

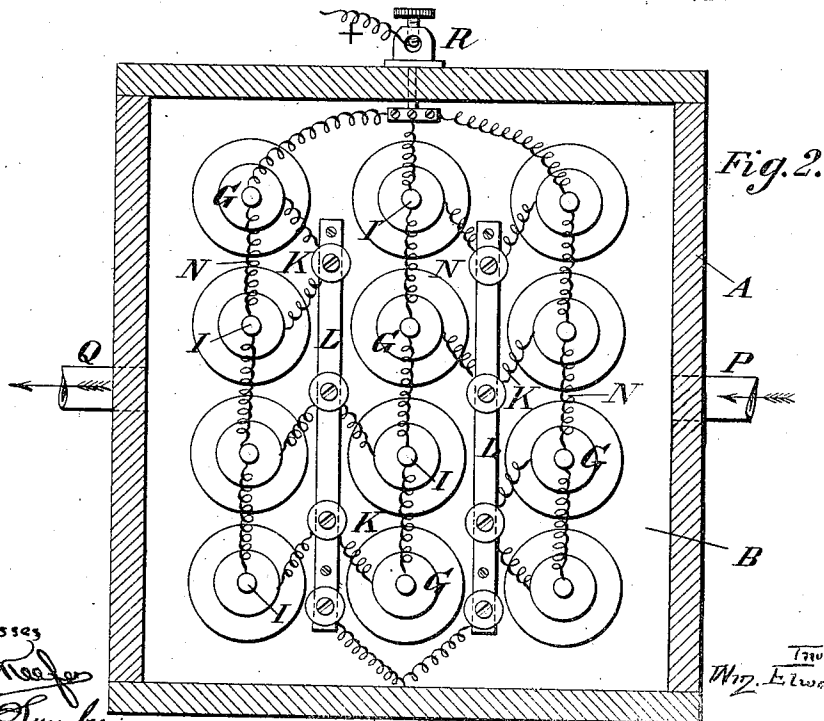
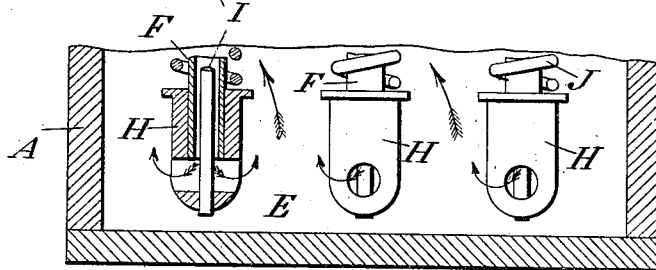
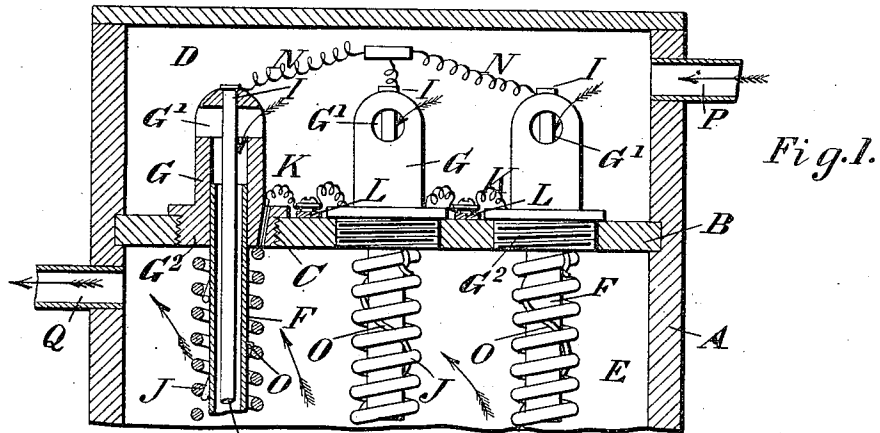
No. 653,078.

Patented July 3, 1900.

W. ELWORTHY.
APPARATUS FOR GENERATING OZONE.

(Application filed Apr. 17, 1900.)

(No Model.)



Witnesses
J. B. Hooper
Lennie C. Dumbly

Inventor
W. Elworthy

by James L. Norman
att'y

UNITED STATES PATENT OFFICE.

WILLIAM ELWORTHY. OF LONDON, ENGLAND.

APPARATUS FOR GENERATING OZONE.

SPECIFICATION forming part of Letters Patent No. 653,078, dated July 3, 1900.

Application filed April 17, 1900. Serial No. 13,267. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ELWORTHY, a citizen of England, residing at 16 Roseberry Gardens, Crouch End, London, in the county of Middlesex, England, have invented a certain new and useful Improved Apparatus for Generating Ozone, (for which I have applied for a patent in Great Britain, dated June 16, 1899, No. 12,612,) of which the following is a specification.

