of enlarged peripheral rim, such as A^3, and bottom or flange piece, such as A^2, and ring or cylinder, such as F, together forming annular concentrates receiver, such as A^4 and A^5, having communication by holes or apertures, preferably adjustable as to size with the said pan, such as A, substantially as herein described and as illustrated in the drawings.

3. In a concentrator of the class set forth, the combination and arrangement with a revolving pan, such as A, having an annular concentrates receiver, such as A^4 and A^5, of ring or cylinder, such as F, having holes or apertures for pipes or tubes, such as F^2, having slits or cuts, such as F^3, piston, such as F^4, and devices for moving such pistons, such as F^4, so as to adjust the length of said slits or cuts, such as F^3, say, such as rods F^5 and thumb-screws F^6, substantially as herein described and explained and as illustrated in the drawings.

4. In a concentrator of the class set forth, the combination and arrangement with a revolving pan, such as A, having an annular concentrates receiver, such as A^4 and A^5, of false bottom, such as F^1, discharge-spouts or -pipes, such as A^6 and A^7, and troughs or launders, such as G^1 and G^3, substantially as herein described and explained and as illustrated in the drawings.

5. The particular combination and arrangement of mechanical parts, altogether forming an improved concentrator, usable preferably as an amalgamator and concentrator, substantially as herein described and explained, and as illustrated in the drawings.

Dated this 8th day of August, 1893. JAMES CHANNON.

IMPROVEMENTS IN THE CHLORINATION OF PULVERISED ORES CONTAINING GOLD OR SILVER AND IN APPARATUS THEREFOR.

I, Joseph William Sutton, of Eagle Street, Brisbane, in the Colony of Queensland, engineer, do hereby declare the nature of my invention for the "Improvements in the Chlorination of Pulverised Ores containing Gold or Silver and in Apparatus therefor," and in what manner the same is to be performed, to be particularly described in and by the following statement:—

My invention relates to the chlorination of pulverised ores containing gold and silver in revolving barrels, cylinders, or other vessels.

Hitherto the material, when being chlorinated, has not been sufficiently disintegrated so as to allow the chlorine to attack every particle of the ore, as the ore, being in a semi-liquid or mortar-like state, was turned over in the barrel or vessel in masses or lumps.

One part of my invention consists in chlorinating the ore while in a semi-dry state in a revolving-barrel or other vessel. By the term "semi-dry" I mean ore containing about 5 to 15 per cent. of moisture.

In carrying out this part of my invention I place the dry ore in the barrel or other vessel, and moisten it, until a handful, when pressed together, will not, when released, form an adhesive mass, but will crumble and fall away at a slight touch; or I may make the ore semi-dry before placing it in the barrel. Chlorine is then introduced and the barrel revolved. As the semi-dry ore has no tendency to fall over in masses or lumps while the barrel is being rotated (at about fifteen revolutions per minute) the chlorine is enabled to attack each particle. When the material has been sufficiently chlorinated it is discharged for further treatment for the recovery of the gold or silver.

Another part of my invention consists essentially in chlorinating ores, containing gold or silver, either while in a semi-dry or semi-liquid state, in a revolving-barrel or vessel provided internally with a screen, so that the material being chlorinated is screened at each revolution.

The forms of screens and barrel may be of various shapes; but I prefer to carry out the operation in the apparatus shown in the accompanying drawings, in which Fig. 1 is a front elevation of my apparatus, Fig. 2 is a sectional plan, Fig. 3 is a longitudinal section, while Fig. 4 is a cross section at AB, Fig. 1. The same reference letters indicate like parts throughout the figures.

C C1 are fast and loose pulleys; D D1, gear wheels; E E1, bearings; F, chlorinating vessel, provided with a lead or other chlorine-resisting lining; G is screen comprised of a number of bars coated with lead, and having an oval section as shown at Fig. 3; H are plates securing the ends of bars of screens by means of bolts; J K is charging-hole provided with a cover, K1; M is chlorine inlet; and M1, steam inlet pike for keeping the passage M2 clear of any particles of ore; M3, bracket supporting the chlorine and steam-pipes.

The operation is carried out as follows:—

The vessel F is revolved until the charging-hole K is at its highest point, when it is charged, preferably with semi-dry ore (which may be roasted, if necessary), until it is one-half full. The cover K1 is then screwed down, and chlorine introduced through pipe M and passage M2. The vessel is then rotated at about fifteen revolutions per minute, so that at each revolution the whole of the material within the vessel is screened twice through the bars of screen G. When the ore has been sufficiently chlorinated, the vessel F is rotated until the charging-hole K is at its lowest point, when cover K1 is unscrewed and the contents discharged, to be further treated for the recovery of the gold or silver.

When it is desired to carry out the operation continuously I make the chlorinating vessel of an approximately cylindrical or rectangular shape, and of a length of about ten times its diameter. The vessel is supported in suitable bearings, and inclined at a slight angle to the horizontal, so that ore charged in at the higher end will pass through the screen at each revolution, and gradually work down to the lower end. In order to insure that no particles of the ore should reach the discharge-end too quickly, I prefer to provide the vessel with webs extending from the internal periphery of the vessel to within a short distance of the screen. The ore is regularly fed into the vessel (preferably by an automatic feeder, such as is well known), and when about half-full the chlorinated ore is discharged through an opening at the lower end at each revolution of the vessel. The chlorine may be introduced into the vessel through one of the trunnions, as shown in Figs. 2 and 3.