Nov. 5, 1929. L. FABER 1,734,164

MEANS FOR PRODUCING FIRE EXTINGUISHING FOAM

Filed March 2, 1927

Fig. 1.

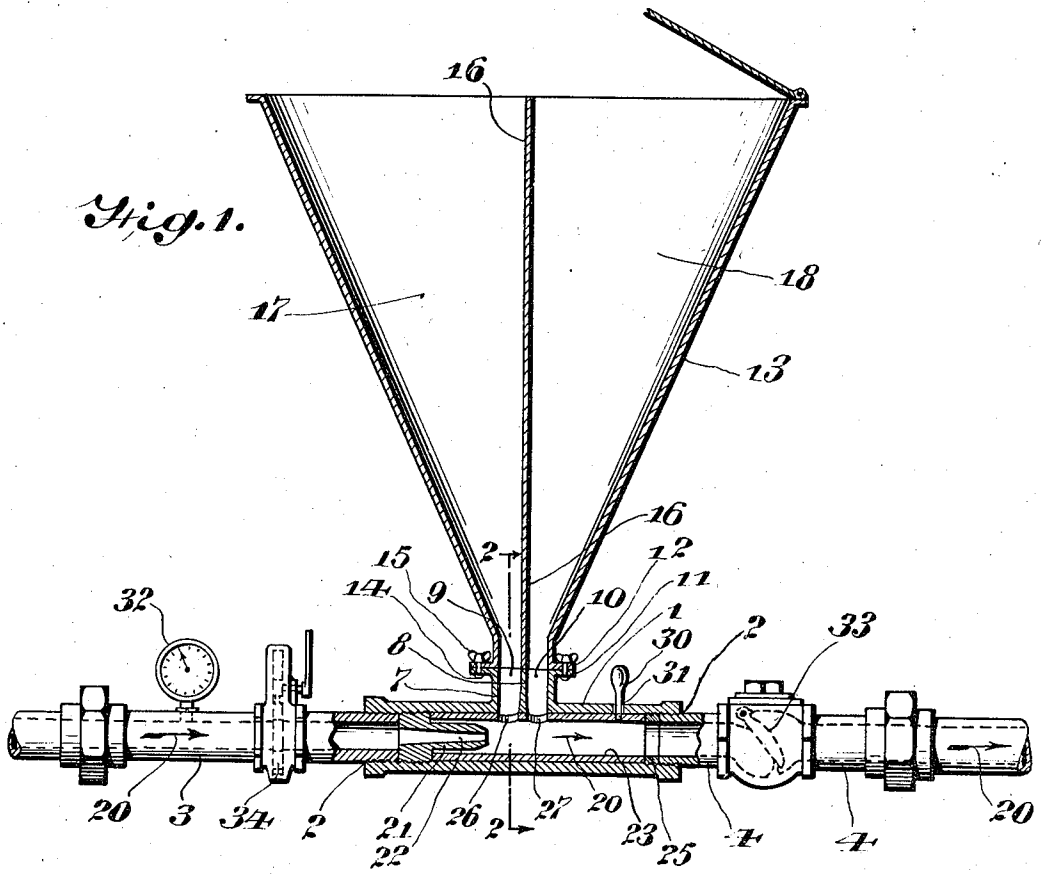


Fig. 2.

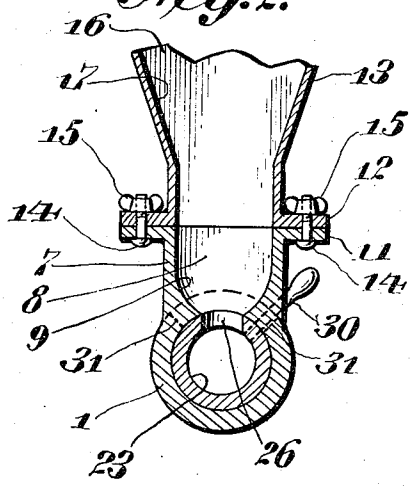


Fig. 3.

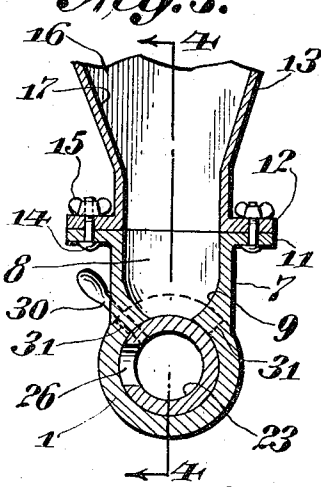
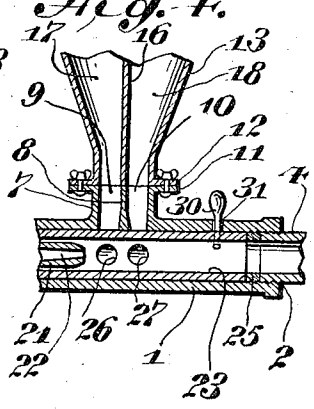


Fig. 4.



