

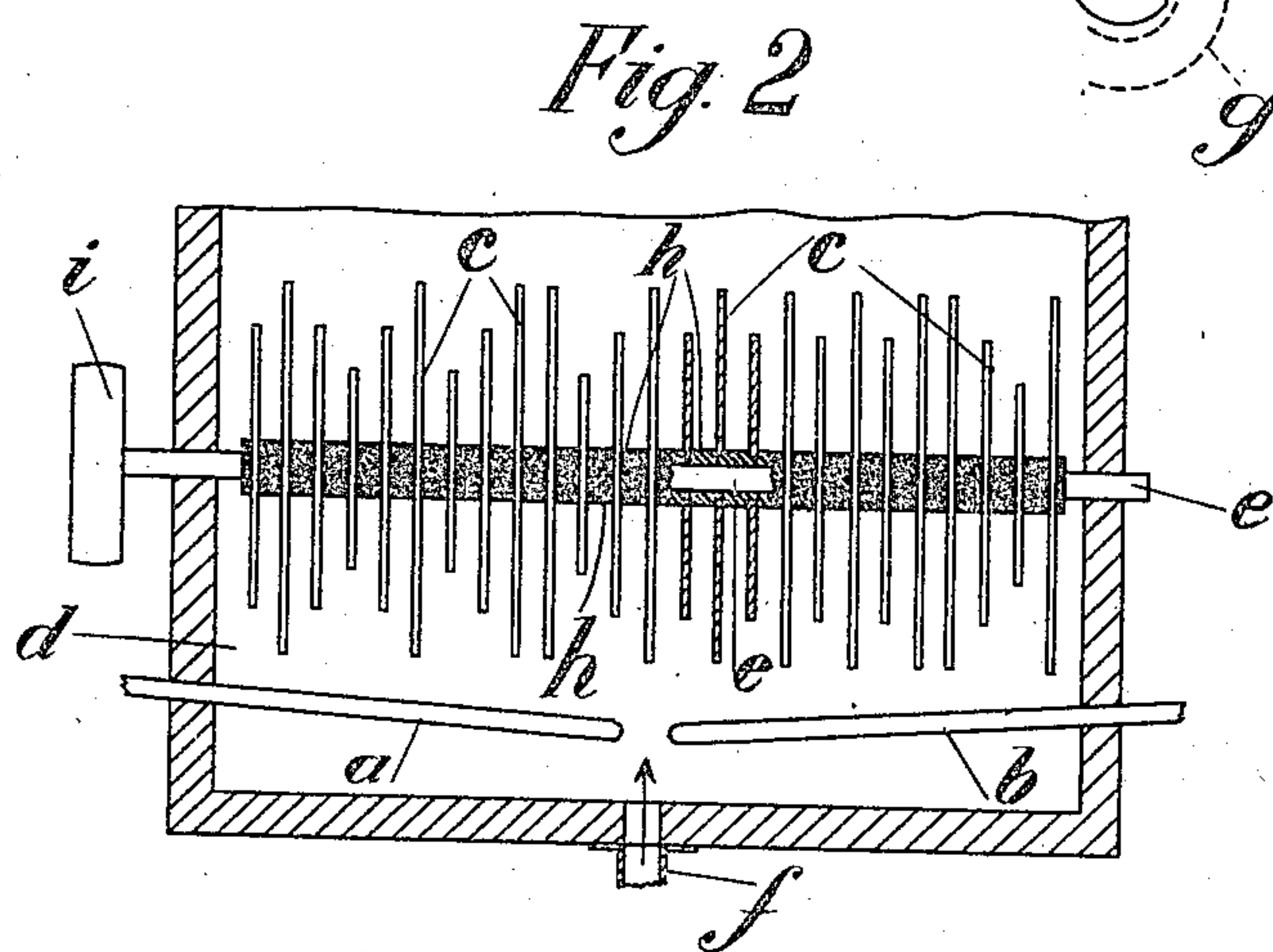
