

The Mining And Metallurgical Journal

Vol. XXI. No. 10

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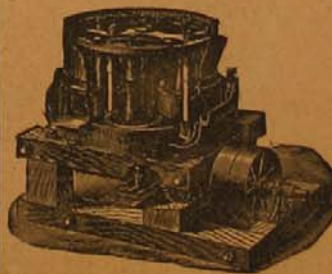
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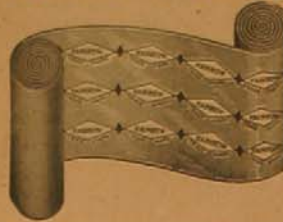
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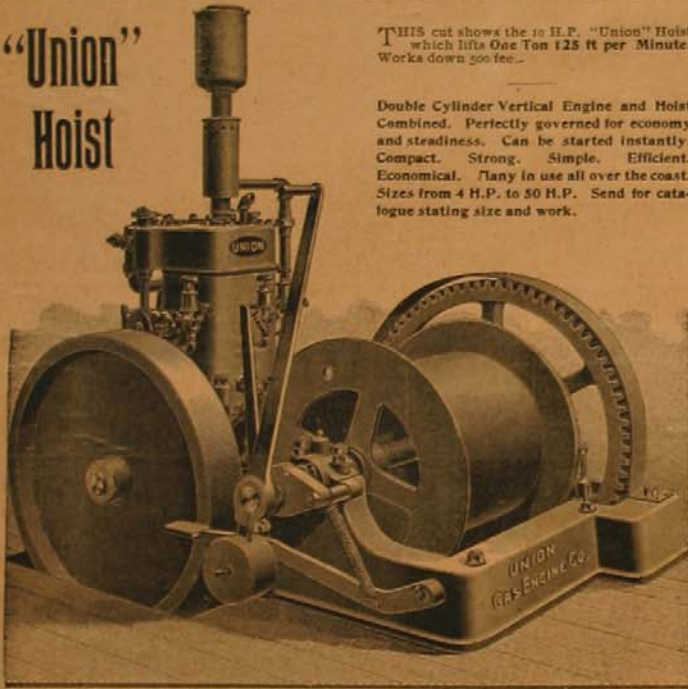
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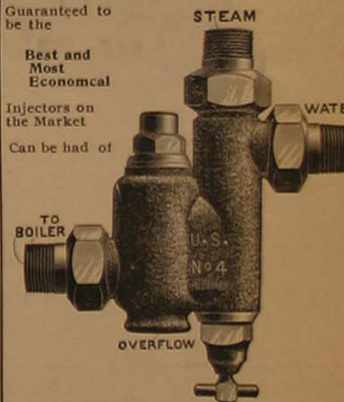
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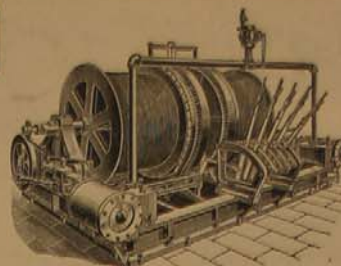
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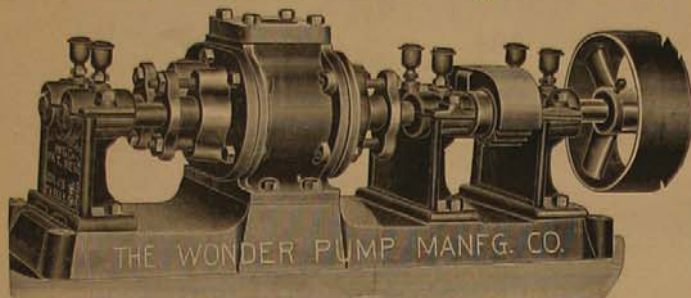
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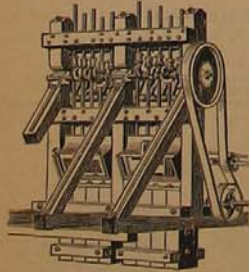
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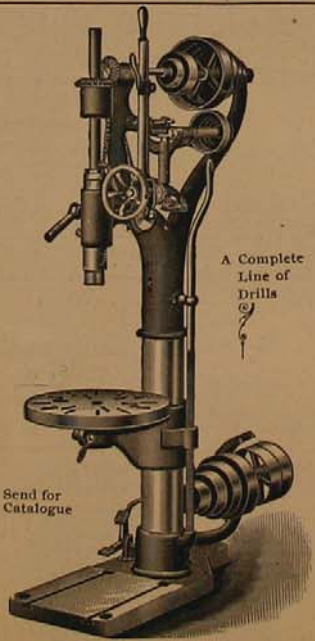
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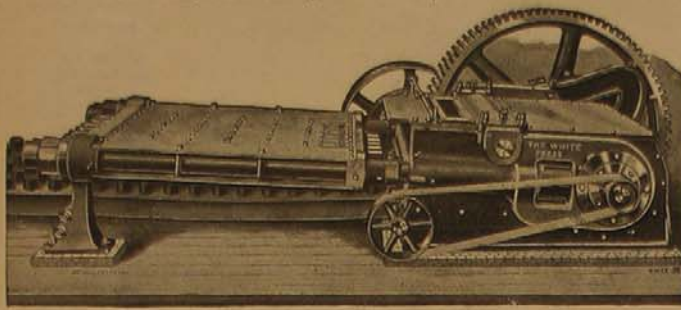
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idation has been effected there has been neglect to introduce all the economies in operation that are practicable, and which should be adopted. One of the items which is immensely expensive is the inordinate salaries paid to the principal railroad officials. Many of these offices could be discontinued, and all the salaries of the high officials could be cut down without impairing the efficiency of the service. It is stated as a statistical fact that there are five or six hundred railroad presidents who aggregate receive salaries to the amount of \$11,000,000. There is really no practical need for but one president of each system, and were they each paid \$25,000 per annum, the cost would be less than \$500,000. To what extent there might be a saving by reducing salaries of other officials and abolishing superfluous offices is a point upon which there has not been sufficient investigation upon which to found a reliable statement.

It is incontrovertible that railroads generally are very much over capitalized, and to pay income on excessive bonds and stocks is another and chief cause why rates for transportation are above what is reasonable. How to eliminate such capital is the most difficult feature of the railroad problem. Some way should be devised for accomplishing it without positive injustice, and the subject will doubtless be agitated until it is accomplished in a peaceable manner. American methods afford the means of righting wrongs without resorting to force and violence.

The constant efforts of railroad officials to arrange affairs so as to avoid the difficulties that confront them, will aid in bringing about more satisfactory conditions, but they will not be acceptable unless the masses, as well as the railroad owners, are recipients of the benefits that will result from the introduction of economies in railway operation.

MINES AND RAILWAY TRAFFIC.

The history of the progressive development of a mining district in the western States is an interesting and instructive social problem. Our liberal mining laws encourage prospecting, and offer a premium to the industrious and venturesome, by giving the discoverer the possessory right to it, as long as he continues to work the claim. Therein lies the success of opening up a new district, for, as development proceeds with energy and intelligence, new discoveries are sure to be the result. The first, and often difficult and dangerous pack trail of the prospector, is followed by a wagon and stage road, and as the work advances, the discovery of rich ore, or that of a quality which requires to be smelted, necessitates the introduction of a cheaper means of obtaining supplies and hauling ore to market than the slow operation of teaming in wagons. The next operation is the narrow gauge tramroad for animals, or the cheapest mechanical power obtainable for operating it, or by hauling with heavy traction wagons. As the business of the small railroad increases, the construction of a standard gauge line of railway is made easy, and soon becomes a matter of economy to establish.

It is a notable fact that the railway company traffic managers, as a class, are nice gentlemen who recline in a rich city office, with carpeted surroundings, and wait for business to come to them. The idea of a railway company sending a traffic manager with a competent mining engineer, to report on the traffic possibilities to and from new min-

ing camps, is a measure unknown outside of Colorado, for in other states the railway management leaves the sphere of opening up new avenues of trade to the companies or persons operating mines.

The urgent requirements of many mining districts, located on each side of railway lines for cheap transportation facilities, as feeders for freight for the line, is never considered or advanced until the miners have demonstrated that a branch line will pay. This is a feature of railway traffic management that many railway lines can better undertake than to leave it to the miners, as the plant when not required in one district can be sent to another.

CORRESPONDENCE

ARIZONA.

CHLORIDE, Ariz., Aug. 9, 1899.

EDITOR JOURNAL:—More mining machinery is coming into the district than at any time during its previous history. Aside from the small steam hoisting works and the little horse whim for hoisting, the Merrimac mine has ordered a complete concentrating plant from Los Angeles which is now passing on its way and will soon arrive. Like all the other mines, the Merrimac is surfeited with ore both above and below, and something will have to be done to make room for the ore now coming out of the mine.

The Tennessee and Elkhart mills are both running at full capacity since the late rains furnished an abundant additional supply of water. The ore body in the Tennessee is said to be eighteen feet thick at its present depth of 375 feet.

The Payroll mine is getting in excellent shape for the extraction of ore from its big vein; and, although the ore is yet far above water level, is fairly high grade in character, and ruby silver is beginning to come in. The wagon road from the mine to the level plain is completed, and soon ore teams will be freighting the products of the mine to the depot of the new railroad to be forwarded to markets east and north. Colin Timmons, the manager, has a fine and very thoroughly equipped assay office in operation in connection with the mine, and is himself installed as assayer.

Robt. J. Ferguson & Son have resumed work on the Redemption mine and will sink 200 feet in the 70-foot tunnel, from which a shipment of ore was recently made. Salt Lake parties are negotiating for the purchase of this property.

Weaver gold district is wild with joy and excitement over the development of a strong stream of water in one of its prospect holes. The shaft was down 140 feet, and the water rose 40 feet so rapidly that the man at the bottom narrowly escaped drowning. The water is standing at that gauge yet, with no signs of its giving way, notwithstanding the district for three and four miles around is supplied with water from it. It has given the camp and district quite a run of prospectors, as heretofore water had to be brought in on the backs of burros or other pack animals from six to eight miles.

The Virginia mine, in the camp by the same name, is taking out and shipping some unusually high grade, free-milling gold quartz, and the Ramrod follows closely with almost as much and of as high grade. Now that water has been found many men who own claims are going in and developing them, and much

prospecting is being done in both directions from the Virginia. This gold belt is known to extend from Colorado river southeast to Union Pass, a point in that range of mountains fifteen miles south of here. Want of water has been its unredeeming feature, and now that this indispensable article to prospectors on the Colorado desert is more convenient and plentiful, that rich gold belt is suggestive of great possibilities yet undeveloped.

JACOB MITCHELL.

CALIFORNIA.

LOS ANGELES, CAL., July 25, '99.

EDITOR JOURNAL:—I note an article in your issue of the 15th inst., entitled, "The Future of the Stamp Mill," taken from T. A. Rickard's work entitled, "The Stamp Milling of Gold Ores," which seems to me to be calculated to discourage any from attempting to improve upon a method of reducing ores, which Mr. Rickard himself characterizes as the clumsy contrivance whose reverberations echo from Coolgardie to Colorado." The discouragement is not only for the inventor but also for the mine owner whose property is not quite rich enough to pay for the old method, but could and would prove lucrative by the adoption of something more modern and less expensive. It must be well known to Mr. Rickard that a great percentage of gold ore is refractory to a greater or less degree, and either cannot be worked profitably by plate amalgamation, or might be worked to a still greater profit by some other process, if intelligently used. As Mr. Rickard demands the intelligent operation of the stamp mill, so also, I demand equally intelligent management of the patent process and patent mill, and in a majority of cases, at least in Southern California, I feel confident that experiment will show a balance in favor of the latter.

This clinging to the stamp mill and discouragement of progressive methods in gold extraction, is on a par with the Chinese, which teaches that the grandson must not presume to surpass the wisdom of his grandfather, and that it is blasphemy to question the superiority of antiquity, a philosophy, alas, which is bearing its fruits today.

Singularly Mr. Rickard deprecates the conditions which he assists so effectually to bring about, and bemoans the luckless inventor and his half-finished inventions, but does not seem to comprehend that it is such as he who are causing the means to be withheld whereby it would be possible to bring the means to a successful issue. In conclusion, I beg to say that the struggling inventor, though he has failed, has done more for humanity than the whole fraternity of moss-backs who have not brains enough to develop an idea, but have control of a few high-sounding words and smoothly-turned phrases, by the use of which they are enabled to down better men. I have not attempted, nor do I presume, to enter into an argument with Mr. Rickard, but simply wish to call the attention of mine owners to the possibilities for improvement on the methods in general use, and also to the possibility of making their mines pay a profit, if handled intelligently and by progressive methods.

Very respectfully yours,

B. I. TURMAN, 132 S. Broadway, L. A.

NOTE.—We venture to say that Mr. Rickard does not wish to discourage the invention of crushing machinery, to take the place of the stamp mill. And we believe he only had

reference to the many fraudulent propositions for quartz crushing, which are constantly being placed on the market "as better than a stamp mill." If a machine has merit, no one would try to down it, and it would withstand a test, which Mr. Rickard recommends should also be made before installing a stampmill.—
[ACTING EDITOR.]

Havilah Mines Active.

Havilah, the pioneer district of Kern county, after laying idle for thirty years, is again receiving attention from mining men and capitalists. The Warrington and Ophir mines, which are on the Mother Lode and were heavy gold producers in the early days, have been purchased by eastern companies and under the management of R. C. Shaw, are again in operation. \$40,000 has been expended in the last few months for new machinery, consisting of a ten-stamp mill at the Warrington, cyanide plants, steam hoists, pumps, etc. The mill at the Ophir has been in operation for several months past, but the Warrington mill was just started last week. Fifty men will be employed in the Warrington and about twenty-five in the Ophir, and Mr. Shaw has sufficient funds at his disposal to keep the property in operation whether anything is taken out of the mines or not. However, from present indications, there is no doubt but that a dividend will be paid in a short time. In fact, with seven feet of \$35 ore in the 600-foot level, it can hardly be otherwise providing that the ore holds out.

The New World, a patented mine on the mother lode, which has lain idle since the sixties, is also again in operation. A company known as the New World Mining Co.; consisting of the following persons: R. T. Harris, Pres.; L. E. Porter, Secy and Treas., J. J. Seamans, Superintendent; Gus. Miller and Wm. McColough, was organized the 10th of last month and sufficient capital has been provided to put in the necessary machinery and commence operations. A large force of men are now at work taking out ore from a 20-foot vein. With the exception of the old Havilah, which has 100 feet of low-grade ore in the face, the New World contains the largest known body of ore in the district.

It is said that work will also commence on the Fairview group in a short time. These mines were heavy producers in the early days, and large results from the new operations are confidently expected.

The Bald Eagle, one of the best-paying mines in the district when Havilah was the county seat of Kern county, was opened up again this year and is paying its owners, J. J. Seamans and A. Robinson handsome returns.

What promises to be a paying proposition is an immense body of antimony discovered near Kern river and owned by Geo. Miller and L. E. Porter. The lead is very large and the ore exceedingly high grade. Chicago parties are now investigating the property with a view of purchasing it.

L. E. Porter, one of the best-known mining men in this part of the country, has established an assay office at Havilah and his services are in great demand.

Great interest is also being shown at the present time in the mines on Piute mountain. Some of the richest mines in the county are in this district, most of them being free milling, though some are of high-grade ore that is slightly refractory. I have a group of five mines leased this year, and at the present time am taking out rock from the Birdseye View, which prospects from \$50 to \$60 per

ton. The pay chute now being worked is 100 feet in length and 18 inches wide.

Twenty-five men are now at work in the Glen Olive mine. This mine paid its owners \$56,000 net last year, and has paid a neat dividend so far this year.

A large body of very rich rock was recently struck in the Fairview, owned by Griffith and Berris, and they are now receiving deserved returns for their pluck and energy.

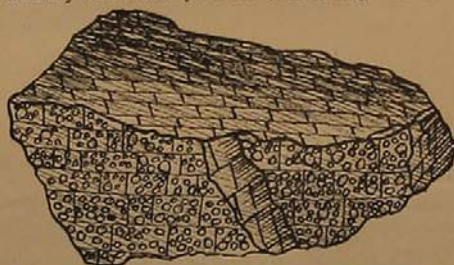
There is still ample room here for both the prospector and capitalist, either of which will find that their time is not wasted by an investigation of the hidden wealth of this district.
R. E. GALLOWAY.

