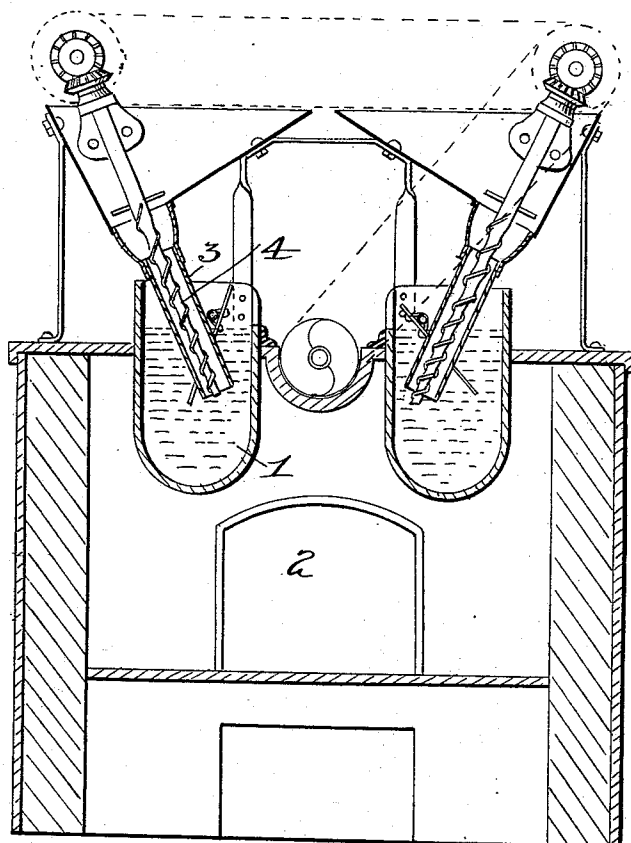


(No Model.)

J. J. CHRISTMAS.  
PROCESS OF TREATING CERTAIN ORES.

No. 539,795.

Patented May 28, 1895.



*Attest*  
*Malvern Muddison*  
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# UNITED STATES PATENT OFFICE.

JOHN JAMES CHRISTMAS, OF BROKEN HILL, NEW SOUTH WALES.

## PROCESS OF TREATING CERTAIN ORES.

SPECIFICATION forming part of Letters Patent No. 539,795, dated May 28, 1895.

Application filed October 6, 1894. Serial No. 525,105. (No specimens.)

*To all whom it may concern:*

Be it known that I, JOHN JAMES CHRISTMAS, mining agent, a subject of the Queen of Great Britain, and a resident of Broken Hill, in the Colony of New South Wales, but temporarily residing at Adelaide, in the Province of South Australia, have invented certain new and useful Improvements in the Treatment of Certain Ores; and I do hereby declare that the following is a full, clear, and correct description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the extraction of gold and certain other metals from their ores, such as silver, platinum, or other metals of like character, to which this particular class or process is suitable.

The accompanying drawing shows an apparatus by which my process can be carried out.

For the purpose of carrying my invention into effect an iron pan 1 is provided filled with melted lead kept at a high temperature by means of furnace heat applied underneath the pan as shown at 2. The ore in a finely divided and dry state is introduced below the surface of the lead by means of suitable tubes 3 depending from a hopper and each provided with an internal revolving screw feed, as at 4.

The special feature of my invention consists essentially in sprinkling upon or otherwise dampening or mixing with the ore prior to its introduction into the lead bath a mineral hydro-carbon either in the form of oil or powder. In practice it is found that about two to four gallons of kerosene or an equivalent quantity of finely divided solid hydro-carbon is sufficient for each ton of ore. The quantity however varies according to the class of ore under treatment.

By the addition of the mineral hydro-carbon, oxidation of the lead is prevented, and the bath readily takes up the gold or other metal contained in the ore. The operation can be worked continuously, the tailings floating on the surface of the bath and passing off through chutes provided for the purpose in

the sides of the pan. As soon as the lead has become saturated with metal it is drawn off through the chutes in the side of the pan provided for the purpose, and the matte treated for the separation of its several metallic contents, in any ordinary or well known manner.

Petroleum as used in my process has material advantages over charcoal or any other preventative of oxidation, the following of which may be mentioned:

First. The crushed ore is easily mixed with petroleum.

Second. On account of the low temperature of vaporization of petroleum every particle of the crushed ore will come in contact with and be under the influence of the reducing power of the petroleum.

Third. As petroleum dissociates at a comparatively low temperature, lower than the smelting point of lead, its components hydrogen and carbon being in *statu nascendi* will act more energetically than if each of them were introduced in ready state.

Fourth. The use of petroleum does away with any complicated gas generator which would be necessary if hydro carbon gases were used.

Fifth. The heat absorbing power of petroleum is more than equalized by its great heat producing power.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

The herein described process for the extraction of certain metals from their ores, consisting essentially of first moistening or mixing a mineral hydro-carbon with the crushed ore and subsequently passing the same into the body and below the surface of a pan or bath of molten lead.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN JAMES CHRISTMAS.

Witnesses:

EDWIN B. COLTON,  
CHARLES S. BURGESS,