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WATERLESS PISTON-TYPE GASHOLDER

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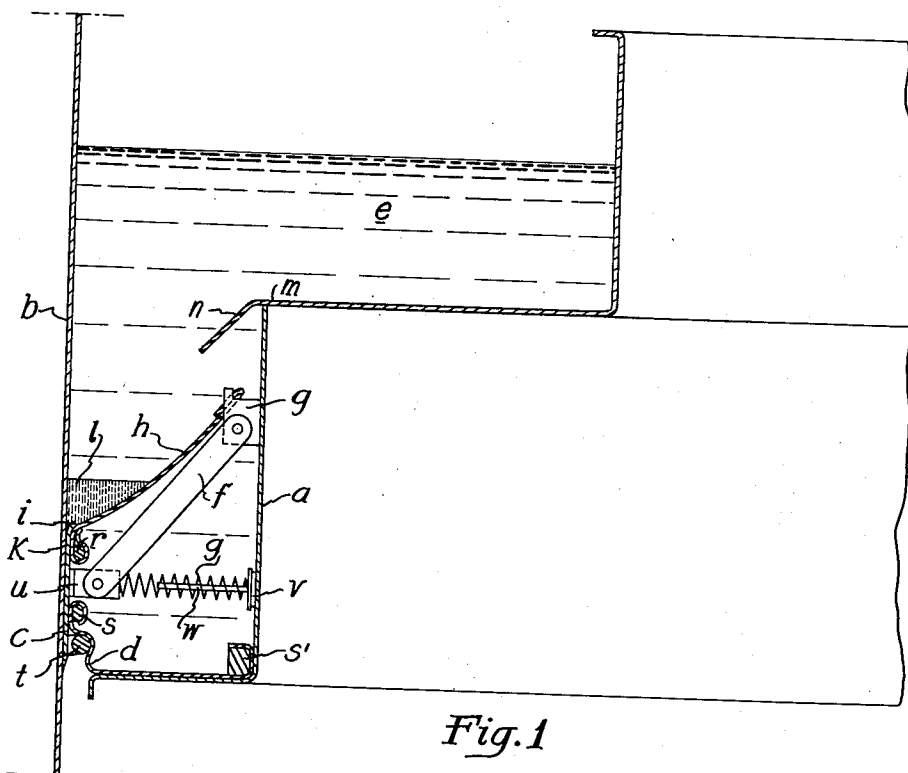


Fig. 1

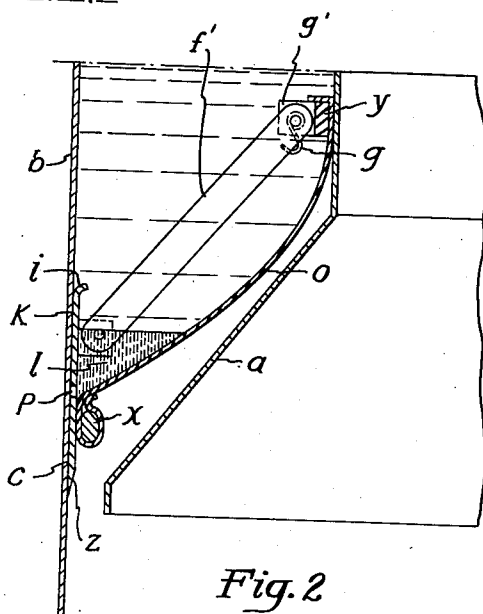


Fig. 2

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WATERLESS PISTON-TYPE GASHOLDER

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8 Claims. (Cl. 48—176)

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This invention relates to a waterless piston-type gas holder of the type having a cup ring which is filled with a liquid lighter than water, for instance mineral oil, serving to form a tight seal between the edge of the piston and the cylindrical or polygonal part of the gas holder.

It is an object of the present invention to provide means ensuring an automatic dehydration of the cup ring so as to prevent the cup ring from being blocked by the formation of ice.

Another object of the invention is to provide an automatic dehydration device constructed in such a way that there are no pipes or ducts which might be permanently filled with water and hence might burst in winter owing to freezing.

Still another object of the invention is to provide an automatic dehydration device which is absolutely safe and reliable and does not require any attendance.