Vaughn, Cal., Aug. 5, 1899.

The New Coal Field.

GARLOCK, Kern Co., Cal., Aug. 5, 1899.

EDITOR JOURNAL:—Of course you shall have a complete description of the coal field which I discovered nearly four years ago, but which only now shows money in sight for reasons which would have to be explained at length. The three large veins, the little veins, the sulphur balls, the clays, keels, fossil leaves, the pitch of the veins, the grain of the coal in the veins—always at right-angles with the vein above or below—and the rim of the original basin in which the coal hardened from mud, peat, oil or wood—all these things are, to me, intensely interesting as I study them day after day and some day when I have more time and know more about it, I will try and write you an interesting article.



PECULIAR FORMATION IN COAL FIELDS AT GARLOCK.

At the present time, however, I want to bother you with a puzzle which has bothered me a long time. I mail you a little box containing a few pieces of coal. Now, if you will step to the window and hold one of these pieces to the sunlight and keep turning it until you get the proper angle, you will observe thousands of little rings from 1-32 to 1/8 of an inch in diameter, overlapping and crowding each other. They show only on the cross-grain or ends, at right-angles with the true grain of the coal. When you first see them they may appear white and indistinct, but tip them a little further over and they will come out in all their brilliancy. They are not only a surprise and a wonder to every coal expert to whom I have shown or sent them, but as far as I can find out, they have never been seen in coal before. There were some spots in the old (first discovery) mine, but in the new mine, and in the vein of best coal—not the largest vein—they seem to be coming in more and more as the vein widens. You will note that the coal is very hard. In burning it pops like a pistol and rattles like broken dishes when it comes down.

If any coal expert who visits your office should chance to recognize them and give the reason for their existence and shape, I would be pleased to hear from him or yourself or to see the same in the JOURNAL. I have often attributed them to the original presence of oil, but suppose a more rational theory would be

they are minute globes or bubbles of gas in the original mud, and were flattened by pressure at the time the mud received its first end grain pressure.
F. H. HEALD.

COLORADO.

The Denver Engineering Works Company report several car loads of machinery already shipped to the two mills they are building for the Mountain Pride Gold Mining Co. and the Ault Wiborg Co., in the vicinity of Breckenridge, Colo. Both of these mills are well advanced in construction, and when finished will be the most modern type of concentrating mills in the state. The Mountain Pride Mill will be operated by steam power and the Ault-Wiborg by electric.

The Denver Engineering Works are now erecting at their works two pyritic smelting furnaces, for which they have recently received orders; a large traveling crane has been constructed especially for the purpose of putting these furnaces together before shipment, to insure that everything will go together properly. One of these furnaces will be erected in Leadville, Colo., and the other near Atlanta, Ga. The total shipment to Georgia, will comprise a fair-sized train load.

This company is also building a sampling plant, to be operated in conjunction with the Georgia smelter.

Ten car loads of 16" x 36" Denver crushing rolls have just been shipped to Cripple Creek, for the large mill now being built by the Economic Gold Extraction Co.

The demand for the Cammett concentrators built by this company has increased to such an extent that they have been obliged to enlarge their facilities for turning out these tables. Inquiries are received from all over the world. This company is making a specialty of these tables and are pushing them very rapidly into the market, where their success seems now well assured.

The three 150-h. p. double drum electric hoists which they are building for the British-American Corporation of Rosland, B. C., are now being put together at their Works, and will be set in operation and put under test previous to shipment.

The demand for the machinery turned out by the Company is now so large as to make it difficult to keep up with the work, and orders have accordingly been placed with several of the best machine tool companies for a new planer, drill press, boring machine and gear cutter, to cost approximately \$15,000.

LEWIS SEARING.

John Wigmore & Sons Co., of 117-123 S. Los Angeles street, Los Angeles, Cal., have just installed an excellent line of mining machinery, such as ore cars, ore buckets, hoisting machinery, gasoline engines, and in fact nearly everything necessary to the successful operation of a mine. Besides the above mentioned articles handled by this firm, they carry a full line of iron and steel, etc.

The favorite lubricant for all kinds of machinery, "Albany Lubricating Compound," is made in four regular numbers and one extra. Of these, Nos. 2 and 3 are especially well adapted for use in moderate and warm weather, and the manufacturers, Adam Cooks' Sons, 313 West Street, New York City, will be pleased to send samples and further particulars to engineers who wish to test the matter. The extra grade (No. X) is of extra hardness, and will lubricate journals with entire satisfaction, when no oil or other lubricant will work.

SEVERAL REPUBLIC MINES.

So much has been said of the wonderful Republic camp in the northern part of the state that we deem it interesting to say something of the different properties in detail. In the JOURNAL of August 1st there appeared a very interesting letter regarding the Jim Blaine and the Princess Maude properties. This issue we treat on the Morning Glory, Blacktail and Butte and Boston mines.

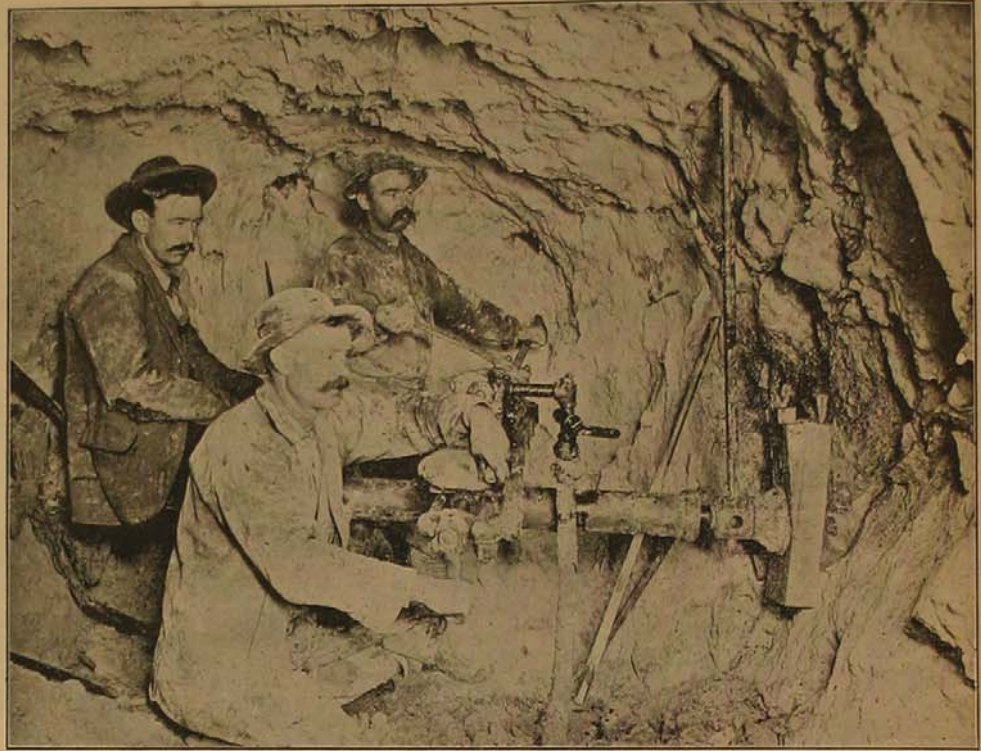
MORNING GLORY.

No gold discovery ever made in the northwest since the steamer Portland arrived from Alaska bringing the news of the gold finds in Klondike, has created the excitement that was caused by the strike on the Morning Glory mine at Republic early last December.

Up to that time the interest of mining men had been centered in the Republic mine and the neighboring properties, which extended north and south along that famous belt.

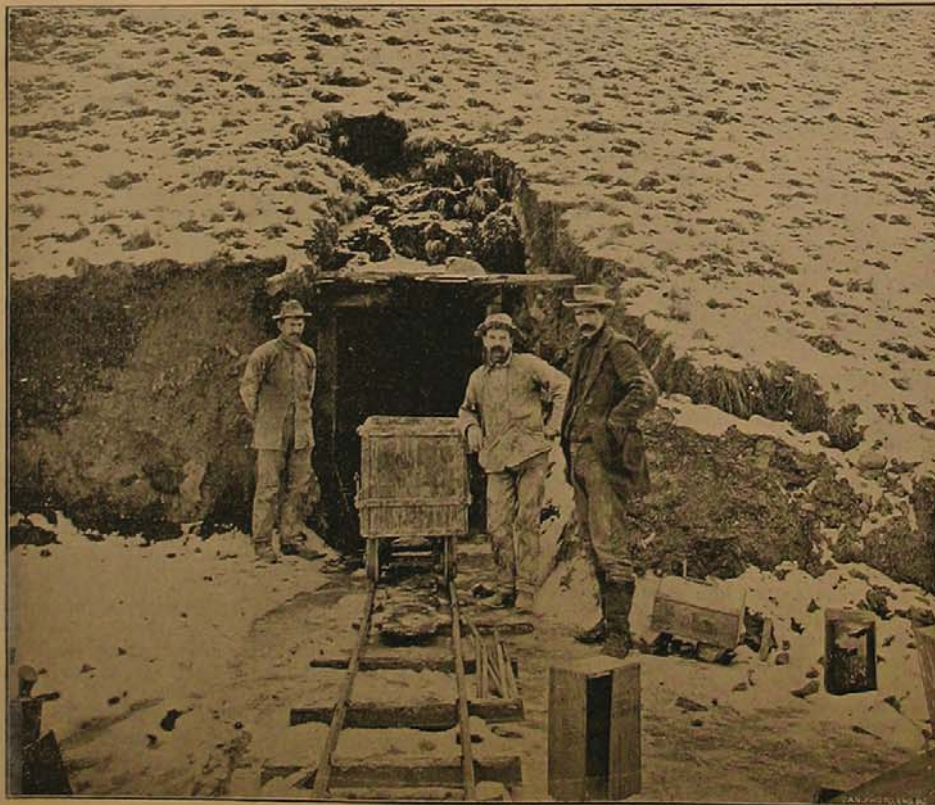
The discovery of a rich and extensive body of ore in the Morning Glory mine, therefore, marked an epoch in the history of the camp, and had the immediate effect of transferring a large part of the interest to the west side of the camp, in which the Morning Glory is situated.

Although but little development work had been done on the mine when



FACE OF TUNNEL, JIM BLAINE.

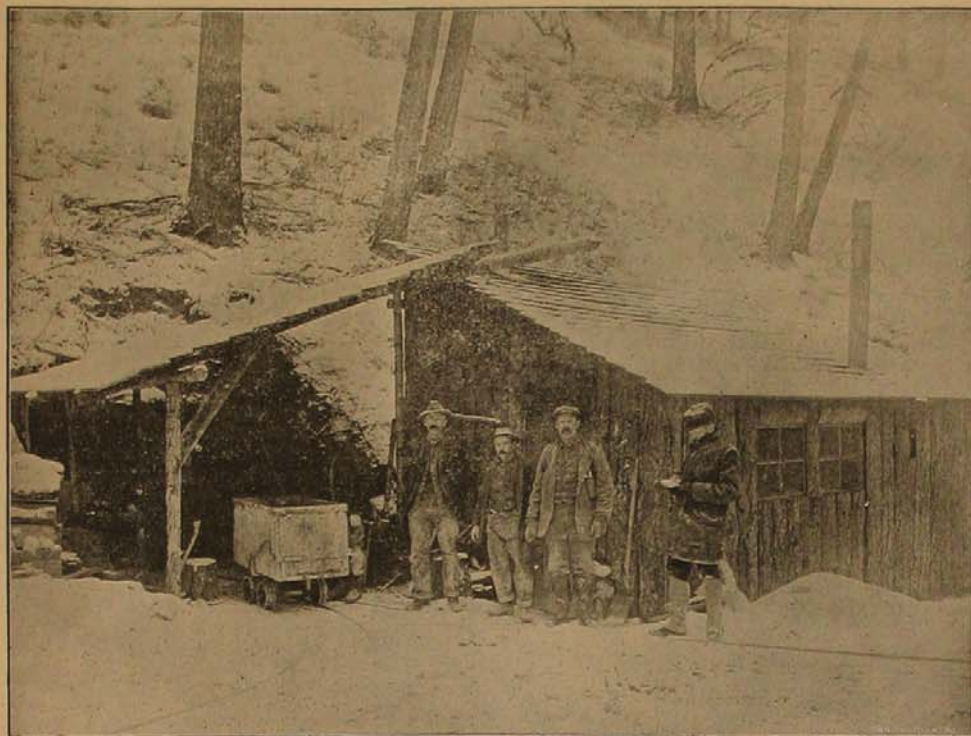
See our issue of August 1st, 1899.



MORNING GLORY TUNNEL.

the strike was made, subsequent operations have demonstrated beyond the possibility of a doubt the existence of a large body of ore running extremely high in gold, and the further fact that the values are maintained as increased depth is reached.

The story of the strike is of intense interest to all who invest money in mining shares. The Morning Glory was located something over a year ago by H. Eidlner a prospector, and in time passed into the control of other parties. There was little or no interest felt at the time in that portion of Republic Camp where the Morning Glory is situated, and now known as the west belt, and it was not until late in the fall of 1898 that the owners decided to organize a company and start work on the property. It was early in December that the newly-organized company sent a representative to the camp with instructions to commence development work at once. A number of open cuts along one of the ledges that traverse the property had been previously made for a distance of six hundred feet, and assays had been obtained running as high as \$40. The representative of the company as soon as he arrived in camp and had examined the property put a force of men at work sinking a shaft near the center of the mine. Almost from the first promising assays were obtained, and by the time the shaft reached a depth of ten feet there were eighteen inches of clean ore lying next to the footwall that gave the following assays: No. 1, \$31.42; No. 2, \$184.39; No. 3, \$69.45; No. 4, \$206.70. The latter assay was



BLACKTAIL TUNNEL.

Two notable Tunnels in
the great Republic Camp.

the highest that had been obtained in the camp so near the surface, and that together with the splendid showing in the shaft, sent the camp wild with excitement. As soon as the news reached Spokane there was a lively demand for the stock, but so great was the confidence the holders of the stock had in the mine that comparatively few shares changed hands.

About four hundred feet further down the hill another shaft was started, and at a depth of eight feet six feet of ore was exposed at that depth, as the shaft was not so wide as the ledge. Assays ranging from \$1.65 to \$136.42 were obtained from the ore in this shaft. All the ore exposed up to that time and since is free milling and the quartz is not what might be called hard. Later on average samples taken from the upper shaft assayed exceeding \$600.

An experienced mine manager was engaged and placed in charge of the work. He immediately started the work of running a tunnel in the ledge, and it is the intention of the company to continue the tunnel until it shall have reached the upper shaft, when a depth of two hundred feet will have been obtained.

As the ores in all of the best developed properties in Republic Camp have materially increased in value as depth is reached, it is reasonable to believe that the Morning Glory will prove no exception, and that with the completion of the tunnel a very large body of high-grade ore will be encountered.

The ledge upon which the tunnel is being run is what is termed a north

east and southwest one. It is about five feet in width and has been traced and fully exposed for over fourteen hundred feet. At the point where the lower shaft was sunk a north and south ledge crosses the property. It is fully fifteen feet in width, and while not fully exposed, it promises to equal its companion ledge as a producer of high grade ore.

The ore in the latter ledge is of an entirely different character from the former, being concentrating ore pure and simple. Assays as high as \$159 have been obtained, but so little development has been done upon it that it is impossible to say what the entire body will average. These two ledges do not, however, constitute the entire possibilities of this remarkable mine. There is a third ledge on the property lying north of the original discovery, but its width and value are unknown at present, as the officers of the company have decided that for the time being at least they will concentrate their energies in the work that is already under way. This third ledge is believed, however, to be equally good as the others, as the croppings, which have several times been assayed, give good values. A drift that is being run from the tunnel will eventually tap this ledge at a considerable depth, and the value and extent of the ore bodies can then be definitely determined. Until that is accomplished it will not be possible to form anything like a correct estimate of its value or merits. The Morning



TUNNEL BUTTE AND BOSTON.

