Nov. 29, 1932. H. LANGE 1,889,606

COVER CLOSING FOR STEAM BARRELS, HEATING BOILERS, AND THE LIKE

Filed April 24, 1931

Fig. 1.

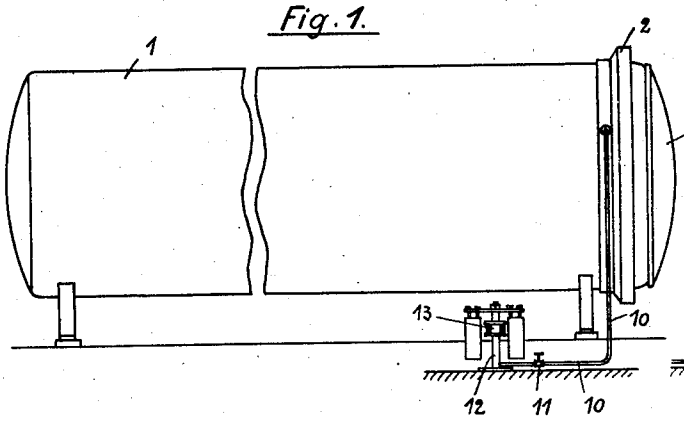


Fig. 2.

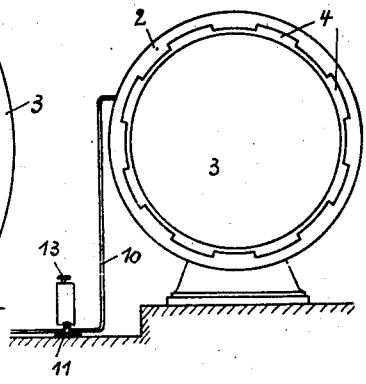


Fig. 3.

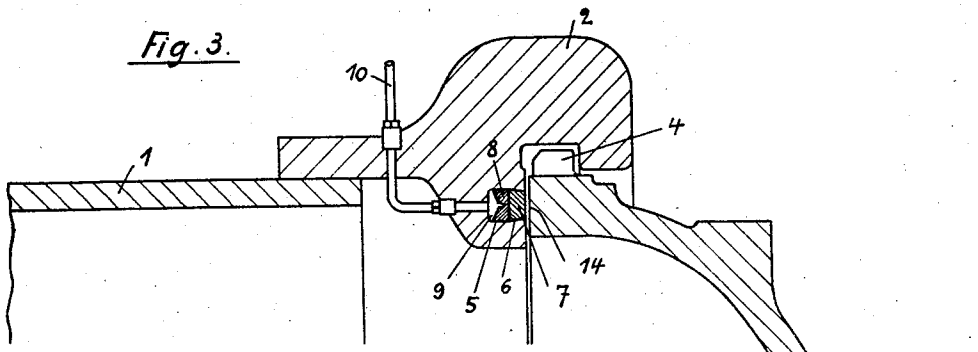
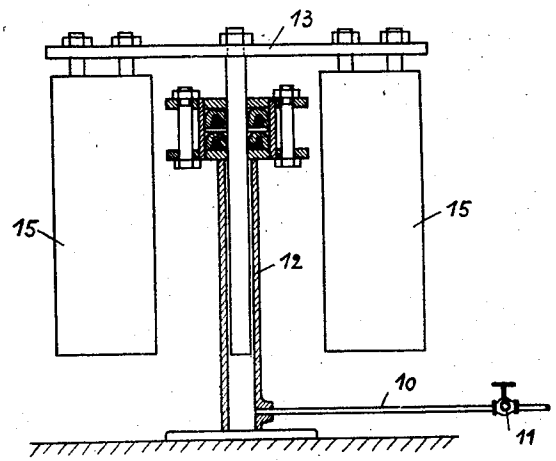


Fig. 4.



Inventor:

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UNITED STATES PATENT OFFICE

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COVER CLOSING FOR STEAM BARRELS, HEATING BOILERS, AND THE LIKE

Application filed April 24, 1931, Serial No. 532,605, and in Germany September 10, 1929.

It is a known fact that with steam barrels and heating boilers adapted for the reception of material of any kind to be set under pressure above atmospheric or below atmosphere, packing of the closing cover presents difficulties. As, after a determinate duration of time, the material contained in the boiler, has to be removed therefrom and fresh material to be introduced thereinto, it is necessary to have the cover closing constructed so as to allow quick opening and closing of said boiler, and to realize at the same time a perfect packing thereof.

