

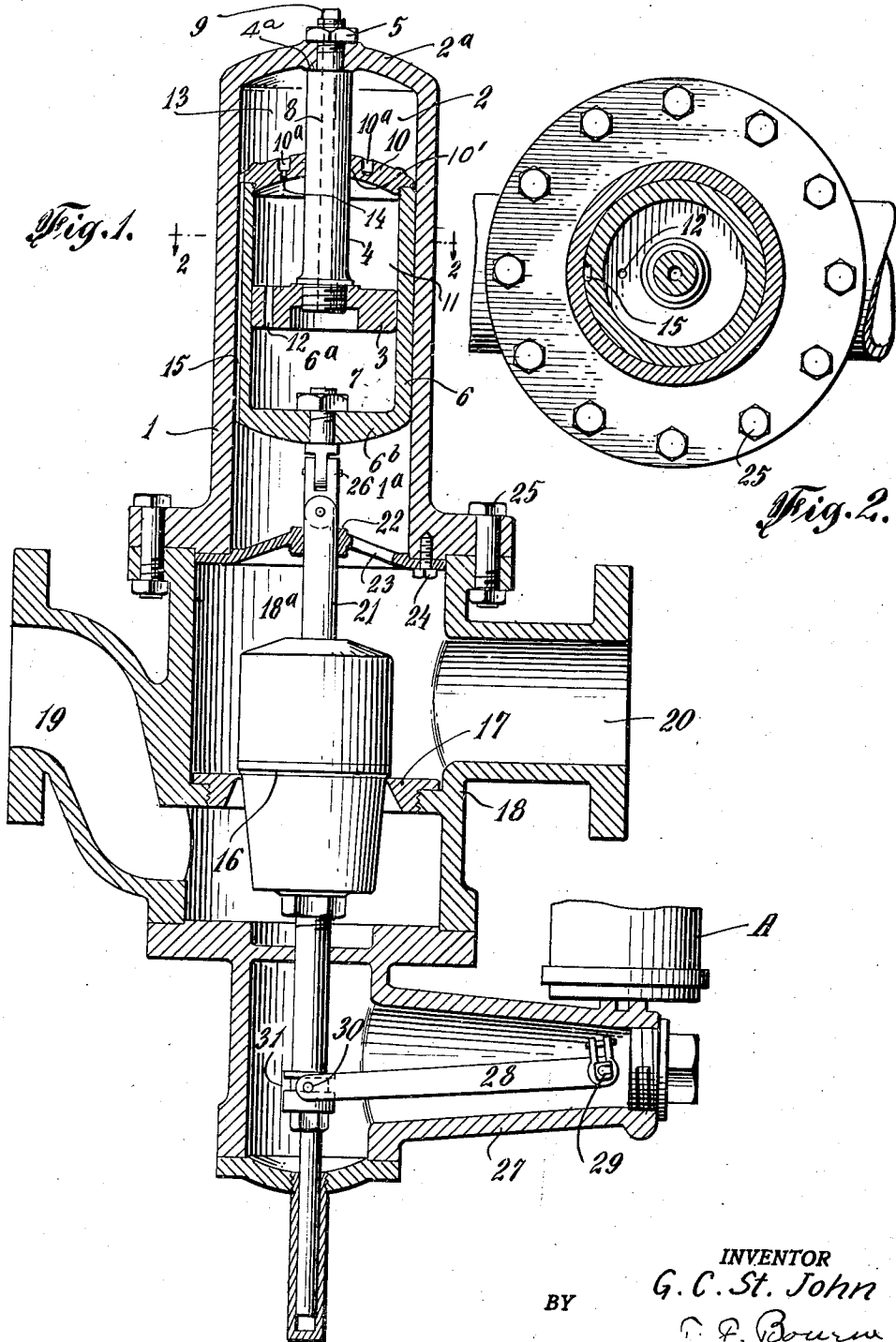
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DASH POT

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BY

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DASHPOT.

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The object of my invention is to provide a dashpot in which fluid that acts as a resistance to the operation of a movable member will not leak away, whereby the uniformity of operation of the dash-pot will be assured and the required resistance to the operation of said member will be maintained.

