THE MINING AND METALLURGICAL JOURNAL.

**THE GRIFFIN MILL**
The only Perfect Pulverizer Working both Wet or Dry Process.

NO JOURNALS IN PULVERIZING CHAMBER.

Delivers a finished product. Will pulverize to a fine powder the heaviest ores, under 150 mesh.

Manufactured and Sold by:
Bradley Pulverizer Co.,
92 State Street,
Boston, Mass.

**Assayers’ Miners’ and Chemists’ Supplies**
Crucibles, Muffs, Scales, Furnaces, Cupels, &c., &c.

C. P. CYANIDE POTASH (98-99 per cent)
Dioxyde Sodium, Zinc Shavings, Borax Glass, Litharge, C. P. Test Lead and everything required by Assayers Miners & Chemists.

We invite Correspondence and Solicit Orders.
F. W. Braun & Co.,
401 to 407 N. Main St., Los Angeles.

**EAGAR & CO.**

No. 10 Stevenson Street,
San Francisco, Cal.

Chas. P. Grimwood,
Mining Engineer and Metallurgist
Laboratory, 214 Pine Street,
San Francisco, Cal.

Wm. H. Hoegee
Manufacture of

136 S. Main Street,
LOS ANGELES, CAL.

**A SELF-EVIDENT FACT.**
In the treatment of many low grade ores, the margin of profit is sometimes so small that great care and judgment is required in the selection of properly designed machines and appliances as well as in the arrangement of the same. The manufacture of MINING MACHINERY of every description is our specialty. Our new shops were especially designed for this purpose.

Gates Rock and Oro Breakers
Have acquired a reputation for superiority world-wide in extent.

Crushing Rolls, Stamp Mills, Smelters, Concentrators, Fans, Settlers, Hoisting, Conveying and Pumping Machinery.

Complete Installations for all Methods of Treatment.

For Catalogues and further information, address Gates Iron Works, 650 Elston Ave, Chicago, U.S.A.

Agency TRIUMPH ELECTRIC CO.
CINCINNATI, O H I O

Generators, Motors, Isolated Lighting Plants Electric Elevators and Pumps Water Wheels, Boilers & Engines

Write for Estimates.

122 W. Second Street
LOS ANGELES, CAL.

Read The Journal.
THE MINING AND METALLURGICAL JOURNAL

CREATED AT THE COST OPENS AT LOS ANGELES, CALIFORNIA, AS MENGLE BUXON DAILY GAZETTE.

VOL. XVI
MARCH 15
No. 12

F. W. EDELESTEN, Editor.

LIONEL A. SHELDON, Special Contrib. U.

ULRICH KOCH, Publisher.

OFFICE, Mission Block, Los Angeles, Cal.

SUBSCRIPTION PRICES:
For United States, Mexico and Canada, $1.00 per annum; 50 cents per quarter.
For all other countries in the postal union, $1.50 per annum; 50 cents per quarter.

ISSUED SEMI-MONTHLY.

SPECIAL REPRESENTATIVES:
The Journal is kept on file at the following places where contracts for advertising space are in force:
San Francisco, Cal.—C. C. Duke, 60 and 65 Merchants Exchange.
Salt Lake, Utah.—Art Advertising Supply Co., 302 West and South Street.
Chicago, Ill.—James A. Tedford, 40 and 46 Street.
New York City—James A. Tedford, 40 and 46 Street.

ADVERTISING RATES FURNISHED ON APPLICATION.

THE INAUGURAL.

The addresses of presidents at the time of taking the oath of office have been filled with generalizations. It cannot be expected that under such circumstances it will be presented specific measures: the announcement of general principles is deemed quite sufficient.

Mr. McKinley has been as specific as any of his predecessors. On the tariff, reciprocity, immigration, free schools, and trusts his views are clearly and emphatically expressed, and they will receive general approval. In regard to the tariff, however, it may be expected there will be a contest on old pariah lines.

The money question will be the chief bone of contention, and it was hoped that on that subject his position would have been more specifically defined. On some points, however, he expressed himself very clearly.

He pledged his support to the question of gold and silver mining and to the appropriation of the Comstock Lode.

He committed himself against reduction of the volume of circulating medium. So far so good; but it would have been a satisfaction to a very large majority of the American people if he had pledged his efforts to an increase of the volume as the growth of population, production and domestic commerce shall demand.

THE CALIFORNIA STATE MINING BUREAU.

The State Mining Bureau is an institution worthy of even greater support than is afforded it by the State. Its publications have advertised the mining resources of California far and wide, and are in a form fit for preservation and reference so that they are by no means ephemeral. The main report treats of the mineral resources of each county separately, and the working mines are all named and described in alphabetical order so that any one may readily find what he wants. Moreover, references are made to pages of former reports, by which the history of any mine may be traced. Not only gold and silver mining but all branches of the mineral industry receive attention. Separate chapters are devoted to petroleum, borax, chrome, malanogas, quicksilver, silica and fluorite; and particular care is given to where all these things are noted and described. Through these means those interested in any particular substance may find the place of its occurrence and learn just what is being done to the material California has. In all this work no county is neglected, but certain one is visited by the field assistants and the resources impartially described. Although these reports are published occasionally, no one official direction is good so to the State and to the mines, goes without question. The newspapers record the weekly or monthly current progress but are not apt to be preserved as are the publications of the mining bureau. Moreover, the Bureau Reports are in great demand in other States and abroad and exercise great influence in attracting outside capital to the mining industries which has operations over California. The bulletins issued by the Bureau in the past few years have been of inestimable advantage to the mining community in the State, treating as they do of subjects of every day interest to the miner in his work. Those on "Gold Milling Practices," "Mine Timbering," "Mine Drainage," "The Cyanide Process," etc., have been very much in demand among ore miners all over the world; and those on the oil and asphalt fields of the State are valuable to persons engaged in those important industries. The Bureau, in addition to its work of collecting and comparing mining returns among the various kinds of mining by counties from year to year, and are the only ones of the kind published in any of the States. Taken altogether the work of the Bureau is to be highly commended in every way. Over 55,000 copies of the reports and bulletins have been distributed, by request, in past two years.

The Legislature has appropriated the same sum as last year—$25,000 per annum for two years, for the support of the Bureau. This amount, in fact, should be $50,000 more. The Field Assistants receive $150 per month and their traveling expenses, but on their return from active field work each year are laid off without pay for from four to five months because there is not sufficient money to keep them on the payroll. As a result their monthly pay the year around is very much less than it should be taking into consideration their experience and skill in their work. With an additional five thousand dollars the minerologist could keep his men longer in the field, give them more time for useful work, and let them have opportunity for working up their field notes when in the office in the winter. As it is now they must work out their notes evenings when in the field. More room is needed at the museum and more office assistants.

It is a notable fact that all of the State Bureau's office reports of the Mining Bureau are most in demand, those of the Horticultural Commission coming next in importance. When last year the requisition for 100 copies of the Bureau report was made the Board of Education ordered an extra thousand copies for the Secretary of State's office, at that official's request, in view of the constant demand for these reports. This is the best indication which could be given of the importance of this Bureau to the people of the State. As to the Bulletins, people interested in mining from other mining States of the Union but from the Australian colonies, British Columbia, South Africa, different parts of South America, and, in fact, all over the world. It has, however, a much broader and a third edition of certain of these bulletins.

These being the facts concerning this important State institution it should be given the very best of support, since it is certainly done a great service to the State by the publications and researches wherever mining is carried on. The miners themselves, for whose benefit it is maintained, should aid the Field Assistants in every way in procuring information. No one should refuse admission to their mines, for they are not desirous of prying into any one's business affairs, but only seeking such descriptions as will interest the general public. It is not at all to the credit of any mine to see mentioned in the report, "Information about, and admission to, the mine refused." This surely does more harm to the miner than to the State, as is done by the holder of a claim by the reduced opportunities and reduced returns. The miners themselves, for whose benefit it is maintained, should aid the Field Assistants in every way in procuring information. No one should refuse admission to their mines, for they are not desirous of prying into any one's business affairs, but only seeking such descriptions as will interest the general public.

We are certainly very glad that the attempt to formally organize a Mining Student Division at the State University, or remove its museum to the Golden Gate Park, where it was last year, is to be continued for the benefit of the mining students of the State. We are glad that the matter has been so amicably settled and that it will be continued for another year. It will be noted that the mining industry needs really better support than ever before and should be encouraged.

Southern California has been complimented by the President of the American Mineralogist of Mr. A. S. Cooper, of Santa Barbara. He being the first time the office has been filled by a citizen of this part of California. Mr. Cooper takes office on the first of April and will hold it four years. Professor W. T. Crawford, of Placerita, whose term has expired. Mr. Crawford has done first class work during his term of office. His administrative capacity has been a credit to the profession, and he has brought out the best set of publications ever issued by the Bureau. Mr. Cooper is an experienced man in asphalt and petroleum mining and has been a resident of Southern California and has had experience in precious metal mining as well. It is probable he will have very thorough investigations made of the desert conditions of California.
and mountain mining regions of Southern California, now assuming greater importance than ever before in view of recent discoveries and developments. This can be done, of course, with due regard to interests of other sections of the country that are thoroughly exploited in the past. But he can select among his assistants some man from Southern California who may make his headquarters in this part of the country, and the expense involved in sending men down from San Francisco every time anything is to be hunted up.

The corps of assistants in the Bureau is an experienced and skilful one, and it is not probable that many changes will be made in the force. This, of course, is a matter for Mr. Cooper to determine. However, it has not been the custom to make many changes on political grounds, most of those in the Bureau having been selected for special fitness for their work rather than for political reasons. Without specially fitted assistants Mr. Cooper could not carry on the work in the manner in which he has carried it on, on account of the press of his work, and the expensive and experienced man to make any mistakes on this score. Most of the assistants are men who have spent their places through several administrations.

Mr. Cooper is to be congratulated on assuming his important office at a time when the industry he represents is in a remarkably prosperous and growing condition. It will give him an opportunity to make a good record not only for himself but for the section of the State which he represents.

THE DESERT MINES AND THEIR FUTURE.

(Written especially for the MINING AND METALLURGICAL JOURNAL.
by C. B. Boothe.

Few persons who have heard of or traveled across a portion of the "Great American Desert" have any conception that this despised portion of our domain will, in time, prove a veritable treasure-box for those who have the courage and perseverance to get at the key to the lock. Only within the past decade some decisive results have been achieved, although tentative efforts, many of them ending in total failure, were made thirty years ago.

For the benefit of those who have not come into real contact with the "desert" and its wonderful resources, a description of the latter may be of value. It will complement, in a measure, the data given in this issue of the "Miners of Randburg," which contains more in detail to localities that have become prominent within the borders of the arid region.

The area properly ascribable to what is generally known as "The Desert" is equal to several of the medium-sized eastern states, and is located almost entirely in Southern California. In a general way it may be said that a large number of regular, narrow mountain ranges trending northeast and southwest, traverse the entire region, being separated from each other by valleys of varying width, singularly uniform in their appearance. In these valleys are finds of wealth, more often than not, elevating, amounting to perhaps 2000 feet on an average.

In some places these mountains are rugged, steep, or low, and have deep canyons and gorges often rather difficult of access. In rare cases only do they show vegetation beyond the size of shrubbery.

Speaking broadly, it may be said that the majority of the ranges are composed of metamorphic,
The Mines of Randsburg.

Probably no district in which mineral has been discovered for the last ten years has been more widely advertised than Randsburg, and in spite of some reports not entirely favorable to the district, it has grown until over 1600 locations have been made, 1100 of which have been recorded. On Feb. 15, 1896, nineteen transfers, relating to Randsburg, were recorded in Bakersfield, the county seat of Kern county. While the location may seem rather inaccessible to the newcomer who has had little experience in mining camps, compared to Tombstone, Arizona, Virginia City, Nevada, and Leadville, Colo., when they were discovered, it has every advantage. A trip to Tombstone in 1870 meant a long stage ride, which was very expensive; it meant all kinds of exposure and privations, if not death at the hands of the Apaches, who infested the territory in those days. The hardships that were undergone by the pioneers of Leadville and other Colorado mining camps are too well known to need any description. We are familiar with camps in Mexico whose indications were apparently no better than Randsburg, where it is necessary to pack machinery and supplies more than 200 miles on the backs of mules and carry the bullion a like distance to a shipping point on the railroad. It would be an easy matter to enumerate a large number of prosperous mining districts which are far more inaccessible than Randsburg, and, in fact, mining freight are very low. From Kramer, on the Atlantic and Pacific road, two four-horse stages are run daily. The line is operated by Messrs. Denair, Crandall & Co. The fare is $2.00 one way. This is the favorite route, being but twenty-six miles. The stages meet the trains and make the trip to Randsburg in about three hours. From Mojave, which is forty-eight miles, three daily stage lines are operated, one being a six-horse, one a four and one a two. The fare is $3.00 one way. The rate for goods or freight is $5.00 per ton charged; in less than car-loads, 50 cents per cwt. From Mojave the rate varies from 40 cents to 80 cents per cwt. We were informed by Mr. P. J. Hirtt, the agent of the Atlantic and Pacific railroad and general agent of the Randsburg and Kramer stage and transfer Co., that 130,000 lbs. of mixed freight was brought from Kramer on the Randsburg and Stage transfer Co.'s teams in twenty-four hours from Feb. 11th to Feb. 12th. Randsburg has a daily mail, two telephone lines, a telegraph line, a good weekly newspaper, the Randsburg Miner, edited by Geo. W. Glover, Jr., former chief assayer, four mining engineers, a mining exchange, operated by Messrs. Fugard, Ragadale & Langdon, several hotels, a number of general stores, two drug stores, restaurants, and, in fact, every line of business is represented, some of the stocks carried being large enough for a place of 20,000 people.

