

H. KRUM.  
Pigment-Furnace.

No. 208,828.

Patented Oct. 8, 1878.

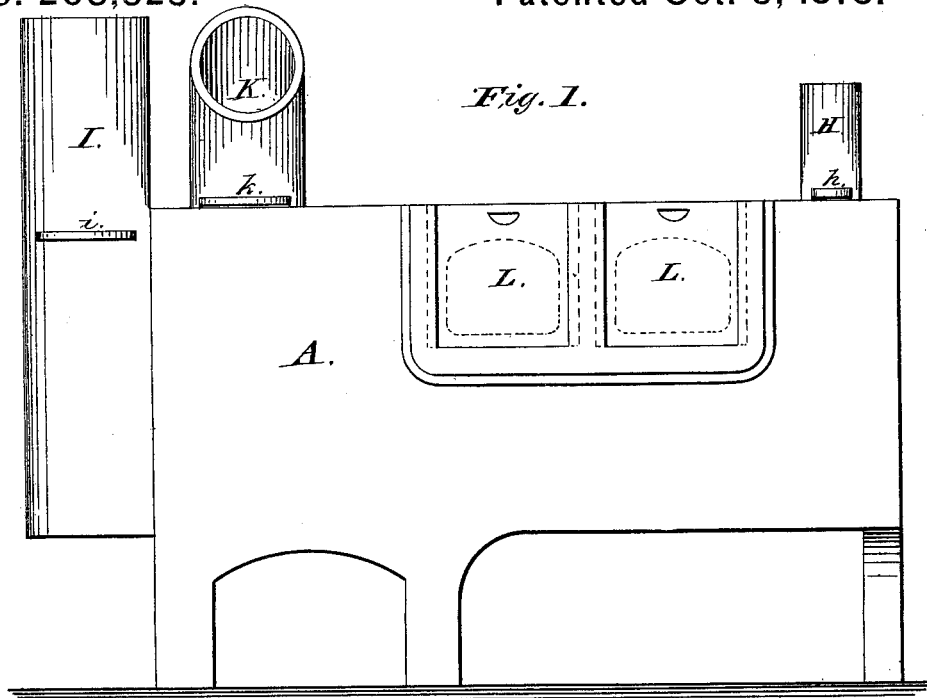


Fig. 1.

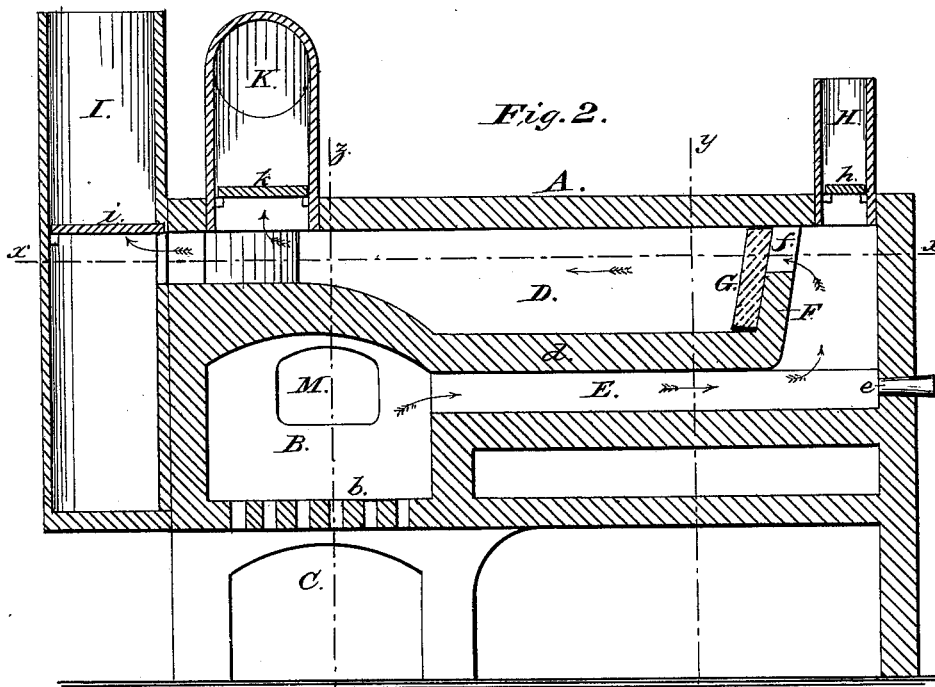


Fig. 2.