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UNITED STATES PATENT OFFICE

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MEANS FOR PRODUCING FIRE-EXTINGUISHING FOAM

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My invention relates broadly to improvements in means for the production of foam for use in the extinguishing of fires.

In the production of such foam different substances may be employed which when brought together in solution in water react to produce a foam which, when applied to a fire by spraying or otherwise, operates to extinguish the same. Substances quite generally used for the generation of fire extinguishing foam are aluminum sulphate and bicarbonate of soda together with a stabilizing substance, in powdered form. The stabilizing substance may consist of extract of licorice root, oak bark or other material known to be usable for that purpose. The effect of these stabilizing substances upon the foam is well understood in the art.

The general object of the present invention is to provide a novel construction of means whereby the foam producing substances in powdered form may be introduced separately into a flowing stream of water wherein they are dissolved and after having been dissolved react to produce a fire extinguishing foam.

To these and other ends the invention comprehends the construction as illustrated and such modifications thereof as may be made within the scope of the claims.

In order that the invention may be readily understood reference should be had to the accompanying drawing in which is shown a form of construction embodying the invention which is at present preferred by me.

In the drawing

Fig. 1 is a view partly in elevation and partly in longitudinal section of a pipe through which a stream of water may flow and showing also in vertical longitudinal section the containers for holding the foam producing substances to be introduced into the said pipe.

Fig. 2 is a view taken on the line 2—2 of Fig. 1 showing the valve for controlling the openings from the containers into the pipe or a section thereof in open position;

Fig. 3 is a similar view but showing the valve in closed position; and

Fig. 4 is a view taken in the plane of the line 4—4 of Fig. 3.

In the drawing I have shown a tubular valve casing 1 the opposite ends of which are screw threaded internally as indicated at 2. The adjoining ends of pipes 3 and 4, which are externally screw threaded, are in screw threaded engagement with the screw threads 2 as is shown in Fig. 1 of the drawing. The section 1 and the pipes 3 and 4 are in alinement with each other. The valve casing 1 is provided with holes located in contiguous relation to each other through which powdered material may be discharged from the containers. The said casing 1 is also provided with a lateral tubular projection 7 which is divided by means of a partition 8 into two passageways 9 and 10. Both of these passageways are in communication through the holes 5 and 6 with the interior of the casing 1, as shown in Fig. 1 of the drawing.

The outer end of the hollow or tubular projection 7 is provided with a laterally extending flange 11 to which the flange 12 at the lower reduced end of a container 13 is connected by means of bolts 14 and wing nuts 15. The container 13 is divided by means of a central partition 16 into two chambers 17 and 18, into one of which —17— aluminum sulphate may be placed and into the other one of which bicarbonate of soda may be placed, both in powdered form. The stabilizing substance, also in powdered form should be placed in one or the other of these chambers, or a portion of said stabilizing substance may be placed in one chamber and a portion in the other. The passageways 9 and 10 constitute in effect the bottom portions of the chambers 17 and 18.

It will be assumed that the water flows through the passageway of the tube 3, casing 1, and tube 4 in the direction of the arrows 20 thereon.

A nozzle 21 is mounted within the casing 1 near its left hand end as shown in Fig. 1. The outer end of the said nozzle is in the form of a head which is provided with external screw threads which are in engagement with the screw threads 2 to which reference has been made previously. The outer end of the

nozzle 21 preferably is in contact with the inner end of the pipe 3 as shown. The opening through the nozzle 21 is tapered as indicated at 22. The nozzle discharges into a tubular valve section 23 rotatably mounted within the valve casing 1. The left hand end of the rotatable tubular valve section 23 is located in contact with the shoulder formed by the inner end of the head of the nozzle 21. The opposite end of the tubular section 23 is in abutting relation to an internal adjustable sleeve 25 within the right hand end of the valve casing 1. The left hand or inner end of the pipe 4 also is in abutting relation to the opposite edge of the sleeve 25. The rotatable tubular valve section 23 is provided with openings 26 and 27 located near to each other as shown in Fig. 1, which openings are adapted to register respectively with the lower ends of the passageways 9 and 10 of the projection 7 previously referred to. It is necessary when the rotatable tubular valve section 23 is in open position that the openings 26 and 27 thereof shall register with the lower or adjoining ends of the passageways 9 and 10 through the hollow or tubular projection 7 previously referred to. In order to insure such registration the nozzle 21 and the sleeve 25 may be adjusted within the valve casing 1 into positions to hold the rotatable tubular valve section 23 in such position that when opened the holes 26 and 27 will register exactly with the lower ends of the passageways 9 and 10.

