Oct. 6, 1964 G. EFFNER 3,151,903

LID-LOCK FOR PRESSURE VESSELS

Filed July 28, 1961

Fig. 1

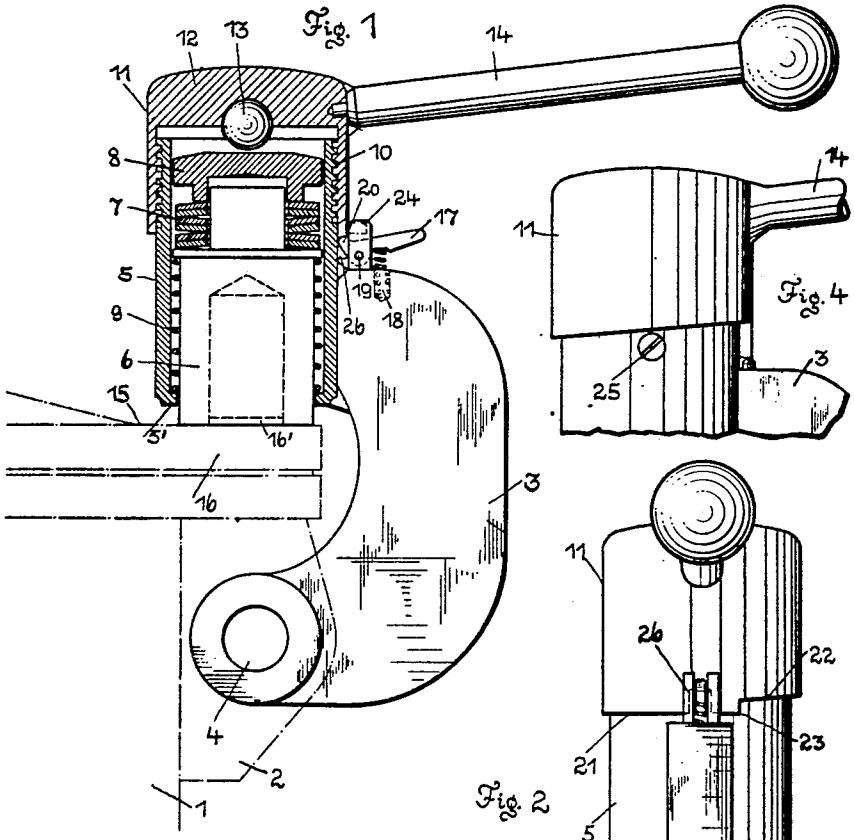


Fig. 4

Fig. 2

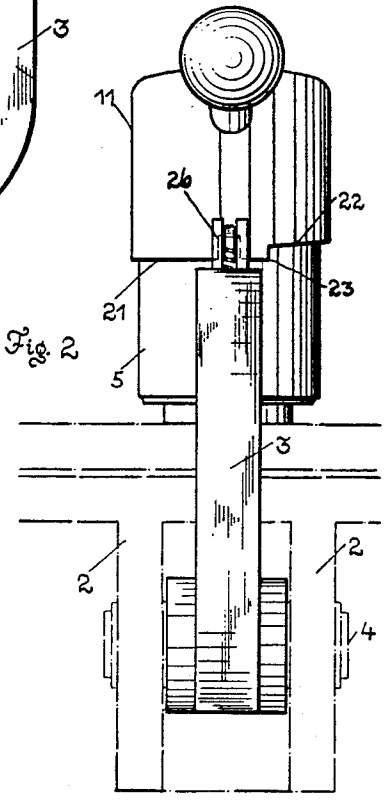
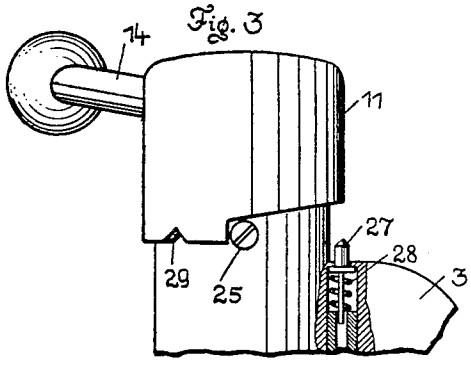


Fig. 3



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LID-LOCK FOR PRESSURE VESSELS

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4 Claims. (Cl. 292—256.75)

The invention relates to a lid-lock for pressure vessels in the form of a hinged stirrup supporting in it a pressure device for forcing the lid on, characterised in that the pressure device takes the form of a screwed sleeve fitted with a hand lever and engaging in a thread on a guide sleeve, the first-named sleeve covering the guide sleeve after the manner of a cap and being limited by abutments to less than one complete revolution of screwed movement, and in that a buffer pressing against the lid and a spring column consisting of spring washers are guided in the guide sleeves, the said column being arranged between the buffer and the screwed sleeve.

The special advantages of the invention reside among other things in that the individual members of such a lid-lock, which can also be called a quick-acting closure, are of conveniently handled design and easy and quick to operate. In addition, various operational requirements of the pressure vessel, for example changes in length of the closure elements, are complied with. There is always sufficient sealing pressure, the quick-acting closure is self-holding, visual checking is possible, and there is no fear of so-called setting of the spring column under continuous heavy loading. In the invention, the screwed sleeve furthermore protects the individual components of the lid-lock from the effects of weather inside the guide sleeve. The lid-lock can thus also be used with pressure vessels, dome-type lids etc. fitted up in the open or carried on a vehicle, for example. No dirt can penetrate between the individual components, and satisfactory functioning and long life are ensured even under severe operating conditions.

