Sept. 25, 1956 F. EMMRICH ET AL 2,764,246

FIRE EXTINGUISHING APPARATUS

Filed May 14, 1953

Fig. 2

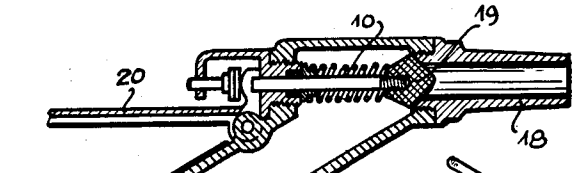
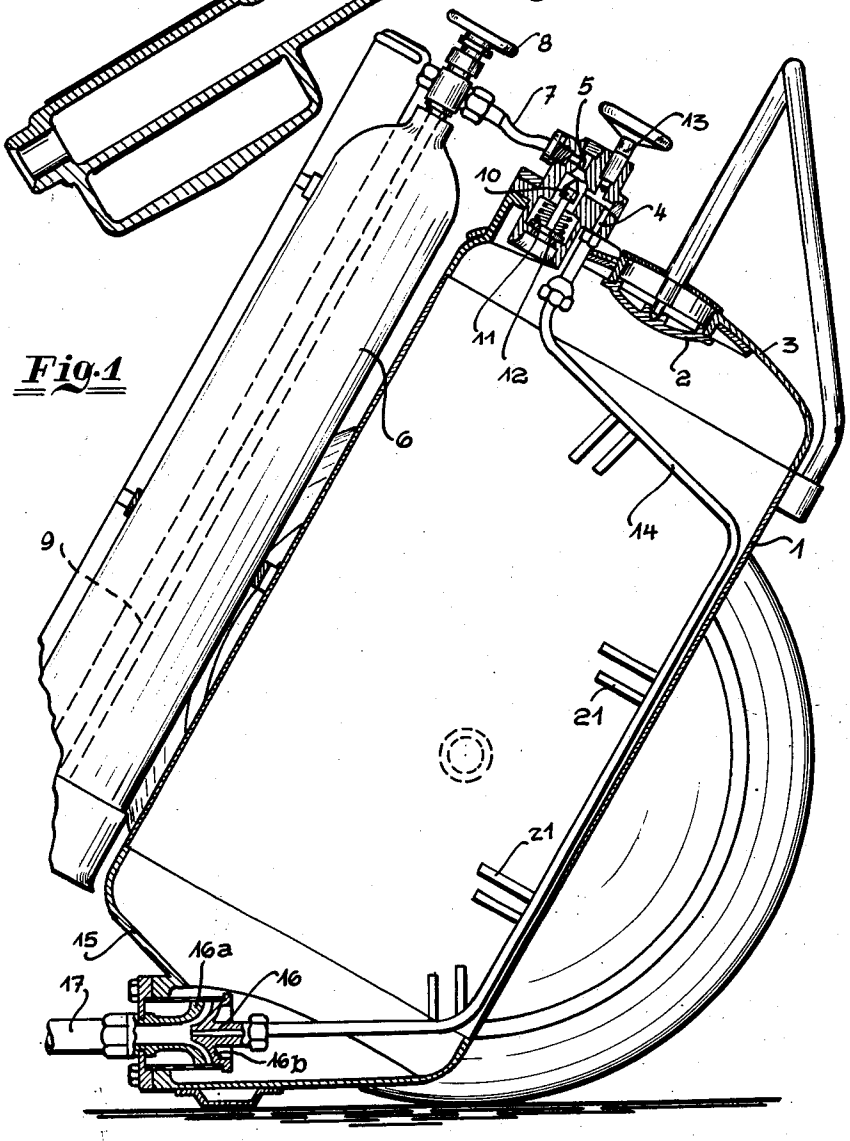


Fig. 1



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FIRE EXTINGUISHING APPARATUS

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4 Claims. (Cl. 169—31)

This invention relates to fire-extinguishing apparatus.

Fire-extinguishing appliances using carbon dioxide and dry powder are known per se in various constructional forms. These constructions, however, exclusively involve hand appliances of relatively small dimensions and consequently only a short operating period. The conversion of the construction of these small appliances to larger dimensions is, however, not readily possible, since the delivery of the corresponding quantities of dry powder presents difficulties when the mixture of carbon dioxide and powder has to be conveyed over relatively long distances and the spray member is adapted to be closed.

According to the present invention there is provided a fire-extinguishing appliance using carbon dioxide and dry powder, having a storage container for dry powder and a pressure-gas bottle, by which the storage container can be placed under the pressure of carbon dioxide, wherein there is a conduit connection from the pressure-gas bottle to an injector nozzle within the storage container, through which injector nozzle powder may be extracted from the container and fed to a closable delivery nozzle, there being also a regulating valve in the conduit connection arranged to be responsive to the gas pressure in said storage container, said regulating valve controlling passage of carbon dioxide from the pressure-gas bottle to the storage container. The pressure-gas bottle can be provided with a rising pipe, so that liquid carbon dioxide can be conveyed from the bottle to the injector nozzle and to tappings branched off from the conduit connection in the storage container.