For the purpose of rotating the tubular valve member or section 23 into open or closed position I have provided a handle 30 the inner end of which is connected with the member 23. The said handle projects through the slot 31 in the casing 1.

In Figs. 1 and 2 of the drawing the tubular valve member or section 23 is shown in open position while in Figs. 3 and 4 it is shown in closed position. In the latter position neither of the foam producing substances may or can be discharged from the chambers 17 and 18. But upon turning the rotatable tubular valve member or section 23 into the position shown in Fig. 2 of the drawing the holes 26 and 27 are moved into registration with the lower end of the passageways 9 and 10 whereupon any foam producing substances which may be present in proper form, such as a powder, in the chambers 17 and 18 are free to be discharged into the passageway through the tubular section 23 rotatably mounted within the valve casing 21. As a matter of fact the tubular section 23 constitutes in effect a part of the pipes 3 and 4.

The water flows through the passageway of the pipes under pressure. Acceleration of the flow is caused by the tapering passageway 22 through the nozzle 21, in known manner, as a result of which a partial vacuum is created within the rotatable tubular valve 23, particularly within that portion thereof adjoining the inner end of the nozzle 21 opposite the openings 26 and 27. The creation of a partial vacuum within the tubular section 23, and particularly within the region thereof as stated, causes the foam producing materials in powdered form to flow or to be discharged from the chambers 17 and 18 into the tubular valve section 23 and into the stream of water flowing therethrough. The flow of the said powdered foam producing substances through the passageways 9 and 10 and openings 26 and 27 into the tubular valve section 23 is due to the combined forces of gravity (if the container 13 occupies a vertical position as shown) and to the excess of the external pressure of the atmosphere over the pressure within the said tubular valve section 23.

The pressure of the water within the pipes may be indicated by a pressure gage as indicated at 32.

In order to prevent a back flow of the water or foam from the pipe 4 I have provided a check valve 33 of usual construction which is located in the pipe 4 at a point near its connection with the valve casing 1, as shown in Fig. 1 of the drawing.

A construction of the character of that indicated permits the storage of the foam producing substances separately and when occasion arises for their use they are introduced separately into the chambers 17 and 18 with the necessary quantity of stabilizing material as above indicated, whereafter the tubular valve section 23 is moved into open position whereupon if a stream of water is flowing through the passageway therethrough the materials are drawn into the tubular section 23 wherein and possibly therebeyond they enter into solution and react to produce a foam under such pressure that it may be sprayed onto a fire to effect extinguishment thereof.

The flow of the water through the passageways of the pipes 3 and 4 is controlled by means of a valve at 34 of any known construction.

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

1. In means for producing fire extinguishing foam, the combination of a valve casing having openings therethrough in contiguous relation to each other through which substances are adapted to pass separately from separate containers, a tubular passageway through which water may flow, the said valve casing constituting a part of the said passageway, means located within the said valve casing whereby the flow of water through the said casing causes the said substances to flow through the said openings and into the stream of water flowing through the said tubular passageway, the said substances being dissolved in the said stream of water and after dissolution reacting to produce foam and

a movable valve member located within the said valve casing for opening and closing the said openings through the latter.

2. In means for producing fire extinguishing foam, the combination of a tubular passageway through which water may flow, containers for holding powdered substances, which containers are in communication through separate passageways with the said tubular passageway, means within the said tubular passageway in cooperative relation to the passageways leading from the said container into the said tubular passageway whereby the flow of water through the said tubular passageway causes the said powdered substances to flow through the openings from the said containers into a stream of water flowing through the said tubular passageway, which substances react after dissolution in the said stream to produce fire extinguishing foam, and a movable valve member located in the said tubular passageway in cooperative relation to the said separate passageways for opening and closing the latter.

3. In means for producing fire extinguishing foam, a combination of a tubular passageway through which water is adapted to flow, containers adapted to hold powdered substances, from which containers separate passageways lead into the said tubular passageway, a valve member located within said tubular passageway in cooperative relation to the passageway leading from the said containers into the said tubular passageway whereby the said passageways from the said containers may be opened and closed, and means included within the said tubular passageway and located in cooperative relation to the juncture of the said passageway leading from the said containers with the said tubular passageway whereby the flow of water through the said tubular passageway causes the powdered substances in said containers to flow through the passageways leading from the said containers into the said tubular pasageway, which substances upon dissolution in the said stream of water react to produce a foam.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 28th day of February, A. D. 1927.

LEON FABER.