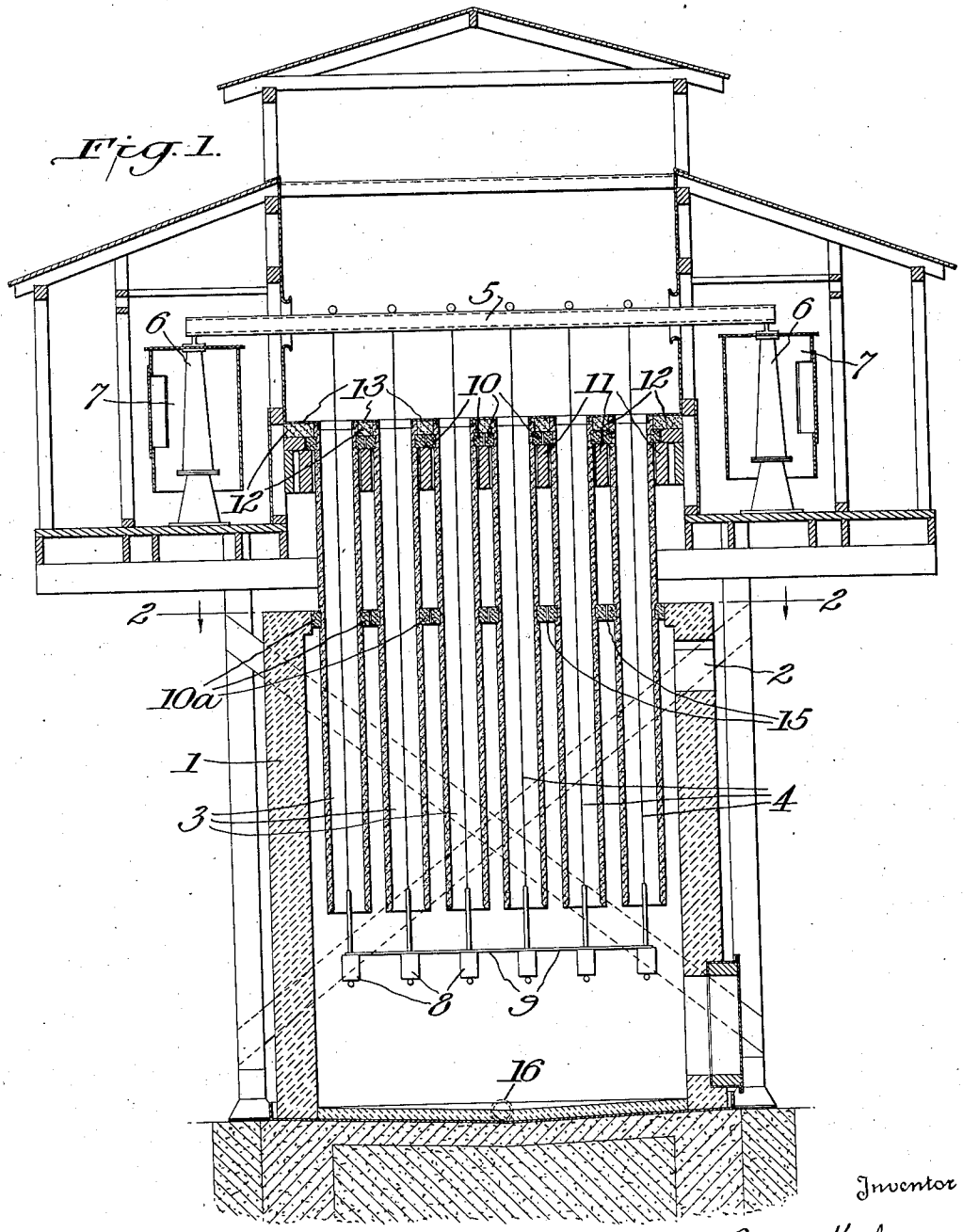
April 16, 1935. P. HERBER 1,997,729

ELECTRICAL PRECIPITATOR

Filed April 11, 1934 2 Sheets-Sheet 1

Fig. 1.



