

*Santiago Mine  
Chas. F. Epple*

# The Argentine-Santiago M. & M. Co.

*A Colorado Corporation*



Capital Stock—500,000 Shares  
Par Value—\$1.00 per Share. Full Paid and Non-Assessable



## OFFICERS

JOSEPH R. CAMPBELL.....*President and General Manager*  
JOHN E. PAINTER.....*Vice President*  
ISAAC SUTTON.....*Secretary-Treasurer*



## DIRECTORS

JOSEPH R. CAMPBELL  
CHAS. F. EPPLE

JOHN E. PAINTER  
ISAAC SUTTON

JAMES L. C. PAINTER

C. D. McFADDEN.....*Consulting Engineer*



JOSEPH R. CAMPBELL—*Mine Operator. Address—Santiago Mine, Georgetown, Colorado.*

JOHN E. PAINTER—*President American Hereford Cattle Breeders' Association.  
Address—Roggen, Colorado.*

ISAAC SUTTON—*Mining. Address—1000 Exchange Building, Denver, Colorado.*

CHAS. F. EPPLE—*Automobiles. Owner, Roggen Motor Company.  
Address—Roggen, Colorado.*

JAMES L. C. PAINTER—*Thoroughbred Hereford Cattle. Address—Roggen, Colorado.*



the hanging side and generally gneiss on the foot walls, thereby insuring safe, substantial walls for stopes and tunnels, without timbering, which will be a great saving in the cost of mining.

6. The main upheaval seems to have started at a point close to the Santiago Mine and fissures here have the greatest width, as shown by tracing the veins in any direction from this territory. To cite one instance, the Santiago Mine is located on what is known as the Centennial Vein. This vein is easily traceable for 15 miles from the Santiago Mine but it gradually decreases in width until it becomes too narrow to work at a profit.

### VEIN SYSTEM

7. The width of the veins vary from 2 to 50 feet. In some instances the ore of a smelting grade has been known to reach a width of 8 feet from wall to wall.

8. The veins are nearly vertical in pitch and have a general northeast and southwest strike.

9. The ore of the Santiago Mine is known as an ore of secondary enrichment. It is a sulphide ore containing galena, copper, gold, silver, zinc and iron.

10. Some of the veins in this district carry more gold than others, the Santiago Mine being one of those chiefly noted for the gold contained in the ore. The principal values in the ore of this mine, however, are in silver, gold, copper and lead, the values in the different metals ranking in the order named. I believe the order will be changed, however, when greater depth is obtained, for the ores become more silicious with depth and as is known from other surrounding properties, where deeper depths have been obtained, the gold value increases, as does the silver. Therefore, I expect the values in the ore to be gold, silver, copper and lead, ranking in the last named order.

11. The silver-lead ores from this district are as greatly in demand at the smelters because of their value as a flux with refractory ores of others parts of Colorado. The treatment charge on the Santiago ores is, for the above reason, very low.

12. As an illustration of the present metallic contents of the ore I will give below a few copies of shipments sold to the W. J. Chamberlain Ore Company:

Net Pounds	Gold ounces	Silver ounces	Dry Lead per cent	Dry Copper per cent	Value per ton
31,586	0.435	29.06	20.45	3.60	\$50.86
39,217	0.615	22.00		4.20	32.65
32,381	1.025	35.30	4.30	7.35	63.40
27,639	1.25	41.10	6.05	7.15	68.37

13. The above shipments were made in 1916 when silver was 57 to 69 cents per ounce, copper 25 to 26 $\frac{3}{8}$  cents, and lead \$7.00. The same ore would be worth more today because of the advance in the price of silver and lead.

### THE SANTIAGO MINE

14. This property is located on the Commonwealth or Centennial Vein and the boundaries of the claims hold the ownership of this famous vein for 3,000 feet. (See plate, Longitudinal Section on next page.

15. There are five working levels on this property which open to the surface. From the 5th Level two shafts have been sunk (see plate Longitudinal Section) one, the South Shaft is sunk 100 feet to the 6th level, the other, the North Shaft, is sunk to a depth of 220 feet, connecting the 5th, 6th and 7th Levels.

