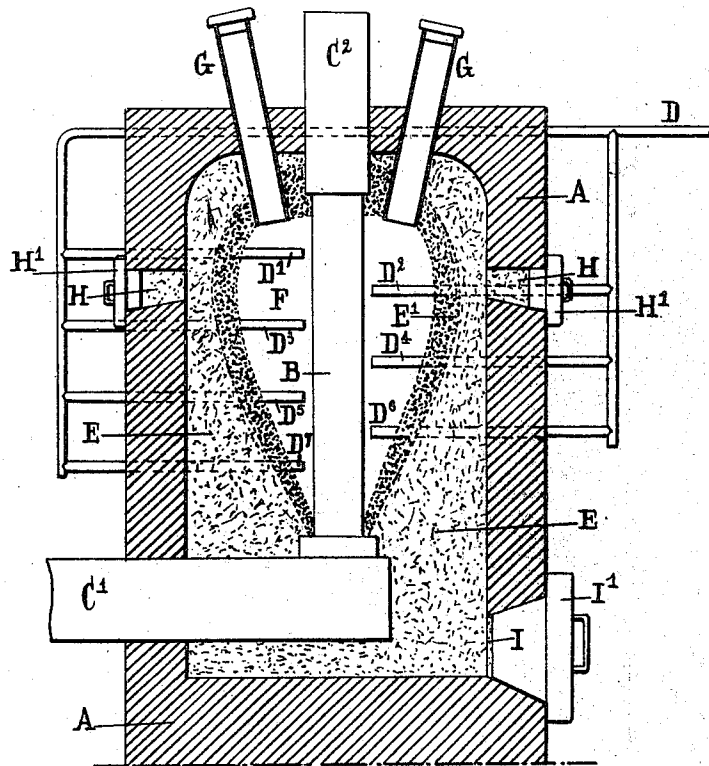


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 PROCESS FOR THE MANUFACTURE OF ALUMINIUM NITRID.  
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1,060,509.

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# UNITED STATES PATENT OFFICE.

OTTOKAR SERPEK, OF PARIS, FRANCE, ASSIGNOR TO SOCIÉTÉ GÉNÉRALE DES  
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PROCESS FOR THE MANUFACTURE OF ALUMINIUM NITRID.

1,060,509.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed May 7, 1912. Serial No. 695,723.

*To all whom it may concern:*

Be it known that I, OTTOKAR SERPEK, a subject of the Emperor of Austria-Hungary, and a resident of 12 Rue Roquepine, Paris, France, have invented a new and useful Process for the Manufacture of Aluminium Nitrid, of which the following is a specification.

It is known that aluminium nitrid is manufactured by heating alumina (or substances containing it) mixed with carbon in a current of nitrogen. But although revolving furnaces have given very good results working on a large scale, it appears that it would be advantageous in working on a small scale to be able to carry out the manufacture of the nitrid in stationary furnaces the construction of which demands little expense.

The object of the present invention is a process allowing of carrying out this manufacture of the nitrid equally well in stationary furnaces. For this purpose, there is employed an electrical resistance furnace, the resistance being brought to the desired temperature by an electric current.

Nitrogen is supplied to the substances heated in such a manner that there are formed cavities around the electrode during the reaction. This result is obtained either by directly introducing nitrogen through the electrical resistance and allowing it to escape at the points where it is more particularly desired to obtain the cavities, or by passing transversely of the mass tubes leading to the immediate neighborhood of the resistance in order to allow the nitrogen to escape at this point. Owing to this arrangement, agglomeration of the nitrid against the resistance is avoided. Since the latter is a very good insulator of heat, without this precaution the radiating effect of the resistance would decrease rapidly to a large extent. This cavity presents moreover the great advantage of allowing the introduction of fresh material. This fresh material introduced arrives in this way directly in the hottest zone which is itself protected externally against losses of heat by the thick layer of

nitrid formed, so that the conversion into nitrid of the mixture introduced takes place very rapidly. This method of working increases considerably the efficiency of the operation in the electrical furnace, not only as regards the absolute quantity of nitrid produced per operation, but also as regards the weight of nitrogen fixed per kilowatt-hour.

By way of example, there is shown in vertical section in the annexed drawing a furnace allowing the carrying out of this process.

The furnace A is vertical. At the center, a heating resistance B is arranged between two conductors C<sup>1</sup> and C<sup>2</sup> serving to convey the current. A series of tubes D D<sup>1</sup> D<sup>2</sup> . . . D<sup>7</sup> bring the nitrogen into the immediate neighborhood of the resistance. The mixture of carbon and aluminous substances E which fills the furnace, stands away from the resistance B under the action of the heat and of the current of nitrogen, forming a cavity F at the same time that a portion E<sup>1</sup> of the mixture E is converted into aluminium nitrid. Tubes G G allow of recharging into the furnace a certain quantity of the mixture.

Instead of using tubes G for recharging the furnace at the top, there may be arranged openings H upon its periphery. After having removed the plugs H<sup>1</sup> closing the openings, the unagglomerated mixture E obstructing them is removed, the crust E<sup>1</sup> of nitrid is broken and through the opening so formed mixture is introduced into the cavity F. An opening I, closed by a plug I<sup>1</sup> and located at the bottom of the furnace, allows of emptying the latter.

As has been stated above, instead of supplying the nitrogen through special passages, it may be brought through the center of the resistance and allowed to escape through openings formed in the latter.

I claim:

The process for obtaining aluminium nitrid from mixtures containing alumina and carbon by means of electrical resist-

ance heating, said process consisting in supplying nitrogen in the immediate neighborhood of the resistance and thereby forming a cavity between the resistance and the nitrid produced and supplying the mixture to said cavity.

In testimony whereof, I have signed my

name to this specification, in the presence of two subscribing witnesses.

OTTOKAR SERPEK.

Witnesses:

H. C. COXE,  
LEON PEILLET.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."