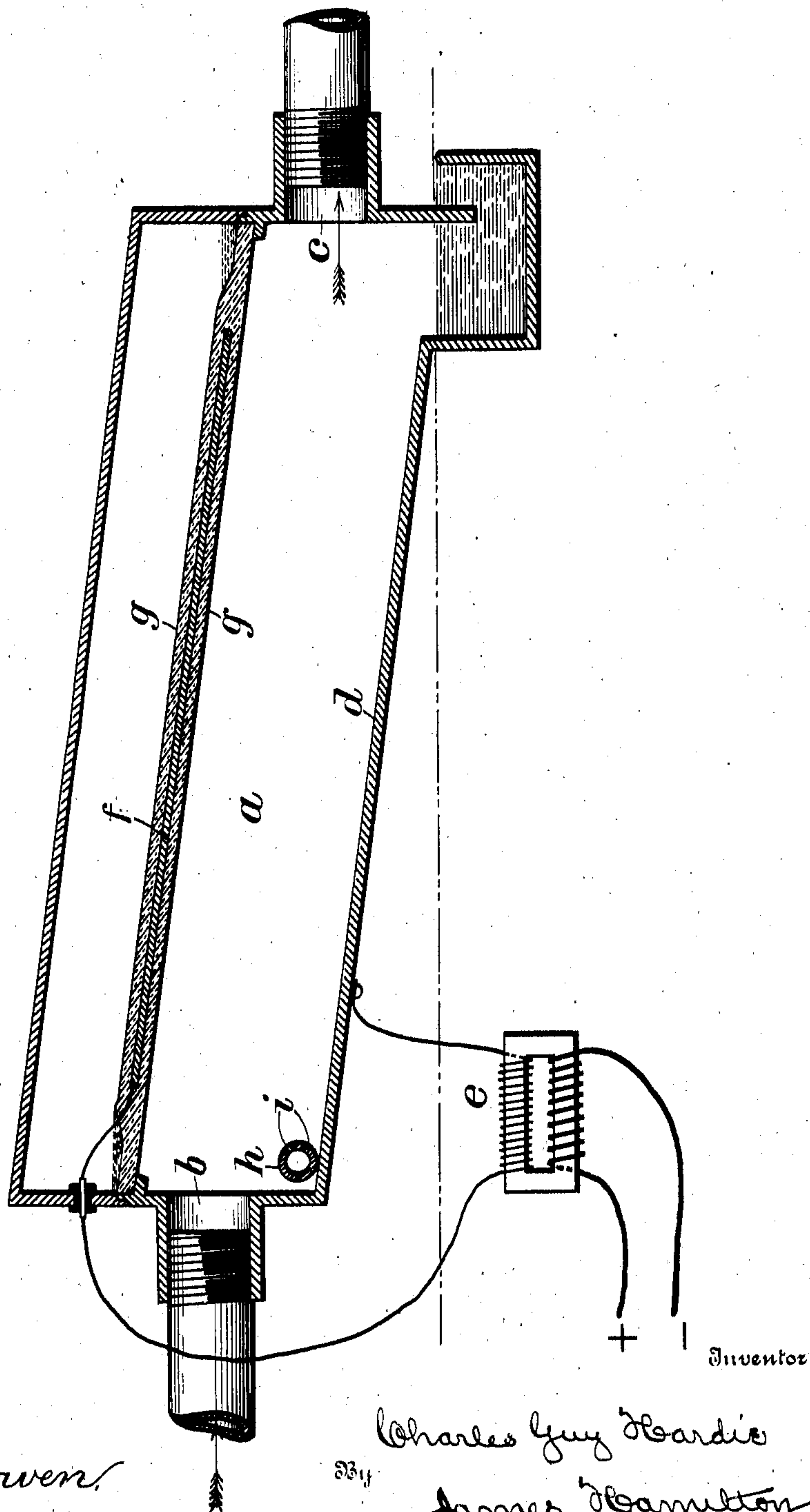


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C. G. HARDIE.
ELECTRICAL APPARATUS FOR CLEANING GAS.
APPLICATION FILED NOV. 12, 1903.

NO MODEL.



Witnesses

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ELECTRICAL APPARATUS FOR CLEANING GAS.

SPECIFICATION forming part of Letters Patent No. 768,450, dated August 23, 1904.

Application filed November 12, 1903. Serial No. 180,951. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GUY HARDIE, a citizen of the United States, and a resident of Hamburg, in the county of Erie and State of New York, have invented certain new and useful Improvements in Electrical Apparatus for Cleaning Gas, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to electrical methods for precipitating from a gas the impurities therein contained; and the object of my invention is to provide a simple and efficient process and apparatus for cleaning producer, blast-furnace, or other gas by freeing it of its impurities.

