

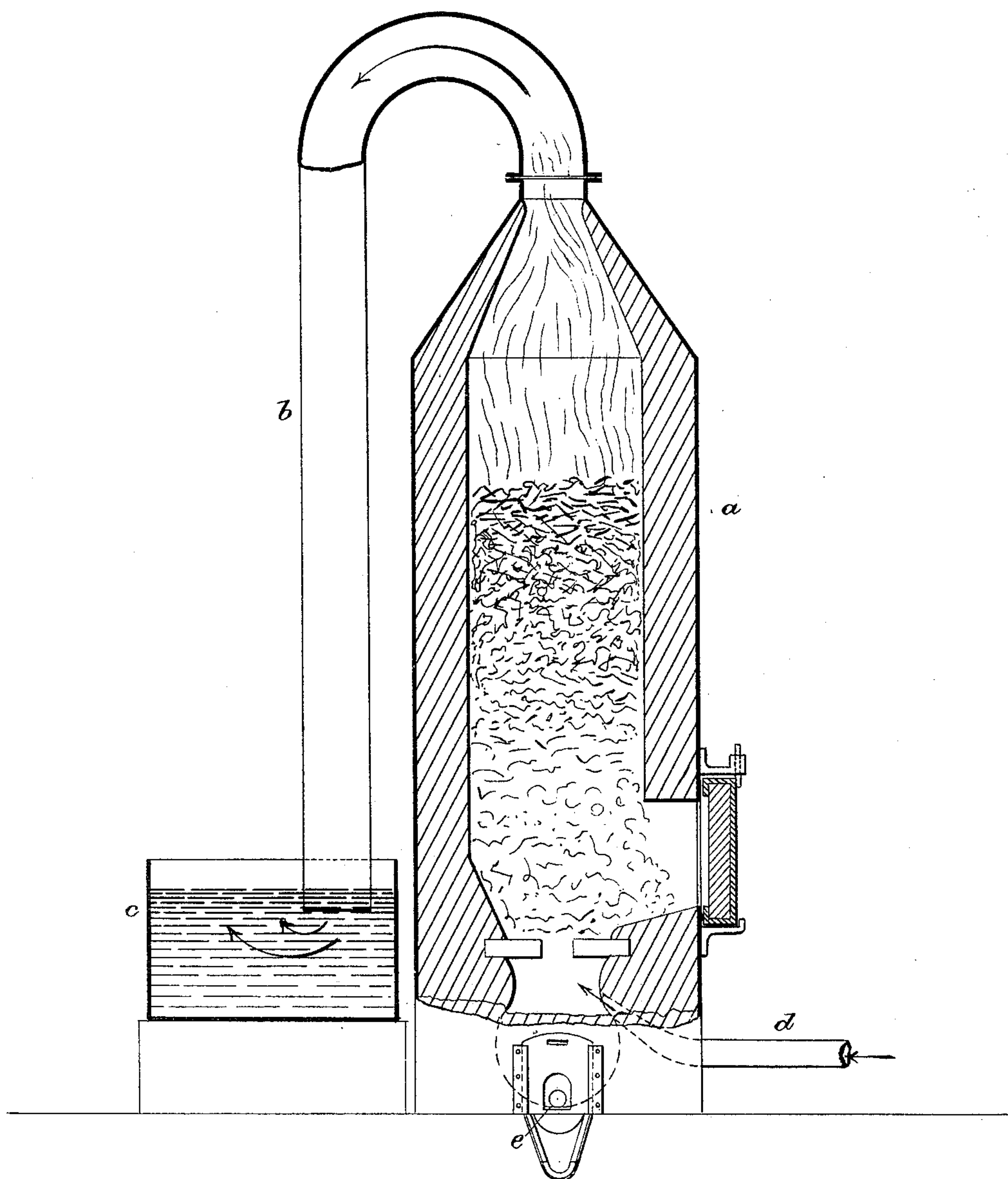
(No Model.)

L. Q. BRIN.

PROCESS OF OBTAINING ALLOYS OF ALUMINIUM.

No. 410,574.

Patented Sept. 10, 1889.



WITNESSES.

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LÉON QUENTIN BRIN, OF PARIS, FRANCE.

PROCESS OF OBTAINING ALLOYS OF ALUMINIUM.

SPECIFICATION forming part of Letters Patent No. 410,574, dated September 10, 1889.

Application filed January 24, 1889. Serial No. 297,440. (No model.) Patented in France March 6, 1888, No. 189,171, and in Belgium March 7, 1888, No. 80,909.

