

THE CONGRESS MINE

MARTINEZ MINING DISTRICT, YAVAPAI COUNTY, ARIZONA

By W. F. Staunton.

*124 West Bennett St.
Los Angeles*

HISTORICAL. The original Congress locations were made by Dennis May and sold by him to "Diamond Joe" Reynolds about the year 1887 for approximately \$65,000.00, the purchase having been made by the advice of Frank M. Murphy, of Prescott, Arizona.

Reynolds developed the property to some extent and built a 20 stamp mill with Frue Vanner tables for concentration. No plates were used in the mill as there was practically no free gold, all of the value being in the sulphides, which consisted principally of the variety of iron pyrite known as marcasite. The surface ores were much oxidized, notwithstanding which no saving of consequence could be made by amalgamation, nor by concentration either, on such ores. The cyanide process was in its infancy then and little known, so that it was a common saying regarding the Congress mine in its early history that while it showed a large amount of ore of good grade, there was no known method of extraction. The finding of sulphides by sinking solved the problem to a certain extent, as such ores were amenable to concentration and the concentrates could be shipped to custom smelters. This furnished the means to profitable operation, but the crude methods employed at that time, - fine crushing by stamps followed by simple unclassified concentration on Frue Vanners, - necessarily resulted in high tailing losses on account of the large amount of sliming that took place. Flotation, as practiced today, was unknown then. Fortunately the tailings from the early operations were saved and were retreated later by cyanide with good extraction.

The property was operated from March, 1889, to August, 1891, when,

owing to the death of Mr. Reynolds, and to await the construction of the Santa Fe, Prescott & Phoenix Railroad, active operation was suspended except for a certain amount of development work and the enlargement of the mill from 20 to 40 stamps with the necessary additional Frue Vanners. The No. 2 shaft had been sunk to a depth on the vein of 1000 feet but no stoping had been done below the 650 ft. level.

Production during this early period is given below:

	<u>Tons.</u>	<u>Net Returns.</u>
March 3/89 to Aug. 31/91, Ore shipped,	1,129.4	\$155,652.29
Sept. 26/89 to Jan. 28/91, Concentrates shipped,	2,500.8	335,308.87
June 3 /91 to Aug. 31/91, " "	<u>1,062.8</u>	<u>101,113.73</u>
	4,693.0	\$592,074.89

In March, 1894, new interests acquired control of the company, the name of which at that time was The Congress Gold Company, E. B. Gage, President, and active operations were resumed, continuing thereafter until the end of 1910. In April, 1901, the company was reorganized as the Congress Consolidated Mines Company, Limited, E. B. Gage continuing as President. The direct supervision was under the writer, at first as superintendent and later as vice president and general manager, from 1894 to 1910.

The production during this second period is given below:

	<u>Net Returns.</u>
March, 1894 to December, 1910, Ore and concentrates shipped,	\$4,259,571.30
" " " " " Cyanide bullion shipped,	<u>2,797,851.45</u>
	\$7,057,422.75

Thus the total recorded production in actual returns for gold and silver sold was \$7,649,497.64.

GEOLOGY. The country rock is granite, the westerly slope of the Bradshaw Mountains. A series of greenstone trap dikes exists over an area of several square miles having a generally easterly and westerly strike and dipping from 20 to 30 degrees from the horizontal, northerly. These dikes are generally mineralized to some extent and the Congress vein is in one of them

and perhaps it can be said that the dike is the vein, for ore occurs in it in all possible positions from one granite wall to the other but generally near the footwall and accompanied by a clay selvage. The dike has a thickness of about 15 feet. Another series of dikes of fine grained quartz porphyry are of later origin, apparently post-mineral, and strike northeasterly with nearly vertical dip. The following analysis of an average specimen of the greenstone was reported from the Sheffield Scientific School:

SiO ₂	52.20 %
Al ₂ O ₃	13.40
FeO	9.75
MnO	1.90
CaO	9.60
Mg.O	1.16

There are other veins, entirely in the granite and unaccompanied by the greenstone so characteristic of the Congress vein. The strike of these is easterly and westerly but the dip much steeper, running from 40 to 50 degrees. The development of quartz is more extensive than in the Congress vein and the average grade is lower. One of these veins, the Niagara, carried large bodies of ore of commercial grade to a depth of 2000 feet. A characteristic of these all-granite veins is the presence of a very small amount of galena and higher silver contents.

