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 [21] Appl. No. **42,819**
 [22] Filed **June 2, 1970**
 [45] Patented **Jan. 11, 1972**
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Essen, Germany
 [32] Priority **June 3, 1969**
 [33] **Germany**
 [31] **P 19 28 217.8**

[56]

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[54] **LID FOR HIGH-PRESSURE CONTAINERS**
3 Claims, 8 Drawing Figs.

[52] U.S. Cl..... **220/46 MS,**
220/3, 220/55 R

[51] Int. Cl..... **B65d 53/00**

[50] Field of Search..... **220/46, 55**
R, 3

ABSTRACT: A cover closing system for high-pressure containers which comprises a cover adapted to be introduced into a cylindrical container head and to be locked thereto, and also comprises a plurality of rotatable bolts distributed over the circumference of said cover and provided with semiannular teeth for selective locking engagement with corresponding grooves in said container and said cover respectively.

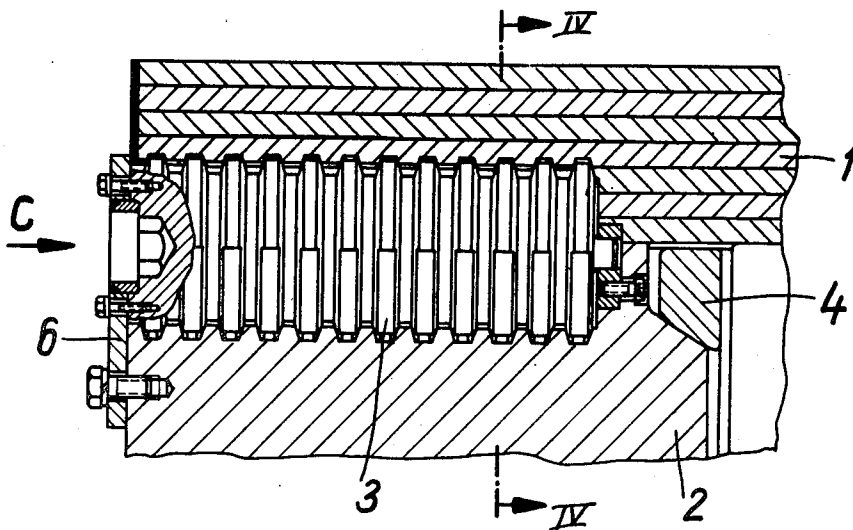


FIG. 1

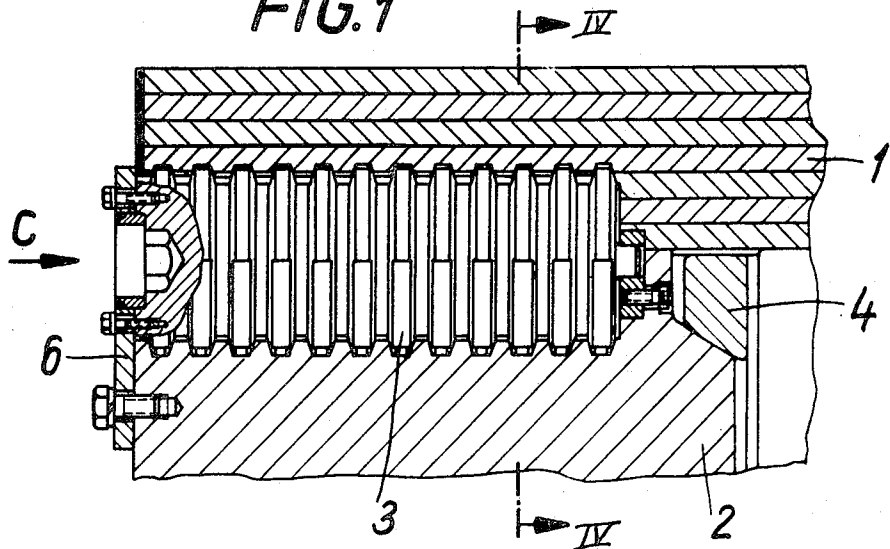


FIG. 2

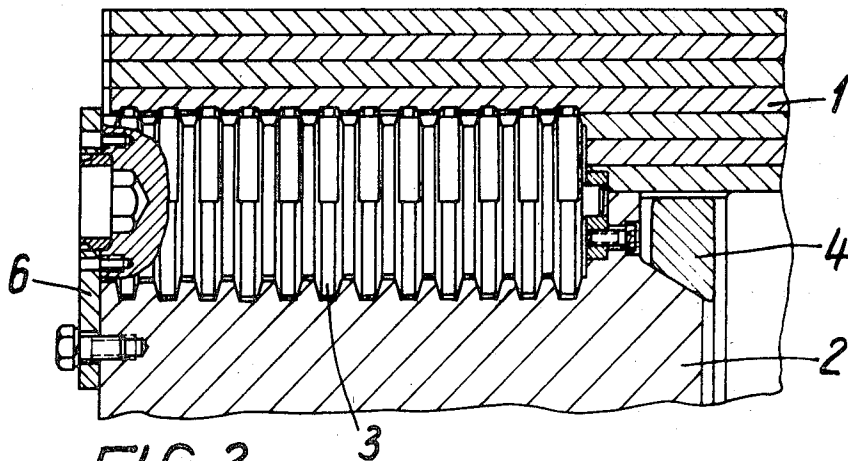
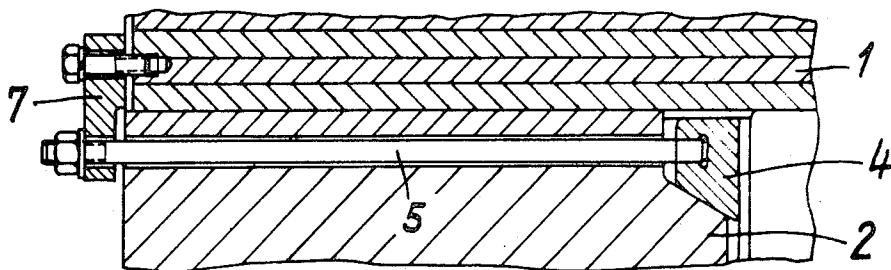


