April 24, 1934. F. L. BOYD 1,956,310

APPARATUS FOR THE EXTINGUISHMENT OF FIRE

Filed March 28, 1929 3 Sheets-Sheet 1

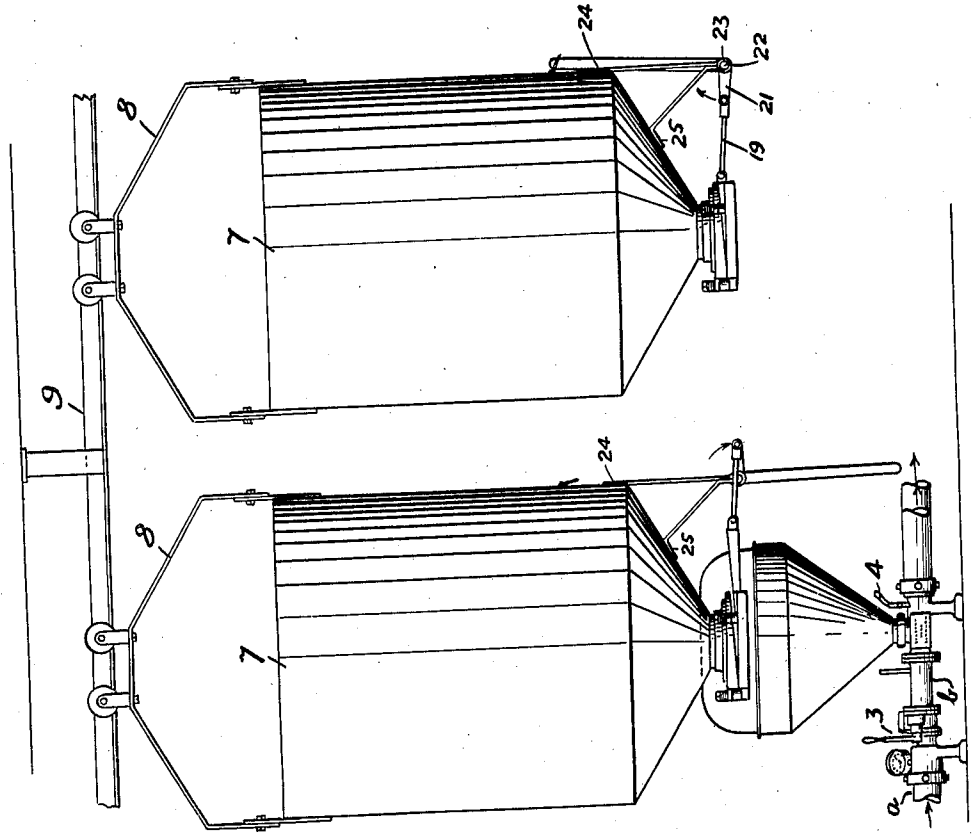


FIG. 1.

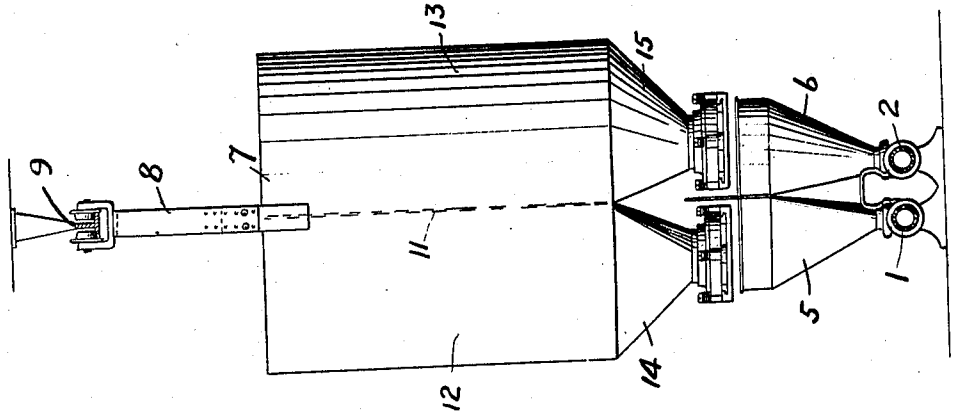


FIG. 2.

INVENTOR

Fisher L. Boyd

BY

Cyrus N. Anderson

ATTORNEY.