Glory mine is situated about one and a half miles northwest of the town of Republic, and about an equal distance southwest of the famous Mountain Lion mine. It is to the west belt what the Republic mine is to the south end. The Morning Glory lies upon the side of a hill that is about five hundred feet above Granite Creek, and is admirably situated for development both by tunnel and shaft. Its situation is such that it can be operated for a long time without hoisting or pumping machinery, which will insure the work of development being carried on at a comparatively small expense. It lies within a few hundred yards of a good wagon road, thus saving the expense of constructing one. The character of the ground in the vicinity of the Morning Glory is admirably adapted for the erection of a concentrator at a distance of less than one-fourth of a mile from the mouth of the tunnel, and it would be entirely practicable to convey the ore from the mine to the mill by means of a tramway, which would, of course, minimize the cost of transportation over that distance.

The west side of the camp at Republic has come to be recognized as of equal value to the section that first attracted the attention of mining men, and in which the Republic mine is situated. Immense ledges traverse the properties located in the west belt and the rapid development of many of them is fast demonstrating that the ore bodies carry good values.

Without detracting in any manner from the value of surrounding property, it is an almost demonstrated fact that the Morning Glory mine occupies the central position in the west belt, just as the Republic does in the south belt. It is the opinion of the most prominent mining men who have examined the Morning Glory that all it needs to make it a great mine is development, and that it is going forward as fast as the work can be pushed.

THE BLACKTAIL.

This mine looks as though it might be another Republic and when one sees the splendid masses of pay ore exposed in the workings of this property he must have renewed and unshaken confidence in the magnificent destiny of the Republic Camp.

The Blacktail was among the first locations made and is situated on the east side of the San Poil gulch. Just above it is the Lone Pine and Surprise on which also have been extensive bodies of pay ore found. There is little or no waste in the Blacktail ore and it looks very solid and compact. One seldom sees such a mass of clean ore.

The capital of the company operating the Blacktail is \$1,000,000, divided into 1,000,000 shares of \$1.00 each full paid and non-assessable.

The management is in thoroughly experienced hands, some of the best known mining men being connected with the company.

We copy the following from an opinion written by the famous expert, Mr. Bernard McDonald, regarding this property. "Within

six hundred feet of the south end line of the Lone Pine and two hundred feet of the north end line of the Blacktail claims I have counted the out crop of nine veins, five on the Lone Pine and four on the Blacktail and all within

ings on the cross vein most developed within the Blacktail and these gave an average value of \$28.00 from an average width of three and one-half feet of quartz. On the main vein, that is upon the one on which the claim was located, I took two samples which gave an average of \$22.85 from an average width of five and one-half feet of quartz."

Eastern Canadian capital after subjecting the property to a rigid examination, have invested heavily until today they are one-third owners and it is not unlikely the control of this property, like that at the Republic, will pass into Canadian hands.

BUTTE AND BOSTON.

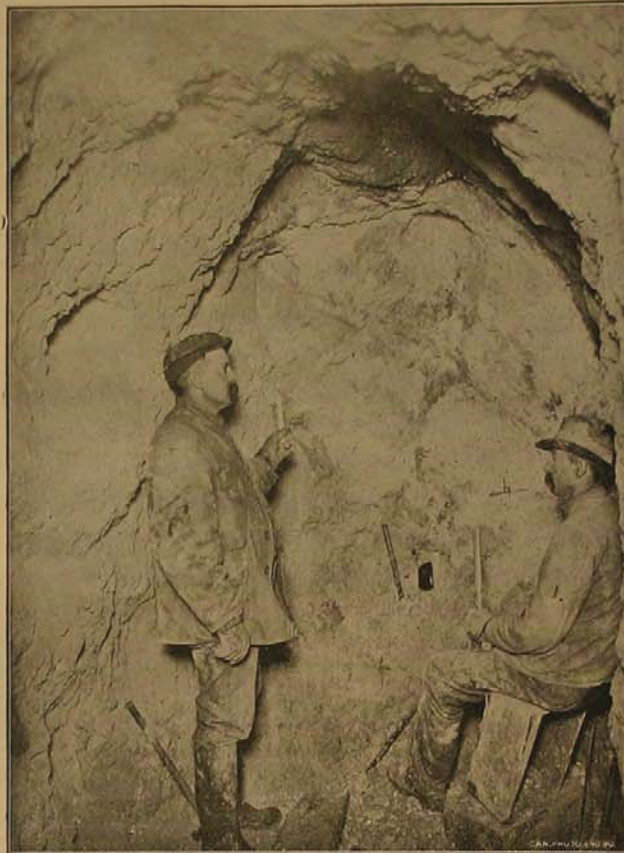
The accompanying illustration of the Butte and Boston in the Republic district shows the immense width of the pay chute in this property.

This claim, the second extension of the famous Republic was opened up in the spring of '98 but energetic and active development only commenced when the management passed into the hands of Mr. J. H. Wilmot who is known in the mining world as a successful operator.

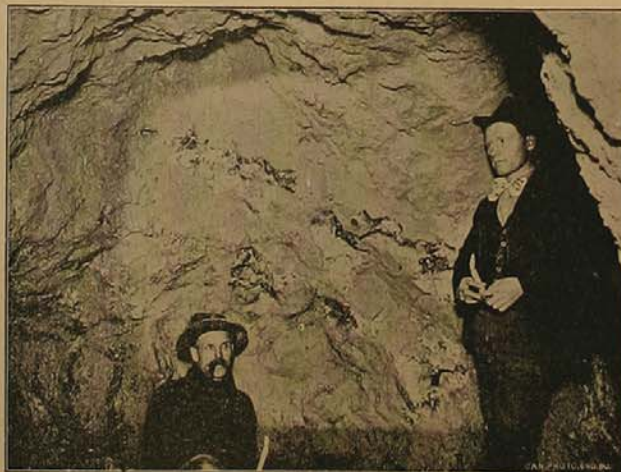
Under the old management a short tunnel was started and a ledge seven feet in width uncovered. The ore, while not what is usually termed high grade, was sufficiently valuable to warrant development. A drift was run to the south along the ledge for thirty feet but the ore was of less value than where first encountered. This was abandoned and work on the north drift began. This was carried forward for a distance of over three hundred feet and a shaft was sunk to a depth of fifty feet from the bottom of which a crosscut was run to and across the ledge. Now came the change in management and the new management decided that the proper method to continue the development was by a cross tunnel. The wisdom of this course has been verified by striking the ledge where it was solid and contained good values. The cross tunnel is something over three hundred sixty feet in length and cuts the ledge at a vertical depth of two hundred twenty feet, but by the dip of the ledge the face of the tunnel is two hundred thirty feet from the surface at the point where cut by the tunnel. The pitch of the ledge is about sixty-five degrees.

The finding of this body of quartz has materially enhanced the value of the stock and has had a marked effect upon the properties adjacent thereto. That the veins of the Republic pass into the Jim Blaine and on out into the Butte and Boston has been conceded by all mining men who have examined the property. Of the mines now under development in the Republic Camp at the present time none have shown such a phenomenal body of ore for the amount of development.

Two very important points should be considered in connection with this property, one is the running of the Republic tunnel to tap the vein at the six hundred foot level. Should this tunnel upon completion expose the vein showing fair values to say nothing of what it



FACE OF DRIFT BLACKTAIL MINE.



BUTTE AND BOSTON TUNNEL BREST.

an area measuring eight hundred feet in a north and south direction. Fortunately for the Blacktail all the veins dip towards the south so that the Blacktail will gain, rather than lose, by their downward extension."

"I took five average samples from the work-

does in the present workings, the adjoining claims known to carry the Republic vein will appreciate in value to a tremendous degree. The further fact that it is now claimed ore can be treated at a cost of \$2.50 per ton saving from eighty-five to ninety per cent. of the values is of itself of immense importance and will enable many properties to develop without burdening the share holders, as the ore taken out will defray development expenses.

BRITISH CANADIAN INVESTMENT
AND MINING SYNDICATE.

Miscellaneous Mining News.

ALASKA.

It is stated that the United States government will probably have to aid prospectors, said to number 1,000, who are stranded in this desolate country. Twelve hundred men went into the Kotzebue country well outfitted. Two hundred succeeded in getting over the snow last winter. Many die en route. The great majority of those who went in are said to be on the shore of the Sound waiting for a chance to come home. No merchant vessels will run to that district this year, and the whalers which call for fresh water will not take passengers. Many of the men are said to have been sick with scurvy and are going to float down the streams running into the Sound to wait for government help.

Details of the loss of the Bens expedition were brought by passengers of the Bertha, which arrived at San Francisco recently. Out of a party of 17 persons who left Port Townsend June 11, 1898, for Kotzebue Sound to prospect for gold, only one survives, Mrs. H. W. Bens, of Clay City, Ky.

ARIZONA.

The Crowned King Company, near Prescott, have started their mill up again. They have been shut down a month or more for repairs. The mine has been running with a full force of men all this month. The rich ore has spread through the vein and the deeper they go the bigger the ledge and the richer the ore becomes. They have struck it rich over at the Big Belt mine. The mine has been worked and managed by Ruby Harrington, and they have got 30 men to work since they put in the new hoist. They are sinking and drifting and struck the rich ore in the 300-foot level. The Star mine is owned by the Harringtons, who have got a large force of men at work. They are drifting now to cut the ledge and when they do so will have 1,000 feet of cover.

Mr. E. M. Foltz, superintendent of the Place mine, expects it to start up again shortly. The Place Mine Company has the south extension of the Crowned King ledge and have a good showing of rich ore. Foltz at present has some men working on the Wire Gold claim. It has the right name, as the superintendent has some specimens of ore rich with wire gold that are worth \$100 apiece.

News from the new copper discovery not far from Davidson's canon, near Tucson, is to the effect that the bodies of ore continue at depth, as on the surface, large and of high grade. H. Bushman has one of the most promising groups in the new district. He is driving a tunnel which will crosscut the vein of ore at a depth of 130 feet. At last accounts they were just coming into the ore body, which indicates that Mr. Bushman has something good and encouraging in sight.

CALIFORNIA.

AMADOR COUNTY.

The shaft on the Defender mine at Pioneer is to be sunk to the 150-foot level as rapidly as possible. It has now reached a depth of 120 feet. The owners claim to have a four-foot ledge of strongly sulphuretted quartz, which also shows some free gold. Fifty feet north of the present shaft an air shaft is being put down.

Cleveland, O., parties, represented by W. A. Cole, have bonded the Sunny South mine in Pioneer district. Mr. Cole says that extensive development work will be prosecuted at once, and, in all probability, a ten-stamp mill will be one of the soon-to-be-made improvements. The new owners give out no information regarding the richness of the property further than to say that they are satisfied with the prospects, and, if they are, outsiders will probably have to be.—*Amador Ledger.*

CALAVERAS COUNTY.

It is reported that some very fine ore was struck this week in the 400-foot level of the Demarest mine near San Andreas. At that point the ledge is about 45 feet in width and the ore shows plenty of free gold and high-grade sulphurets. The mill is kept running full time and everything points to a prosperous season.

At a meeting of the Demarest Gold Mining Company, held on the 11th inst., the following shareholders were elected directors: D. D. Demarest, G. E. Stickle, John Raggio, Thomas Fullen and D. C. Demarest. D. D. Demarest was chosen as president, G. E. Stickle vice president and L. Monte Verde secretary.

EL DORADO COUNTY.

The Alabama mine at Pigeon creek, near Placerville, has closed down for good. After two years of thorough prospecting and spending several thousand dollars they were rewarded with no pay.

It was reported last week that another rich strike has been made in the Union mine at Placerville, a cross ledge being encountered which makes the principal vein very rich at the contact.

A pocket hunter who has been prospecting on China Hill below Shingle Springs for two or three years was rewarded last week by a rich find and has been taking out gold at the rate of about \$200 a day. Up to a few days ago he had taken out something like \$800 and expected more.

INYO COUNTY.

Tuber Mines Sold.

George Montgomery reports that the Oh Be Joyful mine, at Tuber Canyon has been sold and that a forty-ton plant, consisting of a set of rolls and a five-foot Bryan mill are on the way to the mine. With the sale of this property and its being placed in the list of bullion producers, a great stimulus will be given to all mining affairs in the Ballarat country. The Bryan mill, belonging to the World Beater mine in Pleasanton Canyon, has been removed from its old location and set up at the mine. It is expected to be in complete running order by the end of this month. A cyanide plant will be added and

the World Beater will then be on a good paying basis. The sale of the Tuber property means more for southern Inyo than anything that has transpired for a long time. It is sure to be a great bullion producer, and when bars of bullion commence to be shipped, it will awaken great interest in other valuable properties there.

KERN COUNTY.

The Hall cyanide plant is about the only active institution in Garlock at the present time. Almost everybody has gone for a summer vacation to mountains or coast.

However the coal mines are in active operation and are now able to put out two tons per day. This, however, can be increased any number of times needed as the main entrance is driven ahead.

Several thousand dollars' worth of "cotton balls" have been gathered up near Desert Springs lately. They are worth \$150 per ton and are used in making borax at the borax works.

W. C. Ross and a friend of his from Los Angeles have just arrived at Colorado camp and commenced to open the old mine which belonged to the Caval Co. This is believed to be a great mine, but the company was wrecked by its secretary, who was sent to the penitentiary, no work ever having been done under their rule.

Water is drying up very fast in all springs near, but the Garlock wells are not yet affected perceptibly.

Considerable excitement has been occasioned by reported strikes in the various oil fields on the Kern river.

The company, of which J. M. Keith is a member, have gone down 138 feet on section 4 and struck oil. The well will be deepened.

Mr. McWhorter has begun a large bore well on section 28, where the Elwood Oil Company is boring. There are now four outfits boring about five miles up the river. Mr. McWhorter is also working under a lease from the La Corona Oil Company, and struck oil at 128 feet on their property on section 30.

J. Jay has leased his place on section 10 to Whittier & Green, of Los Angeles, who are to begin boring in a week or so.

A report comes from Colinga, which is verified in the city papers, to the effect that a gusher has been opened which wasted 2,000 barrels of oil before the flow could be capped. Another well, larger than the Blue Goose has been also opened. The capacity of the Blue Goose is about 1,100 barrels per 24 hours. Canfield & Co. are the owners of the large well.

The outlook in the new Kern river fields is encouraging, and great things are hoped for in this direction by the numerous development companies.—*Kern County Echo.*

SAN BERNARDINO COUNTY.

Borax Shipment.

Dennis Searles was in town last week. He has gone out to Garden Station and Borax Lake to look after the property and also to ship 50 tons of borax from Johannesburg. Dennis Searles is a young man, and the only son of Mr. Searles, who was so long identified with this country, and who, more than any other one man did more to make it habitable for white men. Mr. Searles, senior, died a couple of years ago and left his interests to his son Dennis, who now owns a one-third in-

interest in the property of the San Bernardino Borax Mining Company. The other two-thirds interest is owned by the Borax Consolidated Company, limited, of England, who own a controlling interest in all the borax of the world. When asked if there was a likelihood of the works starting up soon, Mr. Searles said he knew no more about it than any one else did. He is looking after their interests and is acting under orders from headquarters in coming here and making the small shipment of 50 tons. He will only remain here a few days, going back to San Francisco.—*Randsburg Miner*.

SAN DIEGO COUNTY.

A deed transferring the Elevada mine and millsite and the Agua Jita mine in the Julian mining district, from C. F. Holland to N. D. Jones, of Pittsburg, was filed in the County Recorder's office of San Diego County. The property adjoins the ranch, and is about three miles east of Banner. There is also included in the transaction a piece of property adjoining the mines, together with all dips, spurs and angles of all ledges and mines situated within the boundary lines of the mining claims. The deed was signed on July 3 of this year, although negotiations have been carried on for the purchase of the mining property for a year. The consideration mentioned in the deed is \$1, but the real price is said to be \$17,500.

The Dulzura placer mines, 30 miles southeast of San Diego, which were the first placer discoveries made in California, are today attracting considerable attention. The formations are originally called dikes, which by the action of air and water during the past centuries have decomposed and crumbled the dikes to rich placer deposits. They run to and across the Mexican line. The so-called ores assay \$8 per ton of gold and are easily worked. The mines are also easy of access, and only lack water and fuel to thoroughly develop them on a paying basis. At present there are 17 dry washers at work that pay moderately well. Mr. Gordon, the agent of these mines at San Diego, feels confident of their success.

TUOLUMNE COUNTY.

