

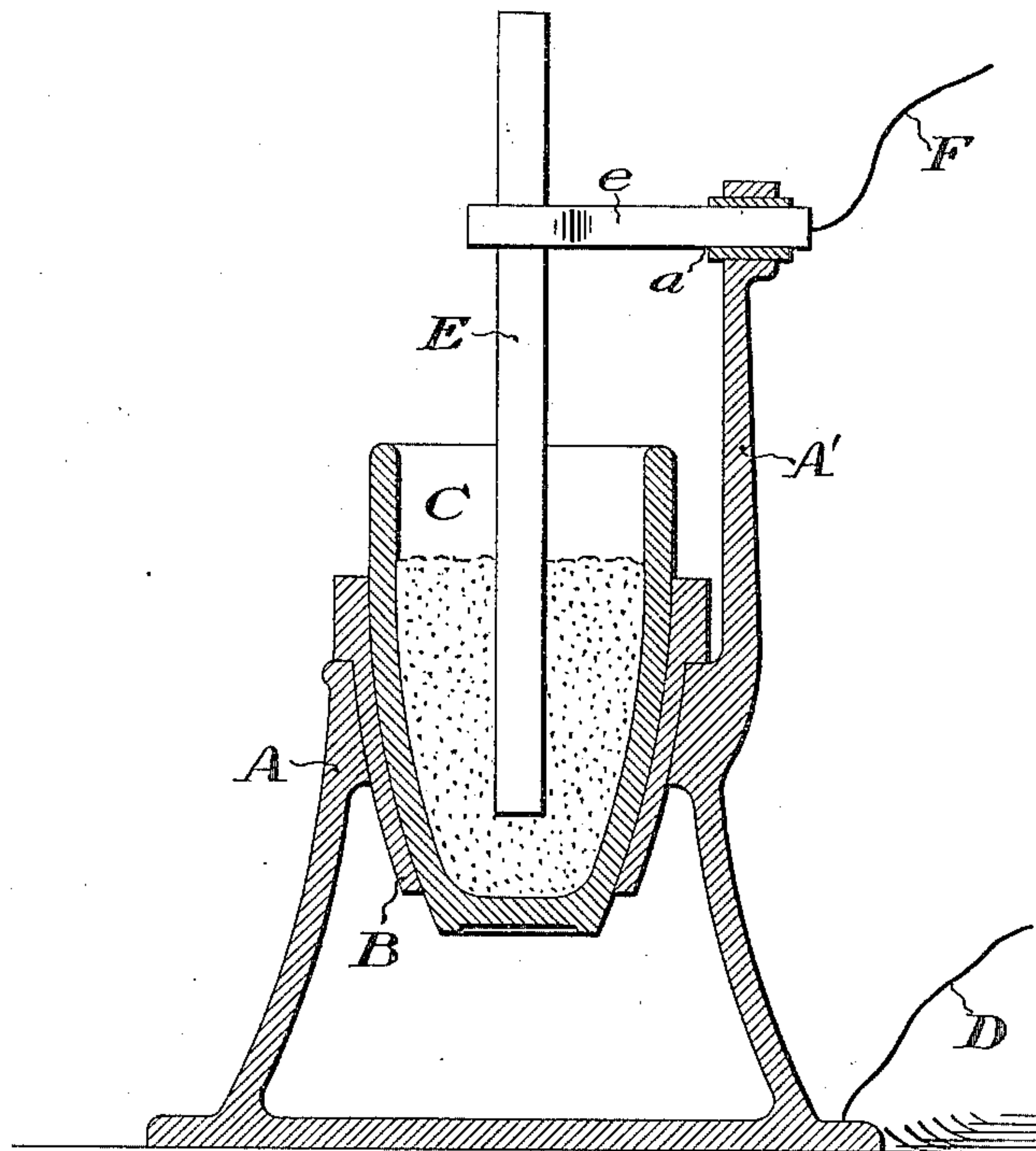
No. 688,699.

Patented Dec. 10, 1901.

M. RUTHENBURG.
METALLIC PRODUCT.

(Application filed Apr. 3, 1900.)

(No Model.)



WITNESSES:

E. L. Fullerton.

Clifton C. Hallowell.

INVENTOR:

MARCUS RUTHENBURG,

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UNITED STATES PATENT OFFICE.

MARCUS RUTHENBURG, OF PHILADELPHIA, PENNSYLVANIA.

METALLIC PRODUCT.

SPECIFICATION forming part of Letters Patent No. 688,699, dated December 10, 1901.

Application filed April 3, 1900. Serial No. 11,277. (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 Metallic Products, whereof the following is a specification, reference being had to the accompanying drawing.

In order to facilitate the reduction of finely-comminuted magnetite, 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 briquettes. Such a product is obviously objectionable in that the cementing medium forms an additional impurity therein, which must be subsequently eliminated. Therefore it is the object of my invention to provide a product wherein the desired agglomeration of the comminuted material aforesaid is secured without the addition of any cementing medium.

My invention comprises an agglomerated mass of unreduced magnetite wherein the assembled particles are fritted together without the interposition of a binding material, as hereinafter described.

Although it is to be understood that the precise means employed in manufacturing my improved product forms no part of my present invention, I have shown in the drawing a simple form of electrical 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 E, 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 and other furnaces having been hitherto employed to reduce ores to a fluid state, and thereby effect the separation of a metallic product freed from the gangue or slag of the material treated. It is to be noted that said old product is essentially different from my improved product in that the latter is merely an agglomerated mass of comminuted material from which no constituents of said material have been eliminated and that the product is a coherent body which is of porous structure and is thus adapted for subsequent reduction in an ordinary furnace. On the other hand, the aforesaid old product not only differs from its original comminuted material as to constituent elements, but is not adapted for subsequent reduction.

Although I have shown and described means for manufacturing my improved product electrically, I do not desire to limit myself to any particular means or method of manufacture, as it is obvious that the same forms no part of my present invention.

I claim—

The hereinbefore-described product, which consists in an agglomerated mass of unreduced magnetite, wherein the assembled particles are fritted together without the interposition of a binding material, substantially as set forth.

MARCUS RUTHENBURG.

Witnesses:

ARTHUR E. PAIGE,
E. L. FULLERTON.