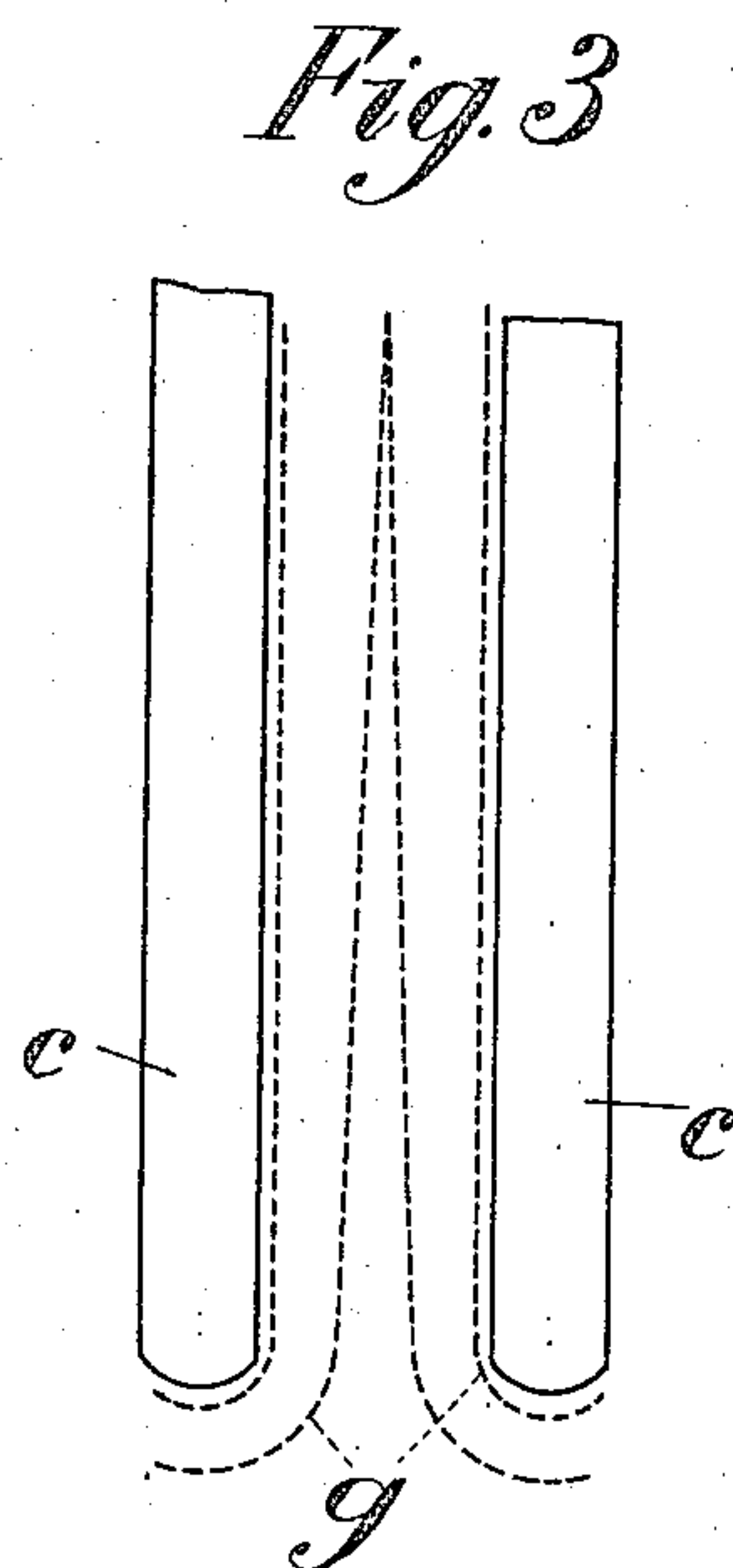
