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DON'T.

If you have intended going to the Klondike—Don't! Don't! Don't!

The letter which we publish in our mining news from the Klondike country bears the latest date—December 12th—of anything so far received from that region. It is from a man who was in the country for some time over ten years ago, when a large part of it was prospected for gold, with but little success. Our correspondent has prospected and worked placer mines all the way from Alaska to Bolivia, and his estimate of the future of the country is worth attention, as is his statement concerning some big schemes for the development of the country. We may add that our correspondent further announces his intention of returning to Bolivia as soon as possible.

The long strike of the British engineers—or machinists, as we call them in this country—is ending in a defeat of the strikers which seems to be nearly complete. They have abandoned the demand for an eight-hour day, which was the central point of the demand made by the union, and have also surrendered several minor points involved, leaving to the employers the regulation of work on machine tools, apprenticeships and other matters of considerable importance. The Union, in fact, made the mistake of trying to hold back the progress of industry in the interest of the inefficient and incompetent members, as Dr. Raymond recently pointed out in our columns; and the result is its defeat, in spite of its strength in numbers and excellent organization. No man and no body of men can permanently succeed in such an effort in these days of sharp international competition.

The retirement of Mr. R. E. Preston from the position of Director of the United States Mint, which is announced this week, deprives the Government of the services of an experienced and faithful officer. Mr. Preston has been in the Treasury Department for 39 years, most of the time in the Mint Bureau. He worked his way up through the several grades, and when Mr. Leech resigned the directorship Mr. Preston's promotion from the office of chief statistician, which he then held, to that of director was accepted as a fitting recognition of long and faithful service. His successor, Mr. George E. Roberts, has had no official experience, but is a man of high character and reputation, who is known as a student of financial questions and a clear and able writer on those topics. Those who know him are confident that he will keep the work of the Mint Bureau fully up to the standard established by his predecessors in office.

The purchase of British iron works by American capitalists seems to be a reversal of the usual order of things; but we are informed that rumors have been prevalent in England, during the past week or two, that the Dowlais Iron Works in Wales, have been bought by an American syndicate, which has also taken the collieries belonging to the Wimborne family. Mr. E. P. Martin, the manager, is now in America, and he is accompanied by Mr. E. Windsor Richards of the Low Moor Iron Works. Inquiries made by our London representative elicit the information that extensive alterations are to be made in the works, and that the most modern plant is to be adopted. To provide new capital the ownership of the property is to be transferred to a limited company, and the public is to be invited to subscribe for shares. The object of Mr. Martin's visit to the United States is said to be purely with a view of studying some of the best practice in this country, though we should not be surprised eventually to hear that the new developments were being made with the help of American capital.

The latest correspondence received from the Yukon or Klondike country, some extracts from which are given on another page, tells little that is new, and simply repeats or confirms what was published in the "Engineering and Mining Journal" in October and November last. The estimate of the value of this gold field, given in our columns five or six months ago, is not changed by these later advices; but there is further discouragement to intending adventurers found in the statement that there is already an over supply of labor on the ground, in spite of the limited number of men who were able to reach the Klondike this season. It is well to repeat—although it has been said so often—that the Yukon country presents absolutely no other resources than its mines, and the miner who fails to find a claim for himself or work on some other man's claim is entirely helpless, and has nothing to do but to get out of the country as best he can. These matters ought to be fully considered, though they are carefully kept out of sight in the glowing advertisements issued by the transportation companies who are interested in keeping up the boom.

The joint convention in Chicago, to which was referred the settlement of the controversies still agitating the Western coal trade, finally

adjourned on Wednesday of this week, having reached an agreement after a somewhat stormy session of ten days. The conclusions reached are, upon the whole, in favor of the miners, and the operators have conceded the points in dispute only after long discussion. Under the agreement the mining rates will be adjusted on the basis of 66 cents per ton of screened coal for the Pittsburg district, with the usual differentials for other districts. This is an increase of 10 cents a ton in the mining rate, and will take effect April 1st. To secure uniformity a uniform type of screen is to be required—the flat-bar screen, with $1\frac{1}{4}$ -inch spaces—and districts are allowed to adjust the differences where there is a preference for paying by run-of-mine instead of screened coal. The diamond-bar screen is to be allowed only in the block coal district of Indiana, where, however, it is the general usage to pay for run-of-mine coal.

It is further agreed that, after April 1st, all rates for day labor shall be based on an eight-hour day, and that wages for such labor shall be uniform. This is a minor concession, but still of considerable importance.

With the adoption of the compromise agreement the differences which led to the great strike of last summer appear to be fully adjusted, and the Western coal trade will have an opportunity for quiet development. How long this will last before competition again forces low prices and brings new troubles it is difficult to say.

The directors of the Joseph Ladue Gold Mining Company of Yukon have been somewhat tardy in realizing the position in which they had been placed, as shown in the "Engineering and Mining Journal" of November 27th; but, as we anticipated, they have now done "what any other honest men would do in their places." They have informed us that, in deference to the criticisms of the "Engineering and Mining Journal," and in view of the facts brought to their attention by this paper, they have decided to give the \$1,000,000 treasury stock of the company, and which is to include all the stock sold for cash, a preference over the remaining \$4,000,000 of the capital of the company, which went to pay for the property of the company in the Klondike district and for the assistance of those who helped the vendor to float the company, as was fully explained in these columns. This treasury stock is to carry a cumulative 6 per cent. dividend and after the common stock has received 6 per cent. in dividends, it is to share equally pro rata with the common stock on any dividends that this common stock may then receive. Moreover, the preference stock, we are informed, is in case of liquidation to have a first lien on all the assets of the company, so that those who put cash into the company are to hold as security what their cash buys, and also what the common stock pays for. We are still awaiting the full official details of the preference stock, but the information, as above stated, has been communicated to us officially, and we have no doubt expresses the final action of the Board of Directors. We record it with great satisfaction as an evidence that the well-known gentlemen who constitute this Board of Directors appreciate the responsibilities which attach to the use of their names, in enterprises that could be so injurious to legitimate mining industry, and our satisfaction is all the greater because they frankly admit that their action in this matter is in deference to the criticisms of the "Engineering and Mining Journal." We think nevertheless, the change has not gone quite far enough. We shall revert again to this subject next week.

MINING REGULATIONS FOR THE CANADIAN YUKON.

We have received from Ottawa the full text of the new regulations governing mining in the Canadian Yukon, which were approved by an Order in Council at Ottawa, on January 17th. The leading points of these new regulations were given briefly last week; in some points they differ little from those heretofore in force; but there are some points to which special attention should be called. The first is that no one can locate or work a claim unless he holds a "free miner's certificate"; nor can any company or individual employ a miner who does not hold such a certificate. There is no limitation of citizenship or nationality upon the granting of such a certificate, and the fee charged is moderate—\$10 a year—but its possession is absolutely necessary to any man entering the country, whether he is prospecting for himself, or looking for employment by others.

The size of a "river claim," under the new regulations is limited to 250 feet in length, parallel to the general direction of the stream, and not exceeding 1,000 feet in width. A "hill claim" has the same dimensions. The discoverer has the right to locate two claims, and the holder of a river claim may locate an adjoining hill claim; otherwise no one can locate more than one claim in a district. Nor can any individual—person or company—hold more than ten adjoining claims, since each alternate block of ten claims is reserved by the Government, to

be disposed of hereafter. Purchasers, or intending purchasers of Yukon claims should remember these limitations; and should also understand that the regulations governing ownership are exceedingly strict. Thus a claim may be forfeited if, during the "open" season—the duration of which is fixed by the mining recorder of each district—it remains unworked for three consecutive days; if miners who do not hold certificates are employed; and if royalties on the product are unpaid. Further, a placer claim entry is practically good for one year only; that is, the entry must be renewed each year, and a new entry fee paid. It will be seen that a claim, however well located, may be easily lost, and the purchaser may find himself the nominal owner of property, which has been legally forfeited and legally taken up by others.

The royalty payable to the Government under the new regulations is fixed at 10 per cent. of the gross output, with an exemption of \$2,500 yearly. Ten days' default in payment will forfeit the claim, and severe penalties are provided for fraudulent statements of production.

It is unnecessary to make much comment on the policy of these regulations. The Canadian Government has an unquestioned right to make and enforce them, and the attention of all who purpose going to the Yukon or investing there should be called to them, that they may understand clearly the laws under which they must live and work. It seems to us, however, that they should and will have a very chilling effect upon the Klondike fever, and will divert a large part of the "rush" to Alaskan and British Columbian districts.

TEMPERATURE IN AMALGAMATION.

Some months ago Mr. Thomas J. Grier, manager of the Homestake Company's mines in the Black Hills in South Dakota, ascertained by experiment that the cooling of the water used in the stamp mill batteries very considerably increased the yield of gold from the Homestake ore. The difference was in the saving of the fine gold—the coarse gold taking care of itself—which was apparently much greater at lower than at higher temperatures. The facts, as communicated to us through the courtesy of Dr. Franklin R. Carpenter of Deadwood, are that two batteries side by side were run upon the same ore, one with the water at a temperature of about 50° F., and the other at a higher temperature of 60° to 70°. There was no possible doubt of the increased yield from the colder battery. It was supposed that more fine gold amalgamated at the lower temperature—the coarse gold not being lost at any temperature. Mr. Grier desired to make the facts public for the benefit of mill men, and we do so with much pleasure, hoping to draw out discussion on the causes of this difference, as well as notes of the experience in other mills.

The first theory propounded by those to whom the facts were submitted was that at the lower temperature there was either less oxidation of the mercury or that there was less decomposition of iron pyrites or other minerals contained in the ore to foul the quicksilver. Either of these causes would, of course, interfere with the amalgamation of the fine gold. In answer to a suggestion that in warming the water by waste steam small particles of oil might be carried to the batteries, Dr. Carpenter obtained from Mr. Allan J. Clark, assayer for the company, a statement that the mill water, while the higher temperature was used, was never in contact with any oil or grease. The steam from the cylinders was passed through a series of pipes, with which the mill water was held in contact for a period of time sufficient to give the desired temperature. The condensed steam was discarded.

Mr. Clark also added to the facts in the case the statements, from his personal observations, that in the Golden Star Mill the water of a single battery was cooled by contact with pipes containing a freezing mixture, placed immediately below the first row of plates, so that the water on the second row of this battery was about 10° F. below that on the adjacent plates presumably receiving the same quality of ore. The recovery of amalgam was decidedly better than from the other plates. In the Highland plate house (third row plates) the recovery of amalgam would diminish during a period of warm weather, and perhaps for 24 hours after.

There seems to be no doubt about the correctness of Mr. Grier's observations, nor about the fact that better results were obtained in amalgamating Homestake ore when the water was at a temperature of 50° than when it was at 60° or over. Whether the explanation is that given above, whether there is really a temperature at which the affinity of quicksilver for gold is at a maximum, or whether the effect is only mechanical does not seem to be decided.

Some light may be thrown upon the question by experience in other places, and in this connection we find the following statements in Mr. T. A. Rickard's "Stamp Milling of Gold Ores," pages 125-126, the first reference being to Australian practice:

"At the Britannia United on Bakery Hill in Ballarat the water used in the batteries is warm, and is made so by conducting the condenser

water of the engine into the tank which supplies the mill. Two points open to discussion are here suggested, the use of warm water and the addition of lime. The object of heating the battery water in such a warm climate as that of Ballarat does not appear very evident. The use of condenser water in any mill is decidedly objectionable. To consider these two propositions, let us take first the effects of warm water upon amalgamation. At the alluvial mines of the mountains of the interior of Otago, New Zealand, the use of mercury, the good friend of the miner all the world over, is hardly known, and the explanation given is that mercury will not act in the cold climate of that region. This is due to the use of hot water in cleaning up at both mines and mills. The idea is, of course, quite an erroneous one, though there is a substratum of truth in it from the fact that amalgamation is usually assisted by heat and retarded by cold, but within narrow limits only. The amalgamation of gold, not silver, in ordinary stamp milling, not pans, is here discussed. On the other hand, at Black Hawk, at over 3,000 ft. above the sea level, in the bitter cold of the Colorado winters, the millmen will tell you that cold weather is better for amalgamation upon the plates than summer heat. Why? Because heat thins the amalgam, and the vibration of the mill, due to the falling stamps, causes the globules of mercury to run off and down the surface of the amalgamating tables, while cold (which thickens the amalgam) tends to keep it in position. From one point of view hot water is to be recommended. Slimes which will float on cold water will sink in warm water, owing to the expansion of the air bubbles, which float the fine dust and are the *raison d'être* of the slimes. On the whole, however, while amalgamation (and here the amalgamation of gold is the only question discussed) is assisted by heat, yet below the temperature of boiling water the effects of a small rise are so slight that it is doubtful if the use of warm water is to be advised in ordinary gold stamp milling. It is certainly not to be recommended in summer at a locality having the climate of Ballarat, and therefore its use at the Britannia United is to be objected to. (At the time referred to it was summer and the temperature outside the mill 82° F.)"

The excellent paper on the "Amalgamation of Free-Milling Gold Ores," by Mr. Louis Janin, Jr., in "The Mineral Industry," Vol. III., has brief references only to this question. Thus he says, on pages 328 and 343:

"Some millmen believe in heating the battery water, but it would seem doubtful if this can produce any result other than to create a fluid amalgam. The plates in particular are softer when warm water is used, but this is a doubtful advantage. If the water be heated at all it should not be done by the direct application of the exhaust steam, as is explained elsewhere."

"A peculiarity of amalgam is that it contains more gold in winter than in summer. This is due undoubtedly to the warmer water in summer making the amalgam more fluid. The difference ordinarily is slight. Amalgam that retorts 40 per cent. in summer may retort 45 per cent. in winter."

The experience reported by Mr. Allan G. Clark in the Homestake Mill itself points rather to the theory that the effect is chiefly mechanical. In the cases reported by him, the amalgam from the third row of plates is softer than that of the first row—it rarely retorts over 20 to 22 per cent. as against 35 to 37 per cent., and after standing for some time after squeezing, it assumes a more or less liquid condition—the material collected during two weeks after coming down to the assay office for retorting, fully 75 per cent. in liquid form, with a few pasty lumps included in it. Moreover, this condition has not been so noticeable during the winter months as it was during the summer and autumn. In this case the colder water, by hardening or stiffening the amalgam, may prevent scouring, and so give higher results.

Mr. Reed, amalgamator at the Golden Star Mill, experimented with a battery that had been worked for some time on water at 56° F. Before leaving the mill one evening, he changed it to 70° F.—at this time the plates being covered with amalgam—and next morning at 7 o'clock much of this had washed off, small wedges remaining where the brushes had broken the even surface of the amalgam; at 11 a. m. these had disappeared, and the plate was almost bare. This was a silver plate; the copper plate of the first row showed no such changes in working when the temperature is varied. Mr. Reed adds that he has only occasionally observed any evidences of chemical action when using warmer water; a black scum showing on the surface of the plate when it is gently rubbed with the hand.

So far, therefore, the weight of testimony seems to be rather in favor of the mechanical effect. The experience of millmen in other localities may point to different theories, however; it would at any rate be of value. Mr. Grier's discovery is suggestive, and it is quite possible that it might be of advantage to pay more attention to the temperature of the water than has heretofore been done in many places.

We wish the new periodical the greatest possible success.

NEW PUBLICATIONS.

"The Strength of Materials." By Mansfield Merriman. New York: John Wiley & Sons, and London: Chapman & Hall. Pages 124; with diagrams. Price \$1.

This book is intended as a text-book for training schools, but it will also be found convenient by many engineers and by builders, mine managers and others who have constant occasion to consider the strength of materials of construction. The author has undertaken to give a presentation of the subject of the strength of materials, beams, columns and shafts, which may be understood by those not acquainted with the calculus; and it has been his aim to present the subject in such an elementary manner that it may be comprehended by them and at the same time cover all the essential principles and methods. As the title implies, the book deals mainly with questions of strength,

the subject of elastic deformations occupying a subordinate place. As the deductions of the deflections of beams are best made by the calculus, they are not here attempted, but the results are stated. All the rules for the investigation and design of common beams, including the subject of moment of inertia, are presented by simple algebraic and geometric methods. As the mechanical ideas involved are by far the most difficult part of the subject, a special effort has been made to clearly present them, and to illustrate them by numerous practical numerical examples. A chapter on the manufacture and general properties of materials is given, as also one on resilience and impact. The book is written in the clear and lucid style of which Professor Merriman is a master, and is an excellent addition to his series of works on this and kindred topics.

"The Metallographist." Edited by Albert Sauveur. Boston, Mass.; published quarterly by the Boston Testing Laboratories. Vol. I., No. 1; January, 1898. Pages 88; illustrated. Price \$2 a year.

Mr. Sauveur, whose work in the microscopic examination and testing of metals is well known through his papers in the "Engineering and Mining Journal" and elsewhere, has undertaken this publication for the purpose of collecting and making available the results of investigations on this subject, which the student can now hardly find, unless he has very unusual facilities. His purpose can best be stated in his own words, as follows: "Unfortunately—and here we come to one of the purposes of the present publication—the results of these important researches are now disseminated throughout the scientific papers and transactions of scientific societies chiefly of France, England, Germany and the United States, and even if the busy engineer or metallurgist, the metal producer or consumer in general, had the necessary knowledge of the three languages, and easy access to these publications, he could not possibly find time to go over such an amount of literature in order to extract from it what is of interest and importance to him. This is precisely the work which the 'Metallographist' proposes to do for its readers by presenting to them every three months a clear, exhaustive and comprehensive review of what has been accomplished in metallography during the previous quarter.

"The most important articles and memoirs will be reproduced in full, while those of minor importance will be condensed, accompanied in every case by such explanatory notes as will make them comprehensible and fruitful for others besides specialists. The 'Metallographist' will publish, moreover, besides the results of the investigations carried on in the Boston Testing Laboratories, original articles by eminent authorities and active workers who have kindly promised their collaboration. The editor will never lose sight of the fact that the importance of these investigations, to the world at large, lies chiefly in their ability to lead to deductions of industrial value, and his presentation of the subject will be conducted accordingly."

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supercede review on another page of the Journal.

"United States Commission of Fish and Fisheries: Bulletins Nos. 351, 352 and 353, 1897." Washington, D. C.; Government Printing Office.

"Annuaire pour l'an 1898, Publie par le Bureau des Longitudes;" Paris, France: Gauthier, Villars et Fils. Pages, 806. Price, in New York, 50c.

"Die Goldfelder Australasiens." By Karl Schmeisser. Berlin, Germany; 1897; Dietrich Reimer. Pages, 183, with tables, illustrations and maps. Price, in New York, \$4.20.

"Ninth Annual Report of the Rhode Island Agricultural Experiment Station, 1896. Part II." Providence, R. I.; State Printers. Pages, 300; illustrated.

"The Proceedings of the Chemical and Metallurgical Society of South Africa, May, 1894, to January, 1897, Volume I." Johannesburg, S. A. R.; published by the Society. Pages, 348, with diagrams.

"The Practical Handbook for the Working Miner and Prospector and the Mining Investor." By John A. Miller. London, England, 1897; E. & F. N. Spon, Ltd.; and New York; Spon & Chamberlain. Pages, 234; illustrated. Price, \$3.

"The Year-Book of British Columbia, 1897, and Manual of Provincial Information, with a Chapter on the Canadian Yukon and Northern Territory Generally." By R. E. Gosnell. Victoria, B. C.; published by the author. Pages, 512; with portraits, illustrations and accompanying maps. Price, in cloth, \$2.50; paper, \$2.25.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

The Pike's Peak Mining, Tunnel and Railway Company.

Sir: I observe from the Edinburgh "Daily Scotsman" of December 15th that one of its advertisement columns is exclusively devoted to the prospectus of the above company; and having recently received several inquiries from the "Tight Little Island" in reference to the company's gigantic undertaking, I will feel obliged by your forwarding copies of the "Engineering and Mining Journal" of that date to the parties mentioned on inclosed list.

To a close and careful observer of the many wild cat mining schemes

which have been exposed in the "Engineering and Mining Journal" for a number of years back, it would seem somewhat strange that an august body such as the American Institute of Mining Engineers can allow (without calling for redress) the name of one of its honorable members to adorn a prospectus, which, to say the least, carries on the face of it a tissue of falsehoods and evasive generalities. A quiet and peaceful observer (like myself) would be inclined to infer that there was a screw loose somewhere in the status or management of that honorable society.