The population of the city of Randsburg is variously estimated from 2500 to 4000. In September of last year where the thriving town now stands there were but a few tents. While there is no doubt that the scarcity of work in other places has driven many people to Randsburg, the mineral development seems to justify the building up of a substantial town somewhere in the district.

Water from Garlock, which is hauled ten miles, is sold for $1.25 per barrel; from Riggs well for $1.50 per barrel. There are nine custom mills in and around the district, six being at Garlock, one at Mesquite Springs, one at Knehe Springs and one at Cutterback Lake. The combined capacity being about 125 tons in twenty-four hours. There are several localities, distant from five to fifteen miles from Randsburg, which are being vigorously prospected and from some satisfactory results are being obtained. A stepping-stone to the desert has been made by the discoveries around Randsburg, and it will lead to a thorough examination of the most remote parts of the vast area of desert country in Kern, Inyo and San Bernardino counties, and the prospector will have the satisfaction of knowing that he is entering a territory not much better known than the heart of Africa, and where his opportunities for making rich discoveries are probably as good as in any other portion of the world. It is generally supposed that the value of the mineral around Randsburg was only ascertained a few years back but this idea is erroneous, as the early history of the camp proves that the existence of rich lodes was known many years ago, but the disadvantages were so great that only a few venturesome prospectors found their way across the deserts, and they did not stop long enough to do more than make locations. A location notice, dated 1853, was found just west of the present site of Randsburg, also an old pair of gold scales. The name on the notice was Hiram Johnson, and eight miles from the present town two prospectors in Feb. 1894 unearthed a fireplace from which they took a black whiskey bottle, which contained $5.00 in gold dust, they also found pieces of ollas. Another discovery that proves the district was known years ago, was the finding of a can near Fremont's peak, eight miles south-east of Randsburg, with a location notice inside which was evidently according to the old California mining law. The date, which was still legible was 1858. In 1879 John Burnett, who is now a partner of Judge Schafer in the Gold Basin mines in White Hills, Ariz., is said to have located the Olympus mine, which is now a part of the Rand group.

North of Randsburg, in what is known as the Rademacher district, a New York company spent $200,000 about thirty years ago. Quite a camp was established. Thirteen tunnels were run from 50 to 300 feet in length and a number of shafts were sunk, while two miles north of the New York Co. an old Chilian worked an ararastra with burros, and is supposed to have had a very rich mine, which a number of prospectors have recently been looking for. The water from the tunnels of the New York Co. have been of great benefit to the miners and prospectors as well as to Garden station, located a few miles from the tunnels, where a fine drinking and orchard flourish in the heart of the desert.

Eight miles north of Randsburg is the Summit district, which was discovered by the Van Slyke Bros. in Nov. 1893. About three hundred men were attracted by the rich ground and a large amount of gold was taken out in dry washers, and at the present time the deep diggings are being worked. Mr. Sears, of the Boax works, also owned and operated a silver mine near the Rademacher district years ago. We were informed by an
old timer on the desert that he had found Indian pottery east of Randsburg and that there was no doubt but that the Indians washed out the gold and used it as a medium of exchange. The town of Goler, which has been the headquarters for the dry washers for eight or ten years past, is only twelve miles west of Randburg. From these facts it can readily be seen that there was life on all sides of the present excitement, and it was only the fact that placer mining was found more profitable and involved less expense than quartz mining that prevented the discovery of the mines that are now making the district famous. The last few years forms the connecting link between the uncertainties of the past and the brilliant successes of the present, as the real history of Randburg begins with the location of the Rand group of mines in 1895 by Messrs. Burcham, Singleton & Moore, who came over from Goler in search of ground to work with dry washers, they started in the gulch at the head of which is now Rand street in Randburg and worked to the top of the mountain and there discovered the Olympus lode. Their dry washing netted them $25.00 per day to the man. In a few months there were 30 dry washers working the Rand group of mines and all making money. In the fall of 1895 the Rand group was worked in a small way and ore was shipped to the Selby Smelting and Lead Company and netted $4.50 per ton. A great deal of ore has been taken out since and milled.

Closely following the Rand group came the discovery of the Kinyon, Wedge and Butte mines in April 1896. The Kinyon by Kinyon & Sons; the Wedge by Thos. Kerns and the Butte by the Ramey Bros, Summers and Tate. By this time the fame of the district had reached all parts of the country and by the summer of 1896 the people commenced to flock into the camp and in an incredibly short time a town sprung up which, although not the largest is certainly one of the liveliest mining camps in the state of California.

The geological formation of the district is bound by nature to form a very interesting study to the mining man. It is impossible in a short article to cover the whole of what is termed the Rand district. In consequence, we will confine our description to the section north and east of the town of Randburg, including therein the Stringer, the Val Verde and the Rand districts proper.

The formation proper is syenite, or altered granite schist and porphyry.

In looking from the Rand Hill, facing in an easterly direction towards the Red Mountain, the chain of granite peaks and outcrop-
pings can be very distinctly seen dividing this section in an easterly and westerly direction.

Looking in a northerly direction, the ore channel, reaching in a northeasterly direction, can be seen for some six or eight miles; then, turning almost due north, passing over a low set of hills and undulating ground into the valley below. Turning to the east, the other branch of the ore-bearing zone can be traced towards the stringer, the St. Elmo and the Fremont’s Peak sections.

These channels are confined on the north and south by the granite, and average in width from three to eight miles.

The schists form the country rock of these channels, abutting on the granite outcroppings, at an angle of from 25 to 45 degrees, those on the west of the main granite upheaval dipping to the west and those on the east to the east.

The general trend of the veins in the Rand section proper is in a northerly and southerly direction, being paralleled by a series of porphyry dikes, of which more will be said later on. The dip of the veins is with the dip of the schists. The veins average from two to eight feet in width, and form the most reliable sources of information obtainable. The ores carry values in a free state of from $15 to $60 dollars.

The veins in the "stringer" country have an easterly and westerly trend, having their own system of dikes running in the same direction.

These stringers seem to be feeder- or small feathering veins between the larger formations that pass through this section in the form of "ball" quartz veins. It will be interesting at some future time, when more work has been done, to see what effect the intersection of these stringers with main veins will have—there is, of course, a fair possibility of large bodies of rock being found at the intersection.

The dip of the veins in this section is not far from a perpendicular, and pass across the formation of the country.

The best information in regard to the ore is that it mulls from $50 to $100 to the ton.

The value of the ores in this section seem to be much higher in general than on the Rand proper, but the quantity is not nearly as great, as the veins only average from three to eighteen inches thick, although they may increase in depth. This part of the country is what might be called the poor man's section, as the properties have paid from the surface at a very small expense for mining.

The porphyry dike movements and their relation to the ore bodies of the Rand will in the near future, no doubt, when sufficient work has been done to demonstrate this relation, prove the key to the successful finding of the pay ore on the veins in this district. Their prominence and close proximity to the pay ore of this section, and the frequency with which these dykes are mineralized, tends to prove this idea.

The dip of the dykes is considerably greater than that of the veins, and, in consequence, the veins at a depth sufficient, which in most of the mines has not been attained, must of necessity cut the dykes or straighten on them and follow them down. This is a point that has not been fully demonstrated, although in one or two properties where sufficient depth has been attained to at least encounter the first dyke, the veins have cut through and increased in width on the lower side. In this case the veins have not varied in dip to any appreciable extent.

The St. Elmo district, which has yielded a large amount of rich ore, is lying on the line of contact between the granite and schist. Along this line of contact, above the St. Elmo near the stringer district, there will undoubtedly be valuable discoveries made.

In describing the mines of the district, due allowance must be made for the small amount of development work done, which makes it very difficult to give more than a general idea as we found it.

The Rand Group consists of ten claims. The Olympus is the main body, the Rand, Triby and Yellow Aster are the most developed. The Olympus, which is on the apex of the mountain, has one incline shaft, 125 feet deep, equipped with a hoist. There are several cuts also drifts in the shaft. On the Yellow Aster is a tunnel 300 feet long. The Rand has a 75 foot shaft, and the Triby one tunnel and other development. Considerable work has been done on the other claims. All the sides of the mountain have been worked with dry washers. The property is said to have produced over $100,000. It is owned by Messrs. Moore, Burcham, Singleton and Reddy. The mine has been favorably reported on by several experts; but it has been in litigation nearly since its discovery. It would probably be the best property in the district for a large company to operate, as there is a large body of ore that would pay to work with a mill on the ground.

The Kinyon Mine has been pronounced by many to have the largest body of high grade ore in any of the mines in the district. It was discovered by the present owners, Messrs. Kinyon & Sons, on April 2nd, 1896. The vein dips at an angle of 45 degrees. The main shaft has
been sunk 135 feet deep. There are two drifts from the 70 foot level. The east drift is 100 feet long, with a winze of 50 feet deep. The west drift is 20 feet long. The vein, which was only four inches wide on the surface, has widened to four feet in the bottom. A 53 ton shipment was recently made to the Koehn mill, which averaged $116.00 per ton in gold. The ore at present is being shipped to Garlock for treatment. A horse power whin will soon be erected, and the main shaft will be sunk deeper immediately—5 men are employed. Mr. George Kinyon is manager. The next property on the east is

**THE WEDGE.**

A fraction between the Kenyon and Butte claims, the run is to a point on the south of the shaft house, and assumes its maximum width of 300 feet on the north side, 350 feet from the shaft house. The main workings have attained a depth of 165 feet. At the 145 foot level, 75 foot drifts have been run east and west. At the bottom of the main shaft, two drifts, each 50 feet are now being worked. On one side some stoping has been done. The width of the vein is 73% feet, with a pitch of 72 degrees, and, as depth is attained, the width of the ore body increases from the side lines. The mine was bought by J. W. Rogers, on Nov. 1, 1896. Messrs. Allen, Pepper, Walker and Rogers now own it. The property is being worked in a business-like way, with three eight-hour shifts. They employ 18 men, have a substantial ore house and horse-power hoist. From Nov. 15th to Jan. 24th, 400 tons of ore were shipped, the average value of which was $200 per ton. The owners are now incorporating the mine. They are also working a group of 13 claims, three miles east of Randburg, on which they employ 11 men, they have several open cuts and tunnels, and a shaft 75 feet deep, in which they are prospecting for water.

Mr. J. W. Rogers is general manager of the Wedge, and under his management the mine, although only a small fraction, has paid well from the start, over $15,000 having been taken out the first two months of their operations.

**THE BUTTE MINE.**

Joining the Wedge on the east, is one of the large producers in the camp. Its discovery dates back one year, and since that time it is estimated that $50,000 has been taken out, mainly in development work and some open cuts. The main shaft is 150 feet deep. At 150 feet, a cross cut has been run north 100 feet, to connect with an air shaft, at 140 feet, another cross cut is in 18 feet, running south. At the 100 foot level, there is a drift 60 feet. The shaft is well timbered, and equipped with a Davis hoist.

Last July, an open cut was made, from which 12 cars of ore were taken that netted $66,000, some of which was shipped to the Selby Smelting and Lead Co. 200 feet east of the main shaft, known as No. 5, is shaft No. 1, which is 55 feet deep, with drifts in bottom. No. 2 shaft is 150 feet further east, and is 50 feet in depth, No. 3 shaft, and No. 4, 200 feet. To the east of No. 2, a shaft 55 feet in depth has been sunk on No. 3, with a drift connecting with No. 4. The main workings in No. 4 are 110 feet deep, and show a large vein that could all we worked at a good profit with a mill at a reasonable distance.

From No. 4, the ground has been stoped, on both sides from the 60 foot level to the surface. 150 feet east of No. 4 shaft an adit is in 130 feet in which there are two winzes, one 50 and the other 50 feet in depth on pay ore. In running the adit, the first 50 feet of work produced $800 worth of ore. Mr. H. C. Tate owns one-fourth, B B Somers one-fourth, J. B. Ramey one-fourth, and Messrs. Ramey and Stanton the balance. The average width of the vein that is worked is 2 feet, while in most places more than 12 inches of ore below $20 in value has been left on the walls. Thirty men are steadily employed in and around the mine. Present the ore is being shipped to Koehn Springs. Mr. H. C. Tate, a practical miner, is superintendent and general manager.

**THE ASHFORD MINING COMPANY.**

Have five claims: the King Solomon, Desert Queen, Magpie, Kootenax and Hector, and join the Butte mine on the east. The group belongs to Thos. Bull and the Ashford Bros., who are pioneers in the camp.

