

G. F. WILSON, T. JONES & C. A. CATLIN.
 Manufacture of Yellow Metal or Brass, &c.

No. 221,889.

Patented Nov. 18. 1879.

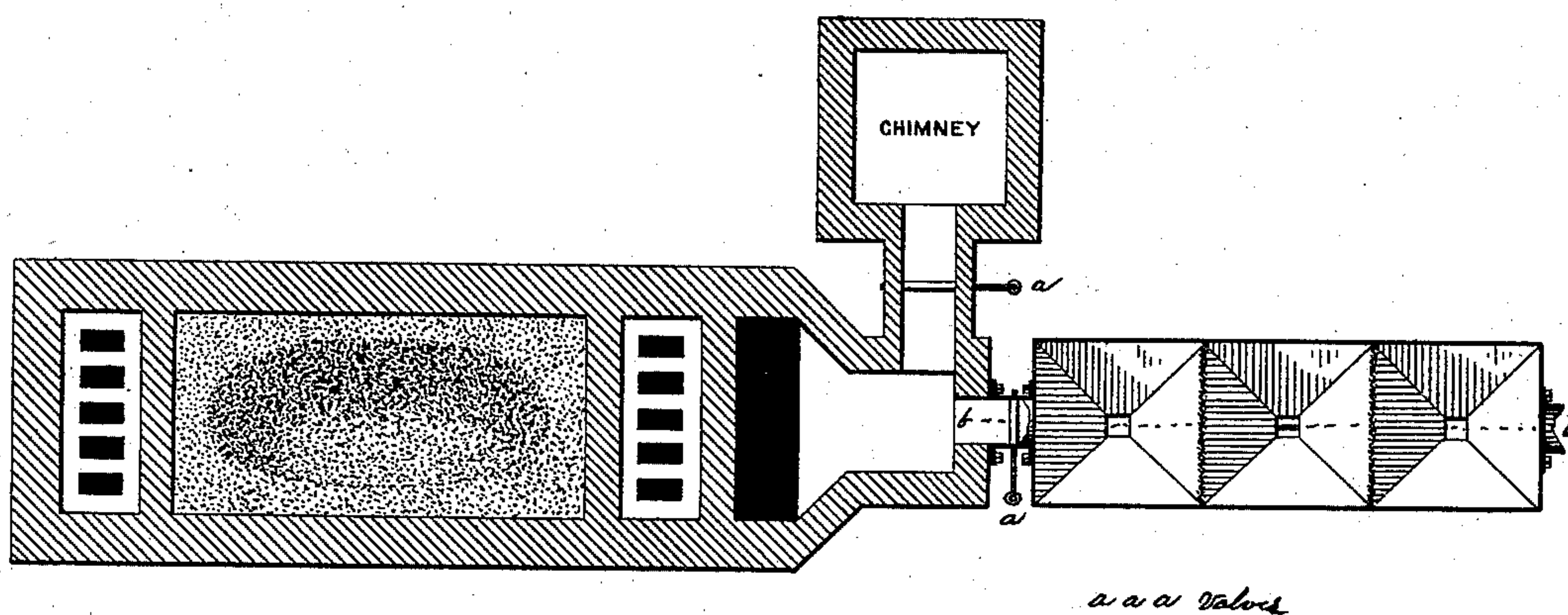


FIG. 1. Plan.

