

and retain the sulphurets and heavy and valuable metallic particles upon the belt, until they are discharged at the proper moment. This peculiar movement is of the utmost importance, and enables these machines to perform more work than any other vanners or concentrators yet devised. The rolls supporting the belt are of galvanised metal, which will neither warp, crack, nor rust. The feeding mechanism is perfect, and permits the travel of the belt to be varied at will to any desired speed. The belts are of an improved form, and manufactured especially for this purpose of rubber, and very durable. The arrangements for saving waste amalgam escaping from the batteries are as complete as possible; and all of the parts of these machines are simple and effective in their operation. An important improvement has recently been introduced into their construction, which consists of a riffle-table, placed in front of the feeding-hopper which takes the discharge from the feed and amalgam bowl. This improvement is in the reciprocal motion which is imparted to the table by the longitudinal motion of the shaking-frame to which the table is attached. A further improvement has also been introduced in the feed and amalgam bowl by which the pulp discharged from the batteries, through the conveying-pipe into the bowl, is evenly distributed to its centre and ends, and thereby a more perfect separation is had by the stirring action of the fingers, and a more even discharge of the pulp on the riffle-table is accomplished."

Three of these concentrators are sufficient for the delivery of pulp from, and to thoroughly concentrate the sulphurets from, two batteries of five stamps each—say ten stamps—when the percentage of sulphurets and metallic particles does not exceed 3 per cent. of gangue-matter; six for a twenty-head and twelve for a forty-head stamp gold-quartz mill. A larger percentage of sulphurets and metal particles will of course require a larger number of concentrators to insure perfect concentration. Weight of machine, boxed, 2,270lb. (including the weight of belt, which is 220lb.); weight of heaviest part of machine, 80lb.

For uniform and close concentration, the speed of the driving-pulley of each machine should be adjusted and maintained at 230 revolutions per minute, or as near as possible.

The size of the driving-pulley on concentrators is 9½in. in diameter and 3in. face—tight and loose.

The power for driving each machine has been carefully determined by an indicator to be less than one-half of one-horse power.

*Directions for setting up and operating the Triumph Ore-concentrators.*

The concentrating-room should be sufficiently large to allow a space of 20ft. long by 10ft. wide for each concentrator. They can be set in pairs, parallel with each other; but it is deemed preferable to set them head to head in a direct line in front of each battery; the head of the first being set away from the battery, and a passage-way between its head and the head of the second. In the event of the use of three concentrators, then two should be placed with their heads away from and in front of the batteries, and the third be set in the opposite direction, with its head towards the heads of the other two, and a passage-way between be provided; and the same rule should be observed in larger mills, where a larger number of concentrators are to be used. The feeding-end of the machine is denominated the head. This arrangement will bring the heads of the concentrators in close proximity, be convenient for testing the pulp, for overlooking their operation, and afford the attendant an unobstructed view of the battery. The floor of this room should be laid not less than 9ft. below the point of pulp-discharge from the pulp-distributing box, which will permit head-room under the pulp-conveying pipes. It should be given a descending grade from the centre of the passage-way at the head of the machines towards the battery, and also in the opposite direction away from the battery; troughs or sluices being laid at the lower ends of these floors for carrying off any valuable particles to a convenient receptacle when washing the floor. This arrangement will serve to keep the passage-way dry and clean. The grade given each way should be about 2½in. to each 12ft.

*Timber and Bolts for Foundation-frame.*—Two pieces, 8in. by 8in., by 11ft. 3in. long, 120ft. B.M.; three pieces, 8in. by 8in., by 5ft. 2in. long, 83ft. B.M.; three bolts, ½in. round by 6ft. 1½in. long, between heads and nuts.

The foundation-frame should be set on a descending grade from its head of, say, 3½in. to each 12ft.

The concentration-tank should then be firmly joined together at its ends and sides, using white-lead or paint in all of the joints. Paint the tank inside and outside, and put in its place between the sides of the foundation-frame. The concentrator-frame (iron) can then be bolted to the foundation-frame, and its ends and intermediate lower cross-piece bolted to the side frames. The upright wooden springs are then to be fitted in their sockets on this iron frame, six on each side, being careful that they are level from corner to corner and across their tops, and in a line lengthwise with the frame. The shaking-frame should then be bolted together, and its cross-pieces fitted. Then screw on to this frame the boxes for the small zinc rollers, fifteen on each side, for fifteen rollers. The first or head set of these roller-boxes are ½in., and the second ¼in., higher than the succeeding sets, which are all of an equal height. Before placing the small rollers in their boxes see that each one is straight from end to end. Then place the two 13in. roller-drums in their boxes, the one which is raised towards its centre at the head of the frame, and the one which is straight from end to end at the foot.

Lay the endless rubber concentrator-belt on the floor, alongside of the shaking-frame; then work the belt over the frame and rollers, and, with lifting-pieces, raise the belt, frame, rollers and all, and set carefully on the upright wooden springs already fitted in their sockets as previously instructed.

The tightener-drums, which are 8in. in diameter, are then to be placed in their allotted position, the straight one near the head, and the one with the tapered or rounded ends near the middle. Place the 4in. roller at the head and across the upper side of the inside of the belt, in which posi-