Dry Ore Concentrator Now In Full Operation

By BETTY DOW

Not very far from Yreka, as one follows North Street on up into the hills, one will find tucked in the midst of a veritable forest of oaks, pines, and many other species of trees, a small house and several buildings. The tiny house perched on the hillside is the home of A. C. Putnam and his wife, Maizie.

The house, far from pretentious, is cozy and homelike, and boasts every convenience that one could ask, including a television set and all other modern appliances to maintain a good and comfortable home life.

Not far from the house, stands a huge wooden structure, also built on the side of a hill, which houses Putnam's pride and joy—the culmination of many years of hard work, thought and ingenuity—the "Dry-Ore Concentrator" — a machine designed by Putnam to extract from ore-bearing rock such precious metals as gold, silver and platinum, while still leaving other important metals that can be utilized for many by-products.

The dry-ore concentrator is installed on the lower floor of the building, while above is a huge hopper, into which is fed the gold bearing ore. However, the very first step, the material must be passed through a drying tube, and it is then fed into a gyrator crusher, which receives it in an approximate chunk of one and one-half inches to two inches, which is reduced to approximately a half inch mesh. Thence it is passed into a diesel-driven ball mill its function being to reduce the ore from the half inch mesh down to a fine 40 or 50 mesh. From the ball mill the material enters a conveying system, which elevates it 40 feet, after which it is passed through a screening process. The next step finds the coarse material returning into a regrind process, while the fine is all classified and by a gravity chute goes into storage tanks of the proper mesh, being stored in the lower compartment of the concentrator.

A better description of the process is explained in a brochure, published by the Dry-Ore Concentrator, Inc., which explains how the dry, screened metal bearing ore is fed by gravity through the controlled feed valve, into the conveying system, over a blank area equal in distance to the space between conveyor chain blades. This synchronizes the flow of ore with the conveyor.

"The ore is moved forward to the first of eight sections, each of which has four or more cells. At this point, the ore is activated by compressed air forced upward through the perforated plate structure of the cells. The action of the air on the moving body of ore causes the ore to float on a continuous air suspension in an animated state. In effect the ore is liquefied. The metallic content is heavier than the gangue, and therefore, falls into the cell. This process is repeated by the continuous flow of ore over the eight sections, cleanly removing the metallic materials from the ore blanket. The entire concentrating process is based upon the principle of air flotation of dry materials so that the heavier materials (metals) of greater specific gravity, drop to the bottom and the lighter, non-metallic materials are floated off."

According to illustrations, "when sections become full of concentrates, the feed valve at the base of the hopper is closed in order to shut off the flow of fresh ore, and the perforated plate bases of the floating cells are raised approximately a half inch, allowing the conveyor blades to carry off the middlings (with flap valve open to middlings chute). These are later returned to the hopper. The cells are then raised to a point level with the conveyor blades to carry off the concentrates over the same route used by the gangue. The flap valve, which during the separating operation had been open to the tailings chute, is now changed to the concentrate chute. When the concentrates are drawn off, the cell bases have been lowered to the running position and feed valve is opened, thus resuming separation on a continuous operating cycle."

In describing the advantages of the dry-ore concentrator process over the wet process, Putnam explains that "it starts in the drying tube, which receives the ore from the secondary jaw crusher. In the drying tube, the moisture is removed and in the handling of sulphide ores, the arsenic and sulphur ore are automatically removed by the heat, either by burning or by other chemical action, leaving the metal free to respond to the process."

A second advantage pointed out by Putnam: "We claim that the heat applied to the crushed rock not only removes the moisture content, but actually expands the small particles of metal, thus breaking the bond between them and the rock, giving us the advantage of a more uniform grind with less micro-particles to contend with."

Citing a third advantage, Putnam states that in nearly every deposit, "a percentage of iron—ranging from one half of one per-cent up to 30 per cent—with the old process is not worth saving—(a) in the wet process, had a magnetic force been applied to the solution, carrying off the metal particles, much of the gold, silver and other precious metals would have adhered to the iron, consequently they would have been removed. (Some deposits have as high as nine different ores.) With the dry ore process this iron can be withdrawn without removing any other metals."

Putnam continued by stating, "It is a known fact in engineering circles, that several of the non-magnetic iron ores in their normal state, when heat is applied they respond to the magnetic force very efficiently. Thus, in our process, by applying heat for drying, enables us to recover practically all of the iron deposit. By separating the iron before entering the hopper, which feeds the machine, it saves that amount from processing."

"When the plant is completed, the iron ore referred to above, will be one of our most valuable recovered ores, Putnam said, "considering its volume as compared to other materials. This can be utilized in the production of such by-products as soil drain pipes. The outlet for all waste material salvaged, should provide 25 per cent as much revenue as the milling for the precious metals."

