

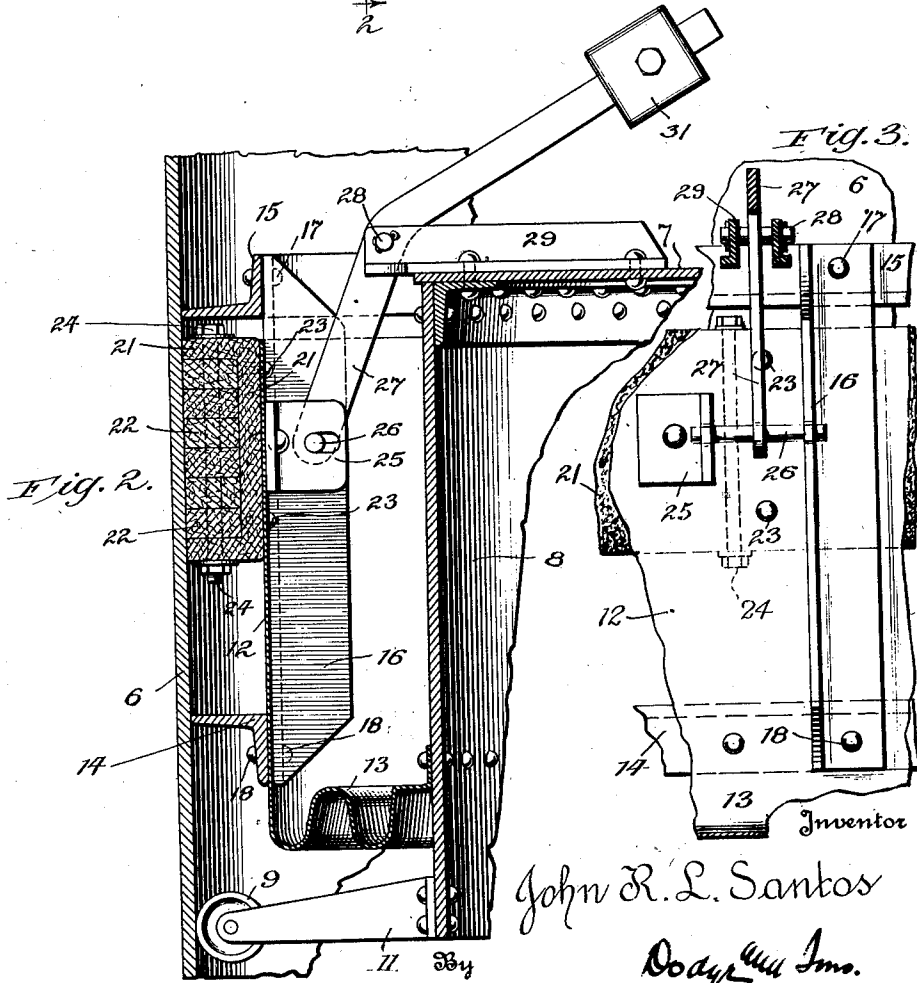
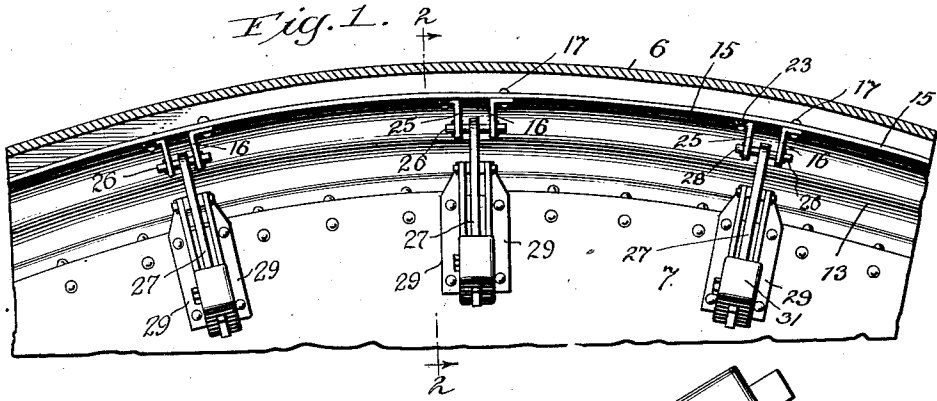
Dec. 15, 1931.

J. R. L. SANTOS

1,836,283

GAS HOLDER

Filed Aug. 29, 1928



Inventor
John R. L. Santos
Doyle & Imo.
Attorneys

UNITED STATES PATENT OFFICE

JOHN R. L. SANTOS, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE BARTLETT HAYWARD COMPANY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND

GAS HOLDER

Application filed August 29, 1928. Serial No. 302,786.

This invention relates to gas holders and particularly to gas holders of the so-called waterless type.

In the waterless type of gas holder there is a vertical shell of cylindrical or prismatic form in which is mounted a piston which moves up and down to vary the effective volume beneath the piston as the quantity of gas in the holder varies. The success of a device of this type is dependent on provision of means to seal the piston in the shell so that it makes a tight joint with the shell and yet moves without undue friction.