Briefly set forth my new method consists in passing between two electrodes, connected each with one of the terminals of the secondary of a transformer, a stream of the gas to be cleaned. The impurities are precipitated from the current of gas, caught by a stream of water, and washed away.

In the drawing the figure represents in sectional elevation the apparatus by which my new process is preferably carried out.

The metal box *a* is provided with an inlet-opening *b*, an outlet-opening *c*, and an inclined base *d*, which is electrically connected with one terminal of the high-potential transformer *e*, the other terminal of which is electrically connected with the plate or electrode *f*. By means of the glass *g* (or other highly-insulating material) the electrode *f* is insulated from the box *a*.

The base *d* is inclined to the horizontal, as shown, and a pipe *h*, formed with suitable perforations *i*, serves to conduct water to the box and to distribute it evenly over the upper surface of the base *d*. As shown on the right of the figure, a water seal is formed near the outlet *c*.

As indicated in the drawing, the current of gas flows between the electrodes *d* and *f*, and were it not for the stream of water flowing over the electrode *d* the impurities would be driven violently by the electrical action back and forth between the said electrodes; but as the impurities are thrown from the electrode *f* toward the electrode *d* they are caught by

the water and washed away. The glass insulation serves to insulate the electrodes from each other and to prevent any discharge or current flowing across the opening. Therefore it serves to prevent any short-circuit due to the splashing of water or to the conductivity (if any) of the impurities. Again, it serves to obviate all danger of explosion due to a mixture of air. To aid in this exclusion of air from the gas, it is inclosed, as shown in the drawing, and, as indicated in the figure, oil may be used to aid in sealing the joints. Also the insulation is covered with a thin film of oil to get rid of air-spaces.

In my new method and apparatus no current flows or is dissipated from points. Indeed, the only current which flows is the condenser-current or current which charges the apparatus—a charging current.

I do not desire to confine or limit myself to the exact structure herein shown, for it will be obvious to all skilled in the art that said structure may be varied without departing from the spirit of my invention. Thus an induction-coil may be substituted for the transformer shown.

What I claim is—

1. An apparatus for freeing gas of impurities comprising the combination of a casing having an inclined base through which the gas flows; an electrode insulated therefrom; a suitable source of electricity the terminals of which are connected, one to the insulated electrode, the other to the casing; and a perforated pipe by which water is caused to flow uniformly over said base.

2. An apparatus for freeing gas of impurities comprising the combination of a casing through which the gas flows and having an inclined base the lower end of which is formed into a catch-pit into which the end wall of the casing projects below the water-level to form a seal; an electrode insulated therefrom; a suitable source of electricity the terminals of which are connected, one to the insulated electrode, the other to the casing; and means by which water is caused to flow over said base.

3. An apparatus for freeing gas of impurities comprising the combination of an electrode connected to earth; an electrode insu-

lated therefrom; means which prevent disruptive discharges between said electrodes; a suitable source of electricity the terminals of which are connected, one to each of said electrodes; means for conducting the gas between said electrodes; and means for causing a stream of water to flow over the first-named electrode.

4. The combination of a casing provided with suitable openings for the ingress and egress of gas; a metallic electrode completely covered with highly-insulating material and so placed in said casing as to prevent disruptive discharges between them; a high-potential transformer one secondary terminal of which is electrically connected with the insulated electrode and the other secondary terminal of which is connected electrically with said casing; and means for causing a stream of water to flow over the base of said casing.

5. The combination of a casing provided with suitable openings for the ingress and egress of gas; a metallic electrode completely inclosed within highly-insulating material, such as glass; a high-potential transformer one secondary terminal of which is connected with the insulated electrode and the other secondary terminal of which is connected electrically with said casing; and means for causing a stream of water to flow over the base of said casing.

6. An apparatus for freeing gas of impurities comprising the combination of a casing through which the gas flows; an electrode so

placed in and so insulated from said casing as to prevent disruptive discharges between them; a suitable source of high-potential electricity the terminals of which are connected, one to said electrode, the other to said casing; and means for causing water to flow over the base of said casing.

7. An apparatus for freeing gas of impurities comprising the combination of a casing through which the gas flows; an electrode insulated throughout its length from said casing and adapted to prevent disruptive discharges between them; means for excluding air from the gas in its flow through said casing; a suitable source of electricity in electrical connection with said electrode and said casing; and means for causing water to flow over the base of said casing.

8. An apparatus for freeing gas of impurities comprising the combination of a device acting as an electrical condenser comprising an electrode insulated throughout its length; a suitable source of electricity for charging said device; means for subjecting a current of gas to the action of said device out of contact with air; and means for causing water to flow over the other electrode of said condenser, to wash away the impurities deposited thereon.

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Witnesses:

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