On the King Solomon three shafts have been sunk—one 128 feet, one 35 feet and one 50. The 138 foot shaft and the 50 foot are connected by a drift. At the 50 foot level of the 138 foot shaft a drift has been run west 50 feet. A cross cut has been started in the 138 foot shaft, which will be put in 100 feet on the foot wall. On the Magpie, some development work has been done, also on the Kootenax. The Hector has taken 177 feet and a 30 foot shaft. 60 tons of ore taken out in development work have been shipped to Garlock. The pay vein in the bottom of the deposit, the ore is well accompanied by a large body of low-grade ore.

The King Solomon is equipped with a six-horse power Harding gasoline engine, and it is the intention of the owners to sink the main shaft immediately as deep as the capacity of the hoist will allow. The Ashford have other properties, three-quarters of a mile north-east of the Ashford group, on which some work has been done, particularly on the Pinmore claim, which has an adit 230 feet long, with an air shaft 70 feet deep connected. The ore averages $10, and awaits cheap milling facilities.

Within half a mile of Johannesburg, and north of the Ashford, is located the **VAL VERDE GROUP.**

Consisting of three claims—Val Verde, Val Verde No. 2 and Val Verde No. 3, or about 60 acres. It lies in the same gold belt as the Rand, Kinyon, Wedge and Butte mines. The development on the veins show 2½ to 7 feet of pay ore, with well defined walls, which will average at the mill $25 per ton in free gold, with about 5 per cent concentrates, which assay $3.10 per ton. The main working incline is down about 77 feet, and there has been taken out in development $7,000. There is another incline shaft, sunk on five feet of ore, which is 25 feet deep. The ore averages $5 per ton. This shaft is located about 300 feet south of the main working shaft, lying in close proximity to the porphyry dyke, of which there is a series within the lines of these mines. There are three well defined veins within this company's property.

The east extension of the Val Verde, La Primera, belongs to the Benson Bros. They have a shaft ten feet deep and other development work.

Starting again at the Rand and going south is a group of mines belonging to Messrs. Kelly and Benson on which some work has been done. West of the Rand are the Rustler, San Diego, Agnes and Skyscraper, joining these on the west are the Sunshine and Minnehaha on which a contract has just been let for sinking and timbering a shaft. The contractors agreeing to do the work for the ore taken out in sinking the shaft.

The San Diego has several shafts and open cuts. The Rustler has an adit 65 feet long and several drifts. Some very rich ore has been taken from these claims. Messrs. Hanson, O'Leary and McGinnis are the owners.

The War Eagle joins the Olympus, one of the Rand group, on the north. The owner, Pete Hanson, has done some sinking and other work, and has four feet of ore which is said to assay $40.00 per ton.

Joining the Skyscraper on the north, are the Eureka, Eureka No. 1 and No. 2, which have been developed enough to expose a good vein in several places. The group belongs to Messrs. Dickerson, Crawford, Hanson and Cooley. West of the Eureka with several
which looks very well. They offer an interest for doing development work, they agreeing to do their share in proportion to interest they retain.

A section which is attracting a great deal of attention now, is the Striinger district two miles north of the town. Here are found veins from three to eighteen inches in width with a value ranging from $50.00 to $120.00 per ton and in some instances higher. Chas. Koehn and O'Brien claim to be the original discoverers of the district, and now own valuable property there.

The Bully Boy, Lucky Boy and one-half interest in the Rose, belong to Messrs. Coftas, Jefford, Atkinson and son; they have started development on the Bully Boy with a shaft 50 feet deep and two drifts from which they have taken some very rich ore. They are said to have eighteen inches of high grade ore in the bottom of the 50 foot shaft. Since last Aug. 12 they have shipped over $4,000.00 worth of ore, and on one shipment of 67 1/2 tons realized $10,000.00, after paying $16.00 per ton for the hauling and milling.

The Mattie is also one of the prominent mines of the Striinger district. Mr. S. C. Wilkinson, the owner, informed us that he had started a mining shaft, 60 feet deep, with a foot drift and several open cuts. His ore has milled from $4.00 to $25.00 per ton. We were shown some float from Mr. Wilkinson's location, which contained a great deal of free gold, and we believe, with one exception, to be the richest we have encountered in California. The Mattie, near the Mattie, has several open cuts, and both have produced some high grade rock. The La Cross is another very promising location, and has shipped several hundred dollars from a very small amount of development work. Joining the La Cross are the Yucca Tree and Winnie, which were recently bonded to San Jose, Cal., people. Chas. Koehn and O'Brien are the owners.

The Napoleon, Santa Ana and Mercedes have been developed, with several shafts 50 feet deep. Messrs. Rowland, Layton and Mullens are the owners. South of these is the Merced, which is being operated; the La Grange also has some work done; next is the Wedge, which is being prospected intelligently. On the Great Bug, the shaft is down 55 feet and exposures a 20 inch vein of ore. There is a stringer on the same claim which assays $50. Next to the Great Bug, Messrs. Cuming & Pierce are working, and have considerable ore ready to ship. North a short distance is the Orphan Boy and Orphan Girl, which have been opened up to some extent. Messrs. Nixon, Ekland, Wilson & Kufel are the owners. Mr. A. N. Nason, who has a prospect southwest of the Winnie, is now having a shipment of his ore milled at Silverback Lake. The Rising Star, west of the Yucca Tree, was recently sold. The Gold No. 2 joins the Santa Ana, work has been commenced. They claim to have six parallel stringers on the claim. Messrs. Doxey and Drew own the Oro Fino, La Grange, Timberline and Christmas Gift. They have started to develop and report encouraging results. The Magureta, Desert Star, Flying Dutchman and Lookout are all promising prospects. We have no doubt overlooked some properties that deserve mention in the stringer district, and will ake pleasure in describing them if the owners will send us a description. We were particularly impressed with the advantages of the stringer district, especially for men without much capital, and the idea occurred to us that if the men had seen in Leadville three weeks before, waiting for the strike to end, would come down to the stringer district, they could in a few months make up all the time they had lost waiting for higher wages.

We saw several small veins in the stringer district on which good miners who were willing to work could make $5 per day. There is every indication that the veins will widen out as depth is gained.

A three miles south of Randsburg, Messrs. Kuffel, Wilson and Lancaster located the Black Hawk, in August, 1895. The main shaft is now 100 feet deep. They have two others, 40 and 50 feet respectively, on different levels. At the 60 foot level, in the 100 foot shaft, they have a drift 150 feet long; a vein 2 1/2 feet wide is exposed in the bottom of the shaft. A large amount of ore has been taken to the mills at Garlock. The formation is porphyry and granite. There are three different ledges on the claim, one runs southwardly, and one east and west. Ore has been shipped from all the different workings. North of the Black Hawk one half mile, Messrs. Willard and Harison have four locations: the Rawhide, Bluejay, Bull's Eye and Ophir. The Rawhide has a 128 foot shaft, the other locations have assessment work done. 500 feet west of the Rawhide is located the Monte Cristo, on which some work has been done. Messrs. Descent & Evolendel own the property. The Republican, southwest of the Monte Cristo, has a 60 foot shaft and some drifting. The owners are Messrs. Fifield & Nelson.

The Elmo Mine
eight miles south-east of Randsburg was discovered by J. Drouillard, who found rich float. The mine is several miles from any range of mountains and is located on a perfectly flat country. Recently a power dryer washer has been used, and the ground was simply loosened up with a plow and then handled by the washer. The development work consists of eight shafts, varying in number from 50 to 120 feet deep; the owners are the St. Elmo Mining Co., Messrs. McEwen, Keough and Linkenbach having a property south of the Rand group.

Street Scene in Randsburg
Five miles northwest of Garlock, at the head of Goler canon, Messrs. Gyger, Showers & Slusser have discovered a large lode of copper, which is said to be 35 feet wide. They have sunk 15 feet, and an average sample from six feet showed 14 per cent copper and 5 ounces silver.

One of the most important discoveries for Garlock, and its main industry of milling, is the coal vein that was located recently by Mr. T. H. Heald, five miles northwest of Garlock. Mr. Heald formerly owned the coal mines near Elsinore, in Riverside county, and knows what coal is. He claims the coal he has discovered has been used in the blacksmith's forge and burns well. The vein is 2 feet wide, 5 inches of which is hard coal. The property now belongs to Heald, Bracewell & Mullen. The future of Garlock as a milling point, not only for Randsburg but as far west as Panamint, is assured—if this coal proves to be in sufficient quantities. The town of Goler is only a few miles from Garlock, and trade from there will naturally come to Garlock.

We found in the Desert Mercantile company's establishment at Garlock everything needed by the miners and were informed that the prices were the same as at railroad points, plus the wagon freight to Garlock.

At Mesquite Springs, 2 miles northwest of Garlock, Mr. Iland is operating a 2-stamp mill on ores mainly from around Mesquite. At Koehn, 10 miles from Garlock, Mr. Chas. Koehn, one of the pioneers of the country, is running a 10-stamp mill on custom work. So thorough has Mr. Koehn's work been that he has been able to keep his mill running, although somewhat handicapped by being farther from the mines than some of the other mills.

The new mill of Willard & Harrison, at Cutterback Lake, six miles from Randsburg, completes the list of mills. The average price for hauling ore from Randsburg to any of the mills is about $2.50 per ton, with a $5.50 charge per ton for milling. There should be no complaint from the miners concerning their treatment by the mills, as their prices compare favorably with some of the older camps where fuel is much cheaper.

The mile from Randsburg, the town of Johannesburg has been laid out; the streets are wide and the location is well chosen. There is a large hotel that will accommodate a number of guests. A bank building is in course of construction, also many other substantial buildings. The tract was recently taken by Easton, Eldridge & Co., who will
sell the lots and look after the interests of the Town-site Co.

The most important enterprise in Johannesburg, and the one that will bring them the most business is the locating of the Sampling Works there—Mr. Charles R. Wores, from Tucson, Arizona, is the proprietor. He has established a sampling works in Tucson in 1882, and, during his seventeen years of business there, won the confidence of all the miners who transacted business with him. He thoroughly understands his business, and the citizens of Johannesburg are fortunate in having a man so well and favorably known locate his plant in their town. He will be able to handle any sized lots of ore, and pay cash on day of sampling. The miners from the districts around and from Panamint can find a market for their ore right at home, where they will obtain fair treatment and be enabled to sell small lots. After knowing Mr. Wores for seventeen years we heartily recommend him to all the miners.

The water used in Johannesburg is brought from wells in pipes four miles, and is of a good quality.

The town has a newspaper, the Johannesburg News, which is aiding very materially in the development of the district.

Coaches are run every half-hour from Randsburg to Johannesburg.

There is a telephone line from Klamath to Mojave, also a telegraph line to both places.

A number of lots have been sold, and the teams cannot bring in lumber fast enough to supply the demand, and the sound of the hammer is heard on all sides. Business houses are opening up, and Johannesburg people are bidding actively for the trade of the miners, many of whom are nearer to them than Randsburg.

Of the districts surrounding Randsburg, special mention should be made of Radermacher, sixteen miles north. Mr. Radermacher, from whom the district was named, discovered an immense deposit of quartz, which cropped over fifteen feet above the ground. A number of prospectors had known of the existence of these croppings for years, but never considered them of enough importance to have made any effort to locate them. It is said to contain $50 per ton in gold. Mr. Radermacher has worked some of the ore in a rastra.

Three miles northeast of Radermacher, the Kenny & Porter, have found a lode four feet wide. One half mile east, Rutherford & Connor have an eighty-foot shaft, in the bottom of which they have a four-foot vein of ore that is milling $60 per ton. The property is now bonded for $10,000.

Messrs. Rutherford & Connor three miles, Mr. Rickey has a 2-foot vein, which shows a large percentage of sulphurized quartz. One half mile north, some locations, formerly owned by Mr. Searles, of the Borax company, have been relocated, the ore is high grade in silver.

The Spangler Bros. have some locations, six miles east from which they have taken some $50 ore. They have been hauling it with two ten-mule teams to Kernville, a distance of 60 miles. The same gentlemen own a silver mine two miles north, which they are starting to open up.

Many good discoveries have been made in and around the El Paso district, also around Freemont's Peak. The miners from Panamint are beginning to make Randsburg their headquarters, as it is the nearest point where provisions can be obtained.

We met Messrs. Slocum & Paddock, of Panamint in Randsburg, who reported activation of the railroad train to take passengers arriving by stage from Kramer to Rand. There is a comfortable hotel with a restaurant under the Fred Harvey management.

We hope to visit Randsburg again before the close of 1897, and expect to find the output such as to justify us in classing it among the great gold-producing districts of California.

Messrs. Shepard, Wheeler & Rhodes, the progressive mining and civil engineers of Randsburg, Cal., are arranging the issue of a complete typographical map of the Randsburg Mining District, showing all the locations from actual and careful surveys made by themselves. The map will enable prospective purchasers to know exactly where their properties are located, and will go a long way towards settling all the petty disputes which arise in new camps about side and end lines of claims. The price of the map will be $50.

Los Angeles is gradually becoming the mining center for Arizona, Southern California, the western coast of Mexico and the southwest in general, and as it grows the institutions which depend upon the mines for business also grow.