It is known, too, to have the cover closing constructed so that, by the interposition of an elastic ring, the packing ring proper becomes placed into a circular groove provided in the boiler collar, the said elastic ring being then held pressed against the jointing surface owing to the action of fluid pressure. One embodiment of that known type may in this respect be particularly referred to, this embodiment consisting in the elastic ring being composed of a thin walled metal diaphragm of tubular shape, the said diaphragm having the property to dilate under the action of the pressure means admitted, the latter causing the packing ring proper to be pressed against the surface to be tightened. However, this known arrangement has the disadvantage, and exposes to risk, that the tubular shaped packing body unable to withstand the pressure of the pressure means admitted, becomes demolished so that the object in view is of course not attained, unless the said tube being made thick walled; but in this case, the adaptation of the packing ring proper is rendered laborious owing to the ring changing in shape when applied. With reference to that known arrangement, it is, however, to be pointed out that the packing ring proper, in consequence of its composition of material, is not at all adapted for use in connection with steam barrels and heating boilers, owing to high temperatures taking place here.

In accordance with this invention, the said packing ring is to be made of heatproof material, such as for instance asbestos, and the ring to be interposed, is to be formed in the shape of a cup ring of known type. The said cup ring on the pressure being increased, will be all the better pressed against the said packing ring and the wall to be tightened, without causing destruction of its material. Furthermore, the manufacture of the packing ring of heatproof material has the advantage of opposing much greater resistance to influences caused by vapours or the like, and by their temperatures.

My invention will be more fully described hereinafter with reference to the accompanying drawing, in which the same is illustrated as embodied in a convenient and practical form, and in which:—

Figure 1 is a side elevation of the steam barrel;

Figure 2 is a front elevation thereof;

Figure 3 is an enlarged scale, a cross-section through the cover closing; and

Figure 4 shows the weighted accumulator.

The boiler designated by the reference numeral 1, is fitted with a collar 2 in which the closing cover 3 is secured and fastened by means of a bayonet-catch, as at 4. In the said collar 2, there is formed a circular groove 5 which in the direction of the cover, is made of somewhat conical shape. This conically shaped portion 6 of said groove 5, is adapted for the reception of a ring 7 made of asbestos, the said ring being designed for packing purposes between said collar 2 and said closing cover 3. In rearward position to said ring of asbestos 7, there is arranged a cup ring 8, preferably made of rubber, and in rearward position to the latter, the groove 5 is formed to a hollow space 9 filled with water. The said hollow space is by means of the tubing 10, connected to the cylinder 12 of the accumulator 13, the said tubing being fitted with a stop valve 11 and the said accumulator being provided with two weights 15.

The manner of operation of my invention is as follows:—

The material which is to be treated, is placed within the boiler 1 and the cover 3 inserted into the collar 2, the said cover being fastened by means of the bayonet-catch 4. Now, the stop valve 11 is opened so as to have

the water contained in the tubing 10 and the hollow space 9 respectively, set under the pressure of the weighted accumulator. The water forces both packing rings 7 and 8 against the walls of the groove as well as against the jointing surface 14 of the cover 3, thus causing a perfect tightening of the latter. When this tightening has been accomplished, steam is then blown in, or air is drawn off, in the case of the objects to be treated having to be set under pressure below atmosphere. During the heating process within the steam barrel, the water under pressure contained in the space 9, is heated and expands. The pressure above atmospheric resulting from this expansion, is retained within the accumulator, of which the weights 15 are raised accordingly. The water under pressure is by means of said accumulator held at constant level, this level suitably corresponding to twice the pressure within the steam barrel.

Before discharging the barrel, the valve 11 is closed and the pressure stored up in the accumulator, retained so as to allow to make use thereof on the next charging of the barrel.

On the rubber ring 8 falls still the duty to prevent water under pressure from entering the boiler.

What I claim is:—

A cover closing for steam barrels, heating boilers, and the like, in combination with the packing ring proper and an interposed elastic ring, a circumferential groove provided in the boiler collar and into which both rings are fitted, the said elastic ring causing by means of fluid pressure, said packing ring to be pressed against the cover, the said groove comprising one portion with parallel side walls and another open portion the walls of which converge toward the opening, the elastic ring constituting a body made of solid india-rubber and provided with wedge-shaped lips fitting into said portion of the groove having parallel side walls, the packing-ring made of heat resistant material, such as asbestos, fitting into said portion of said groove having its walls converging toward the opening and contacting loosely with said body made of india-rubber.

In testimony whereof I have affixed my signature.

HERMANN LANGE.