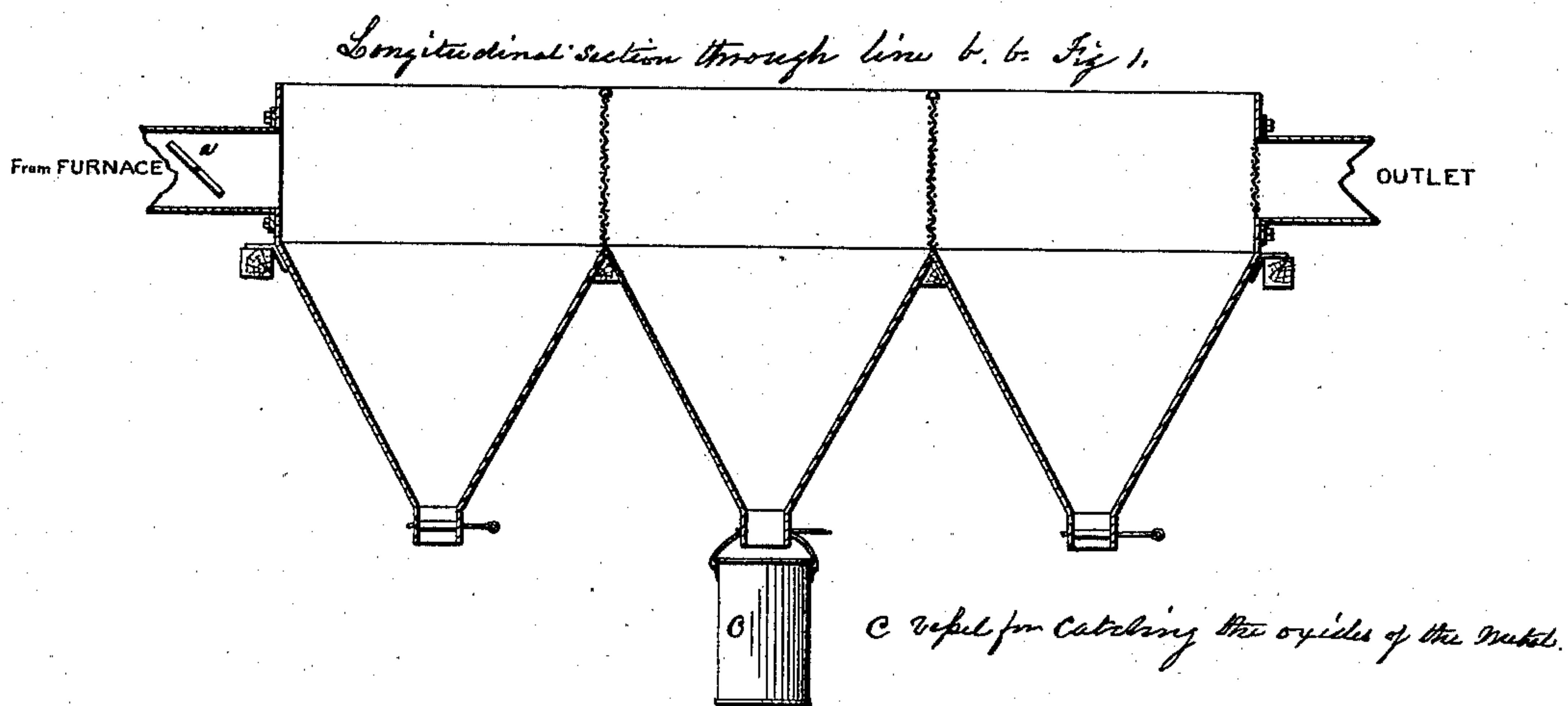


FIG. 2. Section.

ATTEST

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GEORGE F. WILSON, THOMAS JONES, AND CHARLES A. CATLIN, OF EAST PROVIDENCE, RHODE ISLAND, ASSIGNORS TO SAID WILSON, TRUSTEE.

IMPROVEMENT IN THE MANUFACTURE OF YELLOW-METAL OR BRASS, &c.

Specification forming part of Letters Patent No. **221,889**, dated November 18, 1879; application filed June 20, 1877.

To all whom it may concern:

Be it known that we, GEORGE F. WILSON, THOMAS JONES, and CHARLES A. CATLIN, all of the town of East Providence, State of Rhode Island, have made certain new and useful Improvements and Inventions in the Process of Manufacturing Muntz Metal, Yellow-Metal, or Brass, and also in the recovery of this metal from the waste products of the process now in common use, of which the following is a specification.

Yellow-metal is now usually made by smelting zinc and copper in crucibles or in a reverberatory furnace. By either of these processes there is a loss of zinc, arising from its volatilization before its alloy with the copper, resulting in the production of what is called in the art "dross."