There are several other kinds of ore listed by Putnam, such as lead, zinc, molybdenum, which are not in sufficient quantities to warrant expenditures necessary to save these small quantities. "The Dry-Ore Concentrating Company," said Putnam, "takes this fact into consideration and reduces the cost of custom work in proportion to values of the mentioned ores."

A final and major advantage in the dry-ore process, stressed by Putnam, that it is able to handle ore in arid areas, or where no water is available.

That the operation of the dry-ore concentrator will aid in the employment picture was also pointed out by Putnam, for when the machine is in full operation it will require the services of seven men, while in the production of the by-products five men will be employed, not to mention others who will be needed to drive trucks for hauling of materials, delivering of finished products, and the operation of other heavy equipment.

Pertaining to available materials on the 218 acres that encompass the land where Putnam has this machine, there are four deposits on the property itself with eleven claims on gold, silver, lead and zinc, and there are 44 deposits of the same material within hauling distance.

The Dry-Ore Concentrator, Inc., has currently 100 stockholders and is capitalized for $100,000, with $50,000 in stocks having been sold which has been invested in equipment. The company holds one U.S. Patent and six foreign patents.

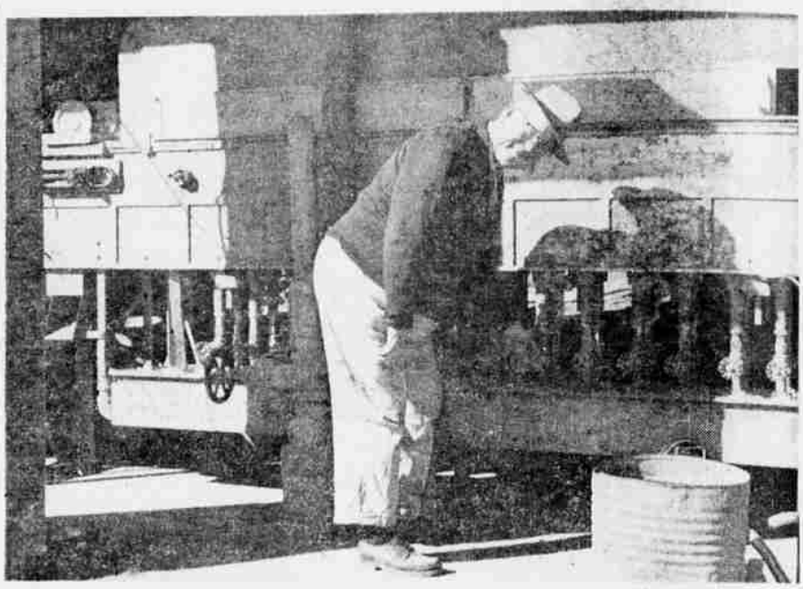
Putnam is the president of the corporation, while his wife, Maizie, is secretary-treasurer. Other officers include Don Davis of Grenada, vice president, and board of directors, Carroll Birdwell and Arnold Tschapp, both of Fort Jones; L. N. Ostrander of Kirkland, Washington. Otto A. Wick, Seattle, is the stock salesman and sales manager.

Putnam stated that there has been no promotional stock that has been allocated or issued. All stock sold for cash or its equivalent in equipment. Putnam leases his property and the machinery to the corporation

On the personal side of Putnam, he was born in New York, and celebrated his 75th birthday last April 22. His career throughout his life has been varied, starting out first when he was employed by the Boston Main railroad, five years as a fireman and six years as an engineer. This was followed by 11 years as an insurance adjustor for the American Fire Group Insurance.

He and Maizie have been married for 45 years, and for many years they were located at Lake George, New York, where they operated a laundry and dry cleaning plant. During the summer months, and in the fall, Putnam contracted to repair and build roads, sea walls and other needed construction at the resort. It was about 1935 when the Putnams pulled up stakes and headed west, settling in Washington where they entered the real estate business.

In regard to the dry-ore concentrator—the brain child of Putnam—he says it took him three years to perfect it, with Maizie standing by to help him, and five more years to have it patented. And Putnam feels proud that he has contributed to more progress in Siskiyou County which is, of course, a part of the great "State of Jefferson."



A. C. PUTNAM is shown here with his brain child, the dry-ore concentrator designed to extract precious metals from ore-bearing rock. Putnam is indicating one of the many valves which are used to regulate the flow of air into the separating chamber. — Photo by Dow

THIS BUILDING houses all the complex machinery of the dry-ore concentrator under the same roof. The concentrator is located in the lower left hand corner of the building. Elsewhere are the ball mill that grinds up the ore-bearing rock, the various big diesel motors and the other equipment necessary to the process. — Photo by Dow