General Superintendent Newcomb arrived in Jamestown last week, to complete final arrangements for the placing of a sixty-stamp mill on the property of the Harvard Gold Mining Company.

South of the Tuolumne River, the Long-fellow mills running on ore from the 185 foot level. At the Mount Jefferson mine, Groveland, a fine ore body has been developed on the 300 foot level.

The F. B. Smith pocket claim on the Fleming vein, located about one mile from Campo Seco, has been generous to its owners of late. Within the past four months pockets containing an aggregate of \$8,000 have been found. Nine pounds of gold, worth \$17.50 per ounce, was shipped in one day. One nugget exhibited weighed \$1500.

COLORADO.

Mr. Henry Sandbothe of Denver, who owns the Little Henry mine on the Montgomery slope of Mt. Lincoln, in the Consolidated Montgomery district near Alma has disclosed on his mine a true fissure vein of rich gold-bearing quartz. He took samples of the mineral along which he will have thoroughly tested in Denver. The vein is at present from six to eight feet in width in mineral.

The discovery attracts the widest attention, as it was generally supposed that fissure veins did not exist on Mt. Lincoln in this section of the country.

The Keystone placer, located on the San Miguel river, four miles west of Telluride, promises to soon become one of the great producers of Colorado.

These immense gravel deposits have been known for a number of years to contain gold in paying quantities, but hitherto every attempt to reach bedrock has resulted in failure, hence they could not be successfully worked. A year ago Prof. Robert Casey secured a bond and lease on this property and began systematic development in the search of bedrock, supposed by experts to lie more than 100 feet below the deepest old workings, which would make the attempt practically impossible. Bedrock was reached a few days ago at forty-three feet.—*Western Miner and Financier*.

IDAHO.

During the past eight years the mines owned by Captain De Lamar at De Lamar, Idaho, have produced \$6,323,000, out of which dividends amounting to \$2,350,000 have been paid, or 117½ of the original capital invested.

L. J. and F. L. Beique and William Strachan of Montreal arrived last week in Wallace and are looking over the Cœur d'Alenes. Mr. Beique is one of the leading attorneys of Canada, having been one of the Queen's Counsel employed in the fishing question with the United States.

Except the Tiger-Poorman and the Morning, all the big mines in the district are running with approximately full crews. The Tiger had trouble with its pumps and the lower level of the mine flooded, says the *Wallace Press*. It is now being pumped out and a number of men are at work. The Morning has about one-third of its normal force with additions almost daily.

W. T. Hales, who bonded the Panhandle group a week ago for \$40,000, has been doing a little work on the property and is highly pleased with the outlook. He says he has no doubt that he will make a mine of it.

KANSAS.

Mining in Kansas.

That the state of Kansas is to rank in the future as a producer of something more than cyclones and sunflowers, is, according to the *Denver Republican* of the 26th ult., an assured fact. A correspondent of that paper writing from Ellis, Kan., tells of the important discovery on the Smoky Hill river of a great bed of mineralized conglomerate, which carries good values in gold, silver and zinc. The formation in which these values are found is an easily worked shale and contains fossils of deep sea creatures and fish and rare shells. It, however, appears to be a schist formation, slate colored and heavily stained with zinc. Assays have been made which show values all the way from a trace to \$60 in gold, 20 per cent. zinc and some silver, the best returns coming from fossil selections.

Options have been secured on a large tract of land, by two companies. Many ranchmen refuse to either sell, lease or bond their land. There is a heavy travel to the prairie mining camp. It is said the Union Pacific contemplates building a branch to the district, which lies in the western part of Ellis and the eastern part of Trigo counties.

MICHIGAN.

Work at the Elba mine has been suspended for 30 days on account of the water. New pumps are being placed in the mine and as soon as they are put in operation Supt. MacCarty expects to have no further difficulty with the water.

Shipping began at the Franklin group last week and a large tonnage of ore is sent to the docks each day. Over 150 men are now employed and more men are being taken on each day. Superintendent Parmelee stated that about 1,000 tons would be shipped from the three properties each day until the shipping season closed. No ore has yet been taken from the stockpiles.—*Iron Ore*.

The Hays Mining Co. will begin unwatering the Ashland mines near Gogobic next week. Several Prescott pumps have been purchased and are now being set up. It is hoped that the work will be finished in sixty days.

Work will not begin at the Germania until the water is removed from the Ashland. Drifts will then be made through under the river and will connect with the Germania at the eighth level. This will practically unite the two mines. It will probably be late in the fall before any ore will be lifted at the Germania.

It is reported that Bessemer parties will reopen the Ruggles, Della and other explorations in the vicinity of Upton, Clare county.

Mr. S. S. Curry has located a vein of ore fifteen feet in width at a depth of forty feet on the Bourne property west of Gile. A crew is now crosscutting to locate the foot wall, after which the ore body already cut will be further explored. The ore is of excellent quality.

At the Hennepin, near Ironwood, Captain Sullivan has a number of men at work putting the old boiler house in repair and as soon as this is done and some hoisting machinery put in, old No. 1 shaft will be opened and ore will be taken out.

Capt. Sullivan is continuing testpitting at the Snider, near Ironwood, and now has half a dozen pits down, part of them bottomed in ore. He will thoroughly explore the property and Daylight.

The work done by the Calumet & Hecla Mining company upon the Osceola amygdaloid has been accompanied by the most gratifying results. The No. 16 shaft which has been started at the northern end of the company's property is proving to be one of the best on this lode. It is full of rich copper rock, and is the delight of the shareholders who have seen it. The company now have five shafts sinking on the Osceola amygdaloid which will take care of the territory on the strike of the vein upon their lands. The shafts will not be so close together as upon the conglomerate, as they will adopt some sort of rapid power tram for conveying the rock from stopes to shafts. The distance between the shafts is 2,400 feet.

MISSOURI.

Joplin Ore Market.

The condition of the ore market has been more satisfactory than for months past, and the outlook is bright. The ore buyers paid the Association scale price for all ore and several cars of top grade sold for \$45 per ton, \$2 above the Association price for 60 per cent,

says the *Engineering and Mining Journal*. A large amount of ore sold at \$43 per ton, and the lower grades sold well up. This, with the heavy demand and large output sent the value for the week above \$250,000 again. Lead sold throughout the week for \$27.50 per 1,000. There is every prospect for a continuation of good prices, and it is believed that the conference between the smelting interests and the ore producers will result in establishing a minimum selling price for six months. As compared with the preceding week, the sales show a decrease of 76,840 lbs. of lead, an increase of 2,422,230 lbs. of zinc, and the value was greater by \$57,770. During the corresponding week last year top grade zinc ore sold at \$26 per ton and lead at \$23 per 1,000. The sales were less than the past week by 3,331,380 lbs. of zinc, 25,720 lbs. of lead, and the value was less by \$126,530. For the first 30 weeks of last year the lead sales were greater than this year by 5,586,110 lbs., but the zinc sales were less by 71,003,760 lbs., and the value was less by \$2,848,324. Following is the turn-in by camps:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin.....	1,623,280	237,640	\$41,271
Galena-Empire.....	3,163,740	233,020	63,914
Cartersville.....	1,505,310	249,450	36,866
Webb City.....	498,920	33,720	10,906
Oronogo.....	80,810	.....	18,959
Belleville.....	623,790	.....	13,412
Duenweg.....	385,620	59,660	8,582
Hells Neck.....	166,020	16,310	4,018
Cave Springs.....	132,350	5,290	2,393
Central City.....	358,660	490	6,825
Stotts City.....	307,650	.....	6,461
South Jackson.....	338,730	25,000	7,122
Alba.....	45,200	.....	994
Aurora.....	1,232,000	11,270	21,259
Granby.....	369,000	15,000	7,054
Carthage.....	108,820	.....	2,285
Wentworth.....	39,440	.....	789

Total for week... 11,769,340 886,850 \$253,110
Total 30 weeks... 304,599,180 27,102,310 \$6,573,974

MONTANA.

The East Butte Mining Company is sinking a two-compartment shaft on the south side of the canon near Columbia Garden, Silver Bow county. It is now down 40 feet, in going which distance it is said to have cut a 10-foot ledge assaying 4 per cent in copper. In the tunnel which has been run above the shaft it is claimed that four ledges were struck, one of them assaying from 12 to 25 per cent in copper. At present the hoisting is being done by hand, but it is the purpose of the company to install a hoisting plant at an early day. The opening up of a good mine there would make things lively in the vicinity of the garden.

The New York and Butte Mining Company is sinking a shaft on the Murray placer, not far from Silver Bow shaft No. 3 near Butte. The company has put up three 100-horsepower boilers with ample pumping machinery. The shaft, which has two compartments, is only a few feet from the Harrington placer of the Butte & Boston Company, where large and valuable deposits are known to exist. There is said to be a copper glance lead in the Silver Bow No. 3, and the New York & Butte Company hopes to find something of the same character. The formation is placer ground with quartz ledges in it, the placer being about 200 feet deep to the bedrock. The work is under the supervision of the Glass brothers.

Stocked for \$2,000,000.

The American Mining and Milling Company is the name of the latest company organized for the purpose of mining in the

Libby district, and from a letter received from Mr. Whitworth of Cleveland, Ohio, who is one of the principal owners and promoters of this enterprise, the machinery for the mill which it is intended to erect on the property has been purchased and is now on the road to Libby. This company has acquired the Gold King group of claims on the West Fisher from George Robinson and others of Libby, which are situated on Blacktail mountain, one of the best known landmarks for mining men in that section. These claims have been developed for several years past, and the showing made is a good one, and those who have organized this company feel justified in putting in a mill at the present time.—*Anaconda Standard*.

NEVADA.

Big Antimony Mine in Nevada.

Charles L. Taylor and John M. Fulton of Reno bought from Samuel Hunt, Orrin Bennett and S. L. Thacker, the largest antimony mine in the United States, there being it is said, over 20,000,000 pounds of high grade ore in sight. The price paid could not be ascertained. The mine is located in Humboldt county about seventy miles north of Winnemucca.

Silver Peak Notes.

Leidy & McAfee's mill, known as the Grasshopper started up and is pegging away on the best batch of ore ever worked there. It is rich in free gold, and as they have new plates, they expect a big clean-up. The mill is "out of doors," as it were, for the machinery is not housed in yet. The engineer goes around firing and oiling up with an umbrella over his head, and the battery feeder has to turn round every time he wants to cool off his sunny side. But the mill works all right and the boys have a good show to make some money. They are taking out ore at the mine and will run the mill steadily.

Henry Jaegles shipped another carload of ore last week to Selby from the Homestake, and Sam Case is going to work about 50 tons from the same mine at the mill here.

Barnes, Cunningham and Kyser are taking out good ore.

Berger & MacNamara have a gold mine at Alida which is very promising. They have crosscut for 20 feet and are not through it yet. They intend to develop it this summer.—*Walker Lake Bulletin*.

NEW MEXICO.

Elizabethtown Notes.

The Confidence mill is running on ore from the Independence this week.

Tom Pulliam and associates have struck the lead in the tunnel of the Rosita. This property is adjoining the Aztec, situated on the east side of Old Baldy.

H. H. Aigne received the first of last week two of the Barr patent amalgamating sluice boxes. They have been placed and are now being used in connection with his sluice boxes on the Moreno placers.

Messrs. McIntyre, Davis and Sparr are sinking a shaft on the Bobtail extension for the Smithfield Co. They found the vein near the surface and are sinking on it. The ore found is of the same kind and value as the Bobtail proper.

Messrs. Johnson, Lawson and McKay are operating the Rebel Chief No. 2, situated on the Ute creek side of Baldy. This property

contains some high-grade ore that will pay to ship, and these parties are sacking the ore as fast as mined and will ship the same to Pueblo.

The Ruby King and High Five, two good properties on upper Red river, have steadily increased in value and width of veins from the very first tests made, says the *New Mexican Miner*. Assays running \$35 and \$40 have recently been had on these properties. J. C. McCullum and associates are locators and owners of these claims.

OREGON.

Bohemia Mines.

In the Wall street group of mines in the Bohemfa district near Cottage Grove, ore has been struck which assays \$67 in gold, silver and lead, and this ore is pronounced very desirable for smelting purposes, as it contains material for fluxing the more rebellious rock. The vein, although but four inches wide on the surface, thickens as it is followed down, and at a depth of 20 feet had increased to 18 inches, with well-defined walls. A tunnel is now being run, which when in 60 feet will strike the vein at a depth of 128 feet from the top surface. A contract has just been let for running 100 feet of tunnel on the White Swan, which is owned by Eugene capitalists. This is a very promising prospect, as it is situated on the same lode as the Musick mine, now working a large force of men in getting out ore for the 15-stamp mill in constant operation. A number of teams are also busy, hauling concentrates from the Musick mine to Cottage Grove for shipment to the smelter at Tacoma.

A 5-stamp mill on the Helena is chewing up ore to its full capacity, and there is a large amount of rich rock on the dumps, the result of several months' development work. The amount of ore in sight, though not yet mined, Mr. Davidson says, is very encouraging to the owners of the Helena. The Harlow & Stokes mine, near the Helena, is also running a 5-stamp mill. The latter mine gives great promise as a rich ore producer.

SOUTH DAKOTA.

Fred Zipp, of Deadwood, has leased the Commonwealth mining claim to David Arnold. The claim is located near the Golden Crest and there is ore in sight.

A 20-foot shoot of ore has been encountered on the Edna mining claim, in the Ida Gray district, which will run \$40 a ton gold. The ground is under lease to Sol Burns.

A great deal of work is being done in developing mining ground around Hill City. On Friday gulch there are several promising properties, which have been opened up by shafts to a depth of 50 feet or more. The ore is free-milling and assays have been obtained which were very rich in gold.

UTAH.

The machinery for the Apex concentrator at Park City is all in place and in a few days will be in operation.

The American Smelting and Refining Co. has decided to erect another stack at the Germania plant at Salt Lake City. Ore supplies are increasing so rapidly that this is absolutely necessary.

Work on the Creole in West Tintic, the property of Messrs. Rumpp and Turner, of Silver City, is going on. The tunnel has been

run in a distance of 40 feet on the vein, and they have started to sink a shaft. They have about five tons of very good ore on the dump which was taken out in running the tunnel.

Returns on samples from the Wandering Jew in Davis county give 23.8 per cent. lead and \$13.22 in gold per ton.

The Eutonia mining company has been organized to develop the Bryan group of seven claims in Erickson district, Tooele county.

The Paymaster mine in the Tutsagubet mining district, near St. George, has been bonded to Samuel L. Adams, of that place, for \$40,000.

On account of bad air, work on the Alice mine at Park City was temporarily suspended last week. A fan was put in and work was resumed.

There is a fine showing of copper in the Steele group, just below Park City, which promises to reward the owner of the group, who has been working and waiting for returns for thirteen years.—*Juab County Republican.*

WASHINGTON.

The Butte & Boston Company, of Republic, has been reorganized as the Butte & Boston Gold Mining and Milling Company, with the following trustees: Phil Aspinwall, J. H. Wilmot, W. B. Heyburn, B. E. Barinds, W. S. Norman and D. Holzeman, of Spokane, and J. H. Forney, of Moscow, Idaho. P. Aspinwall will act as manager.

On the King Solomon, one of the first locations on Palmer Mountain District, near Loomis, an incline shaft has been sunk 130 feet on the vein, which averages 5 feet wide. The ore runs in silver, copper and gold, the principal ore being silver. A contract has been let for another 100 feet on the incline.

The Golden Zone Mining Company, near Loomis, has four adits amounting to 2000 feet. They are about 100 feet above the base of the mountain. The company is now making a raise and sinking a wize to connect them. Many surface improvements have been made in the way of mess and bunk houses, residences and office. A 30-ton concentrator is now being installed.

The Webe Group, at Loomis, has been taken over by Fargo, N. D., and Milwaukee, Wis., people, who have instructed A. M. Webe to contract for about 1,200 feet of work in shafts, adits and drifts. A steam hoist and other machinery, as well as cars, track, etc., will soon be purchased, and the force of 10 men increased.

FOREIGN MINING NEWS

BRITISH COLUMBIA.