Creston, Colo., Jan. 21, 1898.

The Joseph Ladue Company and Other Klondike Fakes.

Sir: The editorial on "The Joseph Ladue Gold Mining Company" in your issue of December 18th, 1897, has perhaps made your paper more friends among miners than anything published by you in recent years. When Mr. Ladue came out of Alaska he was systematically interviewed by the "Post Intelligencer" and other papers of Seattle, and at that time was quoted as being worth—town site, saw-mill, mines and all else—a paltry \$100,000. If I am correctly informed he gave this figure, himself, to the papers, and still when he reaches New York these self-same assets blossom out into a corporation of \$5,000,000—with Mr. Depew and other equally prominent men ready to give their names to the concern. If Chauncey M. Depew could hear men speak of him as I do, he would feel even smaller than he deserves to be considered because of his connection with this scheme. But yet the Ladue company is a gilt-edged investment in comparison with some of the "fakes" which are being offered to the Eastern public, and to the detriment of legitimate mining.

"Locate the land and, above all, be sure your papers are all right; I do not care whether you have a color of gold or not, I can get a lot of money for both of us." What do you think of that sort of advice to a prospector? And, yet, just such advice was given by a man who, after purchasing a lot of nuggets, took the worthless location papers to New York, and to-day is in Europe unloading his truck upon a gullible people by means of the gold he purchased in Seattle from returning Klondikers.

Of course, I cannot prove these statements because I did not see the papers, and get my information from prospectors now in the hills. They bear the imprint of truth sufficiently, however, to warrant belief and to show men who have a reputation to lose that they must go carefully in the matter of lending their names to the promotion of an enterprise, of which they know little or nothing, because there is a snug block of stock in sight.

There is gold in Alaska—quantities of it—and there are strong, reliable companies, with conservative business men back of them, which will unquestionably make money for those who put their money into them; but that does not alter the fact that there are three "fake" outfits where there is but one trustworthy proposition. I venture to say that the reckless greed attending the present Alaska excitement will ruin more well-established reputations—if I am to judge of the heretofore-thought-to-be good names back of worthless enterprises—than it will make successful men. That the whole business has hurt, is hurting, and will continue to hurt legitimate mining, I know from actual experience, for it has, in two instances, taken from the company in which I am interested capital promised us for development purposes and sent it wild-goose chasing into the wilds of the frozen North. In the district in which our company is operating there is but a single other company at work, where, prior to the beginning of the excitement, there were more than twenty; and both companies are compelled to move very slowly because of the scarcity of funds. From the report, herewith, you can form an intelligent opinion of what a hive of industry a few of the thousands squandered in Alaska would make of our camp.

Again I say the "Engineering and Mining Journal" is deserving of all praise for its unflinching course in behalf of honesty, and its brave, outspoken words in criticism of those whose high position, socially and in a business way, exempt them as a rule from just censure by a cringing press.

Everett, Wash., Jan. 15, 1898.

John E. McManus.

UNITED STATES PIG IRON PRODUCTION IN 1897.

The American Iron and Steel Association has received from the manufacturers complete returns of the production of pig iron in the United States in 1897, and also complete returns of the stocks of unsold pig iron in the hands of makers or their agents at the close of the year.

The total production of pig iron in 1897 was 9,652,680 gross tons, against 8,623,127 tons in 1896, 9,446,308 tons in 1895, 6,657,388 tons in 1894, 7,124,502 tons in 1893, 9,157,000 tons in 1892, 8,279,870 tons in 1891 and 9,202,703 tons in 1890. The production in 1897 was 1,029,553 tons more than in 1896, an increase of almost 12 per cent. The increase was almost wholly in the last half of 1897, as will be seen from the following table of half-yearly production in the last four years:

Periods—	1894.	1895.	1896.	1897.
First half.....	2,717,983	4,087,558	4,976,236	4,403,476
Second half.....	3,939,405	5,358,750	3,646,891	5,249,204
Total.....	6,657,388	9,446,308	8,623,127	9,652,680

Large as was the production of pig iron in the second half of 1897, it was exceeded in the second half of 1895 by 109,546 tons.

The production of Bessemer pig iron in 1897 was 5,795,584 tons, against 4,654,955 tons in 1896, and 5,623,695 tons in 1895. The increase in 1897 over 1896 was 1,140,629 tons. The production of basic pig iron in 1897 was 556,391 tons, against 336,403 tons in 1896. The production of 1897 was distributed as follows: New York and New Jersey, 79,041 tons; Allegheny County, Pennsylvania, 265,548 tons; other counties in Pennsylvania, 84,520 tons; Maryland, Virginia and Alabama, 97,562 tons, and Ohio, Illinois, Wisconsin and Missouri, 29,720 tons.

The production of charcoal pig iron in 1897 was 255,211 tons, against 310,244 tons in 1896, a decrease of 55,033 tons. The production of

spiegeleisen and ferro-manganese in 1897 was 173,695 tons, against 131,940 tons in 1896, and 171,724 tons in 1895.

The limestone consumed for fluxing purposes by the blast furnaces in 1897 in the production of 9,652,680 tons of pig iron amounted to 4,247,688 gross tons, of which 3,680,666 tons were consumed by the bituminous coal and coke furnaces in the production of 8,464,692 tons of pig iron, 524,271 tons by the anthracite and mixed anthracite and coke furnaces in the production of 932,777 tons, and 42,751 tons by the charcoal furnaces in the production of 255,211 tons.

The stocks of pig iron which were unsold in the hands of manufacturers or their agents on December 31st, 1897, and which were not intended for their own consumption, amounted to 656,489 gross tons, against 827,163 tons, which were similarly held on June 30th, 1897, and 711,649 tons on December 31st, 1896. These figures of unsold stocks do not include pig iron sold and not removed from the furnace bank, nor pig iron manufactured by rolling mill proprietors for their own use.

In addition to the stocks of pig iron above noted as unsold on December 31st, 1897, there should be added 218,489 tons in the yards of the American Pig Iron Storage Warrant Company, which had passed out of the hands of the makers, making 874,978 tons, which may be said to have been then on the market, against 973,678 tons, which were similarly held on June 30th, 1897, and 847,686 tons on December 31st, 1896. The total quantity of stocks in warrant yards on December 31st, 1897, was 275,800 tons, against 221,600 tons on June 30th, 1897, and 200,700 tons on December 31st, 1896.

CARBORUNDUM.—The production of carborundum in the United States (made entirely by one works, as heretofore) was 1,242,929 pounds, against 1,190,000 pounds in 1896. Of the production in 1897 about 25 per cent. was in the form of powder, and the remainder in grains ranging from No. 8 to No. 220. The present price of the powder is 8@10c. per pound, and of the grain 12@15c. There was in 1897 a continued improvement in the introduction of carborundum in the granite trade, and at the present time about 60 per cent. of the work performed in finishing granite in the United States is done with it. Its rapid introduction into this work is readily understood, as it is claimed that one pound of carborundum will finish eight square feet of granite, while the same weight of emery will finish but one square foot. This wonderful difference in the efficiency of the two materials would undoubtedly by this time have converted the entire trade to the use of carborundum, were it not that a good deal of time and experience are necessary for the workmen to learn how to handle so small a quantity of cutting material upon their granite beds; the use of the small quantity being a necessity for the proper finishing of the stone, since during the process the cutting material must be broken down to a powder, thereby producing the proper fineness of cut. The natural tendency of the workman is to use the same quantity that he had been using of emery, and in so doing he finds it impossible to produce the proper finish, since the carborundum continues to cut with a rankness that precludes closing up the pores of the stone.

Up to the beginning of 1897 carborundum wheels were generally used in small sizes, and it was the common belief that the material would not quickly enter into the large wheel trade; but it is a singular fact that in 1897 there was a complete reversal of opinion, and at the present time the greater consumption is in wheels of large dimensions, and the material is rapidly demonstrating its value for the roughest and hardest classes of work, in foundries, car wheel grinding, plow manufacturing and other lines, in which they are subjected to the roughest kind of treatment. Carborundum spread on cloth and paper, in the same manner that emery and garnet are, made a decided progress in 1897. So far the spreading of the material upon the cloth and paper has been done by several of the manufacturers of emery cloth and paper, and while the finished goods have not been as regular as is desirable, they have, nevertheless, proved their high efficiency, compared with the older materials. In the finishing of shoe bottoms carborundum paper shows much higher efficiencies than garnet paper. Carborundum on cloth in the metal trades has not so far been accurately fixed in the matter of its efficiency, but it has, nevertheless, been permanently adopted by some of the bicycle manufacturers, and, in small quantities, has been sold to many other lines of trade. The results obtained seem to indicate that its complete success as a substitute for emery cloth and paper and garnet paper is solely dependent on its proper mounting and spreading on the supporting cloth or paper, and to accomplish this with a reasonable uniformity the Carborundum Company is now considering the building of a factory for the special work, in connection with its works at Niagara Falls. Carborundum in grains and powders made rapid advances into the steel ball trade in 1897, and at the present time all of the manufacturers of bicycle bearing balls either have permanently adopted it in place of emery, or are about finishing their tests, preparatory to its adoption.

During the year a small factory for the manufacture of carborundum was established near Dresden, in Germany, and for the purpose of determining the value of the German market, preparatory to the construction of large works, American-made goods have been shipped there, where they are meeting with great favor.

One of the most interesting developments of the year in the use of carborundum, or, as it should probably be considered in this particular case, silicide of carbon, was in the manufacture of steel. Its substitution for ferro-silicon in steel manufacture has received more or less attention during the last two years, and the subject was quite fully investigated and written up by F. Lurmann, of Germany, who stated that it fulfilled all the conditions of ferro-silicon and had many other properties not possessed by the older material, and that its introduction was purely a matter of cost. This controlling factor (the cost) has apparently been met by the Carborundum Company, as it has recently received a second order for several tons of the material from one of the large steel manufacturers in the United States, who, it is understood, has permanently adopted silicide of carbon as a substitute for ferro-silicon, heretofore used by him.

ORE TREATMENT IN BOULDER COUNTY, COLORADO.

Written for the Engineering and Mining Journal by C. C. Burger.

The ores of this county may be conveniently divided into two classes, tellurium and sulphide. The districts producing them are in general quite distinct and are separated by a porphyry dyke. The sulphide ores, containing iron and copper sulphides are mostly confined to the Ward district, and their treatment comprises the usual methods of stamping and concentration. Here and there through the county some lead-silver ore is obtained, which goes direct to the sampling works and smelters.

The tellurium ores consist of the various tellurium minerals, marcasite and some pyrite disseminated through a calcareous and magnesia gangue. Sylvanite and petzite are the principal tellurium minerals found, though calaverite, hessite, lead telluride, nickel telluride, bismuth telluride and iron tellurate are frequently met with. Little or no silver is found in the lower grades of this class of ore. In the early days of the county, when nothing less than 4 or 5-oz. ore was looked for or shipped, the question of treatment was not considered; but as in other localities of late years the question of economic milling of the ore at the mine has arisen. The outcome of this feeling was the erection of over 20 mills scattered throughout the county, most of which are now lying idle from various causes. Some of them are closed owing to differences between the owners, but the great majority of them were ill advised ventures, resulting in a plant unsuited to the ore or so badly constructed as to be an economic failure. Concentration and cyanidation seem to have been the most favored methods of treatment. As is well known it is not possible to satisfactorily concentrate tellurium ores; when such material is crushed through a 20 to 40-mesh screen, the values will float off any vanner or concentrating machine ever devised. The cyanide mills have met with very poor success in Boulder county, with one or two exceptions where the ore was decomposed and the gold entirely free.

method as practical and convenient for mixing widely different ores. The bedded ore is elevated to storage bins, thence allowed to pass through a cylindrical dryer divided by longitudinal partitions into four compartments so as to obtain as much heating surface as possible. The dried ore is elevated to the screens, 16-mesh, the oversize being returned to two sets of fine crushing rolls, size 14 by 30-in., the discharge from the rolls falling into the same elevator as the dried ore, thence to screens. The latter, conical in shape and set horizontally, are placed over bins of 25 tons capacity each. All bins are made of heavy sheet iron supported by substantial frame work. The rolls used in the crushing and sampling department are known as the Rogers roll. Their distinguishing features are great strength and general compactness, one shell being placed above the other, not vertically, but at such an angle as to throw all the weight possible of the upper roll onto the ore. The upper roll works in a guide against a powerful spring. The speed of the coarse rolls is 17 revolutions per minute; that of the fine 30 revolutions; this low speed varying as the diameters gives a circumferential speed nearly equal to the speed of the falling ore. The result of this is, that there is no dragging nor grinding of the ore, but simply a cracking. The importance of this feature, in not producing slimes can not be overestimated.

A table of mesh determinations made of an average sample of ore, is as follows, the size of screen being 16-mesh (heavy rolled wire). The screens through which the sample was passed were all of fine wire, and there was little difference in size between the 16-mesh mill screen and the 20-mesh sample screen.

Stayed on 20 mesh.....	3.7 per cent.
Stayed on 30 mesh.....	34 per cent.
Stayed on 40 mesh.....	16 per cent.
Stayed on 60 mesh.....	16 per cent.
Stayed on 80 mesh.....	9 per cent.
Stayed on 100 mesh.....	6.2 per cent.
Through 100 mesh.....	15.1 per cent.

Total..... 100.0



CHLORINATION MILL, DELANO MINING COMPANY, BOULDER, COLO.

The ores must be crushed finely for cyanide treatment and the lime, magnesium and aluminum compounds render leaching nearly if not quite impossible. As most of the ores carry sulphur and tellurium an efficient roasting is absolutely required before even a fair extraction can be obtained with potassium cyanide solution.

The Delano Mining and Milling Company, when seeking to find a process thoroughly suitable to the ores in question, after carefully examining most of the different mills in Colorado, in particular those of the Cripple Creek district, decided to erect a 50-ton chlorination plant. The mill * has now been in operation six months, and has demonstrated that it is a metallurgical and economic success, and that chlorination is a process well adapted to the treatment of tellurium ores. The general arrangement and operation of the mill is as follows: the crushing, roasting and chlorination houses are erected on level ground, the ore being handled by elevator belts and belt and screw conveyors. The advantage of having a compact mill all on one floor is obvious. The different elevators and conveyors have worked very satisfactorily and have cost little or nothing for repairs as yet.

The ore is delivered to a 9 by 15-in. Blake crusher, elevated to a set of coarse rolls 16 by 36-in., set to 1/4-in. The ore leaving the rolls slides along a chute in which a horizontally moving plate is set provided with a slot one-tenth of the width of the chute. As the ore passes over the plate one-tenth of it is delivered on the floor as a sample, the balance going to the bedding floor. The sample thus obtained is split shovelled, recrushed and again cut down to a suitable size for the sample room. Here it is ground in a coffee mill, finishing on a bucking board until all of it will pass a 120-mesh sieve. On most of the ores this degree of fineness seems necessary in order to get results that will closely check. The bedding floor used at present, is simply an utilization of unoccupied floor space in the crusher house. The writer on taking charge of the mill soon found a bedding floor to be indispensable, there being no

It will be noticed that the proportion of fine material is relatively small.

All belts used in the crushing house for elevating ore, are of "Leviathan" belting (made of prepared cotton duck), with one exception. This belting seems little or no worse for five months' wear, while one 8-in. 4-ply rubber belt has been nearly cut to pieces in the same time. The hard, tough yet non-cracking surface of the "Leviathan" belt seems to make it an ideal conveyor of ore.

Every precaution is taken in the sampling and crushing department to avoid the sometimes considerable loss in dust. All ore is dampened before being crushed, the floors are sprinkled with water two or three times to each shift. The discharges from the fine rolls, elevator to screens, screen bins, etc., are all connected with an exhaust fan which delivers the dust into a hopper from which it may be drawn off as desired.

From the screen bins the ore is carried on a belt conveyor provided with flanged sides to the feed hopper of a 40-ft. diameter Pearce turret roaster, similar in general design to those used elsewhere except that the latest improvement in cooling the rabble arms by water instead of air is made use of. Accompanying this innovation forged steel teeth are employed for stirring the ore in place of the usual blades. These improvements are of very great advantage, no useless cold air is admitted to an ore that needs little air but very great heat; the arms retain their shape, being comparatively unaffected by the heat; while the teeth will last a year or two, thus doing away with the expense and annoyance of putting in a set of arms every week or so. In roasting concentrates, sulphides, etc., the deterioration of the air-cooled arm is not nearly so rapid and the air is a very necessary adjunct; but in roasting such ore as is under discussion a very great heat is required, far greater than the former ores would stand without melting. With the old style of rabble arm and blades, any slight variation in the relative height of each arm above the hearth will cause an unequal distribution of the ore and it will pile up either on the outside or inside of the hearth, resulting of course in an imperfect roast; with the forged steel teeth this never occurs, each tooth seeming to act independently

* The mill and its chlorinating machinery which the article describes were designed and successfully run by Mr. John E. Rothwell, of Denver, Colo., the well-known authority on chlorination of gold ores.

of every other one. The teeth are shaped in the form of a plow-share; they were at first used in a nearly flat form but they had a tendency to carry raw ore around the hearth in one revolution. As soon as the present angular shape was adopted, they gave perfect satisfaction. The furnace is provided with three fire-boxes, Northern Colorado or lignite coal is the fuel employed, occasionally mixed with Rock Springs coal if necessary.

A feature of the roasting department that deserves especial attention is that the roasted ore as it leaves the hearth is automatically cooled, carried in a screw conveyor to the boot of an elevator which delivers it to the hoppers above the chlorination barrels. The cooler consists of an iron box set in the hearth at the point of discharge, provided with 2-in. tubes through which the ore is gradually drawn down by a feeding plate,—actuated by trips on the moving gear of the roaster—into a screw conveyor which delivers as stated above to an elevator leading to the chlorination house. The cooling is accomplished by keeping the tubes surrounded by cold water. This device, during six months' actual work, has proved itself to be a thorough practical success. It does away with the first cost of a cooling floor and the great expense for labor in moving 50 tons of ore every 24 hours. It is true that the ore is not delivered absolutely cold from the cooler, but it has never been hot enough to damage the elevator belt or to cause the least anxiety as to fire. Water is allowed to drip on the ore at several points as it passes through the screw conveyor, the quantity being adjusted so as to just keep the dust down and not wet the ore so that it will not discharge from the elevator. This serves as a further protection against fire.

The chlorination house comprises five floors set vertically above each other. On the top are three 5-ton hoppers, on the floor below are set three 5-ton lead lined barrels of the usual type, except that they are provided with Rothwell's sand filter—illustrated and described in the "Engineering and Mining Journal" of October 19th, 1895—instead of asbestos. The filter consists of a layer of coarse quartz 6 in. deep, kept in place by a slotted wooden bottom and a perforated lead sheet on top; the whole is securely braced and held in place by 2x6-in. slats wedged tightly under wooden strips bolted to the barrel. Through this medium using 20 to 40 lb. water pressure, a charge can be filtered in from 60 to 90 minutes. The sand at first used was far too fine, and it was found necessary to use 2-mesh quartz; the idea being to let some of the slimes through, getting rid of them in the settling tanks and thus prevent the filter from clogging up.

Below the barrels are the solution tanks, four in number, each of capacity sufficient to hold the solution from 25 tons of ore. On the same floor are likewise two settling tanks and two precipitating tanks of the same capacity. The use of a Montejus tank for transferring the solution is discontinued, being replaced by an application of the Pohle air pump. All four of the solution tanks are connected underneath by a 3-in. lead pipe which joins a pipe of similar size leading down under the floor below (to give the solution a certain amount of head), then turning and leading up, over and into the settling tanks. Just beyond the lower elbow a lead air pipe is introduced. When it is desired to move the solution, the method of procedure is as follows: The valves of the solution tanks are opened, allowing the liquid to flow through the piping, air pressure is turned on and the rising bubbles of air suck the solution along with them. The operation is entirely automatic and requires little or no attention. The second settling tanks and the precipitating tanks are connected by a similar continuance.

All solution is allowed to stand 12 hours in the solution tanks, and 12 hours in the second settling tanks before being pumped over for precipitation, thus insuring the complete settling of all slimes. Precipitation of the gold is accomplished by the use of sulphur dioxide and hydrogen sulphide, the resulting sulphides being collected in a filter-press, dried, roasted and melted.

