(No Model.)

O. GUTTMANN.

PROCESS OF MAKING NITRIC ACID.

No. 491,481. Patented Feb. 7, 1893.

Fig. 1.

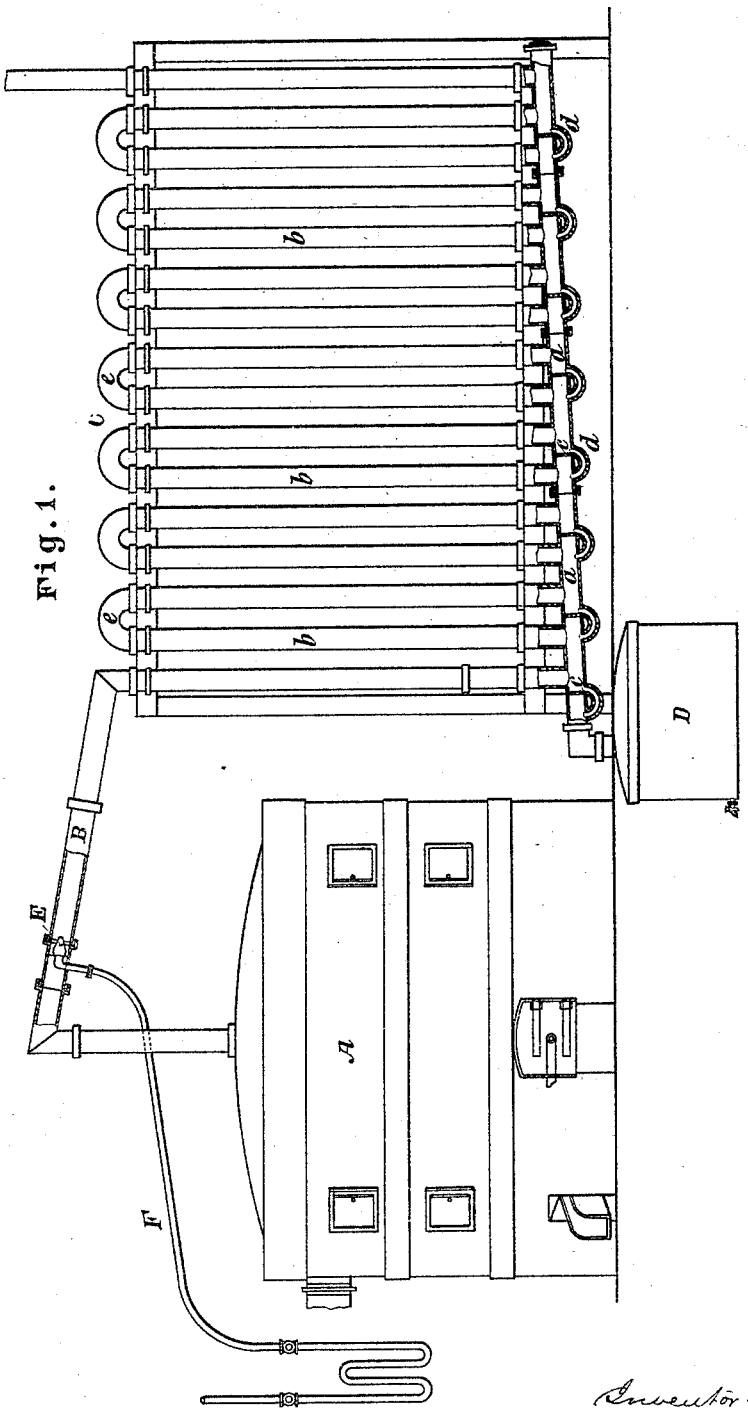

Fig. 2.

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OSCAR GUTTMANN, OF LONDON, ENGLAND.

PROCESS OF MAKING NITRIC ACID.

SPECIFICATION forming part of Letters Patent No. 491,481, dated February 7, 1893.

Application filed January 22, 1892. Serial No. 418,952. (No specimens.)

To all whom it may concern:

Be it known that I, OSCAR GUTTMANN, a subject of the Emperor of Austria-Hungary, residing at Hampstead, London, England, have invented a new and Improved Process for the Preparation of Pure Nitric Acid, of which the following is a specification.

As is well known nitric acid prepared in the usual way, by distillation, contains according to the amount of chlorine in the nitrate of soda used and the degree of heating a varying proportion of low oxides of nitrogen as nitrous acid which particularly in the case of nitric acid manufactured from the waste acids of nitro compounds is considerable and which hitherto has been removed from the finished acid. This removal is effected either by warming the acid and introducing a current of cold or hot air or in various other ways but always by treatment of the finished acid, the low oxides being only slowly removed or oxidized. By the improved process which forms the subject of the present invention on the other hand the acid is treated in a gaseous state at the very moment of its formation, whereby the low oxides are immediately converted into nitric acid, by an air blast, so that pure nitric acid results. This abstraction of water has the further advantage that the nitric acid resulting is more concentrated than usual.

The process consists in the introduction of an air blast by means of an injector or in any other suitable way between the distilling and the condensing apparatus, which air blast mixes the gaseous acid with air before it has time to condense in the condensing apparatus. By thus using an air blast, it assists on the one hand in the passage of the gaseous acid to the condensing apparatus and carries away from the latter the halogen combinations which it may contain, on the other hand it causes a partial vacuum in the distilling apparatus so that the distillation is accelerated and can be carried on at a lower temperature.

In the accompanying drawings Figure 1 is an elevation partly in section of an apparatus for carrying my invention into effect. Fig. 2 is an enlarged longitudinal section through the nozzle E.

The nitric acid is formed in a gaseous state within the distilling vessel A, by the distillation of saltpeter with sulphuric acid in the ordinary manner. The gaseous acid is conducted from the apparatus A, to the condenser C, through pipe B. The condenser C, consists of an inclined lower tube *a*, and of a set of upright tubes *b*, entering the same. The tube *a*, is divided into a number of compartments by means of partitions *c*, and each compartment communicates with two of the tubes *b*. At the lower side of tube *a*, each pair of adjoining compartments is connected by a curved or bent tube *d*. The upper ends of every pair of tubes *b*, that enter adjoining compartments are connected by the curved tubes *e*, excepting, of course, the first and last or inlet and exit tubes. The gases are conducted from one compartment to the other by means of the tubes *b*, and are condensed. The liquid of condensation accumulates within the compartments and flows from one into the other through tubes *d*, to be finally discharged into the reservoir D. As the tubes *d*, are filled by the liquids of condensation, the gases cannot pass directly through the tube *a*, but must pass through the tubes *b*. Before the gases produced within the vessel A, are condensed within the apparatus C, they are subjected to the action of an air blast. The air blast is, by a nozzle E, discharged into the tube B, within which the nozzle is located. The air is conducted to the nozzle E, by pipe F. Thus the gaseous acid is mixed with the air immediately upon its production and before condensation. The air blast can be cold but it is preferred to warm it, by heating the tube F.

What I claim is:

The process of producing pure nitric acid which consits in forming gaseous nitric acid in a distilling chamber, conducting it in a tube to a condenser and in introducing an air blast into the tube to act upon the gaseous nitric acid before condensation, substantially as specified.

Signed at Hampstead, London, this 5th day of January, 1892.

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