D. A. Holbrook was in Rossland from Boundary City. He had with him a number of handsome specimens from the properties of the Boundary City Mining and Milling Company. The handsome specimens are from the Gold Bug claim. They carry large quantities of native silver, besides 12 ounces in gold. It is claimed that the vein from which this was taken is about four feet in width, and that the ore will average \$500 to the ton. This seems very high, but a look at the specimens would convince the most skeptical that this average is under rather than over the amount of the values that the ore carries. The other specimens from the Spokane and S. H. B. averages \$40.44 to the ton. This ore carries a large percentage of copper. Work is being carried on under the superin-

tendence of Mr. Alex. Sharp, late foreman of the Columbia and Kootenay. Mr. Sharp is sanguine about these properties, and he says the group is as good as the Columbia and Kootenay. The work at present in progress consists of sinking a shaft and running a tunnel into the Gold Bug. Both are on the same vein. The intention is to increase the force as the occasion demands, and to ship as soon as the railroad is ready to receive the ore. Superintendent Sharp says he is ready to begin the shipping of ore at any time.

Million Dollar Smelter.

Paul Johnson, a graduate of the Royal School of Mining, of Stockholm, Sweden, and John Norborn, of Union Iron Works, San Francisco, have arrived in Seattle, Wash., en route to Greenwood, B. C., where Johnson, as the representative of an \$8,000,000 English syndicate, will construct a copper smelter, at a cost of \$1,000,000.

The plant will be the largest in the Dominion of Canada, and of the most modern pattern. It is to be devoted exclusively to the treatment of copper ores, and will be completed in November. The Union Iron Works has the contract for all the iron work, and Norborn is also to look after the matter of supplying power for the plant.

MEXICO.

Mr. L. O. Cowan is reported as having negotiated the sale of his gold property at La Calera, 37 miles southeast of Magalena. The price is stated at \$60,000.

In the Ahogado mine a vein of very rich silver ore 12 feet wide has been recently cut. Mr. J. D. McGilvray, the superintendent, and the lucky owners are greatly elated over the find.

Don Manuel Tamborel of the Sierra Pinta mines in the Altar district, has gone to Guaymas to attend to shipping up the coast a consignment of machinery. The mine is about eleven leagues from the coast.

Mr. C. W. Hayes and associates, who are operating properties northeast from Imuris, have enroute from Denver a carload of machinery. They are building a wagon road from Casita station and will tranship at that station.

It is credibly reported that Mr. Talbot has sold La Cuchilla, a very productive gold mine located about three leagues from Altar. The purchaser is a Mr. Weir of Shasta county, California, and the price is stated to be \$30,000 gold.

Messrs. George and Mark Wanless have recently denounced a very promising copper property within three hours' ride of Hermosillo, which has long laid open to location but was considered by no one worthy of attention. They have uncovered a 60-foot ledge of good copper ore carrying some value in gold.—*Nogales Oasis.*

GENERAL NEWS.

The Smelter Strike.

The operating committee of the American Smelting and Refining Company held a meeting, August 3, and decided not to reopen the smelters in Denver and Pueblo at the scale recommended by the state board of arbitration. The committee published a card in which it says:

"The decision of the board of arbitration cannot be accepted by the American Smelting and Refining Co., because it is unreasonable and unjust."

SAMPLING PLACER DEPOSITS.

(BY EDMUND B. KIRBY.)

[Continued from our Issue of July 15th, 1899.]

Sampling Gravel.—In practice, gravel for tests is conveniently washed either by the pan, the rocker, or by small sluices. In pan tests, at each point sampled, a number of pans of gravel are taken at uniform distances apart, down the exposed face of gravel. On account of the variation in the different layers, much judgment is necessary to do this properly. The bank may comprise stones of every size, and only the finer and richer material filling the interstices between the larger stones can be taken into the pan. The sample is, therefore, limited to material less than three or four inches in diameter. In most beds this pan-size gravel ranges from 25 to 60 per cent of the entire mass. This percentage should be estimated. It is not possible to calculate from it the value of this entire mass, because the larger stones are not barren. Much of the gold adheres to their surface, and fine gold seems to have a special tendency to do this. Hence if a pan test shows 20 cents per cubic yard of fine material tested, and this represents only 50 per cent of the mass, it is not correct to assume that the latter averages only ten cents per yard. The test merely fixes an upper and a lower limit, and the real contents lie somewhere between the two; in this case between ten and twenty cents.

Careful hand panning collects fine and scale gold perhaps more closely than any other practical method. It will be found best to wash down to the black sand, which is almost always barren, and then determine the gold by assay. 120 pans are generally called a cubic yard, but the error of measurement in this way is very great. It is better to measure the sample in a small box made for the purpose. The swell of loose gravel above its original bulk in the bank is generally about one-fifth, so that one cubic yard in bank is equal to 1.20 cubic yards in the measuring box.

If the gold is not too fine, and many points are to be sampled, and a large quantity is to be handled from each point, it is better to wash in a rocker instead of a pan.

On account of the difficulties mentioned, the only accurate tests are those in which the excavation of gravel is measured, and the sample taken is so large that it will include all workable sizes of stones, standing in the bank. This requires the use of running water in a sluice. The latter may be 12 or 18 inches wide, and, say, 36 to 48 feet long, with slat riffles arranged for easy removal. It is not necessary to use quicksilver unless the gold is very fine, and the quantity so small that a clean-up is difficult. The gravel from distant sample points may be hauled by wagon to the sluice. For gravel carrying fine gold, the writer has used an undercurrent attached to the sluice, but the additional saving has never exceeded $4\frac{1}{2}$ per cent of the total gold.

The following figures are taken from a certain case which is selected because it typifies a large class of the gravel deposits now remaining. It also illustrates the distribution of fine gold, and the comparative results of tests made by the methods above mentioned, and washing upon a large scale. The gravel was a heavy mass with the gold so fine as to average only 1-140 of a cent to a color. It was, therefore, very uniformly distributed throughout the mass. The tests were scattered over some 200 acres and represent only the general mass of gravel, as the exposures

had not developed any channel or other local concentration of coarse gold. The data from previous hydraulic washing on 60,000 cubic yards showed a recovery of 5.33 cents per cubic yard. Pan tests were made at some 50 points, each test including 6 to 20 pans. The face of gravel exposed at each point ranged from 6 to 30 feet in depth.

A single test was as follows: Vertical depth of gravel sampled, 25 feet; number of pans taken, 13; measured volume of sample, calculated to volume in bank, 0.119 cubic yards; total gold saved (by assay), 1.145 cts.; gold per cubic yard of sample, 9.65 cents; estimated percentage of bank represented in sample, 40 per cent; average contents of bank if large stones are barren, 3.86 cents; actual average of bank lies between 9.65 cents and 3.86 cents.

In order to show the range of values a list of the results is given:

RESULTS.

Contents per Cubic Yard (Cents)		Contents per Cubic Yard (Cents)		Contents per Cubic Yard (Cents)	
Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit
9.65	3.86	2.97	1.78	6.92	4.15
7.23	2.89	1.28	0.77	2.99	1.78
4.70	2.35	16.28	9.77	10.96	6.58
1.57	0.79	4.13	2.48	3.56	2.14
12.44	4.98	0.10	0.06	8.81	5.29
2.94	1.18	6.94	4.16	6.42	3.85
10.35	4.14	2.44	0.98	3.77	2.27
5.27	2.11	5.68	2.28	4.45	2.67
20.81	10.40	6.72	4.03	5.75	3.45
14.08	8.45	11.97	7.18		
8.91	4.46	9.47	5.68		
11.01	6.61	0.18	0.11		
6.80	4.08	2.07	1.24		

Another series of tests was made by careful sluice washing with an undercurrent on quantities measured in place, and ranging from 30 to 80 cubic yards each. The face of gravel sampled in each case ranged from 25 to 35 feet deep. The results were as follows:

- 6.83 cents per cubic yard.
- 5.78 cents per cubic yard.
- 7.61 cents per cubic yard.
- 5.16 cents per cubic yard.
- 6.86 cents per cubic yard.

These tests were so distributed as to make the arithmetic mean of 6.45 cents a correct average. This figure represents the mass of gravel which had already yielded 5.33 cents by hydraulic washing. Hence large scale work yielded 82.5 per cent of the contents as shown by small sluice tests. No doubt the difference is mainly accidental, because a few tests on such small quantities cannot check against the average contents of 60,000 cubic yards. The test sluice, however, has a slower current than the working sluice, and the undercurrent saved about 0.3 cent additional, so that a recovery somewhat higher was to be expected. A number of the pan tests were also taken from this particular ground, and these averaged 6.98 cents as the upper limit, and 2.86 cents as the lower limit. This indicates by calculation that the large stones in the bank carried about 6 o cents per yard, or almost as much gold as the pan-size gravel.

Excavations may be measured by the usual method of cross-sections. When a sample is cut down the face of a gravel bank, the writer has found it more convenient and accurate to use an artificial reference plane made by stretching two wires from top to bottom of the bank. The cross-sections before and after excavation are measured from this plane.

(To be Continued.)

THE SELF-COOLING CONDENSER.

(BY THOMAS L. WILKINSON.)

"This test showed that each 48-inch by 20-foot boiler would evaporate into steam 4,281 pounds of water per hour, giving a capacity of 115,587 pounds steam per hour with every boiler in operation. Coincident with the boiler test, one 18½ by 30 Buckeye engine was using the steam from the boilers under test. Indicator cards were taken at fifteen minute intervals for five hours. The result from the engine test of all cards showed a steam consumption of 46 8 pounds steam per indicated horse-power per hour.

"After the data derived from these tests had been analyzed, it was recommended that the Buckeye engine should be converted from the 18½ by 30 high-pressure engine into a 14½ and 25 by 30 tandem compound condensing engine; also that an additional 750 horse-power tandem condensing engine should be erected in the station, together with a cooling tower and the necessary condenser equipment, and that the only change in boilers should be to raise the working pressure. No increase in boiler capacity has been made.

"After investigation, the Barnard patent cooling tower was selected as desirable to best meet the conditions existing at this plant, which were minimum floor space, and minimum weight, and a considerable elevation above floor level of engine room.

"The cooling tower is of the twin type, having two chambers, with a pair of fans supplying a strong draft of air to each chamber. The interior dimensions are 12 feet 3 inches by 18 feet by 29 feet 6 inches high.

"The tower is mounted on a substructure of steel columns and I beams, supported on substantial foundations.

"There are outside galleries and ladders, affording convenient access to necessary points.

"The shell of the tower is of steel plate, re-enforced with angle and channel irons."

"The hot water from the condenser is delivered through a 10-inch wrought iron pipe, extending the whole length of each chamber, and slotted on top and perforated at the bottom, giving equal distribution to a series of water.

"Means are provided for cleaning these pipes, which is found necessary in cold weather, when the cylinder oil from the exhaust steam is liable to clog the pipes and interfere with the uniform distribution of water.

"The hot water falls from the distributing pipes over galvanized wire mats.

"Each mat is suspended by galvanized iron hooks, and is easily removed for cleaning.

"In actual service it is found that the water is uniformly distributed.

"The circulation of air is furnished by two

pairs of steam-driven fans, each pair of fans being mounted right and left on the same shaft, and the four fans being capable of delivering the necessary quantity of air when driven at a speed not exceeding 150 revolutions per minute.

"The air entering the tower chambers at the lower section is deflected vertically from each fan, thus avoiding cross currents, and affording a uniform blast upwards and between the mats.

"The rated capacity of each section of this cooling tower is to cool the circulating water needed to condense 12,500 pounds of exhaust steam, from an initial temperature of 132 degrees Fahr., when the atmospheric temperature does not exceed 75 degrees Fahr., nor the humidity 85 per cent.

"The following table, extracted from the log records of many months, shows details as to temperatures, speed of fans, reduction of temperature of condenser discharge, etc.

"As previously noted, the 18½ by 30 Buckeye engine was changed to a 14½ and 25 by 30 tandem compound condensing engine, by bolting new tandem cylinders on the existing frame and making necessary alterations in valve rods, etc.

"Please note the following data:

"Revolutions, 137; steam pressure, 113 pounds; mean effective pressure, 50.16 pounds; vacuum per gauge, 26 inches; horse-power developed in high-pressure cylinder, 163.42; horse-power developed in low-pressure cylinder, 168.48—total, 331.9 horse-power, and of this 90.52 horse power is below atmospheric line. It will be noted that the work is divided equally between the high-pressure and low-pressure cylinders; all cards show similar results.

"This change in an existing engine clearly illustrates the advantage derived from the condensing system.

"In addition to the tandem Buckeye engine, a tandem compound condensing engine, 20 and 36 by 42 inches, 120 revolutions per minute, Corliss type, built by the Pennsylvania Iron Works, was installed to drive a connected Stanley 500 Kilowatt two-phase A. C. generator. This engine works 15 to 17 hours per day.

"The usual work required from the cooling tower and condenser varies from 7 to 17 hours per day. A notable record was made on August 2, '98, when the run was from 7 A. M. until midnight; and from the records the following data are extracted:

	Maximum.	Minimum.
Temperature atmosphere...	103°	83°
Temperature condenser discharge water to tower....	128°	106°
Temperature injection water from tower.....	98°	91°

TABLE OF EXTRACTS FROM LOG-BOOK SHOWING TEMPERATURES, VACUUM, SPEED OF FANS, HEAT EXTRACTED THROUGH COOLING TOWER, ETC.

	1898					
	Jan. 31.	Feb.	June 20	July	August 26	Nov. 4
Time.....	9 p. m.	8 p. m.	8 p. m.	8 p. m.	8 p. m.	5:35
Temperature atmosphere.....	30°	36°	78°	96°	85°	59°
" condenser discharge water to cooling tower.....	110°	110°	120°	130°	118°	129°
Temperature injection water returned from tower.....	65°	84°	84°	93°	88°	92°
Degrees of heat extracted by tower.....	45°	26°	36°	37°	30°	37°
Speed of fans at tower, R. P. M.....	36	0	145	162	150	148
Vacuum at condenser, inches.....	25½	26	25	24½	25½	25
Strokes of air pump.....	30	30	37	44	43	28
Boiler pressure, lbs.....	110	110	120	120	120	112
Temperature boiler feed.....	212°	212°	210°	211°	213°	213°

Degrees of heat extracted by tower.....	32°	21°
Speed of fans, revolutions per minute.....	160	140
Vacuum at condenser, inches.....	26	26
Strokes of air pump.....	50	38
Boiler pressure, lbs.....	121	100
Temperature boiler feed.....	212°	200°
Engine horse-power developed.....	900 HP	400 HP

"A continuous heavy load was carried during the entire 17 hours' run. This was not a test record, but simply daily service.

"Indicator diagrams were taken November 8, '98, from 20 and 36 by 42 tandem compound condensing Corliss engine. The conditions were as follows:

Engine revolutions per minute..	120
Steam pressure, lbs.....	112
Vacuum at condenser, inches..	25
The area of the cards shows the work done in high-pressure cylinder to be.....	311.8 HP
And in low-pressure cylinder...	331.5 HP

Total, I H P..... 643.3 HP

"Work done in low pressure cylinder below atmospheric line, 185.1 horse power. Simultaneously with the engine, the air pump and fan engines were indicated.

The work done by the air pump.... 13.75 HP
The work done by the fan engines. 13.5 HP

Total external work..... 27.25 HP

The amount of work, if deducted from the work done below atmospheric line in low-pressure cylinder (*i. e.*, 185.1 horse-power), leaves a net gain of 157.85 horse power by the use of the condenser and cooling tower.

(To be Continued.)

Latest Mining Decisions.

Prepared by Andrews & Murdoch, Berrien Springs, Mich.

A member of a mining partnership has authority to employ a laborer to work in a mine belonging to the firm. *Lyman et al vs. Schwartz*, 57 Pac. Rep. (Colo.) 735.

Assessment work done for a mining claim may be done on an adjoining claim, where it is shown that it was intended for such a claim, and that the work done would inure to its benefit. *Kloppenstine vs. Hays*, 57 Pac. Rep. (Utah) 712.

A recital, in the location notice of a mining claim, that it is the relocation of another mining claim, is an implied admission of the validity of the former location. *Providence Gold Min. Co. vs. Burke*, 57 Pac. Rep. (Ariz.) 641.

A mining partnership exists between persons jointly engaged in working a mine under an agreement by which some of them are to furnish the money, others to do the work, and all to share equally in the result. *Lyman et al. vs. Schwartz*, 57 Pac. (Colo.) 735.

