

establishment of a foundation for the mining industry of Bear Gulch—one that could breast any of the former difficulties which had existed there previously, and at the same time a foundation that would accept no standstill in its industrial development that would in the least have cause to impede its progress. He at once bonded the Legal Tender of the First National bank of Helena, for \$150,000, and in less than 60 days he made his first purchase in the Sowash mine. The next purchase was the Revenue, from George Phelps, a mine whose richness has exceeded the wildest expectations of its former owner. From George Welcome he now purchased the Keets, West Point, W. W. Dixon, North Star and Norse. As soon as quartz mines were purchased Mr. Bush at once put experts at work to develop them, and at the same time prove to the world at large that his judgment in such line of work is faultless. Shortly after getting his quartz interests under way he turned his attention to the purchase of 40 acres of placer ground from Joe Brown, and has just completed a ditch three thousand feet in length, furnishing water for hydraulic mining that is second to none in the state. Thus it has been, while each month new mines are added to his store of hidden wealth.

About ten days after Mr. Bush first set his enterprises on foot he had the old stamp mill increased to a twenty-stamp, with new vanners and tables to conform with his ideas of what a stamp mill should be. His next move was an order for 2,000,000 feet of the best lumber that would go into mills, buildings, etc., and never has there been any delay in the development work caused by a lack of material. Since then he has completed and furnished his Guests' House, a building which alone stands without a peer in the state as to completeness of accommodations and grandness of interior furnishings.

In March, 1899, he laid the foundation for his new Revenue stamp mill, with a ground area of 93x120 feet and height of 103 feet, the foundation of which, alone, contains six hundred perch of stone. The construction work required about 400,000 feet of lumber, and it is safe to say that it is the finest stamp mill in America, taking into consideration its water advantages and situation at the mines where everything is handled by gravity, requiring the labor of two men for the operation of forty stamps.

Leading from the mine about five hundred feet above is a tramway which discharges into a 200-ton pocket. From here the ore runs into a Cammett crusher which discharges it into a 500-ton pocket. The ore is now fed by eight automatic feeders into the eight batteries of five stamps each. From here it

pulp passes by gravity onto another device planned by Mr. James, being so constructed and manipulated by certain machinery that it can be distributed to any battery by the will of the operator. In close proximity to this is situated a dial, with numbers thereon corresponding to the numbers of the different batteries. By moving a lever the ore, as it comes from the crusher, can be dumped at any group of stamps by will of the operator, giving the great advantage of supplying them with sufficient ore to keep them busy continuously.

The eight plates that catch the free gold are of copper and silver plated.

After the pulp passes over the tables and vanners

are more firmly held in place thereby, being directly supplied with 280 horse-power boilers. In front of the engines are situated water taps to which are attached a fire hose with sufficient pressure to throw a stream of water over the entire building, and is sufficient in volume for all emergencies. A fire gong is so situated in the mill that all occupants can sound the fire alarm, and by different openings and stairways they can either get out of the building or to the fire.

Mr. Bush deserves much honor for this valuable addition to the mining machinery of Montana, while in it are combined originality and the proof of his judgment of what the future of the mining camp will



BUILDING SCENE IN BEAR GULCH MINING CAMP.

the concentrates then pass into a pit 7x10 and 8 feet deep, in which are placed an automatic sampler, through which it all passes. This is so constructed that a uniform sample can be obtained at all times.

Directly over the batteries is built a track, extending the entire length of the building, and upon which is placed a crawl which is used in case of a breakage of any heavy machinery. This crawl is brought into position and the broken parts hoisted upon a car, which takes them to the machine shop for repairing. The battery blocks are set in the ground to a depth of fourteen feet and rest on solid hard pan, each one having independent bearings. In

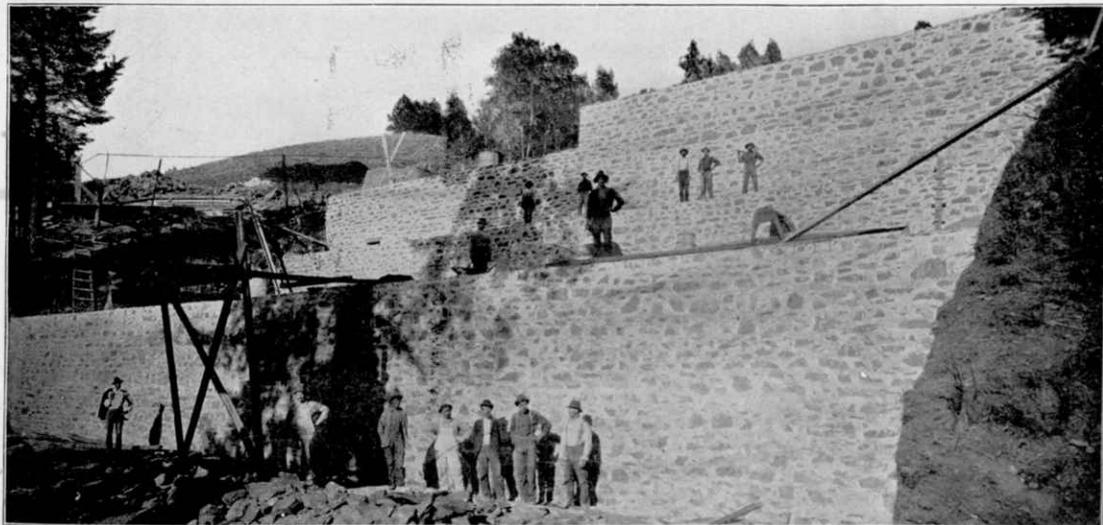
be. Experts acknowledge that this mill is the most complete stamp mill in the world.

THE SOWASH MINE

is in direct communication with the old stamp mill, and is developed by over 300 feet of cross-cut, exposing two veins thereby, one with a development for a distance of over 400 feet along its strike, showing a vein from five to thirty feet in width about 90 feet below the surface, while the other vein, encountered by this crosscut is of a more silicious nature, with a development of 175 feet in length along its strike, showing a width of from five to fifteen feet. Stopping operations have only just commenced, there being 200 or more feet of backs yet to stope. It is above the first vein's development that practically all the ore up to date has been extracted.

THE KEETS

is an extension of the Sowash on its dip and situated higher up. It contains both the veins exposed in the



FOUNDATION OF THE REVENUE STAMP MILL.

passes over the plates which strike the free gold, and onto a series of eight tables, the middlings of which pass onto a similar number of Frue vanners. These tables and vanners separate the heavy metallic particles from the lighter sand or waste, which are in their turn shipped to the different smelters in Montana. All of the dump cars of this mill are supplied with an automatic device, an invention of U. S. James, the construction superintendent, which unlocks the door, dumps, then closes the door and returns for another load of ore. The ore passes through the chutes by gravity, down over screens where the fine particles are separated from the coarse large rocks and passes directly into the crushers, where it is crushed and prepared for the stamps. From the stamp plates the

operating the stamps with ninety drops per minute, at a distance of five inches, the blocks have never settled the slightest degree from the original.

The water for the plant is taken from Bear creek by a ditch with a head of 347 feet and furnishes 500 inches of water.

There are two engines, the smaller one being situated back of the larger one, and supplied with sufficient horse-power and so connected by steam pipes and belts that in case of any disability of the larger engine the burden can be placed upon this smaller contrivance and the work of the mill move on uninterrupted. For convenience these engines and boilers are situated above all other machinery, consequently the former have a downward pull and



RESIDENCE OF J. P. SENNOTT.