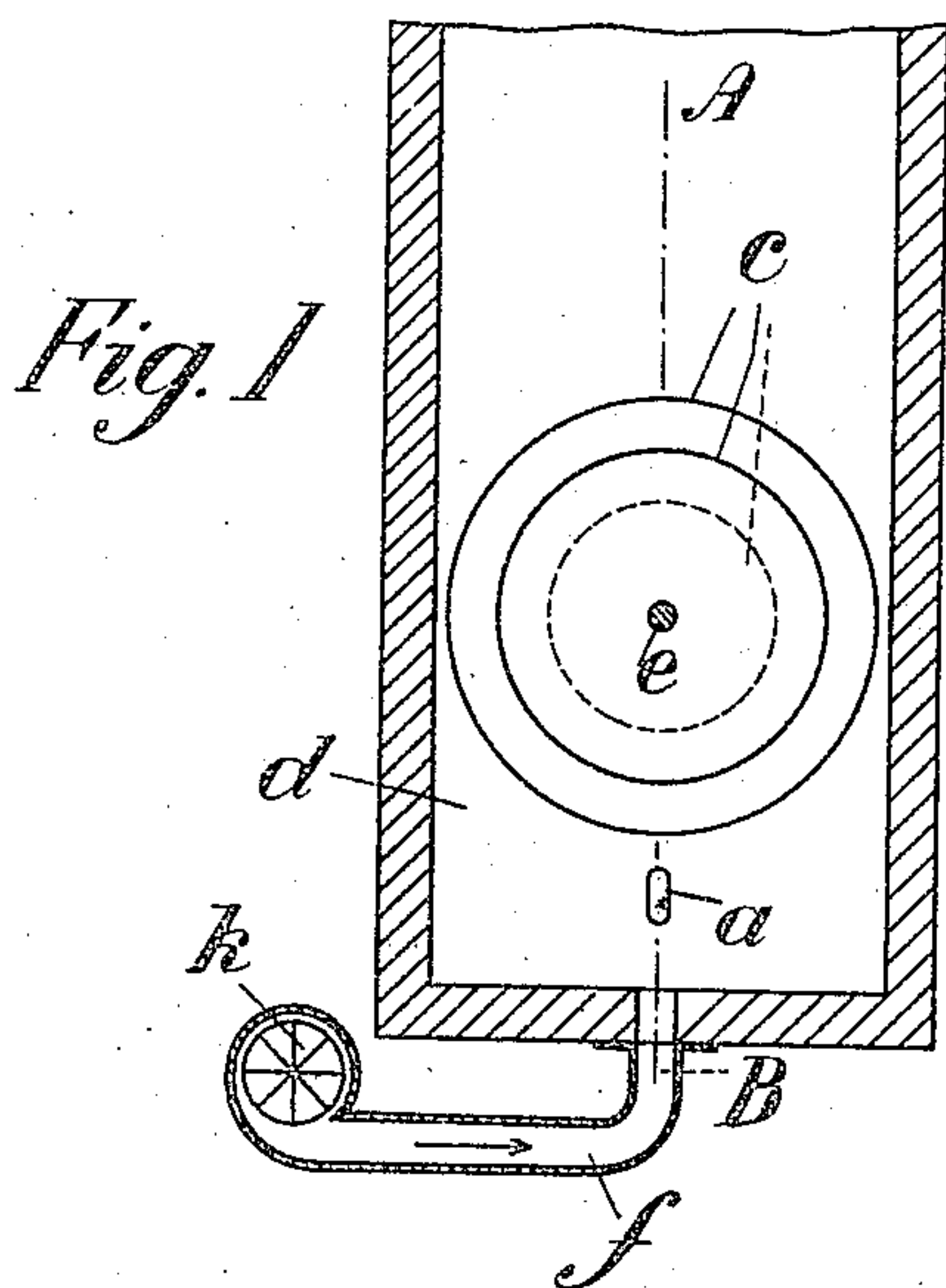
No. 877,446.

