

H. H. DOW.
WATER SEAL.
APPLICATION FILED NOV. 6, 1907.

961,216.

Patented June 14, 1910.

2 SHEETS—SHEET 1.

Fig. 1

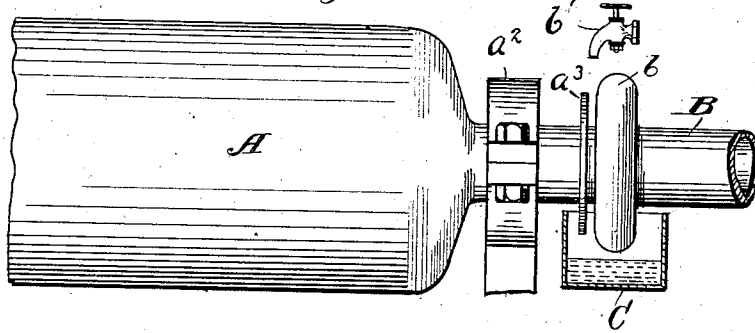


Fig. 2

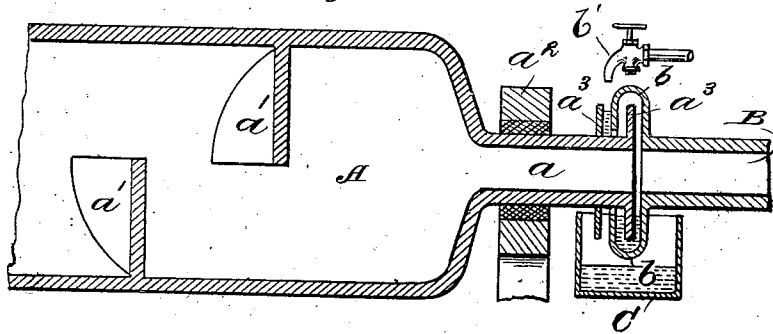
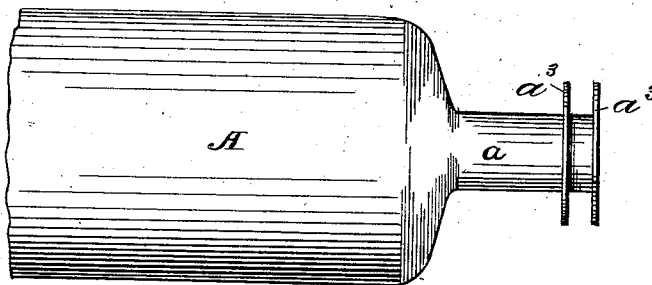


Fig. 3



Witnesses:

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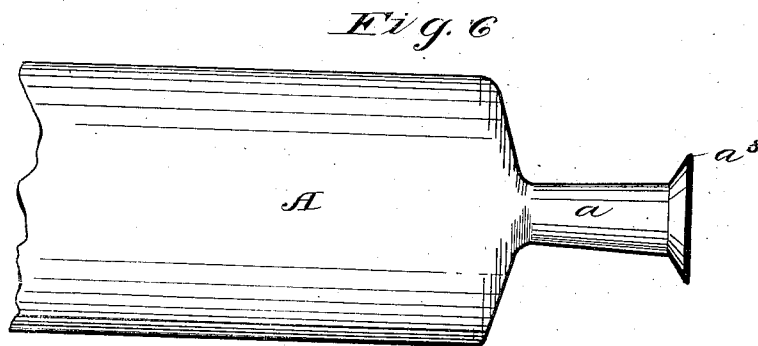
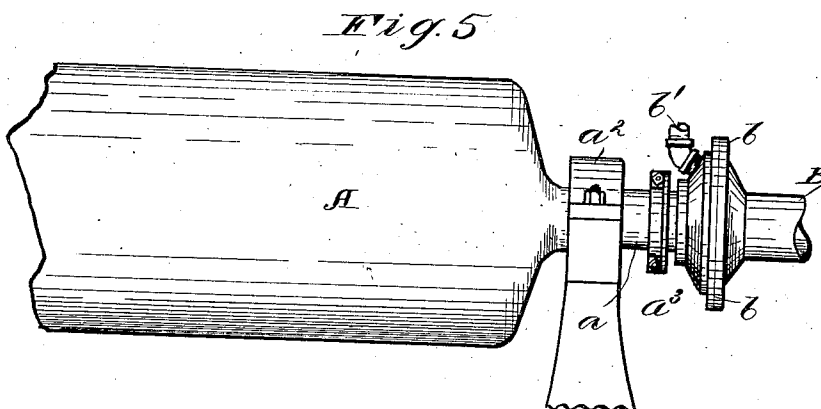
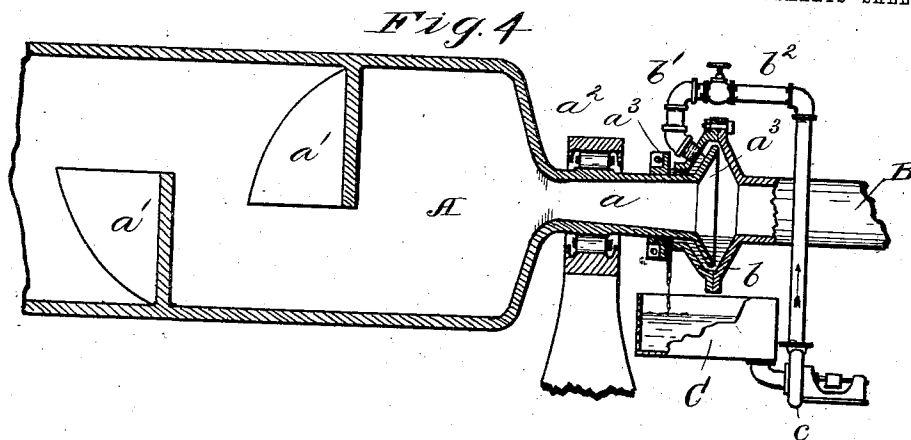
by J. B. Gay

