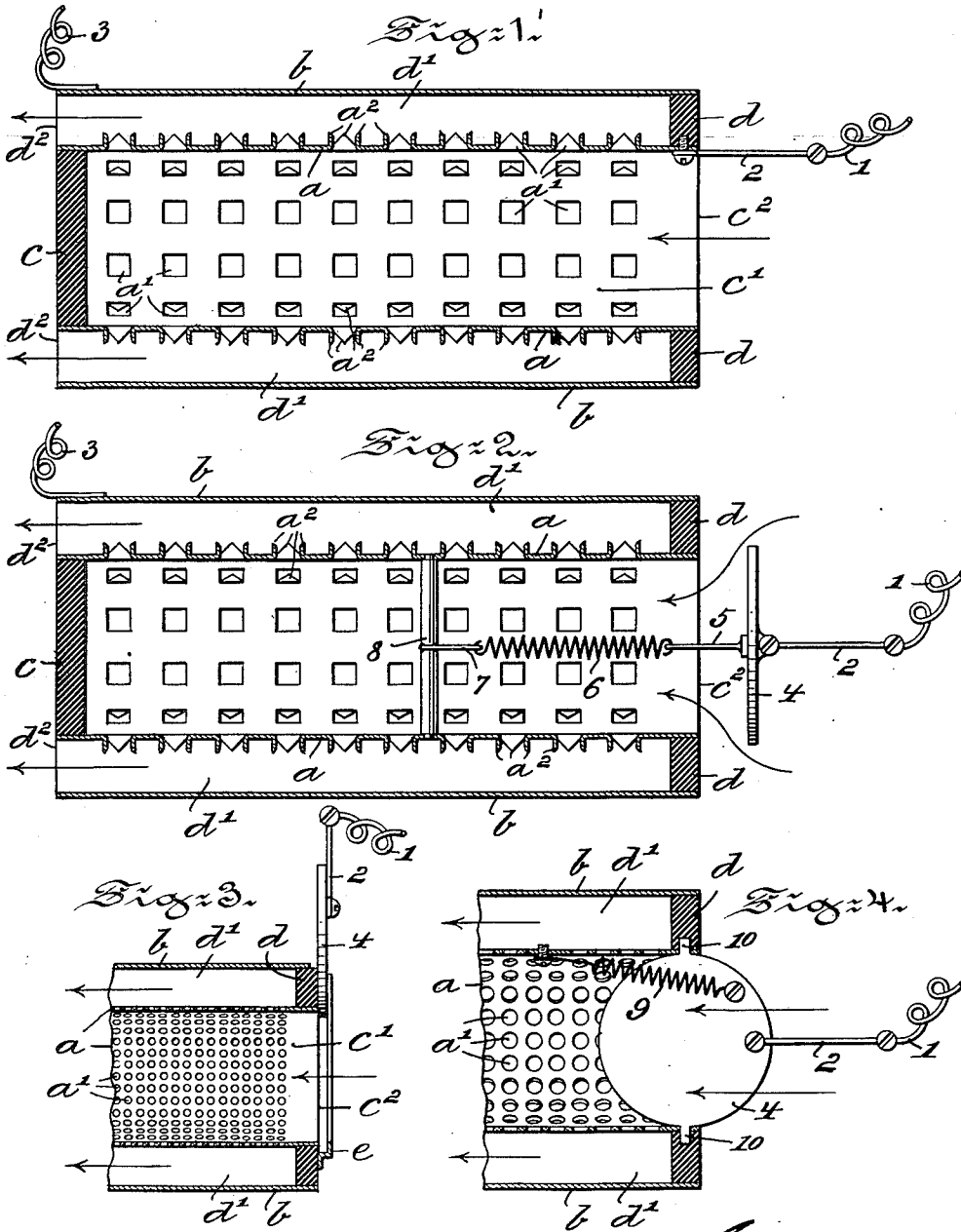


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ELECTRIFIER FOR TREATING AIR OR OTHER GAS.

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ELECTRIFIER FOR TREATING AIR OR OTHER GAS.

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To all whom it may concern:

Be it known that I, JAMES H. BRIDGE, a subject of the King of England, (but having declared my intention of becoming a citizen of the United States,) residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrifiers for Treating Air or other Gas, of which the following is a specification.

My invention has relation to an electrifier for the treatment of air or other gas; and in such connection it relates more particularly to conductive means for preventing destruction of the electrifier by an excessive electric current and of means for cutting off the supply of air or other gas to the electrifier when the conductive means have been rendered inoperative by an excessive electric current. The principal objects of my invention are, first, to prevent destruction of the electrifier for the air or other gas through arcing, short-circuiting, or sparking by introducing into the conductive means of the electrifier a fuse or fusible substance, whereby through burning out of the same the current is cut off, and, second, to provide the apparatus with means whereby when the fuse is destroyed to permit of closing of the inlet for air or other gas into the electrifier to thereby prevent passage of untreated air or other gas there-through.

The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a view illustrating in longitudinal central section an electrifier consisting of tubular electrodes concentrically arranged with respect to each other and with a fuse connected with the positive electrode, in this case the inner tube, and the line-wire, all embodying features of my present invention. Fig. 2 is a similar view illustrating a disk arranged adjacent to the air-inlet of the inner electrode, in this case normally held by a fuse, and a spring for forcing the disk against said inner electrode to close the air-inlet when the fuse is destroyed; and Figs. 3 and 4 are detail views illustrating in, respectively, longitudinal section modified forms of the disk and means for supporting and actuating the same.

