

No. 709,868.

Patented Sept. 30, 1902.

C. S. BRADLEY & D. R. LOVEJOY.

APPARATUS FOR SUBJECTING GASES TO HIGH TENSION DISCHARGES.

(Application filed Aug. 29, 1901.)

(No Model.)

Fig. 1.

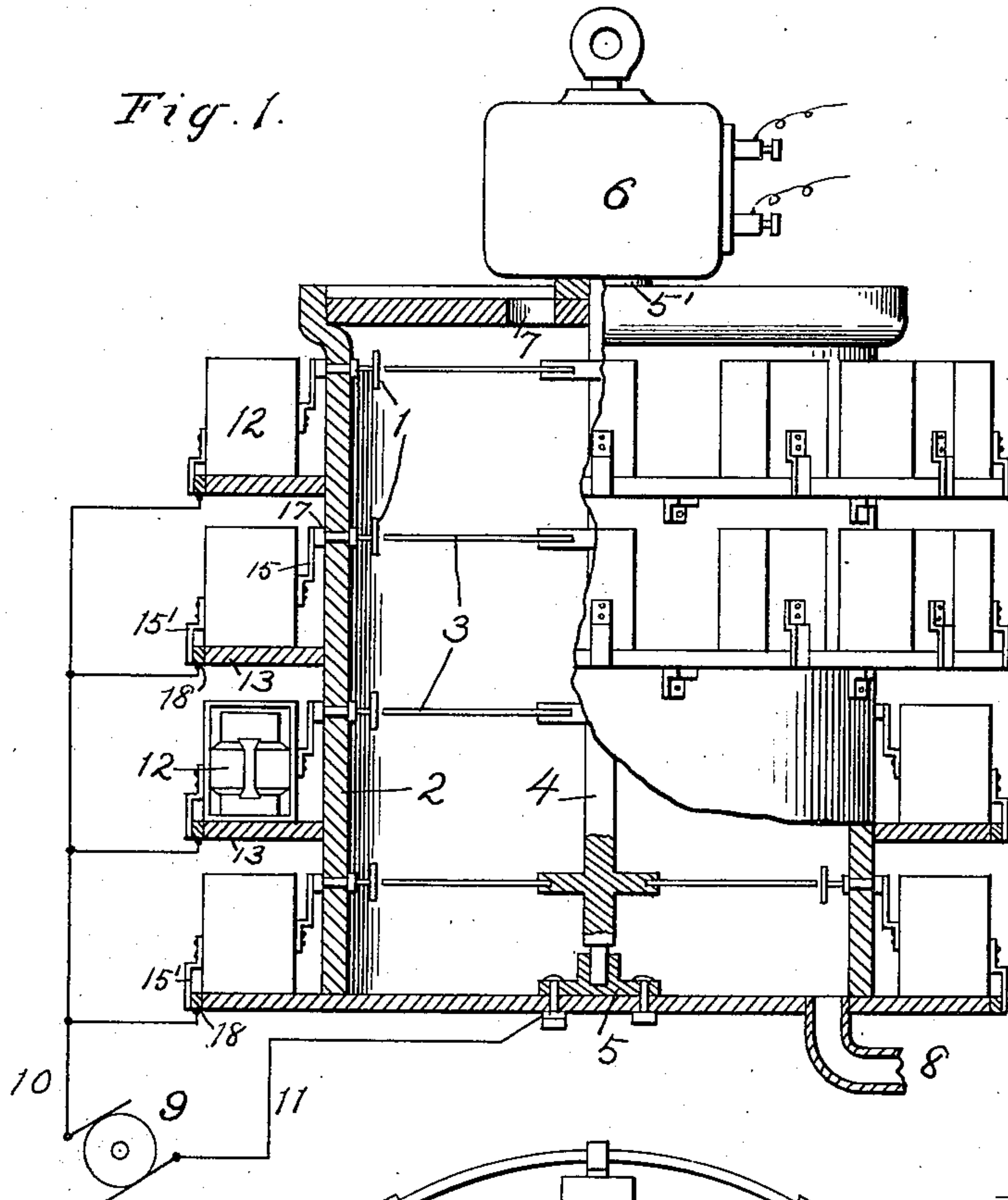
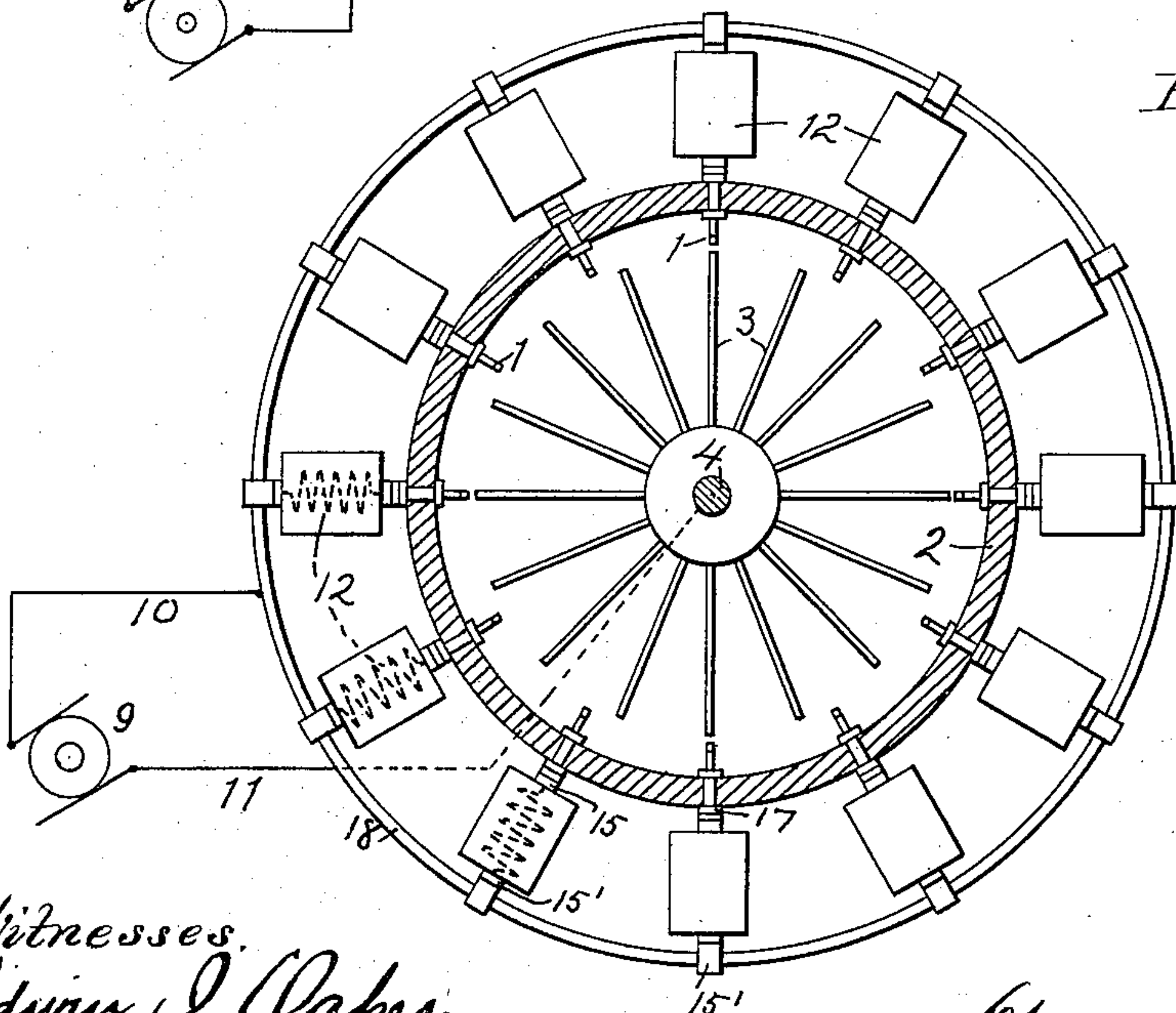