Some metallurgical features developed in actual working may be of interest. Before taking charge of the mill the writer had been informed that Boulder county ores should be roasted at a very low heat not only on account of the loss of gold by volatilization along with the tellurium, but because marcasite and the ferro-tellurides were so apt to form non-porous black oxide of iron under a high heat. The latter condition does not seem to have been attained any more than in roasting iron pyrite. A very careful and exhaustive system of checking by bullion returns and by assays shows that there has not been any appreciable loss by volatilization since the mill started. An average of all daily assays made on ore entering and leaving the roaster has shown a slight increase in value instead of a loss, as it should owing to the loss in weight incurred in roasting. This increment is 0.03 oz. on 1 to 3 oz. ore. It was at first deemed necessary to maintain a moderate fire in the first fire-box of the roaster, and apply the greater part of the heat through the second and third box. This practice was found to diminish the capacity; the three fire-boxes are now fired alike and are crowded to the utmost, a steam jet being used under the grates to aid combustion. The average contents in sulphur of the ore treated has been 2.5 per cent.; this must be reduced to a trace or a few hundredths to give a 95 per cent. extraction. Hence the necessity of a very great heat. In the light of our experience here, remembering also that nearly every member of the tellurium family has occurred in the ore treated, it would seem that the loss of gold in roasting tellurium ores has been overrated, certainly on material ranging from 1 to 3 oz. in value; occasional lots of even much higher grade have been treated without any sensible loss.

After numerous experiments the least amount of chemicals that was safe to use was found to be, 10 lbs. chloride of lime and 15 lbs. sulphuric acid 66° for the barrel charge, per ton of ore; and ½ lb. sulphur, ¼ lb. iron sulphide and 1¼ lbs. sulphuric acid per ton for precipitation.

The machinery was supplied and the buildings erected by the Stearns-Roger Manufacturing Company of Denver. The illustrations are from photographs and give a general view of the mill; two interior views, one showing the dryer and fine rolls and the other the barrel room with the chlorination barrels.

THE OHIO INSTITUTE OF MINING ENGINEERS.

Reported for the Engineering and Mining Journal by C. F. Roy.

The annual meeting of the Institute began in Columbus, Ohio, on Thursday afternoon, January 20th. Prof. F. A. Roy, president of the Institute, delivered the annual address. He gave a brief history of the Institute, when it was formed, its object and its development. He urged the members to become more interested in the meetings.

Mr. R. M. Haseltine, secretary and treasurer, presented his annual report, which showed that the Institute was in a flourishing condition. He paid an eloquent tribute to two of the deceased members, John Kane and J. G. Chamberlain.

Hon. F. G. Keighley was unable to be present and his paper, "What We Pay For," was read by Samuel Llewellyn. The paper was interesting and instructive.

Capt. J. L. Morris next read a paper on "Eminent American Geologists." He gave a brief description of such men eminent in geology as Dana, Dr. Newberry, Powell, Hayden and Dr. Orton. The tribute he paid to the last named brought out much applause.

The first paper at the evening session was read by W. B. Hanlon, chief engineer of the Cleveland, Lorain & Wheeling Railroad, the subject being "Progress in Coal Unloaders During 1897." The paper was illustrated by stereopticon views. He gave a complete description and the history of the various methods adopted by the different coal companies for transferring the coal from the cars to the ships at Lake Erie ports. The progress attained in unloading cars has been wonderful, when we compare the methods in use a few years ago. By present methods one coal unloader can fill eight large ships, while formerly two could scarcely be filled.

Prof. Lewis of the Ohio State University next entertained the audience with fine lantern views of the University buildings and campus. He was accorded a hearty vote of thanks.

A paper, the "Iser vs. the Wuzzer," prepared by J. S. Doe, was read by Prof. Lord. The paper contained some reminiscences of past and present mining, with a glimpse into the future. He advised the operator to keep abreast of the times, and in these days of sharp competition, to operate his mine in the best, and if possible, the cheapest way. The gasoline engine for hauling the cars in the mine was treated, and in the discussion which followed the reading of this paper, opinions were expressed that in the future the power for transportation in the mines would be supplied by gasoline, as it is cheaper, of small bulk and weight, and from practical experience it is not liable to explosion if the proper precautions are taken.

Prof. F. C. Caldwell next read an able paper on "Some of the Conditions Affecting the Designing of Motors for Mining Purposes." This paper was not a technical, but a practical one. He first gave a brief description of the magnetic field and the electro-magnet. The electric motor, he explained, was a device for doing mechanical work at the expense of electrical energy. The conditions which determine a good motor were fully explained. This paper was freely discussed and a vote of thanks was extended to the author.

Part of the Friday morning session was occupied in discussing the wastage of coal. The Institute has taken up the duty of trying to have a law passed by the Legislature now in session to limit the present enormous wastage of coal. A committee was appointed to appeal to the Legislature to pass such a law, the members being Mr. Jennings, chairman; Dr. Edward Orton, Edward Orton, Jr., H. L. Chapman, C. E. Marple and William Smirthwait.

"Fire in the Sunday Creek Coal Company's Mine No. 10," was the subject of a paper by Mr. Coxe. This fire was fully described in the "Engineering and Mining Journal" of May 22nd, 1897, page 571.

"Mistakes in Coal Mining" was the subject of Mr. Hibb's paper, which was instructive to the operator and was very interesting.

The first paper of the Friday afternoon session was read by D. C. Thomas, his subject being the "Practical Part of Electrical Haulage." He compared the different systems of haulage and gave the advantages of the electrical over the rope haulage.

The subject of H. M. Morrison's paper was "Endless Rope Haulage." He gave a complete description of a mine near Scranton, Pa., and its method of haulage. In this mine the cost of rope haulage is less than that of electrical haulage, owing to the elevations and depressions of the entries. Only one or two mines in Ohio employ this method.

Mr. William Ralston's paper on "Gases Met with in Mines; Their Specific Gravity," was read by Mr. Neale. The paper gave a short description of the gases met with in mines, as choke-damp, fire-damp and after-damp. He explained their chemical composition and their dangers to the miner's life. Fire-damp is very explosive when mixed with air in certain proportions. It is very rarely found in large quantities in Ohio mines, but can be found in Pennsylvania, where a safety lamp must be used for protection.

"Surface Plants of Bituminous Collieries" was the subject of Mr. Wilkin's paper. He said that the operator should equip all his surface plants with the best machinery, as it will pay in the end. He gave an excellent description of a model tippie and other buildings.

The last paper read before the Institute was written by Andrew Roy and was read by his son. The subject was the "Geology of the Jackson County Coal." The paper explained the length and breadth of the Wellston shaft coal, its quality, its distance between the blue and the grey limestone and its formation.

Capt. Morris then read his annual poem, which gave a brief description of the mining excursion taken last summer. The poem was amusing and interesting because of its originality.

The following officers were elected for the coming year: President, F. A. Roy; vice-president, W. B. Hanlon; secretary and treasurer, R. M. Haseltine; executive committee, Capt. Morris, Mr. Jennings and Prof. Lord.

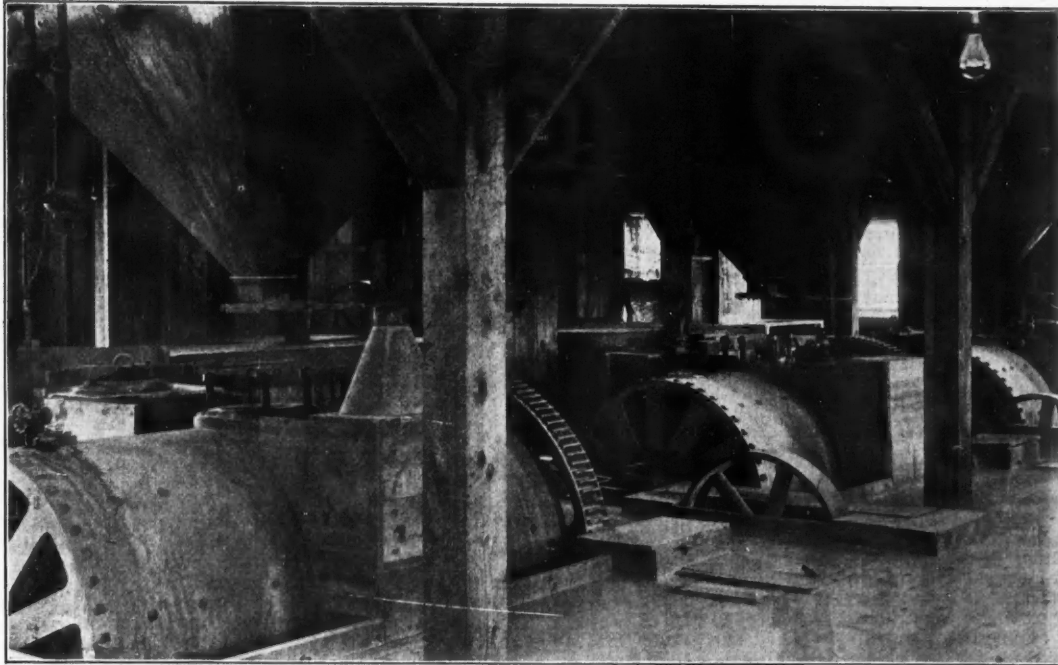
The Institute then adjourned until next year, when the meeting will be held at Columbus, about the middle of January, 1899.

THE INFLUENCE OF ALTITUDE ON SMELTING.

Written for the Engineering and Mining Journal by Herbert Lang.

The increased consumption of fuel in smelting ores at high altitudes has long been a subject of remark among metallurgists, and various

ing a given weight of carbon—allowing, of course, for the same end-products of combustion. Another point is that the chemists of the whole world have found an invariable ratio existing between the proportions of nitrogen and oxygen in the innumerable analyses which they have made to establish the composition of air. This ratio, of approximately four of nitrogen to one of oxygen, is found in every

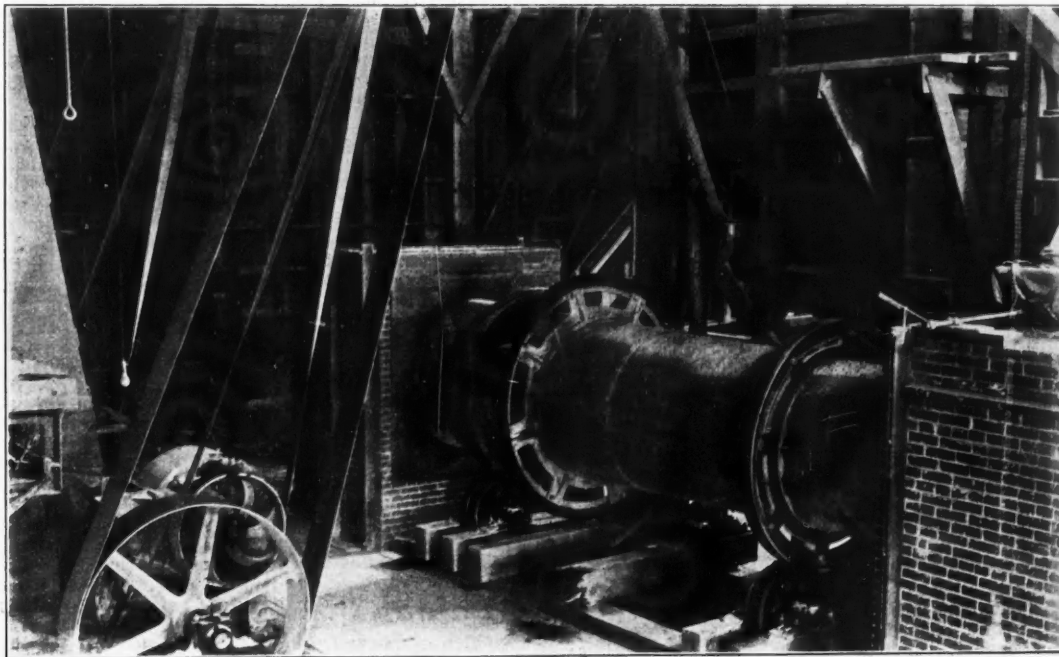


BARREL ROOM, DELANO CHLORINATION MILL, BOULDER, COLO.

theories have been put forward to account for it. Mr. Hixon, in his "Lead Smelting and Copper Converting," expresses his views as follows (page 59): "At Leadville the fuel consumption is from 3 to 5 per cent. more than at Pueblo, 5,000 ft. lower. The reason for this is that a greater amount of air has to be blown through the furnace to get the required amount of oxygen, and the surplus of inert nitrogen produces

place whence samples have been taken upon the loftiest mountain tops and in the lowest depressions of the earth's surface.

Now, instead of ascribing the phenomenon to the preponderance of nitrogen (if I understand Mr. Hixon's position correctly) I would suggest that it can be explained as the inevitable result of the working of a well established scientific principle. That increased density of the



DRYER AND FINE ROLLS, DELANO MILE, BOULDER, COLO.

a chilling effect on the furnace, which has to be remedied by the addition of more fuel."

This explanation seems to imply one of two things; first, that it takes more oxygen to consume a given amount of carbon at the higher altitude, or second, that the proportion of nitrogen is greater. Of course all will admit that the volume of air required to be blown is greater, but if there is anything certain in the world it is that the same weight of oxygen (and consequently of air) will be used in burn-

atmosphere adds to the calorific intensity of combustion is a fact deducible from the theory of heat and susceptible of proof by experiment. Sir Henry Bessemer found that by confining the gases of a reverberatory furnace in such a way as to give a pressure considerably above the normal, he could produce a temperature several hundred degrees above the normal. This principle of increased atmospheric density accompanying or rather causing increased temperature is likely to become of importance in metallurgy, and has already been con-

sidered by advanced engineers who seek to improve their art. Mr. Hermanson of San Francisco proposes to carry on pyritic smelting within a closed blast furnace constructed so as to withstand outward pressure to the extent of several atmospheres, which pressure will correspond to a very considerable elevation of temperature over that attainable by the consumption of the same amount of fuel in the ordinary way. And a New York engineer, whose name I do not feel at liberty to mention, expects to use the same principle in the recovery of zinc from the smelting mixture, that metal being volatilized, as he anticipates, in consequence of the higher temperature achieved. He will then take measures to condense and recover the zinc. It is understood, of course, that the total output of heat is the same, whatever the density of the surrounding atmosphere may be; but the intensity of the combustion is governed by the atmospheric density, the thing to bear in mind being that at lower pressures the gases leave in a more expanded condition and consequently absorb and carry away a greater amount of heat. Otherwise stated, the absolute amount of heat would be the same, but the amount which is left in the furnace to do useful work is less at the higher altitude.

Herein lies, as I believe, the true explanation of the increased fuel consumption found necessary in smelting at high altitudes, where the air is less dense. In speaking of pressure in this connection I do not mean the pressure in the blast engine or pipes, but the pressure against which the escaping gases have to make head. This in the ordinary furnace would only be that due to the friction of the gases passing upward through the interstices of the charge. If the charge were very coarse this would amount to very little, perhaps only the fraction of an ounce; while if the charge were composed mainly of fine particles it might reach almost to the full blast pressure. In the latter case the temperature generated by the combustion would undoubtedly be higher than in the former, and might to some extent compensate for the evils caused in other ways by a fine ore charge. Evidently we can increase the temperature by feeding fine ores in excess, or, still better, by deepening the furnace shaft and the charge to the proper extent; although for results good enough to compensate for the inconveniences of either course are hardly hoped for. It seems probable, however, that some plan of closing in the top of the furnace so as to restrict the exit of the gases and keep them under pressure inside of the shaft will be found to give important results in any kind of blast furnace smelting, more especially if by some appropriate mechanical device the gases at the moment of their escape from the stack may be made to do useful work to offset the consumption of energy required to blow the furnace at high pressures.

BITUMINOUS SANDSTONE.—The production in 1897 was 37,000 short tons, against 53,119 short tons in 1896. As in the previous year, by far the most part of the output originated in California, Kentucky being the only other State to make a considerable yield.

BORAX.—The production was 18,000,000 lbs. in 1897, against 15,258,014 lbs. in the previous year. As heretofore, this was entirely the production of California and Nevada. It was chiefly marketed as borax, but a considerable part of the output was converted into boracic acid.

MONAZITE.—There was no monazite mined in either North or South Carolina in 1897. Producers report a few orders for mineral on hand, which will be shipped early in 1898. A new discovery of monazite in Rabun County, Ga., was reported, and its occurrence in connection with gold in the streams of the Idaho Basin, about thirty miles NNE. of Boise City, Idaho, was described. The American monazite industry may now be regarded as defunct, however, owing to the competition of Brazil, where there are vast deposits of sand (averaging 90 per cent. monazite) on certain beaches, which, it is said, can be delivered in Europe at 2c. per lb.

STRAINS OF THE EARTH'S SURFACE.—Mr. O. H. Howarth, speaking in the British Association, of various strains to which the earth is subjected in its motions around the sun and upon its own axis, ascribed to them the chief responsibility for cracks in the rocky coating of the earth, says the "Popular Science Monthly." He supposed that while gravitation tends to draw all the heavier minerals to the centre of the earth, this process of shaking or breaking and constant readjustment suffices to spread them out again in the form of fissure veins. The theory was experimentally illustrated by kneading pieces of colored matter in plastic clay, when in a short time little vein-like markings were produced. Possibly such ever-present and ever-shifting strains might account for the disturbances to be seen in the sun.

A NEW ELECTRIC FURNACE.—A new form of electric furnace, devised by Mr. W. S. Horry, is described by the London "Electrician." The furnace is constructed in the form of an open hopper of firebrick, suspended from two standards so that its lower end hangs just over the space between the two carbon electrodes in which the arc is struck, and between the flanges of a rotatory spool or reel, to which movable cover plates can be attached, slots being formed on the peripheries of the flanges for this purpose. The carbons rest on the fireproof material of which the hopper is constructed, and their electrical connections are protected by it from the heat of the furnace, the edges of the carbons being bevelled so that they present vertical surfaces to the space between them. The length of the arc is thus kept constant, and does not vary, as in most other forms of furnace. The mixture of coke and lime is fed into the hopper, and is converted into calcium carbide in the arc, and when the ammeter shows that the current rises the spool is rotated to remove the product from the furnace. The action of the furnace is thus made continuous, fresh material being fed into the hopper as that converted into calcium carbide is removed in a plastic sheet, the reel being rotated as required until it is nearly full, when, by lifting off the cover plates, the portion of calcium carbide first formed can be cut off.

MINING CONDITIONS IN THE KLONDIKE.

The latest reliable news from the Klondike region comes under date of December 3d, and is in the form of a letter from Dawson City to the "New York Times." The conclusions of this correspondent are apparently so just and reasonable, and confirm so completely the advices which we have heretofore received, that we give below several extracts from his letter, which was published in the "Times" of January 23d:

"To poor men or men of small means who imagine they see in this territory opportunities to make fortunes, and who, notwithstanding all that has been said so far about the difficulties to be encountered at every point along the journey, and the probable disappointments which await them on their arrival here, are still willing, perhaps anxious, to start on the journey to the new Eldorado, my advice can be summed up in one word—'don't.'"

"There are many disappointed, heartsick men working on the dumps here, winding on a windlass, exposed to the rigors of the climate, and with the thermometer standing at from 35 degrees to 60 degrees below zero—and there is worse to come—who had been advised not to attempt the trip."

"And yet they are here, and while they tell you their troubles and figure out how small, after all, is the remuneration at \$1.50 per hour, —and the average wages here are \$1.25, while many are working for their 'grub'—for six or seven hours a day, they urge the writer to advise others to stay away."

"It is feared here that there will be another rush—many are perhaps already on the way. Nothing but disappointment and loss await those who come."

"The mining district known as the Klondike region comprises only two creeks that are known to be rich—Bonanza and its tributary, Eldorado. Every claim on the creek-bed, as well as all the bench claims, have been located. Not all the claims even on these two creeks are known to be rich enough to pay the expenses of mining them at the present rate of wages—which are, after all, only sufficient to pay living expenses. Others are fabulously rich. Some of those on Eldorado will yield perhaps \$500,000 each, while others adjoining them will not pay for the working. The same is true of Bonanza."