One of the largest houses on the Pacific Coast, dealing in miners' supplies, is the Machinery & Electrical Co., which has just completed their new warehouse, at 351, 353 North Main St., Los Angeles. Mr. Geo. E. Nolan of the firm has been a resident of Southern California for several years, and is well known wherever mining is known through the southwest, he is a practical miner and machinist, and can furnish any information desired by the prospective purchasers of mining supplies relating to machinery or mining.

The firm handle mining and milling machinery of all kinds, boilers, water wheels, pumps, crushers, shoes and dies, concentrators, hoisting machinery, mill rolls, smelting machinery, perforated metals, belting, etc., etc. They have several agencies of eastern manufacturers, and are prepared to figure on anything needed by the miner, mill man or smelter. They also handle electrical apparatus and supplies, dynamos and motors.

The Mining and Metallurgical Journal predicted the future of Los Angeles as a mining centre four years ago, and in spite of the skepticism, it has advocated the mining interests of Southern California and the south west in general in a fearless manner. It believes today as it did four years ago, and has had the satisfaction of seeing the prediction verified.
THE MINING AND METALLURGICAL JOURNAL.

CORRESPONDENCE.

ARIZONA.

Oro Blanco, Ariz., March 4, 1897.

Ed. Journal.—Matters in this camp remain quiet, although favorable progress is being made.

The Old Glory mill has made a very satisfactory run, and is to put in a cyanide plant for tailings in time for the summer rains.

The Tres Amigos mill is running steadily with good results. The ore holds up to usual grade, and some very rich streaks have just been discovered.

The Frisco-American company has started work. This company owns three patented mines, and the prospect for rich developments seem good.

The Oro company have just struck a rich ore body, which is reported to average over $2.00 per ton. The mill is running steadily. I understand they are to put up works for running their concentrates.

Yours Truly,
C. W. Kempton.

CALIFORNIA.

Virginia Dale Mining District.

Wednesday, Mar. 10, 1897.

Editor Journal.—The annual election of the Virginia Dale Mining district was held at Killian’s mill on Monday, March 8th. The miners of the district seemed to take considerable interest in the election of recorder. The respective candidates were Messrs. Hart and Killian. Killian, who is the present recorder, was re-elected by a majority of thirty-eight votes.

The district is improving fast and real estate seems to be on the boom, as a number of men gathered at Lyon’s Well, the most accessible seat, and located about fifty-five acres of land in the way of mill sites and town lots, some are ordering lumber to build business houses. The Virginia Dale Mining and Milling Co. are reducing a mill of 75-ton capacity and intend to do custom work, which will enable miners who have not machinery to have their rock milled. There is considerable development work done on the various mines of the district.

Messrs. Haleworth & Bedford have started a 500-foot tunnel on the Star mine.

The owners of the Leoti mine have started a tunnel that will tap the lode 250 feet below the surface. They struck the ledge a few feet from where they started the tunnel, which shows a lode 400 feet in width.

Dinwiddie & Drew are in 150 feet with their tunnel, near the Virginia Dale mine. Have struck a small lead of ore which assays $7.50 per ton.

Baird & Lingo are doing considerable development work on their mines, which are located three miles and a half south-east of the Virginia Dale mine. They are down on the Lookout, which shows a well defined ledge, assayed from $10 to $15 per ton. And have started a force of men this morning to work on the Ranger, another prominent claim belonging to the company. They will also put a force of men tomorrow on The Ladies mine, which is an extension of the Lookout.

Messrs. Reed & Wagner, of the Gold Basin group, are taking out five tons of ore for a mill test. Reed & A. M. Ham have begun work on the Gold Bug, which is an extension of the Swede No. 2 in the Gold Basin group. The ledge is about 2 feet in width and of good quality.

Col. Sweesy will begin tomorrow to sink a 50-foot shaft on the Noble Grand mine, which is located about five miles south of the Leoti.

Messrs. Wright & Stewart, who have lately come into the district, have located two new claims, the Lulu and Mountain Sheep, which promise to become prominent claims in the future.

COLORADO.

Boulder, Col., March 3, 1897.

The year 1897 has opened very auspiciously for the mining industry of Boulder county. New plants of machinery for treating the low grade ores are being built at the mouth of Boulder canon, one of 20 tons daily capacity, the second 25 tons, while the third projected will have a capacity of 100 tons daily. Then, new mills will treat the telluride ores of our county by the chlorination and lixiviation process, which the owners claim will save 95 per cent. of the gold contained in the mineralized matter at a nominal expense. A short time ago, a phenomenally rich strike was made in the Emancipation mine, operated by J. A. Smith, which is pending the 160 foot level east. The ore was marvelously rich in gold, the first class yielding $35,000 per ton, and the second grade running correspondingly rich in the precious metals.

The vein of solid mineral was from 4 to 6 inches thick in the back stope near the face of the drift, and from an examination would appear to be opening in size as the stope is carried forth. Specimens of the mineral (sylvanite) which were brought to the city, and placed in the company’s office by the superintendent, Prof. Albert Langridge, was a wonderful piece of ore, and the admiration of all who examined it. One assayer offered him $50 for the ore, not as a specimen but for its intrinsic value in gold and silver.

This mine has been in litigation for about ten years, and cost the contending parties over $50,000, when the property passed into the hands of the several attorneys on the property. Perhaps this is the end of such mines for supremacy, and invariably come out at “the little end of the bottle.” The Emancipation was sold in London, England, and since the monopolized and the mine put in shape for operation, it has not ceased to pay a dividend to the owner.

Development work is being carried on extensively, and the levels and shafts are full of beautiful mineral, and teams are constantly hauling ore to the Chamberlain Sampling Works, when it is sampled, assayed and then shipped to the Denver smelter.

Yesterday, a small retort of 27 ounces gold was brought to this city by the Sherman brothers, leasers of a portion of ground in the Golden Age mine, Jamestown. This retort was the result of 25 pounds of first-class stuff, which the boys pulverized and panned out by the aid of quicksilver, to catch the fine gold contained in the mineral, while the common gold from sand runs from $2 to $3 per pound, while the second class runs about 40 ounces gold to the ton. The boys are making great wages, while fifty miners find employment in the mine and all are leasing. (Regular)

REGULAR.

MEXICO.

Zacatecas, Mex., March 4, 1897.

Editor Journal.—Mexico continues to prosper and the investigations now being made clearly prove that there is not a more inviting field in the world for the capitalist in search of mines.

Clarence King and party are making an examination of the San Cristobal gold mines, and from reports are quite likely to take them for a French company. These mines are somewhat high, and have new impetus to gold mining in this district if the sale goes through.

The San Luis del Oro recently struck quite a body of very high grade ores, and have most neatly massed them in bar shapes, of such a size as high as 7 kilos per 1000 kilos. This is owned by a Mexican company, and the report is that they have let the contract for a mill. There are some fair gold prospects in this district and I believe only lack development to create considerable of an excitement. Quite a number of mining operators have looked over the gold district and all seemed pleased with the outlook. The company that has the padrera (the mill) of the Sombrerete Mining Co.’s mines at Sombrerete, causing a great loss of life. At the present time they do not know the origin, but it is supposed to have been caused by carelessness in leaving a lighted tongs hanging on the timbers. As nearly as can be ascertained 105 persons are missing, although up to the 3rd of March only 103 bodies were recovered. The fire occurred on the 22d ult., but by reason of the heavy fumes they have not yet been able to get into all portions of the mine to ascertain the exact condition.

The low price of silver in the United States does not interfere with the operations of silver mines in Mexico, and is a benefit to this country as it keeps the money at home where it is worth as much as it ever was.

Plata Y Oro.

Santa Domingo, Sonora, Mexico, March 7, 1897.

Editor Journal.—The northwestern corner of Sonora, from Altar to Port Isabel, is a country very little known to prospectors or mining men generally. The reason of this is, not because it lacks mineral, but on account of the almost complete absence of practical prospector by the Mexican mining laws, which act as a hindrance both to the native and foreigner.

A foreigner can get a right to work a mine without first getting a “concession,” which is simple enough, and then getting it surveyed, which is quite expensive, and, if a foreigner, he must get a permit from the general government to hold title to mines within the “zona libre” (the lands lying within 60 miles of the frontier).

That there are good mines in this part of the country goes without saying, as it lies in the heart of the best mineral-bearing belt of the world. Your correspondent came across old silver mines, which evidently were worked long ago, the above measures being found 30 feet deep, and all the signs of old dumps, ruined houses, etc., indicating large works; but all are abandoned and forgotten, and prospectors report that no works whatever has as yet resumed its place in the monetary systems of civilization. However, the mineral wealth of the country is not altogether dependent on silver.

Gold has been found in placer which have been worked all over the country, more especially at Cazon, Quituaca and Vera Cruz. I have heard of a very extensive old workings near the frontier at Sonora, but the returns there are very poor, as all the work is done by Indians with dry washers—water being ex.
NEW MEXICO.

ORGAN, N. M., Mch. 7, 1897.

EDITOR JOURNAL—Mining is not very active in the Organ mountains at present, due to a lack of capital for development. I have been doing some prospecting south of San Augustine in what is known as Texas canyon and have located a lode which is from 10 to 40 feet in width, and have had assays from a trace to $62 in gold. Messrs. Dodd & Rigley have several claims in the same district and are working them. The average width of the pay clutes is 6 inches to 2 feet, with plenty of gold and water near. It is expected that work will be resumed at an early date around Black mountains. At the Jicarilla mountains De Mud & Beard have discovered a payable lode in the Animas district on the north side of the Animas, which they report has a tonnage of $50,000, but unfortunately litigation has prevented any transfer.

W. H. Skidmore is still working the Ben- nett mine.

We are suffering here, the same as in other good mining districts, on account of the low price of lead and silver, and if these metals are ever put back to the old price the Organ Mining district will once more teem with life and prosperity.

JOIN P. Foy.

NEVADA.

T. L. Vinton is working a crew of forty men on a portion of the Chino mine, Butte county, under a permit from the United States Debris commission. The ground is very hard, requiring extensive blasting, 2000 tons of rock being blasted each gang at a time, and the contents of ore and start under the most favorable auspices.

CALIFORNIA.

BUTTE COUNTY.

A mill run has just been finished on ore from the Mining district, Butte county, under a permit from the United States Debris commission. The ground is very hard, requiring extensive blasting, 2000 tons of rock being blasted each gang at a time, and the contents of ore and start under the most favorable auspices.

KERN COUNTY.

A mill run has just been finished on ore from the Mining district, Butte county, under a permit from the United States Debris commission. The ground is very hard, requiring extensive blasting, 2000 tons of rock being blasted each gang at a time, and the contents of ore and start under the most favorable auspices.

COLORADO.

The Last Dollar, Cripple Creek, shipped last month three cars of ore, valued at $250,000, and fourteen to the Pueblo smelters. The first ran from $100 to $20, and the second from five to seven ounces. The Dead Pine, on Bottle mountain, Cripple Creek, is being worked under lease and bond by Dan Snell, who has just shipped three cars of ore, valued at $200,000, and fourteen to the Pueblo smelters. The first ran from $100 to $20, and the second from five to seven ounces. The Kinkaid process will be used and the capacity will be 20 tons per day. The starting of both this and the Jackson mill is looked forward to with satisfaction, as ore shipments are steadily increasing and there is work for them to do.

The following mines, located on the blanket veins of Yuba, Dam Flats, Breckenridge, are all being worked under lease and bond: The Stonewall Jackson, Stephenson, Mallee B., Sullivan, Fox Lake and Shepards group. They produce smelting ores, most of a sulphur content, though guinea and carbonate ores are not infrequent. The majority of the development has been by tunnels.

Machinery has arrived for the Anderson mill, at the mouth of the Virginia canyon, Idaho Springs, and it is expected that the plant will be running in a couple of weeks. The Kinkaid process will be used and the capacity will be 20 tons per day. The starting of both this and the Jackson mill is looked forward to with satisfaction, as ore shipments are steadily increasing and there is work for them to do.

The following mines, located on the blanket veins of Yuba, Dam Flats, Breckenridge, are all being worked under lease and bond: The Stonewall Jackson, Stephenson, Mallee B., Sullivan, Fox Lake and Shepards group. They produce smelting ores, most of a sulphur content, though guinea and carbonate ores are not infrequent. The majority of the development has been by tunnels.

Machinery has arrived for the Anderson mill, at the mouth of the Virginia canyon, Idaho Springs, and it is expected that the plant will be running in a couple of weeks. The Kinkaid process will be used and the capacity will be 20 tons per day. The starting of both this and the Jackson mill is looked forward to with satisfaction, as ore shipments are steadily increasing and there is work for them to do.

The following mines, located on the blanket veins of Yuba, Dam Flats, Breckenridge, are all being worked under lease and bond: The Stonewall Jackson, Stephenson, Mallee B., Sullivan, Fox Lake and Shepards group. They produce smelting ores, most of a sulphur content, though guinea and carbonate ores are not infrequent. The majority of the development has been by tunnels.

Machinery has arrived for the Anderson mill, at the mouth of the Virginia canyon, Idaho Springs, and it is expected that the plant will be running in a couple of weeks. The Kinkaid process will be used and the capacity will be 20 tons per day. The starting of both this and the Jackson mill is looked forward to with satisfaction, as ore shipments are steadily increasing and there is work for them to do.
LOWER CALIFORNIA.

Mining on the Gulf Side.