Minor faulting is in evidence throughout the mine workings and there has been considerable relative movement of the walls of the Congress vein resulting in local crumpling of the greenstone. The mine workings terminate to the east against a heavy fault, beyond which the vein has not been definitely located. This fault cuts off both the Congress and Niagara veins.

The mines were practically dry down to the deepest point reached, 4000 feet on the Congress vein at an approximate inclination of 25 degrees from horizontal, the small amount of surface water which found its way in being easily handled by bailing tanks in the shafts. No mine pumps were ever put in or needed.

While the Congress vein is continuous and well defined for a mile or more to the west of the mine workings and shows both the characteristic quartz and sulphides, the pay ore was practically confined to a shoot in the vein pitching to the northwest and coinciding closely with the intersection of one of the fissure veins in the granite. The granite vein is faulted by the Congress vein so that the intersection is obscure in the mine workings. The portion of the granite vein in the hanging wall of the Congress carried bodies of pay ore.

The Congress pay shoot varied greatly in length on different levels, being longest on the 650 ft. level where it was stoped continuously for 1800 feet. The average thickness of pay ore was less than 3 feet. Several pinches were met with in following the vein down, the most serious being at the 1700 ft. level where there was no stoping ground. On the theory that if pay ore existed below that point it would probably be found on the general line of trend of the ore shoot above, a deep prospecting winze was sunk from the 1700 ft. level, in the vein but with a northwesterly pitch corresponding to the established trend of the pay ore in the upper workings. This winze was sunk 1000 feet and bore out fully the theory upon which it was projected, the pay ore coming in again as good as ever after a few hundred feet of lean ground.

The 3900 ft. level was the deepest point at which any considerable amount of development was done. For several levels above this there had been a gradual pinching of the pay shoot which became very small and irregular although retaining its mineralogical characteristics and the small amount of sulphides which remained still showing the characteristically high gold contents, about 7 oz. per ton. The conditions were very similar to those existing at other horizons in the mine where persistent deeper work had been rewarded by expansion of the ore shoot to normal size.

GENERAL. Seven shafts were sunk, all of them inclines following the veins. Three of these were on the Congress vein, designated as No. 1 (1100 ft.) No. 2 (1700 ft.), and No. 3, (4000 ft.). On the Niagara vein three shafts were also sunk, No. 4 (1000 ft.), No. 5 (2050 ft.) and No. 6 (1800 ft.). On the Queen of the Hills vein one shaft was sunk to a depth of 200 ft. below the tunnel level.

Figures on tonnage of crude ore are not available for the first period from March 3, 1889 to August 31, 1891, but on account of the great uniformity of the ore they may be closely approximated from the figures of the later period, on which basis the amount of ore milled in the first period appears to have been about 70,000 tons, all of which came from the Congress vein, as also did the shipping ore, together making a total of 71,129 tons. In the second period the amount of ore milled was 617,542 tons and shipping ore 3,661 tons, a total of 621,203 tons. The figures may be grouped as follows:

	<u>From Congress.</u>	<u>From Niagara.</u>	<u>From Q. of H.</u>	<u>Total.</u>
March 3/89 to Aug. 31/91	71,129 tons			71,129 tons.
March 1/94 to Dec. 31/10	<u>307,863</u> "	<u>293,215</u> tons	<u>20,125</u> tons	<u>621,203</u> "
	379,022 "	293,215 "	20,125 "	692,352 "

The recorded production of gold and silver in shipments shows a total of 388,477 ounces of gold and 345,598 ounces of silver. As this came from 692,352 tons of ore a recovery is indicated of \$11.81 a ton, figuring gold at \$20.67 and silver at 60¢ per punce. Average tailing assays were about \$1.20, which indicates a gross average value of all ore mined of \$13.01.

The history of the Congress mine, its remarkable persistence due probably to its association with an intrusive dike of profoundly deep origin, and the existence of similar parallel veins in both hanging and footwall over a wide belt, suggest a careful study of the whole situation to determine the feasibility of a broadly planned scheme of exploration by means of a vertical shaft so arranged as to cut the Congress vein at greater depth than has been attained and incidentally to cut and explore the other similar veins, many of which not cut by the shaft could be reached by crosscuts.