

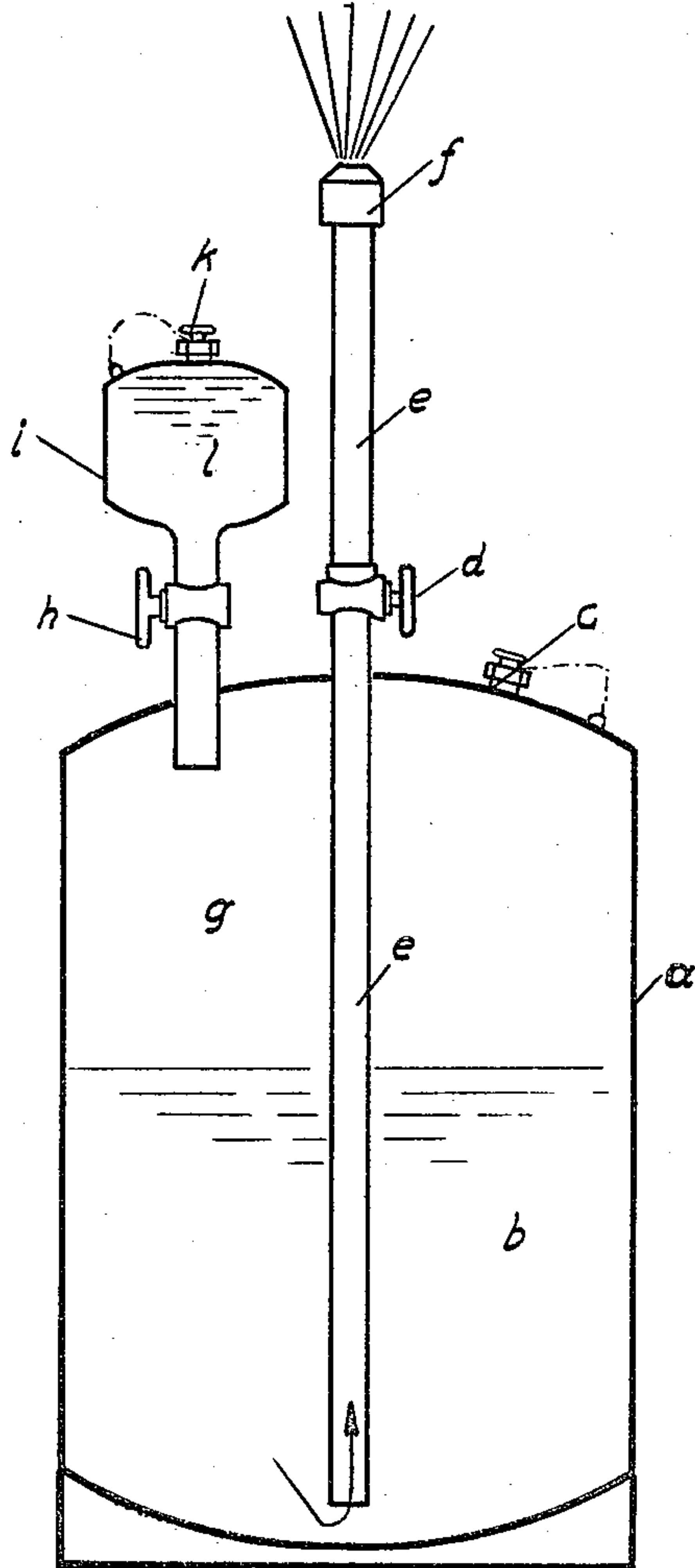
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ARTIFICIAL PRODUCTION OF FOG

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UNITED STATES PATENT OFFICE

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ARTIFICIAL PRODUCTION OF FOG

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The present invention relates to the artificial production of fog.

For the artificial production of fog, the atomization or spraying of the fog-forming substances through special nozzles under pressure has been practiced with great advantage. The pressure employed for this purpose has heretofore been supplied by compressed air or other gas. This practice, however, has several disadvantages which hinder the general use or adoption of such fog-spraying equipment. More particularly, the fog apparatus becomes comparatively heavy through the necessity of carrying a flask of compressed gas, and furthermore such apparatus is dependent upon a filling station with special mechanical equipment. The conveyance of a steel flask containing gas under high pressure also represents a source of some danger, particularly in field operations.

The present invention contemplates the production of the operating pressure only at the time of placing the apparatus in use, by taking advantage of the dehydrating property of the fog-producing acids (for example, sulphur trioxide dissolved in chlorosulphonic acid). It is known that formic acid or oxalic acid can be dehydrated by interaction with sulphuric acid in a heated state, and carbon monoxide or a mixture of carbon monoxide and carbonic acid produced. It was not heretofore known that this reaction occurred with a solution of sulphuric anhydride in chlorosulphonic acid in the unheated state. These materials decompose under the influence of a strong dehydrating agent into gaseous bodies without forming a solid residue. In this action, carbon monoxide and carbonic acid are produced, thus from oxalic acid equal volumes of the two, or from each 90 grams of dry oxalic acid there will be produced 44 liters of this mixture. In the decomposition of dry formic acid, 22 liters of pure carbon monoxide are produced from 46 grams of the formic acid.

The accompanying drawing illustrates diagrammatically a conventional form of apparatus in which the process may be performed.

The apparatus illustrated can be employed as stationary equipment or it may serve as a buoy. It comprises a completely closed container *a*, the lower portion *b* of which is supplied with a fog-producing acid. The opening *c*, which may be closed by a screw cap, serves for filling the container. From the space *b* rises a pipe *e*, which is closed by the valve *d*, and carries on its top an atomizing nozzle *f*. Delivering into the upper portion *g* of the container *a*, is a reservoir *i*, the discharge from which is controlled by a shut-off valve *h*, the reservoir *i* having at the top an opening *k* which is closed by a screw cap. Reservoir *i* is supplied with a suitable organic compound indicated at *l*.

When the valve *h* is opened, the organic compound *l* (for example, oxalic acid) flows into the fog-producing acid at *b* (for example, sulphur trioxide dissolved in chlorosulphonic acid) and is at once decomposed with the formation of the desired gas pressure. The gas thus produced accumulates in the space *g* and upon opening of the valve *d*, expels the fog-producing acid in the direction of the arrow through the riser pipe *e* from which it is discharged through the nozzle *f* in an atomized condition as a result of which it produces the fog.

I claim:—

The method of creating a pressure in a fog-producing apparatus for the purpose of expelling a fog-producing solution of sulphur trioxide in chlorosulphonic acid which comprises introducing a carboxylic acid dissociable by dehydration into the said solution to generate a gas without a solid residue.

In testimony whereof I affix my signature.

ULRICH MÜLLER.