

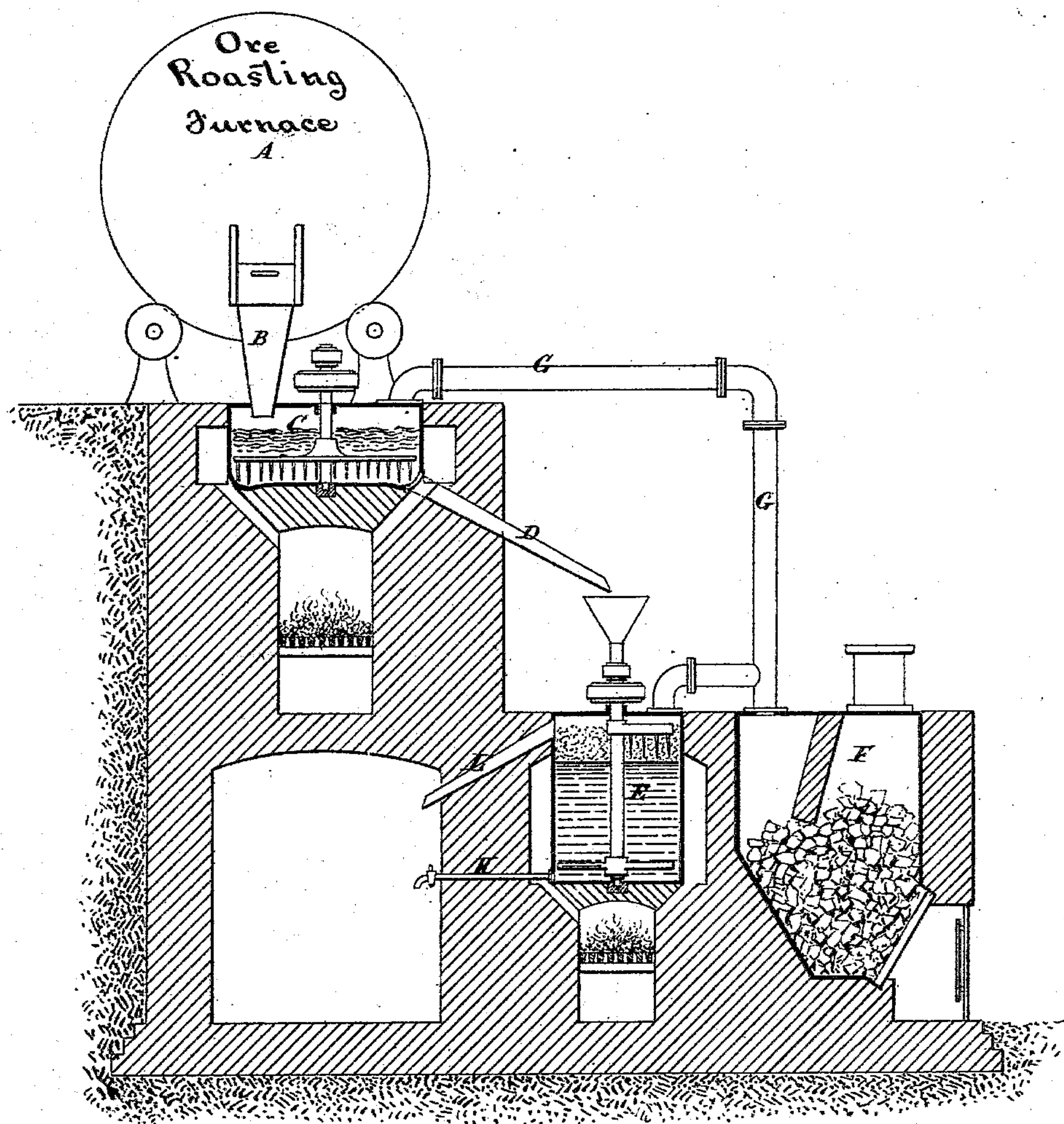
(No Model.)

A. K. HUNTINGTON & W. E. KOCH.

PROCESS OF EXTRACTING PRECIOUS METALS FROM ORES.

No. 281,074.

Patented July 10, 1883.



Witnesses

Wm H. Powell.

A. A. Connolly

Inventors

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UNITED STATES PATENT OFFICE.

