

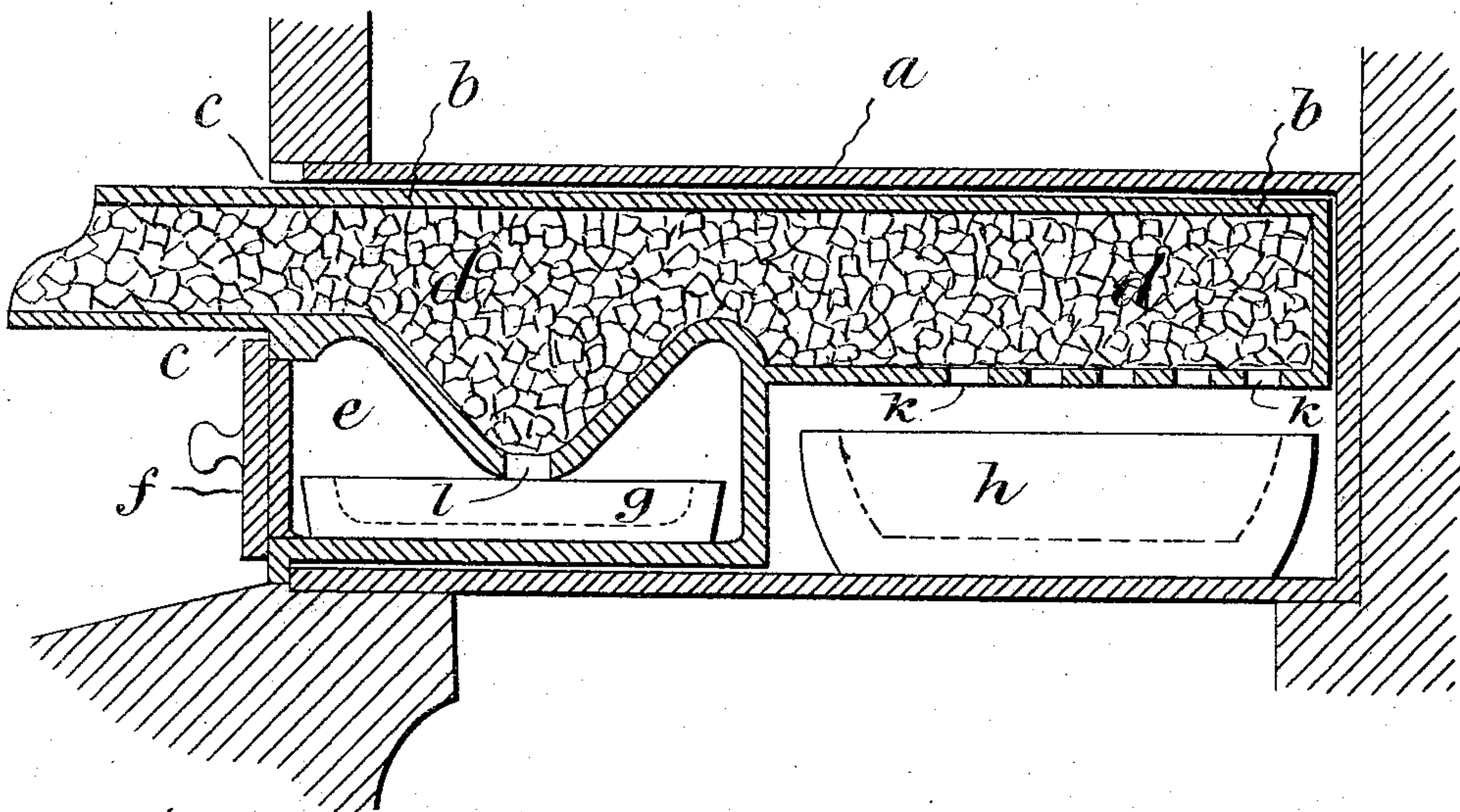
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originals

No. 754,141.

PATENTED MAR. 8, 1904.

E. H. HOPKINS.
PROCESS OF OBTAINING ZINC.
APPLICATION FILED JUNE 4, 1903.

NO MODEL.



Witnesses.

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UNITED STATES PATENT OFFICE.

EVAN HENRY HOPKINS, OF SOUTH KENSINGTON, LONDON, ENGLAND.

PROCESS OF OBTAINING ZINC.

SPECIFICATION forming part of Letters Patent No. 754,141, dated March 8, 1904.

Application filed June 4, 1903. Serial No. 160,117. (No specimens.)

To all whom it may concern:

Be it known that I, EVAN HENRY HOPKINS, clerk in Holy Orders, a subject of the King of Great Britain, residing at 32 Redcliffe Square, South Kensington, London, England, have invented certain new and useful Improvements in Processes of Obtaining Zinc from Bodies Containing It and other Metals in a Metallic State, of which the following is a specification.

