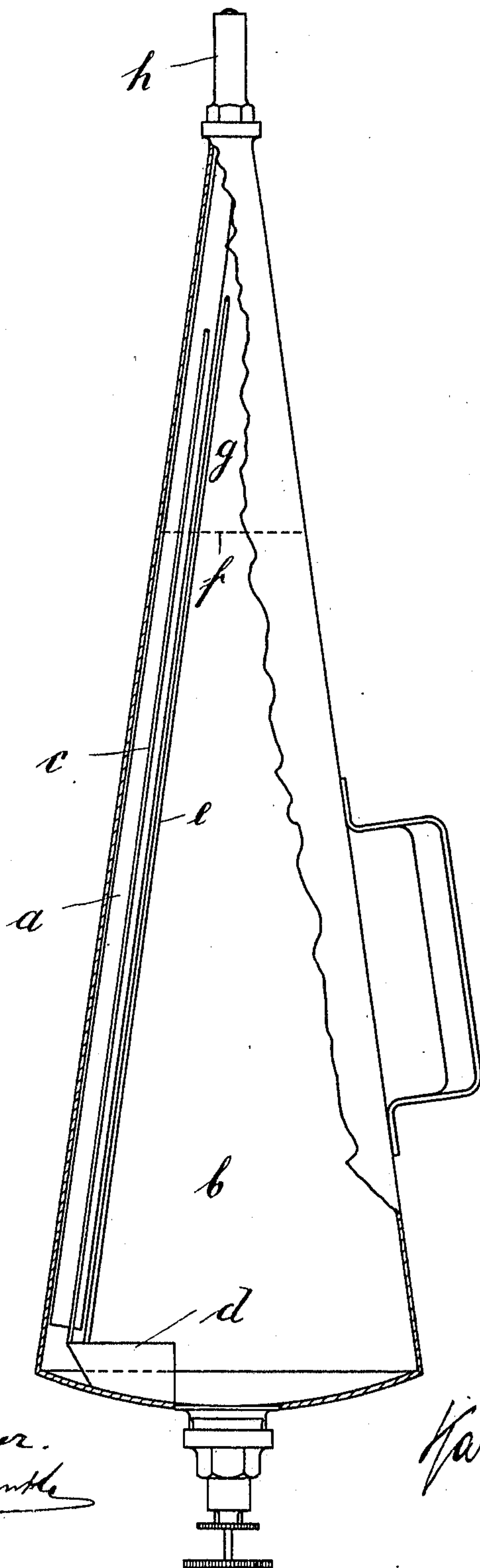


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 PRESSURE COMPENSATING DEVICE FOR THE AIR INCLOSED IN FIRE EXTINGUISHING APPARATUS.
 APPLICATION FILED JUNE 25, 1907.

945,288.

Patented Jan. 4, 1910.



Witnesses:

Alenus Wagner.

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UNITED STATES PATENT OFFICE.

KARL SCHMIDT, OF NEURUPPIN, GERMANY, ASSIGNOR TO THE FIRM OF MINIMAX CONSOLIDATED LIMITED, OF LONDON, ENGLAND.

PRESSURE-COMPENSATING DEVICE FOR THE AIR INCLOSED IN FIRE-EXTINGUISHING APPARATUS.

945,288.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed June 25, 1907. Serial No. 380,707.

To all whom it may concern:

Be it known that I, KARL SCHMIDT, a merchant, and a subject of the German Emperor, a resident of 9 Knesebeckstrasse, in the city of Neuruppin - in - the - Mark, Kingdom of Prussia, and German Empire, have invented a certain new and useful pressure-compensating device for the air, inclosed in fire-extinguishing apparatuses, and in particular in chemical fire-extinguishers, of which the following is a specification.

This invention has reference to a device in connection with fire extinguishers, by means of which the air space existing on top of the extinguishing liquid of the fire extinguishers is connected to the outer atmosphere in such a manner, that, when the inclosed air is expanded, a compensation of the pressure can take place, in order to prevent the so-called "working," that is to say the undesirable liberation of gas in the fire extinguishers when not in use. Devices of that kind have already been employed. Thus the fire extinguishers have been provided with a valve casing, communicating on the one hand with the discharge pipe for the extinguishing liquid and on the other hand with the interior air space, a ball valve being arranged in the casing. This ball valve is intended to open by the expansion of the air inclosed in the receptacle, so as to produce in this manner the compensation of pressure between the inclosed air and the outer atmosphere. As soon as the fire extinguisher is used, the ball valve is moreover intended to close the connection between the valve chamber and the discharge pipe of the fire extinguisher. This well known construction of extinguishers presents the inconvenience, that the ball valve is likely to stick completely to its seat in consequence of the vapors arising from the receptacle for the extinguishing liquid and in consequence of the oxidation of the metallic parts by the action of the atmospheric air, so that the purpose aimed at, is not accomplished; or it may happen, that the valve ball does not close at all the ring, situated before the outlet of the valve chamber and consisting of tightening material, at the side of the discharge pipe of the fire extinguisher, inasmuch as this ring would be destroyed by the vapors arising from the extinguishing liquid

or by accidental contact with the soda-solution. In such cases, considerable losses of pressure gas are unavoidable, so as to render the complete emptying of the liquid container doubtful. Further than that, holes have been provided in that part of the raising pipe, which is situated in the air space, in order to effect an admixture of gas to the jet of the extinguishing liquid. These holes permit at the same time the direct communication of the air contained in the fire extinguisher with the outside air. The arrangement of these holes results in an escape of gas, in consequence whereof a jet emitting a strongly cracking sound and interrupted in its continuity, is produced. Besides, the intentional discharge of gas appears rather useless, so as to constitute an unnecessary loss, since the gas bubbles, which are mixed with the liquid in the discharge pipe of the fire extinguisher, are separated at once completely or almost completely from the jet of liquid, when in the open air, as a result of the difference of specific gravities of gas and liquid, the gas bubbles being separated off mechanically in the open air by the friction of the jet, so that the said bubbles do not arrive at all at the seat of fire.