One purpose of the present invention is to provide such a seal which should be of simple construction and to combine with the seal a scraper structure to protect the seal by removing ice and other obstructions from the shell.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view partly in section;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary view, in elevation, showing a detail of the pressure applying mechanism as seen looking toward the inner wall of the holder.

A portion of shell, here illustrated as cylindrical, appears at 6. The piston consists of a flat horizontal section 7 having a peripheral depending flange 8 of substantially smaller diameter than the shell 6. The piston structure as a whole is guided in the shell 6 by means of rollers 9 carried on brackets 11 of which only one is shown. In the interval between the flange portion 8 and the shell 6, and approximately parallel thereto, is a flexible metal annulus 12 connected at the lower end with the flange 8 of the piston by means of a flexible diaphragm portion 13. This is shown as corrugated which is the preferred form. The joint with the flange 8 is gas tight.

Encircling the member 12 adjacent the diaphragm portion 13 is an annular scraper 14 conveniently formed of angle iron and so arranged as to contact with the shell 6. A similar scraper 15 is positioned above the up-

per margin of the flexible annulus 12 and is sustained by a plurality of vertical struts 16 conveniently formed of angle iron and riveted at 17 to the upper scraper 15, and at 18 to the flexible annulus 12 and lower scraper 14. Except for the rivets 18 the strut members 16 are entirely free from the annulus 12. In effect, therefore, the two scrapers 14 and 15, with their connecting struts 16 form a unitary structure supported at the rivets 18 on the flexible annulus 12, but otherwise entirely free from said annulus.

Supported on the upper or free edge of the annulus 12 is a packing which conveniently is made up of a U-shaped strip 21 of felt, canvas or other material which embraces between its arms a plurality of strips 22 of felt or the like. The packing structure is mounted on the flexible member 12 by connecting the U-shaped portion 21 to the member 12 by means of rivets 23 and thereafter locking the entire packing structure together by the through bolts 24 which engage the two flanges of the U-shaped strip 21 and pass through all the intervening strips.

Riveted to the strip 12 adjacent to each strut member 16, but spaced from said strut member by a substantial distance, are brackets 25. A plurality of bearer pins 26 extend through openings in the members 16 and 25 and are engaged by the lower ends of levers 27 which are pivoted at 28 on the brackets 29. The brackets 29 are mounted on the top plate 7 of the piston structure as shown. The levers 27 carry at their upper ends the loading weights 31 which have the effect of canting the pins 26 to urge the annulus 12 outward relatively to the strut members 16. In this way the levers 27 not only tend to sustain the scrapers and the annulus 12 in position, but they also serve as means for exerting sealing pressure on the packing.

The invention may be embodied in various alternative forms within the scope of the appended claims.

What is claimed is:

1. In a waterless gas holder, the combination of a shell; a piston movable therein to vary the effective volume of the shell; a flexible metallic cylindrical annulus surrounding

the piston and having a flexible connection with the piston along the lower margin; an annular scraper structure yieldingly supported on said piston; a packing annulus supported on said flexible annulus in position to be protected by said scraper structure, and contacting said shell; and yielding means for expanding said flexible annulus to press said packing into sealing engagement with the shell.

engagement with said spacers and said flexible annulus to expand the latter and press said packing into sealing relation with said shell.

In testimony whereof I have signed my name to this specification.

JOHN R. L. SANTOS.

2. In a waterless gas holder, the combination of a shell; a piston movable therein to vary the effective volume of the shell; a flexible metallic cylindrical annulus surrounding the piston, interposed between the shell and piston and having a flexible connection with the piston along the lower margin; an annular scraper supported on said flexible annulus adjacent said margin and contacting said shell; a second annular scraper contacting said shell beyond the other margin of said flexible annulus; a packing annulus supported on said flexible annulus between said scrapers and contacting said shell; and yielding means for expanding said flexible annulus to press said packing into sealing engagement with said shell.

75

3. In a waterless gas holder, the combination of a shell; a piston movable therein to vary the effective volume of the shell; a flexible metallic cylindrical annulus surrounding the piston, and flexibly connected therewith along the lower annular margin; an annular scraper supported on said flexible annulus adjacent said margin and contacting said shell; a series of spacers connected at their lower end only to the inner lower portion of the annulus and extending above the same; a second annular scraper attached to the upper ends of said spacers; a packing annulus carried by said flexible annulus between the scrapers and contacting said shell; and loading means reacting between said spacers and said flexible annulus to expand the latter and press said packing into sealing relation with said shell.

80

85

90

95

4. In a waterless gas holder, the combination of a shell; a piston movable therein to vary the effective volume of the shell; a flexible metallic cylindrical annulus surrounding the piston, and flexibly connected therewith along the lower annular margin; an annular scraper supported on said flexible annulus adjacent said margin and contacting said shell; a series of upwardly extending spacers connected at their lower ends only to the inner lower portion of the flexible annulus and extending above the same; a second annular scraper attached to the upper ends of said spacers and free of contact with the flexible annulus; a packing annulus carried by said flexible annulus between the scrapers and contacting said shell; a plurality of loaded pivoted levers; and rocking pins sustained by said levers and in thrust

100

105

110

115

120

125

130