WITNESS:

Robt P. Kitchel.

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APPARATUS FOR THE EXTINGUISHMENT OF FIRE

Filed March 28, 1929 3 Sheets-Sheet 2

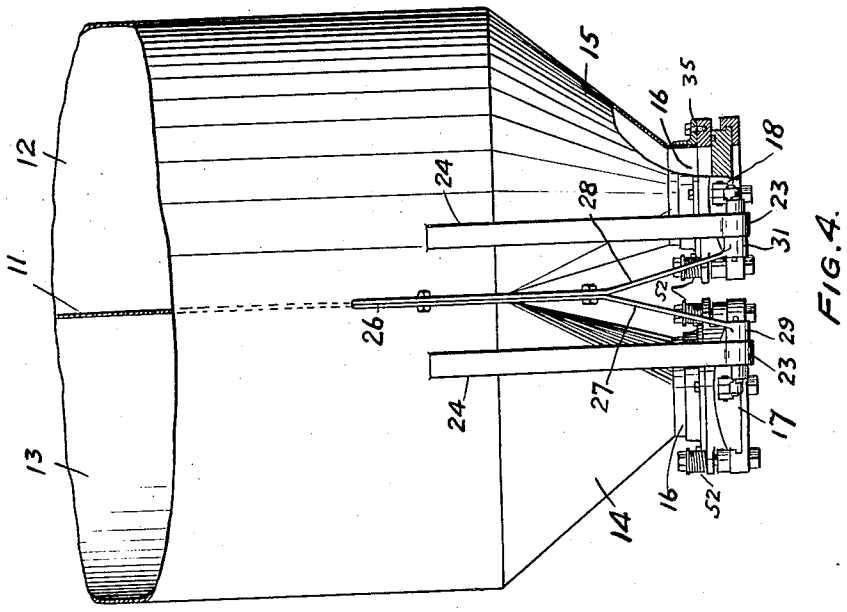


FIG. 4.

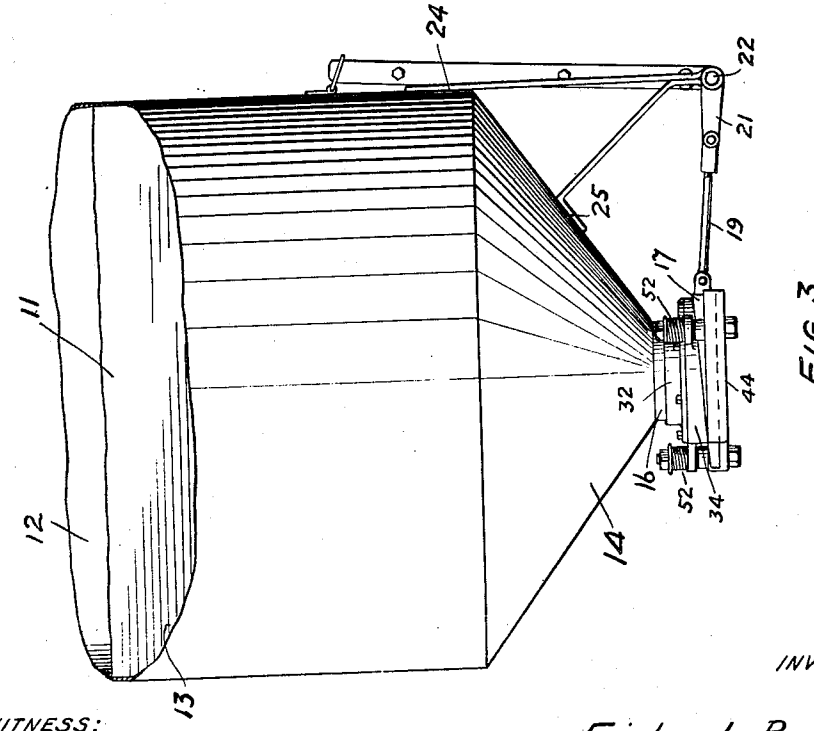


FIG. 3.

INVENTOR

Fisher L. Boyd

BY

Cyrus N. Anderson

ATTORNEY.

WITNESS:

Robt. P. Kitchel.