FIG. 3



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FIG. 4

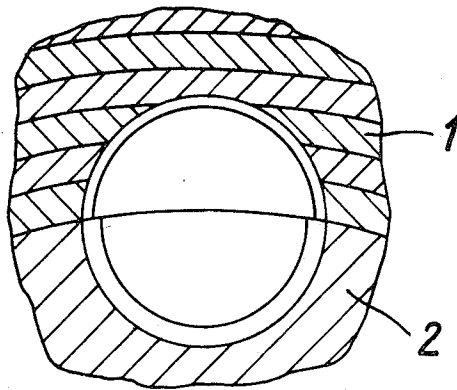


FIG. 5

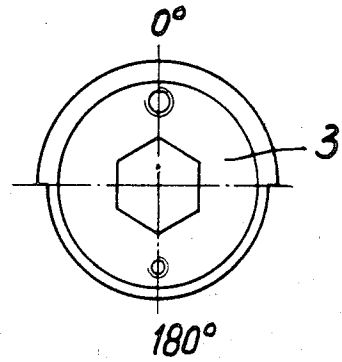
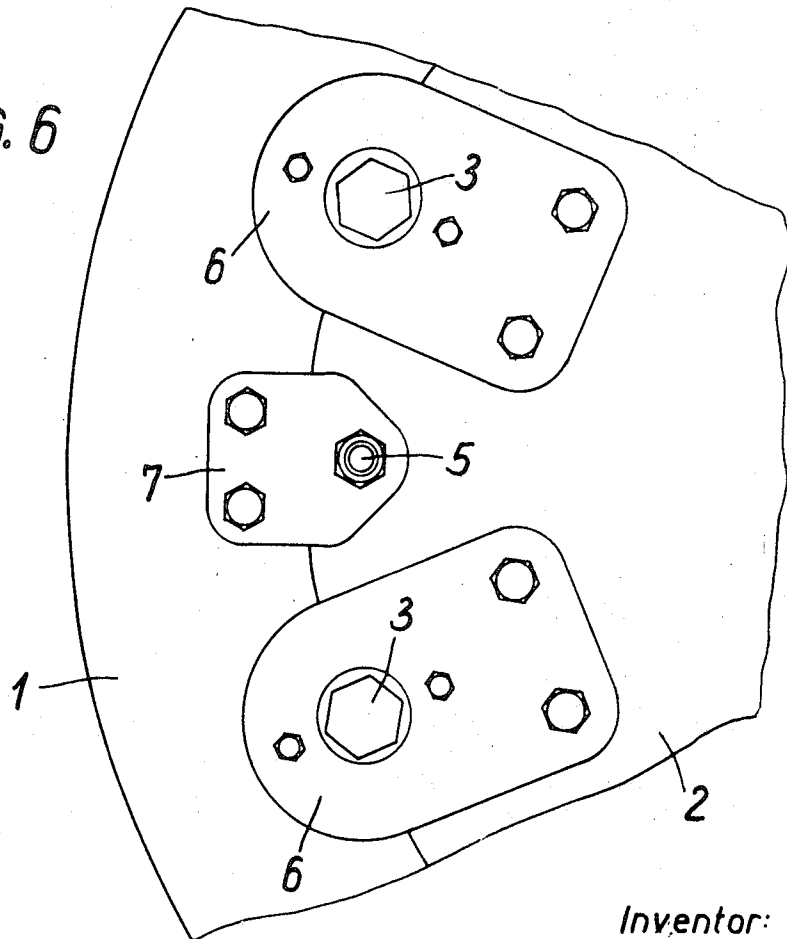


FIG. 6



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FIG. 7

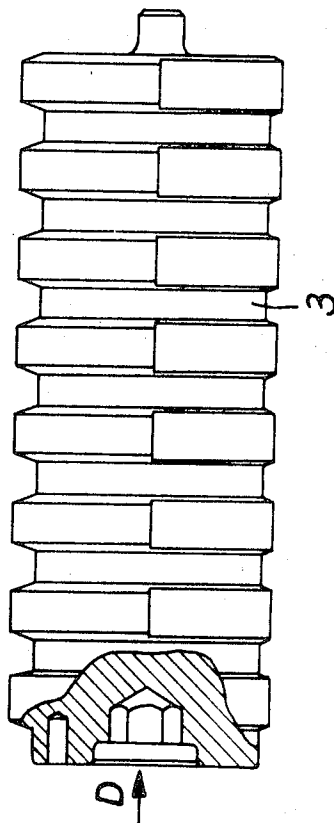
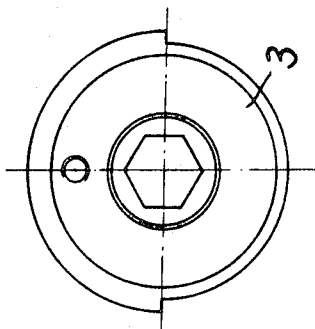


FIG. 8



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LID FOR HIGH-PRESSURE CONTAINERS

The present invention relates to a lid or cover locking device for high pressure containers with a lid or cover which is adapted to be introduced into a cylindrical container head and to be latched thereto.

Heretofore known lid or cover locking devices of the above mentioned type, for instance the so-called Uhde-Bredtschneider locking device as disclosed in the VDI-Periodical 104 (1962), page 479, are relatively difficult to install and to remove.

It is, therefore, an object of the present invention to provide a lid or cover closing or locking device which can be installed and removed in a considerably simpler manner than heretofore possible and in which the essential elements, when closing devices with different cover diameters are involved, do not have to be replaced by elements of different size but only by a different number of elements.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIGS. 1 and 2 respectively are longitudinal sections through a segment bolt according to the invention in its locked position and in its installed position when it is turned by 180° relative to its locked position.

