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GASKET CONSTRUCTION FOR CYLINDER HEADS

Filed Sept. 28, 1925

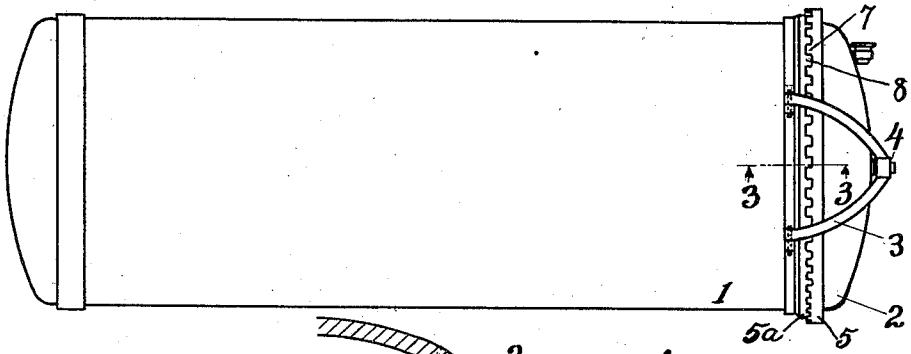


Fig. 1.

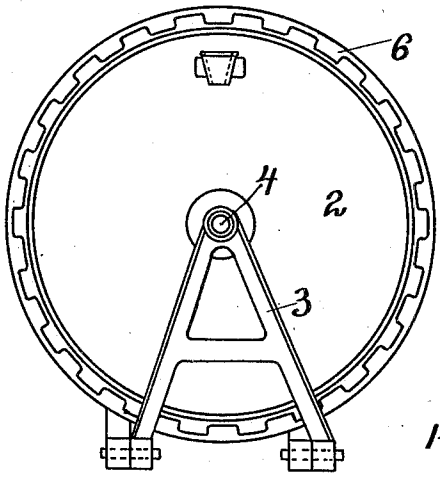


Fig. 2.

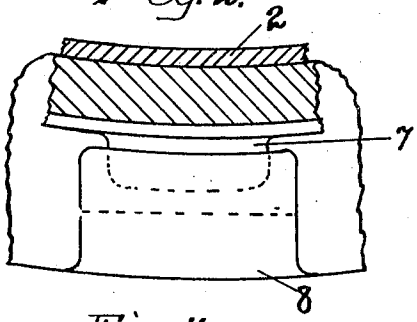


Fig. 4.

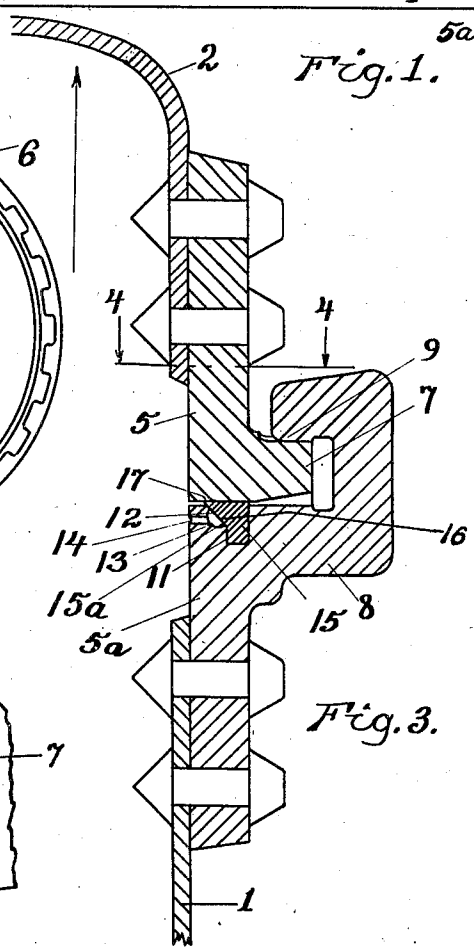


Fig. 3.

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UNITED STATES PATENT OFFICE.

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GASKET CONSTRUCTION FOR CYLINDER HEADS.

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This invention relates to steam tight closures for the charging doors of steam drums or cylinders now in general use for the steam treatment of various commodities, such as sand lime brick.

As is well known, such steam treating operations are carried on by charging cars or trucks of material into a cylindrical drum, usually made of boiler plate, one or both ends of the drum provided with removable covers for that purpose.

My present improvement has to do with the construction and mode of operation of such a removable cover, having in mind the difficulties that must be met because of the peculiar conditions of use to which such cylinders are subjected. For example, said lime bricks are extremely gritty and moreover, the vapors from them when steamed are to a considerable extent corrosive. Therefore, a steam-tight cover suitable for a cylinder in which such material is to be treated must be free from interior working parts, such as levers, cams and the like, and the gasket or packing ring, by which the cover is made steam-tight, must be capable of being brought into service, when the door is repeatedly opened and closed, without any scraping or rubbing action that might wear the gasket or force it out of shape. It is not feasible in such circumstances to apply heavy clamping pressure to the gasket, and it is necessary to so arrange the door or cover that it can be opened and closed repeatedly without using any direct force on the gasket and without, as above stated, subjecting it to any scraping or rubbing action in order to get it into its steam-tight position.

