

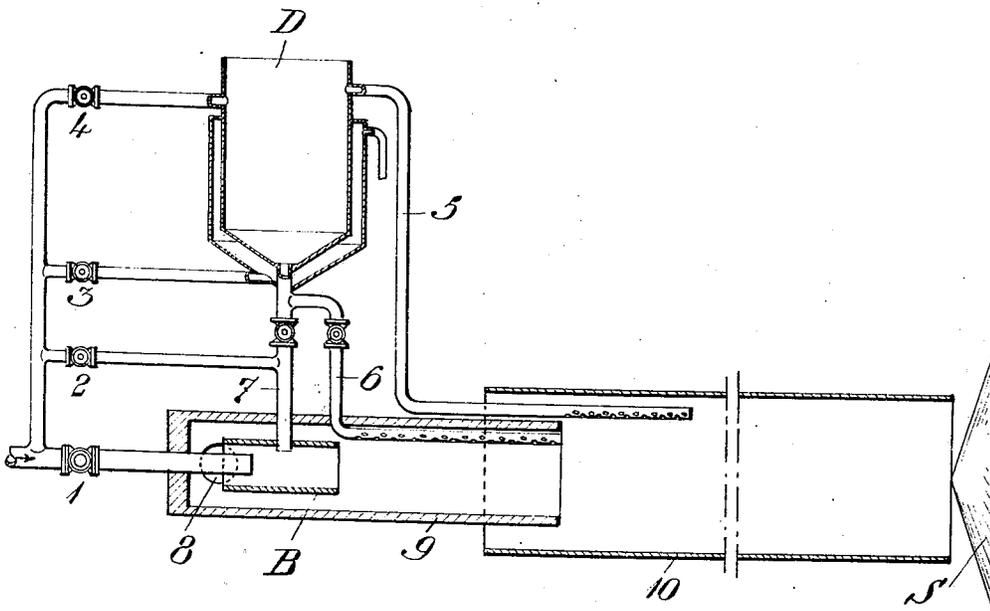
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PROCESS OF PRODUCING ARTIFICIAL FOGS

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## UNITED STATES PATENT OFFICE.

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## PROCESS OF PRODUCING ARTIFICIAL FOGS.

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In the production of artificial fogs it is necessary, in order to obtain a successful result as well as from an economical point of view, to have the material or materials used in the production of the fog as finely divided as possible before entering the open air and to see that the concentration of the fog particles formed during the process does not become so large on any point, that an agglomeration of such particles can take place at that point, thereby reducing the efficiency of formation of the fog.

My invention refers to a process for obtaining the best possible result in this respect and consists in that the material or materials, used for the production, are finely divided in two or more stages before entering the open air. This division can be executed in several ways, either chemically or mechanically or in a combined mechanico-chemical way.

The nature of the process may suitably be explained by a description of a practically tested apparatus for its performance. A constructional form of such an apparatus (smoke or fog-syringe) is illustrated diagrammatically in the accompanying drawing. The apparatus consists of a smoke or fog syringe, comprising a tube 9, closed at its back end and with its other end open and projecting into another and wider tube 10, provided with a spreading screen S at its outer end. The tube 9 surrounds a tube B (the mixer) and is provided with an inlet 8 for air or another gas in its back part. Through the back end of the tube 9 runs a pipe 1, forming an inlet for the fluid or fluids (gases or liquids) used in the production of fogs with this apparatus. A double walled container D for the fog-producing materials for instance phosphorus is placed above the tube 9 and is connected to conduits or pipes 2, 3, 4, 5, 6, 7. The contents of the container may be delivered into the interior of the tube 9 by means of the conduits 6, 7, and suitable gases (as air, steam, combustion gases from a motor and the like) may be forced into the conduit 7 or into the space between the double walls of the container D or in the interior of said container by means of the conduits 2, 3, 4.

The apparatus operates as hereinafter described. When the fog-producing material has been introduced into the container D and

transferred into a suitable form (for instance by heating the container by steam from the conduit 3) the cock 1 is opened, whereby the gas for example steam or combustion gases flows into the tube B and further through the tube 9, thereby sucking with it on both sides of the tube B air from the air inlet 8. If now the fog producing material for example phosphorus is introduced into the tube B through the conduit 7 a first decomposition of said material takes place in that tube whereby a current of gas is formed which when leaving the tube B joins with the current of air, passing outside the tube. This current, however, has not the same speed as that passing through the tube B, for which reason a friction between the two currents occurs, causing an effective division or pulverization of the fog producing material. The division thus has been carried out in two stages or phases, viz, within the tube B and when leaving it. Simultaneously the concentration of the fog particles, generated in B is diminished. A further division or pulverization of the fog producing material as well as a further diminishing of the concentration of the fog particles for the same reason takes place when the current of gas passes from the tube 9 to the outer tube 10 and also when the said current strikes the screen S. When the fog current leaves the apparatus at S the fog producing material thus has been pulverized four times.

If the fog producing material used is such that it becomes chemically combined with the "driving gas" and the air at their contact, whereby heat is generated, still one phase of pulverization arises, because the gases are expanded by the heat developed at the reaction, whereby the speed of the gas is increased, thus contributing to the pulverization of the fog producing material and a decrease in the concentration of the fog particles already formed.

Another method of producing artificial fogs according to the present invention consists in forcing a diluting gas through the tube 2 into the material flowing through the tube 7 in which case the fog producing material will become extremely finely pulverized at the entrance in the tube B &c.

About the same result is obtained by using the pipes 4 and 5.

The fog producing material also may be introduced in the tube 9 through the perforated pipe 6, whereby the material at first is divided in several fine currents, which are further divided by the driving gas current and the air.

The feeding-pipes 6 and 7 for the fog producing material may also be heated, so that the said material after the entrance in them totally or partially is brought into a gaseous condition, before it meets the driving gas current.

Having now particularly described the

nature of my invention and the manner of its operation, what I claim is:

A process of producing artificial fogs according to the smoke syringe method, which comprises introducing melted phosphorus, repeatedly effecting a fine division of the phosphorus by the application of fluid pressure, and thereafter delivering the finely divided material to the open air.

In testimony whereof I have signed my name to this specification.

AXEL VIDAR JERNBERG.