FIG. 3 shows in section the pretensioning device for the metallic sealing ring.

FIG. 4 illustrates on a somewhat larger scale than FIG. 1 a section taken along the line IV—IV of FIG. 1 while the segment bolt has been omitted.

FIG. 5 illustrates an individual segment bolt as seen in the direction of the arrow C of FIG. 1.

FIG. 6 illustrates a portion of an installed closing device as seen in the direction of the arrow C of FIG. 1.

FIG. 7 shows a segment bolt by itself.

FIG. 8 shows the bolt of FIG. 7 as seen in the direction of arrow D.

The cover or lid closing device for high pressure containers according to the present invention is characterized primarily in that a plurality of bolts distributed over the circumference of the cover are rotatably arranged and have one half of their circumference extend into corresponding semicylindrical recesses in the cover and in the container head, the bolts being so designed that in a certain positions of rotation they will lock the cover to the container head.

According to a further development of the invention, the bolts are provided with annular teeth having a different height over their circumference. These teeth engage corresponding semiannular grooves of likewise different height in the recesses on the cover and on the container head. Such segment bolts have, after the lid or cover has been put on the container, only to be turned by a certain angle, for instance 180°, in order to lock the cover to the container head. A self-locking closing device can be realized by providing in a conical recess at the edge of the inner end face of the cover a metallic sealing ring with a cylindrical outer surface and a conical inner surface. This metallic sealing ring may, after the cover has been locked, be pulled against the conical recess and the cylindrical wall of the container head by means of pretensioning screws extending through the cover for purposes of presealing the

closing device.

This presealing operation by means of the pretensioning screws may be facilitated by interposing thin metallic foils which will plastically deform in response to the tightening of the screws. When employing the inner pressure, in operation, the metallic sealing ring is loaded to such an extent that it will sealingly engage the conical recess in the inner end face of the cover and also the cylindrical wall of the container head whereupon the pretensioning screws can be loosened again.

Referring now to the drawings, these drawings illustrate an embodiment of the closing device according to the present invention for a multilayer container with eight segment bolts evenly distributed over the circumference of the cover. More specifically, the arrangement shown in the drawings comprises a container head 1 closed by a lid or cover 2 by means of segment bolts 3. A metallic sealing ring 4 is interposed between the container head 1 and the cover 2. The arrangement shown in the drawings furthermore comprises pretensioning screws 5 and plates 6, 7 for respectively rotatably connecting the segment bolts 3 to the cover and the pretensioning screws 5 to the container head.

As will be evident from the above, in addition to the advantages of permitting a fast and simple installation and removal of the cover, the present invention also yields the advantage that standardized closure parts can be used and a reduced flange reinforcement on the container head will suffice so that a corresponding saving in material and weight will be realized. The metallic sealing ring is in view of its cylindrical outer surface prevented from jamming or tilting.

It is, of course, to be understood that the present invention is, by no means, limited to the particular construction shown in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. In a combination with a high pressure container having a cylindrical opening, a cover inserted into said opening for closing the same and having its peripheral surface provided with semicylindrical first recesses, said pressure container having its inner periphery within the region of said opening provided with semicylindrical second recesses, and a plurality of bolts distributed over the circumference of said cover and circumferentially provided with means operable in response to turning about their axes to engage said first and second recesses so as to interlock said cover and said container.

2. The combination according to claim 1, in which the circumferentially provided means of said bolts form annular teeth having circumferential sections of different height, and in which said first and second recesses form semiannular grooves having circumferential sections of different height corresponding to and for engagement with said annular teeth of the respective bolt.

3. The combination according to claim 1, in which the inner end portion of said cover is provided with a conical circumferential area, and which includes metallic sealing ring means having a cylindrical outer surface and a conical inner surface corresponding to and for engagement with said conical circumferential area, and pretensioning screw means extending from the outside of said cover through the latter and operable to engage said sealing ring means for pulling said sealing ring means into sealing position.

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