

# UNITED STATES PATENT OFFICE.

ADOLPH PATERA, OF VIENNA, AUSTRIA.

## IMPROVEMENT IN EXTRACTING MERCURY FROM ITS ORES.

Specification forming part of Letters Patent No. 118,147, dated August 15, 1871.

*To all whom it may concern:*

Be it known that I, ADOLPH PATERA, of Vienna, in the Empire of Austria, have invented a certain Process and Means for Extracting Mercury from Mercurial Ores, of which the following is a specification:

The extraction of mercury from mercurial ores has hitherto been executed either in shaft or reverberatory furnaces or in closed retorts. In the shaft and reverberatory furnaces the mercurial vapors evolved pass off together with the products of combustion into the condensing devices, and great losses of mercury result from the excessive heat employed and the contamination with the products of combustion. In the closed retorts the ore is mixed with decomposing fluxes, such as lime and iron oxides, and very high temperatures are employed, causing great loss of mercury and a large consumption of fuel. In both cases the ore is worked in large pieces.

Now, my process of extracting or distilling the mercury from mercurial ores containing the metal in a native state, or in the state of sulphide, as cinnabar, consists in the employment of muffles or pipes heated externally like the retorts used in the production of gas from coal. The muffles or pipes, which may be of iron or burned clay, and have any suitable shape, lie horizontally in the furnace, and the front ends are open to the access of air, while the hind ends are connected airtight with any ordinary means for condensing the mercurial vapors evolved during the process. The size of the furnace and of the apparatus may vary to any extent according to local requirements. The mercurial ore, having been crushed to coarse powder, is introduced into each muffle or pipe by means of a hopper and spread over the bottom. The ore contained in the muffles or pipes is then raised to a temperature slightly exceeding the boiling-point of mercury, (360° centigrade,) but not exceeding the beginning of a low red heat, (about 500° centigrade,) the muffles or pipes being heated from the exterior by means of an ordinary grate-firing or by other suitable means.

At the end of the condensing apparatus, which may be of any suitable length and have any desirable shape, an exhausting or suction apparatus is fixed for the purpose of producing a draught of air from the front end of the muffle or pipe through the condensing apparatus, and thus con-

veying the entire mercurial vapors evolved from the muffles or pipes into the condensing apparatus. The suction apparatus may consist of a fan, an air-pump, a jet of steam, or any similar device, or, when poor ores are worked, a draught produced by connecting the end of the condensing-pipes or chambers with the furnace-chimney is sufficient. From the open front ends of the muffles or pipes the white vapors evolved during the process are visible even when poor ores are worked, and from the gradual diminishing and final disappearing of the same the continuation and end of the process can be observed. Toward the end of the process a cold iron bar may be introduced into the muffle or pipe to determine whether vapors are still being evolved, in which case a white coating is at once formed on the bar. If the temperature and draught be properly regulated, which the workmen can easily learn to do after a little practice, nearly the whole of the mercury condenses in the first condensing-tube or chamber close to the end of muffle or pipe.

The advantages of my process are: First, a considerable saving of mercury, the metal being obtained in a pure state, free from soot and the like, and condensing much sooner than usual. Secondly, a great saving of fuel, the ore being worked at a low temperature. Thirdly, greater protection of the workmen from mercurial vapors; and fourthly, the enablement of a convenient regulation and watching of the process.

Having thus so fully described my invention as to enable any person skilled in the science to which it appertains to make use of the same, I desire it to be understood that I do not claim any mode of condensing the mercurial vapor or any peculiar firing for heating the muffles or pipes from the exterior, or, apart from the device described, the employment of an artificial draught.

I claim as my invention—

1. Employing for the extraction of mercury from mercurial ores a muffle or pipe heated from the exterior and having one end open for the access of air, while the other end is connected with means for condensing the vapors evolved, the whole constructed essentially as described, and essentially for the purpose of excluding the mercurial ores and vapors from contact with the fuel and products of combustion, and of preserving a regulated temperature.

2. Employing, in connection with a muffle or

pipe constructed substantially as described and for the purpose aforesaid, any kind of device for producing a draught of air through said pipe and condensing devices, essentially as described.

3. Employing, in the extraction of mercury from mercurial ores by the process and means described, a temperature slightly exceeding 360° centigrade, but not exceeding 500° centigrade, substantially as and for the purpose described.

4. Employing, in the extraction of mercury from mercurial ores by the process and means described, the ore in the form of coarse powder to enable the distillation to take place at the lowest possible temperature.

ADOLPH PATERA.

Witnesses:

HENRY PAGET,  
WILLIAM HUNING.