

centrifugal pumps, which relift it the height of the Spitzlутten system for middle coarsely-powdered grains, sand, and slimes. This is the level where the slimes originally left the stamps, 12ft. 6in. above the principal level of the plant. Two range of pipes lead the slimes to the principal system. It may be also mentioned that all the piston-jiggers, situated on the bottom level, are also five-partitioned, fitted with eccentric motion, with a throw varying between $\frac{3}{8}$ in. and $\frac{1}{2}$ in., and with 200 to 260 strokes per minute. Only the two first jiggers for separated grains give (besides the clear products) a small quantity of poor mixed waste to be stamped; the remainder consists of finished clean products. All these machines give—1. Rich lead-ore in the first division. 2. Mixed arsenical lead-ore in the second, when arsenical ore is worked; otherwise pyritic lead and ore. These products are reworked in both cases on the reserve machine. 3. Rich arsenical and iron-pyrites in the third and fourth divisions. 4. Iron-pyrites or zinc-blende in the fourth and fifth divisions, the latter when working stamp-tailings containing blende.

"The Waste Tailings from the Fine-grained Jiggers.—The waste grains, from $\frac{5}{8}$ in. to $\frac{1}{8}$ in., which come from all six machines belonging to one washing system, flow into the principal channel backward to an apparatus which is used for the purpose of leading them automatically to the reservoir of the bucket-elevators for the fine grains and coarse sand, which is situated next to the bucket-elevator for coarse-grained tailings. This apparatus was found to be not absolutely necessary for the plant.

"The Final Working of Fine Grains and Slimes.—The proper working of fine grains, sand, and slimes commences with entrance of the slimes into the principal Spitzlутten system. Here the separation of the grains takes place according to their specific gravity, as is also the case in the first system, and that is with more or less perfection, as the Spitzlутten gradually increase in size, whilst the velocity gradually decreases. The Spitzlутten system is divided into two parts: the principal portion for coarsely-powdered sands, and another portion for the finest sand and slimes. The principal portion gives coarse sand, middle grains, and fine sands and slimes in all siphon-pipes. To treat the coarsest sands from the first siphon-pipe there serve small series jigs, called element machines, on the same principle as the other jiggers. These jigs were erected later on, between the reserve machines in the row of principal jigs, and consist each of three single parts. These give direct: Lead shipping-ore, mixed shipping-ore, in the first part (the latter to be worked); pyritic shipping-ore in the second part; shipping-ore containing blende in the third part—the latter, naturally, only when stamp tailings containing blende are treated. The machines work with throws of $\frac{3}{8}$ in. and 220 strokes per minute. The second principal part of the first principal Spitzlутten system treats sands of middle and finer grains, which leave the apparatus through six separate siphon-jets. Instead of treating these products directly on the percussion-tables, they are first concentrated on a special apparatus for the purpose of separating any remaining coarse-sand tailings. This is done on the large circular pulsating jig. This jig is erected at the end of Spitzlутten, and at such a height that the concentrated ore which comes from it may flow through siphon-pipes directly on to the concentrating-tables. This jig consists of six plunger-sieves, moving up and down about 200 to 220 times per minute, and working in a circular clutch, divided into compartments by radial partitions, each partition having a properly-sized mineral-bed. The fine sands from the pointed boxes, or Spitzlутten, are led on to the periphery of the round jig by means of pipes, and flow radially towards the middle. In this way the concentrates pass through the mineral-beds into the hutches below, and are led on to the percussion-tables through separate jets in a highly concentrated form. This machine serves both halves of the washer at once, each half having three sieve-compartments. The coarse barren rock is discharged through the pipe in the centre of the machine, and go to the slime-tanks. One of these patent pulsating jig-concentrators, about 7ft. in diameter, is sufficient to treat the whole of the fine sands of a well-arranged dressing-floor, having a capacity of about 120 tons of pyritic lead-ore per day of ten hours. To further treat the middle and finer sands prepared or concentrated on the above machine, the continuously-working percussion-tables are used, which are erected on both sides of the first principal Spitzlутten system. These machines are percussion-tables, with arrangements for altering the slope, but otherwise with a fixed wooden table, over which an endless rubber belt travels after Stein's principle, with improvements, which, with the previous concentration, greatly influence and improve the working of the tables. The rubber band of these tables travels forward 13ft. to 14ft. per minute, with a bump of $\frac{1}{2}$ in. in amplitude, and about 140 percussions per minute. The incline of the table is adjustable, in order to regulate it to the class of concentrates to be treated. These tables produce pure galena, mixed galena to be worked on the reserve tables, pure iron-pyrites, blende, and poor waste. The separate portion of the principal Spitzlутten gives finest sand and slimes in six separate jets. To concentrate the former, a single-sieve percussion-jig is used; the other—that is, the very finest slimes—the double Spitzlутten are used. The finest sand and slimes from these apparatus, after concentration, are led through three separate jets to three separate percussion-tables erected in the two side-wings of the building. These tables are the same size, and similar to the other table. The products are also the same as those from the previously-mentioned tables. This ends the continuous working of the finest sand and slimes.

"Personal.—Besides the workmen employed in the crushing part of the plant, there are in two principal divisions below—two men to transport the products, two men for the reserve machines, two men to look after all the tables, two men for the reserve tables, four men for the transport of the products from the tables, three men for transporting the waste tailings, one carpenter, one overseer; so that fifty-one persons are employed inside and about the washer; two under-overseers and two overseers, of which one (the shift-boss) looks after the various cobbing-tables, and the carriage from the shaft to the washer, and the general loading arrangements.

"The Arrangements for Clear and Purified Washing-water.—35·3 cubic feet of clear water flow to the plant per minute, as already mentioned. This amount is next taken up by the condensation-pump of the driving-engine, and goes, after being heated to 23·5° C., to the pump-shaft of the big lifting-pump. The feeding-pump takes its supply from the condensation-pump, and forces it through