April 24, 1934. F. L. BOYD 1,956,310

APPARATUS FOR THE EXTINGUISHMENT OF FIRE

Filed March 28, 1929 3 Sheets-Sheet 3

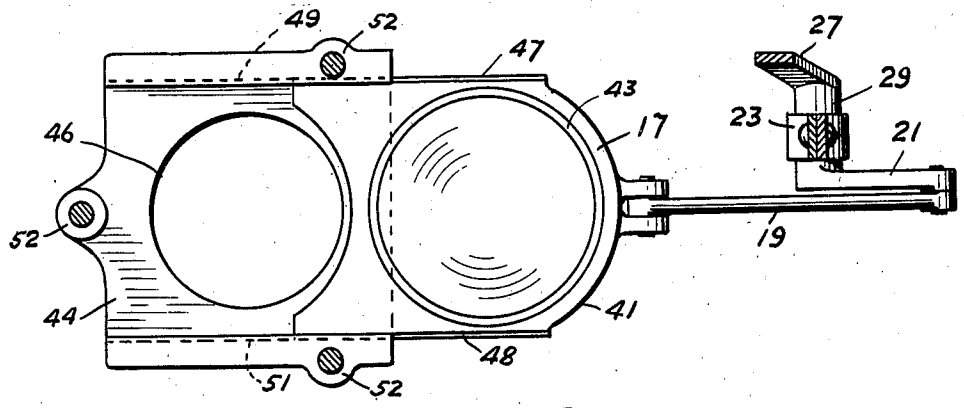


FIG. 5.

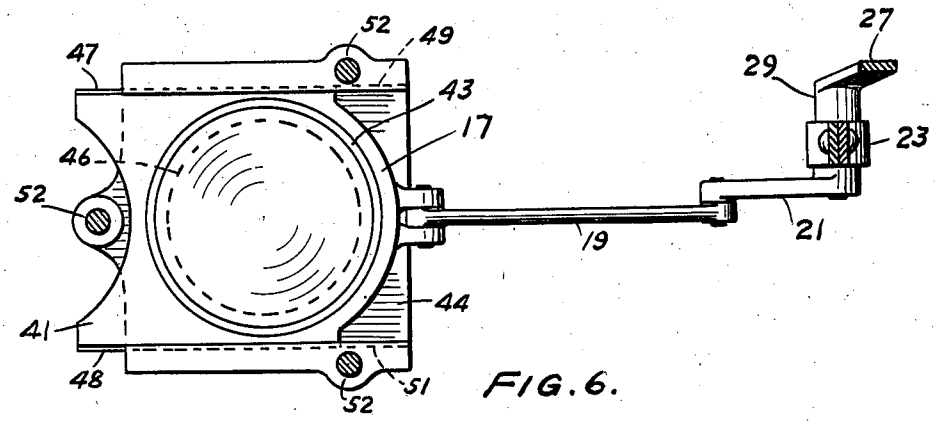


FIG. 6.

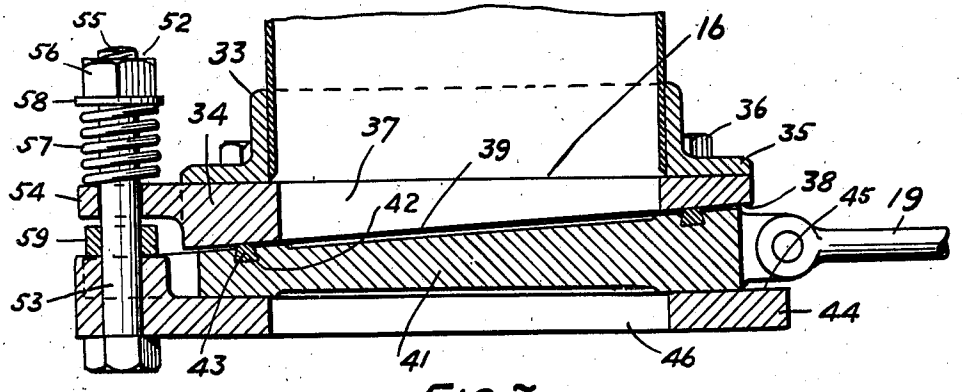


FIG. 7.

INVENTOR

Fisher L. Boyd

BY

Cyrus N. Anderson

ATTORNEY.