In carrying out my invention I provide a chamber containing a stationary head or piston and a hollow movable member having its lower end closed, said head or piston being within said member providing a space for fluid between the lower closed end of the member and said head or piston, whereby when the closed end of the member operates toward the head or piston the said fluid will resist the movement of said member for steadying the operation of an element that is connected with said member.

My invention is particularly adapted for use in connection with fluid meters and I have illustrated my invention with a fluid meter of the class set forth and referred to in Letters Patent No. 1,513,016, granted to me October 28, 1924.

My invention comprises novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part hereof, wherein—

Fig. 1 is a vertical section illustrating my improvement associated with a steam meter of the class referred to, and

Fig. 2 is a cross section on line 2, 2, in Fig. 1.

Similar numerals of reference indicate corresponding parts in the several views.

The numeral 1 indicates a cylinder or shell having a chamber 2 closed at its upper end and open below, said cylinder containing a head or piston 3 shown suspended by a rod 4 secured to the end 2^a of the cylinder, as by means of a shoulder 4^a on the rod bearing against the inner surface of end 2^a, and a nut on the rod bearing against the outer surface of said end. Within the chamber 2 is a reciprocative hollow member 6, operative in the nature of a piston closely and slidably fitted within the chamber. The member 6 is shown of cup-like form, the bore or chamber 6^a of member 6 receiving the head or piston 3 which fits slidably and snugly against the inner

wall of the said member between the ends of its bore. The lower end of member 6 is closed by the head 6^b so as to retain fluid, such as water, in the space 7 between said head 6^b and the head or piston 3. Means are provided for charging the space 7 with water or other fluid which I have illustrated in the form of a longitudinal bore 8 passing through rod 4 and extending without the dashpot to be closed by a plug 9. The outer end of the bore or chamber 6^a of member 6 is closed by a cap or cover 10 provided with a bore 10^a slidable along rod 4 as a guide. The member 6 and cover 10 may be connected together by screw threads. A chamber 11 is located within member 6 between the head or piston 3 and the cover 10. Bores 10^a in cap 10 are adapted to receive a tool for rotating the cap. A passage 12 in head or piston 3 provides communication between the chambers 7 and 11. Beyond the cap or cover 10 is a chamber or space 13 in chamber 2 of cylinder 1 and cap 10 is provided with one or more holes 14 to provide communication between chambers 11 and 13. Means are provided for communication between chamber 13 at the outer end of member 6 and the space 1^a within chamber 2 at the opposite end of said member, for which purpose I have shown a longitudinal groove 15 in the outer surface of member 6 through which steam may flow from space 1^a into chamber 13 for balancing pressures within the various chambers and spaces.

The member 6 may be actuated or reciprocated by any part whose movement is to be controlled by said member. In the accompanying drawings I have illustrated my improved dash-pot in connection with a well known type of steam meter, the member 6 being shown connected with the valve 16 adapted to cooperate with a seat 17 within a casing 18 having a steam inlet at 19 and a steam outlet at 20. A rod 21 is connected with valve 16 and with member 6 for operating said member in accordance with the movements of said valve, the member 6 thereby being supported by the rod. I have illustrated the upper portion of rod 21 guided in a bearing 22 in a guide or spider 23 secured upon the valve casing, as by screws 24, the shell or cylinder 1 being shown detachably secured to said casing by bolts 25. A universal joint at 26 is shown connecting the member 6 with the rod 21 for

ease in operation of the parts and to permit free sliding of member 6 within chamber 2. In the form of steam meter illustrated the casing 18 is shown provided with a hollow projection 27, in which a lever 28 is pivoted at 29, the opposite end of the lever being operatively connected with the rod 21 by means of the pin 30 on the lever operative in a groove 31 of the rod in a well known way. A recording or integrating machine A, shown supported upon projection 27, may have a stylus or other indicating element adapted to be operated by shaft 29 in any well known manner customary in fluid meters. The lever 28 and recording or integrating machine A form no part of my present invention but are similar to the corresponding parts referred to in my aforesaid Letters Patent.

