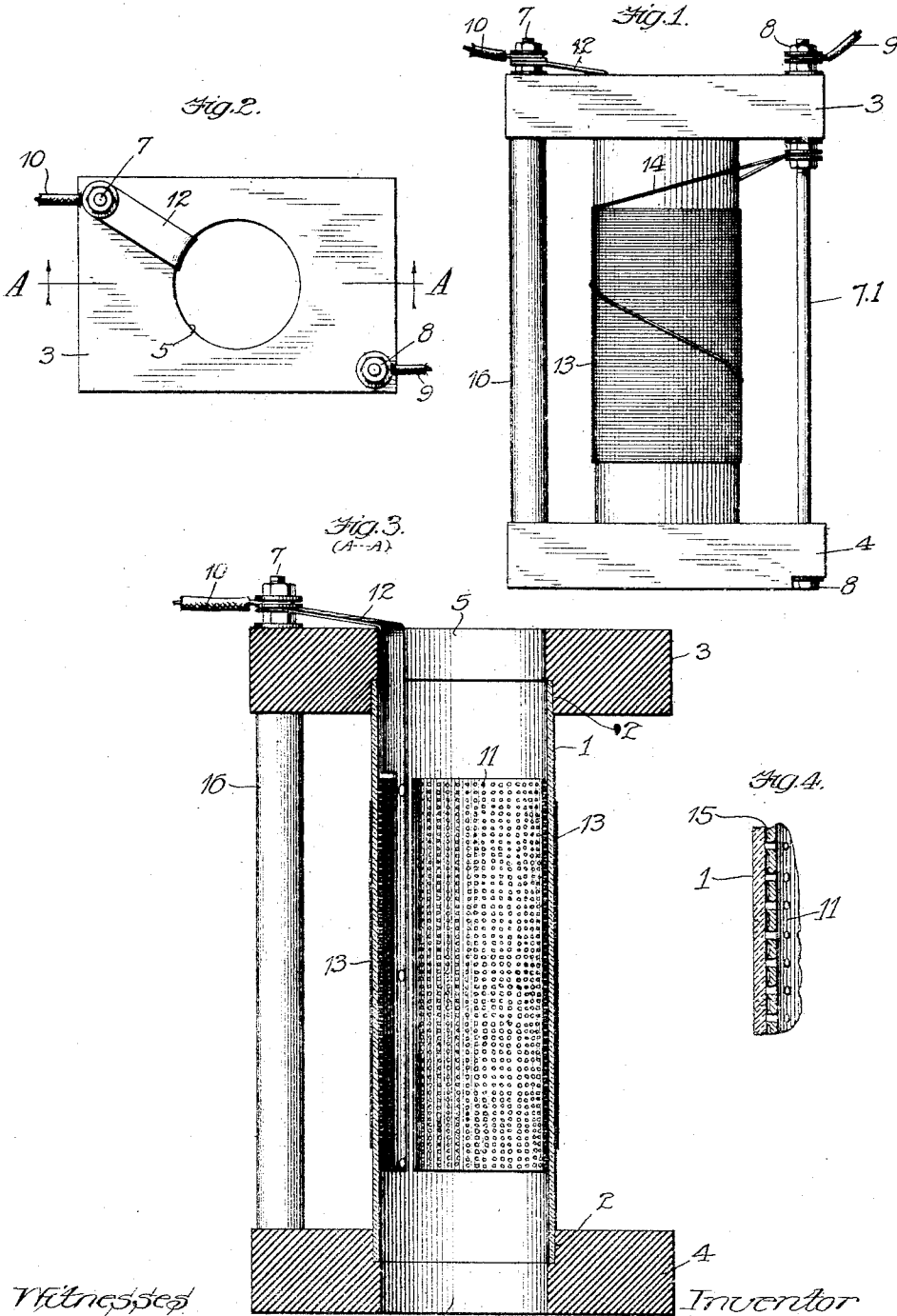


L. GOLDBERG.
 OZONATOR.
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1,136,227.

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UNITED STATES PATENT OFFICE.

LOUIS GOLDBERG, OF INDIANAPOLIS, INDIANA.

OZONATOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS GOLDBERG, a citizen of the United States of America, and a resident of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Ozonators, of which the following is a specification.

This invention relates to apparatus for generating ozone.

The main objects of the invention are to produce a highly efficient apparatus of this nature at low cost; to provide a pair of cylindrical electrodes, one on the inside and the other on the outside of a single dielectric tube, whereby equal spacing between the electrodes is certain to result upon assembling the device without requiring any special adjustments of the electrodes; to provide an electrode formed of resilient sheet metal rolled in the form of a cylinder whereby it may contract or expand into contact with the dielectric tube and thereby perfectly align itself with the companion electrode on the opposite side of said tube; to provide a non-oxidizing electrode made of a sheet of perforated aluminum; and to provide an electrode with burs for separating it from the dielectric and thereby provide suitable air spaces between the electrode and dielectric for the air or oxygen treated by the apparatus.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Figure 1 is a front elevation of the ozone generator with its casing and inlet and outlet conduits omitted. Fig. 2 is a plan view of the generator. Fig. 3 is a vertical section taken on the line A—A of Fig. 2. Fig. 4 is a sectional detail showing how the inner electrode is spaced from the dielectric tube.

