

(No Model.)

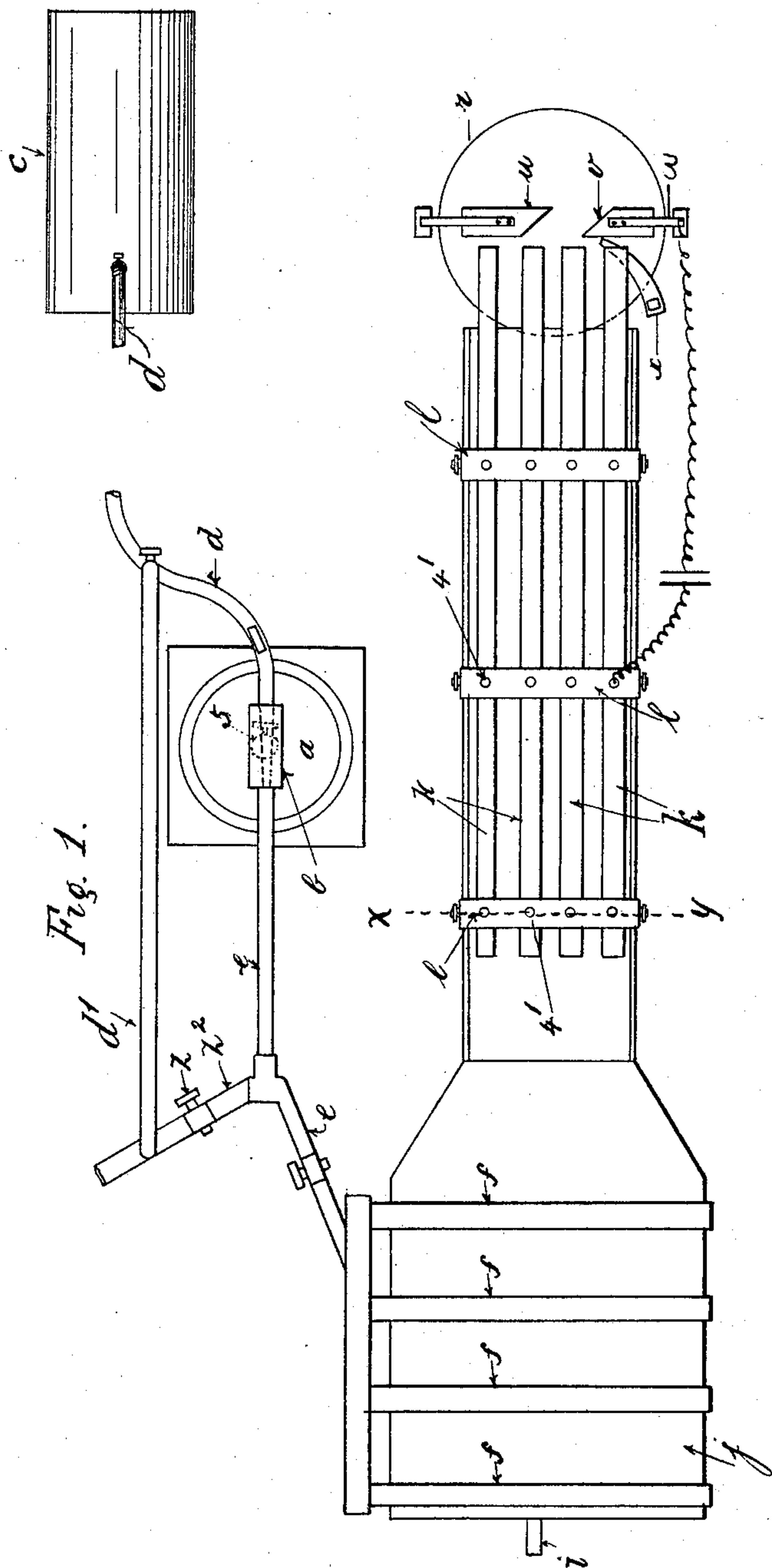
2 Sheets—Sheet 1.

E. L. OPPERMANN.

APPARATUS FOR EXTRACTING GOLD, &c., FROM DRY CRUSHED ORES.

No. 596,535.

Patented Jan. 4, 1898.



Witnesses:  
Benjamin Clark  
Levil Ford.

Inventor.  
Emil Lawrence Oppermann  
per E. Eaton,  
His Attorney.

(No Model.)