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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HERBERT H. DOW, OF MIDLAND, MICHIGAN, ASSIGNOR TO THE DOW CHEMICAL COMPANY, OF MIDLAND, MICHIGAN, A CORPORATION OF MICHIGAN.

WATER SEAL.

961,216.

Specification of Letters Patent. Patented June 14, 1910.

Application filed November 6, 1907. Serial No. 400,996.

To all whom it may concern:

Be it known that I, HERBERT H. Dow, a citizen of the United States, resident of Midland, county of Midland, and State of Michigan, have invented a new and useful Improvement in Water Seals, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other constructions.

My invention relates to liquid seals such as frequently require to be made between a fixed and a rotating conduit. Said invention is directed more particularly to the provision of a closure of this sort in conjunction with a horizontally disposed connection, occasion for the use of which arises, for example, in connection with a horizontally disposed gas producer, a type of machine that would possess numerous advantages were it possible to successfully secure a liquid seal between the rotary cylinder of the producer and the pipe, or conduit, leading therefrom. It has been with a view to providing a satisfactory closure of this character for use in places of the sort noted, that the present invention has been devised, and to this end said invention consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 represents, in more or less conventional fashion, a horizontally disposed gas producer and a connection therefor provided with a liquid seal embodying my several improvements; Fig. 2 is an axial cross-section of the same; Fig. 3 is a view of the drum or cylinder of the producer, similar to Fig. 1, one part of the connection being removed in order to show another part that is affixed to said drum or cylinder; while Figs. 4 and 5 represent respectively an axial cross-section and side elevation of a slightly modified form of seal; and Fig. 6 is a side elevation, corresponding to Fig. 3, of the drum of the producer as adapted to such modification.

Having reference to the first three of the

figures just described, A will be seen to designate the horizontally disposed drum or cylinder of the producer. Such drum is formed with a hollow trunnion *a* as shown, through which the gases generated therein are led. Interiorly the drum is further provided with spiral ribs *a'* to properly agitate and move along within the cylinder the contents of the same. The trunnions *a* of such cylinder, the one only appearing in the figures, are supported in suitable bearings *a²* and project a short distance therebeyond, as shown. In the form of connection here illustrated, then, I provide such projecting trunnion end with two spaced, encircling flanges, or ribs *a³*, fixedly attached thereto. Such ribs will be seen to form thus a sort of outwardly projecting, trough-like, element. Alined with trunnion *a*, which forms, as stated, the discharge end of the cylinder, is the pipe or conduit B wherewith sealed connection is required to be made. The end of such pipe or conduit adjacent to the end of the trunnion is provided with an inwardly opening annular trough-like element *b* that incloses the outermost of the two flanges *a³* upon such trunnion end, Fig. 2. The outer wall of trough-like element *b* is spaced from the outer face of the trunnion so as to permit of the free entrance into the element of liquid, such liquid being supplied as will presently appear. This liquid in the case in hand will, of course, consist of water, but may in other situations be exchanged for any other suitable liquid. Such water is supplied from a faucet *b'*, or through other connection, between the two flanges *a³* from above and in a quantity sufficient to afford a stream of such depth that the opening between the outer wall of trough *b* and the upper face of the cylinder trunnion is effectually sealed. Such water as it flows downwardly along either side of the trunnion, enters through the opening in question into the trough *b* and will there accumulate such quantity as to similarly effectually seal the under portion of the joint. It will thus be evident that the connection between the pipe end and the trunnion is effectually sealed about the entire periphery of said two members. A suitable trough C is provided for conducting away such water as may escape from the trough *b*. By the simple means thus provided I am enabled to seal a horizontally extending connection as satisfac-

torily as it has heretofore been possible to seal one vertically alined. The volume of the stream of water need not ordinarily be very great if the intergaging parts of the joint are made of proper size and relative proportions. It has already been indicated that the particular field of use for the device, herein pointed out, is not to be regarded as being in any sense a limitation, but merely an illustration, of the adaptability of my improved seal.

