Aug. 9, 1927. 1,638,729

W. FRIEDRICH

DRY FIRE EXTINGUISHER

Filed March 29, 1922

Fig. 1

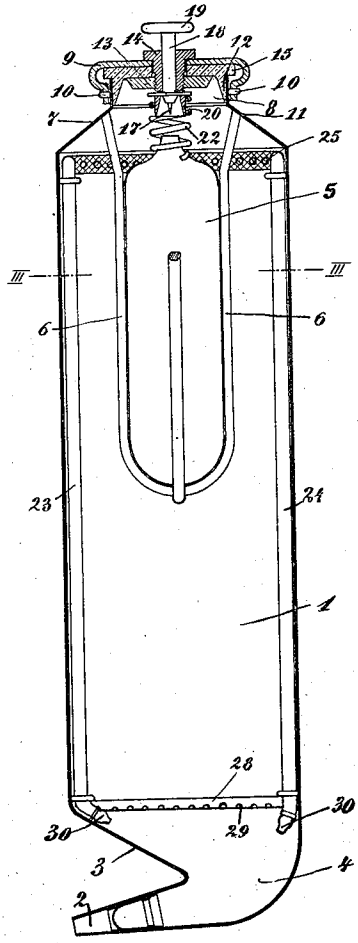


Fig. 2

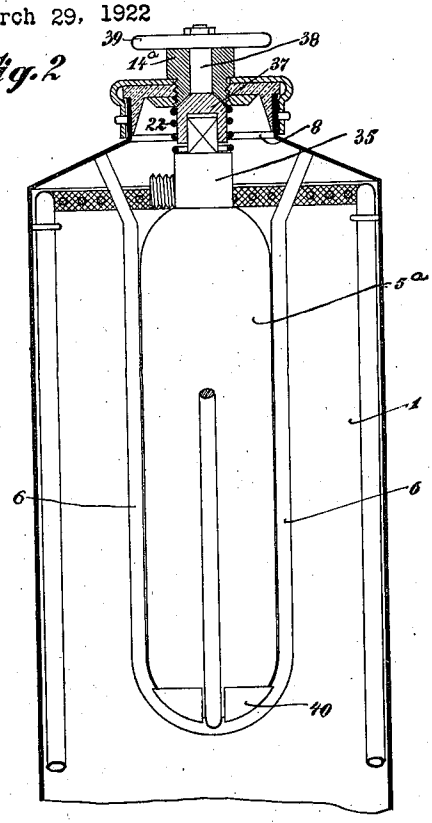


Fig. 5

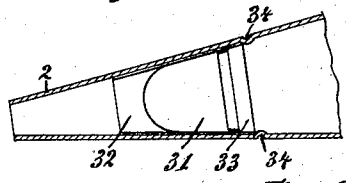


Fig. 3

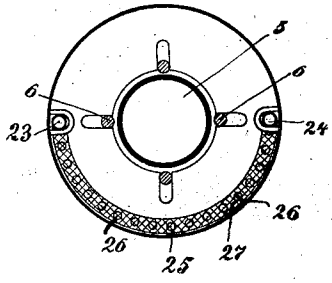


Fig. 4

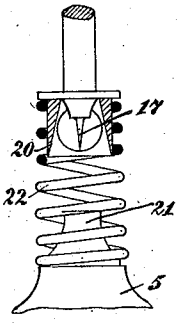


Fig. 6

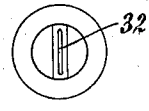
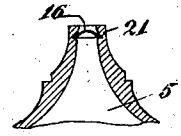


Fig. 7



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UNITED STATES PATENT OFFICE.

WILHELM FRIEDRICH, OF BERLIN-LANKWITZ, GERMANY.

DRY FIRE EXTINGUISHER.

Application filed March 29, 1922, Serial No. 547,652, and in Germany January 27, 1922.

My invention relates to a fire extinguisher of the kind in which a pulverulent extinguishing powder is enclosed in a receptacle and driven out thereof in the form of a jet by means of a suitable gas contained under pressure in a gas-bottle located within said receptacle. More especially my invention relates to particularly reliable and securely operating constructional forms of fire-extinguishers of the type mentioned, and in order to make my invention more clear, I refer to the accompanying drawing in which are illustrated diagrammatically and by way of example two extinguishers devised according to this invention.

Figure 1 is a longitudinal section through one form of the invention,

Figure 2 is a similar section through the other form, drawn to a slightly enlarged scale,

Figure 3 is a horizontal section on line III—III of Figure 1, and

Figures 4, 5, 6 and 7 are details.