Fig. 2.



Witnesses:
Edwin J. Oakes
George W. Holberich

Inventors:
Charles S. Bradley
D. Ross Lovejoy
by *Thurman*
attys.

UNITED STATES PATENT OFFICE.

CHARLES S. BRADLEY, OF NEW YORK, AND DIMMITT ROSS LOVEJOY, OF
NIAGARA FALLS, NEW YORK, ASSIGNORS, BY MESNE ASSIGNMENTS, TO
ATMOSPHERIC PRODUCTS COMPANY, OF NIAGARA FALLS, NEW YORK, A
CORPORATION OF NEW YORK

APPARATUS FOR SUBJECTING GASES TO HIGH-TENSION DISCHARGES.

SPECIFICATION forming part of Letters Patent No. 709,868, dated September 30, 1902.

Original application filed March 9, 1900, Serial No. 8,008. Divided and this application filed August 29, 1901. Serial
No. 73,674. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. BRADLEY, residing at New York, in the county of New York, and DIMMITT ROSS LOVEJOY, residing at Niagara Falls, in the county of Niagara, State of New York, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Subjecting Gases to High-Tension Discharges, of which the following is a specification.

This invention relates to improvements in apparatus for subjecting gases to high-tension discharges, the present application being a division of our application, Serial No. 8,008, filed March 9, 1900.