In the use of such an apparatus the liquid carbon dioxide or the like contained in the pressure-gas bottle is also consumed and thus the contents of the bottle are better utilised. Furthermore, with the opening of the closable delivery nozzle of the pressure-gas bottle, a positive pressure is first of all set up in the storage container and this pressure is maintained for the whole of the operating period, since with the closing of the delivery nozzle for the extinguishing mixture the continued flow of carbon dioxide to the storage container and the injector nozzle is shut off upon reaching a predetermined pressure by means of the regulating valve.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made to the accompanying drawing in which,

Figure 1 is an axial section through one embodiment of the apparatus, and

Figure 2 is a section through a delivery nozzle.

The drawing illustrates a transportable appliance, but the invention is not, however, restricted to such appliances.

The storage container 1 accommodated on a carriage or truck and holding the dry powder is provided for filling purposes with a man-hole cover 2 in the top 3, which also carries a valve housing 4. The bore 5 in the valve housing 4 is connected at one end to an intermediate member 7 connecting it with a carbon dioxide bottle 6 which, in

the embodiment illustrated, is carried by the storage container 1. The manual shut-off valve 8 of the carbon dioxide bottle 6 is connected to a rising pipe 9 extending almost to the bottom of the bottle 6.

The bore 5 of the housing 4 is controlled by an independent auxiliary regulating valve 10, which is held in the open position by a spring 11. The spring 11 loads a plate 12, the opposite side of which is acted upon by the pressure obtaining in the container 1. The bore 5 of the housing 4, the passage of which is also adjustable by a reducing valve, for example needle 13, is connected to a pipe 14 which is led in the container 1 to an injector nozzle 16 arranged in the bottom 15 thereof. Branched off from the pipe 14 inside the container 1 are small discharge pipes 21. The liquid carbon dioxide issuing from these small pipes 21 effects a loosening of the dry powder in the container 1 and produces a build up of pressure in the latter. As soon as the pressure in the container 1 has reached a certain level, the plate 12 is lifted against the action of the spring 11, so that the valve 10 shuts off the further supply of carbon dioxide to the container 1. The injector nozzle 16 consists of the mixing nozzle 16*a* and the nozzle 16*b* which is adjustable relatively thereto. By this means, the quantity of the powder entrained by the pressure-gas can be regulated.

By means of the carbon dioxide supplied from the pipe 14 to the injector nozzle 16, the dry powder is extracted from the container 1 in a proportion determined by the dimensions of the injector nozzle, and the mixture then passes into a flexible pipe 17 with delivery nozzle 18 connected to the nozzle 16, the outlet of said nozzle 18 being adapted to be closed by a valve plug 19. A hand lever 20 serves for the actuation of the valve plug 19.

When the hand lever 20 is closed, the flow of carbon dioxide from the storage bottle to the container is shut off by the regulating valve 10 simultaneously with the reaching of the pre-adjusted maximum pressure in the container 1. However, the appliance remains ready for operation, the delivery of the carbon dioxide dry powder mixture being regulated only by the valve 19.

I claim:

1. A fire-extinguishing appliance, comprising, in combination, a storage container for dry powder having a top part and a bottom part, a bottle containing a compressed gas, a connection between said bottle and said storage container, said connection being adapted for building up a gas pressure in said container, manual means adjacent said bottle for closing said connection, means independent of said manual means controlled by said gas pressure in said container for closing said connection whenever a predetermined gas pressure in said container is reached, said independent closing means being arranged in said top part of said container, a pipe arranged in said container and extending from said top part to said bottom part thereof, a communication between said pipe and said connection, said pipe being adapted to be closed by said independent closing means upon reaching said predetermined gas pressure in said container, means for adjusting the cross-section of said communication, and an injector nozzle arranged in said bottom part of said container and connected to said pipe, said injector nozzle being adapted to extract dry powder from said container in a proportion determined by the dimensions of said injector nozzle.

2. An appliance as claimed in claim 1, said independent closing means including a valve housing having a bore, a regulating valve arranged in said bore of said valve housing, and means responsive to said gas pressure in said container for closing said regulating valve.

3. An appliance as claimed in claim 2, said pressure responsive means including a plate arranged in an opening of said top part of said container so as to close the

same in one end position thereof, and resilient means inserted between said plate and a wall portion of said opening, said plate being rigidly connected with said regulating valve.

4. An appliance as claimed in claim 1, said injector nozzle including a mixing nozzle connected to said bottom part of said container, and an adjustable nozzle connected to the end of said pipe for regulating the flow of the compressed gas from said pipe to said mixing nozzle.

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