PATENTED JAN. 21, 1908.

H. PAULING.

APPARATUS FOR MANUFACTURING NITRIC ACID OR OXIDE FROM AIR.

APPLICATION FILED DEC. 18, 1905.



Witnesses:  
*Fried Döring*  
*Carl Hehner*

Inventor:  
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# UNITED STATES PATENT OFFICE.

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APPARATUS FOR MANUFACTURING NITRIC ACID OR OXID FROM AIR.

No. 877,446.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed December 18, 1905. Serial No. 292,296.

*To all whom it may concern:*

Be it known that I, HARRY PAULING, mining engineer, a subject of the German Emperor, and resident of 84 Wilhelmstrasse, in Gelsenkirchen, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in an Apparatus for Manufacturing Nitric Acid or Oxid from Air, of which the following is a specification.

This invention relates to an improved apparatus for carrying out the process of manufacturing nitric acid or oxid from air, described in Letters Patent No. 814,917, dated March 13, 1906. In this patent, for the purpose of chilling or cooling the nitrous products, it has been proposed to employ either tubes, cooled by water, or an atomizer.

The present invention consists, broadly, in substituting plates for the said contrivances, such plates being better adapted for the purpose. For example, they are found to effect a more rapid cooling and besides to most effectually avoid the formation of an aureola, such as may occur when the tubular arrangement is adopted, the aureola then forming either above or between the tubes.

In the accompanying drawing an embodiment of the invention is diagrammatically shown.

Figure 1 is a sectional view, Fig. 2 a section, partly in elevation, on the line A B of Fig. 1, and Fig. 3 is a detail view, drawn to an enlarged scale, illustrating the mode of action of the plates relatively to the electrical discharges.

*a* and *b* are the electrodes and *c* a number of plates contained within a casing *d* and mounted on an axis *e*, a pipe *f* being connected to this casing for supplying it with the gas (air) to be acted upon. Located within the pipe *f*, at any suitable part thereof, is a fan *k* which acts to blow such gas into the casing. The gas on its passage through such casing is blown through the space between the electrodes *a*, *b*, as indicated by the arrow in Figs. 2 and 3, where it undergoes the action of the electrical discharges, when the products (nitric oxid) resulting from this reaction are passed through the spaces between the plates *c*. Here they are cooled down to the desired temperature, while the electrical discharges are elongated, as shown by the dotted lines *g* in Fig. 3, until they break and extinguish.

The plates *c* may be of any suitable material; they are insulated from each other, as shown at *h*, and are located at substantially right angles to the electrodes.

The axis *e* may be rotatable, for example by means of a pulley *i* driven from a suitable source of power, so that fresh parts of the plates are always presented to the reaction gases and electrical discharges, the previously presented parts being thus enabled to cool down again.

The plates *c* are preferably different in diameter, as shown in Fig. 2, in order to aid in preventing the formation of an aureola.

Changes in the form, proportion, size, and the minor details may be resorted to within the scope indicated by the appended claims, without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is:

1. In an apparatus for manufacturing nitric acid or oxid from air, in combination, electrodes, arranged in a plane, for producing electric discharges, a number of plates so disposed at one side of such electrodes as to cut the plane of the latter at right angles and form interspaces lying crosswise of the electrodes, means arranged at the opposite side thereof for blowing a current of gas through the space between the electrodes, and means for insulating the said plates from each other, substantially as described.

2. In an apparatus for manufacturing nitric acid or oxid from air, in combination, electrodes, arranged in a plane, for producing electric discharges, a number of plates so disposed at one side of such electrodes as to cut the plane of the latter at right angles and form interspaces lying crosswise of the electrodes, means arranged at the opposite side thereof for blowing a current of gas through the space between the electrodes, means for insulating the said plates from each other, and means for rotating them, substantially as described.

In witness whereof I have hereunto signed my name this seventh day of August 1905, in the presence of two subscribing witnesses.

HARRY PAULING.

Witnesses:

WOLDEMAR HAUPT,  
MAX TOBIAS.