A special object of the invention is to provide means by which any amount of water getting into said cup will be passed immediately to the upper edge of the sealing strips so as to flow off freely through the sealing joint formed between these sealing strips and the wall of the gas holder in such a way that the accumulation of water is rendered impossible.

With these and further objects in view, according to the present invention an inclined guide member is secured to a sliding strip, said guide member being adapted to intercept the water of condensation getting into the cup and leading the same to the sealing joint, utilizing the difference of specific gravity between the sealing liquid and the water.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and appear in the appended claims forming part of the application.

In the accompanying drawing two now preferred embodiments of the invention are shown by way of illustration and not by way of limitation.

Fig. 1 is a radial section through the wall and the sealing cup of a gas holder having the invention applied thereto, and

Fig. 2 is a similar view but showing a modification.

Referring now to the drawing in greater detail, and first to Fig. 1, it will be seen that the sealing cup of a cylindrical or polygonal gas holder whose wall is shown at *b* comprises a circular or polygonal sliding ring or strip *c* of iron adapted to the inner surface of wall *b*, a flexible connecting sheet *d*, consisting of cotton cloth or the

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like between the ring *c* and the rear or inner wall *a* of the cup, and an oil filling *e*. The sliding strip *c* is supported by slanting link levers *f* whose upper ends are hinged to blocks *q* projecting from the inner surface of the cup *a* while their lower ends are hinged to extensions *u* projecting from the sliding ring *c*. The sliding strip *c* is resiliently held against the wall *b* by means of compression springs *g* or other pressure elements fitted between the extensions *u* and flat spring plates *v* fastened on the rear wall of the packing cup *a*. The springs *g* may be guided, especially where they consist of helical springs, by bars *w* extending from the spring plates *v*.

In accordance with the present invention, an inclined deflecting or guide member *h* is secured to the upper end of the sliding strip *c*, which guide member will catch or intercept the water drops coming into the cup *a* from above and rapidly sinking down in the sealing oil *e* owing to their higher specific gravity, and lead said drops to the upper edge *i* of the sliding strip or to the sealing joint *k*, respectively, through which they will leak out under action of the fluid pressure. The end of the sheet *d* facing away from the sliding strip *c* is fastened, for instance, suspended, to the blocks *q*. The spaces within the sealing cup *a* above and below sheet *h* communicate with each other through the gaps provided between the blocks *q*. The guide member *h* and the flexible sheet *d* are fixedly secured to the sliding strip *c*, so as to be safe against tearing, by passing the ends of these parts (*h*, *d*) around clamping rails *r*, *s* and then connecting them together therewith to the sliding strip *c*, in per se known manner. Similarly, the end of the flexible member *d* shown to the right is passed around a member *s'* of rectangular cross section and fastened together therewith to the rear wall and to the bottom of the sealing cup *a*, for instance, by screwing.

In order that the movability of the sliding strips *c* may not be affected, the guide member *h* is preferably made of a flexible material (cotton cloth or the like) which is suspended from the rear wall *a* of the cup or spread by a suitable device. For the sake of better illustration, a layer *l* of water is shown in the figures which layer however, as pointed out above, in reality cannot permanently exist owing to the leakage through the sealing joint. Provided on the edge or corner *m* of the cup is an eaves *n* covering over the upper end of the member *h* and preventing the water from entering into the space below member *h*. The guide member *h* advantageously is easily

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detachable from its anchoring points so as to permit access to the sealing elements. To this end, there may be provided special clamps or tongues (not shown) to be introduced from above and gripping the guide members *h* from both sides or engaged in loops (not shown) provided in a known manner in the guide members *h* for suspension.

A round wooden strip *t* arranged within the sealing cup *a*, for instance, between opposite legs of the sliding strip *c* by its deflecting action prevents the flexible sheet *d* from being jammed or pinched between the guide strip *c* and the sealing cup.