Messrs. Salvador and Manuel Solario, who have recently returned from the Gulf side of the Peninsula, state that the mining situation there is better than that section. The San Juan mines, just below the 28th parallel, on which work was temporarily suspended for a time, are now operating with enthusiasm and are nearing their full capacity. About 150 men are employed at the mines, and the smelting works, which are about seven miles distant from the mine and connected by a railroad. The San Juan mines have been in operation for the past twelve years, and the main shaft is down 1,000 feet, with extensive drifts and cross-sets. The ore contains gold and silver, of the latter the average is 0.04 oz. per ton, of the former $8 to $10. These mines were formerly owned by the Canoa Brothers of San Jose, Cal., who developed the property to its present importance. At San Francisco the Lacy Brothers of Los Angeles are pushing development work on a property known as the Barden mines which they recently purchased. They have a large force of men at work, have sunk the shaft to a depth of ninety-five feet and have tunneled a hundred feet or more. Their machinery, including a Huntington mill of 20 tons daily capacity, is dynamo for electric lighting, etc., is on the ground and is being rapidly got in position.

With the schooner Anita, which arrived from Santo Domingo last March, came the cheerful news that the Barden mills are in full blast, and the entire property is in complete development. There are extensive bodies of ore, much of which is very high grade, and that work will probably soon be resumed on a large scale.

It is reported that miners are again in demand in the Alamo district, some of the companies are increasing their forces, and a number of men have left Las Vegas during the past week to find work there.

Mr. E. F. D. M. of the Rio Grande says that they are hoisting some nice looking rock and are working twenty thousand feet. He states that indications are most promising—Lower Californian.

MEXICO.

Mr. Cameron, representing the Pelton Wheel Company of San Francisco, paid a recent visit to the company's electrical engineer foreman, Mr. Chihuahua last week, for Jesus Maria, to investigate the feasibility of utilizing the falls in the vicinity of that place for supplying power to the numbers of stamp mills in that neighborhood. Should the project materialize, mining will be greatly helped thereby, as the existing circumstances, the cost of running the mills is said to be too expensive on account of the price and scarcity of wood.

On March 7th, the new pumping engine at the Maravilla de Jesus Maria, formerly the Arizpe, ceased to function. A Mexican discovered a quicksilver deposit near San Luis Potosi, about two months ago, and has since that time shipped three carloads of quicksilver from the mine, and one of the results of the current incident is the recent mining development of the property.

"La Compania Limitada de Terrenos Auriferos en Mexico" of London, with a capital of $200,000, has purchased twenty-five square miles of mountainous and in the Arizpe district of Sonora, which is said to be abundant in gold and silver.

NEVADA.

The Bailey process, as it is to be used in extracting the precious metals from the tailings and low-grade ores of the Holmes Mining Company at Candelaria and Bellevue, in Elko County, is formally in operation.

Gold Creek, New mining camp, is to have a daily stage from Biko, and the fare will be $5. Two other lines are to be started or have, in operation.

The Ore Hill Mining Company, in Eureka, has been in operation in January. Owing to trouble with the miners, work has been temporarily discontinued.

It is reported that 50 additional men are to be put to work in the Adeline, and before a few days a large force will be on the premises ready to begin mining operations.

Mrs. M. A. Graham, of Salt Lake City, Utah, and Mrs. Thomas Reynolds, of Las Vegas, have been visiting mining properties on the west slope of the Cumberland Mountains, and the visit is a success. They have ore which averages $25 in gold and silver.

THE AMERICAN MINER.

The American miner made a test run on one ore last week, running between four and five tons, and the reporter was informed that this small amount of ore yielded $1,225. This ore was taken from an 8-inch vein that runs along on the 28th parallel, and has a 2-inch vein. Other ore of a lower grade has also been encountered.

It is reported that the placer miners have made a new discovery of pay gravel near San Pedro and are doing well, extracting the gold with small drying works for treatment, is well acquainted with the differences that frequently occur in weights and assays between mine and smelter returns. Many companies, shipping regularly and in considerable quantity, are represented at the smelter when their ores are sampled, a practice permitted at all works, and by personal supervision during the sampling and the final results of the final sample, reducing the possibility of error.

Mr. Abbot A. Banks, 718 Montgomery St., San Francisco, is making a specialty of refining gold and silver from the bullion of mine and smelter brands. Mr. Banks is present during the assay, checks the weights and moisture, and takes a portion of the final floor sample for assay. He is particularly well fitted to perform this work, being by profession a chemist and assayer, and having his own laboratory in which his floor samples are kept. He is very careful to see that each branch of the work is carried out properly and that his results are correct.

In this age of economy the discovery of anything to save money is the aim of all, while the finding of the manufacturer of matches or the building of houses of the greatest economizers that has been produced, at least for steam users, in recent years is the Anti-Calorizer Plaster and Steam Pipe Covering, which is claimed to be derived from a mineral by a miner is scarcity of water, and when eventually develops sufficient for his mill his next aim is to save it and use it over again. There are many benefits in this water saving method. The first way is to cover the boiler and steam pipes with a covering that will keep the heat in the pipes and boiler, in this way the amount of water consumed for steam purposes is reduced. The value of the Anti-Calorizer plaster and steam pipe covering for mills and steam pipes conducting steam to pumps in the lower levels of mines is almost incalculable. In mills and re-applied to softening with water without losing any of its steam saving properties. Recently a test was made of plastering a house with the preparation and then subjecting it to a test for half an hour. The house was finally turned over and rolled about without injuring the plastering in any way or burning the lath under the water. Insulation made of this material is not only as pleasant as being surprised at the results. The covering has been adopted by many of the large mining companies on the Pacific coast, among other the North Pacific and Pacific Coast Borax Co. The United Iron Works Company, in New York, use it extensively, also the Southern Pacific railroad. On steamboats it is also becoming very popular, the Pacific Mail Steamship company having installed it in several of their boats. The company will furnish any in formation desired about their products, also samples and price lists on application.
AN IMPROVED IMPULSE WHEEL.

This has been called "the age of steam." Would it be more exact to say the age of power? The former expression has probably arisen from the fact that nearly two-thirds of the applied power of today is derived from steam, while but one-third is derived from water.

Our present enormous and constantly increasing coal consumption must, however, in the distant future exhaust the most accessible of nature's stores, and be followed by increased cost of production and rising prices, which will render economical the development of water power and its substitution in many instances for steam previously employed.

Recent rapid strides in the successful and economical long distance transmission of electric power has and will be the most potent agency in rendering serviceable many natural water powers easily and cheaply developed, which have hitherto been to remote from any market to attract the attention of the manufacturer and the engineer.

These two agencies will undoubtedly hasten the rapid development and utilization of a considerable part of the 200,000,000 H.P., which has been estimated the streams of this country alone capable of affording.

It must therefore seem that any substantial advancement in the perfection of the mechanical appliances whereby the power of falling water can in its greatest entirety be transformed into useful work, must be of more than usual interest to the general public as well as to engineers and others directly interested in the utilization of power.

The two general types of water wheels which have ousted all competition in the gradual development of mechanical perfection and high theoretical efficiency are the turbine wheel and the jet propulsion wheel. Without entering into any general discussion of the relative merits of these two types, it may be said that each has its special field of adaption, and that when these are properly understood the line between the two is too well defined to leave any considerable field for conflict. Of both there are, of course, many varieties, differing in details of design and having various degrees of efficiency in use, but it is desired in this instance to direct the attention of the reader to some particular features of the impeller wheel, designed by Mr. S. J. Tuttlehill of San Francisco and manufactured by the Oakland Iron Works at Oakland, California.

The wheel differs from other well known jet propulsion wheels, principally in that with which its designer has embodied the results of the most recent scientific research in the arrangement of all important details; and thus by a full appreciation of the true supplemental relation between sound theory and good practice, has produced an unusually high type of wheel.

In order to fully appreciate the accomplished results it may be well to here briefly outline the special theoretical requirements which must govern the correct design of all impulse wheels. On just how nearly these requirements are fulfilled will depend the ratio between the useful work given off by the wheel and the power applied to its periphery in the issuing jet. The more nearly this ratio approaches unity, the more perfect and the more economical the wheel. The energy of the issuing jet of water in striking the buckets of the wheel, if they be of the backward discharge type, is transformed into useful work by imparting motion to the wheel in two ways: first, by the direct impulse of the jet; and second, by the tangential reaction of the water as it is deflected by the curve of the bucket back more or less nearly parallel with the direction of the issuing stream. The theoretical perfect wheel would require that the impelling jet strike exactly tangentially with the wheel's periphery, that the stream without change in the form of its cross-section be deflected 180 degrees in the bucket, and that it then fall vertically from the wheel with all its power of motion spent; and that in the accomplishment of this there be no spraying, foaming or friction, since all such disturbances represent loss of energy in useless heat instead of work. The wheel that gives off the same degree of energy that it receives will, of course, never be built. Friction in bearings and between water and buckets can never be wholly eliminated; breaking up of the molecular lines of discharge and incidental foaming must always occur to some extent on striking the buckets. The condition for most economical working, when the peripheral velocity of the wheel is equal to one-half the mean velocity of the impelling jet, is not often maintained, and is consequently the reversal in the direction of the impinging jet cannot be entirely complete without producing some backwash on the buckets.

All these and other conditions prevent the attainment of the ideal, but do not prevent under intelligent design the realization of a high degree of efficiency. In the Tuttlehill wheel these incidental losses have been kept very low in the following manner:

1. The impelling stream is not divided on striking the bucket, but entering tangentially to the curve of the bucket, in entire reflected in one direction, alternately to the right and left with each succeeding bucket; thus reducing to a minimum all tearing or separating of the stream and incidental wasteful production of heat instead of work, while the alternation of the bucket discharge between right and left gives large clearance for the falling of the more or less completely spent water, and permits the nearest approach to a complete reversal of the direction of the stream with backwash. Any gain in clearance thus afforded, of course admits of greater capacity for receiving water, and consequent greater output of power for a wheel of given diameter and speed.

2. The shape of the discharge lip of the bucket is a radical departure from other makes, and is a recognition of the requirements of theory in accomplishing the reversal of the stream and the energy without serious loss incident to the impact resulting from the distorting of its section. The usual flattening of the stream's section and the discharging of it in a thin sheet along a lip of considerable length is in buckets of such a type, a cause of very considerable loss of energy.

In addition to the above points, the designer has given special attention to the form of the nozzle employed, and has adopted a form similar in design and directly in accord with the requirements for high efficiency as determined by scientific hydraulic investigators. It is evident that the successful embodiment in practice of the true theory for the correct design of impulse wheels, as accomplished in this particular instance, must result in an unusually high degree of efficiency; and while no precise tests have been as yet completed for determining the exact degree of efficiency obtained, approximating tests, made on some of the considerable number of wheels already in use, clearly indicates this to be another illustration of the truth of what should be among engineers, i.e., the best practice is always the most perfect embodiment of sound theory.

Lickhardt's Combined Assay Office and School of Instruction, incorporated, whose card appears in another column, begins business under the most favorable auspices, having convenient and well equipped assaying rooms, a strong corps of teachers and a reputation for absolutely correct work already done. They give courses, which will enable a man to do all ordinary work for prospecting or similar purposes, to a full course which gives a complete knowledge of the determination and the economical treatment of ores, metals, mill tests, etc., making a man a practical and competent assayer, either to take charge of a mine, assay office or open one on his own account.

The school is under the direct supervision of Mr. W. H. Lickhardt, and is under the charge of C. A. Lickhardt, formerly proprietor of the Nevada Metallurgical Works, who was so well known as a practical and successful metallurgist, and had been sighted up from infancy to his work. He formerly taught at his father as well as elsewhere, did check work for the U. S. Mint, the Selby Smelting Company, Daniel
Meyer and others and was head assayer and manager for his father. During the exhibition in 1885 at the Mechanics' Fair, Mr. Luckhardt constructed dynamos and machines for the Pacific Coast Electrical Construction Company, the company then being awarded a grand silver medal. Luckhardt then was serving his apprenticeship in order to gain knowledge for the electrical decomposition of metals from ores. He is Vice-President and assayer of this corporation. The Secretary A. E. Hawson, is also a skilled and practical man, the other parties interested being likewise practical mining and business men.

In the line of general assaying, etc., this office will be found equal to any in San Francisco and ores, etc., submitted to them for determination or any business of the kind will be promptly and satisfactorily attended to at reasonable rates.

**Hercules Gas, Gasoline & Distillate Engines**

Hoisting Engines 1 to 300 H.P., Stationary Engines 1 to 200 H.P., Marine Engines 2 to 200 H.P.

Our newly designed and perfected **DISTILLATE VAPORIZER** insures a saving of 30 per cent. on cost of running. Just 85 per cent. of fuel saved by using a HERCULES in place of any other. We make no exceptions.

Nearly 3000 Hercules hoisting, Stationary and Marine Engines in Actual Use, high Grade.

We claim full power, automatic and positive adjustment, regulation of water and consumption of fuel in proportion to work being performed. No spring of ignition, speed and amount of fuel can be changed while engine is in operation.

**TUTTHILL WATER WHEEL**

The Latest and Best Wheel in the Market, BARRING NONE.

