

# UNITED STATES PATENT OFFICE.

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## MAGNETIC PREPARATION OF ORES.

996,491.

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No Drawing.

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*To all whom it may concern:*

Be it known that I, ALFRED ARTHUR LOCKWOOD, a subject of the King of Great Britain, residing at Baltic House, 27 Lead-  
5 enhall street, in the city of London, Eng-  
land, have invented a new and useful Im-  
provement in the Magnetic Preparation of  
Ores, of which the following is a specifica-  
tion.

10 This invention relates to the magnetic  
preparation of ores. This is effected accord-  
ing to this invention by treating an ore with  
a magnetic substance, an oily liquid and a  
15 solution of a sulfid of an alkali metal espe-  
cially potassium monosulfid and potassium  
hydrosulfid. I have further discovered that  
it is not necessary to subject the oily liquid  
to a preliminary treatment in order that a  
magnetic oxid shall be retained by the oily  
20 liquid when agitated with water, the best  
results being obtained when the ore, mag-  
netic oxid and oily liquid are agitated to-  
gether, a soluble metallic sulfid being subse-  
quently added.

25 By this invention it is found that metallic  
oxids or carbonates can be successfully sub-  
jected to a magnetic preparation to the ex-  
clusion of the gangue.

30 In the following examples there will be  
described methods of coating carbonate ores  
with a mixture of oil and a magnetic oxid.

Example I: 100 lbs. of a lead ore con-  
taining carbonate, phosphate and chlorid of  
lead is crushed to pass a screen having 24  
35 meshes to the linear inch. The crushed ore  
is suspended in 80 lbs. of water by agitation  
and a mixture composed of 4 lbs. of finely  
ground magnetite and 2 lbs. of Texas re-  
siduum oil added thereto. After agitation  
40 for about ten minutes there is added while  
still agitating a solution of 3 ounces of po-  
tassium sulfid in water; the carbonate par-  
ticles will be found to be successfully coated  
and the pulp is now in a state to pass  
45 through a wet magnetic separator. In some  
cases it is advisable to first add to the un-  
treated pulp either some oily concentrate  
from a previous operation or a magnetic  
mixture composed of magnetite and an  
50 easily saponifiable oil.

Example II: 100 lbs. of an ore composed

partially of copper carbonate is crushed as  
in the preceding example and suspended in  
80 lbs. of water by agitation. To this pulp  
is added a mixture composed of 4 lbs. of 55  
finely ground magnetite and 2 lbs. of an  
easily saponifiable oil. When after agita-  
tion the metallic particles of the ore have  
become coated there is added 200 lbs. of the  
ore and 160 lbs. of water and also a mixture 60  
composed of 8 lbs. of finely ground mag-  
netite and 4 lbs. of Texas residuum oil.  
After agitation for about ten minutes an  
aqueous solution of 4 ounces of potassium  
sulfid is added while still agitating. It will 65  
now be found that the copper carbonate par-  
ticles have been successfully coated and that  
the pulp is now in a good condition to pass  
through a wet magnetic separator.

What I claim is:—

1. In the magnetic preparation of an ore,  
the process which consists in treating the  
ore with a magnetic substance, an oily liquid,  
and a solution of a sulfid of an alkali metal  
and magnetically separating the mixture. 75

2. In the magnetic preparation of an ore,  
the process which consists in adding to the  
ore a magnetic substance and an oily liquid,  
agitating the whole, adding a soluble me-  
tallic sulfid and magnetically separating the 80  
mixture.

3. In the magnetic preparation of an ore,  
the process which consists in adding to the  
ore a magnetic substance and an oily liquid,  
agitating the whole, adding a sulfid of an 85  
alkali metal and magnetically separating  
the mixture.

4. In the magnetic preparation of an ore,  
the process which consists in treating the  
ore with a magnetic substance, an oily liq- 90  
uid, and a solution of potassium sulfid and  
magnetically separating the mixture.

5. In the magnetic preparation of an ore,  
the process which consists in adding to the  
ore a magnetic substance and an oily liquid, 95  
agitating the whole, adding potassium  
sulfid and magnetically separating the mix-  
ture.

ALFRED ARTHUR LOCKWOOD.

Witnesses:

GEORGE KAIN RADCLIFFE,  
GEORGE WILLIAM CROSS.