Referring to Figure 1, 1 denotes the receptacle receiving or containing the pulverulent extinguishing substance, and 5 denotes the gas-bottle which is carried within the receptacle 1 by a skeleton or cage 6 consisting of rods affixed to, and suspended from, the conical top 7 of the receptacle 1. The lower end of the receptacle 1 is contracted to form an oblique wall 3 and a chamber 4 from which extends obliquely and downwardly a nozzle 2 through which the pulverulent extinguishing substance is expelled. The object of the oblique wall 3 is to permit positioning the nozzle 2 in such a manner that it does not project beyond the limits of the cylindrical wall of the receptacle 1 on that side where the nozzle 2 terminates. Shaping the lower part of the receptacle 1 in this manner is advantageous for transportation purposes in that a larger number of the extinguishers can be packed into a chest of a certain given size.

At the upper end of the receptacle 1 is a short sleeve or flange 11 forming an opening 8 of comparatively large diameter. The diameter of this opening 8 is such that the gas-bottle 5 can be inserted into the receptacle 1 therethrough, and, of course, also removed out of the receptacle. The same orifice serves for the introduction of the dry extinguishing powder into the receptacle, in that the top of the gas-bottle is located so much below the sleeve 11 that a sufficiently large annular passage remains through which said powder can be deposited into the receptacle.

The orifice 8 can be closed by means of a cap 9 which can be connected with the sleeve 11 by two oppositely located bayonet-joints, of which only the pins 10 are shown in Figure 1. The cap 9, the cylindrical portion of which encompasses the sleeve 11, is connected with an inner cap 12, which consists of a soft material, such as rubber or leather or the like, and the cylindrical portion of which is encompassed by the said sleeve 11 and contacts intimately therewith so as to serve as a packing. The flat top-member of this inner cap contacts with the edge of the sleeve 11 and is held in intimate contact therewith by the two bayonet-joints of the cap 9, for which, of course, other, equivalent means may be used. The two caps are firmly connected with one another by a small sleeve 14 which is flanged at its top and threaded at its lower end. The flange lies on the top of the outer cap 9, and the thread carries a disk 13. The top portions of the two caps are pressed against one another by said flange and said disk. In the constructional form illustrated in Figure 1 the caps are connected with each other also by the rim 15 of the inner cap 12 engaging an internal circular groove formed in the suitably bulged-out edge portion of the outer cap 9, as shown.

When an internal pressure arises within the receptacle, 1, the cylindrical portion of the inner cap is pressed against the sleeve or flange 11 so that no gas can escape. The greater the pressure of the gas in the receptacle is, the more securely is the receptacle closed.

The compressed gas enclosed in the bottle 5 is prevented from escaping by means of a small disk 16 (Fig. 7) consisting of tin or other metal inserted into the top portion 21 of the gas-bottle and adapted to be pierced by a pin. Besides the disk 16 a rubber cap or solder may also be employed to ensure perfect tightness of the bottle.

The sleeve 14 serves as a guide for an axially moveable bolt 18 provided on its top with a knob 19, and at its lower end with a piercing pin 17 of iron or steel by means of which a hole can be made through the closing disk 16 of the gas-bottle 5. Normally, the members 17, 18, 19 are held in the position shown in Figures 1 and 4 by means of a helical spring 22, the lower end of

which bears upon the top of the gas-bottle, and the upper end of which embraces a hollow conical member 20 connected firmly with the bolt 18. When the bolt 18 with its pin 17 is struck down by a blow upon the knob 19, the pin will penetrate into, and will pierce, the closing disk 16 whereby the gas will be permitted to escape into the receptacle 1.

The spring 22 not only holds the members 17, 18, 19 normally in raised position, and moves them back thereinto after the opening of the gas-bottle, but retains also the gas-bottle in its cage.

The space in the casing 1 below the gas-bottle, and also around it, having been filled with the pulverulent extinguishing substance, and the vessel 1 closed perfectly tight by the means hereinbefore described, then the closure 16 of the gas-bottle is pierced by means of the parts 19, 18, 17, and the gas escapes into the casing, and pressing upon the upper surface of the extinguishing substance, drives it out of the nozzle 2. The gas is conducted for this purpose, however, into the lower part of the casing 1 by means of two vertical tubes 23 and 24 which are located oppositely to one another and are connected with each other at their upper ends by a semi-circular tube 25 having a plurality of apertures 26 covered with a fabric 27 which prevents particles of the extinguishing powder being conveyed by the gas into the tubes 25, 23 and 24. The gas filling the space above the extinguishing powder flows through the apertures 26 of the tube 25 and through this tube to and through the tubes 23 and 24 and escapes at the lower ends of the same through nozzles 30 into the extinguishing powder which is whirled up and driven out through the nozzle 2 of the casing.