Whelp, Buckets and Nozzles designed to suit Special requirements, when asked for. We have a Simple, Efficient and Durable Governor, entirely new and novel, that will positively regulate speed of wheel. Specially adapted for electric railway and Lighting Plants.

**OAKLAND IRON WORKS, BUILDERS,**

186 First Street, San Francisco

Telephone 107 Main

**PROSPECTORS! Assaying and Determination of Minerals Simplified at**

LUCKHARDT'S COMBINED ASSAY OFFICE

26 0'Farrell Street, San Francisco, Cal.

(Incorporated)

**MORRIS BALL PULVERIZER**

**Ores! Ores! Ores!!**

Gold, Silver and Lead Ores and Concentrates Purchased at Reduced Rates for Treatment.

**Selby Smelting and Lead Co.**

416 Montgomery St., San Francisco

Consign Shipment to Vallejo Junction, Cal.

**GEORGE F. HOYT,**

MINING ENGINEER U.S. DEPUTY MINERAL SURVEYOR

Office, 335 336 Wilson Block, Los Angeles, Cal.

**W. M. Darling, of Oakland, Calif., interested in the Slate Range, Cal., came down to Los Angeles last week and made the Journal a call.**

**E. R. Gage, of the Congress mine, Arizona, spent some days in Phoenix, Arizona, last week.**

**Sr Enrique C. Creel, of Chihuahua, Mexico, recently made a trip to the City of Mexico on important mining business.**

**L. P. Sancy, an old time New Mexican, was in Las Vegas, N. M., from Cemex, Kansas, recently.**

**W. F. Carson, a prominent mine operator of Prescott, Arizona, left Prescott March 7th to examine mining property in Conchula, Mexico.**

**Capt. W. W. Hill, of the Black Warrior Copper Co., Arizona, spent several days in Globe, Arizona, last week.**

**Messrs. Clas D. Lane, part owner of the Utica mine at Angels Camp, Cal., and Jas. W. Taylor, of Texas, arrived in Chihuahua, Mexico, March 8th en route for the La Bita mines near Batopilas, which property they intend to purchase.**

**N. B. Fulbright, formerly of Garden Valley, El Dorado county, Cal., left Los Angeles last week for the mining districts of Riverside county.**

(Continued on page 36)
R. M. Force has recently returned to Santa Fe, N.M., from Denver, Colo., where he has been for some time.

William H. Hall, of San Francisco, formerly state engineer of California, has been in London for some time past, and sailed last week for South Africa with John Hayes Hammond, to make an examination of the water supplies of the Rand for the Consolidated Gold Fields Company.

A. G. Shinn, of Colorado, is in Los Angeles for a few days. He has been examining mining property at Randsburg.

A. P. Holmen, a prominent mining man and miner in Brigham, Utah, was one of the callers at the Board of Trade office on the 12th of this month.

H. B. Botsford, the Virginia Dale, Cal., mining man, was a tourist visitor in Los Angeles today.

J. W. Rogers, general manager of the Wedge mine, at Randsburg, Cal., who has been on a business trip east, returned to Randsburg March 16th.

Peter Kihlstedt has recently returned to Riverside, Cal., from a visit to the mines of Randsburg.

James Hannum, of Aspen, Colo., has been on a trip to the Gold Creek gold fields, of Elko county, Nevada.

L. J. Brown, of the Little Johnie mine, in Leadville, Colo., arrived in Los Angeles yesterday. He has been looking over Randsburg for a month, and has bought some properties there.

A. G. Hubbard, the mining promoter of Redlands, Cal., was one of Yuma’s visitors the 1st of March.

H. T. Lewis and James Sheal, of Montana, are in Los Angeles for a week or more.

Ex-Governor A. W. McIntire, of Colorado, has gone to New York in the interest of a mining proposition in Mexico.

James B. Dennis, of Perris, Riverside county, Cal., has been in Los Angeles the past week.

Mr. R. M. Dusseldorf, manager of the Comstock mine at Bunker Hill, Cal., has gone to New York on business connected with the mine.

Frank H. Jackson, of Los Angeles, has gone to Arizona, to inspect some mines.

Col. Perfect, of the Va. Verde mine of Randsburg, spent a few days in Los Angeles last week.

D. H. Jackson, of Oakland, Cal., who is operating in some mines in El Dorado county, Cal., will start week.Saturday, and resume active operations.

M. H. Angeline, of Hassayampa Mining district in Arizona, called at the journal office March 15th.

W. H. Harding, of Denver, Colo., has recently returned to Los Angeles from New York, where he has gone on mining business.

J. H. Mariott, of Osceola, Nev., is in Salt Lake, Utah.

James F. Mathews left the City of Mexico for his Velodrorni mining property, and expects to continue his trip on to New York.

Robert Lunde, of Salt Lake, Utah, was in Phoenix, Ariz., the fore part of March.

J. J. Daly, of the Daily West mine, in New Mexico, is in mining business.
PATENTS!
HAZARD & TOWNSEND
SOLICITORS OF PATENTS

Patents on Inventions secured in all countries. Copyrights, Trade Marks and Labels.
Office, 2, Dower Block.
Telephone 347.
Los Angeles, Cal.

WASHBURN & MOEN MFG. CO.
WIRE ROPE AND WIRE
OF EVERY DESCRIPTION

PACIFIC WORKS
SAN FRANCISCO

Attention Mining Men!
J. MAIT'S DRY GOLD SAVER
Manufactured and Exhibited at
625 Howard Street, San Francisco, Cal.

The Best Manufacturing Co.
San Leandro, Cal.

METAL MARKET.

New York Quotations:

<table>
<thead>
<tr>
<th>Metal</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myr.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.00</td>
<td>60.5</td>
<td>36.0</td>
</tr>
<tr>
<td>2</td>
<td>2.00</td>
<td>121.6</td>
<td>72.0</td>
</tr>
<tr>
<td>3</td>
<td>3.00</td>
<td>182.7</td>
<td>108.0</td>
</tr>
<tr>
<td>4</td>
<td>4.00</td>
<td>243.8</td>
<td>144.0</td>
</tr>
<tr>
<td>5</td>
<td>5.00</td>
<td>305.0</td>
<td>180.0</td>
</tr>
<tr>
<td>6</td>
<td>6.00</td>
<td>366.1</td>
<td>216.0</td>
</tr>
<tr>
<td>7</td>
<td>7.00</td>
<td>427.3</td>
<td>252.0</td>
</tr>
<tr>
<td>8</td>
<td>8.00</td>
<td>488.4</td>
<td>288.0</td>
</tr>
<tr>
<td>9</td>
<td>9.00</td>
<td>549.5</td>
<td>324.0</td>
</tr>
<tr>
<td>10</td>
<td>10.00</td>
<td>610.6</td>
<td>360.0</td>
</tr>
<tr>
<td>11</td>
<td>11.00</td>
<td>671.7</td>
<td>396.0</td>
</tr>
<tr>
<td>12</td>
<td>12.00</td>
<td>732.8</td>
<td>432.0</td>
</tr>
<tr>
<td>13</td>
<td>13.00</td>
<td>793.9</td>
<td>468.0</td>
</tr>
<tr>
<td>14</td>
<td>14.00</td>
<td>855.0</td>
<td>504.0</td>
</tr>
<tr>
<td>15</td>
<td>15.00</td>
<td>916.1</td>
<td>540.0</td>
</tr>
</tbody>
</table>

MEXICO

<table>
<thead>
<tr>
<th>State</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanajuato</td>
<td>500</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>400</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>300</td>
</tr>
<tr>
<td>Sonora</td>
<td>250</td>
</tr>
<tr>
<td>Nayarit</td>
<td>200</td>
</tr>
<tr>
<td>Durango</td>
<td>150</td>
</tr>
<tr>
<td>Sinaloa</td>
<td>100</td>
</tr>
<tr>
<td>Coahuila</td>
<td>50</td>
</tr>
<tr>
<td>Baja California</td>
<td>25</td>
</tr>
<tr>
<td>Tamaulipas</td>
<td>10</td>
</tr>
</tbody>
</table>

C. C. FOWLER
686-88 Howard Street, San Francisco.
McDearmon & Co.
Asbestos Boiler & Steam Pipe Coverings
Asbestos Cement for Burying, Heating, Etc. Special facilities for supplying the mining trade.
Pacific Coast Agents for J. A. B. W. John's Co's Asbestos Structural Coverings.
420 Sacramento Street, - San Francisco, Cal.

CRUSH
Investigation means Accumulation.
Possibility Salvation,
for prospecting or mining exploration.
GATES IRON WORKS, CHICAGO.

"Union" Hoist

Union Gas or Oil Engine and Hoist Combined, on strong, iron base.

No Fire No Steam No Boiler No Danger.

Ten Years' Experience. Two Thousand Engines in Use.

Started instantly. Compact, strong, simple, efficient, economical. Perfectly governed, so that oil is used only in proportion to the work done. No expense when idle.

Particularly Adapted to Mining in Localities Where Fuel and Water are Expensive.

Built in the following sizes: 1 H.P., 4 H.P., 8 H.P., 10 H.P., 15 H.P., 20 H.P., 30 H.P., 40 H.P.

Send for Catalogue and state what H. P. required.

Union Gas Engine Co.,
301 Howard Street, - San Francisco, Cal.

J. R. TOMLINSON, M. E.
Miner Roy, Arizona.
Mining Properties Examined, Appraised and Reported Upon.
Estimates Taken for the Development of Prospects and the Operation of Mines.

L. E. AUBURY
ASSAY OFFICE
P. R. Street
Mining Engineer & Metallurgist
SAN DIEGO, CAL.

Special attention given to examination and report on mining properties on Pacific Coast. Reference, Robson & Banking Co., San Diego.

L. BOOTH, MECHANICAL ENGINEERS

WOODBURY CONCENTRATOR
No. 121 First St., - San Francisco

Miners' Assay Office
L. BOOTH & SONS
Engineers and Machinery Merchants
We carry the best stock of power generating and transmission machinery in Southern California.

GET THE
Screws and Screws

Screws and Screws

Screws and Screws

The CONSOLIDATED PIPE CO.
Of Los Angeles, Cal.

Leads, Plate Lead, and Lead Sheet, 75 Cents.

Have about 20,000 feet 7 1/2 inch inside diameter.

Which they offer at lowest market prices.

Standard Iron Works
MINING MACHINERY

Castings in Iron and Brass, Shocks and Dies, Pumps, Engines, Boilers, Windmills.

Blacksmithing and Machine Work of Every Description.
Cor. 7th and L Sts., - San Diego, Cal.

Advertise in The Journal

L. BOOTH, M. E.

Miners' Assay Office

L. BOOTH & SONS
Engineers and Machinery Merchants
We carry the best stock of power generating and transmission machinery in Southern California.

Advertise in The Journal

Technical Scientific Books

Including BOOKS ON MINING Chemistry, Metallurgy, Assaying, Electricity, Mechanics Trades, Science, Etc. &

TOOLS and HARDWARE Workshop Machines operated by foot and steam power.
Novelties, New Tools and all recent Inventions.

Geo. Webb Alexander,
401 Market Street,
SAN FRANCISCO, - CAL.

Rix Compressed Air Machinery Co.

11 and 13 First Street, - San Francisco, Cal.

Manufacturers of
Pneumatic Machinery of all kinds,
Rock Drills,
Compressed Air Compressors,
Compressed Air Hoisting Engines,
Stone Cutting and Carving Tools, driven by Compressed air,
Compressed Air Machinery for quarrying stone,
Compressed Air Pumps for both cold & hot air,
Appliances for reheating compressed air.
"Perrite" Shoes and Dies,
Projectile Steel Shoes and Dies,
Guaranteed to be the most economical Shoe and Die on the market.

Advertise in the Journal

Also Dealers in
General Mining Machinery

Send for Latest Catalogue.

Practical Treatise on Compressed Air Machinery.
A useful book for mine owners and Superintendents and all engineers who are interested in Compressed Air and Compressed Air Transmission. Price $4.00.

For sale by
Rix Compressed Air Machinery Co.,
11 and 13 First Street, - San Francisco, Cal.
THE CHEAPEST PLACE ON EARTH
TO OUTFIT A MINE IS AT
The J. H. Montgomery Machinery Co.,
1220-22 Curtis St., Denver, Colo., U. S. A.

Our List includes every known Mine Equipment, from the smallest to the very largest.

1st Line: Babbitt Castings, Steel, Iron, Nickel, Copper, Bronze, Lead, etc., to fit
any mining requirement. Our castings are
made to order, and our machining
includes every detail.

2nd Line: Hoes, Shovels, Excavators, Drills, etc., to
fit any mining requirement. Our equipment is
made to order, and our machining
includes every detail.

3rd Line: Transportation, including
every type of mining transportation, from
the smallest to the very largest.

4th Line: Power, including
every type of mining power, from
the smallest to the very largest.

5th Line: Communications, including
every type of mining communication, from
the smallest to the very largest.

6th Line: Accessories, including
every type of mining accessory, from
the smallest to the very largest.