To all whom it may concern:

Be it known that I, LÉON QUENTIN BRIN, engineer, of 6 Rue Wilhem Auteuil, Paris, France, have invented new and useful Improvements in the Process of Obtaining Alloys of Aluminium, (for which I have obtained Letters Patent in the following countries, namely: France, dated March 6, 1888, No. 189,171, and Belgium, dated March 7, 1888, No. 80,909,) of which the following is a full, clear, and exact description.

This invention relates to a new system of metallurgical treatment for obtaining alloys of aluminium with other metals. This improved system comprises a process which yields therefor new and important commercial results.

The process consists in placing the metal to be alloyed and a mixture of flux containing aluminous clay or aluminous salt or earth and common salt (or other suitable chloride) upon and in direct contact with a bed of fuel, and in then igniting said fuel and subjecting said metal and mixture to a melting heat in the immediate presence of the burning fuel, thereby effecting the reduction of aluminium and alloying it directly with said metal.

The operation is or may be effected in an apparatus similar in many respects to a blast-furnace, such as is generally employed by iron-founders.

The accompanying drawing represents a vertical transverse section of a furnace suitable for carrying out my process.

In carrying this process into effect I take copper, iron, or other metal in the form of sheets, lumps, granules, or bars, and having, if necessary, cleansed them, I immerse or coat them with a composition formed by mixing the following ingredients: Clay or ore rich in alumina, one hundred parts; chloride of sodium, one hundred and twenty-five parts; borax, twenty-five parts; fluor-spar, fifteen parts, triturated with sufficient water to form an adherent paste or mud. Another suitable mixture consists of clay or ore rich in alumina, one hundred parts; chloride of sodium, one hundred and twenty-five parts; borax, ten parts. In subsequent operations I replace or omit the borax and employ in lieu thereof

twice the weight of pulverized slag obtained from previous operations. These proportions may be varied in accordance with experience and according to the nature of the metal to be alloyed. The quantity of the above fluxes required for each operation will be about ten per cent. of the weight of the metal treated.

The furnace is charged as follows: Upon a bed of shavings or straw is placed a layer of gas-coke broken into small pieces. Upon this is placed a layer of metal coated or mingled with a mixture of flux prepared in accordance with the above directions, and upon this is placed a final layer of small coke. If the furnace be large, two or more alternate layers of metal and fuel may be employed. The fire being lighted and a blast admitted, the metal is soon melted, and at the same time the salts of alumina are reduced to metallic aluminium, which at once combines with the copper or other metal and forms an alloy. If an alloy containing a higher percentage of aluminium is required, the metal thus obtained is then treated as if it were a pure metal, and the above operation is repeated as often as may be necessary until the desired percentage of aluminium is obtained.

The mixture or flux above described may be enriched by employing chloride of aluminium or other aluminous salts in lieu of the clay, or mixed therewith and with the other materials; but the employment of an aluminium salt is costly and generally unnecessary.

The furnace used in this operation resembles the ordinary blast-furnace generally employed by iron-founders; but, in order to avoid the loss of any products which may be carried off by the draft, the furnace is provided with a chimney or escape-pipe of sufficient diameter to afford free outlet to the gases. These gases may be passed into a muffle and utilized in forming aluminium alloys, in the manner described in another application for Letters Patent of even date herewith; or, preferably, the pipe or tube may be allowed to dip its mouth just under the surface of water or other suitable fluid in a tank, wherein the products carried off by the blast will be condensed and retained as by-products. I prefer to furnish the mouth of the pipe with a

rose pierced with small holes, so as to bring the gases into more intimate contact with the water or other arresting-fluid.

Although I prefer a blast-furnace, the comparatively-low temperature at which these alloys melt enables me to alloy and melt iron and aluminium in an ordinary furnace without the use of a blast.

Iron, cast-iron, steel, and other metals may be treated according to this invention with like facility and advantage, and will produce alloys of great industrial value.

In the accompanying drawing, *a* represents the furnace; *b*, the chimney or escape-tube; *c*, the tank, containing water or other fluid; *d*, the blast-pipe or tuyere; *e*, the running-hole for drawing off the metal; *f*, a ladle or ingot-mold placed beneath it.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

The herein-described process of producing

alloys of aluminium with copper or other metal in the immediate presence of ignited fuel, said process consisting in placing the said metal (copper, &c.) and a mixture of flux containing aluminous clay or aluminous salt or earth and common salt (or other suitable chloride) upon and in direct contact with a bed of fuel, and in then igniting said fuel and subjecting said metal and mixture to a melting heat in the immediate presence of the burning fuel, thereby effecting the reduction of aluminium and alloying it directly with said metal, as specified.

The foregoing specification of my improvements in the process for obtaining alloys of aluminium, and particularly aluminium bronze, signed by me this 8th day of January, 1889.

LÉON QUENTIN BRIN.

Witnesses:

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