WITNESS:

Robt. R. Mitchell

Patented Apr. 24, 1934 1,956,310

UNITED STATES PATENT OFFICE

1,956,310

APPARATUS FOR THE EXTINGUISHMENT OF FIRE

Fisher L. Boyd, Haverford, Pa., assignor to National Foam System, Inc., Philadelphia, Pa., a corporation of Delaware

Application March 28, 1929, Serial No. 350,470

1 Claim. (Cl. 169—15)

My invention relates to means for extinguishing fire, and it has particular relation to apparatus for the production of fire-extinguishing foam.

Such an apparatus, for example, is shown in my co-pending application for Letters Patent of the United States Serial No. 199,277, filed June 16, 1927. In that apparatus, different substances are introduced into separate flowing streams of water wherein they are dissolved. Upon the uniting of said streams, chemical reaction between the substances in solution takes place to produce a fire-extinguishing foam. Such union of the streams and the resultant chemical reaction should take place at a point in proximity to the place of application of the foam. The substances employed may and actually do consist of aluminum sulphate and bicarbonate of soda, together with a suitable stabilizing agent.

One object of my invention is to provide, in apparatus of this kind, a storage chamber having a dry foam-producing substance, in combination with means whereby said storage chamber may be easily and quickly moved from a distant position to one which is in discharging relation to the hoppers of the foam-producing apparatus. Such arrangement does away with the necessity for manually pouring the chemicals into the said hoppers and it also makes possible the operation of the equipment by one man.

With these and other objects and applications in mind, my invention further consists in the details of construction and operation and arrangement, hereinafter described and claimed and illustrated in the accompanying drawings, wherein,—

Figs. 1 and 2 are side and end elevational views, respectively, of fire-extinguishing apparatus embodying my invention, one of the movable storage chambers being shown directly over the hoppers of the foam-producing apparatus, with the valves thereof in the open position;

Figs. 3 and 4 are enlarged, detail, side and end elevational views, respectively, of the storage chamber with its associated valve mechanism;

Fig. 5 is an enlarged horizontal sectional view of the valve mechanism, showing the valve in its open position, permitting the passage of material from the storage chamber into one of the hoppers;

Fig. 6 is a view similar to Fig. 5 but showing the valve closed; and

Fig. 7 is an enlarged, detail, vertical sectional view of the valve mechanism, showing the valve closed.

Referring to Figs. 1 and 2, a pipe or conduit *a* is provided for supplying water from a source (not shown) through a Y-connection *b* to a pair of conduits 1 and 2. The conduits 1 and 2 may be united at a distant point (not shown), which is in proximity to the place of application of the fire-extinguishing foam. A valve 3 is provided in the pipe *a* for controlling the flow of fluid therethrough and through the pipes or conduits 1 and 2. The conduits 1 and 2 are connected through valves 4 to a pair of hoppers 5 and 6, respectively, which are adapted to receive the foam-producing substances, all as is set forth in my co-pending application aforesaid.

In accordance with my invention, the foam-producing materials for the hoppers 5 and 6 are stored in a large chamber or casing 7 which is supported by a trolley structure 8 traveling on an overhead track 9. The track 9 may extend from a distant storage point (not shown), and it is so positioned with respect to the hoppers 5 and 6 that the casing 7 may be moved directly over said hoppers so as to be in discharging relation with respect thereto. Fig. 1 shows one storage chamber 7 in the act of discharging its contents into the hoppers 5 and 6, with a second storage chamber close by ready to be moved into the position of the first storage chamber 7. Such arrangement eliminates the necessity for the manual pouring of the chemicals, as has heretofore been the practice, and it further simplifies the control of the equipment as a whole, since only one man is necessary for the successful operation thereof.

Referring further to the storage chamber 7 it is divided by a central partition 11 into separate sections 12 and 13 in which the different foam-producing substances may be stored. The lower ends of these chambers terminate in funnel sections 14 and 15 having outlet openings 16 which are respectively controlled by slide valves 17 and 18. The valves 17 and 18 are respectively connected by links 19 to arms 21 rigidly mounted on shafts 22 journaled in bearings 23. Each of the bearings 23 is formed by bending an intermediate portion of a strap member around the shafts 22. The end portions 24 and 25 of each of the strap members are welded or otherwise secured to the casings. The shafts 22 may be operated by a common hand lever 26 comprising a pair of straps 27 and 28, the upper ends of which are bolted together to form the handle. The lower ends of the straps 27 and 28 are respectively provided with hub portions 29 and 31 which are rigidly secured to the shafts 22, so that

when the hand lever 26 is moved from the position shown in Fig. 3 to the position shown in Fig. 1, the valves 17 and 18 are actuated from their closed position to their open position, as will appear hereinafter in greater detail.