WE ARE THE SOLE AGENTS AND MANUFACTURERS OF
THE FINLAYSON PATENT WIRE ROPE TRAMWAY
This tramway is the best that has ever been placed on the market. It has no rival. It is strictly automatic and its capacity runs up to 1000 lbs. per bucket. We especially call attention to the automatic loading and unloading terminals and intermediate stations, as being important improvements over all other systems. If you are interested in a tramway and want the best that can be had, write us for information.

THE COLORADO IRON WORKS CO., COLORADO SPRINGS, COLO.

Contracting Engineers for and Manufacturers of
MINING, MILLING AND SMELTING PLANTS
We design and erect CRUSHING PLANTS with guaranteed capacity to any degree of fineness. Investigate late improvements in our line of machinery.

CORRESPONDENCE INVITED
CATALOGUES ON APPLICATION
Kellers' New Improved Feed Water Heater, Purifier, Condenser, and Hot Air Blast Combined.

Built entirely upon new mechanical lines to that of all other Heaters; 30 per cent. of fuel saved, and steam condensed saving nearly one half of Water Bill.

No compounds needed to keep boilers from scaling and all impurities are precipitated and trapped in the tank.

Feed water is superheated after it leaves the pump and goes to the boiler at boiling temperature without "back pressure" on engine or no charge for Device; the Thermometer and Back Pressure Gage registers results.

1810 lb. of hot air forced out of device which can be utilized for drying or heating purposes or carried under boilers as a force draft. The fuel air can all be drawn out of mine with this same attachment. Where the air is not required leave off the Fan, it will not condense quite so fast, but other results will be the same.

This Device is endorsed by practical Mechanics and the largest Smelters and Plants in the country. This is the Only Heater Endorsed by the American Institute of Mining Engineers. Send for Descriptive Catalogue.

Theodore Lexow
168 Broadway New York
Importers of
CARBONS
For
DIAMOND DRILLS and all Mechanical Purposes

Henry Demmert

J. Howard Wilson
Assayor & Chemist
A Specially Made of Uspire Work.
306 Santa Fe Ave., Pueblo, Colo.

A. Kratzmer
Iron and Brass Castings of All Kinds, Shoes and Dies, Cams, Bosses, Tappets, Mortars, etc., etc., Complete

Stamp Mills
of any size made and sold at strictly
San Francisco Prices.
Correspondence Solicited.

Bakersfield, California

UNION IRON WORKS
BUILDERS OF
Dressing, Milling, Concentrating and Smelting Machinery
922 Market Street, San Francisco, Cal.
Send for New Catalogue
Hammond Manufacturing Co.

Manufacturers of

Stamp Mills
Concentrators

And all Classes of
Mining Machinery

Wire Rope Tramways with Automatic Loading Apparatus permitting the ore bins to be permanently open.

Specialty made of the Improved, Iron Frame Self-Contained Stamp Mill, the greatest success of the day in reduction of ore to pulp. A great boom to mill builders in countries where timber is plenty and therefore a greater boom to those who have no timber from which to draw the huge pieces needed in old style mills. We claim for this mill:

1st. It is no longer a new thing, but well tried and its durability proven.
2d. Cheaper than the Wooden Frame Mill when ready to run.
3d. Better mill that can be erected from foundation and it can be set up in a short time as a self-contained engine.
4th. Seven much space.

We call the attention of Prospectors to our Self-Contained Two Stamp Mill.

We have inaugurated a system of amalgamation and Concentration which renders both much more satisfactory and cheapens the cost of concentration by a great saving in the repairs to the complicated machinery now used. Parties intending erecting mining plants would do well to investigate our mills. We build any mill desired and will deliver F. O. B. Steam or cars at San Francisco, California.

Write us for Catalogues and Estimates.

Hammond Manufacturing Company

The Pacific Amalgamator

This machine is guaranteed to do the work represented and will save coarse or fine gold equally well. The weight of the standard size for mill use is 600 lbs. for placer use 1000 lbs. The machine can be shipped in sections, no piece weighing over 100 lbs., this makes it by far the cheapest for use in mountainous districts where it is necessary to use pack animals for transportation. The standard size machine has seventy square feet of amalgamating surface constructed in such a manner as to give the greatest contact without scouring the plates. This machine can be opened and the process of amalgamation be seen at any time while in operation.

Send for further particulars to

The Pacific Amalgamator

Mining Machinery Company
127 First Street, San Francisco, Cal.

John P. Culver, Civil Engineer.

John P. Culver & Company,
Assayers, Mineralogists and Mining Engineers,
145 South Broadway, Los Angeles, Cal.

Belting of all Descriptions

For Mills, Mines and Smelters

Specialties:
Dynamo, Water Proof, Rawhide and Sewed

Fred R. Cook,
208 Mission Street, San Francisco, Cal.

Union Iron Works

Foundry and Machine Shops.
Albert Thomas, Prop.
First and Alameda Sts., Los Angeles, Cal.

Represent Leading Properties

Surveys and examinations made and reports furnished by the most competent experts.
Correspondence solicited.
Address J. C. O'Hannon,
Duranro, Mexico

Eveleth & MacLennan,
Assayers and Analysts of Ore. Practical Mill-tests by 3-stamp Mill and Concentrating Plant
10 Annie Street, San Francisco

Von Schulz & Low
Assayers, Chemists, and Refiners

Prices for Specimen and Commercial Analyses, Copper, &c, each SAMPLE COMPLETELY ANALYZED.

B-Air, Tint, and Dyeing. 25c. 100c. 

A. Y. Maurer, N. A. I. M., President.

A. Vanier N. A. I. M., Secretary.

Address of Office: 515 Howard, San Francisco.
W. W. MONTAGUE & CO.
MANUFACTURERS OF
Riveted Sheet Iron and Steel
WATER PIPE
For Hydraulic Mining Power Plants and Mills.
Iron Cut, Punched and Formed for Making Pipe on the Ground Where Required to Save Freight.

GALVANIZED IRON
Air Pipe, Concentrator Rolls, Water Tanks
SAN FRANCISCO, CAL.

THE BI-METALLIC ASSAY OFFICE
AND CHEMICAL LABORATORY.
Assaying in all its branches. Determinations accurately made.

FREIGHT FREE

KENNETH DONELLY
Stock & Mining Broker
Weekly quotations furnished on request.

324 S. MAIN ST., LOS ANGELES, CAL.

$32,450,000
Paid in Dividends by Utah Mining Stocks
Weekly Market Lists on Application. Quotations by Wire, etc.
JAMES A. POLLOCK, Mining Stock Broker.
SALT LAKE CITY, UTAH.

For Sale

TANKS
OF EVERY DESCRIPTION
FOR
Mines, Mills and Cyanide Plants
Patent Non-Shrinking Water Tanks
The only tank that will stand the Desert and Hot Climate.
Write for Catalogue and Estimate on any kind of Tank Work.
Pacific Tank Co.
33 BEALE ST., SAN FRANCISCO

To Gold Miners!
Silver Plated Copper AMALGAM PLATES
For Saving Gold.
GOLD REMOVED FROM OLD PLATES AND REPLACED

San Francisco
GOLD, SILVER and NICKEL Plating Works
655 and 665 Mission Street, San Francisco, Cal.
Telephone, 66581.
E. G. DENNISON, Proprietor
Every description of work plated. See for Circular.

UNION HARDWARE AND METAL CO.
DEALERS IN
Boiler Tubes, Iron Pipe and Fittings
RAILROAD, MILLING, MINING AND FOUNDRY SUPPLIES
214 and 216 N. Los Angeles Street
Los Angeles, Cal.

THE WILSON
Forged High Grade Steel
Shoes and Dies
GἉtanteed to Wear Longer and Prove Cheaper than any others.
Made only by
WESTERN FORGE AND ROLLING MILLS,
St. Louis, Missouri.

JOSHUA HENDY MACHINE WORKS
SOLE AGENTS
38 to 44 Fremont Street,
San Francisco, Cal.

The Modern Motor
THE WHITE & MIDDLETON
Gas, Gasoline or Distillate Engine,
Manufactured by the White & Middleton Engine Co.
This engine is not to be compared with other engines now upon the market.
People who are using them say they are a revolution over other models, always having perfect speed under varying conditions. Tests made in N. Y. give the same results for all other models. All boats, if P. & H. P. are made satisfactory. Engine for any purpose and every kind of work furnished by Amos B. Carter.

F. M. ENDLICH, EVAN DAVIS
ENDLICH & DAVIS,
Mining Engineers and Metallurgists
Correspondence Solicited.
Office: 201 Bullard Block,
Los Angeles, Cal.
Neil McLean
Mojave, Kern County, Cal.

THE Mine & Smelter Supply Co.

DENVER, COLORADO

ARE SOLE AGENTS FOR THE

WILLEY CONCENTRATOR

and claim for it BETTER work than any Concentrator made, with a capacity of from 10 to 25 tons per day of 24 hours. It is simplicity itself. No moving belts or intricate parts. Any one can learn to operate in an hour.


BRECKENRIDGE, COLO., Dec. 1, 1896.

The Mine & Smelter Supply Co., Denver, Colo.

Gentlemen—You asked us what experience we have had with the Willey Table, and we would state that after trying a Woodbury, a Free Vann, a Johnstone, a Kirby and Electrical Process, Hartz Jig, and Buddle, we have found that the Willey Table is the only table that has given us satisfaction. We are using two tables, at a profit to our mill, whereas all other devices have proven a failure, and we can heartily recommend them to any intending purchasers. Yours very truly,

B. D. B. B., President. Sept.

Price - $450.

We also Handle the Huson Wire Tramway.

These Tables have displaced belt tables of almost every make, as is shown by letters in our possession.

Assayers and Chemists

Supplies

Manufacturers of
Crucibles, Scourifiers, Muffles.

- AND -

FIRE BRICK
- AGENTS FOR -
Baker & Adamson’s Celebrated
Acids and Chemicals

DEALERS IN

Glassware, Porcelain Goods, Etc.

THE

S. S. MACHINERY CO.

Buy, Sell and Trade in All Kinds of SECOND-HAND Mining and Wood Working Machinery.

CORRESPONDENCE SOLICITED.
OFFICE: 1329 Lawrence WORKS: Sixth and Market

DENVER, COLORADO
TELEPHONE, Works, 1234

THOUSANDS Now in Use Over the World

TRAUX PATENT IMPROVED Automatic Ore Cars.

These Are the Best and Cheapest.

TRAUX Mfg. Co.
DENVER, COLORADO.
The Only Exclusive Ore Car Manufacturers in America.

Pat. Jan. 29, 1891, Aug. 27, 1892. Send for Catalogue. All dealers in Mining Machinery have them.

The Newman Gold-Saving Machine.
(Patents Pending)

The Most Simple Amalgamating Process known that actually Saves all the Gold. Can be used in hydraulic, river washing, or quartz mining.

Is not a Dry-Washer. Positively saves the Float Gold and fine Quick-silver.

No EXTRA LACE, No MOTOR POWER, No EXTRA EXPENSE.

A. ROYALL, MGR.
Office, Room 205, 1st National Bank, 212 W. T.

We also Handle the Huson Wire Tramway.

These Tables have displaced belt tables of almost every make, as is shown by letters in our possession.

Assayers and Chemists

Supplies

Manufacturers of
Crucibles, Scourifiers, Muffles.

- AND -

FIRE BRICK
- AGENTS FOR -
Baker & Adamson’s Celebrated
Acids and Chemicals

DEALERS IN

Glassware, Porcelain Goods, Etc.

THE

S. S. MACHINERY CO.

Buy, Sell and Trade in All Kinds of SECOND-HAND Mining and Wood Working Machinery.

CORRESPONDENCE SOLICITED.
OFFICE: 1329 Lawrence WORKS: Sixth and Market

DENVER, COLORADO
TELEPHONE, Works, 1234

THOUSANDS Now in Use Over the World

TRAUX PATENT IMPROVED Automatic Ore Cars.

These Are the Best and Cheapest.

TRAUX Mfg. Co.
DENVER, COLORADO.
The Only Exclusive Ore Car Manufacturers in America.

Pat. Jan. 29, 1891, Aug. 27, 1892. Send for Catalogue. All dealers in Mining Machinery have them.

The Newman Gold-Saving Machine.
(Patents Pending)

The Most Simple Amalgamating Process known that actually Saves all the Gold. Can be used in hydraulic, river washing, or quartz mining.

Is not a Dry-Washer. Positively saves the Float Gold and fine Quick-silver.

No EXTRA LACE, No MOTOR POWER, No EXTRA EXPENSE.

A. ROYALL, MGR.
Office, Room 205, 1st National Bank, 212 W. T.
C. DUCOMMUN, 300-302 N. MAIN STREET, LOS ANGELES

Assayers Materials, Mine and Mill Supplies

Dixon's Black Lead Crucibles, Denver Fire Clay Crucibles, Muffles, Scorchers, etc.; Quicksilver, Drill Steel, Retorts, Mortars, Gold Pans, Drilling Hammers, Drifting Picks, Horn Spoons and Shovels.

THE JOHANNESBURG SAMPLING WORKS

Purchasers of Gold, Silver, Copper and Lead Ores and Concentrates
Cash Returns Made Within Twenty-four Hours after Receipt of Ore.

CHRIS. R. WORES, Manager.
Johannesburg, Cal.

SHEPARD, WHEELER & RHODES

Mines, Engineers and U. S. Deputy
Mining Engineers and Mineral Surveyors.