16. The ore shipped from this property has been only such ore as had a higher value than \$20.00 per ton, and represents about 1/5 of the total ore mined, the remainder being run out on the dumps or left in the mine as stope filling. In other words, the entire amount of mill ore from all past mining is yet in the property, broken and ready to put thru the mill.

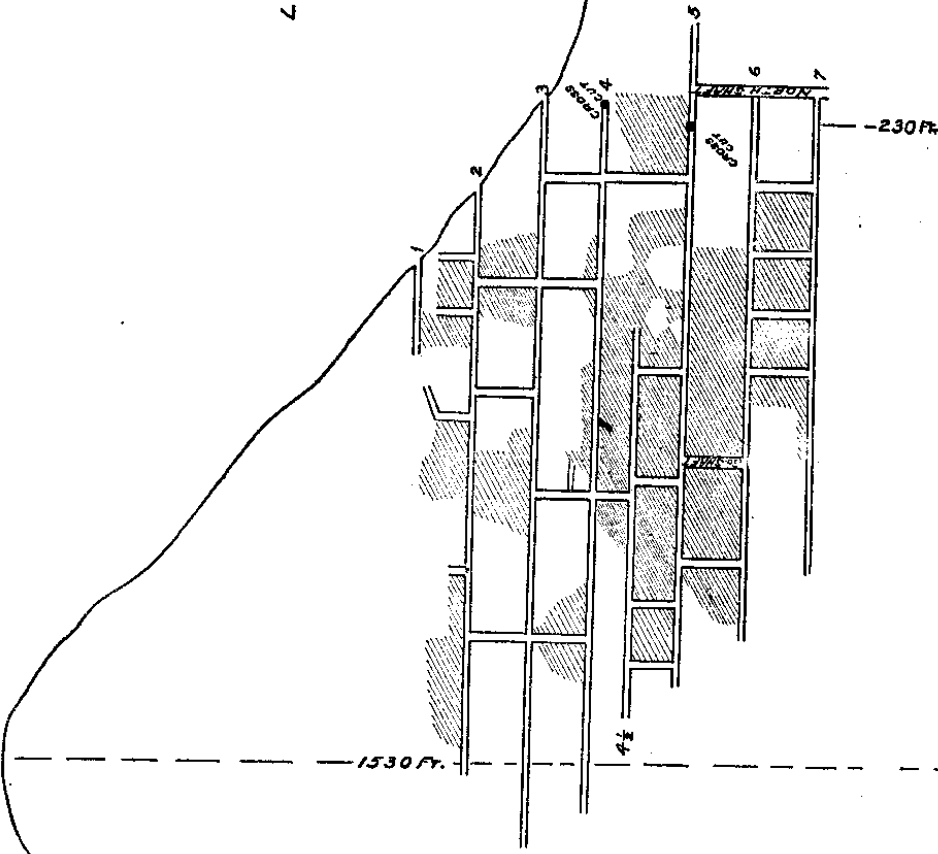
17. The ore in the vein has been exceptionally uniform in character and value as is evidenced by the shipments from the different levels. Aside from rich bodies which have been encountered, the ore shows a very uniform value and width in the vein. Below is given a record of shipments from the 3rd Level, showing 133 tons to have an average value of \$61.43 after all freight and smelter charges are deducted:

LONGITUDINAL SECTION  
SANTIAGO MINE  
1 INCH = 100 FT.