The fact that one of two joint locators of a mining claim is not a citizen of the United States, but the other is, does not invalidate the location, and a joint conveyance by them vests a valid title in the grantee. *Providence Gold Min. Co. vs. Burke*, 57 Pac. Rep. (Ariz.) 641.

Where one locates a mining claim on the theory that a former location by another was forfeited by failure to do the necessary amount of work thereon, the burden is on him to prove such failure in an action by the former locator to determine the right of possession. *Providence Gold Min. Co. vs. Burke*, 57 Pac. Rep. (Ariz.) 641.

Where mineral claims in litigation are lo-

cated on lands recently [a part of an Indian reservation, and which have not been open to occupation by white people except for mining purposes, the actual mineral character of the land involved must be shown, otherwise the court will not adjudicate rights therein in favor of either party. *Durant vs. Corbin*, 94 Fed. Rep. (U. S.) 382.

In an action involving the title and right to the possession of certain mining ground, a deed given by the original locator to plaintiff prior to the commencement of the action, for the purpose of correcting the description, is properly admitted, as bearing on the rights of parties. *Kloppenstine vs. Hays*, 57 Pac. Rep. (Utah) 712.

A location notice of a mining claim is admissible in evidence, though the location of the closing location line is indefinitely described, the location being sufficient in all other respects, and the proof showing that all the monuments were on the ground. *Providence Gold Min. Co. vs. Burke*, 57 Pac. Rep. (Ariz.) 641.

It is the policy of the government, in disposing of its mineral lands, to make a general distribution among as large a number as possible of those who wish to acquire such land for their own use, and it is contrary to this policy, and to the provisions of Rev. St. §§ 2230, 2231, to permit one person to cover more than 20 acres of placer ground by one location by the device of using the names of his employes or friends as locators. *Durant vs. Corbin*, 94 Fed. Rep. (U. S.) 382.

Under a contract for milling ores which provides that "said ores, rock, and earth shall be worked in the usual and ordinary manner of working like ores, and returns therefrom shall not be less than seventy (70) per cent of the pulp assay," the return is for an average of 70 per cent and not on each ton of ore furnished. *Fox vs. Mackey et al.*, 57 Pac. Rep. (Cal.) 672.

Although the owner of a mineral location, originally valid, has failed in his assessment work, so that the ground is open to relocation, yet if, before any valid relocation is made by others, or after the abandonment of a valid relocation, the original locator or his grantee resumes possession, and does the necessary work, his rights are revived under the original location. *Kloppenstine vs. Hays*, 57 Pac. Rep. (Utah) 712.

The provisions of Rev. St. § 2320, that no location of a mining claim shall be made until the discovery of the vein or lode within the limits of the claim located, is mandatory; and, to sustain an adverse claim filed against an application for a patent on a mining claim on the ground of a conflicting prior location, there must be evidence reasonably tending to show such discovery before the prior location was made. *Ledoux vs. Forester et al.*, 94 Fed. Rep. (E. S.) 600.

Defendant contracted to mill ores furnished by plaintiff, and return 70 per cent of the pulp assay. Plaintiff sued for an accounting, alleging fraud and conspiracy, and that less than 70 per cent was returned by defendant on a certain number of tons of ore furnished. There was allegation that the 70 per cent had reference to the pulp assay, or how much it fell short of 70 per cent, or when the ore was furnished. *Held*, that such complaint was insufficient. *Fox vs. Mackey et al.*, 57 Pac. Rep. (Cal.) 672.

Under Rev. St. § 2324, requiring a mining location to be distinctly marked on the ground so that the boundaries can be readily traced, in marking a claim regard must be had to the topography of the ground and the

markings must be so placed that they can be readily followed from one to another, and that a person accustomed to tracing the lines of mining claims can, after reading a description of the claim in the posted notice of location, by a reasonable and bona fide effort, find all the stakes. *Ledoux vs. Forester et al.*, 94 Fed. Rep. (U. S.) 600.

2 Hill's Ann. Laws, p. 1906, providing that miners' liens shall not bind the mine upon which labor is performed for a longer period than six months after the claim therefor shall have been filed, unless within that time a suit be brought for their foreclosure, provides an exception to 1 Hill's Ann. Laws, § 16, providing that absence or concealment of defendant shall prevent the running of the general statute of limitations, and the absence from the state of the agent of defendant mine does not prevent the running of the former statute. *Burns vs. White Swan Min. Co.*, 57 Pac. Rep. (Gr.) 637.

PERSONAL NEWS ITEMS

C. C. HOWARD, Jr., president of the Mount Shasta Gold mines, "Ltd." of California, has recently returned to San Francisco, Cal., from the East.

R. H. HERRON of R. H. Herron & Co. has returned to Los Angeles, Cal., after examining the oil-bearing territory of Colusa County, Cal.

FRANK OWEN of London and A. W. GRAZEBROOK mining engineers, of Dudley, Eng., have recently arrived in the United States to examine mineral lands in West Virginia for a London Syndicate.

H. Z. OSBORNE of Los Angeles, Cal., is examining mining property in Trinity County, Cal.

PROF. G. P. GRINSLEY of Topeka, Kans., returning from California, spent last week in examining the geological conditions of the most prominent Utah districts.

L. C. TRENT has returned to Salt Lake City, Utah, from London, Eng.

THE NATIONAL ASSOCIATION OF STATIONARY ENGINEERS have adopted a very generous policy, by securing for its members any position that may be possible to obtain. Employers of engineers should encourage such a policy, and make their needs known, when desiring to employ such engineer. See advertisement on page 20.

PATRICK CLARK of Spokane, Wash., was recently visiting in Rossland, B. C.

GAIL BORDEN, president of the Colorado and California Mineral Developing Co., of Los Angeles, Cal., has returned to his official duties after an extended pleasure and business trip through the East.

JOHN B. FARISH, M. E., of Denver, Colo., is in San Francisco, Cal.

THE TORRES & PRIETAS RAILWAY has secured the new wood contract with the Grand Central Mining Co. of Minas Prietas, Sonora, Mexico, and will begin delivery at once.

J. L. PARKER of Rossland, B. C., has been making an examination of the Salmon and Yellowstone sections of the Ymir Division, West Kootenay, B. C.

JOS. SMITH of the Grand Central Co., at Minas Prietas, Sonora, Mexico, will have charge of the work to be done for the company on the Verde mine.

DE PUTRON GLIDDON, who is president of several large Colorado mining companies, is in San Francisco, Cal.

E. N. WEBSTER of Minas Prietas, Sonora, Mex., has terminated his connection with the Grand Central Co., and gone to California.

JOHN B. HASTINGS, general manager of the War Eagle Mine, has been making an inspection of the mining outlook on the west coast of British Columbia.

SUPT. FRANKLIN LEONARD of the Sutro Tunnel Co. is in New York City, N. Y.

FINANCIAL NOTES.

Average Prices of Metals

In New York per 100 lbs. from January 1st, 1899:

Month	Copper	Tin	Lead	Spelter
January	14.75	29.48	4.18	5.34
February	18.50	34.30	4.49	6.28
March	17.54	33.89	4.37	6.31
April	18.91	44.98	4.31	6.57
May	18.35	28.76	4.44	6.88
June				
July				
August				
September				
October				
November				
December				
Average				

Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1899, and for the years 1898 and 1897:

Month	1899	1898	1897
	Cents.	Cents.	Cents.
January	59.36	56.77	64.79
February	59.42	55.07	64.07
March	59.04	54.90	63.06
April	60.10	56.02	61.85
May	61.23	56.98	60.42
June		58.61	60.10
July		59.06	59.61
August		59.54	54.19
September		60.68	55.24
October		60.42	57.67
November		60.60	57.91
December		59.42	58.01
Year		58.26	59.79

Comparative statement of the circulation in the United States on June 1st 1899. Comparison being made with statement on May 1st, 1899.

	June 1.	Changes.
Gold	\$724,282,177	I. \$23,294,735
Silver	133,479,197	D. 328,322
Legal Tenders	311,095,424	D. 961,981
Treas'y & N'U B'k N'tes	331,219,380	D. 1,216,868
Totals	\$1,500,076,178	I. \$20,697,504

Gold and Silver certificates and currency are not included in this table. By adding the amounts given in this table with those in the following will give the total amount coined or issued. The

figures herewith are furnished by the Bureau of Statistics Treasury Department.

Comparative statement of changes of money in United States Treasury during June 1st 1899, comparison being made with statement, on May 1st, 1899.

	June 1.	Changes.
Gold	\$139,459,075	D. \$18,666,234
Silver	422,200,268	I. 3,459,432
Legal Tenders	35,585,592	I. 961,981
Treas'y & N'U B'k Notes	4,952,689	I. 73,949
Totals	\$602,197,632	D. 15,199,472

The Gold and Silver bullion on hand in the Treasury is not included in this statement.

Gold and Silver Exports and Imports.

At all United States ports, for the month of May, 1899, and eleven months ending May, 1898, and 1899:

MAY.		1898	1899
Gold—			
Exports	\$ 109,157	\$2,049,255	
Imports	1,322,111	3,975,295	
Excess	I. \$1,212,954	I. \$1,926,040	
Silver—			
Exports	\$4,184,432	\$4,436,549	
Imports	1,574,479	3,010,353	
Excess	E. \$2,609,953	E. \$1,426,196	

ELEVEN MONTHS ENDING MAY.

	1898	1899
Gold—		
Exports	\$15,010,862	\$16,613,759
Imports	117,661,062	258,429,917
Excess	I. \$102,650,200	I. \$69,735,158
Silver—		
Exports	\$50,948,589	\$52,475,756
Imports	28,898,978	28,779,665
Excess	E. \$22,049,611	E. \$23,696,093

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

WANTS

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge, to all paid-up annual subscribers. Other than above \$1.00 per month. Advertisements not accepted for less than one month.

COPPER MINE. State full particulars in regard to development work location, distance from water, price of fuel, character of ore and returns from shipments. Must have at least 1500 feet of development work. Send all information possible. Address,

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Care THE MINING AND METALLURGICAL JOURNAL.
150 Nassau St., New York, N. Y.

GOLD mine anywhere in *United States*, must have at least 1000 feet of development; where coal is not over \$6.00 per ton or wood \$4.00 per cord delivered; plenty of water; no objection to low grade ore if profit can be made by having large plant to amalgamate and concentrate; want 6 months working bond; no property considered unless owners are prepared to deposit a *certified check* for expenses of engineer if property is not as represented. Address with price and full particulars

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METALLURGIST and Chemist, ten years experience, assaying, ore buying and smelting, at present engaged with large pyritic smelting company in Mexico, desires engagement in the States or British Columbia. Address: "W. H. C." JOURNAL OFFICE.

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The National Association of Stationary Engineers is prepared to furnish Engineers of guaranteed ability for any plant in the city or elsewhere. Give us a call.
Address: J. T. CHAMBERS, Sec'y,
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FOR SALE

A GROUP of 4 Copper claims in Northern Arizona. By-product of gold and silver, recently discovered and show great promise will sell at a great bargain.
E. R. HOTSCHILLER,
Dewey, Ariz.

TREMAIN Two Stamp Steam Mill at Tucson, Arizona. 15-H. P. Boiler Pump and every thing complete, set up ready for work. In excellent condition, used less than six months. Address DREDGING MINING MACHINERY CO. Kansas City, Mo.

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A VERY valuable, extensive Lead Mining Property in Southwest Virginia. Shafts sunk over 200 feet and actual work has demonstrated richness of veins and purity of ore. Address: GEORGE FRANK, Baltimore, Md.

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A 60-TON copper smelting plant, consisting of two 30 ton furnaces, one of which has new, seamless liner. Plant is complete in every detail. Also an 80-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of CA RINKER, WORTHEN & Goss, dealers in Mining and Mill Supplies, Tucson, A. T.

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New England Building, Cleveland, Ohio.
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Morgan-Watson Mining and Construction Co.
809-810 New England Building, Cleveland, Ohio
MINES AND STOCKS { We Buy, Sell, Lease and Bond Mines of all kinds
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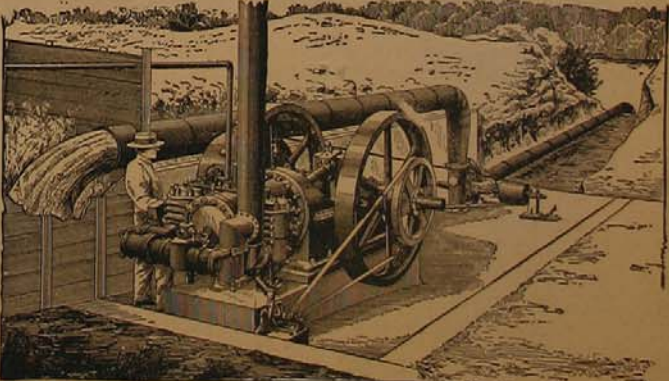
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MERCUR:
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Metallurgists & Chemists
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See Mining Stock Quotations Page 21

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MINING STOCK QUOTATIONS

BOSTON

Adventure	10 00	Mass	11 00
Aetna	4 00	Mercer	9 00
Albion	5 50	Mohawk	26 00
Anaconda	50 50	Napa Quicksilver	25
Arcadian	56 00	Old Colony Min.	10 25
Arnold	13 50	Old Dominion	37 00
Atlantic	32 00	Oscoda	88 75
Baltic	31 00	Parrott	57 50
Bingham	11 50	Pioneer	2 50
Bonanza	2 50	Quincy	150 00
Boston & Mont'	350 00	Rhode Island	7 25
Breccia	2 00	Santa Fe	11 37 1/2
Butte & Boston	77 00	Santa Ysabel	14 25
Calumet & Hecla	700 00	Tamarack	200 00
Catalpa	35	Tecumseh	5 25
Centennial	33 37 1/2	Tri-Mountain	10 50
Cochiti	12 00	Victor	3 50
Copper Range	45 00	Victoria	5 50
Crescent	30	United States	21 00
Dominion Pref.	116 50	Utah Mining	42 25
Franklin	19 50	Washington Mining	25
Gold Dredging	34 50	White Knob	11 50
Humboldt	2 75	Winona	13 50
Isle Royale	45 00	Wolverine	45 50
Melones	4 00	Wyandotte	5 50

ROSSLAND, BRITISH COLUMBIA.

Brand'n & G'd Cr'k	29	Kootenay Gold F.	—
Brit-Amer. Cor	6 25	Lerwick	—
Brit-Col. Cor	6 00	Lily May	57 50
Canad. G'd Fields	08	Lon & Van M. D. Co.	—
Carribou	1 23	London R. C. G. F.	9 00
Commander	—	Monte Cristo	07
Deer Park	08	New G'd Fields B. C. S.	00
Dundee	20	Novelty	03 1/2
Evening Star	11 1/2	Queen Res. Prop.	3 75
Fern	35	Rambler Con	28
Gold Fields of B.C.	—	Red Mount, View	—
Hattie Brown	—	Reco	60
Hall Mines	2 75	Silver Bell	—
Homestake	05	Silver Queen	15
Iron Horse	10 1/2	St. Elmo	42 25
Iron Mask	70	Slocan Star	1 10
Josie	—	Vic. Tr. M. Dev. Co.	07 1/2
Jumbo	25 1/2	Waverly Mines	20
Kenneth	—	War Eagle Con	3 70
Keystone	—	White Bear	10

SAN FRANCISCO.