"There are many other creeks hereabout, every one of which, lying within a radius of 50 miles, has been staked from mouth to source, and in many cases to a point beyond the summit of the slope from which they run. There is, therefore, absolutely no chance for prospecting or locating in this district. It will be necessary for anyone coming to this country to prospect in other districts, and with very little chance of success, for there are hundreds of men here now who have spent anywhere from three to 15 years in the Yukon districts prospecting for the gold which is said to be there, and who are still looking with longing eyes for the fortune for which they have hoped so long. When men who were within 50 miles of Dawson when this strike was made are still without the means to buy food for the winter, how can a man 5,000 miles from here hope to pick up a rich claim in the Klondike region? There are many such here. I cannot, knowing as much as I do of the country, use language strong enough or convincing enough to advise those who are thinking of coming to this desolate country to give up the notion. No matter how discouraging may be the outlook at home, I can assure the reader that there are more avenues through which to make a living, and perhaps a comfortable fortune, at home than are presented by the seemingly rich Klondike."

"There are hundreds of men here to-day who mortgaged their little homes and left wife and children poorly provided for in order to raise the necessary money to make the trip to a land which promises so much. They spent every cent of that money, which represented the labor and savings of years, in getting over the Skaguay and Dyea trails, and bore up under hardships which they would not have thought themselves capable, in the hope of getting possession at the last of a rich claim in this region, where they had heard that men became rich in a day. To-day they regret their madness and curse the day when they gave up all—and received nothing in return. Many have not even reached the New Eldorado. Money played out and they were compelled to winter on the pass, while others were frozen up in the river and will either have to haul their outfits down on sleds or to live in idleness and eat the food which, on an average, cost them more than \$1 per pound to get over the pass."

"Of those who did reach Dawson, about 3,000 in all, some 300 were compelled to go down the river to Fort Yukon, where they will cut wood all winter for their board, while from 400 to 500 more have started on the trip out over the ice. This latter is a most perilous journey. Until this winter it was thought to be next to impossible to make the journey, even when well provided with food, robes and one or two good dog teams. Few of those now on the way are so provided. Many are so poorly provided for the journey that it seems certain that many lives must be lost this winter."

"Many of those who arrived here this season have been given 'lays' on good properties in the richest districts. A 'lay' consists of the privilege of working a portion of a claim—usually 50 ft. in length, and extending from bank to bank of the creek. This is more ground than four men can work out in a season with the system of mining in vogue here at present, and the men who work the lays receive from 50 to 75 per cent. of the output of the ground for the season, the mine owner taking the balance. This would seem, to one not familiar with the system of mining and its many difficulties, to be an excellent chance to make money. And yet every day lays are being thrown up by those who were to have worked them."

"What inducement is there, therefore, for men to come to this country with the intention of doing this same work in localities that are totally unknown? And yet this is what they must expect. It may seem incredible, but it is true nevertheless, that over half the claims on both these creeks still remain untouched, and men who had been lured here by the reports of wealth on them have declined offers of lays on them after seeing for themselves how hard it was to procure the gold that undoubtedly lies hidden beneath that robe of frozen earth."

"It is hoped that some less expensive method will have been found soon for the working of these mines—in fact, that problem has, I think, already been solved, but it offers no inducement to the laborer. If machinery or hydraulic methods are employed less men will be required than now, and already the supply in that line is far in excess of the demand. Besides, as soon as food becomes more plentiful, wages will be reduced, and a man is better off working at the smallest wages that are paid for common labor at home—no matter where his home may be—than he is when drawing \$10 per day here.

"I might go on indefinitely enumerating the many disappointing features of this region and the many reasons why it offers to the poor man no real inducements at all, but enough has been said already to set people thinking before staking everything on the chance of making a fortune in the gold fields of this region. The same is true of all the gold fields of Alaska. I have talked with many old miners here, some of whom have spent long, weary years in the country hoping at some time to stumble on to a fortune, but with very few exceptions, indeed all, have found it impossible to make more than a grub-stake. These men all tell me that it is not less than criminal to advise men to come here. It may be asked why these men remain. That is one of those questions which are hard to answer. They cannot tell you themselves. In many cases they have failed even to make a grub-stake, and the trading companies have been compelled, in order to prevent starvation, to give them an outfit, allowing them to pay for it the next season if luck favors them. And so it happens that they are compelled to remain over another year to pay the bill. Finally they fall into the rut with their companions, and they live on and on, hoping to strike it rich some day. And when the coveted fortune arrives, as it does in the case of perhaps one in one hundred, he finds himself unable to enjoy it. * * *

"To the investor this region offers many advantages, but great care must be taken less worthless properties be acquired. Owing to the fact that the gold in these mines is held in the earth by several feet of almost impregnable ice, which must be thawed out by a most laborious and slow process, it is probable that many of the mines will not have been thoroughly worked out during the next five years. I speak now of those already known to be rich in gold deposits. This thawing method is so expensive, too, that ground which will not yield \$15 a day to the man cannot be worked except at a loss. It happens, therefore, that great areas of rich ground are being left untouched. The miners, while drifting about in the gravel and bedrock, take out from time to time pans of gravel, thaw it in their cabins, and wash the gold out, so that they may see how it is running. If the pay streak seems to be giving out in the direction in which they are working, they change their course, in the endeavor to follow it. As soon as the pannings show that the gravel is not running over 10c. to the pan they abandon that portion of the drift, and either locate the pay streak at some other side of the shaft, or, if it is not found there in what, according to the above, is paying quantities, they sink a new shaft, in the endeavor to relocate it. It will be seen that a great deal of dead work is necessary, and, of course, this is all loss, since it costs just as much to drift in poor ground as in the richest portions of it. In many instances the pay streak runs in a course so irregular that it is very hard, indeed, to follow it. At places the bedrock is smooth, and consequently did not hold the gold. At others it is very rough and shaly, and it is at such places that the big pans, of which one on the outside hears so much, are found. Owing to these conditions, it happens that not only are some spots immensely rich, but also some others—sometimes entire claims—are worthless blanks.

"And there is where the investor must exercise great discretion in the purchase of properties on creeks which are known to be rich. I think that I may say that in every case, both on Eldorado and Bonanza Creeks, where the present owner has located a pay streak, he is either unwilling to entertain a proposition to purchase his ground or puts a figure on it at which, with the expensive methods of mining in vogue, would offer no inducements to the speculator who understood the conditions throughout. * * *

"By the time that this letter reaches the eyes of the reader hundreds of men who are now on the way out will be flooding the country with Klondike gold mining properties. It will be readily seen that these men must have seen much more prospect of making money by selling their claims than by working them.

"I think that there are some of those now going out who have really valuable properties to sell, but when one considers the great risk that they run by taking such a trip he will understand that the prices which will be put on properties will be far in excess of their real value. Besides, these men know that they have but to wait until the river breaks up in the Spring, when they will be overrun by anxious buyers—but men who are on the ground to investigate before parting with their money. It does not look, therefore, as if many of these men who are braving the dangers of a 600-mile trip over the ice in the dead of winter in order to sell to those who cannot investigate, are working in good faith. That is the impression that prevails here among those who are in a position to know.

"The few claims on which these men have secured options—such options running in most cases only until July, some only until March, thus allowing the investor no opportunity to investigate—are those on Bonanza and Eldorado which have the reputation of being blanks; those near the mouth of Bonanza, where the creek bed is several hundred feet in width and where it is impossible, with the present system of mining, to locate the pay streak with any chance of getting enough out to pay expenses.

"Then, again, properties at the upper ends of Bonanza and Eldorado, which have not so far been opened up by their owners, because they feared they would not pay for the outlay, are being offered for sale, the agents and owners counting on the ignorance of purchasers.

"Other properties which will be offered for sale are those located on the small gulches, varying from a few hundred yards to two or three miles in length, tributary to these two streams. These properties are from first to last unknown quantities, with little chance of any of them proving at all rich, according to the best authorities here. A few of the bench claims on these two streams are proving valuable, but this

is only in spots where the old river or glacier bed has been left by the present stream, and these, like all other properties, should not be touched by investors without first investigating them. * * *

"There seem to be many opportunities to make money here by buying up large numbers of consecutive claims and working them by some more economical method, but these, too, should be investigated thoroughly before much money is expended on them. There is no doubt in my mind that there are other methods by which to extract the gold from the ground here, but none can be worked successfully on a small scale. Neither will it pay to work them under present conditions, with food stuffs selling at an average of \$1 per pound and labor consequently very high.

"I do not think it advisable for the man of means to purchase a single claim in any district, for if the present owner cannot work it to advantage another certainly cannot. It will be said that the present owner has not the means to do so. In some cases this is undoubtedly true, but in most cases his willingness or anxiety to sell is based on the fact that he has little confidence in his property. Money is obtainable—at very high rates of interests, it is true, but still obtainable—for the working of claims which can be shown to be in a district where they should, taking all things into consideration, be rich.

"And I think that none but those whose means place them in a position where they can afford to lose should purchase mining property here without first being on the ground and understanding thoroughly the conditions. Fortunes will undoubtedly be made by men who buy wisely here, but unless great care is exercised enough money will have been squandered on worthless properties to stamp as disreputable everything which bears the Klondike brand. And this would be a great pity, for this region is really one of great wealth so far as known. It may prove as rich as the most sanguine expect. But there is still plenty of time left in which to investigate before plunging blindly into it."

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EMERY.—The production of emery in the United States in 1897 was 1,500 short tons, against 1,550 short tons in the previous year. This was mined chiefly in Massachusetts. The domestic emery industry suffered from the same causes that affected the corundum industry.

SODA.—There was no production of natural soda, either sulphate or carbonate, in 1897. It appears as if the deposits of Wyoming, which have been productive, are too remote from markets to be profitable at the present time. The discovery of a new deposit of soda was reported from Arizona, the beds being situated near the head of the Gulf of California.

MINERAL PAINTS.—The total production of mineral paints in the United States in 1897 was 62,169 short tons, against 54,153 short tons in 1896. These figures include the production of natural ferric oxide, artificial ferric oxide (venetian red), ochre of various kinds, ultramarine, umber, sienna and slate pigment. The production of other pigments, such as zinc oxide, white lead, barytes and graphite, are reported under those captions, respectively.

THE BRITISH ALUMINUM COMPANY.—The water power facilities of the British Aluminum Company's works at Foyers Fall, Scotland, have been completed. The storage reservoir was made by building a dam across a valley just below two small lakes and a sheet of water 5½ miles long was thus obtained containing about 4,000,000,000 gallons. The distance from the turbines is three miles and the effective fall is 350 ft. It is hoped to obtain continuously 5,000 H. P. from the turbines.

MINERAL WOOL.—The production in the United States in 1897 was 3,327 short tons, against 5,953 short tons in 1896. There were six producers in 1897, two of them being new concerns, while one of the producers in 1896 dropped out of the business. In general the mineral wool industry was in a very unsatisfactory condition in 1897, owing to a falling off in the construction of the class of houses in which this product is particularly used, while close competition between architects led frequently to the omission of mineral wool which would otherwise be used, it being employed between walls and consequently out of sight. The falling off in production is accounted for in this manner.

ILLUMINATING OIL IN GREAT BRITAIN.—The Anglo-Caucasian Oil Company of London, which was formed some six months ago to handle in Great Britain the products of the Baku petroleum fields, has just taken a very decided step in competition with the Standard Oil Company. It has decided to sell throughout the United Kingdom an oil called the "Anchor" brand of a uniform flash point of 103° Abel, at exactly the same price as the "Tea Rose" brand of the Standard Oil Company, which has a flash point of 73° Abel. For quite a year a parliamentary committee has been inquiring into the petroleum question more particularly with a view of ascertaining the exact element of danger encountered by the use of American petroleum such as is shipped to the United Kingdom. Though many eminent people in England have been pressing Parliament to enact a law against petroleum of less than 100° Abel., nothing has yet been done, and the committee has not given any recommendations based on evidence placed before it. If it is possible to sell Russian oil of 103° Abel. at equal prices with the American (and it may be presumed that a firm controlled by Rothschilds and Nobels knows its business) there would appear to be no further need for parliamentary action to stop the sale of low flash oil. People who are intimate with the business tactics of the Standard Oil Company in Great Britain, however, think it just as well to proceed in that direction.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

PRIORITY OF CONFLICTING CLAIMS.—Where the question of the priority of two conflicting mineral claims, one of which had been relocated, was in issue, evidence that such relocated claim was based on a discovery within a prior, valid, subsisting location, was admissible (though such claim as relocated had been patented), for the purpose of showing that the relocation of such patented claim was void, as not having been made on the unappropriated public domain.—*Fisher vs. Seymour* (49 Pacific Reporter, 31); Supreme Court of Colorado.

FAILURE OF DISCOVERER OF MINING VEIN TO MAKE LOCATION.—If one first discovering a vein of mineral, or a lode, does not make a valid location, another may do so. A location of such claim is invalid if not "distinctly marked on the ground, so that its boundaries can be readily traced," as required by the laws of the United States (Sec. 2,320). But it is not necessary, in the absence of local rules or customs, for one asserting a location to prove the notice posted on the claim, but merely the recorded notice, which he may do by a copy.—*Willeford vs. Bell* (49 Pacific Reporter, 6); Supreme Court of Colorado.

ENTRIES ON ALASKA PUBLIC LANDS.—Citizens of the United States have the right to go upon the public lands of Alaska, and possess, occupy and use, and improve them. Such rights may be conveyed from one person to another, and written conveyances are admissible as tending to establish a right in the last grantee. Such rights are forfeited by removal and abandonment, and return to the public domain. Where two persons claim adversely to each other the possession of such land, the one having the prior possession has the prior right. A location notice made on mineral lands may be received as evidence tending to show possession by the locator, together with any other acts indicating possession.—*Carroll vs. Price* (81 Federal Reporter, 137); United States Circuit Court.

EXECUTION OF AGENCY IN SALE OF MINERAL LANDS.—An agent for the sale of a mineral location, within two days after his appointment, in the absence and without the knowledge of his principal, contracted with the owner of another claim, which conflicted with a portion of that which he was agent for, to patent for them such conflicting claim in consideration of a one-half interest in same, and then relocated such conflicting claim in another name, so changing its boundaries as to include a greater portion of the claim for which he was agent, and obtained a patent accordingly, in the meantime corresponding with his principal respecting the claim for which he was agent, as though interested for such principal. The court held that such conduct constituted fraud in law.—*Fisher vs. Seymour* (49 Pacific Reporter, 30); Supreme Court of Colorado.

WHAT CONSTITUTES A MINING LEASE.—An instrument declared that the owner of land "does demise and lease," for mining purposes only, certain land. The grantee was given the right to erect all necessary buildings and machinery, and was required to provide and keep closed gates through which to enter upon and pass off said land. He was to take possession for ten years and pay a fixed rent. The court declared this to be a mining lease, and not a mere license to mine.

Where such a document provides that on a failure to perform the conditions the same should end, and the grantor might thereupon enter, he has a right without demand to bring ejectment against the grantee on the failure of the latter to sink a shaft and continuously work the same, as required by the lease.—*Kirk vs. Mattier* (41 Southwestern Reporter (252); Supreme Court of Missouri).

APPROPRIATION AND PRESCRIPTION OF WATER.—No prescriptive right to the use of water of a stream can be acquired by one riparian owner as against another, by a use of the water at times when such use does not interfere with the latter's use of same, and when, as often as there is interference, the latter has protested, and sought to prevent the use. Nor is there any superiority in rights acquired in the water of a stream for the purpose of irrigating arable land over rights acquired in same for mining and milling purposes. When water of a stream has been appropriated for the purpose of running a mill, the mill owner is entitled to increase the running capacity of the mill, provided the amount of water used does not exceed the amount first appropriated. He is required to make an economic use of the water appropriated, for the purpose for which it is appropriated; and if the capacity of his ditches is greater than is necessary to provide for such use, he should be confined to the amount necessary for such economic use.—*Union Mill and Mining Company vs. Dangberg* (81 Federal Reporter, 73); United States Circuit Court.

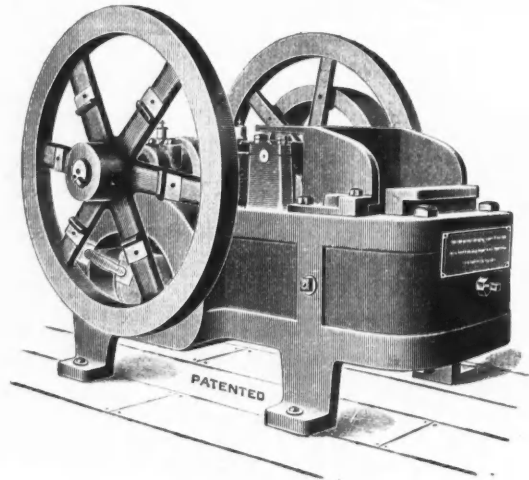
STRIKE CLAUSE IN A COAL CONTRACT.—Where a "strike clause" in a contract for the delivery of coal at Pittsburg only provides for the contingencies of "a general strike or shutdown in the Pittsburg district," the penalties, provisions or conditions in same will not be enforced or applied to a condition of general suspension of coal mining, enforced by intimidation and violence, reaching to transportation and mining and everything connected with the supply of coal throughout all districts from which a supply could be drawn to Pittsburg. Where a party seeking relief from penalties and damages resulting under such contract, from general conditions, such relief will terminate as soon as the conditions permit it to resume the fulfillment of its contractual obligations, although the exercise of great diligence and large expense would thus be imposed by such fulfillment; and the other is also required to inquire as to what amount of coal will be needed, and will not be permitted, without inquiry or notice, to shelter itself behind a minimum amount indicated in the contract, the course of dealings

not indicating the minimum amount as that which is expected to be delivered either by seller or buyer under normal conditions.—*New York & Cleveland Gas Coal Company vs. Pittsburg* (6 Pennsylvania District Report, 22); Court of Common Pleas.

THE STURTEVANT ROLL-JAW CRUSHER.

The accompanying illustration shows a new form of crusher recently introduced by the Sturtevant Mill Company, of Boston, Mass., to which that company has given the name of the "roll-jaw crusher." For this machine it is claimed that it will take in hard rock and reduce it at once to the form of gravel or sand, combining the work of the ordinary crusher or rock-breaker with that of crushing rolls. It is a machine of the jaw and toggle type, but the movable jaw, although it seems to approach and recede as in the ordinary crusher, has a true rolling motion—not a rubbing motion—given to it. As the two jaws are always at the same minimum distance apart, the effect of a pair of rolls is obtained, and the crushing is fine and uniform. The roller motion also does away with any tendency of the crushed material to clog. In order to assist the clearing the lower opening is made wider than the upper. The distribution of the material is aided by the corrugated form of the jaws.

The crusher shown in the engraving is a 6 by 16-in roll-jaw crusher; it weighs about 14,000 lbs., and requires about 10 H. P. to run it. The jaws can be set 2 in. apart, or to approach within $\frac{1}{8}$ in. of each other. The moving jaw is elastically mounted, so that the machine is not likely to be broken by any substance, such as a steel sledge, which may get into the crusher accidentally. It is claimed for this crusher that as the jaw does not crush the stone by a direct pinch, but rolls on the material, the latter will break down easily under a moderate pressure, since no rock can withstand a crushing and a rolling stress applied at the same time. Owing to this rolling action, allowing no rubbing, the jaws are very durable. The toggles are similar to those of



THE STURTEVANT ROLL-JAW CRUSHER.

the Blake crusher, but a greater leverage is claimed, owing to the long roll-jaw. The crusher has large capacity on coarse work, and, it is claimed, as above noted, that it will reduce rock to gravel or sand at one operation.

The machine has been carefully designed and is well constructed, the object being to make a machine which will do good work with the least possible trouble and expense for repairs.

CHEMICAL INSTRUCTION IN FRANCE.—The Societe des Laboratoires Bourbouze, of Paris, offers scientific courses to workmen, free of charge, on Sunday from 9 to 11 o'clock. Physics and chemistry will be taught in the laboratories, the courses being adjusted to the practical needs of the students.

GERMAN IRON PRODUCTION.—The output of the German blast furnaces in November was 599,125 metric tons of pig iron. For the eleven months ending November 30th the production was: Foundry iron, 1,018,301 tons; forge iron, 1,479,786 tons; Bessemer pig, 519,670 tons; Thomas (basic) pig, 3,255,855 tons; total, 6,273,612 tons. This shows an increase of 465,349 tons over 1896, and of 995,219 tons over 1895.