The objects of my invention, therefore, are to provide steam-tight doors for cylinders used in the above mentioned arts, and for the purposes above mentioned, wherein steam tightness is essential; first, without liability of rubbing or grinding the gasket while the door is being inserted and removed and, second, to render the gasket steam-tight by its own automatic operation when it becomes subjected to the action of steam pressure from within the cylinder.

More specifically, therefore, my improvement relates to the construction and arrangement of the gasket and the associated cooperating parts of the cylinder and cover.

With the foregoing and certain other objects in view, which will appear later in the specifications, my invention comprises the devices described and claimed and the equivalents thereof.

In the drawings, Fig. 1 is a side view of a cylinder with a door in place.

Fig. 2 is an enlarged end view.

Fig. 3 is a part sectional detail through the gasket and one of the cover-tightening lugs, the section taken on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 3.

To show its general construction and mode of operation I have illustrated herein a cylinder or drum of the class to which my invention is adapted, equipped with a removable swing door of otherwise usual construction.

As is clearly shown in the drawings, this usual drum consists in the shell 1, and the removable cover 2 hinged to the shell by means of a swinging bracket 3.

Upon the free end of the bracket is a trunnion 4, the cover 2 being swiveled upon the trunnion so as to be capable of partial rotation.

Lugs and recesses are provided on the circular flange to which the head is attached, and on the cover 2 respectively, the lugs and recesses registering when the cover is put into place, and overlapping so as to lock when the cover is partly rotated. Such interlocking construction is well known in the art and requires no further detailed description here, except it will be noted upon referring to Fig. 3 that the flange 5 of cover 2, when in place, is flush with the ring 5^a on the end of the shell 1, consequently offering no interior projections. The lugs 7 on ring 5 project radially outward at right angles to the ring and the lugs 8 on ring 5^a of shell 1 project outward at right angles to the flange, and their ends are directed radially inward. The free inwardly turned end of lug 8 engages the outer face of the lug 7, as shown in Fig. 3, and these two faces are so fitted as to closely engage each other when the cover 2 with its lugs 7 is partly rotated.

To form steam-tight joints having the features previously referred to, a circumferential groove 11 is formed in the face of flange 8. This groove is of substantially rectangular cross section with its inner wall 12 beveled.

A channel 13 is formed in the beveled wall

and conduits 14 are provided in the cover to connect the channel 12 with the interior of the cylinder.

A packing ring 15, of flexible material, is fitted into the groove 11 and the ring is formed with a beveled face 15^a to fit the beveled wall 12 of the groove.

The outer face of the packing ring is thus provided with a thin edge 17 directed toward the interior of the cylindrical shell 1. The door is applied or removed while being supported and kept in alinement by means of the swinging bracket 3 and this is done without clamping pressure. Consequently the exposed face of the packing ring is not subjected to wear when the door is closed or opened, nor when the door is partly rotated to lock it in position.

When steam pressure is generated within the cylinder, the internal pressure is transmitted through conduits 14 and channel 13 and against the beveled face 16 of the gasket. The width of the channel 13 is such that enough pressure is enabled to be exerted against the beveled face of the gasket to bodily bend the beveled part of the gasket outward, so as to spring it into forcible contact with the under face of ring 5. At the same time the thin edge 17 of beveled face 16 is tightly lapped against the inner peripheral wall of flange 5, and the joint is thereby made steam tight.

If the thickness of the gasket were dependent upon the sealing action of the extreme edge 17, as in some thin edged gaskets heretofore employed, the tightness of the joint could not be maintained satisfactorily if the surfaces were likely to become covered with grit.

By providing the relatively wide channel 13, I am enabled to apply sufficient steam pressure to the thick part of the beveled body of the gasket to bend that part outwardly, so as to bring a relatively thick section of the gasket into contact with the opposing wall of the cover ring. In addition, steam pressure enters the crack between the two flanges and presses the extreme thin edge of the gasket against the opposing face, but in any event, whether the thin edge remains sealed or not, I have found in practice that the channel 13 results in bending the body of the gasket and thereby forms a positive seal.

By the means above described I have produced a joint especially adapted for service of the nature indicated. Grit, dust and particles of sand are not likely to accumulate on the surfaces which are to be made steam tight, and if so, the surfaces are so arranged that they can be dusted off easily. There is no wear on the gasket and no clamping, crushing or distorting strain is brought upon it by the door-fastening means. Neither is the gasket subjected to wear or pressure, except when there is steam pressure in the cylinder, and in that case the pressure on the gasket is merely sufficient to keep the joint steam tight. The pressure of the gasket and its thin lip against the flange 5 is automatically released as soon as the steam pressure is removed. The working life of the gasket is prolonged, and one of the most frequent causes of leaks and trouble is eliminated in the use of steam treating drums that are used in the manufacture of sand lime brick and other gritty materials.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

A closure for cylinders for use in the steam treatment of sand lime bricks and the like, comprising a head ring and a flanged cover, co-operating lugs and notches on the head and cover respectively for securing the head to the cover, said head ring formed in its outer face with a groove of substantially rectangular cross section, said groove having a beveled wall, a circular channel formed in said beveled wall, conduits connecting said channel with the interior of the cylinder, a packing ring of flexible material secured in said groove, the outer periphery of said ring having a beveled part and a thin edge directed toward the interior of the cylinder, the beveled part of said ring and the thin edge thereof adapted to be tightly forced against the wall of said head by fluid pressure within the cylinder.

In testimony whereof, I affix my signature.

EDGAR D. CHURCH.