Devices of this general class are much in use at the present time, ozone being employed in many ways in the sciences and arts because of its power to produce rapid oxidation and because of its antiseptic and germicidal properties. These devices generally involve a pair of electrodes separated by a dielectric, such as glass, the electrodes being in circuit with a source of varying or alternating electric current of high potential or high frequency. The dielectric between the electrodes has the effect of finely dividing the discharge between the elec-

trodes, so that there is a greater brush effect and the production of ozone is greater with the dielectric than without the dielectric. Also the dielectric tends to prevent destructive sparking between the electrodes. Further to prevent sparking and an unequal distribution of the brush discharge, it is necessary that the pair of electrodes are equally spaced from each other throughout their surfaces.

In the present case this alinement of the electrodes is effected by employing an electrode of resilient material, which may be rolled to the form of a split cylinder and allowed to expand into contact with the dielectric tube which separates it from its companion electrode. With this construction of electrode no special care is required in assembling it with the remaining parts of the apparatus. The said expanded inner electrode is also in contact with the air or oxygen treated by the apparatus, and is therefore preferably made of aluminum because of the non-oxidizing nature of aluminum. The said inner electrode is also perforated in such manner as to provide ridges or burs for separating it from the dielectric tube, and thereby admitting air to a very powerful part of the field of force between the two electrodes.

Referring to the drawings, a dielectric tube 1 is fitted at its ends into seats 2 in insulating blocks 3 and 4. These blocks are respectively provided with an outlet 5 for the gas and an inlet 6 for the air or oxygen to be acted upon by the electric discharge between the electrodes, this discharge, as is known, converting more or less of the oxygen into ozone.

The dielectric tube 1 is properly retained in place and the blocks 3 and 4 spaced from each other by tie rods 7 and 7.1, these tie rods being preferably threaded to receive nuts 8. The tie rods also serve as binding posts for conductors 9 and 10. The inner electrode 11 is connected by a metallic strip 12 to the tie rod 7, while the outer electrode 13 is connected to the tie rod 7.1 by the wire 14 of which the said electrode 13 is composed.

The outer electrode consists of a coil of wire, preferably in a single layer, wound around the dielectric tube 1 and preferably coated with a suitable varnish. For conven-

ience both ends of the wire 14 are preferably secured to the rod 7.1, as shown in Fig.

1. To prevent sparking between the electrode 13 and rod 7, the latter is surrounded
5 by a tube 16 of insulating material.

The inner electrode 11 is formed out of sheet metal, preferably aluminum, punched in the manner clearly indicated in Fig. 4, whereby burs 15 extend outwardly from one
10 side of the sheet around the holes therein. The conducting strip 12, which may also be of aluminum, is riveted to one edge of the sheet metal electrode, and the electrode is then rolled into cylindrical form and inserted
15 within the dielectric tube 1. It is then permitted to expand into contact with the inner side of the tube 1, so that the burs 15 engage said tube as shown in Fig. 4. The electrode 11 therefore adjusts itself perfectly
20 with respect to the space between it and the electrode 13 while there is still an air space between the tube 1 and the electrode 11 due to the ridges or burs 15.

In the operation of the device, the air or
25 oxygen, which is admitted or forced through the opening 6 in block 4, comes into contact only with the dielectric tube and the aluminum electrode. A certain portion of the air is acted upon by the electric discharge taking
30 place between the electrodes and the inside of the electrode 11. Thus when the gas is discharged from outlet 5 more or less of it has been converted into ozone.

The efficiency of the apparatus is to a
35 considerable degree due to the construction of the inner electrode, whereby with the burs 15 it is in contact with the dielectric 2, but

still provides minute air spaces between the electrode and tube.

Although but one specific embodiment of
40 this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined
45 by the following claims.

I claim:

1. In a device of the class described, the combination of a pair of blocks, a dielectric
50 tube having its ends in contact with said blocks, air passages in said blocks communicating with said tube, an electrode inside and an electrode outside of said tube, and tie rods connecting said blocks, said tie rods
55 serving as binding posts for said electrodes.

2. In a device of the class described, the combination of a pair of blocks, a dielectric
60 tube having its ends in contact with said blocks, air passages in said blocks communicating with said tube, an electrode inside and an electrode outside of said tube, tie rods connecting said blocks, said tie rods
65 serving as binding posts for said electrodes, said inside electrode being formed of perforated sheet metal, and a metallic strip connecting said inside electrode with one of said tie rods.

Signed at Toledo this 25th day of July
1914.

LOUIS GOLDBERG.

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