According to this invention, about to be described, an unimpeded communication of the air contained in the liquid receptacle with the outside air, is also intended to be produced, but any loss of gases in the operation of the fire extinguisher should be avoided. With this end in view, a U-shaped pipe is arranged in the fire extinguisher, one leg of which terminates in the discharge pipe above the level of the liquid in said pipe, while the other leg communicates with the air space of the liquid container. In this manner a direct communication of the inclosed air space of the fire extinguisher with the outer atmosphere is produced. When the fire extinguisher is operated, which is invariably resulting in an inclined position of the same, the said communicating pipe is filled with extinguishing liquid, so as to operate as a liquid seal, making it impossible for any pressure gas to escape. In order that this liquid seal may be maintained until the fire extinguisher is completely emptied, the connecting or communicating pipe should be sufficiently long, being preferably of such a

length, that the elbow of the pipe is at about the same level with the entrance opening of the discharge pipe of the fire extinguisher.

On the drawing a form of construction of the subject matter of the invention is shown, as applied to a pointed conically shaped fire extinguisher.

In this form of construction, given by way of example, the raising pipe *a* of the receptacle *b* contains the leg *c* of the communicating pipe, the lower end of said leg being connected to a chamber *d*, while the upper end terminates above the level of the liquid in the discharge pipe. To the chamber *d* or to the lower end of the leg *c* of said pipe the other leg *e* of the communicating pipe is connected, which terminates above the water level *f* in the air space *g* of the fire extinguishing apparatus.

By means of the pipes *c* and *e*, connected to each other, the air space *g* of the container communicates with the outside air through the liquid raising pipe *a* and the nozzle *h* of the same, so that no change of the level of the liquid is caused, the air in the interior of the container being able to compensate its pressure with the outside atmosphere.

The capacity of the chamber *d* is preferably of such proportions, that it is larger than the total capacity of the two pipes *c* and *e*. This is for the purpose of allowing any liquid, which might have entered into the pipes *c* and *e* on the filling of the apparatus, to run out into the chamber *d*, an air space being left however above the level of the liquid in the chamber *d*, whereby the direct communication between the two pipes *c* and *e* is established, so as to obviate any depression or raising of the column of water in one of the two pipes *c* and *e*.

The pipes *c* and *e* project preferably with their lower ends, which are connected to the chamber *d*, beyond the edge of the entrance opening of the raising pipe *a*, in order to prevent any siphon action in the filling of the apparatus, which is placed with the pointed end directed downward in this operation, such siphon action being likely to cause the entire contents of liquid of the container to be emptied out by this siphon action. There is no necessity of having the pipe *c* ascend in the liquid raising pipe in the manner, represented on the drawing. This pipe, as well as the pipe *e*, may be arranged outside of the pipe *a* and at a suitable point above the water level at *f*, the said pipe *e* may terminate into the raising pipe *a*.

There is no cause to fear any blowing out

of gas through the pipes *e*, *c* and *a* in the operation of the fire extinguisher, inasmuch as in the horizontal or approximately horizontal operating position of the manually operated fire extinguisher shown in the drawing, the pipe *e*, the chamber *d* and the pipe *c* are filled with liquid and remain filled with liquid, even when the sprinkling nozzle *h* is directed upward. The chamber *d* may also be dispensed with, and it may be replaced by an elbow piece, connecting the pipes *c* and *e*, provided the position of the fire extinguisher when not in use and stored, is identical with its filling position, as is the case in some constructions of fire extinguishers, because in such cases there is no fear of the pipes *c* and *e* getting filled with liquid, when the fire extinguisher is filled. The fire extinguisher shown in the drawing with its filling opening at the bottom, has to be placed with the jointed end downward, when it is desired to fill the device, while it is kept for storage with the pointed end directed upward. In this case, liquid will enter into the pipes *c* and *e* during the filling of the fire extinguisher, and provision has to be made for the running out of said liquid, when the fire extinguisher is reversed again, for the purpose of producing free unimpeded passage for the air, by the arrangement of the chamber *d*.

What I claim and desire to secure by Letters Patent of the United States is:—

In a fire extinguishing apparatus the combination of a discharge tube having a nozzle, with two pipes intended for connecting the air space existing on top of the extinguishing liquid of the liquid container to the outer atmosphere through said discharge tube and the nozzle of the same, the lower ends of said pipes terminating at a certain distance below the entrance opening of the discharge tube, while the upper ends of these pipes are in communication with the air spaces of the liquid container and the discharge tube respectively, and a chamber to which are connected the lower ends of said pipes, the capacity of this chamber being larger than the capacity of the pipes connected therewith, substantially as described.

In witness whereof I have hereunto signed my name this 23d day of May 1907, in the presence of two subscribing witnesses.

KARL SCHMIDT.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.