The object of the present invention is to enable subdivision of the high-tension discharges, so as to obtain a large number of arcs or discharges from the same source or circuit. The discharges being in the nature of arcs, it will be understood that when a number of discharging devices are arranged in parallel in connection with a common energizing-circuit the discharge will tend to continue and increase abnormally in one or more of the arcs that have been first formed, to the exclusion of the other devices. This results not only in rendering the other devices inoperative for the time being, but the concentration of all the energy on one or a few of the devices is liable to burn out such devices. To prevent this, we provide inductances which are placed individually in circuit with the respective arcing devices, so as to resist any sudden increase in current in any one of these devices. This in connection with the use of a rapidly-moving discharge-terminal, which constantly tends to elongate and finally break the arcs formed, insures against undue heating of any of the devices and causes the energy to be distributed uniformly over all of the devices.

In the accompanying drawings, Figure 1 is a partly-sectional elevation of an apparatus embodying our invention. Fig. 2 is a horizontal section of the same.

The apparatus here shown is adapted to carry out the process disclosed in our prior

application above referred to—namely, the nitrification of air—by exposing a current of air to the action of intermittently elongated and interrupted arcs; but it may also be applied to the treatment of other gases or mixtures of gases with electric discharges.

The apparatus comprises a plurality of discharge devices or terminals 1, arranged in annular rows around the walls of a cylindrical vessel 2, and corresponding series of movable terminals 3, arranged on a shaft 4, rotated in bearings 5 5' by a motor 6. The vessel or chamber 2 has a cover or top, but is provided with intake 7 and outlet 8 for the fresh and the nitrified air, respectively. The electric current may be taken from any suitable source, whether direct or alternating, (indicated at 9,) connections being made by wires 10 11 from this source in parallel to the plurality of fixed terminals 1 on one side and to shaft 4 (through its bearing 5) on the other side. Included in the connection to each terminal 1 is an inductance or self-induction device 12, here shown as consisting of coils of wire connected in series and wound on a core of magnetic material. To facilitate the connecting in of these induction devices, they are arranged on annular supports or shelves 13 around the vessel 2, and one of the terminals, 15, from the coils of each of the induction devices is adapted to bear against a fixed terminal 17, arranged on the outside of vessel 2 and connected to a terminal 1 on the inside of said vessel, while the other terminal, 15', of the induction device is adapted to bear on a contact-ring 18 on the shelf 13, the several contact-rings 18 being connected to one side of the supply-circuit.

In operation the shaft 4 is rapidly rotated; and the terminals 3 are thereby caused to move past the fixed terminals 1. These terminals being connected with opposite sides of a high-tension electric source or circuit—that is, to a circuit of an electromotive force sufficient to produce and maintain an arc without actual contact of the terminals—arcs will be developed as each movable terminal passes a fixed terminal, and in the movement of the

terminal 3 this arc will be drawn out and finally broken. If it were not for the presence of the inductance 12, however, in each individual branch circuit, the decrease of resistance of each arc, due to its heat, would far more than overcome the drawing-out effect and practically the whole power of the supply-circuit, which in practice would be very great, would be thrown on the first set of terminals brought into action and the apparatus would immediately be rendered inoperative. The self-induction of devices 12 is, however, sufficient to hold back or check the rise of current, so as to give the apparatus time to elongate and break the arc, while at the same time a proper amount of the energy is forced to flow to the other arcing devices.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. The combination with a high-tension supply-circuit and a plurality of discharge devices connected thereto in parallel, of inductance devices located in circuit with the respective discharge devices and means for subjecting gases to the action of the discharge devices.

2. The combination with a high-tension supply-circuit and a plurality of discharge devices connected thereto in parallel and comprising relatively movable terminals, of inductance devices located in circuit with the respective discharge devices and means for

subjecting gases to the action of the discharge devices.

3. The combination of the containing vessel, fixed terminals arranged therein, the shaft rotatably mounted in said vessel and carrying movable terminals, means for passing gases through the vessel, induction devices connected in circuit with said fixed terminals, means for detachably supporting said induction devices on said vessel, and means for supplying high-tension current connected to the induction devices and the aforesaid shaft.

4. The combination of the containing vessel, fixed terminals arranged therein, the shaft rotatably mounted in said vessel and carrying movable terminals, means for passing gases through the vessel, induction devices connected in circuit with said fixed terminals, means for detachably supporting said induction devices on said vessel, means for detachably placing the induction devices in circuit when they are placed on their supporting means, and means for supplying high-tension current connected to the induction devices and the aforesaid shaft.

CHARLES S. BRADLEY.

D. ROSS LOVEJOY.

Witnesses as to Charles S. Bradley:

J. GREEN,

A. P. KNIGHT.

Witnesses as to D. Ross Lovejoy:

L. E. SAUNDERS,

CHAS. B. JACOBS.