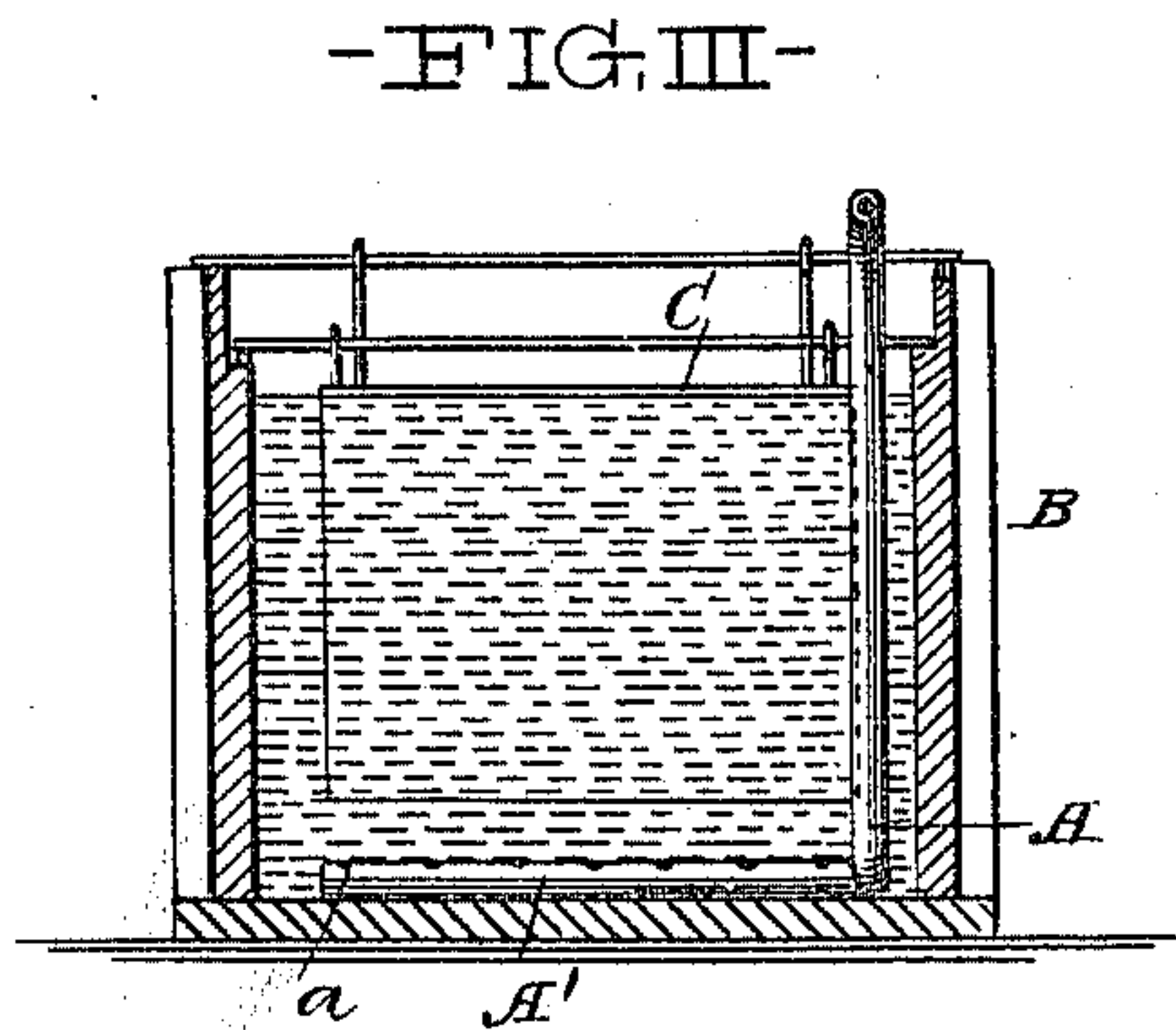
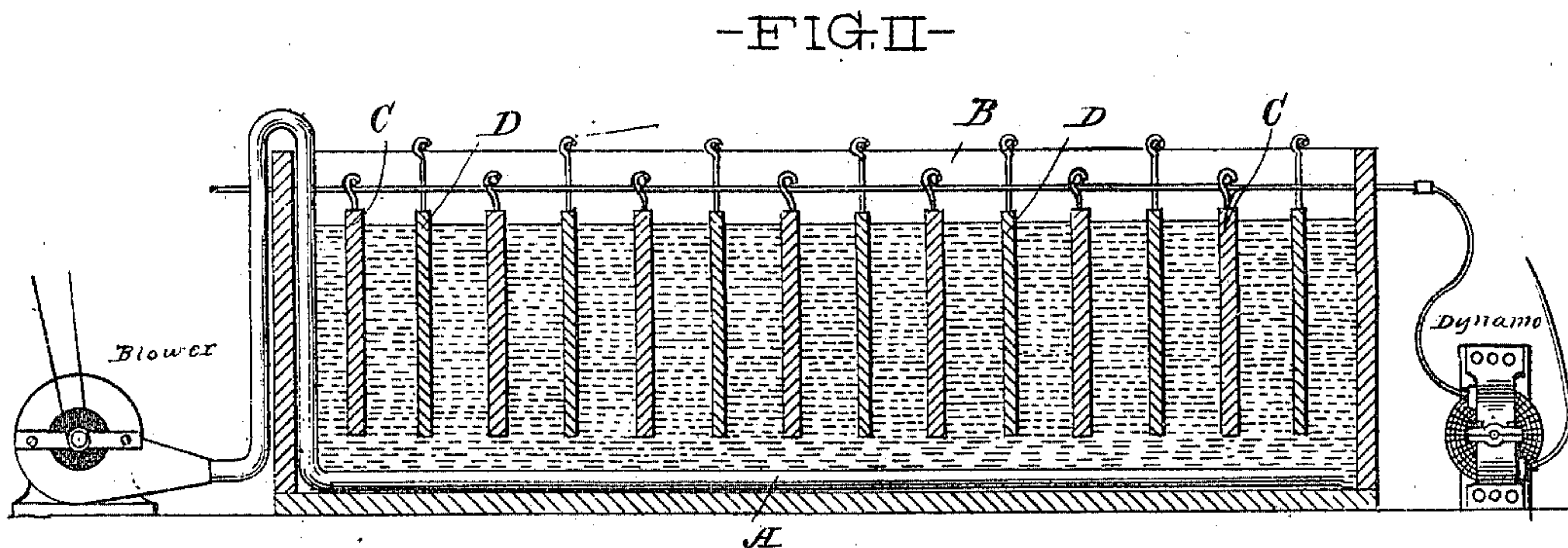