Witnesses:

Dea Bill Williamson  
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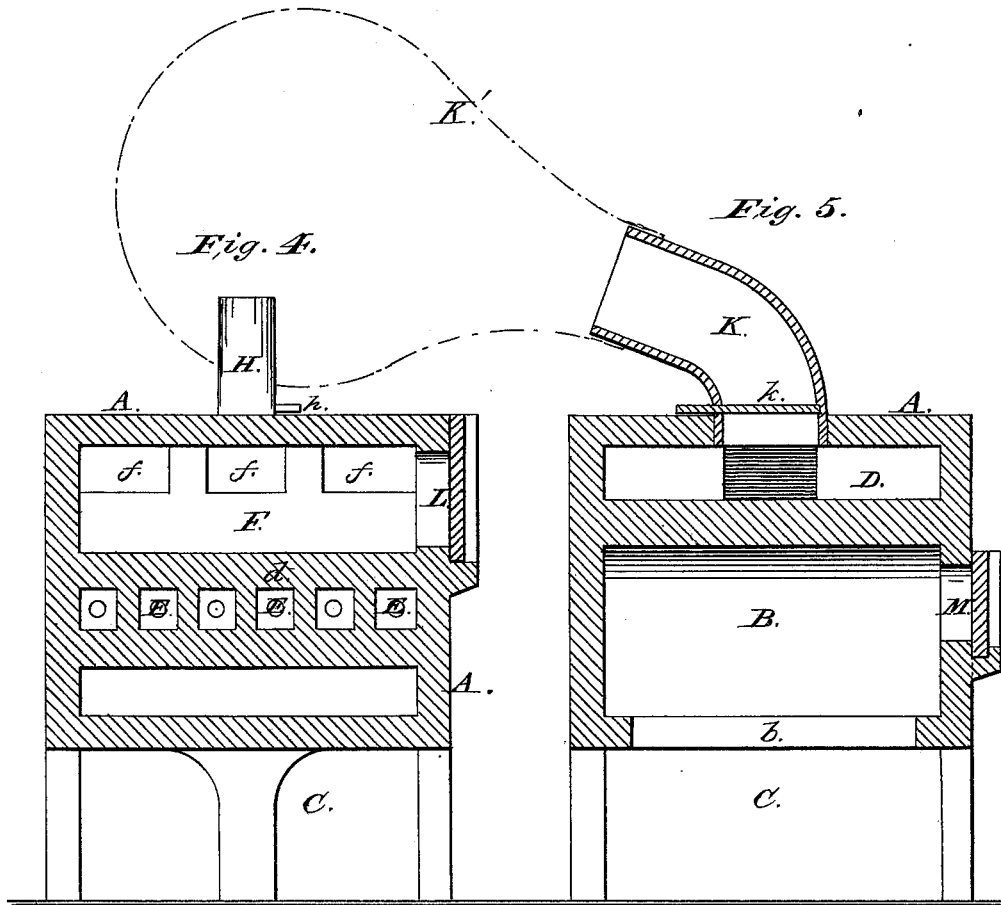
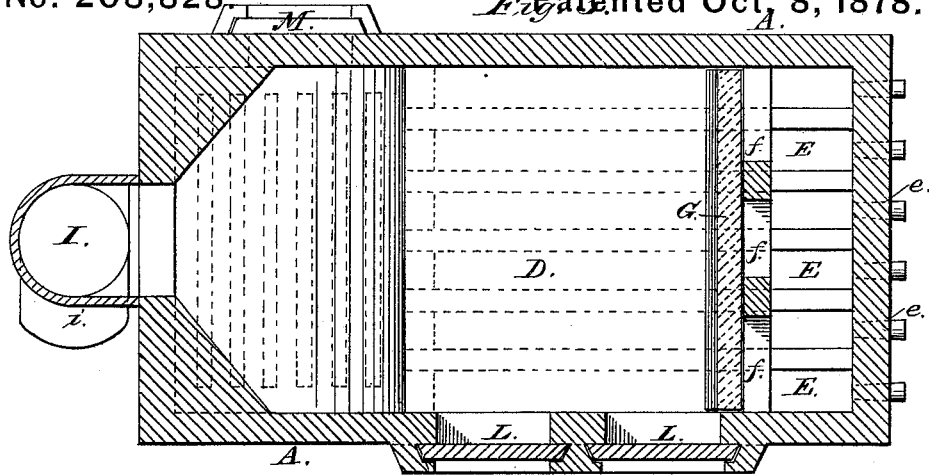
Inventor:

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Witnesses:  
S. Cabell Williamson  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

HENRY KRUM, OF CINCINNATI, OHIO.