Inventor:
Pierre Herber

By Potter, Pierce & Scheffler
Attorneys.

April 16, 1935. P. HERBER 1,997,729

ELECTRICAL PRECIPITATOR.

Filed April 11, 1934 2 Sheets-Sheet 2

Fig. 2.

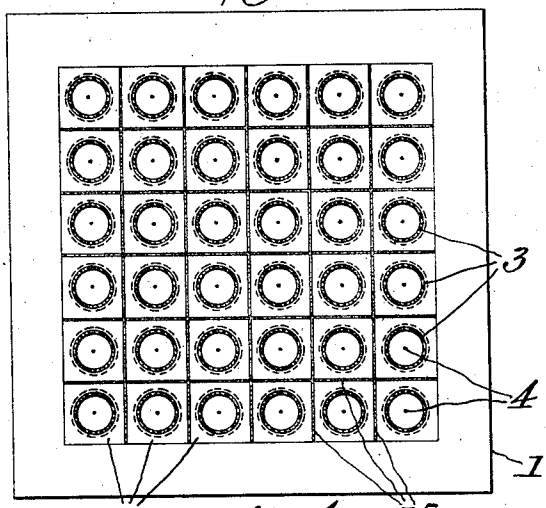


Fig. 3.

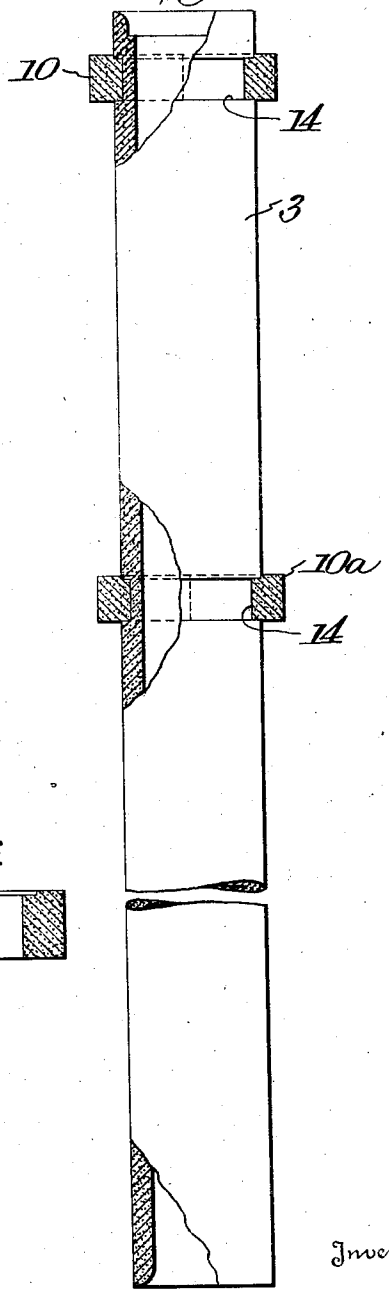


Fig. 4.

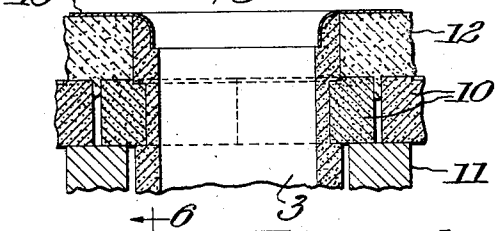


Fig. 5.

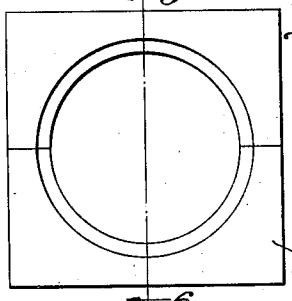


Fig. 6.