The dash-pot is shown located above the metering valve 16 and above the steam chamber 18^a of casing 18, from which chamber steam may flow into space 1^a and through groove 15 into space 13, and may pass through hole 14 into the chamber 11, for balancing the pressure on the parts. The space 7 between head or piston 3 and the end 6^a of member 6 will be charged with water when the dash-pot is used with a steam meter, said head and end being normally spaced a suitable distance apart when valve 16 is upon its seat 17. When the steam entering casing 18 raises the valve 16 from its seat the rod 21 and the member 6 will be raised correspondingly and the water within space 7 will be forced against the head or piston 3 by the end 6^a of said member and thereby will resist the rising of member 6, any excess water flowing from chamber 7 through bore 12 into chamber 11. The resistance of the water to the movement of member 6 with the valve will have the effect of steadying the operation of the valve due to the steam passing from inlet 19 to outlet 20 of the casing. Upon descent of member 6 with valve 16 the water in space 7 will descend with said member and water which may have been forced into the space 11 through bore 12 will flow back into space 7 to maintain said space fully charged with water. In other words, whatever position the member 6 may be in respecting the head or piston 3 the space 7 therebetween will remain charged with water for resisting the outward movement of member 6 in all positions of the latter, and since no water can leak from member 6 the same will always remain charged. My improvement eliminates the danger of not having water to resist the outward movement of member 6 in any position of valve 16 or any other part that may be connected with said member for its control. In case steam condenses in the space 13 the water of condensation may flow back into the casing through groove 15, and

steam that condenses in space 11 will assure a supply of water being maintained in space 7. The space 11 is sufficiently large to contain all the water or other fluid from space 7 when member 6 is raised to its maximum position. In case there should be excess water or other fluid in space 11 it will be forced therefrom through the bore 14 into space 13 to flow away through groove 15.

Dash-pots having springs or air resistance against the operation of their pistons are known. In such forms of dash-pots the increased tension of the springs and the compression of the air create variable or increased resistance against the strokes of the piston, continuing when the pistons are at rest, so that the operation of a part to be controlled is more or less variable. With my improvement the resistance of the fluid in space 7 to the movement of member 6 is constant so that at all pressures of the valve 16 or the operating part connected with member 6 will be the same in all positions of said member by reason of the constant supply of fluid in space 7, so that undue fluctuations of valve 16 or the moving part corresponding thereto will be prevented in various positions thereof.

In case my improved dash-pot is used for other purposes than with steam meters water, oil or other suitable fluid may be used in the space 7 of member 6.

Having now described my invention what I claim is:—

1. A dash-pot comprising a cylinder, a hollow member therein having a closed lower end to contain fluid, a head within said member normally located between the ends of its bore providing spaces within the member on opposite sides of said head, one of said spaces being adapted to contain fluid between the closed lower end of said member and said head, means providing communication between said spaces for the flow of said fluid between said spaces and means to admit fluid within the cylinder on opposite sides of the member.

2. A dash-pot comprising a cylinder, a hollow member reciprocative therein, a head carried by the cylinder and located within the bore of said member, said member having a closed lower end normally spaced from said head providing a space therebetween to contain fluid on one side of the head, the member having a space on the opposite side of the head, means providing communication between said spaces for the flow of fluid therebetween, the cylinder having a space between its outer end and said member, and means providing communication between the last named space and the opposite end of the cylinder.

3. A dash-pot comprising a cylinder having a closed outer end, a hollow member reciprocative within the cylinder and pro-

vided with a closed lower end to retain fluid, a head carried by the cylinder and located within the bore of said member and normally spaced from opposite ends of the member providing spaces therein on opposite sides of said head, means providing communication between said spaces and means to admit fluid within the cylinder on opposite sides of the member.

10 4. A dash-pot comprising a cylinder having a closed outer end, a hollow member reciprocative within the cylinder and provided with a closed lower end to retain fluid, a head within said member, a rod carried
15 by the closed end of the cylinder and supporting said head within said member with

spaces within the member on opposite sides of the head, means providing communication between said spaces for the flow of fluid from one space to another and means to admit fluid within the cylinder on opposite sides of the members.

5. A dash-pot as set forth in claim 4, in which the member has an open end provided with a cap, the cap having a bore slidably receiving said rod, a space being provided between the closed outer end of the cylinder and the cap, and means providing communication between said space and the interior of the hollow member.

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