Relatively high closure pressure can be applied with the lid-lock according to the invention, since the hand lever pivots through a relatively wide range, without the possibility of visual checking being lost, as in the case of screw closures of known design.

Two constructional examples of the invention are illustrated in the drawing.

FIGURE 1 shows a lateral elevation of the hinged stirrup, with a section through the screwed sleeve and the guide sleeve,

FIGURE 2 shows another lateral elevation of the device shown in FIGURE 1,

FIGURE 3 shows a modified constructional example of the invention in the open position, and

FIGURE 4 shows the device shown in FIGURE 3 in another operating position.

The hinged stirrup 3 is pivotably supported in known manner with the aid of two lugs 2 fitted to the container 1 and a pin 4. A cylindrical guide sleeve 5, which receives a buffer 6, a spring column consisting of spring washers 7 and a pressure-plate 8, is arranged on the hinged stirrup 3. The buffer 6 bears via the return spring 9 against the shoulder 5' at the lower end of the guide sleeve 5.

The guide sleeve 5 has an external thread 10 on to which the screwed sleeve 11 is screwed. As a result, the screwed sleeve covers the guide sleeve after the manner of a cap. A reversed thread arrangement is in itself conceivable, but would additionally require a hood-like component on the screwed sleeve to prevent dirt from reaching the gap between the screwed sleeve and the guide sleeve.

A thrust ball 13 is inserted into the crown 12 of the screwed sleeve 11, and when the latter is screwed on to the guide sleeve 5 by means of the hand lever 14 the thrust ball 13 exerts a thrust on the buffer 6 via the pressure-plate 8 and the spring column 7, and the buffer 6 presses against the top 15 of the lid 16. The stud 16' on the lid 16 prevents the buffer 6 from slipping off.

A latch 17, acted on by the spring 18 let into the hinged stirrup 3, is supported on the latter, and can be rotated about the articulation 19. The screwed sleeve 11 comprises a groove 26, and in the closed position the projection 20 on the latch 17 engages in this groove and secures the screwed sleeve 11. The latch 17 can be pushed down and thereby released, with the result that the screwed sleeve 11 can be unfastened again.

The lower edge 21 of the screwed sleeve 11 is bevelled at 22 to correspond to the pitch of the thread 10, and stepped at 23, so that an abutment is formed for a pin indicated in dash-dotted line at 24 in FIGURE 1, or for a screw 25 (FIGURES 3 and 4). The pin 24 or the screw 25 limits the open position of the lid-lock. The pin 24 with the associated step 23 on the one hand and the latch 17 with the groove 26 on the other hand are so arranged with respect to one another that the screwed sleeve 11 can make less than one complete revolution of screwed movement. In the variant shown in FIGURES 3 and 4, the latch 17 in the constructional example shown in FIGURES 1 and 2 is replaced by a spring-loaded pin 27 pushed upwards by the spring 28. This pin 27 engages in the cut-away 29 in the screwed sleeve 11 when the lid-lock is in the position in which pressure is applied. Suitable mutual adaptation of the thread pitch and the position of the pin 27 and the cut-away 29 provides a simple means of preventing further tightening after the pin 27 has engaged in the cutaway 29, but enabling reverse movement to take place after the safety hold has been overcome.

The invention can be used not only with vessels in which there is relatively heavy internal pressure, but also with vessels with only slight internal pressure, or even with vessels and containers with sensitive or corrosive contents, in the case of which secure closure by means of relatively heavy closure pressure is necessary or expedient.

I claim:

1. A lid-lock for pressure vessels in the form of a hinged stirrup supporting in it a pressure device for forcing the lid on, said pressure device including a screwed sleeves fitted with a hand lever and engaging in a thread on a guide sleeve, said screwed sleeve covering the guide sleeve to form a cap thereover and being limited by abutments to less than one complete revolution of screwed sleeve fitted with a hand lever and engaging in a spring column consisting of spring washers guided in the guide sleeve, said column being arranged between the buffer and the screwed sleeve, a central thrust ball disposed between the crown of the screwed sleeve and a pressure plate disposed above the spring column.

2. A lid-lock for pressure vessels in the form of a hinged stirrup supporting in it a pressure device for forcing the lid on, said pressure device including a screwed sleeve fitted with a hand lever and engaging in a thread on a guide sleeve, said screwed sleeve covering the guide sleeve to form a cap thereover and being limited by abutments to less than one complete revolution of screwed movement, a buffer pressing against the lid and a spring column consisting of spring washers guided in the guide sleeve, said column being arranged between the buffer and the screwed sleeve, said abutment which limits the position in which pressure is applied including a safety latch engaged under spring pressure.

3. In a lid-lock for pressure vessels, a stirrup adapted

to be hingedly mounted on the vessel and supporting a pressure means for co-action with the lid, said pressure means including a first sleeve having open ends and a screw-threaded portion, a second sleeve having a closed end and a screw-threaded portion engageable with the threaded portion of the first sleeve with the closed end closing one open end of the first sleeve, a hand lever operably attached to said second sleeve for turning the same, abutment means for limiting movement of the second sleeve relative to the first sleeve to less than one full revolution of threaded movement, buffer means within said first sleeve for pressing against the lid, and a plurality of spring washers located within said first sleeve between the closed end of the second sleeve and the buffer means for applying pressure to said buffer means.

4. The lid-lock as claimed it claim 3, in which the threaded portion of said first sleeve is an external thread and that of the second sleeve an internal thread.

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