Inasmuch as the structure of the valves 17 and 18 is identical, only one of the valves, say 17, will be described in detail. Referring to Figs. 3, 4, 5 and 6, and 7, a vertical flange 32 of a circular angle member 33 is welded or otherwise secured to the lower portion of the section 14 of the casing 7 immediately adjacent to the cutlet opening 16 thereof. A ring member 34 is secured to an under side of a flange 35 of the angle member 33 by means of bolts 36, so that an opening 37 therein registers with the outlet opening 16 of the casing section 14. The ring 34 is provided with a beveled lower side 38, as shown in Fig. 6, forming an inclined seat for a correspondingly beveled upper side 39 of a plate 41 forming the valve 17. The upper side 39 may be provided with a circular recess 42 which is adapted to receive a sealing ring 43 of lead or similar material positioned in sliding engagement with the seat 38.

The valve plate 41 may be supported on a base plate 44, an upper side 45 of which constitutes a lower seat for said valve plate 41. The base plate 44 is also provided with an aperture 46 which registers with the opening 37 in the upper ring member 34. The valve 41 may be guided during the movement caused by the swinging of the hand lever 26 in the manner shown in Figs. 5 and 6, wherein it is noted that longitudinal side edges 47 and 48 of the valve plate 41 are interlocked with grooves 49 and 51, respectively, formed in the base plate 44, so as to prevent a relative vertical movement between the valve plate 41 and the base plate 44 while permitting a relative longitudinal sliding movement, such as occurs when the valve plate 41 is moved from the position shown in Fig. 5 to that shown in Fig. 6.

The bottom plate 44 may be resiliently supported by means of a plurality of devices 52, each of which comprises a bolt 53 which extends upwardly through the plate 44 and a horizontal projection 54 on the upper ring member 34. The bolt 53 terminates in a threaded portion 55 having a nut 56 mounted thereon, which is positioned in spaced relation to the projection 54 so as to receive therebetween a spring 57. A washer 58 may be positioned between the upper end of the spring 57 and the adjustable nut 56. The combined force of the several springs is such as to hold the valve plate 41 tightly in engagement with the upper and lower valve seats 39 and 45 when the valve plate 41 is in the closed position shown in Fig. 6. When the valve plate 41 is moved from its closed position between the valve seats 39 and 45, the lower plate 44 moves upwardly under the force of the springs 57 a slight amount, which is determined by the thickness of one or more washers 59 positioned between the extensions 54 of the upper ring 34 and the upper side of the base plate 44.

In operation, when it is desired to fill the hoppers 5 and 6, one of the storage chambers 7 is moved on the overhead track 9 until the discharge outlets 16 thereof are directly over the hoppers 5 and 6. The valve-operating member 26 is then moved from its upper position shown in Fig. 3 to the lower position shown in Fig. 1. Such movement actuates each of the valves 17, 18 from the position shown in Fig. 6 to that shown in Fig. 5. When it is desired to remove an empty storage chamber 7 so as to make room for a new one, the hand lever 26 is raised into a vertical position, so as to close the valves 17 and 18. The introduction of the chemicals from the hoppers 5 and 6 into the conduits 1 and 2 may be controlled by the valves 4, as set forth in my aforesaid application.

While I have shown only one form of embodiment of my invention, for the purpose of describing the same and illustrating its principles of construction and of operation, it is apparent that various changes and modifications may be made therein without departing from the spirit of my invention. I desire, therefore, that only such limitations shall be imposed thereon as are indicated in the appended claim or as are demanded by the prior art.

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

In a system for extinguishing fires, in combination, a dual container for receiving in separated relation dry foam-forming ingredients capable upon reacting with each other in the presence of a solvent to produce foam; a foam producing and ejecting apparatus including a dual hopper for separately receiving and introducing said ingredients into a flowing stream of water; a continuous elevated track extending from a point above said apparatus to a point removed therefrom, means for suspending said dual container from said track for movement therealong, said dual container being provided with separate discharge openings through which said ingredients are separately discharged; and means for simultaneously effecting the separate discharge of said ingredients from said container into said hopper when the former is moved into discharging relation with respect to the latter.

FISHER L. BOYD.