Alta Con	04	Mexican	48
Andes	11	Occidental	25
Belcher	34	Ophir	1 55
Best & Belcher	45	Overman	17
Bullion	06	Ontario	—
Caledonia	67	Plymouth	—
Challenge	26	Potosi	26
Chollar	28	Quicksilver	—
Confidence	1 00	Quicksilver pref'd	—
Con. Cal. & Va.	1 50	Savage	24
Crown Point	28	Seg. Belcher	07
Deadwood	—	Sierra Nevada	88

Gould & Curry	25	Silver Hill	02
Hale & Norcross	34	Standard	2 40
Homestake	—	Union Con	37
Iron Silver	—	Utah	14
Justice	17	Yellow Jacket	38

COLORADO SPRINGS STOCKS

Acacia	07 1/2	Hayden	01 1/2
Alamo	09 1/2	Ingham Con	08 1/2
Altamont	—	Isabella	04 1/2
American Con	04 1/2	Jack Pot	45 1/2
Anaconda	49	Kimberly	07 1/2
Aola	03 1/2	Lexington	12 1/2
Arcadia Cons	—	Magnet Rock	04 1/2
Argentum Junlata	26	Matos	32 1/2
Bankers	08 1/2	Montreal	—
Banner	02 1/2	Mountain Beauty	05 1/2
Bob Lee	04	Mollie Gibson	25 1/2
Creede & C. Co.	10	Moan-Anchor	1 10
Cripple Cr'k Con	—	Mount Rosa	25
Dance	12 1/2	New Haven	33 1/2
Des Moines	03 1/2	Oriole	08 1/2
Elkton Con	81 1/2	Orphan Bell	07 1/2
El Paso	41 1/2	Pharmacist	65
Emma Aimee	01 1/2	Pilgrim	1 10
Fanny R.	00 1/2	Portland	1 85
Favorite	04 1/2	Pr. Albert	04
Findley	17 1/2	Rattler	03 1/2
Fl'wer of the W't	03 1/2	Specimen	11 1/2
Golden Fleece	25	Theresa	03 1/2
Gold & Globe	05	Trachy	08 1/2
Gold King	85	Union	34
Goald	22 1/2	Vindicator	—
Granite Hill	02 1/2	Work	26 1/2

SALT LAKE CITY

Alice	68	Joe Bowers	18 1/2
Ajax	1 20	Joe Bowers Ex.	—
Alliance	05	La Reine	98
Anchor	10	Little Pittsburg	07 1/2
Buckeye	02 1/2	Lower Mammoth	41
Bullion Reck	5 75	May Day	65
Cent. Eureka	51 00	Mammoth	1 75 1/2
Chloride Point	70	Mercur	6 88 1/2
Daisy	30 1/2	Northern Light	55 1/2
Dalton	01 1/2	Omaha	26 1/2
Dalton & Lark	03 1/2	Ontario	7 25
Daly	1 60	Petro	79
Daly West	12 10	Rich. Anaconda	10
Dexter	2 00	Sacramento	45
Eagle	05	Shower Con	37
Eagle & Blue Bell	27	Silver King	40 25
Emerald	09 1/2	Star Consolidated	35 1/2
Four Aces	20	Sunbeam	47
Galena	21	Sunshine	60
Geyser-Marion	49 1/2	Swansea	3 82 1/2
Golden Eagle	03 1/2	So Swansea	1 55
Grand Central	8 25	Tetro	08 1/2
Homestake	03 1/2	Utah	68
Horn Silver	1 35	Valco	81
Ingot	15	West M'n P'cer	25

NEW YORK.

Adams Con	66	Isabella	80
Alamo	09	Iron Silver	50
Alice	1 00	Jefferson	13
Alliance	—	Jennie Blanche	57
Anaconda	55 13	Justine	01 1/2
Anaconda Gold	48	King & Pemb	01 1/2
Anchuria L.	70	Leadville Cons	09
Argentum Junlata	23	Little Chief	15
Belcher	22	Mexican	57
Best & Belcher	60	Mollie Gibson	25
Burl Gold	—	Mt. Rosa	23
Breece	1 70	Occidental	18
Brunswick	15	Ontario	6 75
Chollar	24	Ophir	1 10
Chrysolite	—	Pharmacist	04
Comstock Tunnel	04	Phoenix	11
Comstock Stocks	04	Plymouth	10
Comstock Supt.	04	Portland	1 85
Con. Cal. & Va.	2 20	Potosi	45
Cr. & Cr. Creek	09	Quicksilver	2 00
Crescent	15	Quicksilver pfd.	8 00
Crown Point	26	Rocky Mountain	—
Cripple Creek Con	11	San Juan Star	—
Deadwood Terra	85	Savage	20
Elkton Cons	91	Sierra Nevada	55
Enterprise	1 25	Small Hope	06
Good Samaritan	—	Specimen	06
Gold Coin C. Cr'k	—	Standard Con.	2 55
Gold Coin Gilpin	—	Syndicate	08
Golden Fleece	24	Union Con	33
Gould & Curry	40	Union	33
Gregory Gold	—	Utah Con	13
Hale & Norcross	33	Union Gold	—
High Five	—	Vindicator	—
Homestake	65 00	Work	24
Horn Silver	1 40	Yellow Jacket	33

SPOKANE, WASHINGTON.

Cariboo	—	Mountain Lion	1 20
Ben Hur	17	Morrison	—
Black Tail	15	Number Six	—
Bryan and Sewall	01	Palo Alto	02
Rutte and Boston	05 1/2	Pearl	—
Deer Trail No. 2	25 1/2	Picahontas	—
Earlman	03	Princess Maude	05
Eureka First Th't	04 1/2	Quip	11
Eureka Queen	05 1/2	Rebate	—
Golden Harvest	03	Republic	1 21
Gold Leaf	—	Republic Big Six	—
Insurgent	08 1/2	Republic No. 2	04
Iron Monitor	02 1/2	San Poil	57
Jim Blaine	23	Surprise	—
Liberly	—	Thoughtful	01 1/2
L. Pine Surp. Con	28	Tom Thumb	19
Merrimac	—	Trade Dollar	10
Monroe	01	Treasury	—
Morning Glory	12	Winipeg	—

DENVER STOCK REPORT.

Aetna	—	Keystone	12 1/2
Anchuria Leland	75	Lillie	—
Anaconda	49 00	Matos	32 1/2
Arcadia	64	Mollie Gibson	—
Argentum Junlata	28	Moon Anchor	1 10
Rainier	02 1/2	Mt. Rosa	25

Bob Lee	84	Old Gold	01 1/2
Elkton	31 1/2	Peoples	06
El Paso	41 1/2	Pilgrim	—
Enterprise	08	Pine Creek	—
Fanny B.	00 35	Portland	1 85
Garfield	15	Prince Albert	04
Geo. Washington	00 3	Republic	07 1/2
Golden Eagle	04	Sacramento	05 1/2
Gold Con	2 05	Smuggler	28
Gilpin & C. Co.	—	Specimen	11 1/2
Gilpin Four	—	Tamarack	—
Golden Fleece	25	Union	34
Iron Clad	05 1/2	Virginia M	05
Jack Pot	45 1/2	Work	26 1/2

MEXICO

Name of Company	State	Price
Amistad y Concordia	Hidalgo	32
Angustias	Guanajuato	340
Arvalo y Anexas	Guanajuato	200
Asturiana y Anexas	Zacatecas	140
Barradon y Cabras	Durango	49
Barotome de Medina	S. Luis Potosi	100
Cabezon y An.	Zacatecas	15
Candelaria de Pinos	Mexico	80
Capuzaya	Durango	30
Carmen	Hidalgo	460
Cinco Senores y An	Guanajuato	320
Concepcion y Anexas	S. Luis Potosi	100
Coronas	Mexico	75
El Oro	Guanajuato	20
El Oro, pref.	Guanajuato	30
Esparanza y An.	Mexico	1,500
Gloria	Chihuahua	50
Guadalupe	Guanajuato	250
Luz de Borda Aviado	Michoacan	30
Luz de Borda aviado	Michoacan	20
Luz de Maravillas	Hidalgo	150
Pabellon	Durango	250
Palma de Somb.	Zacatecas	80
Piñoles	Durango	2,000
Rafael y Anexes	Hidalgo	—
Real del Monte	Hidalgo	750
Restauradora	Durango	20
Rosario y Annexas	Durango	10
San Rafael	Hidalgo	100
San Rafael aviado	Hidalgo	400
San Rafael del Oro	Hidalgo	85
Ste. Maria de la Paz	S. Luis Potosi	720
Soledad	Hidalgo	280
Sorpresa	Hidalgo	240
Trinidad Aviator	Guanajuato	80
Trinidad Aviator	Guanajuato	80
Thausingo	Puebla	28
Union Hacieda	Guanajuato	380
Zona Min. de Paz	Guanajuato	68

Note—The above Mexican stocks are figured on the basis of Mexican silver

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Catalogue No. 72

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THE PORTLAND GOLD MINING CO.,
(Stock Transfer Office, Colorado Springs.)
Mines at Victor, Colorado.

COLORADO SPRINGS, COLO., May 19, 1898

The Ingersoll-Sergeant Drill Co.,
Gentlemen:—We bought two years ago one of the largest size of the straight line type of Ingersoll-Sergeant Piston Inlet Compressor.

This was found to be too small for our needs about a year ago and we purchased of you a Duplex Corliss machine 16" x 18 1/2" x 42".

This was set in place in our shaft house in the Cripple Creek District, 10,000 feet above the level of the sea, and has been running continuously ever since, and at times over 10 1/2" Eclipse drills. The steam cylinders were connected to an Independent Jet Condenser, for which we are using the mine water, and the resultant economy of operation is very noticeable.

The operation of this Compressor is as near perfect as that of any machine we have ever seen, and this type is well worth the extra cost on account of the great permanent economy in operation.

Our mine is equipped exclusively with your drills and we have only the highest words of praise to give them.

Yours very truly, The Portland Gold Mining Co.,
Jas. A. Burns, President

INCORPORATED MINES PAYING DIVIDENDS.

	NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
1	Aetna Cons	California	100,000	\$ 500,000	\$ 5	\$ 10	July 1899	\$ 180,000	Q.
2	Alamo	Utah	125,000	125,000	1	02	April 1899	2,500	G, C, L.
3	Alaska, Treadwell	Alaska	200,000	5,000,000	25	37½	Apr 1899	4,070,000	G.
4	Alaska Mexican	Alaska	200,000	1,000,000	5	10	Apr 1899	353,031	G.
5	Anaconda	Montana	1,200,000	30,000,000	25	1 25	May 1899	9,750,000	C.
6	Anchoria Leland	Colorado	600,000	600,000	1	03	Apr 1899	198,000	G.
7	American Gold	Colorado	300,000	3,000,000	10	09	Mar 1899	407,000	G, S, L.
8	American Coal	Maryland	60,000	1,500,000	25	1 25	March 1899	652,500	Coal
9	American Zinc, Lead and Smelting	Missouri	200,000	500,000	25	10	July 1899	20,000	Z, L.
10	Aurora	Michigan	100,000	2,500,000	25	50	June 1899	890,000	L.
11	Argonaut	California	200,000	2,000,000	10	10	June 1899	300,000	
12	Bald Butte	Montana	250,000	250,000	1	06	May 1899	702,148	G, C, S.
13	Bonanza Development	New Mexico	300,000	3,000,000	10	3 50	June 1899	1,500,000	
14	Boston & California	California	600,000	600,000	1	06	March 1899	38,000	
15	Boston and Colorado Smelting	Colorado	15,000	750,000	50	5 00	April 1899	375,000	
16	Boston & Montana	Montana	150,000	3,750,000	25	6 00	May 1899	10,775,000	G, C, S.
17	Breece	Colorado	200,000	5,000,000	25	05	June 1899	50,000	L.
18	Bullion Beck and Champion	Utah	100,000	1,000,000	10	10	June 1899	2,378,400	G, S.
19	Bunker Hill and Sullivan	Idaho	300,000	3,000,000	10	07	May 1899	705,000	S, L.
20	Cariboo	British Col.	800,000	800,000	1	01½	Feb 1899	248,965	G.
21	Calumet & Hecla	Michigan	10,000	2,500,000	25	20 00	June 1899	62,850,000	C.
22	Centennial Eureka	Utah	30,000	1,500,000	50	50	June 1899	2,120,000	S, L.
23	Central Lead	Missouri	10,000	1,000,000	100	50	June 1899	112,000	L.
24	Charleston	S. Carolina	10,000	1,000,000	100	2 00	June 1899	200,000	
25	Colorado Smelting	Montana	100,000	1,000,000	10	1 00	Jan 1899	1,945,000	G, S, C.
26	Consolidated Tiger and Poorman	Idaho	1,000,000	1,000,000	1	02	Dec 1898	20,000	G, S.
27	Creston Leasing	Colorado	1,000,000	1,000,000	1	01	Dec 1898	54, 00	
28	Crowned King	Arizona	600,000	6,000,000	10	02	Dec 1898	232,000	G, S, L.
29	De Lamar	Idaho	4 0,000	2,000,000	5	12	May 1899	2,346,000	G, S.
30	Deer Trail No 2	Washington	1,000,000	1,000,000	1	0025	June 1899	32,500	
31	Doe Run	Missouri	5,000	500,000	100	50	June 1899	75,000	L.
32	Empire State	Idaho	75,000	750,000	10	20	July 1899	185,638	
33	Fanny Rawlings	Colorado	1,000,000	1,000,000	1	01	May 1899	10,000	G, S.
34	Ferris-Hagerty	Wyoming	1,000,000	1,000,000	1	00½	Mar 1899	5,000	C, G, S.
35	Garfield Consolidated	Colorado	1,200,000	1,200,000	1	01	May 1899	34,000	G.
36	Golden Star	Ontario, Canada	100,000	100,000	1	01	July 1899	41,000	
37	Gold Coin of Victor	Colorado	1,000,000	1,000,000	1	01	June 1899	210,000	G.
38	Gold King	Colorado	1,000,000	1,000,000	1	02	May 1899	30,000	G.
39	Golden Cycle	Colorado	200,000	1,000,000	5	05	June 1899	198,500	
40	Grand Central	Utah	250,000	250,000	1	15	June 1899	531,250	G, S, C, L.
41	Gwin	California	20,000	1,000,000	50	25	June 1899	71,500	G.
42	Grass Valley Exploration	California	50,000	100,000	2	25	July 1899	12,500	
43	Helena and Frisco	Idaho	500,000	2,500,000	5	25	June 1899	550,000	S, L.
44	Highland	S. Dakota	100,000	10,000,000	100	20	July 1899	3,924,718	G.
45	Holy Terror	S. Dakota	300,000	300,000	1	01	Mar 1899	122,000	G.
46	Homestake	S. Dakota	125,000	12,500,000	100	50	June 1899	7,556,250	G.
47	Horn Silver	Utah	400,000	10,000,000	25	05	July 1899	5,270,000	S, L.
48	Idaho	British Col.	500,000	500,000	1	05½	Jan 1899	292,000	
49	Isabella	Colorado	2,250,000	2,250,000	1	02	June 1899	448,500	G.
50	Jack Pot	Colorado	1,000,000	1,000,000	1	02½	Mar 1899	25,000	G.
51	Jamison	California	390,000	3,900,000	10	10	April 1899	50,700	
52	Lake Superior Iron	Michigan	84,000	2,100,000	25	1 00	Feb 1899	736,000	L.
53	Lillie	Colorado	1,000,000	1,000,000	1	05	July 1899	285,380	G.
54	Modoc	Colorado	500,000	500,000	1	02	June 1899	140,000	G.
55	Montana Ltd	Montana	660,000	3,300,000	5	12	Apr 1899	2,997,557	G, S.
56	Montana Ore Purchasing	Montana	40,000	1,000,000	25	1 00	July 1899	1,200,000	
57	Morning Star	California	2,400	240,000	100	2 50	June 1899	732,600	G.
58	Mercur	Utah	200,000	5,000,000	25	12½	Jan 1899	1,266,000	G.
59	Mammoth	Utah	400,000	10,000,000	25	20	July 1899	1,430,000	G, S, C, L.
60	Mead	California	2,000,000	2,000,000	1	20	June 1899	120,000	G.
61	Monument	Colorado	300,000	300,000	1	01	Dec 1898	12,624	
62	Moulton	Montana	400,000	2,000,000	5	05	Feb 1899	480,000	
63	Mt. Shasta	California	20,000	100,000	5	30	May 1899	6,000	
64	New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	June 1899	1,650,000	S, G.
65	Napa	California	100,000	700,000	7	20	Jul. 1899	1,100,000	Q.
66	New Idria Quicksilver	California	100,000	500,000	5	20	July 1899	140,000	Q.
67	North Star	California	200,000	2,000,000	10	25	Apr 1899	550,000	G.
68	Original Empire	California	50,000	5,000,000	100	1 00	May 1899	500,000	G.
69	Osceola	Michigan	50,000	1,250,000	25	3 00	June 1899	2,801,500	C.
70	Parrot	Montana	230,000	2,300,000	10	1 50	May 1899	2,690,898	C.
71	Pennsylvania Consolidated	California	51,500	5,150,000	10	20	July 1899	84,975	
72	Pioneer	California	100,000	1,000,000	10	12½	Mar 1899	62,500	G.
73	Portland	Colorado	3,000,000	3,000,000	1	02	June 1899	2,197,080	G, S.
74	Plumbago	California	300,000	300,000	1	15	Jan 1899	45,000	G.
75	Quicksilver Pref.	California	43,000	4,300,000	100	50	May 1899	1,845,411	Q.
76	Quicksilver Consolidated	California	57,000	5,700,000	100	40	July 1899	643,867	Q.
77	Quincy	Michigan	100,000	2,500,000	25	6 00	August 1899	11,070,000	C.
78	*Republic Consolidated	Washington	3,000,000	3,000,000	1	01	June 1899	183,000	G.
79	Rancher-Cariboo	British Col.	1,000,000	1,000,000	1	01	April 1899	50,000	
80	Royal Consolidated	British Col.	2,500,000	2,500,000	1	01	June 1899	1,050,000	G.
81	Sacramento	Utah	1,000,000	5,000,000	5	00½	July 1899	92,500	G.
82	Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	Feb 1899	3,325,000	S.
83	South Swansea	Utah	150,000	150,000	1	05	June 1899	126,560	S, L.
84	Standard	Idaho	500,000	500,000	1	06	Apr 1899	1,745,000	G, S.
85	Standard Consolidated	California	200,000	20,000,000	100	10	May 1899	3,859,226	G, S.
86	St. Joseph	Missouri	30,000	3,000,000	10	50	June 1899	2,859,500	L.
87	Silver King	Utah	150,000	3,000,000	20	25	June 1899	2,425,000	S, L, G.
88	Smuggler	Colorado	1,000,000	1,000,000	1	01	June 1899	1,155,000	S, L, Z.
89	Swansea	Utah	100,000	500,000	5	05	June 1899	168,500	S, L.
90	Tamarack	Michigan	80,000	1,500,000	15	4 00	June 1899	5,910,000	C.
91	Tomboy	Colorado	200,000	2,000,000	10	4 00	May 1899	730,000	G.
92	Utah	Utah	100,000	1,000,000	10	02	Jan 1899	179,000	G.
93	Vindicator Consolidated	Colorado	1,500,000	1,500,000	1	05	July 1899	253,750	G.
94	War Eagle Consolidated	British Col.	2,000,000	1,000,000	1	01½	June 1899	335,250	
95	Wolverine	Michigan	60,000	2,500,000	25	1 50	Apr 1899	150,000	G.
96	Yellow Aster	California	100,000	1,000,000	10	10	May 1899	208,789	G.