IRON TRADE OF FRANCE.—For the 10 months ending October 31st the imports into France included 51,372 metric tons of pig iron, 18,753 tons wrought iron and 5,166 tons steel; in addition, 73,148 tons of pig iron were imported, which were afterwards re-exported in various forms. Imports of iron ores were 1,802,243 tons; of coke, 1,270,430 tons. The exports for the same period included 80,971 tons pig iron, 47,484 tons wrought iron, 39,554 tons steel and 247,746 tons iron ore.

NOTES ON LUCIUM.—Mr. Waldron Shapleigh, in the "Journal" of the Franklin Institute, has shown that the precipitate with sodium thiosulphate, on which great stress is laid as a reaction for lucium, can be produced by heating a concentrated solution of the double sulphates of the yttrite group and potassium, and that the precipitate is due to the heat alone and not to the presence of the thiosulphate. One kilogram of monazite sand was worked over, following the directions set forth in the patent of M. Barriere, without obtaining any earth corresponding to the reactions of lucium.

THE WINTER MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

A circular from the secretary states that the seventy-fourth meeting of the Institute (being the twenty-eighth annual meeting) will be held, as already announced, at Atlantic City, N. J., beginning on Tuesday evening, February 15th. There will be no local committee, and all communications regarding the meeting should be addressed (as early as possible) to Mr. Theodore Dwight, P. O. box 223, New York City. Hotel headquarters will be at Haddon Hall, and sessions will be held in the Casino, which will be opened specially for the use of the Institute. The number of members who have signified their intention of attending this meeting is larger than any one of the hotels is ready to accommodate. Members desiring to secure accommodations in advance are requested to write early to Mr. Dwight, giving particulars as to rooms required and time of intended arrival. It is believed that many will find it agreeable to spend the preceding Sunday and Monday at Atlantic City, in view of the attractions of the place as a winter seaside resort. There are no special arrangements for railway fares.

It is expected that the meeting will close with a visit on Friday to the Philadelphia Museum, where a complimentary luncheon will be served, without return to Atlantic City. Further details will be given as far as possible to those giving early notice of their intention to attend.

The following is a partial list of the papers thus far announced for this meeting. It is impossible at this time to say which of them will be printed and distributed before the meeting, or read at the sessions otherwise than by title. In providing opportunity for the full presentation of papers, and for contributions to discussions, preference will be given to priority of notice, given to the secretary, of a desire to that effect.

"Compressed Air Power Transmission at Kellogg, Idaho," by F. W. Bradley, Washington, Cal.

"Camp Floyd Gold Deposits, Mercur, Utah," by E. A. Wall, Salt Lake City, Utah.

"A New Form of Ingot-Mould for Casting Brass or Bronze Ingots, with Remarks on the General Form of Ingots," by Erwin S. Sperry, Bridgeport, Conn.

"Emery, Chrome, Ore and Other Minerals in the Villayet of Aiden, Asia Minor," by W. F. A. Thomae, London, England.

"The Bildt Automatic Feed-Device for Gas-Producers," by C. W. Bildt, Worcester, Mass.

"Notes on the Caucasus," by Dr. Persifor Frazer, Philadelphia, Pa.

"Apparatus for Removing the Sand from the Waste Water of Ore-Washers," by J. E. Johnson, Jr., Longdale, Va.

"The Influence of Antimony on the Cold-Shortness of Brass," by Erwin S. Sperry, Bridgeport, Conn.

"The Ultimate and Rational Analysis of Clays, and their Relative Value," by Heinrich Ries, New York City.

"Mining Districts of Colombia," by H. G. Granger and E. B. Treville, Quibdo, Colombia, S. A.

"A New Departure in Breaker Building at Cranberry Coal Mine, Hazleton, Pa.," by W. S. Ayers, Hazleton, Pa.

"A Study of the Elimination of Impurities in the Reverberatory and Converter Processes of Copper Production from Copper Matte," by Edward Keller, Baltimore, Md.

"Note on Limonite Pseudomorphs from Dutch Guiana," by R. W. Raymond, New York City.

"The Manganese Ore Industry of the Caucasus," by Frank Drake, New York City.

"Mining Timber and the Forest Reserves," by Gifford Pinchot, Washington, D. C.

"Some Peculiar Occurrences of Gold Ore in Montana," by W. H. Weed, Washington, D. C.

A number of important and interesting papers, not included in the above list, are expected, but not so definitely promised, up to this date, as to warrant the publication of their titles.

COKING BROWN COAL IN HUNGARY.

In a recent paper in the "Montan Zeitung," Mr. R. Hofmann says that, in view of the importance of having a supply of coking coal in a country like Hungary where the coal resources are not equal to those of iron ore, trials have been made at various times since 1850 to convert the Upper Oligocene coal, notably that occurring in the extensive Zsily coal-field, into coke. On the whole, however, the results have not been satisfactory.

In the year 1884, at Lupeny, in the western portion of the coal-field in the so-called seam V, a specially pure brown coal was found, and new coking trials were undertaken. They gave on washing a loss of 11 per cent., and on coking a yield of 61 per cent, with 8.2 to 9 per cent. of ash. Similarly the coal from seam II could be converted into coke, even in an unwashed condition. After the government had granted a concession for the construction of the railway from Petrozseny to Lupeny, the Urikany-Zsilthaler Hungarian Coal Company was formed, and in 1895 the output of the company's colliery at Lupeny was 215,156 metric tons. The deeper seams of the west of the Zsily coal-field proved purer, richer in carbon and poorer in oxygen than seam V. Indeed, the brown coal chemically resembled bituminous coal. The output in 1896 amounted to 300,000 tons with a waste of 60,000 tons of small coal, a quantity sufficient for the requirements of a coking plant. The trial on the largest scale was made with 50 tons of coal, and yielded 33.2 to 41.7 per cent. of volatile constituents, 0.2 to 0.48 per cent. of ammonia and 5.4 to 1.2 per cent. of tar. The proportion of ash in the crude coal amounted to 17 per cent.; it could, however, be reduced by washing to 8.3 per cent. The yield of coke was from 62.26 to 71.20 per cent., with 12.7 to 13.3 per cent. of ash and 2.57 per cent. of sulphur. The coking process was quite normal and the

coke was obtained in compact masses. It closely resembled the Karwin and Zabrze coke, and is consequently well adapted for blast-furnace use.

THE PREPARATION OF CARBIDES.—A new method of preparing carbides by the action of calcium carbide upon oxides was described at the last meeting of the Paris Academy of Sciences by M. Moissan. It appears that calcium carbide reacts with many metallic oxides at the temperature of the electric furnace, giving the carbide of the metal and lime, the latter being again partially converted into carbide by the carbon of the crucible. The carbides of aluminum, manganese, chromium, molybdenum, tungsten, titanium and silicon were obtained by this method. The oxides of lead, bismuth and tin gave the pure metals on similar treatment.

A GREAT JAPANESE BRIDGE.—It is reported that Japanese engineers are preparing plans for the construction of a bridge across the Straits of Shimonoseki, so as to unite the main line of the Kiushiu Railway with that of the Sanyo Railway from Shimonoseki to Hiogo. The straits, at the point referred to, are about one mile in width, and the current through them is very rapid. The bridge, moreover, must be constructed sufficiently high to enable the largest ocean steamers to pass beneath. Thus the undertaking, if successfully carried out, would be one of the greatest engineering feats of its kind. The work will be undertaken and supervised by Japanese engineers exclusively.

THE VELNA BRIQUETTE PROCESS.—This process of making briquettes is being tried in Belgium and France. To make the briquettes petroleum residues are mixed with any convenient animal fat and the whole saponified with soda to an emulsion, which is used as a binder for the coal dust or slack. For the rest of the process any ordinary type of briquette machine can be used, the only special machinery needed being a mixing tub. The petroleum serves to enrich the mixture, so that very good briquettes can be made from common lignite or brown coal. The quantity of the binder used is from 5 to 10 per cent. by weight of the coal. This emulsion costs in Belgium about \$12 per ton, or from 60c. to \$1.20 per ton of briquettes.

WHETSTONES, SCYTHESTONES AND OILSTONES.—The production of oilstones, including the Hindostan, Indiana sandstone, Arkansas stone, and Washita stone, in 1897, was 900,000 lbs., against 615,000 lbs. in 1896. The production of scythestones in New Hampshire, Vermont, Ohio, and Michigan increased in value from \$45,000 to \$62,220. Scythestones are commonly sold by the gross, and it is, consequently, impossible to give figures that would enable comparisons as to the quantity of the output to be made. There was not much change in the market for these materials. There has been during the past three years a steady falling off in the domestic demand for carpenters' tools, and a nearly equal falling off in the sales of oilstones. The foreign demand has been steadily increasing, however, particularly for Washita oilstones, since the foreign mechanic is slowly but surely learning that the Washita stone is much superior to the Turkey oilstone for sharpening tools.

FUEL GAS PROCESSES.—In a paper read before the New York Society of Chemical Industry, Mr. F. L. Slocum says that methods of producing fuel gas can be divided into:

1. Coal Gas. The yield from 2,000 lbs. of coal is 10,000 cub. ft. of gas of a calorific value of about 600 B.T.U. per cubic foot, 1,400 lbs. of coke, 100 lbs. of tar, 5 lbs. of ammonia and 0.75 lb. of cyanogen.
2. Water Gas. The yield of 2,000 lbs. of coal is about 51,250 cub. ft. of gas of an average calorific value of 363 B. T. U. per cubic foot, 8,03 lbs. of ammonia as sulphate, and a considerable amount of tar.
3. Producer Gas. The Siemens non-regenerative gas producer yields gas of a calorific value of 878 B.T.U. per cubic foot, and the Mond producer, which admits of the preheating of air on the regenerative system, and the recovery of ammonium sulphate, yields 2,000 lbs. of coke, 160,000 cub. ft. of gas of a calorific value of 156.9 B.T.U. per cubic foot, and 100 lbs. of ammonium sulphate.

The percentage of the total heat of the original coal from which the gas is made, which is available in the gaseous fuel, is as follows: Coal gas, 20 per cent.; water gas, 62 per cent.; Siemens gas, 60 to 65 per cent.; Mond gas, 80 per cent.

CHEMICAL EFFECT OF CATHODE RAYS.—Some experiments on the chemical effect produced by the impact cathode rays, made by Professors Momson and Skinner, are thus reported by "Nature": "Aluminum is rapidly evaporated from the cathode by an electric discharge in a highly exhausted vacuum tube in which air has been replaced by mercury vapor. The metal is condensed over the walls of the tube in the form of a bright mirror. An iron cathode gives a similar mirror in a mercury vapor discharge tube. When the aluminum coating is dissolved off the wall of the bulb by hydrochloric acid a gelatinous membrane remains, which gives the reactions of silica. When potassium vapor is used the glass opposite the aluminum cathode is roughened. In parts sheltered by screens from the discharge the glass is not attacked. In potassium vapor the aluminum cathode is not evaporated to any marked degree. Opposite the cathode, both in the mercury vapor and potassium vapor bulbs, a dark annular stain of the shape of the cathode is formed. This stain resists the action of strong hot hydrochloric acid, nitric acid, aqua regia, and potash solution. The action of hydrochloric acid removed it, apparently by dissolving the glass. The tests indicate carbon, but the quantity of the stain is too small to make certain. The stain is also formed on screens of mica, quartz and calcite. Monatomic gases appear to permit the evaporation of aluminum, as Prof. Callendar has observed its evaporation in an argon vacuum tube."

QUESTIONS AND ANSWERS.

A. V. P., New York.—Can chemically pure carbonic acid gas be made from magnesite by calcination?

(Answer.—A large quantity of crude magnesite is used by several firms in New York in making carbonic acid. The American Carbonate Company uses it in this way and sells the calcined remainder.)

R. L., Texas.—In your issue of January 8th you quote average monthly prices of zinc ore per ton in the Joplin, Mo., district for the year 1897. Will you kindly give the analysis of this ore?

(Answer.—Zinc ores in the Joplin market are not sold by assay. The prices quoted are for clean zinc blende, which probably averages about 60 per cent. zinc. This means that the ore is about 90 per cent. blende and about 10 per cent. impurities; the latter being chiefly isomorphous FeS, a little FeS₂ and SiO₂.)

E. C., Houghton, Mich.—Is silicon copper made in the United States and where; also for what purposes is it used? In addition to this, can you tell me what the production was in 1897, and whether all of it was consumed in this country?

(Answer.—Silicon copper is made in the United States, by one firm, in Bridgeport, Conn. It is used in making some grades of wire. The production is not large, and is consumed in the United States chiefly, we believe, by the makers.)

C. C., St. Louis.—In a recent issue the New York "Sun" refers to the "acid process" mills at Cripple Creek, Col. Where can I get definite information regarding this process?

(Answer.—The term "acid process" is probably a mistake, due to want of information on the part of the reporter or editor. There are chlorination and cyanide mills in the Cripple Creek district, where the lower grade ores of the camp are treated, and it is to these mills that reference is probably intended.)

J. R. J., Cleveland.—Can you inform me whether there is any instrument in use for measuring compressed air? As air is now being used to a considerable extent for transmitting power, it would seem that use could be found for such a device.

(Answer.—There is no instrument or device at present in actual use for measuring compressed air. We are informed, however, that some improvements have been made in the Venturi water meter with the purpose of adapting it to the measurement of compressed air or gases. There seems to be no reason why the Venturi meter could not be used for such a purpose.)

F. L. M., Minneapolis.—Will you kindly give me such information as you can concerning the firms engaged in the tin-plate industry, and the sources from which I can obtain something concerning the history of this industry?

(Answer.—The history of the tin-plate industry in this country is a short one, dating back only a few years, and no connected account of it has been written. The statistics of its growth have been given from time to time in the "Engineering and Mining Journal" and "The Mineral Industry." Other information can be obtained from the "Directory" of the American Iron and Steel Association.)

G. M. T., Chicago.—Will you kindly inform me through the columns of your paper what is the capital stock of the Copper Queen Company, per value and number of shares? Also what is the total of dividends paid, and what were the dividends for the past year? I am unable to find the stock listed on any of the exchanges, but understand that it is a large producer and a good dividend payer.

(Answer.—The stock of the Copper Queen Consolidated Company of Arizona is not listed on any of the mining stock exchanges. It is the largest producer in Arizona, its output for 1896 having been 23,298,150 lbs. fine copper. The company has paid—as shown in the "Engineering and Mining Journal" for January 1st, 1898—a total of \$1,910,000 in dividends. No dividend was paid in the year 1897.)

C. W., Westfield, Mass.—Where is there a market for monazite? What are its uses? What is the demand, and where can samples be obtained?

(Answer.—The market for monazite is limited, its chief use being found in the manufacture of mantles for incandescent gas burners. This business is in the hands of a single company, or group of companies, which owns the patents for such burners in this country and Europe. Very full information about this mineral and its uses was given in "The Mineral Industry," Volume V. At present there is no demand for North Carolina monazite, as the supply is obtained from Brazil, where it can be furnished in large quantities and at a low price.)

PIG IRON PRODUCTION IN SWEDEN.—The output of pig iron from the Swedish blast furnaces during the nine months ending with September amounted to 410,300 tons, as compared with 380,300 tons in the corresponding period of 1896.

COPPERAS.—The production in 1897 was 13,924 short tons, against 12,070 short tons in the previous year. There were eight works engaged in the production, but the output of several of them was very small.

GARNET.—The production of garnet in 1897 was 4,000 short tons, against 2,800 short tons in the previous year. There were four producers, one in Maine, one in Connecticut, one in New York and one in Pennsylvania.

SILVER LOSSES IN CUPELLATION.—In a recent number of the "Transactions" of the American Institute of Mining Engineers, Mr. L. D. Godshall says that the silver losses in cupellation are due to absorption by the cupel and volatilization. He has determined the combined loss from these two sources and has studied the effects of a variable quantity of silver, of the weight of the lead button and the nature of cupel. The investigation is of much value as far as the commercial assay is concerned.

SHIPBUILDING IN GREAT BRITAIN.—The British returns relating to the production of new ships for the year 1897 are now practically complete. They show that altogether 934 vessels of 1,122,824 tons have been launched, as compared with 1,391,249 tons in 1896, and 1,154,018 tons in 1895. The decrease is not so great as might have been expected in view of the great disturbance caused by the engineering dispute. Of the vessels reported, 222, of 65,799 tons, were sailing vessels, and 712, of 1,057,025 tons, were steamers. The average tonnage was 297 for sailing vessels and 1,486 tons for steamers.

THE LARGEST MONOLITH.—It is claimed that the largest single stone ever quarried is the Wisconsin monolith, which is 115 ft. long, 10 ft. square at the base and 4 ft. square at the top. This stone was taken from the red sandstone quarries of F. Prentice, at Houghton Point, Wis., and it was originally proposed to send it to the Chicago Exposition as a Wisconsin exhibit. But engineering and financial reasons prevented, and it has been left at the quarry until the present time. A movement is now on foot to ship it by water to Milwaukee, and set it up there as a memorial of the fiftieth anniversary of the admission of Wisconsin as a State. Plans and estimates have been made, and it is estimated that \$40,000 to \$50,000 will do the work. The claim is made that the stone is 10 ft. longer than any recorded single stone quarried in the world.

MAGNESITE.—The production of magnesite in 1897 was 1,907 short tons, against 2,067 short tons in 1896. The total production continues to be from California, where two mines are operated; one at Child's Valley, twelve miles from Rutherford, and the other in Pope Valley, both in Napa County. The existence of the mineral is known at several other places in California; the mineral is of good quality, but the deposits are too remote to permit shipment to the Eastern States at existing freight rates. The Californian production has not much chance, therefore, of increasing beyond the requirements of the Pacific coast. Up to the present these comprise material for furnace linings in the rolling mills of San Francisco; the manufacture of Epsom salt and magnesia, which is carried on in San Francisco on a small scale; the preparation of carbonic acid, and for use as a bleaching agent in the manufacture of paper from wood pulp. In 1897 the consumption of crude magnesite for furnace lining amounted to 212 tons, while the remainder was used for the other purposes mentioned. Operations were carried on by the chief producer during a part of the year only, beginning July 12th and ending November 1st. The greater part of the output of this mine was consumed by the paper works on the Pacific coast, and changes from the soda process to the sulphite fiber process of paper manufacture and a gradual increase in the paper business are causing an increased demand for magnesite for this purpose. At the close of the year this producer reported larger orders for calcined magnesite than ever received before. Inquiries for the product have been received from steel makers of the East, but no business has been done yet in that direction, whether the cost of transportation is an obstacle. Some material has been furnished, however, for furnace linings in Nevada and Montana.

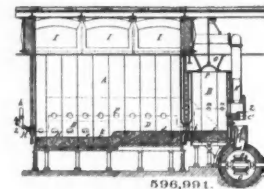
PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending January 11th, 1898.

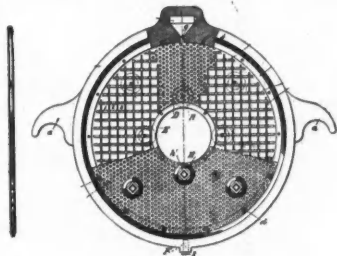
596,991, 596,992.—METHOD OF AND APPARATUS FOR MATTE OR PYRITE SMELTING. Oliver S. Garretson, Buffalo, N. Y. The method consists in conducting the operations of producing molten matte and converting or bessemerizing the same side by side, maintaining a flow of matte from the matte-forming region to the connecting or bessemerizing region, forming a fluid slag by the addition of flux



in the converting or bessemerizing region, and compelling such slag to flow through the matte-forming region on its way to the slag outlet, thereby subjecting the slag to the action of the sulphur and sulphides in the matte-forming region, whereby the values contained in the slag are intercepted and returned to the matte.

596,995. FILTER PRESS. Philander R. Gray, Jr., Elizabeth, N. J. Combination of the two outer perforated plates and a central member con-

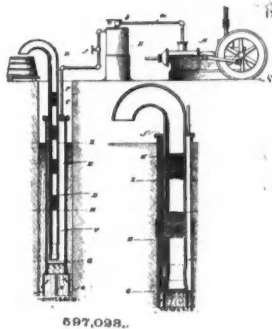
sisting of interlacing horizontal and vertical bars, the horizontal bars being flat and having the planes of their faces of greater



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dimensions parallel with the plane of the plate, and the vertical bars having flat portions parallel with the plane of the plate at each intersection, and between the horizontal bars flat portions standing at right angles to the plane of the plate.

