offset relation to the aligned studs **33** aforesaid. Such studs **34** preferably are of circular cross section as shown.

In operation, and as best seen in Figs. 2, 3, and 5, the aligned studs **33** are pivotally seated in the holes **28** of the bail ears **27** of the closure **20**. The feet **32** extend unidirectionally along the outer surfaces of the bail ears **27** so that the cam lug studs **34** are located beyond the edges of the bail ears. The plug or closure **20** is inserted in the neck **12** so that the bail ears **27** are radially outwardly aligned with the cams **18**. In this position and with the parts in the unseated position of Fig. 2 with bail **30** elevated, the aligned free ends or cam lug studs **34** may be passed through the openings **19** formed in the sput flange **17** aforesaid upon swinging of the bail **30** downwardly in a clockwise direction as indicated in broken lines in Fig. 2. This operation causes the cam lugs **34** to engage the cam surfaces **35** of the cams **18** and continued movement in a clockwise direction seats the cam lugs on the dwell portions **36** of the cams **18**. This operation has seated plug **20** and has also drawn the gasket **29** into sealed engagement with the bead **13** as clearly illustrated in Figs. 3 and 5.

The O-ring **24** functions in a well known manner in its groove **33** in that it moves vertically and is distorted into sealing engagement with the joints upon fluctuations of pressure within the container in a well known manner. This structure forms no part of the invention and may be omitted if desired.

While I have shown and described what is now thought to be a preferred embodiment of the invention it should be remembered that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. A cam closure for a container including a container opening and at least two fixed cams on opposite sides of said opening, comprising a plug adapted to fit in said container opening, an annular flange extending radially outwardly of said plug, diametrically opposite portions of said flange being formed with radially outwardly directed extensions, said extensions terminating in downwardly directed bail ears disposed in radially outwardly spaced relation to said plug, a wire bail including a pair of radially inwardly directed and aligned studs pivotally connected to said bail ears, and said

bail including a second pair of radially inwardly directed studs in offset parallel relation to said first pair of studs, said second pair of studs being disposed radially outwardly of said bail ears and having free ends disposed adjacent said plug, and said free ends providing cam lugs adapted to engage said fixed cams on said container.

2. A cam closure for a container including a container opening and at least two fixed cams on opposite sides of said opening, comprising a plug adapted to fit in said container opening, an annular flange extending radially outwardly of said plug, diametrically opposite portions of said flange being formed with radially outwardly directed extensions, said extensions terminating in downwardly directed bail ears disposed in radially outwardly spaced relation to said plug, a wire bail, said bail having substantially parallel end portions providing legs, a foot extendng angularly of each leg in flatly overlying relation to the adajcent bail ear, a pair of radially inwardly directed and aligned studs on said bail, there being a stud at the intersection of each foot and leg, a recess formed in each bail ear pivotally receiving a stud therein whereby to provide a pivotal connection between said bail and closure, said feet extending unidirectionally beyond said bail ears in parallel coplanar relation, said feet having radially inwardly directed free ends providing cam lugs disposed adjacent said plug, and said lugs being adapted to engage said fixed cams on said container.

3. A cam closure for a container, comprising a plug adapted to fit in a container opening, an annular flange extending radially outwardly of said plug, diametrically opposite portions of said flange being formed with radially outwardly directed extensions, said extensions terminating in downwardly directed bail ears disposed in radially outwardly spaced relation to said plug, a wire bail, said bail having substantially parallel end portions providing legs, a foot extending angularly of each leg in flatly overlying relation to the adjacent bail ear, a pair of radially inwardly directed and aligned studs on said bail, there being a stud at the intersection of each foot and leg, a recess formed in each bail ear pivotally receiving a stud therein whereby to provide a pivotal connection between said bail and closure, said feet extending unidirectionally beyond said bail ears in parallel coplanar relation, said feet having radially inwardly directed free ends providing cam lugs disposed adjacent said plug, a container neck defining an opening and having a radially outwardly directed annular neck flange, said neck flange being formed with oppositely disposed cams depending therefrom in radially outwardly spaced relation to said neck, said neck flange being formed with

slots therethrough in juxtaposed relation to like sides of said cams, and said cam lugs of said closure upon pivotal movement of said bail being located to pass through said slots into and out of operative engagement with said cams when said plug is seated in said neck with said bail ears radially aligned with said cams.

4. A cam closure for a container including a container opening and at least two fixed cams on opposite sides of said opening, comprising a plug adapted to fit in said container opening, said plug including a pair of diametrically opposite extensions radially outwardly thereof, said extensions including downwardly directed free ends formed to provide bail ears located in radially outwardly spaced relation to said plug, a wire bail including a pair of radially inwardly directed and aligned studs pivotally connected to said bail ears, and said bail including a second pair of radially inwardly directed studs in offset parallel relation to said first pair of studs, said second pair of studs being disposed radially outwardly of said bail ears and having free ends disposed adjacent said plug, and said free ends providing cam lugs adapted to engage said fixed cams on said container.

5. A cam closure for a container, comprising a plug adapted to fit in a container opening, said plug including a pair of diametrically opposite extensions projecting radially outwardly thereof, said extensions including downwardly directed free ends formed to provide bail ears located in radially outwardly spaced relation to said plug, a wire bail pivoted in said bail ears, a pair of cam lugs on said bail below said bail ears and extending radially inwardly thereof, of a container neck defining an opening and having a radially outwardly directed annular neck flange, said neck flange being formed with oppositely disposed cams depending therefrom, said neck flange being formed with slots therethrough in juxtaposed relation to like sides of said cams, and said cam lugs of said closure upon pivotal movement of said bail located to pass through said slots into and out of operative engagement with said cams when said plug is seated in said neck with said bail ears radially aligned with said cams.

References Cited in the file of this patent

UNITED STATES PATENTS

554,448	Keil	Feb. 11, 1896
1,108,765	Lawless	Aug. 25, 1914
1,755,015	Muller	Apr. 15, 1930
2,360,351	Kuhne	Oct. 17, 1944
2,572,629	Kolell	Oct. 23, 1951

FOREIGN PATENTS

2,458	Great Britain	1882