## IMPROVEMENT IN PIGMENT-FURNACES.

Specification forming part of Letters Patent No. **208,828**, dated October 8, 1878; application filed July 11, 1878.

*To all whom it may concern:*

Be it known that I, HENRY KRUM, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Furnaces for the Manufacture of Oxide of Zinc; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to produce, as a new article of manufacture, an oxide of zinc that is of a superior quality to that now in use; and it consists of an apparatus or furnace provided with flues and a chamber, arranged with certain dampers in such manner that the smoke and gases or products of combustion are excluded from the working-chamber, so as not to come in contact with the spelter, zinc ore, galvanized iron, &c., from which it is intended to extract the oxide of zinc, which is to be caught and condensed in a balloon, as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawing, Figure 1 is a side elevation of my furnace. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a horizontal section on line *x x*. Fig. 4 is a cross-section on line *y y*. Fig. 5 is a cross-section on line *z z*.

In the drawing, A represents the furnace, which is provided with the fire-chamber B, having a suitable grate, *b*, and ash-pit C; and it communicates with the working-chamber D by means of a number of horizontal flues or passages, E, and flues *f* in the bridge F. In the rear wall of the furnace, and opposite each of the flues E, is arranged a hole, *e*, provided with a plug, and through these holes the flues may be cleaned. At the rear end of the working-chamber is formed a bridge-wall, F, provided with flues *f*, which can be closed, if desired, at certain times, hereinafter described, by a tile or damper, G, of fire-clay or other suitable material. At the rear end of the working-chamber is arranged a small smoke-

stack, H, provided with a sliding damper, *h*, through which the smoke escapes when it is open. At the forward end is a large stack, I, also provided with a sliding damper, *i*, which is opened when starting the fires. Near the stack I is arranged a curved or inclined flue, K, having a sliding damper, *k*, and over the mouth of this flue a balloon, K', of any suitable material, (shown in dotted lines in Fig. 5,) is attached, into which the volatilized zinc passes, and is therein retained.

The balloon is provided with one or more openings, through which the oxide of zinc is withdrawn into suitable receptacles. In the side of the furnace are arranged the doors L, through which the working-chamber D is charged with the spelter, zinc ore, galvanized-iron scraps, &c. Another door, M, is arranged in the fire-chamber, through which the fuel is introduced.

The operation is as follows: The fire is made on the grate *b*, the tile or damper G is removed, the damper in the stack I opened, and the products of combustion passing through the flues heat the working-chamber in their passage, and finally pass out at the stack. When the fire is well started and burning the tile G is replaced, the damper in the stack H opened to allow the smoke to escape, and the spelter, scraps of galvanized iron, or other material is introduced through doors L into the working-chamber. The damper *k* in the curved flue K is then opened, after the balloon has been attached. The fire, acting on the under side of the floor *d* of the working-chamber, acts on the material contained therein, which soon melts and begins to boil, and by admitting air through the doors L in the side of the furnace, which are raised slightly for a few minutes at a time, and it will cause the highly-heated and boiling material to burn, which thereby volatilizes the zinc, which is carried through the flue K into the balloon, and, condensing therein, forms oxide of zinc, and can be withdrawn into barrels or other suitable receptacles. The smoke from the fire passes out through the small stack H.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The furnace herein described, consisting

of the fire-chamber B, flues E, working-chamber D, stacks H and I, flue K, and balloon K', substantially as shown, and for the purpose herein set forth.

2. In the furnace herein described, the combination of a fire-chamber, B, flues E, and working-chamber D with the bridge-wall F, having flues *f*, tile or damper G, and curved flue K, as shown, and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

HENRY KRUM.

Witnesses:

L. CABELL WILLIAMSON,  
ALFRED LEE.