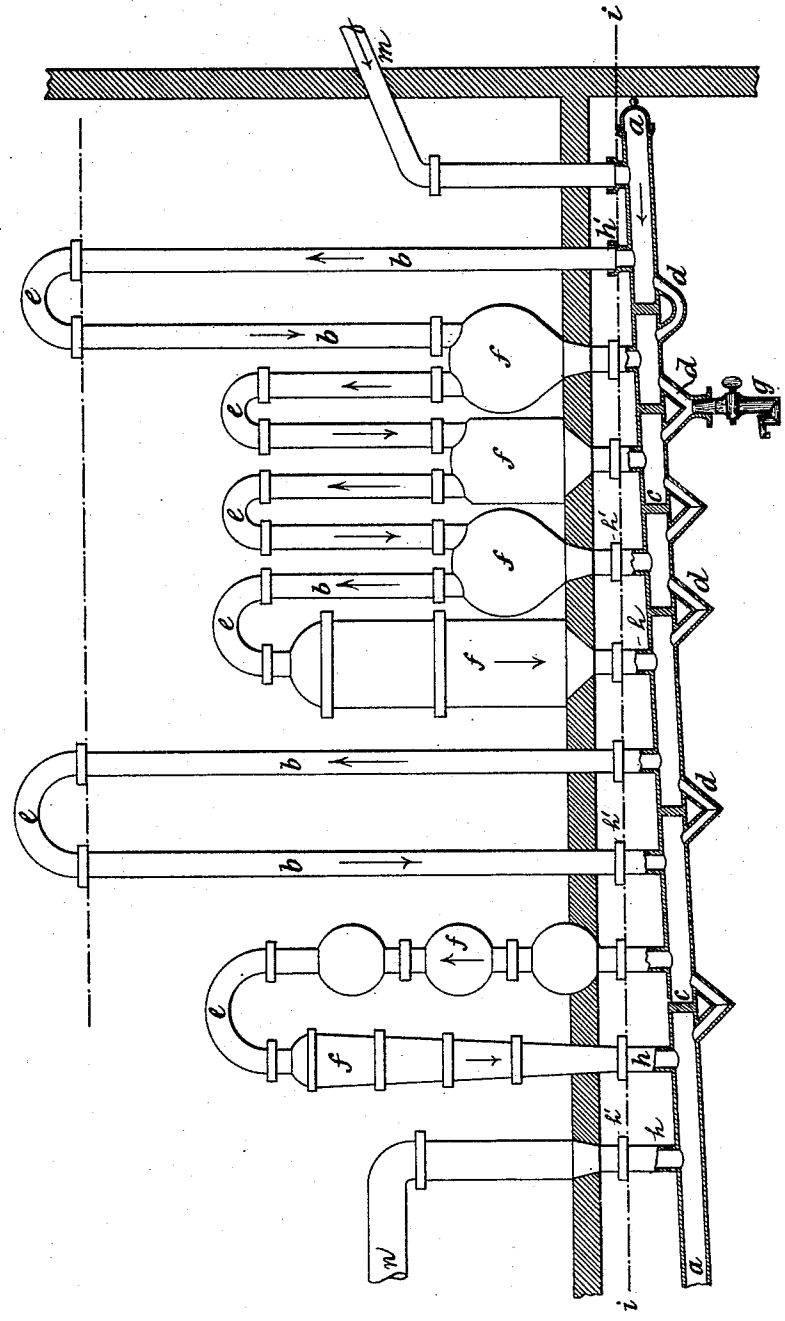
(No Model.)

O. GUTTMANN.

APPARATUS FOR CONDENSING NITRIC ACID.

No. 472,498. Patented Apr. 5, 1892.



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UNITED STATES PATENT OFFICE.

OSCAR GUTTMANN, OF LONDON, ENGLAND.

APPARATUS FOR CONDENSING NITRIC ACID.

SPECIFICATION forming part of Letters Patent No. 472,498, dated April 5, 1892.

Application filed July 9, 1891. Serial No. 398,893. (No model.)

To all whom it may concern:

Be it known that I, OSCAR GUTTMANN, a resident of London, Hampstead, England, and a subject of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Condensing Nitric Acid, of which the following is a specification.

This invention relates to an improved apparatus for condensing nitric acid; and it consists in the various features of improvement more fully pointed out in the claim.

The accompanying drawing is a side elevation of my improved apparatus.

For the purpose of advantageously condensing nitric acid it is necessary to bring the momentarily-forming nitric acid out of touch with the defilement contained in the gases as quickly as possible. This purpose is attained by guiding the gases through a pipe system consisting of an inclined main pipe *a*, which may be made out of one or more sections, and of vertical gas-conduits *b*, communicating with the main pipe. The pipe *a* is divided into a number of chambers by diaphragms *c*, and with each chamber two pipes *b* are made to communicate. On the under side of the main pipe *a* every two neighboring chambers are connected by a curved or elbow pipe *d*. The upper ends of every two adjoining pipes *b* which enter two different chambers are connected by an arc pipe *e*, except the inlet and outlet pipes *m n*. It is evident that the gases flowing from one chamber into the other are conducted by the pipes *b*, and that the products of condensation liquid collect in the chambers. The condensed nitric acid flows from the first chamber to the second, from this to the third, and so on through the elbow-pipes *d*, which are thus filled up and prevent the gases from taking the same course. The condensation of the gases takes place either in the pipes *b*, which can be of sufficent length, or in condensation bulbs *f*, which are arranged between the main pipe *a* and conduits *b*. The elbow-pipes *d* are provided with cocks *g*, that permit the discharge of the liquid at the end of the operation. The pipes are made out of a material not affected by acids, such as stone, clay, or glass.

The main pipe *a* is provided with tubes *h*, gradually increasing in length from right to left and terminating in sockets *h'*. These sockets receive the condensation-pipes *b* or the fictile bulbs *f*. The sockets *h'* lie all in one horizontal plane *i i*, so that the pipes *b*, when of equal length, can be connected by means of arc pipes *e*, having shanks of equal length.

What I claim is—

The combination of an inclined pipe *a*, subdivided into chambers, with tubes *b*, bulbs *f*, and arc pipe *e*, connecting adjoining chambers on top, and with elbow-pipes *d* connecting adjoining chambers at the bottom, substantially as specified.

In testimony whereof I hereunto sign my name, in the presence of two subscribing witnesses, this 24th day of June, 1891.

OSCAR GUTTMANN.

Witnesses:

GEORGE C. HITT,
U. S. Vice-Consul-General, London.

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