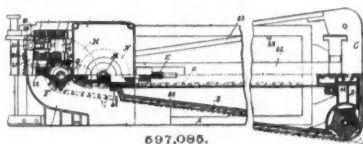
- 596,999. PROCESS OF MAKING CALCIUM CARBIDES. James E. Hewes, Philadelphia, Pa. The process consists in subjecting a mixture of carbide of calcium producing materials, and a flux consisting of manganese oxide and calcium carbonate to the action of heat sufficient to effect reduction of the calcium and manganese compounds.
- 597,006. PROCESS OF MAKING AMMONIUM NITRATE. Robert N. Lennox, London, England. Patented in England March 2, 1897, No. 5,483. The process consists in separating nitrate of ammonia from a mixture of sulphate of ammonia and nitrate of a metal capable of double decomposition, such as nitrate of soda, by distillation under pressure less than atmospheric pressure, and at a temperature such that material destruction of the nitrate of ammonia does not occur.
- 597,023. AIR LIFT PUMP. William L. Saunders, North Plainfield, N. J. The method consists in supplying directly to the open end of a



597,023.

valveless delivery pipe surrounded by an open-bottom chamber continuously supplied with a gas under pressure, of charges of the liquid and of the gas under pressure and in alteration.

- 597,078. COMPOSITION OF MATTER FOR BUILDING BRICK. William H. Dufree, Elgin, Ill. The composition consists of water, (for one thousand brick), fifty gallons; sand, forty-one cubic feet; cement, (Portland,) one and one-fourth barrels; oil of vitriol, one pint; ammonia water, two quarts; pulverized alum, one and one-half pounds.
- 597,085. MINING MACHINE. Edmund C. Morgan, Chicago, Ill. This machine has a main frame, a frame movably mounted on the main frame and carrying a cutter, a shaft mounted on the movable frame, a gear mounted on the shaft to rotate therewith, means engaged by the gear for moving the movable frame upon the main frame, a



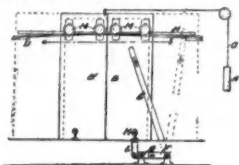
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master-wheel mounted concentrically with but adapted to rotate independently of the shaft, means for rotating the master-wheel, and gearing engaged and driven by the master-wheel, and intermediate the wheel and shaft, for rotating the shaft.

- 597,111, 597,112. ART OF SOLDERING ALUMINUM. Frank A. Gooch, New Haven, Conn. As a flux for this use is a mixture composed of a metallic fluoride and of other suitable halogen salts such that the fusing-point of the mixture shall be lower than that of aluminum.
- 597,113. COMPOSITION OF MATTER FOR GOLD COLLECTING PLATES. Charles E. Greene, Providence, R. I. Assignor to the Gold Magnet and Mining Company, same place. The composition is composed essentially of zinc, quicksilver and metallic sodium, combined in a molten state and consolidated when cold, as distinguished from amalgam plates in which successive coatings or washes of mercury composition in a soft or plastic state is applied to the surfaces of the plates.
- 597,139. ART OF SEPARATING AND REFINING METALS. Franklin R. Carpenter, Deadwood, S. D. The improvement consists in subjecting melted copper containing precious metals to an oxidizing atmosphere here acting on its surface, thereby forming an oxide of copper, and discharging it in a liquid state from the furnace, leaving the precious metals behind.
- 597,147. AIR-DOOR FOR COAL MINES. Albert E. Holbrook and John F. Harding, Abertillery, England. In combination with the sliding

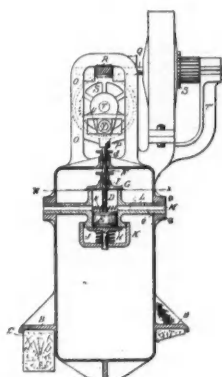


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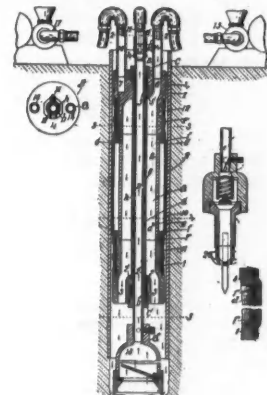
doors, the endless cord connecting them to move in unison in opening and closing, the weight for closing the doors automatically, the

lever E connected directly to one gate, the rock-shaft F adjacent to the track and carrying the lever, the movable track-section adjacent to the gate and the arm under the section connected to the rock-shaft.

- 597,223. AIR COMPRESSOR. Thomas H. Roberts, Detroit, Mich. Combination of an air-tank formed of two sections, and an air-pump secured in between the sections, the pump having its pump-cylinder formed with a supporting means fitted in and secured between the sections and provided with a series of air-inlet passages extending through the supporting means into the pump-cylinder.
- 597,238. CHLORIDIZING SILVER ORES. Ernst Heiligendorfer, Canelas, Mexico. The process consists in subjecting the same at an elevated temperature to the action of copper chloride, which is also called cupric chloride (CuCl₂) and of cuprous chloride dissolved in brine.
- 597,253. CENTRIFUGAL SEPARATOR. Charles A. Backstrom, New York, N. Y. Assignor to George Westinghouse, Pittsburg, Pa. Combination with a separator-bowl, a supporting-stud upon which the bowl rotates and a sleeve depending from the bowl, of a fluid-motor comprising two drums having intermeshing gear-teeth pistons and a casing provided with an inlet and an exhaust port, the casing and one of the motor-drums being respectively rigidly mounted upon the stud and the sleeve and the other motor-drum being journaled in the casing.
- 597,291. ACETYLENE GAS APPARATUS. Julius Leede, Minneapolis, Minn. Combination of a generating-chamber, a water-chamber below the generating-chamber, an exterior water-supply and means arranged outside the chambers for adjusting the normal water-line in the water-chamber to vary the rate of generation of the gas.
- 597,316. HYDRAULIC WELL-BORING MACHINE. George W. Durbrow, Salton, Cal. The combination of the bottom piece provided with the passage for a drill-pipe and also provided with another passage or passages for water; a head-piece provided with a passage for the drill-pipe and also with a water-passage, and a pas-



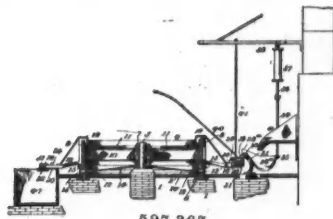
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sage for inflating the expansible wall of the plug; a drill-pipe casing between the head and bottom piece; a drill-pipe extending through the casing and drill-pipe passages; stuffing-boxes for the pipe in the head and bottom piece; a coupling-pipe connecting the head and bottom piece and surrounding the drill-pipe casing with a water-passage therebetween, and the expansible tubular wall around the coupling.

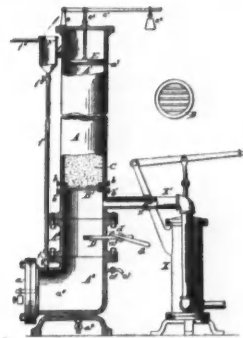
- 597,367. APPARATUS FOR CASTING METALS. Arthur L. Walker, Baltimore, Md. Combination with a ladle, of a circular track laid upon a fixed foundation, a shaft fixed to the foundation and arranged concentric with the track, a carrier-wheel resting on and supported



597,367.

wholly by the track and mounted on the shaft to have a determined or fixed plane of rotation, mold-carrying brackets adjustably hung upon the rim of the carrier-wheel, and a mold mounted in two adjacent brackets, whereby a series of removable molds of different kinds may be supported upon the rim of the carrier-wheel.

- 597,372. PRECIPITATING SAFE. Patrick J. Donohue and John F. Corker, Salt Lake City, Utah. The apparatus comprises a compartment for the operation of separation, a compartment for the deposition of the precipitate, the latter compartment being provided with an out-



597,372.

let and the compartments having communication one with the other, a grate in the passage of communication between the compartments, and means for closing the passage between the separating-compartment and the outlet, in the compartment for the deposition of the precipitate at a point between the grate and outlet.

PERSONAL.

Mr. T. R. Jones, manager of the Germania smelter, Salt Lake, is visiting New York City.

President John Dern, of the Mercur Company, has returned to Utah from a visit to Nebraska.

Mr. Samuel Newhouse is sojourning in New York, and is liable to remain East till the middle of February.

Mr. Hermann A. Keller has just completed an examination of a promising new copper proposition at Bingham, Utah.

Mr. O. L. Ridgely will be superintendent of the Danville, Ill., district of the Consolidated Coal Company's mines after February 1st.

Mr. A. B. Harmon, of San Francisco, recently inspected the Gold Bug property in Granite County, Mont., for San Francisco parties.

Mr. Edward Saunders, who is connected with the Le Roi mine at Rosslund, B. C., is at present in Chicago, on his return from New York.

Mr. Horace V. Winchell, mining engineer, of Minneapolis, Minn., is in Chicago at the present time on business in connection with a metallurgical process.

Mr. W. B. Devereux, en route eastward from Nevada, devoted last week to Utah. He spent several days in the Marysvale region, Piute County.

Mr. David Moore of Cleveland, O., and Mr. R. E. Hayes of the Senate Mining Company recently visited the Buena Vista mine, near Yuma, Arizona.

Mr. F. E. Rutland, of London, England, representing the Occidental Syndicate, has been in the Rat Portage district, Ontario, and is going to the Klondike.

Mr. Frank E. Shepard, mechanical engineer, January 1st assumed the position of superintendent of the Denver Engineering Works Company of Denver, Colo.

Mr. D. J. Duncan, of Colorado Springs, Colo., recently returned from Dutch Guiana, where he was a member of a party that examined some placer gold fields.

Messrs. Thomas Kearns and David Keith, principal owners of the Silver King, Park City, after an outing of several weeks on the Pacific, are again in Utah.

Mr. J. E. Mills, consulting geologist and mining engineer for the Anglo-Mexican Mining Company, of London, has been in Denver, Colo., purchasing machinery.

Mr. Thomas J. Barbour, of the Risdon Iron Works, has returned to San Francisco from a business trip embracing New York, Boston and several Colorado points.

Mr. A. G. Brownlee, of Chicago, has gone to Colorado, where he will inspect for Chicago people the North Star Gold Mine at Maucos, Montezuma County.

Mr. E. N. Marvin, accompanied by E. Winsor Richards, president of the Iron and Steel Institute of Great Britain, recently examined the coke region about Pittsburg, Pa.

Mr. A. H. S. Bird of Salt Lake, Utah, has begun operations on the Mother Lode in California, and for the next few months his headquarters will be at Placerville and Sacramento.

Mr. Frank Nicholson, mining engineer, has returned to New York from London, and goes on at once to Mexico, where he is manager of the properties of the Consolidated Gold Fields of Mexico.

Mr. W. A. Carlyle, provincial mineralogist of British Columbia, was lately in Rosslund, B. C., in company with Mr. D. J. Macdonald, who was recently appointed inspector of metalliferous mines for the West Kootenay District.

Mr. Charles H. Deuell, of Syracuse, N. Y., has been appointed Commissioner of Patents by the President, to succeed the late Mr. Butterworth. The new Commissioner is a lawyer of good standing, and has had much practice in patent cases.

Mr. Oliver Durant, manager of the Center Star mine, at Rosslund, was recently at Butte, Mont., attending the funeral of the late P. A. Largey, who was president of the Center Star Company up to the period of his untimely death.

Mr. George E. Roberts, of Fort Dodge, Iowa, has been appointed Director of the Mint of the United States, to succeed Mr. R. E. Preston, who has resigned, after nearly forty years' service in the Treasury Department. Mr. Roberts has been an editor, and has written a number of articles and pamphlets on financial questions. He is a man of high character and much ability.

OBITUARY.

George Picton, an old-time colliery manager, died recently at Plymouth, Pa., aged sixty years. He was born in Wales, and in 1862 emigrated to America. For twenty years he was inside superintendent of the Gaylord mine.

John W. Hepbourn, of Chicago, died in San Francisco, Cal., on January 15th, aged 46 years. He was a prominent member of the Chicago Board of Trade, and recently acquired large interests in mines in Amador and Calaveras counties, Cal. He was sole owner of the Bell Wether mine near Jackson.

Edward Davis, one of the largest and wealthiest coal owners in Wales, died of paralysis at Plas Dinam, Cardiganshire, on January 15th, aged 45 years. He was president of the Ocean Collieries Coal Company, and managing director of the Barry docks and railroads. He leaves an estate valued at \$20,000,000.

Fredrick T. Pierson, of Syracuse, N. Y., died in that city on January 19th, in the 60th year of his age. He went to California in 1860, and became an assayer and mining engineer, with headquarters at San Francisco. He was well known throughout the State and had great success. He returned East in 1870.

John B. Winters died at Halley, Idaho, on January 15th, in the 71st year of his age. He was born in Pennsylvania, but went West when a young man, and became one of the best known citizens of Nevada. He was one of the earliest miners on the Comstock Lode, and for several years one of the most important men there, being superintendent of the Yellow Jacket and Kentuck during the time of wild speculation in the early 70's.

SOCIETIES AND TECHNICAL SCHOOLS.

Chicago School of Assaying.—This school commenced the year with 30 students in its class of assaying, from all over the country. Professor Young has opened a night school at the school offices and a large number of pupils are taking advantage of the evening instruction.

Engineers and Architects' Club of Louisville, Ky.—The annual meeting was held January 15th. The following officers were elected: President, Webster Gazlay; vice-president, William B. Blake; secretary, James K. Zollinger. Directors: Henry Vogt, J. P. Claybrook, J. C. Murphy, Marshall Morris, Granville W. Shaw, Charles Hemanly.

Society of Chemical Industry.—The New York Section held an interesting meeting at the College of Pharmacy on January 21st, Dr. Chandler presiding. The feature of the evening was the address of Dr. Jokechi Takamine, the well-known Japanese chemist and discoverer, who described the Japanese method of making alcoholic beverages. A very lively discussion followed this address. Thereafter the secretary read Mr. Glenn's paper on the sampling of a cargo of ore.

British Columbia Association of Mining Engineers.—This body recently met at Vancouver. F. C. Loring of Rosslund read a paper on the "Mining Laws of the Province and Their Application to Mines." Robert R. Headley, of the Nelson smelter, read a paper on the "Possibilities of Smelting in British Columbia." Other papers were "Notes on Ore Bodies," given by J. C. Gwillim; "Odd Notes on Mining," by A. H. Holdich of Nelson, and "Mining Machinery in the Slocan," by Howard West, New Denver.

Engineers' Club of St. Louis.—A regular meeting of the club was held on January 19th. The paper of the evening, entitled "Experiments with a New Machine for Testing Materials by Impact," was by Mr. S. Bent Russell. A description was given of the usual methods of testing materials by impact, with drawings of the new machine, and the method by which the machine had been calibrated and tested. Tables of tests, drawings, samples of broken specimens, and cutters used in forming test bars, were exhibited.

Ohio Society of Surveyors and Engineers.—The annual meeting of the society was held at Columbus on January 17th, 18th, and 19th. The following officers were elected: President, J. L. Gilpatrick, Granville; vice-president, Edward A. Kemmler, Columbus; secretary-treasurer, C. N. Brown, Columbus; trustees, J. B. Weddell, Mansfield; G. A. McKay, Xenia; G. S. Innis, Columbus; J. B. Strawn, Salem; and J. M. Harper, Cincinnati. A number of interesting papers were read and discussed at the various sessions of the meeting, and many of the members visited the various points of interest about the city with the excursion parties.

INDUSTRIAL NOTES.

The Le Roi mines, Rosslund, B. C., have placed an order for a large size special Knowles sinking pump.

The Pittsburg Locomotive Works have received an order for four six-wheel Mogul locomotives for the Kiushu Railroad in Japan.

The rolling mill at Laramie, Wyo., is to supply 2,000 tons of angle plates and rail couplings for the Idaho Division of the Oregon Short Line.

The Butler Clay Company, of Butler, Ga., capital \$30,000, has applied for a charter to mine and manufacture clay. T. C. Butler and others are interested.

The American Clay Working Machinery Company of Bucyrus, O., shipped 100 tons of machinery to Mexico last month, for the Mexican Clay Manufacturing Company.

The St. Joe Mining Company, capital \$58,400, has been incorporated at Little Rock, Ark., by John B. Jones, George W. Dale, and H. L. Watts, to own and operate mines of all kinds.

Henry H. Spears, W. C. Kennedy, and S. S. Fox, of Valley Station, Ky., have applied for a charter for the Kentucky Portland Cement Company, to manufacture Portland cement and hydraulic cement. Capital stock, \$9,000.

The Riter & Conley Company, of Pittsburg, is to erect two large steel tanks at Los Angeles, Cal., for the Oil Producers' Combination. The tanks will be 85 ft. in diameter and 35 ft. high, with a capacity of 35,000 bbls. each.

Nathaniel P. Pratt, of Fulton County, Ga., and G. J. Baldwin, of Chatham County, have applied for a charter, at Atlanta, for the Pratt Process Company, to manufacture acids, fertilizers, machinery, mills, etc. Capital, \$40,000.

The Schoen Pressed Steel Company of Pittsburg, Pa., is building five steel sample cars for the Butte, Anaconda & Pacific Railroad of Anaconda, Mont. The company will also build 5 cars of 110,000 lbs. capacity for the Pennsylvania Railroad.

The Barnum & Richardson Company of Chicago, which formerly manufactured car wheels, is now giving most of its attention to casting shoes and dies for stamp mills. These are said to be made on scientific principles and have great endurance.

The Massillon, O., Bridge Company has received an order for the construction of a cantilever bridge 562 ft. long and 18 ft. wide, which is to be built by the New York Dredging Company at Honda, on the Magdalena River, in Colombia, South America.

The Asphaltum Company of America, Syracuse, N. Y., has elected these officers: President, William J. Gillett; vice-president, Frank L. Bapst; secretary and treasurer, Duncan W. Peck; directors, William J. Gillett, Frank L. Bapst, John A. Just, Duncan W. Peck and F. E. Englehardt.

The United Alkali Company, Limited, of England, is reported to have decided to locate its American plant at Bay City, Mich. Some time ago it was stated that the United Alkali Company would spend £200,000 (\$1,000,000) in the first year of its enterprise, and a like amount in the year following.

The Pulsometer Steam Pump Company of New York made a shipment of two 1,000 gal. pumps to the Southern States this week and reports that it has taken orders for a like number of pumps of the same capacity for South America and also two for Mexico, in addition to one of 700-gals. for the West Indies.

H. J. Reiling, president and general manager of the Gold Dredging Company of Chicago and Bannack, Montana, has disposed of his interest in the company. He was among the first to successfully operate gold dredging plants in the United States. Mr. Reiling will devote his time to the building of dredging machinery and has removed his offices in Chicago to the Tacoma Building.

Messrs. S. E. & H. L. Shepherd of Rockport, Me., are using an electrically operated cableway built by the Lidgerwood Manufacturing Company, of New York, in which electric motors are installed in twins, operating the hoisting drums, located near the head tower. The machine works with remarkable smoothness. It employs the standard Lidgerwood carriage and Miller fall rope carriers.

Mr. I. C. Yawger is now carrying on at 21 Maiden Lane, New York, the business so long conducted by the old firm of Victor Bishop & Company, as importer and dealer in diamonds, carbon and bort for diamond drills and similar purposes. Mr. Yawger was long connected with the old firm and his thorough acquaintance with the business enables him to maintain fully the high reputation earned by the house.

Peter D. Wanner and George Harrison were appointed receivers on January 22d of the Reading Foundry Company, one of the largest manufacturers of cast iron pipe in Pennsylvania. The company was organized in 1884, succeeding the Mellert Foundry Company, and employs 300 men.

when in full operation. The assets amount to \$360,000, with liabilities aggregating \$250,000, which includes two mortgages of \$50,000.

The firm of Saunders, Fielding & Bond of New York has been dissolved by mutual consent, Mr. Charles W. Fielding having retired as from June 30th, 1897, and Mr. Franklin S. Saunders as from December 31st, 1897. The business of the firm will be continued by F. E. Vivian Bond under the firm name of Vivian Bond & Co. This firm must not be confounded with the well known old English house of Vivian, Younger & Bond, of 117 Leadenhall street, London, with which it has no connection.