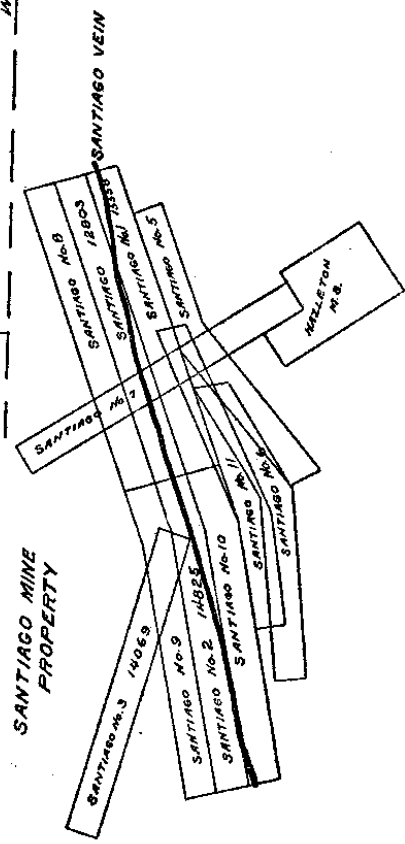
NORTH END LINE

SHARDED AREA SHOWS  
MILL ORE NOW IN MINE

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WILCOX TUNNEL LEVEL



SOUTH END LINE

## TEN SHIPMENTS FROM THIRD LEVEL

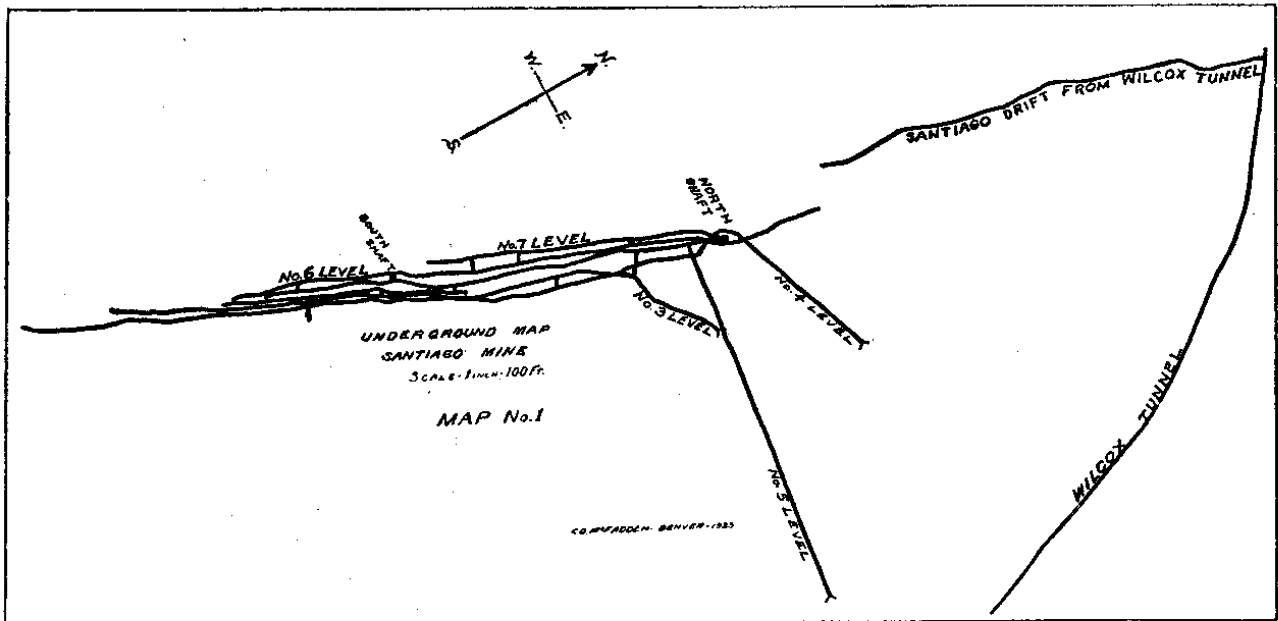
Date	Pounds	Gold ounces	Silver ounces	Dry Lead %	Dry Copper %	Net Value
7-30-16	32,230	.435	29.06	20.45	3.6	\$ 707.37
10-18-16	52,060	1.215	40.55	7.9	7.1	1744.04
12-2-16	43,780	.51	26.4	7.95		903.50
12-5-16	25,000	.33	11.6	4.72	1.57	133.72
12-20-16	36,820	1,185	39.65		8.72	1514.38
1-17-17	12,027	.445	19.72	19.70	1.60	350.66
1-20-17	14,985	1.425	44.90	5.05	8.60	1198.16
3-21-17	22,440	.375	7.00		1.75	235.98
3-26-17	9,463	.795	35.50	11.70	4.45	582.33
9-11-17	17,140	.61	18.05	18.2	2.06	800.03

18. Below is also given a record of five shipments from the 5th Level showing the average value of 100.06 tons to be \$81.18 per ton, after all freight and smelter charges have been deducted:

and a very noticeable increase in gold and copper is obtained as shown by shipments from the lower levels. (See pp. 17 and 18.)