Have a Complete and Accurate Map made from Actual Surveys, Showing all Mining Claims in the Randburg Mining District.
Price, 10.00 Randburg, Cal.

RANDBURG

A. J. PETTER
MINING ENGINEER AND ASSAYER
Examiner and Dealer in Mines. Have several properties listed for sale. Correspondence solicited with intending purchasers.

H. L. NELSON & CO.

Real Estate and Mining Broker
Abstract Bureau & Notary Public
Correspondence Solicited.
RANDBURG AND JOHANNESBURG, CALIF.

G. WHEATLEY.
Mines and Mining
Correspondence Solicited.
TUCSON, ARIZONA

HALLIDIE PATENT ROPEWAY

FOR THE
Transportation of Ore, Fuel and other material, has been erected by us all over the country and is the most economical and efficient method known. Nothing to get out of order; has always given satisfaction.

California Wire Works
332 Bay Street, San Francisco, Cal.

WE MANUFACTURE

STAMP MILLS, CRUSHERS, CONCENTRATORS, ENGINES, PUMPS, HOISTS,

Best equipped works in California, outside of San Francisco.
CORRESPONDENCE SOLICITED
Matteson Manufacturing Co.
STOCKTON, CALIFORNIA.

It Pays To Advertise in THE JOURNAL.

WIRE TRAMWAYS

Ropeways, Incline Planes, and Railways.

California Wire Works
332 Bay Street, San Francisco, Cal.
NEW IMPROVED
McGlew Ore Concentrator

IN USE IN
California
Oregon
Washington
Nevada
Arizona
Mexico
Central America
Australia

Patented
Sept. 1893

We guarantee these machines to handle an average of ten tons per 24 hours, and to do cleaner and closer work than any other CONCENTRATOR in use.

Price, $3000 Net Cash, f.o.b.
Write for Descriptive and Testimonial Circulars
THE McGLEW ORE CONCENTRATOR CO.,
131 First Street
San Francisco, Cal.

FAIRBANKS Ore and Bullion Scales

Ore Cars, Steam Pumps, Fairbanks Gas Engine.
Scales of all Sizes and Capacities
We make a Specialty of Scales for Mines, Mills and Smelters.
Fairbanks, Morse & Co.
310 Market St., San Francisco, Cal.
210 North Los Angeles Street, Los Angeles, Cal.
Correspondence Solicited.

KROGH MANUFACTURING CO.
Successors to the San Francisco Tool Co., MFG. CO., manufacturers of Engine and Centrifugal Pumps for Mining and Water Works. These pumps can be operated by horse power, water power, steam, gasoline or electric motors.

Horse Power Mine Holster.
also manufacturers Cyanide Tanks and Centrifugal Sand Pumps for filling and discharging them. The Pumps work the tailings to perfection and are made to handle small or large quantities.

OFFICE AND WORKS
51 Beale St. and 9 to 17 Stevenson St., San Francisco, Cal.

J. F. TAGGART,
Mines and Mining
Properties reported on in all parts of the world.
Correspondence Solicited.
201 BULLARD BLOCK, LOS ANGELES, CAL.

C. A. LUCKHARDT & CO.
Nevada Metallurgical Works,
71 AND 73 STEVENSON STREET, SAN FRANCISCO, CAL.
Assaying, Analyses, Sampling.
Practical Working Tests of Ore by all Processes
STAMP MILL AND CONCENTRATOR IN OPERATION ON PREMISES
N. OHLANDT & CO.
MANUFACTURERS OF
Best Quality of BONE ASH for Assayers.
Our Goods are used in all parts of the United States and Mexico.
Extra No. 1 and No. 2
Correspondence Solicited
327 MARKET STREET, SAN FRANCISCO, CAL.

MINING PIPE

STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior to none.

THE TRAUX EASY AIRE CAR.
SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,
SACRAMENTO, CALIFORNIA.

The Harrington & King Perforating Co.
METALS PERFORATED AS REQUIRED
FOR MINING SCREENS OR ALL KINDS FOR USE IN
Mining and Milling Machinery, Reduction and Concentrating Plants
Stove Coal, Ore Screens, Stamp Battery Screens
Standard Sizes Perforated Tin and Hoes Always in Stock.
MAIN OFFICE AND WORKS, 214-218 NORTH UNION ST., CHICAGO, ILL.

Dry Gold Washers
ADAPTED TO PLACER MINING
MANUFACTURED BY
F. F. COLLINS,
MANUFACTURING CO.
SRN ANTONIO, TEXAS

Send for Catalogue of General Pumping and Water Supplies.

The Mining and Metallurgical Journal

Is the ONLY publication in the SOUTHWEST devoted to the Mining Industry and circulates in every MINING CAMP or place where there is a MINE, MILL or SMELTER in California, Mexico, Lower California, Arizona, New Mexico, Texas, Nevada, Utah and Colorado. It has a LARGER circulation in Southern California, Mexico, Lower California, Arizona, New Mexico and Texas than any other MINING JOUR published and is therefore the best advertising medium for those seek with the Mines Mills and Smelters.
W. H. BIRCH & CO.
OFFICE AND WORKS, 127-129-131-133-135 FIRST STREET, SAN FRANCISCO, CALIFORNIA

"Birch" Improved TWO-STAMP MILL
IRON FRAME. TRIPLE DISCHARGE. 800-LB. STAMPS. FORGED STEEL SHOES AND DIES.
PRICE $450 F. O. B.

LLEWELLYN IRON WORKS.
Manufacturers and Dealers In
All Kinds of Mining, Smelting and Milling Machinery, LOS ANGELES, CAL.

J. C. WINANS,
Sole Agent Peerless Rubber Manufacturing Co.
Winans' Anti-Formation Powder, Giant's Ring
Packing, Peerless Rod
Packing, Eclipse Tubular Gaskets, Peerless Lubricating Compound, Rubber Pump Valves, Valved
Nosed Pipe Fittings, Magnetic Anti-Friction Pipe, Peerless Rod, High Pressure, Special Pumps, Special
Pipe, Vents, Pumps, Steam, Boiler, Tourist, Rainbow Sheet, Sheet Rubber of all kinds, Squirrel
Water Pumps, Adapting All Kinds of Water Pumps, and All Kinds of Pumps and Pumps on the Market,
Special Hydraulic Pump Packing, Winans' Pressure Regulators, Absolutely Automatic. Pronounced by Experts
the Best Manufactured.

ANTI-CALORIC STEAM PIPE AND BOILER COVERING
In canvas, BACKETED SECTIONS and Plastic
Material Manufactured in San Francisco under
Patents controlled exclusively by the Co.
Certificate of Superiority
Over All other Covers awarded by
Mechanics Institute Exhibition 1896
401 CALIFORNIA STREET, SAN FRANCISCO, CAL.

EASTERN PRICES BEATEN
IMPROVED FACILITIES, FINEST WORK, LOWEST PRICES.

PERFORATED SHEET METALS
For House and Roof Stacks, Greenhouse Stacks, Gravel and Grout, Revealing and Shot
screens, Stop Log Screens, Baffle Plates, Boiler Screens, Etc.
= American Finish, Zinc, Copper and Brass Screens.

M I N I N G S C R E E N S & S P E C I A L T Y
Mill screens using screens exclusively, can construct for large supplies at favorable rates. J. W.
QUICK, the only competent and successful manufacturer of screens on the Coast, having furnished
screens to the principal Mills of California, Nevada, Alaska, Mexico, Arizona, Central America, Australia and British Possessions.
San Francisco Pioneer Screen Works
P.O. Box 213, San Francisco.

FULTON ENGINE WORKS
Mining, Milling & Smelting Machinery
Estimates Furnished on all Classes of Mining Work
P. O. Box 296, Station "C"
LOS ANGELES, CALIFORNIA

W. O. ABBOTT
ASSAYER
ASSAYING IN ALL ITS BRANCHES
CHEMICAL DETERMINATIONS ACCURATELY MADE
TOMBSTONE
ARIZONA

The Puget Sound Reduction Company
PURCHASERS OF
GOLD, SILVER, LEAD AND COPPER ORES
Special Facilities for Handling ores from the South-West and Mexico
SANDERS & JONES
Analytical Chemists & Assayers
WASHINGTON

GOLD MINES!
In Julian District
SOUTHERN CALIFORNIA
I have listed for selling, leasing or
leasing. Strict investigation invited
letters of inquiry about any mine or
company answered for $1. Inclose stamp
for reply.

B. A. STEPHENS
917 F STREET
SAN DIEGO, CAL.

Wanted!
A Chemist and Assayer now
holding position in Mexico desires a
change of position. A Spanish
speaking country preferred. Also
capable of assuming position of
assistant superintendent of a small
Lead-Silver blast furnace.
ADDRESS "U"
JOURNAL OFFICE,
Stimson Block, Los Angeles, Cal.
THE PUEBLO
Smelting and Refining Company,
PUEBLO, COLORADO.

BUYERS OF
Gold, Silver, Lead and Copper Ores,
Copper Matte and Bullion.

Refiners of Gold, Silver, Lead and Copper.

Manufacturers of Bar and Pig Lead, Lead Pipe, Antimonial Lead, Copper Ingots,
Granulated Test Leads and Litharge.

Pays Highest Prices for all classes of Ores.
Especially Attention to Sampling by most Approved Processes.
Quick Returns on all Consignments.

CHAS. B. BOOTE & CO.
— Dealers in —
Engines, Boilers, Pumps, Shafting, Hangers, Pulleys, Belting, Lubricating Oils,
Engineering Supplies
MINING Hoists Irrigating, Oil Well,
IRON and WOODWORKING Machinery
Of All Kinds
Electrical Machinery and Apparatus.

We invite an inspection of our goods at the New Store,

126-128 S. Los Angeles Street,

Los Angeles, Cal.

VULCAN ROPEWAY
* For Conveying Ore, Cordwood, Etc.

EMPORIA, KANSAS, April 17th, 1890
Vulcan Iron Works—Gentlemen: The rope-way furnished by your Company to convey tailings
from Morgan Mill to Mexican Mill, a distance of seven-eights of a mile, is giving entire
satisfaction. We transport 200 tons of tailings in ten hours; one man does the whole busi-
ness, including elevating tailings from hopper in the ground, operating Vulcan self-loader, and
attending to the rope-way generally. The self-dumper requires no attention whatever. The Vulcan Loader I consider the
best feature in the whole Rope-way, making it possible for one man to load 200 tons in ten hours.
Yours very truly,
J. F. Woodbury, Supt.

VULCAN IRON WORKS,
Manufacturers of Mining Machinery,
SAN FRANCISCO, CAL.

CLARENCE HERSEY,
Assayer and Chemist,
(Established 1879)
LEADVILLE, COLORADO.
Fraser & Chalmers

CHICAGO, ILL.

Have Brought Out a New Line of MEDIUM-SIZED Steam Hoisting Engines

These are designed with great care by engineers familiar with the best previous practice, and knowing just what is wanted to render satisfactory service on a mine. Do you want such service? Then buy one of these improved machines.

JOSHUA HENDY MACHINE WORKS

Nos. 38 to 44 Fremont St., San Francisco

Dealers in and Manufacturers of All the Latest Improved Mining, Sawmilling, Pumping, Smelting and Electrical Machinery, Engines and Boilers, and Mining Supplies of all kinds.

Manufacturers of the HENDY IMPROVED TWO-STAMP MILL.

BAKER IRON WORKS

Los Angeles, California

Manufacturers of Mining and Milling Machinery, Atlas Engines and Boilers, Worthington Steam Pumps

RISDON IRON WORKS

Office and Works, Cor. Beale and Howard Sts., San Francisco

Manufacturers of

Johnston Concentrators, Free Type
Bryan Patent Roller Quartz Mills
Evans' Patent Hydraulic Gravel Elevators
Risdon Ore Feeders, Challenge Type

Air Compressors
Mines, Milling, Pumping and Hoisting Plants,
Risdon Pat. Water Wheels, "Pipe Line" Type

KNIGHT WATER WHEELS
GOLD AND SILVER STAMP MILLS
Catalogues and Prices on Application

Risdon, Risdon, and Steel Works and Bros

IMPROVED HYDRAULIC GIANT

The above cut illustrates the improved form of Hydraulic Giants, in which a t'ender bolt is dispensed with, which was liable to catch tears. Prices and catalogues of our specialties sent free on application.

PARKE & LACY COMPANY

21 and 23 Fremont St., San Francisco, Cal.

MINING MACHINERY

SOLE AGENTS FOR THE INGERSOLL-SERGEANT AIR COMPRESSORS AND ROCK DRILLS.

WE CARRY IN STOCK:
Horizontal, Vertical and Portable Engines and Boilers. Rock Breakers, Cornish Rolls, Pulverizers, Concentrators, Ore Feeders, Hoisting Engines, Horse Power Hoisting Whims, Water Wheels, Steam Pumps, Ore Baskets, Water Buckets, Skips, Blowers and Exhaust Pans, Shifting and Pulleys, Belting, Oils and Mine Supplies. Manganese Steel Shoes and Dies (heavy)

Satimated Plates for Complete Plants for Mining Works, Smelters, Concentrating and Smelt Mills.