(No Model.)

W. E. HARRIS.

APPARATUS FOR DESULPHURIZING GOLD AND SILVER ORES.

No. 267,198. Patented Nov. 7, 1882.

Fig: 1.

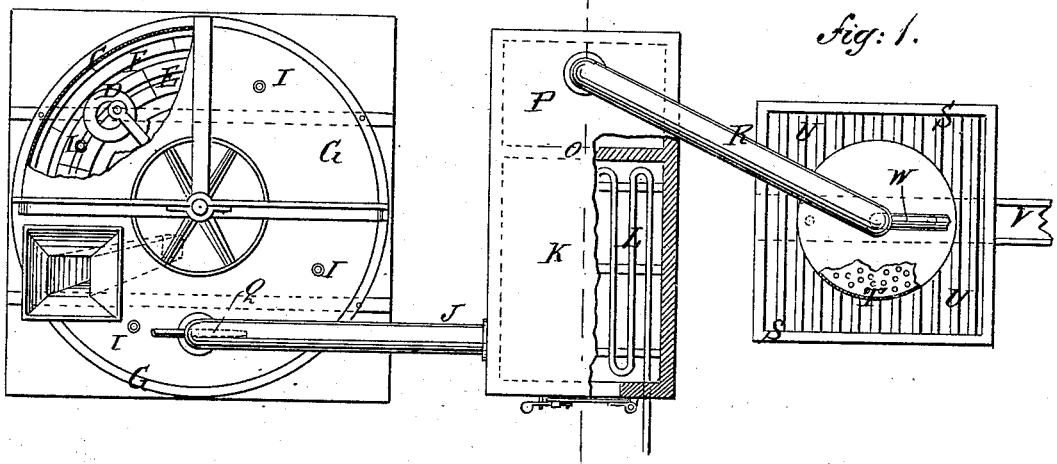


Fig: 2.

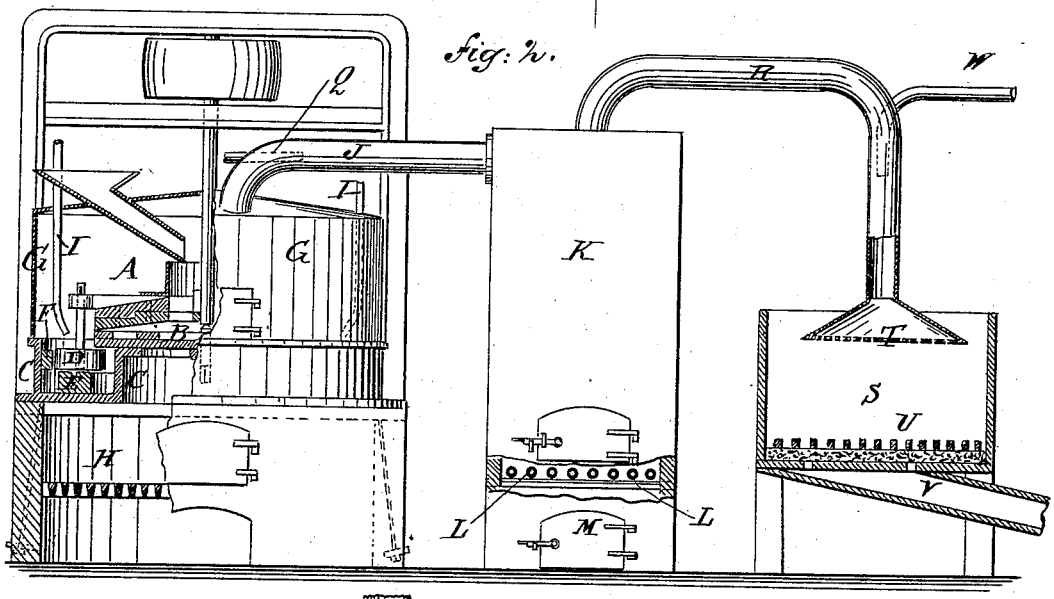
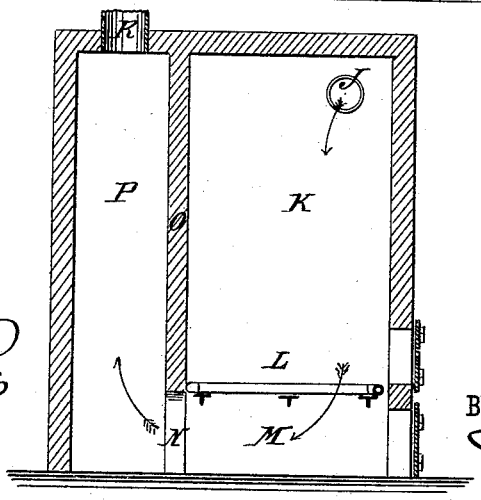


Fig: 3.