21. At present, ore can be obtained from Level No. 7, Level No. 6, Level No. 5, Level No. 4, Level No. 4½ and Level No. 3. From the surface above all the levels is a 30-inch streak of galena showing in the outcrop of the Santiago Vein.

22. Level No. 1 is 625 feet above Level No. 7. Below No. 7 Level 230 feet is what is known as the Santiago Drift, which is driven from the Wilcox Tunnel from a point where the Santiago Vein was cut by the Wilcox Tunnel; this drift is on the Santiago Vein and the heading now shows ore of about \$15.00 value at a point 850 feet from the Wil-



## FIVE SHIPMENTS FROM FIFTH LEVEL

Date	Pounds	Gold ounces	Silver ounces	Dry Lead %	Dry Copper %	Net Value
11-21-16	49,000	2.255	50.40	3.57	7.55	\$2377.42
9-9-16	37,340	1.095	38.95	4.45	6.70	1098.42
2-27-17	90,001	1.35	39.55	3.85	8.75	2876.69
3-29-17	10,035	3.45	57.75	3.40	9.15	1404.79
4-13-17	13,753	.34	9.10	17.72	.70	346.37

19. From all the foregoing records it is quite evident that the grade of ore to be found in the Santiago Mine is of exceptional value. The tonnage, from past experience and records, will be very large. Incidentally the ore now in sight, in the different levels is simply more proof of what to expect from this property when it is repaired and properly managed.

20. The vein is prominent in each level. As depth is gained the lead decreases in quantity

cox Tunnel, and it must be remembered that this drift is not yet driven to a point where the great ore body of the Santiago Mine will be found. However, the ore now showing in this drift, if milled, will pay for the work of driving it to the main ore body (see plate Map No. 1).

23. Up to the present time all mining has been done by hand. The cost of getting the ore out has been as follows:

Average price per ton on mining.....	\$ 6.00
Average price per ton on sorting.....	1.50
Average price per ton on tramming.....	1.00
Average price per ton on freight and treatment.....	11.00
	\$19.50

This excessive cost can be reduced by repairing some of the main chutes and lining them. However, even with this high cost of mining, the ore leaves a very attractive profit.

## WHAT A MILL WOULD DO

24. There is a 5-acre mill site below the mine but at present there is only water available for a first unit mill of 50 tons daily capacity.

25. In the stopes from the different levels I estimate the mill dirt as follows:

	Cu. Ft.	Tons
Level No. 2.....	97,600	6,100
Level No. 3.....	141,600	8,859
Level No. 4.....	27,600	1,725
Level No. 4½.....	77,000	4,812.5
Level No. 5.....	216,900	13,556
Level No. 6.....	196,600	12,287.5
Level No. 7.....	105,200	6,575
<b>Total</b> .....		<b>53,906</b>

26. Below are given the records of a car load shipment of this mill ore:

Weight, pounds .....	24,750
Gold, ounces .....	0.33
Silver, ounces .....	11.60
Dry Lead, per cent.....	6.22
Dry Copper, per cent.....	1.57
Value per ton.....	\$16.18
Freight .....	52.55
Net value per ton.....	12.00

27. Estimating the cost of handling this mill ore as follows: Trammings, \$1.00 per ton; milling, \$3.00 per ton gives \$4.00 per ton. Then from the shipment of this mill ore shown above, we find the ore to be worth \$12.00 per ton. Deducting the \$4.00 charge leaves a profit of \$8.00 per ton at Leadville. This profit would be reduced some for the reason that the mill would not give 100% efficiency in saving the minerals. We can, however, be sure of at least 80% saving and this would leave a net profit at Leadville of \$6.40 per ton on the entire 53,906 tons of mill dirt now in the mine, or a profit of \$344,998 net, after deducting all mining, milling and freight charges.