The Canadian General Electric Company is putting in a plant at Bonnington Falls, B. C., on the Kootenay River, 30 miles from Rossland. The plant is being installed for a company of which Oliver Durant, of the Centre Star mine, is president, and the company's intention is to transmit power to Rossland for use in operating mines. The generators are to produce 2,500 electrical horse power, and a three wire line will carry the current to Rossland, at a pressure of 20,000 volts.

Among the extensive improvements now being made by the Benjamin Atha & Illingworth Company, at Harrison, N. J., is a new steel building known as the Tower Building. This building is 30 ft. square and about 40 ft. high; 35 ft. above the ground is a circular trolley track carried by the roof trusses. The framework of the building is of steel throughout, and the siding and roofing of corrugated iron. The complete contract for furnishing and erecting this building has been given to the Berlin Iron Bridge Company.

Mr. Edward C. Bacon, engineer of the Farrell Foundry and Machine Company of Ansonia, Conn., recently shipped several carloads of crushing machinery to a large mining company in the Lake Superior region, and has also completed an order for 27 crushers for a large contractor in New York. Mr. Bacon has now under construction a complete plant for mining, crushing and separating tungsten in Connecticut, and lately finished in Canada what is probably the largest plant ever erected for use in the asbestos industry.

It has been more than 14 years since Mr. Hoskins first introduced his hydro-carbon blow pipes and furnaces to the assaying public, and though it was at first up-hill work to convince those interested that the use of gasoline was not attended with danger and that the apparatus was practical, it is now admitted that his appliances have been of great benefit to the practice of assaying. The firm of Wm. Hoskins & Company, Chicago, has just issued a new catalogue, with full description and prices of new designs and types of furnaces, including combination and portable furnaces. It might be well to add that Mr. Hoskins has just been allowed protection on his new combination furnaces by letters patent No. 596,707, issued January 4th, 1898, which was referred to and illustrated in our columns.

The Pelton Water Wheel Company reports some important shipments recently, including wheels, governors and accessories covering a 2,000 H. P. plant for San Rafael Paper Mills, Mexico; six wheels for various other localities in Mexico; a 1,200 H. P. wheel, with governors and accessories for an electric transmission plant for Petropolis, Brazil, this being a duplicate of a former; an electric power transmission plant for Fruijillo, Brazil; seven wheels with governors, pipe lines and accessories, to operate tea and coffee plantations in Java; three wheels for the Ruby Mines in India; two 50 H. P. wheels for operating mills in Tasmania, Australia; three 1,000 H. P. wheels, with governors and accessories, direct connected to Stanley generators, for the Yuba Power Company, Marysville, Cal.; one 200 H. P. wheel for operating the mill of the Dexter Gold Mining Company, Tuscarora, Nevada; nine wheels for various mining operations in California.

The American Fisheries Company, which was incorporated at Trenton, N. J., recently, has elected the following Board of Directors: John E. Searles, Chauncey M. Depew, Charles J. Canada, W. M. Coler, Jr., Capt. N. B. Church, Rt. Hon. Lord Lurgan, F. B. Jameson, George V. Sims, and John Jameson Cairnes. The officers are: President, Charles J. Canada; vice-president, Lord Lurgan, London; chairman of the board, John E. Searles, New York; secretary and treasurer, Winthrop M. Tuttle, New York; assistant treasurer, Charles Cummings, Dublin; general manager, N. B. Church, New York; general counsel, Hobbs & Gifford. The capital of the company is \$10,000,000, of which 1,600,000 \$5 shares are common and 400,000 are accumulative 7 per cent. preferred stock. Half of the preferred stock is now being sold in London. Besides acquiring all the principal menhaden fisheries in America the company will also secure the Stanley patents for treating of fish offal, and will enter with them into business in the Pacific Coast salmon fisheries.

TRADE CATALOGUES.

A very neatly illustrated and clearly printed pamphlet of 256 pages makes up Catalogue No. 7 of "Powell's Steam Brass Goods," issued by the William Powell Company, of Cincinnati, Ohio. The pamphlet contains mention of the different styles of valves, lubricators, oil feeders, improved oiling devices and many other Powell specialties, besides useful information to users of such goods.

Arthur Koppel of Bochum, Germany, issues a handsomely illustrated catalogue of portable and permanent industrial railroads and railroad material. At the Bochum works steam and electric roads of many different patterns are built, as well as machinery for handling freight on docks, at stations, etc. The illustrations show railroads and other works in a number of different countries. These include mining and quarry lines and several at coal mines and coke works. Rope haulage plants are also found in the catalogue, which is well worth attention.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufactures in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

The inter-state joint convention of bituminous coal miners and operators, met at Chicago January 17th, to fix a wage scale for 1898. At the outset it was seen that the field to be covered was so large and the interests so varied that little could be accomplished in open convention, and a committee was appointed representing miners and operators of Illinois, Indiana and Ohio and some of the West Virginia fields.

This committee finally drew up the following resolutions, which were adopted on January 26th, with but two dissenting votes. It is said that the changes affect 200,000 miners:

"Resolved, 1st, That an advance of 10c. per ton for mining screened coal take effect in the Western Pennsylvania district, Hocking Valley (Ohio) district, and Indiana bituminous district, the 1st day of April, 1898, and that a relative run of mine price be determined in all the districts named, by a uniform flat or Akron shaped bar screen of 72 ft. superficial area, 1 1/4 inch space between the bars;

"2d, That the price of run of mine coal in Grape Creek district, and in the Indiana bituminous district be 40c. per ton for the same district, based upon 66c. in Pittsburg thin-vein district, and that in Hocking Valley and Indiana,

"3rd, That on and after April 1st, 1898, the 8-hour day shall be in effect in all districts here represented; that uniform wages for day labor shall be paid the defendant classes of labor in the field named, and that internal differences in any of the States, both as to prices and conditions, shall be referred to the States affected;

"4th, That we further agree to the use of the diamond bar screen of present pattern in the block district of Indiana, with the privilege of run of mine as may be desired by the market conditions."

Petroleum.—There was shipped from the United States in 1897 16,157,271 cases of petroleum to foreign countries, as against 13,913,373 cases in 1896. In only one case was there a decrease in exports in 1897, and that less than 100,000 cases, to Penang, Singapore. The shipments in 1897 were distributed as follows: China, 6,680,628 cases, against 4,982,418 cases in 1896; Japan, 4,371,299 cases, against 4,046,813 cases; India, 3,333,983 cases, against 2,604,022 cases; Java, 1,483,019 cases, against 1,912,521 cases; Penang, Singapore, 279,342 cases, against 368,199 cases. The new discoveries abroad, while they appear promising, are still to be developed on a commercial basis before their output of oil can compete with the American product.

ALABAMA.

Blount County.

Robert Stevens and his associates have purchased 5,000 acres of coal land near Hanceville, and will develop it. A 12-mile spur track from the main line of the Louisville & Nashville Railroad at Hanceville will run to the properties. The vein is 4 1/2 ft. thick. The coal is very good.

ARIZONA.

Pima County.

Saginaw Reduction Works.—This plant, six miles from Tucson, is now provided with 3

Huntington mills, six concentrators and a smelter.

CALIFORNIA.

Calaveras County.

(From Our Special Correspondent.)

Paragon Consolidated Gold Mining Company.—This group of mines near West Point comprises the Paragon, Mountain View, Palomacita, Princess, Tip-Top, Bullion and Empress. They will be operated under the management of F. L. Sherman.

Santa Ana.—This mine, 2 miles south of Angels, on Albany Flat, between the mother lode and the east vein, is down 400 ft. and is still sinking in good ore. A large mill is about to be erected.

Tracy.—The hoisting plant at this mine south of Angels has been completed. Power is furnished by a 60-H. P. engine, with an 80-H. P. boiler, capable of hoisting from a depth of 1,000 ft. The management intends to sink to the 400-ft. before crosscutting. The croppings of the vein go as high as \$20 to the ton.

Utica-Stickles.—At these mines in Angels, 180 stamps are dropping and a new four-compartment shaft is being sunk to a depth of 2,000 ft.; this will increase the output very largely. The chlorination works are probably the largest in the world. The power plant is operated by 3,000 miners' inches of water brought through a 90-mile ditch and flume.

El Dorado County.

(From Our Special Correspondent.)

Superior.—This property, three miles south of Placerville, which has been idle for some time, will be opened up by a Sacramento Company. The tailings on Webber Creek will be worked by a steam arrastra.

Inyo County.

(From Our Special Correspondent.)

Mazourka Canyon.—A Los Angeles company has secured 240 acres of placer ground in this canyon, which will be worked through a tunnel now in 330 ft. A flume is to be built.

Panamint Mountains.—Arrangements are being made by Montgomery Bros., the owners of the Dennison mine, to erect a stamp mill on each of their properties. There has been a great deal of prospecting done in this district this winter, and some very promising prospects are reported.

Mono County.

(From Our Special Correspondent.)

Black Lake District.—This new district, lying about six miles northwest of Benton, in the Sawmill range of mountains, has been organized. Water for milling purposes will be obtained from the Black Lake, three miles distant.

Monterey County.

(From Our Special Correspondent.)

Carmel Land and Coal Company.—This company has sold 640 acres of its property to Alexander M. Allen. The land transferred includes part of the old Rancho San Jose y Sur Chiquito in the Point Lobos vicinity, about 10 miles from Monterey. The mines were reopened about three months ago when the present owner began his investigations in regard to the property. The coal is semi-bituminous of good quality.

Nevada County.

(From Our Special Correspondent.)

A. B. Calkins & Sons have discovered a rich lead of blue gravel on their 80-acre patented tract, at the foot of Selby's Flat. Since August last they had run the main tunnel 215 ft. and had upraised and drifted several hundred feet when the strike was made. They think they have at least half a mile on the channel, which runs parallel with and several feet above the tunnel. Prospects show from 10c. to the pan upward. Arrangements are being made to work the claim on a large scale.

Providence Mining Company.—At the annual meeting of this company held at San Francisco January 11th, the following directors were elected: Peter Tauthaus, Fred Boeckmann, John V. Hunter, Dr. E. F. Liebrich and Joseph Buttgenbach. The Board re-appointed William McKinley, Sr., superintendent. The property of the company comprises 180 acres, located about a mile west of Nevada City.

Red Dog.—The permit to hydraulic having been obtained from the Debris Commission, work has been commenced on the restraining dam on Greenhorn Creek, and the mine will start up as soon as water can be obtained. The dam is being built of logs, 40 ft. high, 175 ft. long and 20 ft. wide on top. Twelve men are employed under superintendent F. W. Whitten. The property of the company comprises 200 acres on the Blue Lead channel.

Placer County.

(From Our Special Correspondent.)

Drummond.—On this property, near Sugar Pine mills, eight miles north of Forest Hill, there are two veins, and on each a great deal of development work has been done. The new tunnel has cut a 14-inch ledge at a depth of 750 ft.

Golden Thread.—This mine in Star Town, Last

Chance district, is claimed by two sets of parties both of whom are doing assessment work by running a tunnel.

Gold Run.—The 10-stamp mill at this mine at Gold Run, between Dutch Flat and the American River, has started up. The company has a dam and a permit to hydraulic, but water supply is too small. The property comprises 7 miles of ground.

Seller.—The tunnel at this drift mine, two and a half miles northeast of Michigan Bluff, is in 430 feet, and has reached a fine body of blue gravel which is believed to be a continuation of the famous Red Point lead. A dump is being built and a fine equipment for operating the mine will be put in.

Riverside County.

(From Our Special Correspondent.)

North Helmet.—This group of mines on the San Jacinto Mountains, has been sold to the Gold Hill Mining Company of Riverside. The property comprises 15 claims, on which are located three small mills. A. F. Judson is superintendent.

San Bernardino County.

Randsburg-Santa Fe Reduction Company.—The company at Barstow has placed an order with the Colorado Iron Works of Denver, for a 50-stamp mill concentrating plant, including also a complete ore sampling plant. The mill is to be a modern one throughout and will be completed and ready for operation about the first of May. J. N. Beckley of the Randsburg railroad is chief owner of the mill.

(From Our Special Correspondent.)

Pioneer.—This group of mines, 12 miles west of the Needles, in the Ibox district, has been purchased by Clay & Jackson of Kansas City, who will erect a mill at once and begin development.

Shasta County.

(From Our Special Correspondent.)

The Afterthought Smelter at North Cow Creek resumed work after lying idle about a year, running from December 13th to January 13th. The 1,000 tons of roasted ore on hand was run through and 60 tons of very high grade matte was obtained, which was shipped to the refinery. Twelve men were employed. The assessment work now being done, the plant will remain idle again until the settlement of the estate of Joseph Enright, deceased.

Salt Creek.—The Corrinne, one of this group of mines, 4 miles west of Redding, is turning out some good ore; the ledge was crosscut at a distance of 130 ft., then a drift was run 62 ft., and an upraise made 60 ft.—in ore all the way up. The average is said to be \$30 to the ton.

Trinity County.

(From Our Special Correspondent.)

Applegate & McCulley.—This mine, three miles south of Dedrick, at the mouth of Fischer Gulch, comprises 20 acres which are operated by water from Fischer Gulch.

Brown Bear.—This mine at Deadwood now employs over 50 men, 20 of whom are engaged on prospect work. The 15-stamp mill is running steadily on fair grade ore.

Highland.—This hydraulic mine at Taylor Flat, on Trinity River, has passed into the hands of a Red Bluff company. The ditch has been enlarged and the mine thoroughly equipped for the season's run. Piping is carried on about three hours a day. The force will be increased as soon as the water comes. Gilbert Pelletreau is superintendent.

Truax & Dillon.—This quartz mine on Morrison Gulch near Carrville has shut down temporarily on account of the weather. The ledge is said to assay from \$25 to \$35 per ton. Work will start up about March 1st.

COLORADO.

The miners in the lignite fields of the northern part of the State have struck for higher pay, and the mines have closed indefinitely. The trouble is said to be due to an over supply of labor, and the competition of better coal from the southern fields. From 500 to 700 men are out of employment.

Clear Creek County.

(From Our Special Correspondent.)

Cashier.—A consolidation of this property and the Mint at Empire is under way.

Comstock.—The fight between the owners of this property and the Dove's Nest over the vein which left the Comstock side lines and came into Dove's Nest, was heard in the Federal Court in Denver last week. The jury brought in a compromise verdict. The Comstock has the vein to where it leaves the side lines, the Dove's Nest then for about 200 ft. and the Comstock from there to the end lines about 90 ft. It then connects with the Dove's Nest proper. This decision puts a block of ground for each of the owners which cannot be worked without trespass and shows how absurd a verdict a jury can render. It does not please either side. It is probable the owners will get together and compromise, or else consolidate the two claims.

Hecla.—The new mill at Empire will be run-

ning next week. It treats ores by concentration.

Little Pittsburg Company.—The Atlantic at Empire has been secured by this company working the Brighton mine at Idaho Springs. It is the intention to sink the shaft and also operate the old Knickerbocker mill on the low grade product.

New Dunderberg Company.—Some time ago Judge Hallett issued an injunction preventing the company from taking ore from the Frostburg lode belonging to R. O. Old. It is claimed that this injunction was violated and B. C. Catron, the manager, has been cited to appear before the court for contempt.

Silver Mountain Gold Mining Company.—The shaft on the property at Empire is being sunk in a big body of ore. In one of the levels the entire streak is smelting ore.

Smelter Combine.—It is reported that the smelters and ore buyers are beginning to give secret cuts to big shippers. If this continues it means a collapse of the combine of last November. The Mine Owners' Association is believed to have something to do with it.

Dolores County.

Emma.—At this mine in the West Dolores district a large concentrating plant is nearly completed. It contains 10 stamps, 2 Wilfley tables and 2 Frue vanners. A large amount of ore is said to be blocked out and 50 men are employed. The stockholders live in New York and Boston.

El Paso County—Cripple Creek.

(From Our Special Correspondent.)

Dead Pine.—A new ore house is being built on this property, which is situated on Battle Mountain, near the town of Victor, and is owned by Ed. Wolcott, Dennis Sullivan and others. Considerable ore has been shipped.

Garfield-Grouse.—It is rumored that the Garfield-Grouse and the Mineral Rock claimants have settled their disputes and consolidated, and the new company will be known as the Garfield Consolidated. The property lies on Bull Hill, between the Union and the Pharmacist. Some very good ore has been taken out, but no work has been done lately.

Golden Cycle.—The Golden Cycle tunnel has cut the Legal Tender shaft of this company. The tunnel is in over 500 ft. It starts in the town of Goldfield and runs into Bull Hill toward the Victor.

Gold Sovereign Mining and Tunnel Company.—The tunnel is in 500 ft. No work is being done pending the settlement of the litigation with the John A. Logan. The case comes before the Court of Appeals at St. Louis soon.

Hallet & Hamburg.—This property on Battle Mountain is shipping about 150 tons of ore per week. For the past six weeks the value of the ore has averaged about 7 oz. per ton. The shaft is down 300 ft.

Isabelle.—At the annual meeting new directors were elected as follows: Nelson B. Williams, George D. Hilburne, J. A. Hayes, W. T. Jackson and H. J. Von Hemert. Ore shipped during the past year was 11,826 tons, as against 9,588 in 1896. The profit for 1897 was \$54,579; for 1896, \$220,114. The difference in profit is due to some extent to sinking and equipping the new shaft, but principally to the falling off of the grade of ore. The amount paid in dividends during 1897 was \$67,000; for 1896, \$180,000. The balance in the treasury is now \$103,023. No change for the present at least will be made in the management.

Jolly Tar.—Considerable development work has been done by Mr. Sutphin and others, who have a bond and lease on the same. The shaft is now down about 400 ft., and sinking and drilling is being done. Two air drills are in, and some ore is being shipped.

Lexington Group.—Colorado Springs people are operating this group of seven claims excellently located in the Weston Pass territory. The main work is on the Lexington, where the new shaft is down nearly 100 ft. It is to be sent to the contact. Work is carried on also through a tunnel on the Pay Rock claim of the group. Trouble with water was experienced last week and a plant of machinery is now being put in.

Little Joe.—Considerable work has been done on this property on Bull Hill, by W. H. Reynolds, of Brooklyn, N. Y., who has a lease and bond on this and on the Kalamazoo. The shaft on the Little Joe is down 500 ft. and drifting is being done on the lower level, which is at the bottom of the shaft. There is also a level at 200 ft., on which a large amount of work has been done. The property has been worked for over a year, and about 2,000 ft. of work has been done in all. No ore has yet been found. Eighteen men are at work.

Mary McKinney.—Considerable work is being done by lessees, who shipped about 350 tons of good ore per month. On the Birch lease the ore is said to average about 7½ oz. gold per ton. Two compressor plants are at work. Mr. George F. Keener has charge for the company.

Moon Anchor.—The showing of this company for the past seven months has been very good. The statement for that time is as follows: Total amount of ore shipped to smelter, 2,925 tons; gross smelter returns, \$263,156; average gross value per ton, \$91.66; net smelter returns, \$227,387; net value per ton, \$77.73; average net smelter returns per month, \$32,487; operating expenses, \$76,846; average expenses per month, \$9,406. The sum of \$76,846 operating expenses includes \$13,000 spent in sinking a new working shaft a short distance south of the present shaft. It is 4½x15 ft., with 3 compartments, and is now down about 280 ft. A dividend of 2½c. per share, or \$15,000, was declared this week, making a total of \$126,000.

Raven Gold.—This company paid its first dividend this week of 1c. per share amounting to \$10,000. The company owns the Raven, Pioneer E., Gregory, Maid of Erin and Snowy Range lodes on Raven Hill, having about 30 acres of ground in all.

Gilpin County.

(From Our Special Correspondent.)

A New Mill.—E. H. Collier & Company, of Denver, are going to build a small mill at Russell Gulch, having purchased the Jones mill site. The buildings are well under way. Two Little Giant stamp mills, which are reported to treat about 4 tons each daily, will be put in. The building will hold additional stamps enough to increase the capacity to 20 tons per day.

Chlorination Plant.—Your correspondent is informed by reliable authority that a chlorination plant is very likely to be erected at an early date.