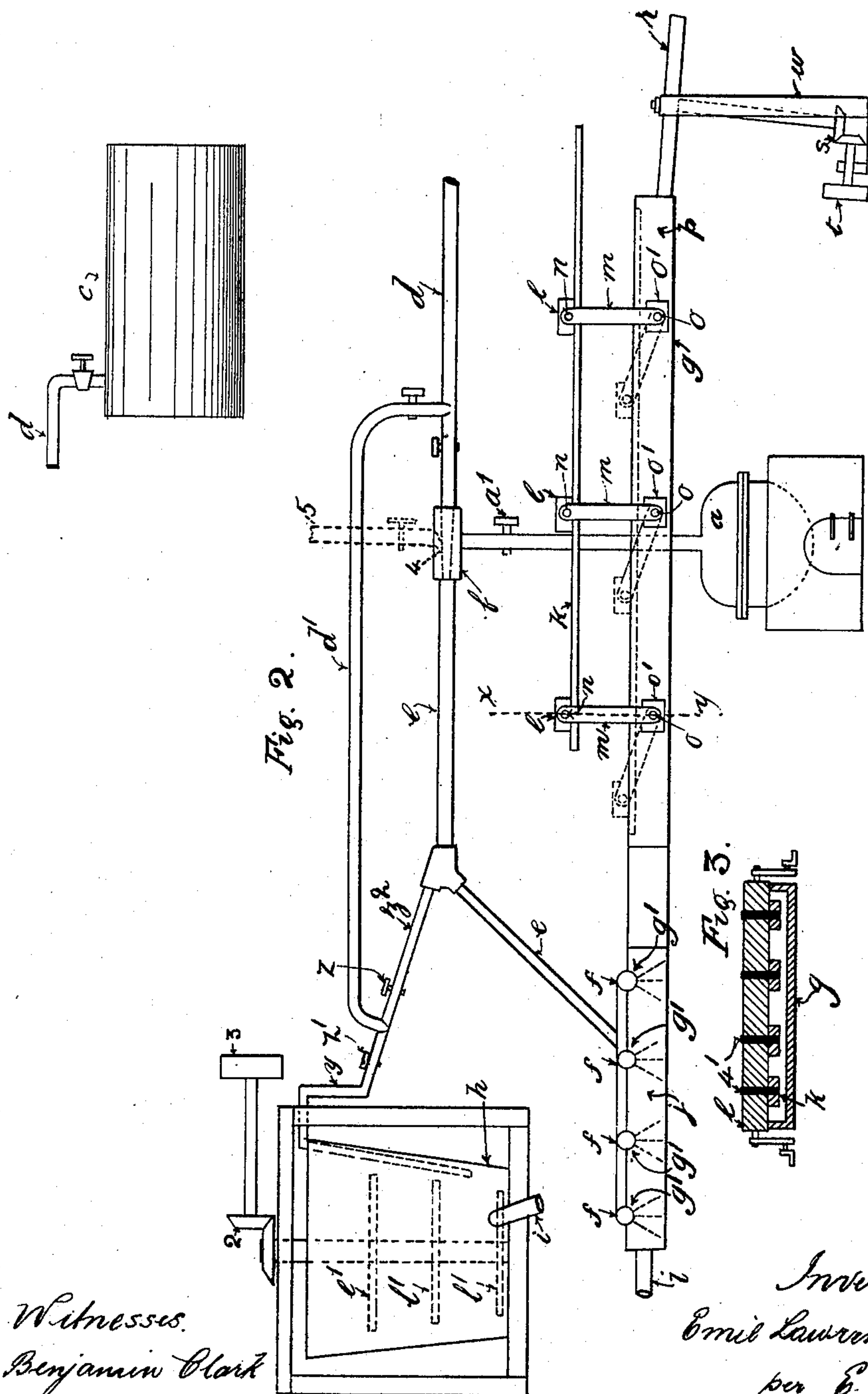
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# UNITED STATES PATENT OFFICE.

EMIL L. OPFERMANN, OF LONDON, ENGLAND.

APPARATUS FOR EXTRACTING GOLD, &c., FROM DRY-CRUSHED ORES.

SPECIFICATION forming part of Letters Patent No. 596,535, dated January 4, 1898.

Application filed March 11, 1897. Serial No. 627,026. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL L. OPFERMANN, a subject of the Queen of Great Britain, and a resident of London, England, have invented certain new and useful Improvements in Apparatus for Extracting Gold and the Like Metals from Dry-Crushed Ores, of which the following is a full, clear, and exact specification.