28. A mill should save better than 80% on this ore and herewith is given the cost of the machinery for a mill of 50 tons daily capacity:

**MACHINERY EQUIPMENT FOR FLOTATION MILL FOR SANTIAGO MINE, FOR 50 TONS CAPACITY EACH 24 HOURS, FURNISHED BY THE DENVER ENGINEERING WORKS COMPANY, DENVER, COLO.**

	Wt., lbs.	Price
1 GRIZZLY, 3 ft. wide, 8 ft. long, 1½-in. spaces between tapered steel bars .....	575	\$ 75.00

1 BLAKE CRUSHER, 7-in. by 10-in. jaw opening, chrome steel jaw plates, single drive pulley.....	5,700	750.00
1 ORE FEEDER, Challenge type, adjustable feed, tight and loose drive pulley .....	800	250.00
1 ROD MILL, 3-ft. diameter, 6 ft. long, with machine cut geared drive, and friction clutch pulley, 40-in. diameter by 12-in. face; including hard castiron shell liners.....	24,000	1,495.00
1 CLASSIFIER .....	2,000	500.00
3 CONCENTRATING TABLES, DEISTER PLATE TYPE, standard mechanism for mounting on concrete foundations .....	11,400	1,425.00
1 GREENAWALT FLOTATION MACHINE, six (6) compartments, including wood and iron work.....	5,000	1,500.00
1 SAND PUMP, Wilfley type, 2-in. discharge .....	660	300.00
1 DEWATERING CONE, 40-in. diameter, center feed, annual overflow, bottom spigot discharge.....	250	65.00

### ELECTRIC MOTORS

3 phase, 60 cycle, 440 volts, with base frame, pulley and hand compensator, with overload and under voltage protection.

	Wt., lbs.	Price
1 10-H.P., 900 RPM for Crusher.....	730	\$ 255.00
1 25-H.P., 900 RPM for Feeder, Rod Mill and Classifier.....	1,230	385.00
1 15-H.P., 900 RPM for Tables, Flotation Machine and a Sand Pump .....	880	300.00

RUBBER BELTING. Estimated cost of rubber belting to connect electric motors to machinery or transmission motors to machinery or transmission. Approximate only .....

300	100.00
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TRANSMISSION MACHINERY. Shafting, pulleys, bearings, couplings to connect electric motors with Mill machinery. Approximate only.....

5,000	750.00
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Machinery Equipment, F. O. B. Denver .....

58,525	\$8,150.00
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**ESTIMATED ADDITIONAL COST OF TRANSPORTATION AND ERECTION OF MACHINERY AND MILL BUILDING:**

Freight, Denver to Georgetown, 586 cwt. at 36½ cents .....	\$ 213.89
Estimates haulage from Georgetown to mill site, 30 tons approximate at \$10.00.....	300.00
Excavation of mill site.....	500.00
Concrete foundations, mill and machinery.....	500.00
50,000 board feet lumber at \$50.00 per M. M. F. L. ....	2,500.00
Erection of mill building and machinery.....	4,000.00

Total .....

\$16,163.89
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(Signed) FRANK E. SHEPARD.

29. Now suppose a mill is not built. Then we have only the mining to consider.

30. To put the Santiago Mine in first class condition, whereby the ore can be mined for the least expense, the following things should be done:

31. The drift from the Wilcox Tunnel, which is 230 feet below the lowest level of the Santiago Mine, should be driven to the main ore body, a distance of 280 feet, costing \$4,700.00. (See Plate Map No. 1.)

32. While this work is being done, the main chutes should be repaired and lined, and as much ore shipped from the different levels as is possible. The cost of the mining, freight and treatment will not exceed the past price of \$19.50 per ton. There would then be the mining cost of \$19.50 to deduct from the average value of \$60.00, leaving \$40.50 per ton profit.

33. If the chutes are repaired and the connection made from the Wilcox Tunnel, then the cost of mining and freight would be lowered by about \$4.00 per ton and also a large tonnage of new ore would be available; incidentally the wagon haul would be shortened by one mile.

34. The fact must be remembered that about 20% of the entire ore is of a value above \$60.00, the remaining 80% is a milling grade, as shown by paragraph 26, to be worth \$12.00 per ton, whereby it is evident that for each ton of ore of a smelting grade, we get 4 tons of mill ore, worth over \$12.00 per ton. This is just the exact condition that exists and that has existed during the 20 years of mining on this property and even under this wasteful method the mine has paid. But can one afford to waste mill ore worth \$12.00 per ton?