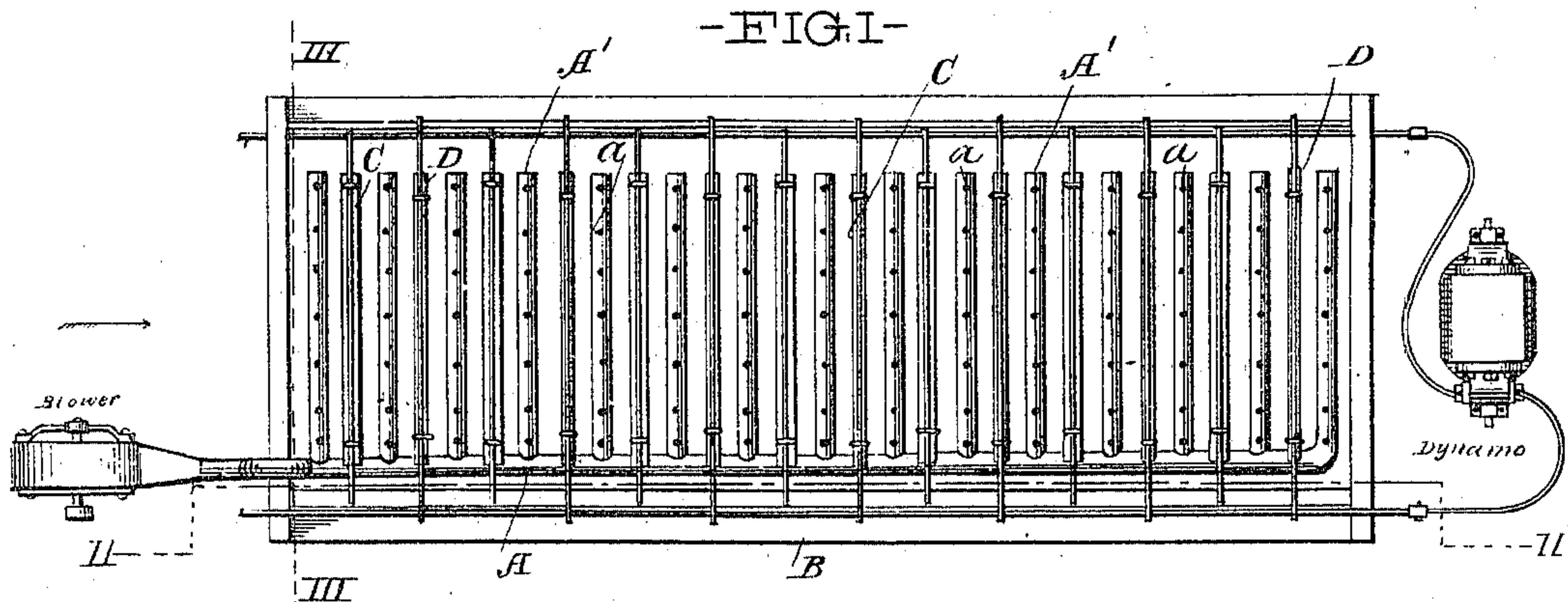


