

No. 641,552.

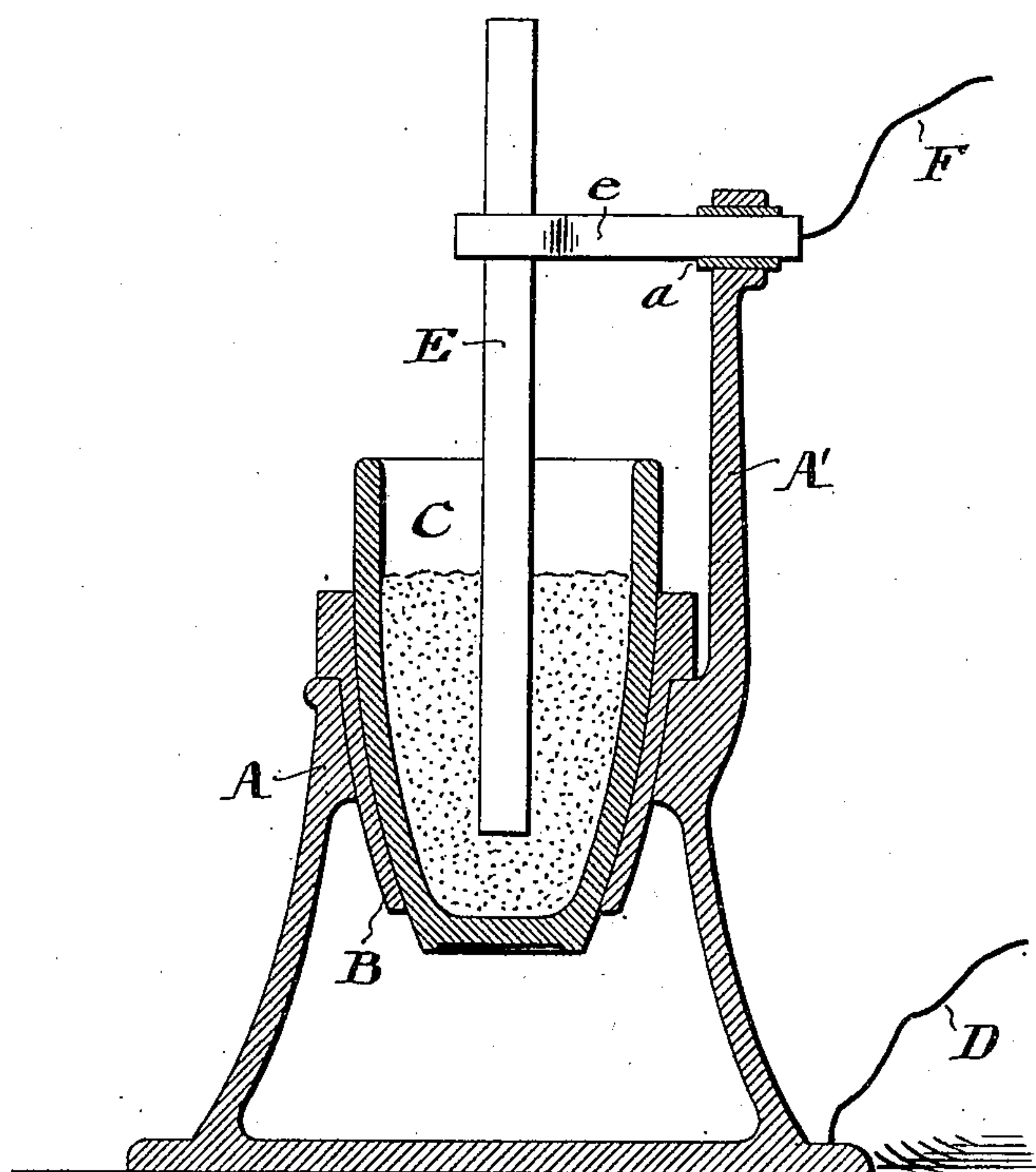
Patented Jan. 16, 1900

M. RUTHENBURG.

PROCESS OF AGGLOMERATING COMMINUTED ORES OR CONCENTRATES.