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APPARATUS FOR DESULPHURIZING GOLD AND SILVER ORES.

SPECIFICATION forming part of Letters Patent No. 267,198, dated November 7, 1882.

Application filed November 26, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD HARRIS, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Desulphurizing Gold and Silver Ores, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improvement, parts being broken away. Fig. 2 is a front elevation of the same, partly in section. Fig. 3 is a sectional elevation of the desulphurizing-furnace.

The object of this invention is to facilitate the operation of desulphurizing gold and silver ores.

A B represent the crushing-plates of an ore-grinding apparatus from which the crushed ore passes into the ring-trough C, where it is ground to powder between the ring-plates D and the bottom and side plates, E F, of the said trough. As thus far described, there is nothing new in the construction, and any other suitable ore-grinding apparatus can be used. The ore-grinding apparatus is inclosed by an air-tight casing, G, and beneath the said apparatus is placed a furnace, H, so that any moisture that may be in the ore will be driven off. A blast of air is forced into the ore-grinding apparatus by a fan-blower, which is not shown in the drawings, through the pipes I. The pipes I, four (more or less) of which can be used, pass down through the top of the casing G, and terminate a little above the ring grinding plates D. The air from the pipes I rises, and carries with it the finely-pulverized ore through the discharge-pipe J, which is connected with the middle part of the top of the casing G. From the casing G the pipe J leads to an opening in the upper part of the side of the chamber K of the desulphurizing-furnace. In the lower part of the chamber K is placed a fire-grate, L, the bars of which are made hollow, and are designed to be connected with the feed-water pipe of a steam-boiler, so that the feed-pump of the boiler will force a continuous stream of water through the said grate-bars L, and thus keep the said grate-bars from being melted or burned out by the heat. The air-blast from the pipe J passes down through the fire upon the grate L, and through the said grate L into the ash-pit M, whence it passes through an opening, N, in the lower part of the partition O into the chamber P. By this construction the metal and the dust fall into the ash-pit M, and the sulphur vapors and the other gaseous products of combustion pass with the air into the chamber P. The escape of the air and dust through the pipe J is facilitated and the suction power of the said pipe J is increased by introducing a blast of air from the fan-blower into the said pipe J through an injector, Q. In an opening in the top of the chamber P is secured the end of a pipe, R, through which the air and vapors escape from the chamber P, and are conducted into the open-topped condensing-chamber S. The lower end of the pipe R is made flaring, and has a finely-perforated sheet-metal plate, T, attached to it to distribute the vapors. The lower part of the pipe R is cooled, to condense the vapors as they pass through and escape from the said pipe, by a stream of cold water discharged upon or into the said pipe R from a pipe, W. The water and condensed vapor and any dust and vaporized metal that escape through the pipe R fall upon the grate U, placed in the lower part of the filtering-chamber S, and the metal, sulphur, dust, and other solid substances are detained by a filter placed beneath the said grate, while the water escapes through perforations in the bottom of the condensing-chamber S, and is conducted to a suitable receiver through a spout, V. With this construction every particle of the gold and silver may be separated from the gangue.

I am aware that it is not broadly new to place a drying-furnace under a grinding-mill, or to inclose an ore-pulverizing apparatus in a close case, or to blow the finely-divided ore through a furnace for the purpose of removing the sulphur; but

What I claim as new and of my invention is—

The combination of an ore-grinding apparatus having above it an inclosing air-tight case, air-inlet pipes adapted to be connected with an air-forcing apparatus, and a fire-cham-

ber under said grinder with a pipe connecting said case with the upper part of a desulphurizing-furnace, such furnace being constructed as described, whereby the blast carrying the pulverized ore enters above the grate and passes down through the same, the whole operating to dry the ore as it is ground and then blow the same through the desulphurizer, as set forth.

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Witnesses:
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