This effect is ensured and increased by an annular tube 28 which is connected with the tubes 23 and 24 and supplied by them with the gas, and provided with downwardly directed orifices 29 through which the gas escapes into the extinguishing powder, which is blown out of the nozzle 2. Also the orifices 28 are preferably covered with a fabric, preferably a fine wire-netting of brass or copper which is soldered to the tube 28 at suitable places. Instead of mere nozzles 30, preferably lip valves are employed which prevent the extinguishing powder from entering into the tubes 23 and 24.

I prefer to insert a lip valve also into the nozzle 2. In the constructional form shown in Figure 5 this valve consists of a body 31 which is circular in cross-section and conical in axial section and forms at its smaller end an outlet member 32 having the lips and the outlet opening between them, as shown in Figure 6. The valve body 31 consists of rubber or the like, and is at its rear end provided with a rigid ring 33 held in place in the nozzle 2 by the projections 34.

Referring now to the modification illustrated in Figure 2, the gas-bottle 5^a is provided with a valve 35 of its own, upon the square head of which a correspondingly shaped mate-member 37 fits. The member 37 is connected with a hand-wheel 39 by a short spindle 38 whereby the valve 35 of the gas-bottle can be opened and closed. The spindle 39 is located in a sleeve 14^a which is practically an equivalent of the sleeve 14 of Figure 1. The bottle has at its lower end a member 40 which engages between the wires of the cage and prevents the bottle from turning on opening and closing it. The helical spring 22 serves to retain the gas-bottle in proper position in the cage 6.

I claim:—

1. A fire extinguisher for use in connection with an extinguishing powder, comprising, in combination, a receptacle adapted to receive said powder, a gas-bottle located completely within said receptacle, the gas escape opening of the bottle being in direct communication with the space above the extinguishing powder in said receptacle when the bottle has been opened, means for opening said bottle from outside the receptacle, a delivery nozzle at the other end of the said receptacle, and tubes connecting the two ends of the receptacle with each other and being adapted to conduct the driving gas from the space around the top of the gas bottle to the space at the delivery nozzle, substantially as set forth.

2. A fire extinguisher for use in connection with an extinguishing powder, comprising, in combination, a receptacle adapted to receive said receptacle, means for opening said bottle from outside the receptacle, a delivery nozzle at the other end of the said receptacle, tubes connecting the two ends of the receptacle with each other and being adapted to conduct the driving gas from the space around the top of the gas bottle to the space at the delivery nozzle, and a circularly curved perforated pipe connecting said tubes with each other at their delivery nozzle ends, the perforations being so located as to be adapted to direct the gas towards the delivery nozzle of the receptacle, substantially as set forth.

3. A fire extinguisher for use in connection with an extinguishing powder, in combination, a receptacle adapted to receive said powder, a gas-bottle located completely within said receptacle, means for opening said bottle from outside the receptacle, a delivery nozzle at the other end of the said receptacle, tubes connecting the two ends of the receptacle with each other and being adapted to conduct the driving gas from the space around the top of the gas bottle to the space at the delivery nozzle, and circularly curved

perforated pipes connecting said tubes with each other at their delivery nozzle ends, as well as at their opposite ends, the perforations of the curved tubes at the delivery nozzle ends of the said tubes being so located as to be adapted to direct the gas towards the delivery nozzle of the receptacle substantially as set forth.

4. A fire extinguisher for use in connection with an extinguishing powder, comprising, in combination, a receptacle adapted to receive said powder, a gas-bottle located completely within said receptacle, the gas escape opening of the bottle being in direct communication with the space above the extinguishing powders in said receptacle when the bottle has been opened, means for opening said bottle from outside the receptacle, a delivery nozzle at the other end of the said receptacle, and tubes located near the inner wall of the latter, and connecting the two ends of the receptacle with each other and being adapted to conduct the driving gas from the space around the top of the gas bottle to the space at the delivery nozzle, substantially as set forth.

5. A fire extinguisher for use in connection with an extinguishing powder, comprising, in combination, a receptacle adapted to receive said powder, a gas-bottle located within said receptacle, means for opening said bottle from outside the receptacle, a delivery nozzle at the other end of the said receptacle, tubes located near the inner wall of the latter, and connecting the two ends of the receptacle with each other and being adapted to conduct the driving gas from the space around the top of the gas bottle to the space at the delivery nozzle, and circularly curved perforated pipes connecting said tubes with each other at their delivery nozzle ends the perforations being so located as to direct the gas towards the delivery nozzle of the receptacle substantially as set forth.

In testimony whereof I have affixed my signature.

DR. WILHELM FRIEDRICH.