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R. AUERBACH

2,019,333

PRODUCTION OF IONS IN AIR OR OTHER GAS

Filed July 15, 1932

Fig. 1.

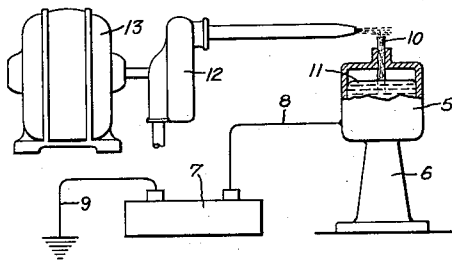


Fig. 2.

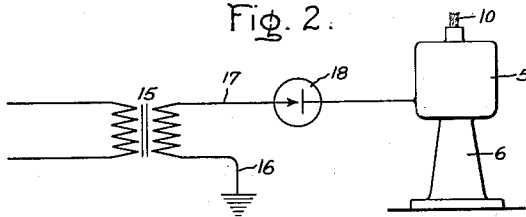


Fig. 3.

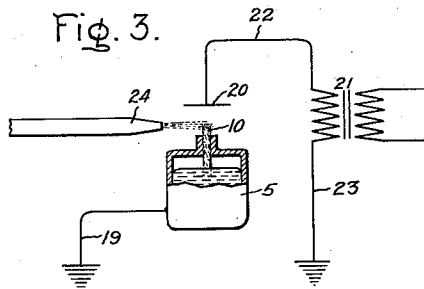
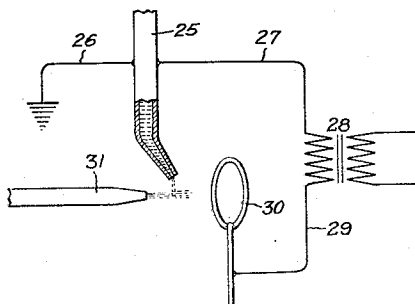


Fig. 4.



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## UNITED STATES PATENT OFFICE

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PRODUCTION OF IONS IN AIR OR  
OTHER GAS

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Application July 15, 1932, Serial No. 622,772  
In Germany July 23, 1931

## 1 Claim. (Cl. 204—31)

The present invention relates to the production of ions in air or other gas.

In accordance with my invention liquids are charged to desired electrical potentials and such charged liquids are converted into minute droplets by atomization or evaporation. My invention will be pointed out with greater particularity in the appended claim.

In the accompanying drawing Fig. 1 is a side elevation of one form of an apparatus for atomizing and charging a liquid; Figs. 2 and 3 illustrate modifications of the electrical charging means and Fig. 4 illustrates diagrammatically a modified apparatus in which the electrical charge is imparted to the droplets after atomization.

The apparatus shown in Fig. 1 comprises a conductive container 5 for liquids which is electrically insulated by an insulator 6, and is connected to one pole of a source of electrical potential 7 by a conductor 8. The other pole of this source is connected to earth by a conductor 9. A wick 10, or other suitable capillarity device, carries liquid from the container 5 to the exterior. The liquid 11 may consist of water.

Air, or other gas, is blown by a compressor 12, driven by a motor 13, against the saturated wick 10 causing rapid vaporization of the electrically charged liquid upon its surface. As during vaporization the water molecules on the surface disappear and since the electrostatic charge is on the surface, the molecules of liquid carried away by the gas are charged and produce an atmosphere strongly charged with ions. If desired the ionized air or other gas can be conveyed away by conduits. On the other hand, it may be allowed to diffuse in the surrounding atmosphere. The source of voltage 7 may consist of a high voltage battery as indicated for illustrative purposes or may have any other suitable embodiment.

As shown in Fig. 2 the electrical source may consist of a transformer 15 having as usual a primary and secondary winding, one terminal of the secondary winding being earthed by conductor 16 and the other terminal being connected to conductor 5 through conductor 17. A suitable rectifier symbolically indicated at 18 is included in the circuit 17. A rectifier also may be used in the arrangements illustrated by other figures. The polarity of the liquid determines the sign of the ions produced (i. e. whether negative or positive).

As indicated in Fig. 3 the vapor particles instead of being charged by direct contact may be charged inductively. In the system shown in Fig. 3 the conductor 5 for the liquid is connected to earth by the conductor 19. Opposite the wick 10 is a plate-formed or ring-shaped non-liquid conductor 20 which is connected to one terminal of the secondary of the transformer 21 by a conductor 22. The transformer receives energy from a suitable source (not shown). The other terminal of the secondary winding is connected to earth by a conductor 23. The electrode 20 induces charges on the surface of the wick 10 and the charged particles of vapor are carried away by a blast of air or other gas delivered by a nozzle 24.

A somewhat modified arrangement is shown in Fig. 4 in which the liquid to be atomized flows through a metal tube 25 which is connected to earth by conductor 26 and by a conductor 27 to one terminal of the secondary of transformer 28. The opposite terminal of the secondary winding is connected by conductor 29 to a ring-shaped non-liquid electrode 30. The liquid flowing from the open end of the tube 25 is atomized by a blast of gas from the tube 31 and becomes charged by the conductor 30.

The described method and apparatus are suitable for controlling the ionization of air as in ventilating systems or in fact anywhere where such action is desirable for physiological or other purposes. The ionized air is also suitable for encouraging the growth and fertility of plants. In general, voltages of the order of three to ten thousand volts may be employed, the voltage chosen depending on the character of the apparatus.

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

An ionization apparatus comprising a container for a liquid, a wick located in contact with said liquid and having one end exposed to the atmosphere, a source of electric potential having one terminal connected to said liquid, a non-liquid conductor juxtaposed to said liquid connected to the opposite terminal of said source, and means for diffusing charged vapor particles from the surface of said wick into the atmosphere.

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