(Application filed Nov. 22, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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PROCESS OF AGGLOMERATING COMMINUTED ORES OR CONCENTRATES.

SPECIFICATION forming part of Letters Patent No. 641,552, dated January 16, 1900.

Application filed November 22, 1899. Serial No. 737,854. (No specimens.)

To all whom it may concern:

Be it known that I, MARCUS RUTHENBURG, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Processes of Agglomerating Comminuted Ores or Concentrates, whereof the following is a specification, reference being had to the accompanying drawing.

In order to facilitate the reduction of finely comminuted ores or concentrates, it is necessary to agglomerate the same into lumps of convenient size to be subsequently manipulated in the reducing-furnace. Such a result has hitherto been secured by binding the independent particles together with a cementing medium in a press arranged to mold the mixture in briquets. Such a method is obviously objectionable in that the cementing medium forms an additional impurity, which must be subsequently eliminated from the product. Therefore it is the object of my invention to secure the desired agglomeration of the comminuted material aforesaid without the addition of any cementing medium.

My invention consists in assembling a mass of independent particles of comminuted ore or concentrate so that the same shall form a path for an electric current, thereupon subjecting said mass to the action of an electric current in such a manner as to agglomerate the same by the fusion and adherence of the contiguous corners of the assembled particles, and removing the product from the action of the electric current in a coherent porous body.

Although it is to be understood that the precise form of apparatus employed in carrying out my invention is immaterial, I have shown in the drawing a simple form of apparatus which I have found convenient for the purpose specified.

In said drawing, A is the casing or framework, formed of electrical conducting material, comprising a lining B, which forms a jacket for the crucible C. Said crucible C is composed of refractory material, preferably graphite, and forms the cathode, being in electrical connection with the conductor D through the jacket B and casing A. The carbon rod which forms the anode is suspended within said crucible C from a bracket

e, which is upheld by the extension A' of the casing A and insulated therefrom, as indicated at a. The rod E is in electrical connection with the conductor F, and it is of course to be understood that through said conductors D and F the apparatus is in proper connection with any suitable source of current.

With the type of apparatus above described I have secured advantageous results in the treatment of magnetite so comminuted as to be capable of passing through a screen having forty meshes per inch by the employment of a current of between ten and twenty volts and approximately one thousand amperes per square inch of surface of the rod E in contact with the comminuted material, the action of said current upon such material for a period of five minutes sufficing to form the same into a coherent body of open and porous structure, such as hereinbefore described.

Electrical furnaces having been hitherto employed to reduce ores to a fluid state, and thereby effect the separation of the metallic portion thereof from the accompanying gangue or slag, it is to be noted that such a process is essentially different from my invention both in operation and result in that my improved process serves merely to agglomerate a mass of comminuted material without elimination of any constituents thereof and that the coherent body thus produced is not solid, but is of porous structure, and is thus adapted for subsequent reduction in an ordinary furnace. On the other hand, the old process serves to separate the constituent elements of the material treated and is productive of a solid body not adapted for subsequent reduction.

I claim—

1. The hereinbefore-described process, which consists in assembling a mass of independent particles of ore or concentrate, in the path of an electrical current, subjecting said material to the action of an electrical current, until the contiguous corners of its component particles cohere, and terminating the action of said electric current, while the coherent body, thus produced, is of open, porous structure, substantially as set forth.

2. The hereinbefore - described process,
which consists in assembling a mass of inde-
pendent particles of magnetite, in the path
of an electrical current, subjecting said ma-
5 terial to the action of an electrical current,
until the contiguous corners of its component
particles cohere, and terminating the action

of said electric current, while the coherent
body, thus produced, is of open, porous struc-
ture, substantially as set forth.

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