The modifications introduced in the form of device illustrated in Figs. 4 to 6, inclusive, are for the most part of an operative character; such figures, in other words, indicate certain changes in details of construction such as I contemplate as being possibly desirable and which are fully within the scope of the invention. As will be noted from an inspection of the figures named, the principal change consists in introducing the liquid between the outermost of flanges a^3 on trunnion a and the wall of trough b on fixed conduit B. The function of the other flange a^2 accordingly becomes simply that of a deflecting plate whereby the liquid is prevented from running along the trunnion and to the bearing; so far as its active participation in effecting a seal of the joint is concerned, it might well be omitted. A pump c' is furthermore shown in connection with receptacle C whereby the water after escaping from the seal may be returned thereto through pipe b^2 to be used over again.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a device of the character described, the combination with fixed and rotating members, of means for supplying a stream of liquid to the joint between said members, and engaging means borne by said members, respectively, and adapted to form, in conjunction with such stream of liquid, a closure of such joint.

2. In a device of the character described, the combination with a fixed and a rotating member, of an inwardly opening trough borne by one of said members and a flange borne by the other member, and means for supplying a stream of liquid to said trough, said trough engaging said flange so as to form, in conjunction with said stream of liquid, a closure between said members.

3. In a device of the character described, the combination with a fixed and a rotating member, of an inwardly opening trough borne by one of said members and a flange borne by the other member, and means for

supplying a stream of liquid to said trough from above, said trough engaging said flange so as to form, in conjunction with said stream of liquid, a closure between said members.

4. In a device of the character described, the combination with a fixed and a rotating member, of an annular flange encircling the latter and an annular trough borne by the former, said trough opening inwardly and inclosing said flange, and means for supplying a stream of liquid to said trough.

5. A liquid seal comprising an intergaging, inwardly directed trough and an outwardly directed flange of annular form, borne by the two members to be joined, respectively, and means for supplying a stream of liquid to said trough from above.

6. A liquid seal for a horizontal gas producer comprising, in conjunction with a rotary drum of such producer and a pipe alined with the discharge end of said drum, an annular outwardly projecting flange encircling such discharge end, an annular trough borne by said pipe, said trough opening inwardly and inclosing said flange, and means for supplying a stream of liquid to said trough.

7. In a device of the character described, the combination with a fixed and a rotating member, of an inwardly and an outwardly opening trough borne by said members, respectively, and means for supplying a stream of liquid to said troughs, said troughs engaging with each other so as to form in conjunction with such stream of liquid a closure between said members.

8. In a device of the character described, the combination with horizontally disposed fixed and rotating members, of an inwardly and an outwardly opening trough borne by said members, respectively, and means for supplying a stream of liquid to said troughs from above, said troughs engaging with each other so as to form, in conjunction with such stream of liquid, a closure between said members.

9. In a device of the character described, the combination with a fixed and a rotating member, of two annular flanges encircling the latter, an annular trough borne by the former, said trough opening inwardly and inclosing the outermost of said flanges, and means for supplying a stream of liquid between said flanges.

10. In a device of the character described, the combination with horizontally disposed fixed and rotating members, of two annular outwardly projecting flanges encircling the latter and an annular trough borne by the former, said trough opening inwardly and inclosing the outermost of said flanges, and means for supplying a stream of liquid between said flanges from above.

11. A liquid seal comprising intergaging,

inwardly and outwardly directed troughs of annular form respectively borne by the two members to be joined, and means for supplying a stream of liquid to said troughs from
5 above.

12. A liquid seal for a horizontal gas producer comprising, in combination with the rotary drum of such producer and a pipe aligned with the discharge end of said drum,
10 two annular outwardly projecting flanges

encircling such discharge end, an annular trough borne by said pipe, said trough opening inwardly and inclosing the outermost of said flanges, and means for supplying a stream of liquid between said flanges. 15

Signed by me this 17 day of October, 1907.
HERBERT H. DOW.

Attested by—

THOS. GRISWOLD, Jr.,
JAMES C. GRAVES.