Since the filing of my application on which Letters Patent No. 731,184, bearing date June 16, 1903, was granted I have discovered that the process described therein is applicable to the separation of zinc from the slimes of the cyanid process for obtaining gold, the scums of the Parkes process, and like substances which also contain zinc and another metal or metals in the metallic state. In those cases in which the metallic mixture contains little or no lead the latter should preferably be added in the metallic state, as it is found that the lead alloys with the gold and silver and retains it in the retort. The metallic mixture containing the zinc and other metal, with or without the added lead, is then placed in a retort, and the zinc is distilled off under conditions similar to those described in my former patent. Gold and any other metals present are left behind in the retort, the gold being recoverable by cupeling. As described in my former patent, air is prevented from entering the retort and from coming in contact with the zinc before it is liquefied.

The drawing shows a longitudinal vertical section of apparatus which may be used in the process, the furnace proper being broken away.

a is a retort which may be heated in any desired manner.

b is a self-contained receptacle which is inserted into the retort *a* and luted into it at *c c*.

d is a chamber charged with carbon in small lumps.

e is a compartment having a door *f* and in which is placed a receiver *g*.

h is a pan in which the charge is placed.

While I have shown and described an apparatus which may be used in my process, it

will be obvious that the apparatus shown in my patent before referred to and other forms of apparatus may be employed.

As before stated, the process forming the subject of the present application is intended for use on substances in which the zinc is contained in the metallic state, and therefore no addition of a reducing agent is necessary in the retort or, in the apparatus above described, in the pan *h*. The condensing-chamber being filled with carbon and the receptacle for the charge being filled with the body containing metallic zinc without any reducing agent, the retort or muffle is subjected to the flames, or the retort may be hot when the materials are inserted. When the necessary temperature is reached, the gaseous zinc passes into the carbon-filled condensing-chamber in the apparatus shown through the perforations *k* into the chamber *d*. As stated in my patent above referred to, the carbon at the point of entrance of the zinc-vapor will be at a temperature above the condensing-point of zinc-vapor and will be so arranged that as the vapor advances it passes into cooler and cooler carbon until it gets into carbon at a temperature below the condensing-point of zinc-vapor, when it condenses and trickles down through the carbon. In the apparatus shown this will be approximately above the perforation *l*, through which the zinc falls into the receiver *g*. The remaining metals remain in the retort or the pan.

I claim—

1. The process of obtaining zinc from substances containing it in a metallic state which consists of subjecting the substances to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of heated carbon from which air is excluded, substantially as described.

2. The process of obtaining zinc from substances containing it in a metallic state which consists of subjecting the substances to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of car-

bon from which air is excluded and which is heated to a temperature above that at which zinc solidifies, substantially as described.

3. The process of obtaining zinc from substances containing it in a metallic state which consists of subjecting the substances to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of carbon from which air is excluded and which is heated to a temperature below that at which zinc vaporizes, substantially as described.

4. The process of obtaining zinc from substances containing it in a metallic state which consists of subjecting the substances to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of carbon from which air is excluded and which is heated to a temperature between those at which zinc solidifies and volatilizes, substantially as described.

5. The process of obtaining zinc from substances containing it in a metallic state which consists of subjecting the substances to heat, excluding air and the heating-flame therefrom, conveying the zinc-vapors into and condensing all of them in a mass of heated carbon from which air is excluded, and collecting the condensed metal as a liquid beneath the carbon, substantially as described.

6. The process of obtaining zinc from substances containing it in a metallic state, which consists of adding lead to the substances and subjecting them to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of heated carbon from which air is excluded, substantially as described.

7. The process of obtaining zinc from substances containing it in a metallic state, which consists of adding lead to the substances and

subjecting them to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of carbon from which air is excluded and which is heated to a temperature above that at which zinc solidifies, substantially as described.

8. The process of obtaining zinc from substances containing it in a metallic state, which consists of adding lead to the substances and subjecting them to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of carbon from which air is excluded and which is heated to a temperature below that at which zinc vaporizes, substantially as described.

9. The process of obtaining zinc from substances containing it in a metallic state, which consists of adding lead to the substances and subjecting them to heat, excluding air and the heating-flame therefrom, and in conveying the zinc-vapors into and condensing all of them in a mass of carbon from which air is excluded and which is heated to a temperature between those at which zinc solidifies and volatilizes, substantially as described.

10. The process of obtaining zinc from substances containing it in a metallic state, which consists of adding lead to the substances and subjecting them to heat, excluding air and the heating-flame therefrom, conveying the zinc-vapors into and condensing all of them in a mass of heated carbon from which air is excluded, and collecting the condensed metal as a liquid beneath the carbon, substantially as described.

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Witnesses:

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