diameter and 5ft. high, with a capacity of 20 tons to each tank. The tanks have counterbalanced lids fitting in water-channels on the outer edge of tank when chlorine gas is used. The two precipitating-tanks are 10ft. in diameter and 6ft. high, and the lower or copper precipitation-tanks are 12ft. in diameter and 4ft. high. The tanks and foundations are all built on inclined watertight floors leading to the waste-tanks. The generator for the production of chlorine is a very satisfactory machine, made, after the designs of the builder, to run by power, and heated directly by a wood fire, being practically a lead-lined kettle of 120 gallons capacity, arranged with valves and safety overflows, the connection with the vats being made with water-stopped lead valves, no hose being used in the works. These works are not only the most recent, but undoubtedly the model gold-chlorination works on the Coast."

"They are now handling 1,000 tons of gold tailings, assaying from $4 to $6 [16s. 8d. to £1 5s.] to the ton, at a cost of about $1 75c. to $2 [7s. to 8s. 4d.] per ton, by the chlorination process. The fact that such low-grade material, in which not a trace of gold is visible, and from which but 30c. [1s. 3d.] per ton, even after roasting, could be obtained by amalgamation, can be treated by the chlorination process at a profit is one that, to say the least, deserves notice. The capacity of these works is from 300 to 400 tons per month, of which only about one-tenth of th material operated on is roasted."

HEDLEY'S PATENT ELECTRIC ORE AND METAL CONVERTER.

This is a process that has been invented and patented by Mr. John Hedley, of Heathcote, Victoria, for crushing and treating ores, separating and refining metals, by the aid of electricity; but, as it has not yet been tried on a large scale, nothing can be said as to its success or otherwise. However, as it is on an entirely new principle, a description of it may be interesting, as inquiries were made by mine-proprietors in New Zealand, and instructions forwarded to me in Melbourne to inquire particulars respecting it. Mr. Hedley describes the process thus (taken from the last Victorian Mining Report) (see Figs. 27 to 36 of annexed sketches):—

"My apparatus has for its object the complete, economic, and speedy extraction of metals from high- and low-class ores, and the subsequent separation and refining of the same, and is particularly suitable for the treatment of those ores containing the more valuable metals—namely, gold, silver, and bismuth, and their combinations.

"It will be seen by the description hereinafter contained that two metallic baths are employed, one for the treatment and extraction of ores which do not contain a sufficient percentage of fusible material for smelting, and another for those ores which permit of the fusion of the whole mass, and the separation into slag and metallic regulus.

"My process of refining, hereinafter described, refers more particularly to the deposition of lead and antimony, and provides for the separation of the valuable metallic constituents from an antimonial regulus or base bullion by the deposition of the antimony or lead, as the case may be, by electro-chemical agency.

"Before describing the several parts and construction of my metallic baths, and the separation and refining process, I wish it to be understood that before the treatment of the more valuable ores I find it necessary to reduce the latter to a finely-divided state, which is accomplished preferably by my improved pulsating crushing or pulverising machine, illustrated at Fig. 27 in the accompanying drawings as a combined half-vertical section and front view. The construction and mode of operation of said machine are as follows: The frame consists of two longitudinal timbers A, supported and secured by four vertical standards B. Said timbers carry the transverse pieces B^1, upon which I secure two pillow-blocks or other bearings C, as shown, to receive the horizontal shaft D, having two grooved eccentrics or cams E keyed upon it to impart a pulsating motion to the conoidical-shaped casting F, which is suspended by two metallic bands or straps G, connected by a double shackle or other clevis H at four equidistant points to the circular wall of the conoidical-shaped casting F. Between the said bands or straps G and the grooved eccentric sheaves E, I insert removable brasses I. Each of the latter is provided with a set-screw J and jamb-nut as shown. By this means the vertical pulsating motion given to the casting F may be varied, to reduce the ore or material to any required degree of fineness for after-treatment in the metallic bath shown at Fig. 28. A conical-shaped body K, of a less angle than the aforesaid casting F, is secured by any suitable means to the cone-shaped bolster L affixed to the vertical shaft hereinafter described. A rotary motion is imparted to this body K, through the medium of gearing and a driving pulley M affixed as shown upon the horizontal shaft D. The crushing faces or surfaces of the casting F and the body K have furrows formed at an oblique angle on each and in opposite directions, and which die or lead into a plane surface of about 4in. from the skirt of each face. These faces present an extensive crushing-surface, and may be hardened or chilled to reduce the wear-and-tear to a minimum. The vertical shaft N, kept perpendicular by the affixed bearing N^1, as shown, has a bevelled spur-wheel O secured near its top end, to engage with the pinion P keyed upon the horizontal shaft D. To prevent the latter from moving laterally when revolving I affix a collar Q (provided with a set-screw) preferably against the outer sides of the aforesaid pillow-blocks or other bearings C. The bottom or foot of the vertical shaft N revolves within a footstep R, held in position by the two set-screws S (and jamb-nuts) projected from an outer receptacle T. To guide the casting F in a vertical line when in motion, I affix the two blocks U to the supports of frame. These blocks have concave faces to correspond with convexed-faced ears V cast upon the periphery at the bottom edge of aforesaid casting F. The ore or other material to be crushed or pulverised is fed in any convenient manner into the circular wall of the casting F, thence by its own gravity falls into the wedge-shaped space or opening W, where it is crushed between the furrowed and plane surface or face of the pulsating casting F and the body K, both of which afford sufficient vent at the bottom for the passage of the crushed material.