According to my invention I construct apparatus for generating ozone as follows: A number of tubes of dielectric material, preferably glass, are arranged side by side at small distances apart within an inclosing chamber into which their lower ends open, so that no air or oxygen can enter the said chamber except through the said tubes. The upper ends of the tubes open into an upper chamber hermetically separated from the lower chamber by a horizontal partition, through which the tubes pass and from which they are suspended. Within each tube is a metal rod or tube of smaller diameter than the internal diameter of the dielectric tube and arranged so as not to be in contact with it, and around the outer surface of each dielectric tube, at a slight distance therefrom, is coiled a wire or metal cord or chain in such manner as not to be in contact with the tube. The metal rods within the tubes being connected to the one terminal of an electric circuit including any suitable electric generator, while the coiled wire is connected to the other terminal of the circuit, air or oxygen is admitted through an inlet in the upper chamber, whence it passes down through the annular space between the metal rod and the inner surface of the dielectric tube, being partially ozonized during such transit by the electric discharge from the central metal rod to the inner surface of the dielectric tube. On issuing from the lower open end of the dielectric tube into the surrounding space of the lower chamber the air or oxygen then passes up both in the small space between the outer surface of the dielectric tube and the wire coil surrounding the same and also generally in the spaces between the several tubes in the chamber, during which passage the air or oxygen will be again subjected to the electric discharge from the dielectric

tubes to the wire coils, whereby it will become ozonized in a very perfect manner before passing away through an outlet at the upper end of the lower chamber.

The accompanying drawings show the construction of ozone-generating apparatus which I prefer to employ.

Figure 1 shows a vertical section, and Fig. 2 a sectional plan.

Within the casing A is provided a horizontal partition B, of ebonite or other suitable dielectric material, cemented in so as to divide the casing into an upper chamber D and a lower chamber E, which are hermetically separated from each other.

The partition B has screw-threaded openings C for the reception of the upper ends of the glass tubes F. These tubes are for this purpose fixed in caps G, of vulcanite or other dielectric material, having openings G' at top and a threaded boss G², which screws tightly into one of the openings of the partition B, so that this holds the glass tubes F suspended in the lower chamber E. On the lower end of each glass tube is fixed another cap H, and a metal rod I is passed through a central hole in the cap G, down through the tube F, and into a central hole in the cap H, so that the rod I will thereby be held perfectly central in the tube and out of contact therewith.

Surrounding the outside of the glass tube F at a small distance therefrom is a coiled wire J, the upper end of which is connected by a wire K to one of two conducting-bars L, fixed to the partition B, which bars are connected to the terminal M of the electric circuit.

The upper ends of the rods I are all connected by wires N to the second terminal R of the circuit.

For keeping the coiled wires J out of contact with the tubes F various arrangements may be employed. Thus, as shown, a cord or strip O of dielectric material may be coiled around the outer surface of the tube F in the contrary direction to that in which the wire J is coiled, or a thread of dielectric material may be wound around the wire, metal cord, or chain forming the coil J.

P being the inlet for air or oxygen into the upper compartment D and Q the outlet for

the ozonized air or oxygen from the lower compartment E, it will be seen that the action of the apparatus will be as follows: The air or oxygen will enter the upper ends of the tubes 5 F through the holes in the caps G and in passing down through the same will be partially ozonized by the current discharge from the metal rod I. On issuing from the tubes through the holes of the bottom caps N the 10 partially-ozonized air or oxygen will travel upward partly through the narrow spaces between the outer surface of the tubes F and the wire coils J and also through the spaces between the several tubes. In flowing up- 15 ward the air or oxygen is consequently subjected to a second ozonizing action by the electrical discharges. This action is rendered the more perfect by the fact that owing to the sectional area of the chamber E between the glass tubes being much greater than 20 that of the collective area of the interiors of all the glass tubes the upward flow of the air or oxygen will take place at a much slower rate than that of the downward flow within the tubes, and consequently the electrical discharges will operate upon the same during a 25 much longer time.

Having thus described the nature of this invention and the best means I know for carrying the same into practical effect, I claim— 30

Apparatus for generating ozone consisting of tubes of dielectric material fitted air-tight in a partition in a box which divides the box into two hermetically-separated compartments, metal conductors passing through the 35 said tubes out of contact therewith, metal conductors coiled helically around the said tubes out of contact therewith, the said metal conductors within the tubes being connected with one terminal of a source of electricity while 40 the said metal conductors surrounding the tubes are connected with the other terminal of the same source of electricity, an inlet for air to be ozonized in the upper compartment of the box and an outlet for the ozonized air 45 in the lower compartment of the box substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM ELWORTHY.

Witnesses:

JOSEPH LAKE,
GERALD L. SMITH.