ALFRED K. HUNTINGTON, OF HAMPSTEAD, AND WALTER E. KOCH, OF KENSINGTON, COUNTY OF MIDDLESEX, ENGLAND.

PROCESS OF EXTRACTING PRECIOUS METALS FROM ORES.

SPECIFICATION forming part of Letters Patent No. 281,074, dated July 10, 1883.

Application filed May 3, 1883. (No model.) Patented in England August 11, 1882, No. 3,831; in Victoria September 20, 1882, No. 3,308, and in India November 29, 1882, No. 119.

To all whom it may concern:

Be it known that we, ALFRED KIRBY HUNTINGTON and WALTER EDWARD KOCH, citizens of England, residing, respectively, at Hampstead and at Kensington, both in the county of Middlesex, England, have invented a new and useful Process for Extracting Precious Metals from Ores, (for which we have obtained patents in Great Britain, bearing date August 11, 1882, No. 3,831; Victoria, dated September 20, 1882, No. 3,308, and India, dated November 29, 1882, No. 119,) of which the following is a specification.

Our invention relates to a process for extracting precious metals from ores.

We first calcine the ore from which the metal is to be extracted under an oxidating-flame, so as to drive off sulphur and other impurities; and for this purpose we operate by preference in a rotating furnace, so as to keep the ore in agitation while it is undergoing calcination. When the ore is sufficiently calcined, as we can ascertain by testing a sample taken from the furnace, we transfer it, still hot, to a pan or vessel set in a flue and kept heated. Within this vessel is a revolving agitator, which keeps the calcined ore in agitation in a deoxidating atmosphere, which consists of combustible gas conveyed from a producer by a pipe opening into the upper part of the pan, such agitation having the effect of mechanically separating the sulphurets, the presence of the gas preventing the oxidation of the precious metals and assisting in the removal of sulphur. After the calcined ore has been thus agitated for a time, it is transferred, still hot, to an amalgamating apparatus of the kind described in the specification accompanying an application of date May 3, 1883, Serial No. 93,796, with the present. In this amalgamating apparatus the ore is caused to ascend through molten lead or other amalgamating metal fusible at a moderate temperature, such as tin, antimony, or zinc, or alloys of these metals.

In order to prevent oxidation of the amalgamating metal, we keep the amalgamating

vessel supplied with a deoxidating atmosphere consisting of combustible gas supplied from a producer by a pipe leading into the upper part of the amalgamating-vessel. As the ore rises through the molten amalgamating metal, the precious metal is dissolved out from the ore, forming a molten amalgam, which from time to time is run off wholly or partly from the vessel, and fresh amalgamating metal supplied in its place. The amalgam is then treated by the known methods of cupellation and distillation to separate the precious metal from it.

In carrying on the process which we have described, various forms and arrangements of apparatus may be employed. In the accompanying drawing we illustrate a convenient form and arrangement of apparatus for the purpose.

In this drawing, A indicates the end of a rotating furnace in which the calcination is effected. B is a spout by which, from time to time, portions of the calcined ore are withdrawn from the furnace A and introduced into a heated pan, C, in which the ore is agitated by a revolving agitator, under a deoxidating atmosphere of combustible gas conveyed to the pan by a pipe, G, from a gas-producer, F. From the pan C a spout, D, conveys the material to the amalgamating apparatus E, which is constructed and operates as described in the specification accompanying our application of this date for letters for "a new or improved amalgamating apparatus." The molten amalgamating metal used in the vessel E is protected against oxidation by supplying the vessel at its upper part with combustible gas from the producer F. This producer may be of any known construction, fed with carbonaceous fuel, producing combustible gas by its imperfect combustion under a limited supply of air. The spent ore from which the precious metal has been extracted is discharged from the upper part of the amalgamator E by a spout, and the molten metal, when sufficiently saturated with the precious metal, is from time to time run off from E by a pipe, H.

Having thus described the nature of our invention and the best means we know of carrying it out in practice, we claim—

5 For extracting precious metal from ores, the herein-described process, consisting of the following steps of operation: calcining the ore, subjecting the calcined ore to heat and agitation in a deoxidating atmosphere, passing the ore thus treated through molten amalgamating metal protected against oxidation, and separating the precious metal from the amalgam.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 17th day of April, A. D. 1883.

ALFRED KIRBY HUNTINGTON.
WALTER EDWARD KOCH.

Witnesses:

D. W. ROGERS,
JNO. P. M. MILLARD.