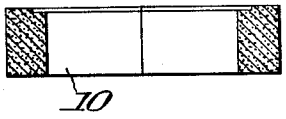
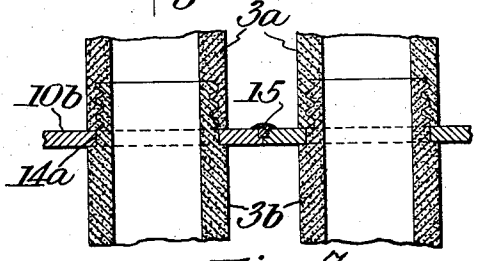


Fig. 7.



Inventor:
Pierre Herber
By Potter, Pierce & Scheffler
Attorneys.

Patented Apr. 16, 1935 1,997,729

UNITED STATES PATENT OFFICE

1,997,729

ELECTRICAL PRECIPITATOR

Pierre Herber, Middlesex Borough, N. J., assignor to Research Corporation, New York, N. Y., a corporation of New York

Application April 11, 1934, Serial No. 720,114

14 Claims. (Cl. 183—7)

This invention relates to an electrical precipitator, and more particularly it comprises an electrical precipitator adapted for the treatment of gases containing corrosive substances such as phosphoric acid, for example.

An object of the invention is to provide an electrical precipitator suitable for the treatment of gases containing highly corrosive substances.

A further object of the invention is to provide an acid-proof precipitator of simple construction involving the use of a minimum of expensive acid-resistant materials.

Other objects and advantages of the invention will appear from the following description.

It has been found that in the construction of electrical precipitators of the Cottrell type for the treatment of gases containing corrosive substances that it is highly desirable to construct the parts of the precipitator coming in contact with the corrosive substances of acid-resistant materials. For example, in the treatment of gases containing phosphoric acid it is advantageous to use carbon members for the parts of the precipitator coming in contact with the phosphoric acid or phosphoric acid-containing gases which are required to be conductive. Other non-metallic conductive or semi-conductive materials, for example, materials comprising a mixture of acid-resistant ceramic substances and carbon, may also be used to advantage.

A difficulty in the use of such materials arises in providing for the proper support of the ceiling of the chamber in which the precipitation is effected. The use of metallic supporting members is subject to the disadvantage that they are subjected to the corrosive effect of the acid substances. The use of beams or other supporting members of carbon or other non-metallic material is impracticable because of the high cost of such members and their low strength.

It has now been found that an economic and satisfactory structure may be produced by supporting the corrosion-resistant collecting electrode members outside the precipitating chamber and supporting the members forming the ceiling of the precipitating chamber upon the collecting electrode members.

The invention will be more particularly described for the purpose of illustration with reference to the accompanying drawings, in which:

Fig. 1 is a vertical section through a precipitator embodying one form of the invention;

Fig. 2 is a horizontal section on line 2—2 of Fig. 1;

Fig. 3 is an assembly of a collecting electrode member and associated supporting members and ceiling members, in partial section;

Fig. 4 is a detail showing the construction of the top support of the collecting electrode members;

Fig. 5 is a plan view of a split collar forming part of the invention;

Fig. 6 is a section on line 6—6 of Fig. 5; and

Fig. 7 is a detail of a modified embodiment of the invention.

Referring particularly to Figs. 1 and 2, 1 is a precipitating chamber having walls and floor of acid-proof brick, gas inlet 2 and drain outlet 16. Cylindrical collecting electrodes 3 made of carbon are vertically positioned in the upper part of the chamber and discharge electrode 4 is suspended in each collecting electrode. The discharge electrodes are suspended from a conductive beam 5 supported upon insulators 6 positioned in insulator hoods 7. The discharge electrodes are maintained taut by porcelain weights 8, and are centered in the collecting electrodes by members 9.

The collecting electrodes are supported at the top on split carbon collars 10 (Figs. 3–6) which are supported in turn by beam members 11 (Fig. 4). The collar members are positioned in grooves somewhat below the top of the electrodes and the space above the collars is filled with cement mortar 12 to the level of the tops of the electrodes. To provide adequate grounding of the collecting electrodes a sheet of lead 13 is dressed over the rounded upper inside edges of the electrodes.