(No Model.)

D. H. BROWNE.
METHOD OF ELECTROPLATING PURE NICKEL FROM FERRO-NICKEL
ANODES.

No. 559,255.

Patented Apr. 28, 1896.



WITNESSES:

J. C. Turner
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INVENTOR.

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UNITED STATES PATENT OFFICE.

DAVID H. BROWNE, OF BROOKLYN, OHIO, ASSIGNOR TO THE CANADIAN
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METHOD OF ELECTROPLATING PURE NICKEL FROM FERRO-NICKEL ANODES.

SPECIFICATION forming part of Letters Patent No. 559,255, dated April 28, 1896.

Application filed July 29, 1893. Renewed October 19, 1895. Serial No. 566,259. (No specimens.)

To all whom it may concern:

Be it known that I, DAVID H. BROWNE, a citizen of the United States, and a resident of Brooklyn, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Methods of Electroplating Pure Nickel from Ferro-Nickel Anodes, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mode of carrying out the invention, such specific mode being but one of various ways in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a top plan view of an electrolytic bath constructed according to my invention; Fig. II, a longitudinal section of the same on the line II II in Fig. I; and Fig. III, a transverse section on the line III III, Fig. I.

In plating nickel by the process of electroplating nickel anodes containing more or less iron and other impurities have heretofore been employed in the following manner: A solution of nickel and ammonium sulphate has been provided to form the electrolyte, and in the bath thus prepared nickel anodes and the articles to be plated have been suspended, the anodes being connected with one pole of the source of electricity and the articles to be plated, which consequently form the cathodes, being connected to the opposite pole of such source. This process of plating has, however, yielded an impure plating, contaminated with iron or other impurities, on account of the iron or other impurities which come from the anodes and are plated onto the articles, together with the nickel. To obtain a plating of perfectly pure nickel, it is therefore necessary to provide means for removing the iron and other impurities from the nickel solution, as it is connected with great difficulty to obtain nickel uncombined with other metals to be used as anodes. This removal of the iron may be done by forming it into an insoluble hydrated oxid, which will be precipitated out of the solution.

In carrying out my invention I arrange a

pipe A of lead, glass, porcelain, or other material unaffected by the solution of nickel-salt forming the electrolyte in the bottom of the plating-tank B, the pipe preferably running parallel with and close to one side of such tank. Said pipe is provided with transverse branches A', having perforations *a* in their upper sides and extending between each pair of anodes and cathodes in the tank. The anodes are indicated by C and the cathodes by D in the drawings, and are suitably connected, respectively, to the poles of a dynamo, battery, or other source of electricity. The pipe is connected to an air-compressor or other source of air under pressure, so that air will be forced through the perforated pipes and up through the electrolyte.

The electrolyte is a solution of nickel-salt of any suitable or preferred form, and to this solution ammonia is added until the solution contains an excess of ammonia and smells faintly of the same.

The anodes may consist of crude metallic nickel, ferro-nickel, nickel-matte, or any combination of nickel which may be used as an anode—viz., nickel sulphid, nickel-iron pyrites, or any compound of nickel which will conduct an electric current.

The cathodes consist of the articles to be plated.

After having connected the anodes and cathodes to the source of electricity the iron in the material used as anodes will dissolve in the plating solution and would plate with the nickel if not prevented therefrom. The iron, however, dissolves as a ferrous salt, which is soluble in the plating solution; but the current of atmospheric air which is forced through the solution bubbles up through the same and oxidizes the iron and changes the latter to a ferric salt, which combines with the ammonia of the bath to form an insoluble precipitate, which can be removed from the bath as it accumulates. Therefore, as the solution is constantly being freed from iron, the deposited nickel will be free from said iron and will be perfectly pure metallic nickel.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the steps herein set forth,

provided the principles of operation set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. The process of electroplating nickel from ferro-nickel anodes, which consists in adding ammonia to the nickel-salt solution until the latter is perceptibly smelling of ammonia, passing the current through the anodes, solution and cathodes, and introducing air in comminuted condition through the solution, substantially as set forth.

2. The process of electroplating nickel from ferro-nickel anodes, which consists in depos-

iting the iron contained in the anodes as an insoluble hydrated oxid by adding ammonia to the solution of nickel-salt until the latter smells of ammonia, and introducing an oxidizing gas through the solution when the current is passed through the anodes, solution and cathodes, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 24th day of July, A. D. 1893.

DAVID H. BROWNE.

Witnesses:

WM. SECHER,
DAVID DAVIES.