35. The mill ore now in the mine is worth net \$344,998. Assuming no more mill ore is obtained, then the costs of getting the values out of the mill ore are as follows, after paying for mill:

Mill of 50 tons daily capacity installed.....	\$16,163.89
Yearly operating cost.....	24,000.00
Interest on \$16,163.89.....	1,293.00
Superintendence .....	300.00
Taxes .....	300.00
Insurance .....	600.00
Depreciation .....	1,616.00
<b>Total .....</b>	<b>\$44,272.89</b>

The mill working 25 days per month for 12 months would net the owners \$51,727.11 as follows:

50 tons for 300 days.....	15,000 tons
Net profit per ton (p. p. 28).....	\$ 6.40
Net profit on 15,000 tons.....	96,000.00
Cost of mill for first year (p. p. 35).....	44,272.89
Net earnings first year.....	51,727.11

The second and third years of operation would net about \$90,000.00 in earnings in each year.

36. At present, there is an electric hoist in the North Shaft all equipped and ready to use. This hoist is used to bring ore from the 7th and 6th Levels up to No. 5 Level, the present main outlet for transportation.

37. Machine mining is not essential in this mine for the vein is of a soft material and easily drilled. Past experience has shown that the hand work causes less waste in mining on this property than would be the case if power drills were used.

38. Title to the mine includes title to the following described property in Georgetown, Colorado:

39. One mill building and milling machinery installed of 25 tons daily capacity, located in Georgetown, Colorado.

40. The title also includes a power plant, certain brick buildings, consisting of an assay office, office building and pump house, also all water rights, flumes, ditches, pipe lines, etc., together with certain lots and mill-sites more particularly described in the records of the County Clerk and Recorder's office at Georgetown, Clear Creek County, Colorado.

## SUMMARY

41. As seen by a study of the Longitudinal Section of this mine there is a great amount of unexplored ground yet to be opened. On the south end of the property is a tunnel showing a high grade ore in the Santiago Vein, thus proving the continuity of the values in the ore for over 2,000 feet.

42. There should be available a sum of \$10,000 to pay for such repair work as is necessary and leave a sufficient working capital for the development of ore bodies now in sight, and opening of new ground.

43. The mining can be done independent of milling, and the first grade ore can be shipped to the smelter as in the past. All

mill ore can be stored in the stopes to be milled when the mill is built.

44. The mining profit will be obtained from the ore shipped and the property would be gaining in value every day of mining because of the mill ore accumulating in the stopes.

45. In the past the mill ore exceeded the storage capacity in the stopes and it became necessary to put the ore outside in dumps; these dumps are very large and the value, as known by sampling to be over \$9.00 per ton, is not mentioned in this report for the reason that it is not possible at this time of year to make a correct survey to obtain the tonnage in the dumps. However, it is in excess of the tonnage in the stopes and will leave a good profit from the milling, for it can be put thru the mill at a cost not exceeding \$5.00 per ton, leaving \$4.00 per ton profit.

46. The titles to the entire holdings are all clear.

47. The mine can produce \$25,000 worth of ore per month, beginning sixty days after work is started.

48. There is a mine track in each level also a mine car, thus showing the facilities for immediate resumption of work.

49. There are quarters for the miners, consisting of bunk houses and boarding house.

50. The mine is not in a delapidated condition but is in need of some repair to increase the output. This repair work will cost less than \$4,000.00 but should be done at once.

51. The mill information is given so that the cost of installation and operation may be known, also the saving by the mill and what may be expected as profits from this branch of the mining. The mill, if built, will become an important factor by increasing the profits from the Santiago ore.

52. The ore, quantity and value, make this property worth the consideration of anyone contemplating investment in proven mining property.

C. D. McFADDEN,  
*Mining Engineer.*

Denver, February 5, 1923.

The Santiago Mine, according to our engineer, contains thousands of tons of gold, silver, copper and lead ore already mined in its stopes and dumps that, when milled, will return thousands of dollars to the stockholders of the Argentine-Santiago Mining Company and still the ground is scarcely scratched. For the purpose of securing these values the directors of the Company have placed in the treasury 100,000 shares of its capital stock to be sold at 50 cents per share, full paid and non-assessable, the money to be used to purchase the property, build a mill, make necessary repairs and open up new ground.

Most of our Directors are men of practical mining experience and the others, men of large experience in business.

Read our Mining Engineer's report carefully. It does not exaggerate and needs no enlargement as Mr. McFadden is known to be conservative and reliable in his estimates.

THE SANTIAGO M. & M. CO.