The chamber ceiling is formed by split carbon collars 10*a* similar to collars 10 which are supported by the collecting electrodes in grooves 14. The collars 10*a* cooperate with the collecting electrodes to form a ceiling for the precipitator chamber which requires no other supporting means. A flexible acid-proof plastic material 15 is placed in the joints of collars 10*a* or spread over the top of the collars 10*a*, effectively sealing all of the joints.

A modified form of the invention is shown in Fig. 7. In this form the collecting electrode member consists of an upper section 3*a* and a lower section 3*b*, fitting together with a screw joint which is formed to leave a groove 14*a* at the level of the precipitator chamber roof. In this embodiment, the roof of the chamber is formed of one-piece collars 10*b* which are slipped over the tops of the lower electrode sections 3*b* before the upper sections 3*a* are joined thereto. In this way the roof may be erected and the plastic sealing material 15 placed in the joints before the upper sections of the electrodes are put in place.

In either of the forms of the invention described above, the collar members may be an integral part of the collecting electrodes.

It will be seen that the invention provides a simple and economical construction for electrical precipitators treating corrosive gases and gases containing corrosive materials.

I claim:

1. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported non-metallic acid-resistant collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and non-metallic acid-resisting members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

2. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported non-metallic acid-resistant conductive collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and non-metallic acid-resisting members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

3. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported non-metallic acid-resistant semi-conductive collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and non-metallic acid-resisting members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

4. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported carbon collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and non-metallic acid-resisting members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

5. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported carbon collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and carbon members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

6. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported non-metallic acid-resistant cylindrical collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber and non-metallic acid-resisting members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

7. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported non-metallic acid-resistant cylindrical collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and non-metallic acid-resisting collar members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

8. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported carbon cylindrical collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and carbon collar members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

9. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, externally supported carbon cylindrical collecting electrode members projecting vertically upwards from said chamber and defining conduits for the passage of gases out of said chamber, and carbon split collar members supported by said collecting electrode members and cooperating to define a ceiling of said chamber.

10. In an electrical precipitator, a chamber provided with an opening for admitting into said chamber gases containing suspended matter, vertical cylindrical carbon collecting electrodes comprising an upper section supported outside said chamber, a lower section joined thereto at the level of the ceiling of said chamber, carbon collar members supported at said joint and cooperating to form the ceiling of said chamber.

11. An electrical treater for removing suspended particles from gases comprising vertical flues of non-metallic acid-resisting material, discharge electrodes positioned in said flues, a chamber communicating with the lower end of said flues, means for passing gases into said chamber, a ceiling for said chamber comprising horizontal members supported by said flues on the outside thereof, and means for impressing an electrical potential between said discharge electrodes and said flues.

12. An electrical treater for removing suspended particles from gases comprising vertical flues of carbon, discharge electrodes positioned in said flues, a chamber communicating with the lower end of said flues, means for passing gases into said chamber, a ceiling for said chamber comprising horizontal members supported by said flues on the outside thereof, and means for impressing an electrical potential between said discharge electrodes and said flues.

13. An electrical treater for removing suspended particles from gases comprising vertical flues of carbon, discharge electrodes positioned in said flues, a chamber communicating with the lower end of said flues, means for passing gases into said chamber, a ceiling for said chamber comprising horizontal carbon members supported by said flues on the outside thereof, and means for impressing an electrical potential between said discharge electrodes and said flues.

14. An electrical treater for removing suspended particles from gases comprising vertical flues of non-metallic acid-resisting material, discharge electrodes positioned in said flues, a chamber communicating with the lower end of said flues, means for passing gases into said chamber, a ceiling for said chamber comprising horizontal members supported by said flues on the outside thereof and joined together by a flexible sealing material, and means for impressing an electrical potential between said discharge electrodes and said flues.

PIERRE HERBER.