This invention relates to a new or improved apparatus for effecting the extraction of gold and the like metals in ores, the object being to more effectually amalgamate what is known more particularly as "float-gold" in ores or very finely-divided gold, the same being constructed and utilized in the following manner, and I will now proceed to describe the apparatus with which the process is carried out.

Figure 1 is a plan view of the apparatus; Fig. 2, a side elevation of same; Fig. 3, a section through line  $xy$  in Fig. 1.

Referring to Figs. 1, 2, and 3,  $a$  is a retort in which the mercury is heated by any well-known source of heat, a tap  $a'$  being provided for regulating the supply of fumes to the injector. The vapor will then pass to the injector  $b$ , which may be of any well-known type suitable for the purpose. The steam, which is generated in a boiler  $c$ , is brought through the pipe  $d$  to the injector  $b$  at a suitable pressure. The mixed mercury-vapor and steam then passes through the pipe  $e$  to the perforated pipes  $f$ , having the perforations at  $g'$  in the direction of their length. The steam performs a special function in combination with the injector—namely, by ejecting the mercury-vapor and at the same time intimately mixing with same and forcing same upon the ore before condensation can take place between the point of entrance and exit. The crushed ore is fed from the mixer  $h$  by means of the pipe  $i$  to the covered passage or slide  $j$ , and upon which the mixed steam and mercury-vapor impinge during the passage of the ore to the electrolytic rods  $k$ , which are secured to the bars  $l$  by screws  $4'$  or the like, or the ore may pass direct from the stamps to the passage  $j$  without the intervention of the mixer. The rods  $m$  are pivotally connected at  $n$  to the bars  $l$  and at  $o$  to the supports  $o'$ , by which means it will be seen that the bars  $k$  may be raised or lowered, as required, be-

ing shown in their raised position in Fig. 2 and in their lower position by the dotted lines. The bottom  $g$  of the channel  $p$  is metallic and has a slight inclination toward the lower end, and the bars  $k$  in their lowest position do not of course touch this metallic bottom  $g$ , as the bars  $k$  and the bottom  $g$  form two electric terminals.

$r$  is a shallow rotating pan which is driven by the bevel-wheels  $s$  and pulley  $t$  by means of any convenient power.

$u$  and  $v$  are two electrodes, carried upon the supports  $w$  and which dip into the rotating pan  $r$ .

$x$  is a fixed piece which projects into the rotating pan  $r$  and tends to guide the contents of the pan upon the electrodes  $u$  and  $v$ .

$y$  is a pipe having the stop-cock  $z'$ , so that when desired a certain amount of steam may be admitted to the mixer  $h$ , and  $z''$  is a pipe by which steam may be admitted to the covered slide  $j$ , with or without mercury-vapor mixed therewith.

The mixer  $h$  consists, essentially, of a vessel having conical sides in which a series of mixing-arms  $l$  are rotated by means of the bevel-wheels 2 and pulleys 3, driven by any convenient power.

$d'$  is a branch pipe for enabling steam alone to be introduced into the mixer  $h$  or to the covered slide  $j$ .

Although I have shown this form of mixer it will be readily seen that any of the well-known forms of mixers may be equally well employed.

When it is desired to mix ammonia-gas with the mercury-vapor and steam, the ammonia-gas may be mixed with same either in the injector  $b$ , as shown by the dotted lines 4, or other suitable position, 5 being the pipe which conveys the ammonia-gas from a suitable retort or receptacle.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The improved apparatus for effecting the amalgamation of gold and other metals in ores consisting of a retort in which the mercury is heated; a pipe or pipes connecting the retort to the injector; a pipe or pipes connecting said injector to a supply of steam under pressure; a series of perforated pipes

through which the mixed mercury-vapor and steam are blown under pressure upon the crushed ore; a mixer having rotating arms in which the ore is mixed; a pipe or pipes for  
5 conveying steam to said mixer; electrodes carried by movable supports, and forming one terminal of a circuit; a channel having a metallic bottom over which the ore passes forming the other terminal and over which  
10 said electrodes depend; a rotating pan hav-

ing electrodes in same; a fixed projection for agitating the contents of the pan; all in combination and substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of 15 January, 1897.

EMIL L. OPPERMAN.

Witnesses:

BENJAMIN CLARK,

WILLIAM JOHN WEEKS.