S. Silver; G. Gold; L. Lead; C. Copper; Q. Quicksilver; I. Iron; Z. Zinc.

N. B.—Companies not listed paid nothing in the last twelve months. *Paid since consolidation, \$63,000; Republic paid \$120,000 under old management.

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The perfect vanner motion given to the pulp by our head motion together with the freedom from "jumping" resulting from the special rigid guides used, explains why the Cammett riffles never "pack," and why the table has such a great capacity when handling slimes.

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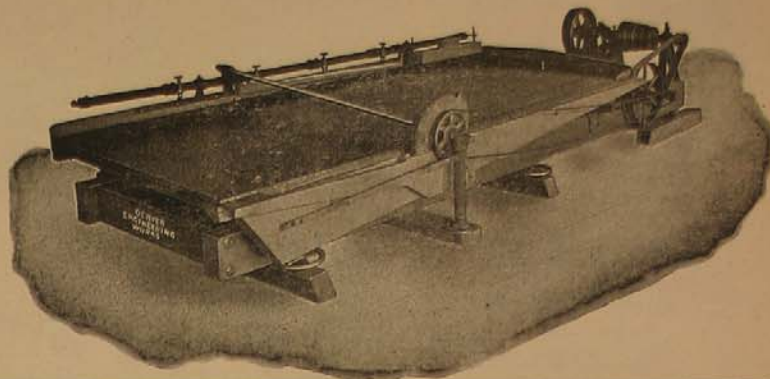
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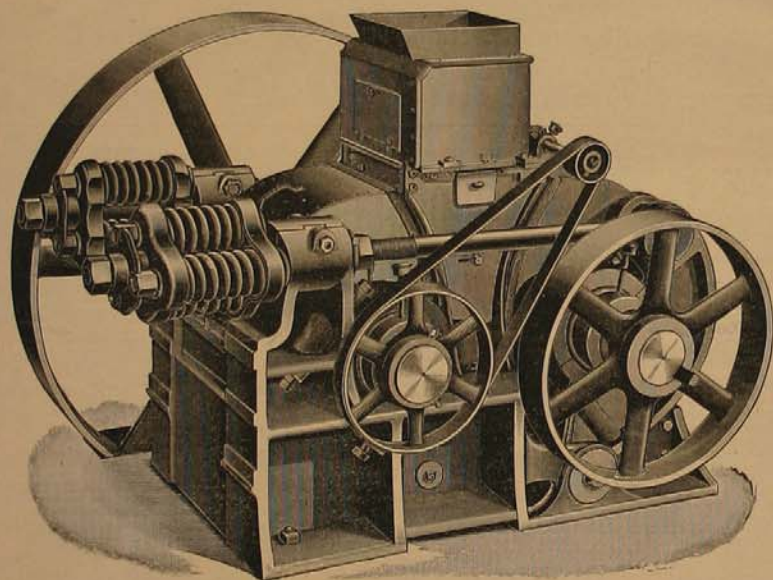
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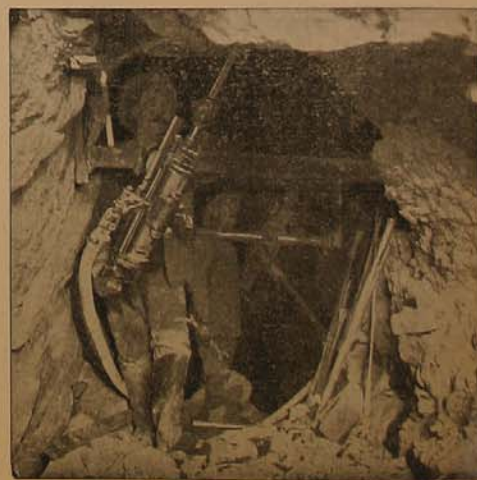
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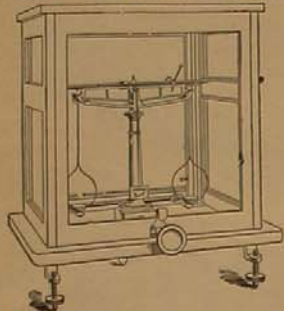
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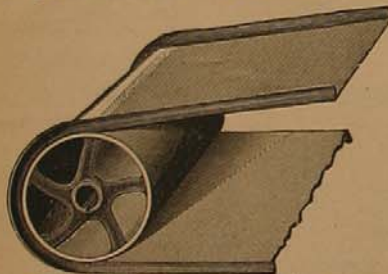
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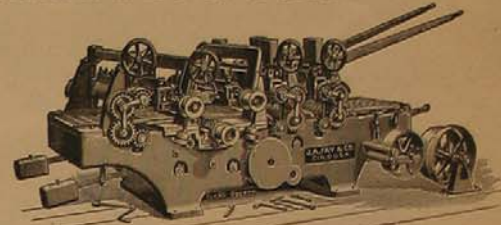
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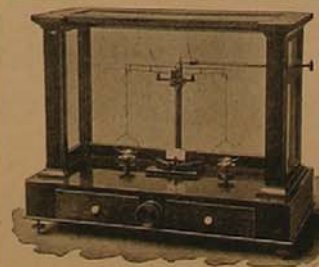
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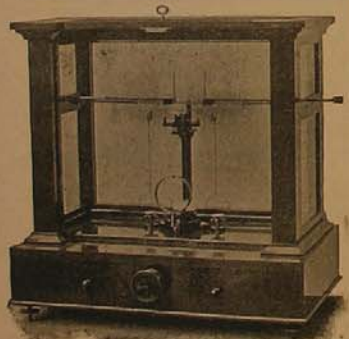
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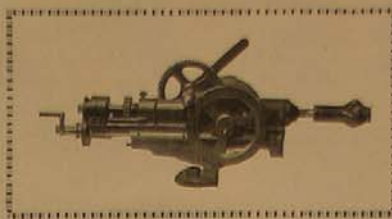
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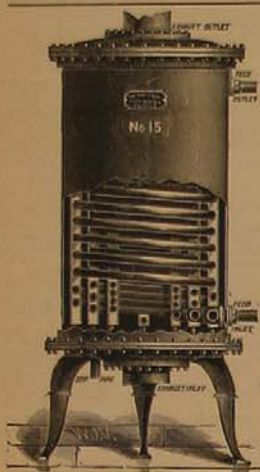
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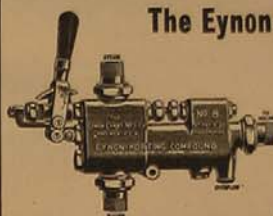
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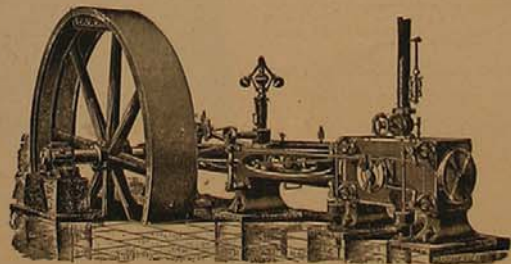
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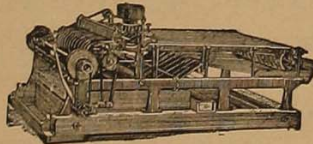
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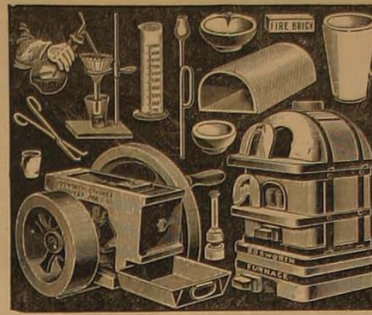
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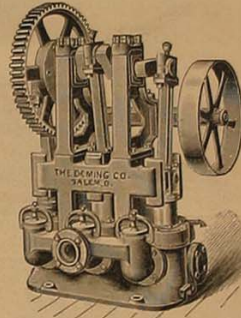
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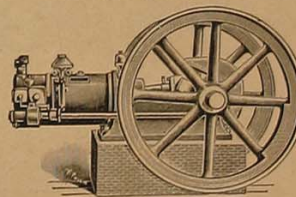
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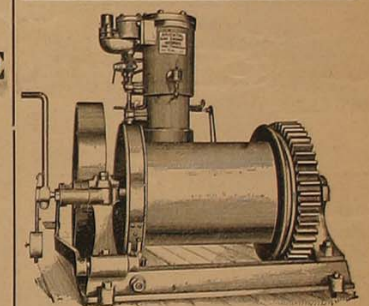
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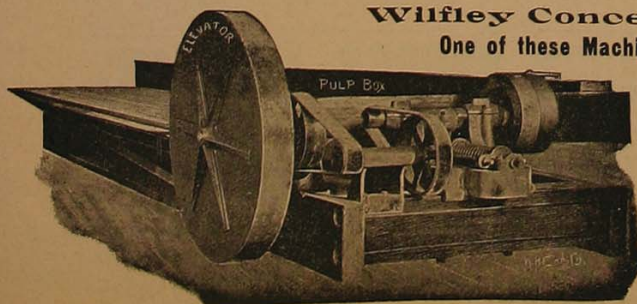
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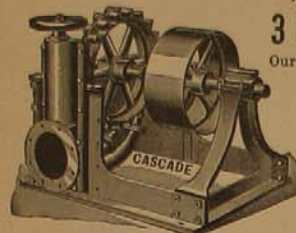
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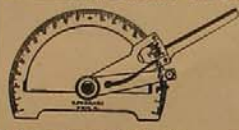
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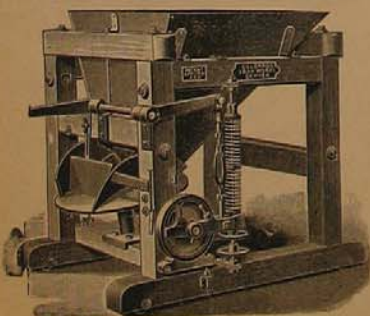
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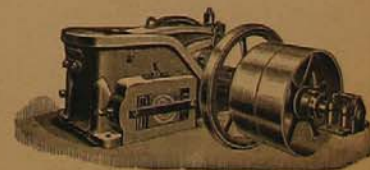
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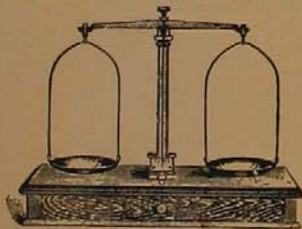


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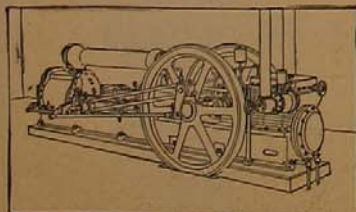


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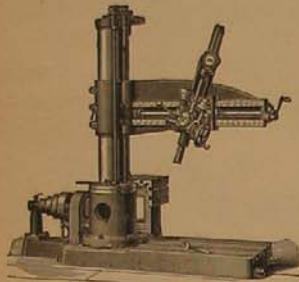
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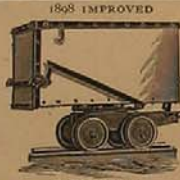
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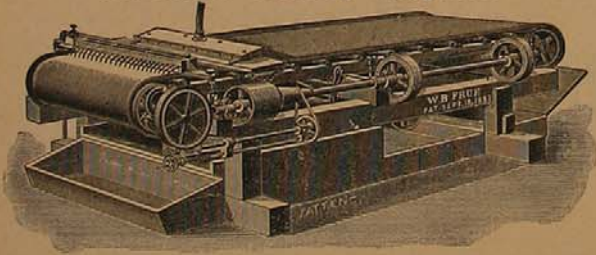
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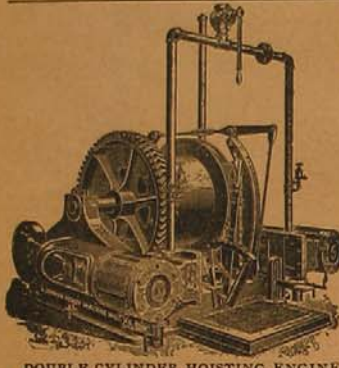
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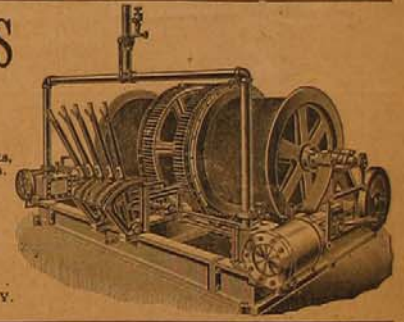
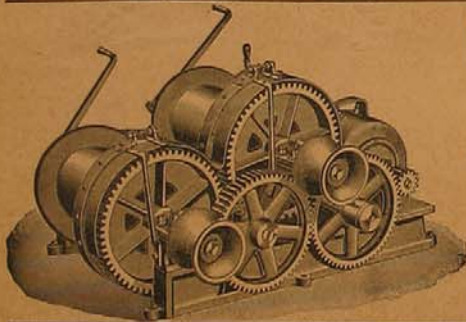
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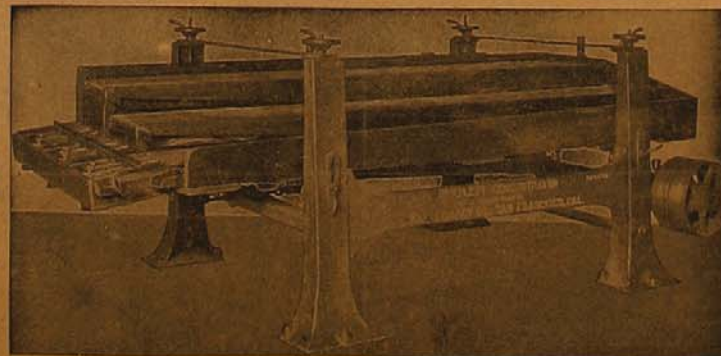
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