Referring now to the embodiment shown in Fig. 2, it will be seen that in this case the flexible sheet *o* between the rear wall *a* of the cup and the sliding strip *c* is arranged in an inclined direction and, therefore, will perform also the function of the guide member *h* of Fig. 1. It will be understood that the flexible sheet *o* thus serves two purposes, i. e. it acts as a lower wall of the sealing cup *a* and as an intercepting means for the water. The upper end of the flexible sheet *o* is located between the rear wall *a* of the sealing cup and a clamping strip *y* extending over the entire width thereof and being screwed to this rear wall *a*, thus also holding the flexible sheet *o*. The lower part of the flexible sheet *o* is passed around a clamping strip *x* and fixed together therewith, for instance by screwing, to the sliding strip *c*. The sliding strip *c* is pressed against the wall *b* of the gas holder by per se known means, for instance, by levers *f'* acted upon by a torsional spring *g'* and hinged to blocks *q'* which are secured, together with the strip *y*, to the rear wall of the sealing cup *a*. Outlets *p* provided in the strip *c* permit discharge of the water through the sealing joint *k* between the strip *c* and the wall *b* of the gas holder. The lower part of the rear wall *a* of the sealing cup is shaped in such a way that the flexible sheet *o* is covered thereby.

The downwardly directed narrow edges *z* of the sliding strips *c* are intended as ice scrapers and, therefore, are formed with a sharp edge.

The sliding strip *c*, Figs. 1 and 2, is made of commercial, smooth sheet iron from which the scale has been removed, and with its flat face engages the inner wall of the gas holder, under action of the spring (*g* or *q'*). It has been found by thorough researches that the leakage of gas through a seal of this kind is almost completely prevented by the formation of a thin oil film flowing slowly between the sliding strips *c* and the wall *b* and connecting the two parts *b* and *c*. It has been observed that water present in the oil will rapidly settle in the sealing cup *a* and leak out from the same within a time which is exceedingly small compared to the leakage of the oil which in case of a normal filling will take at least the thirty- or fifty-fold of the time required for the leakage of the water. When the oil is almost completely leaked out, a pumping equipment which is not shown and does not form part of the present invention will restore the oil into the sealing cup.

In the embodiment as per Fig. 2 the oil is able to enter into the sealing joint *k* not only from the upper edge *i* of the sliding strip *c* but also through the outlet *p* provided for the discharge of the water collected in the cup. However, the sealing effect of the portion of the joint *k* of the sliding strip located above the outlet *p* is not af-

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fectured by this, since the pressure of the oil acting upon the outlet *p* will exert a sucking effect rather than a stopping effect in regard to the entering of oil at *i*.

While the invention has been described in detail with respect to two now preferred examples and embodiments of the invention it will be understood by those skilled in the art after understanding the invention that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, to cover all such changes and modifications in the appended claims.

I claim:

1. In a waterless piston-type gas holder having side walls, a roof vertically movable within said walls, and sealing means between the outer periphery of said roof and the inner surface of said walls, said means comprising a sealing strip slidably engaging said inner wall surface, means extending between said roof and said strip for resiliently pressing said strip against said surface, a filling of a liquid lighter than water covering said strip and said resilient pressing means, and means for guiding water settling through said liquid to said strip for leakage between said strip and said surface.

2. In a waterless piston-type gas holder as in claim 1, said means for guiding water further comprising a sheet member downwardly from the outer periphery of said roof to said sealing strip.

3. In a waterless piston-type gas holder as in claim 2, brackets secured to said roof for holding the upper edge of said sheet member slightly spaced from said roof, and an eaves on said roof projecting over said space.

4. In a waterless piston-type gas holder as in claim 3, said sheet member extending above said resilient pressing means.

5. In a waterless piston-type gas holder as in claim 4, further comprising means for securing the lower edge of said sheet member to the upper edge of said sealing strip.

6. In a waterless piston-type gas holder as in claim 1, said means for guiding water further comprising a sheet member tightly fastened to the periphery of said roof and inclined downwardly to said sealing strip, means for securing the lower edge of said sheet member tightly to the lower portion of said sealing strip, and water drainage openings through said sealing strip immediately above said securing means.

7. In a waterless piston-type gas holder as in claim 1, said means for guiding water further comprising a flexible sheet member inclined downwardly from the outer periphery of said roof to said sealing strip.

8. In a waterless piston-type gas holder as in claim 7, further comprising a mineral oil liquid filling.

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