The object of our invention is to prevent, as far as possible, the oxidation of the zinc, and to save this waste if oxidation should take place, and also to produce the yellow-metal without the formation of dross, or, as compared with the present processes, the formation of a very much smaller quantity of such dross. We have also in view the recovery of yellow-metal from the dross produced in the ordinary process of manufacture above referred to.

To obtain these results we subject the zinc and the copper, in their usual proportions, or the dross, as the case may be, to the action of a carbo-oxyhydrogen flame, as such flame is understood in the arts, and however the same may be produced. For example, the reducing-flame or producer-gas from a gas-furnace may be employed; but hydrogen, or a gas containing hydrogen, obtained from the decomposition of steam from petroleum or otherwise, is ordinarily and preferably introduced into the producer-gas after it leaves the generator, as the said gas may, and often does, contain an excess of oxygen, which is thus avoided. In the production and application of this flame we prefer to use the furnace patented by George F. Wilson on the 18th day of June, 1872, and numbered 128,004, though we have used what is known in the arts as the "Sie-

mens furnace" for this purpose successfully. We prefer the former furnace, for the reason that the products of combustion, after the flame reaches the metal or dross in the furnace, pass out of the furnace into the chimney, or into condensing-chambers used for the purpose of recovering the oxides of zinc, in which furnace the regenerators are heated by fires specially adapted to that purpose, while in the Siemens furnace the products of combustion and oxides of zinc resulting from the application of the flame are carried through the regenerators, and are, to a greater or less extent, deposited therein, and finally interfere with the draft of the furnace.

It has been found impracticable to manufacture yellow-metal or to reduce its dross in a large way by the use of crucibles. In the use of a common or reverberatory furnace for the same purposes, the length of time required to obtain a heat sufficient to fuse the two metals allows the introduction of so much of the oxygen of the air that a great loss of metals by oxidation ensues, and there further results a mechanical mixture of particles of metal with these oxides, which envelop particles of the molten metal, and hold them when cold in the form of dross.

By the process which we have invented the metals are fused and combined before any considerable degree of oxidation can take place, because the oxygen introduced into the carbohydrogen gas from the air—the gas being in excess of the oxygen—is nearly or quite used in consuming the gas in the production of the flame, and there is little or none left to combine with the metals.

We have found it useful to introduce into the metal, while in a state of fusion in the furnace, hydrocarbon gas, for the purpose of reducing any oxides of the metals which may be held in solution in the molten metal.

In order to enable others skilled in the art to use our invention and process, we now proceed to describe the same.

For information concerning the Siemens furnace and the Wilson furnace, mentioned above, reference may be had to the respective patents.

For the purpose of saving the volatilized oxides which may be produced in the process of smelting heretofore described, we attach to the furnace-flues a series of chambers and screens. (Shown in the drawings hereto attached.) They are so connected with the furnace that, at will, the products of combustion may be diverted from their course through the direct flue into the chimney and caused to pass through these chambers, where, the oxides being condensed, the remaining products pass out through a flue connecting the last chamber with the chimney.

In the operation of the furnace the products of combustion are carried directly into the chimney until there is evidence of oxidation to be seen at its summit, and when this is observed the flue into the chimney is closed by means of valves, as shown, and the products of combustion are passed through the condensing-chambers so long as oxidation continues.

We have found it useful to have a body of water under the generating-furnace, our object being to pass the steam arising therefrom through the burning coal, by which the steam will be decomposed, with the production of hydrogen and carbonic oxide, which, entering the furnace with the hydrocarbon gases, will great-

ly increase the heating and reducing power of the flame produced by their combustion.

The same result may be obtained by filling the first series of retorts in the Wilson furnace with charcoal or coke, and introducing steam into them at that point, when the same will be decomposed, as hereinbefore described.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The smelting and mixing of copper and zinc for the purpose of producing yellow-metal or brass, or the smelting of copper and of zinc ore for the same purpose, or the smelting and reduction of yellow-metal dross and waste products of brass-foundries and other manufactories where waste products of brass are produced, by subjecting the same to a carbo-oxy-hydrogen flame, produced and applied in the manner substantially as described.

2. The combination, with furnaces, herein described, of condensing-chambers, substantially as and for the purposes set forth.

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Witnesses:

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