Referring to the drawings, *a* is a tubular electrode, which is surrounded by a similarly-

shaped electrode *b*, preferably arranged concentric with respect to the electrode *a*. In the electrode *a* are arranged at suitable distances apart openings *a'*, which are provided at the side contiguous to the electrode *b* with projections or elevations *a''*, formed either by first cutting the plate and then bending the cut portions outward or by forming conical projections in the plate and then splitting or cutting the apex of each cone and spreading apart the same. In this manner a plurality of projections or elevations *a''* are formed integral with the plate *a*, surrounding each of the openings *a'* therein, which openings, according to the manner of forming the elevations *a''*, may be square or circular in outline, as shown in Figs. 1 and 2. However, the openings *a'* may be formed without projections or elevations *a''*, as shown in Figs. 3 and 4. The electrode *a* is closed at one end by an insulating-plate *c*, forming a chamber *c'*, while the annular insulation *d* separates the electrode *a* from the electrode *b* and forms in conjunction therewith a chamber *d'*. In the high-tension conductor 1, leading to the electrode *a*, is placed a fuse or fusible substance 2, while a conductor 3 is connected with the electrode *b*, and both conductors serve to connect the same with a source of electric energy (not shown) to conduct a current through the electrodes *a* and *b*.

Instead of connecting the fuse 2 of the conductor 1 directly with the electrode *a*, as shown in Fig. 1, the same may be connected with a disk 4, of conducting material, which by means of a conductor 5, conducting-spring 6, conductors 7, and a conductive ring, bar, or other attachment 8, secured to the electrode *a*, is connected with the same, as shown in Fig. 2, for a purpose to be presently more fully explained. In this instance the disk 4 is held in proper position with respect to the inlet *c'* of the inner electrode *a* by a fuse 2 and a ring, bar, or other attachment 8. However, the disk 4 may be supported only by the fuse 2, in which case the same is held suspended therefrom and in a position above the inlet-opening *c'* of the electrode *a*, as shown in Fig. 3, or the disk 4 may be placed within the electrode *a*, in which instance the same will be held in an inoperative or open position by the fuse 2, while a spring 9 serves to swing the disk 4 on the projections 10 to close the inlet *c'* when the fuse is destroyed, as will be understood from Fig. 4. The electric current thus conveyed to the electrode *a* may

pass from the same to the electrode *b* across or through a dielectric medium in the form of a silent brush discharge by passing between the electrode *a*² and the electrode *b*. To convert oxygen of the air into ozone, the same will enter the chamber *c*' in volume and will travel through the openings *a*' of the electrode *a* from one side to the other, being thus divided into streams, each of which is forced to pass substantially through the cores of the silent brush discharges, and after passing through the cores the streams are reunited by deflecting their path of travel and again forced to pass through the electric discharges before leaving the chamber *d*' through the outlet *d*². From the outlet *d*² the air or other gas so treated can be conducted to any point for utilization or storage. (Not shown.) If other gas than air is to be treated, the same will be conducted through the chambers *c*' and *d*' and be treated in the chamber *d*' by the electric discharges in the same manner as hereinbefore explained with respect to the treatment of air. In order to treat a large volume of air or other gas at a time, a series of electrifiers formed by the electrodes *a* and *b* may be arranged side by side in a manner not shown. The fuse 2, directly engaging the electrode *a*, as shown in Fig. 1, prevents by burning out the destruction of the electrifier through short-circuiting, the formation of electric arcs, or prolonged sparking. In instances where a series of electrifiers are employed the current is cut off only from the electrifier in which the fuse 2 has been destroyed, while the other electrifier will remain operative. By such an arrangement, however, air or other gas entering the inoperative electrifier will leave the same untreated. In order to overcome this disadvantage, the electrifier, as shown in Fig. 2, is employed, in which the fuse 2 by being destroyed permits the spring 6 to force the disk 4 against the electrode *a*, and thus to cut off further admission of air or other gas into the electrifier through the inlet-opening *c*² by holding the disk over the same. However, the disk 4 may be permitted to drop by gravity over the opening *c*² when the fuse 2 is destroyed, for which purpose the electrifier is provided with a support *e*, into which the same descends and by means of which the disk 4 is

held in proper position with respect to the electrifier, as will be readily understood from Fig. 3. In this instance the disk 4 contacts directly with the electrode *a*. On the other hand, the disk 4, placed within the electrode *a*, as shown in Fig. 4, and by being held in an open or inoperative position by the fuse 2, will be closed by the spring 9 at the inlet *a*² when the fuse is destroyed.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electrifier, consisting of electrodes provided with an inlet and outlet for air or other gas to be treated by passage there-through, a conductor for each of said electrodes, one of said conductors having means and a fuse arranged therein, said means adapted when said fuse is destroyed by an excessive electric current passing there-through to prevent entrance of air or other gas into said electrodes.

2. An electrifier, consisting of tubular electrodes concentrically arranged with respect to each other having an inlet and outlet, a conductor for each of said electrodes, a fuse and a disk forming part of the conductor for the positive one of said electrodes, said disk adapted when said fuse is destroyed by an excessive electric current passing there-through to close the inlet for air or gas leading to said electrodes.

3. An electrifier, consisting of tubular solid and tubular perforated electrodes arranged concentrically with respect to each other, insulating means adapted to close said electrodes at one end to form in conjunction therewith an inlet and an outlet for air or other gas, a conductor for each of said electrodes, a fuse and a disk forming part of said conductor, for the positive one of said electrodes, said disk adapted when said fuse is destroyed by an excessive electric current passing therethrough to close the inlet leading to said electrodes.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JAMES H. BRIDGE.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.