Carr.—Sinking has stopped on this Bobtail Hill property for the present, the shaft being down 515 ft. At this depth a 5 ft. ore body has been opened up which returns \$27 per ton. The first class smelting ore from this property runs \$107 per ton, and the mill ore averages over 3 ozs. gold per cord.

Cicero.—A home pool is pumping out this mine on Bates Hill.

Dowell Franklin.—Local parties are operating this Bates Hill property, and are taking out smelting ore worth \$50 per ton.

Egyptian.—An Eastern syndicate is examining this Quartz Hill mine. For several years it has been worked only in a small way by leasers.

Enterprise.—Idaho Springs and Colorado Springs parties have secured a lease and bond on this property at Yankee Hill, owned by Central City parties. The lessees have also leased the Kent stamp mill, to treat Enterprise ore.

Gregory-Bobtail.—This property, that is the incline, is reported by the management to be looking better, and the mill ore is carrying increased values.

Harsh.—Messrs. Collins Bros., the well-known mining and milling men, have taken a 5-years' lease and bond on this mine in Leavenworth Gulch. A new shaft house, 25x45 ft., is being erected, and a new plant of machinery is to be installed at once. The vein is one of the largest in the country, but of a low grade, its value lying mostly in iron. The lessees are treating the ores of several low grade properties at their Rocky Mountain mill with success.

Ivanhoe.—Sinking is going on in this mine on Quartz Hill, at over 1,200 ft., with encouraging indications, according to the management. St. Louis parties are interested in the operations.

Johnson-Kansas.—Philadelphia parties have taken a lease and bond on this mine, on Quartz Hill, and are sinking a new shaft, which at 50 ft. shows a small vein coming in.

Monroe.—Denver parties have taken a lease and bond on this claim on Quartz Hill, and have about completed a new shaft house and installed a small plant of machinery. The shaft is now 150 ft. deep, and sinking will begin at once.

Moon Gulch.—This young camp is in the Union district, about ten miles north from Central City. Several sales of mining claims are reported since January 1st, and in all probability that section will receive considerable attention this year.

Risdon Mill.—C. A. Hale, of Denver, representing the Jenny Creek Mining and Exploration Company, purchased the Risdon 15-stamp mill at the mouth of Stewart Gulch this week. The mill is to be rebuilt at Jenny Creek as early as possible, to treat ores from the company's claims. New bumping tables of the Gilpin County pattern are to be put in, as well as a Wilfley table. The successful operations of this mill on the ores in that section lying in the Phoenix and Ransas districts in this county and bordering on Boulder County, will do much to develop it.

Starling.—Chicago parties have taken a lease and bond on this property. It is developed by a tunnel, and operations are to be pushed.

Lake County.

(From Our Special Correspondent.)

Dollie B.—The Conley Brothers, of this city and New York, are opening the strike recently

reported, which is proving a rich bonanza. It is doubly important as it opens up new territory. The Dollie B. strike now shows, it is said, a fine breast of ore 7 ft. high, which assays 1 oz. gold, 35 ozs. silver and 40 per cent. lead. Shipments are steady and average 20 to 25 tons per day.

Hope.—Lessees on this property at the head of Seventh street, are in good ore. They have been running a drift to get under it, and will resume shipments on February 1st, of about 25 tons per day. It is a lead ore running 5 to 6 ozs. silver and about 20 per cent. lead, with a good iron excess. There is no trouble with water.

Jason.—This property in Poverty Flat section is operated by lessees, who last month shipped 1,876,960 lbs. of ore, and are now handling about 40 tons of ore daily for the steel works at Pueblo. It comes from the first contact at the 204-ft. level, but goes deeper, and measurements show that the streaks of ore extend to the last contact, at a depth of 320 ft. There is some good lead ore in the Jason, in the lower levels.

Lida Gold Mining Company.—This is a new company of which J. C. Kortz of Cleveland, Ohio, is president and treasurer, and W. E. Brooks of Elyria, Ohio, vice-president. Timothy Goodwin is manager. The company's ground comprises the Katy, Mosquito and Midnight, 26 acres altogether. A new shaft is begun on the Katy ground, 400 ft. east of the old Midnight, and a plant of machinery is being put in. The shaft is to open up the celebrated Midnight ore shoot, and being only about 200 ft. from the end line of the Dollie B., where the rich strike was recently made, the management has great hopes of catching it.

Little Star Group.—This group of claims in the Horseshoe district includes the Little Star and Twinkle. An excellent ore body is opened after months of development. Shipments will be steady from now on. The workings are down 175 ft. The ore assays on an average 46 oz. silver and 44 per cent. lead, and indications are that an immense body of this character has been uncovered.

Lone Tree.—Lessees operating this property in California Gulch report a strike. At 140 ft., it is said that they have opened up an 8-in. streak of very fine ore. They are running in a drift, and arrangements are to be made to ship at once.

Mahala Mining Company.—The Mahala, which has been shipping from 150 to 175 tons of ore per day for months past, ceased this week owing to a cave-in at the 1,100-ft. workings. As ore bodies at this level are about worked out the workings have been abandoned, and about 75 men laid off. Important development work is being carried on at the 900-ft. level, but it will be some months before the Mahala ships again.

M. M. Fraction.—This piece of ground next the Glengary shaft, on Breece Hill, is vigorously operated and promises big results. The new shaft on the Fraction has reached a depth of over 300 ft. and should at 600 to 700 uncover the rich ore shoot. Some ore has been struck in sinking, but the main point is to catch the Glengary ore body in the M. M. Fraction ground.

New Elkhorn Mining Company (Limited).—C. B. Roger has been appointed agent here for the company. He has nothing to say about its future plans. It is rumored this big London company will resume operations on their important territory soon.

New Monarch Mining Company.—The fine bodies of ore in the Virginus shaft have been opened up, and shipments will increase on February 1st, from 20 to 40 tons per day. It is a silicious oxide, carrying gold, silver and lead. On the 212-ft. level it is over 30 ft. in height. It is in the intrusive porphyry, at right angles with the dip of the formation. At the Monarch shaft a magnificent plant of machinery has been put in, and sinking will be resumed on February 1st. The shaft is now 430 ft. deep and will go down to open up the sulphide contact.

Nist Prius Group.—Local leasers have done much dead work for some months, and now have a fine body of lead ore opened up, from which pretty large shipments began this week. The main work is by the Stead lease, who operate on the old Hall shaft. Three drifts are being sent in, and shipments are now made of 30 to 50 tons per day, the ore coming from all three levels. It is of a fair grade and the body is growing larger. Fine bodies of iron ore are blocked out, but shipments to the valley and local smelters have ceased until better contracts can be made. Sub-lessees are operating the Crown Point and Vivian shafts, and have uncovered, after months of prospecting, a fair grade ore body, from which shipments will begin at once.

Oro City.—Lessees are after the Smuggler ore shoot. After a large amount of drifting in the old workings at 250 ft., without locating the ore body, they have resumed sinking and will go down 100 ft. further and then drift. The property is well located on Rock Hill.

Rex.—It is announced by the local owners of this property, in Iowa Gulch, that a contract will

be let to sink the Rex shaft and conduct the development work on this valuable piece of territory, which has lain idle so long.

Whian.—This shaft on Printer Boy hill is going down after the Printer Boy ore chute, and is now 350 ft. deep. C. F. Saunders is in charge. It is thought the shaft can cut the ore body by a drift, after 100 ft. more.

Ouray County.

(From Our Special Correspondent.)

Atlas.—This mine, in the Sneffels district, owned by Fred Herbst, is worked by Charles Carroll et al. of Grand Junction, under bond and lease. The vein recently disclosed is large and assays run very high in gold.

Camp Bird Mining Company.—This company owns 54 claims, embracing all the ground between Imogene basin and Ironton, on the Camp Bird vein. About 100 men are employed. The ore is pure white quartz, carrying large quantities of free gold. Recently the company bought the old Austin smelter at Kokomo and had it shipped here. It will be made into a mill for treating Camp Bird product. Its location is 4 miles below the mine, near the Revenue power house No. 2. It will be at work by February 15th, and will employ 160 men. A new power house near the mill will hold an electric lighting plant. T. F. Walsh is general manager, and John Benson superintendent.

Meldrum Tunnel.—This project, similar to the Treasury tunnel, and near it, is being pushed by a Scotch syndicate. Large plants of machinery are at work at Pandora, on the west end. The tunnel is now in 175 ft. Richard Whinnerah is resident manager. Robert Cairns, one of the chief owners, is here.

Silver Ledge.—The mill near Ironton shut down from lack of water January 16th. A large force is opening up ground in the mine for a resumption of operations March 15th.

Teller.—The owners let a contract for driving the Teller tunnel to Charles Muller, and at 30 ft. uncovered a good sized body of milling ore. Shipments will begin February 1st.

Treasury Mining, Milling and Power Company.—This company owns the Treasury tunnel site, and has a large force of men at work on the Ironton side. The machinery has not arrived and will not be installed until spring. Three years will probably be taken to construct the tunnel. Messrs. Hammond and Hamilton, two leaders in the project, are in town.

KANSAS.

Cherokee County.

(From Our Special Correspondent.)

B. Miller & Company.—On the DeGraff Brothers' lease this company is drifting at 118 ft. on a large face of ore and is producing weekly 50 to 60 tons of zinc ore and about 2,000 lbs. of lead ore. Only 15 men are employed.

Crown Point Mining Company.—This company has just put in a new boiler at its plant on the North Empire lease and last week made over 40 tons of high grade zinc ore.

Kahn Mining Company.—This company has two lots on the DeGraff Brothers' lease and with 10 men makes 25,000 to 30,000 lbs. of lead ore weekly.

Mathews & Company have a fine steam concentrating plant on an 80 acre lease of the Bonanza land, and are producing from 45 to 60 tons of high-grade zinc ore weekly.

Pump Shaft Company.—The plant on the DeGraff Brothers' lease is running day and night. The company is hoisting from two shafts and makes about 90 tons of zinc ore and 15,000 lbs. of lead ore weekly. It is drifting at 120 and 160 ft. This lease and machinery sold recently for \$110,000, with 80 acres of land adjoining. It was bought by Eastern parties and is producing over \$6,500 worth of ore weekly.

Union Mining Company.—This company has a large steam concentrating plant on the North Empire lease, and it is producing from 45 to 50 tons of zinc ore weekly.

Worth Empire Mining Company.—The new company, composed of New York and New Jersey capitalists and T. N. Davey, of Carthage, who owns a 1/4 interest, took possession the first of the year. The Eastern capitalists paid \$120,000 for 1/4 interest in the lease and machinery, and 120 acres of undeveloped land nearby. Mr. Davey was the original lessee. The old company paid over \$150,000 in dividends in two years and a half. Mr. Davey's interest cost him only \$80. The lease made over \$6,000 last week.

MICHIGAN.

Copper.

Baltic.—A pit sunk 900 ft. north-east of pit No. 3 struck the lode under but 3 ft. of surface. This pit shows plenty of stamp rock and makes the total known length of the lode about 1,800 ft. The width of the lode at the new pit is not yet determined. A steam hammer will soon be erected at pit No. 1, when a large amount of rock is to be got and a thorough test of the lode made. A shaft will be located at pit No. 2, 300 ft. south-west of pit No. 1, as the ground

at pit No. 1 is not suitable for a permanent shaft. The lode is, so far as shown up, about 48 ft. wide, but is not mineralized from wall to wall throughout, containing streaks of barren ground.

Iron—Gogebic Range.

Aurora.—At the recent annual meeting in Milwaukee, it was stated that the mine produced 181,095 tons of ore in 1897 and shipped 166,122. The following were elected directors: Charles F. Rand, Frederick T. Gates, James C. Colgate, Charles W. Harkness, all of New York; Louis H. Severance of Cleveland; William J. Olcott of Bessemer, and Edwin H. Abbot of Boston. Mr. Rand was elected president and Howard Morris secretary and general solicitor.

Iron Belt.—The company has increased its working force. The new McKinley shaft is sinking through a fine body of ore.

Metropolitan Iron and Land Company.—At the annual meeting of the company, owner of the Norrie group, in Milwaukee, the following-named officers were re-elected: President, H. W. Oliver; treasurer, H. M. Curry; secretary, C. D. Fraser, all of Pittsburg. The directors chosen were H. W. Oliver, H. M. Curry, James Gayley, D. W. Clemson and F. C. Cole. The company has given notice of an increase in wages, to take effect February 1st. The increase will probably be about 10 per cent. and affect 1,000 men.

Iron—Marquette Range.

Twenty tons of rock from this old copper property near Mt. Mesnard were recently shipped by J. M. Longyear to Aurora, Ill., for treatment at the smelters. The vein is 10 ft. wide, between walls of quartzite, and the shaft is down 40 ft. The copper is not native.

Bay County.

There are 13 rigs sinking test holes for coal in the county. Zagelmeyer Bros. are prospecting for the United Alkali Company near Linwood. The land under option by various companies runs up to thousands of acres. The beds underlie a very large tract of country, but further work will be needed to determine the value of the coal.

Saginaw County.

The numerous finds of coal have made something of a boom, and a number of syndicates are getting options on large tracts of land.

Saginaw Valley Mining and Prospecting Company.—The company has a 6 ft. vein at 286 ft. below the surface. An iron shaft 5 1/2 ft. in diameter is down 36 ft. It is proposed to use an endless chain device for hoisting the coal.

J. H. Somers Coal Company.—This Cleveland firm has a shaft down about 125 ft., which will be sunk 50 ft. more. The seam is 52 in. thick, of good quality. The Michigan Central is building a double track spur to the mine.

MINNESOTA.

(From Our Special Correspondent.)

The Keystone Bridge Company has the contract for the steel superstructure of the Duluth, Missabe & Northern's bridge over the Whiteface River.

The Lora Mining Company of Duluth has filed articles with \$50,000 capital stock. The incorporators are: M. H. Alworth, W. H. Cole, J. B. Johnson, and the company's purpose is to mine for gold, copper and other minerals.

W. W. Oliver, N. P. Hulst and Messrs. Currie, Tener and others of the Oliver Mining Company were present at the company's annual meeting in Duluth last week. There was no change in officers. Plans for the coming season on the Mesabi and Gogebic ranges were discussed but nothing was announced as to shipments. It is generally understood that the Mesabi shipments of the company, which in 1897 were nearly 1,400,000 tons, will be over 1,600,000 tons. On the Gogebic the company's Norrie and Tilden mines will probably ship as much.

On the ground that the present ore freight charges of 80c. to \$1 a ton from points on the Mesabi and Vermilion ranges to Duluth and Two Harbors are excessive, another move is to be made to reduce rates. That it will succeed better than previous attempts seems scarcely likely. A plan is being arranged under which the owners of mines neither owned nor controlled in any way by the two big corporations, will pool to raise money to present their case to the State authorities or to the courts.

Mesabi Range.

Arcturus.—This property, the farthest west on the Mesabi to show much ore, is in litigation. John Mallman, who was employed to do exploration work by parties who held an option, has brought suit for the work done against the Hayward heirs, who own the property.

(From Our Special Correspondent.)

Lake Superior Iron Company.—At the Hull new drifts have materially increased the capacity and a day shift is hoisting about 1,100 tons daily.

Mahoning Ore Company.—This company is making heavy preparations. New machinery has been ordered for stripping. It is expected

that 35 acres of ore will have been uncovered before next fall. Boring shows the ore to be from 120 to 260 ft. deep. Testpitting screws are now at work proving up the grades of ore in various portions of the mine.

Minnesota Iron Company.—At this company's Elba mine some 4 acres have been cleared of timber and the main shaft is sinking very rapidly. At the Genoa 225 men are employed. At the Fayal 600 are busy and the stockpits indicate far greater shipments than ever before. The company's Norman, Auburn and Canton continue idle. Canton, which has been idle since 1896, may resume next summer.

Oliver Mining Company.—This company has suspended shipping at the Mountain Iron. At the Oliver it is working about 25 men drifting and testpitting in the north side of the Lone Jack and Oliver, in order to learn the full extent of the deposit and so govern its future operations. Capt. John Gill, late of the Mountain Iron, has been put in charge of the Oliver.

Penobscot Mining Company.—This company will add a full electric light equipment at once.

Pettit & Robinson Lands.—A shaft will be sunk by Harry Roberts on lands owned by these parties near McKinley. Ore will be shipped this year.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The hard rains the latter part of the week reduced the output of ore in the district, and the hauling was bad. The sales would have been still lighter if miners had not hauled in last week's surplus the first of the week. As it was, the sales were less than for the preceding week, by 858,950 lbs. of zinc ore, and 304,970 lbs. of lead ore, and \$11,759 in value. There was a small surplus of zinc ore left over, most of which was sold. There is a surplus of a little over 500,000 lbs. of lead ore in the district.

The top price paid for zinc ore was \$23 per ton, and for lead ore was \$21.50 per 1,000 lbs., delivered, the same for both as the preceding week. For the corresponding week last year the top price for zinc ore was \$21 per ton and for lead ore was \$15.50 per 1,000 lbs., delivered. The sales for the same week in 1897 were 1,673,726 lbs. less of zinc ore and 77,880 lbs. more of lead ore, and the value was less by \$29,847, with the demand for ore not near as good. Following were the sales of lead and zinc ores from the different camps in the district, for the week ending January 22d: Joplin, zinc, 1,236,500 lbs.; lead, 313,950 lbs.; value, \$20,351. Carterville, zinc, 1,200,640 lbs.; lead, 239,320 lbs.; value, \$17,152. Webb City, zinc, 855,680 lbs.; lead, 32,610 lbs.; value, \$9,252. Oronogo, zinc, 431,330 lbs.; lead, 21,850 lbs.; value, \$5,232. Galena, zinc, 2,550,000 lbs.; lead, 414,750 lbs.; value, \$35,692. Aurora, zinc, 845,000 lbs.; lead, 30,000 lbs.; value, \$7,922. Stott City, zinc, 315,740 lbs.; value, \$3,631. Carthage, zinc, 151,570 lbs.; value, \$1,622. Belleville, zinc, 37,800 lbs.; and 3,820 lbs.; value, \$499. District total for the week, zinc, 7,624,260 lbs.; lead, 1,056,310 lbs.; value, \$101,393. District totals for three weeks, zinc, 24,027,820 lbs.; lead, 3,670,430 lbs.; value, \$325,680.

Hayes, Hagerty & Company.—This company has built one of the finest and largest steam concentrating plants in the district on the Keller land and started in the machinery last Saturday.

Indiana & Missouri Mining Company.—At Tuckahoe this company made a ten-year lease of their 80 acres and machinery to J. A. Nichols, formerly superintendent. He is offering special inducements to prospectors.

MONTANA.

(From Our Special Correspondent.)

According to the best estimates obtainable, Montana's metal output for 1897 shows an increase over that of 1896 of more than \$2,000,000. The assayer in charge of the United States assay office in Helena estimates the total production of Montana for 1897 at \$52,750,000, while the value of the metal output of the year before was \$50,732,098. Even the silver output was larger than in 1896, because of the continued increase in the great copper mines of Butte, the ores of which in some cases carry a large per cent. of silver and gold. There are only a very few mines operating on silver exclusively in the State.

Jefferson County.

Rose.—Messrs Hallenbeck & Heckert are reported to have struck a 15-ft. ledge containing an 18-in. streak of galena which runs very high in silver.

(From Our Special Correspondent.)

Basin & Bay State Mining Company.—At a meeting of the trustees held in Basin, January 17th, this company increased its capital stock from \$500,000 to \$600,000.

Columbia.—C. W. Hoffman has made a good strike in the 300-ft. level.

Liverpool.—Since the Miners' Union ordered a strike in August, 1896, and closed the Lump mines, this has been worked in a small way by tributaries. Now I learn the machinery will be

taken away. Lump Gulch, three years ago, was looked on as the richest silver camp in the State. Several mines were regular shippers. Three hundred miners were earning \$3.50 per day each. Everything had a go to it that made things hum. The flat came from Butte to form a miners' union, so a union was formed. Finally Butte said strike and they struck. The mines closed down and have remained closed. Machinery has been carted away to some other section. Men in business failed, and the members of the union are tramping the State looking for jobs. This is the passing of Lump.

Mayflower.—Three six-horse teams are hauling ore to the railroad. The legal controversy has been compromised by a pooling of all interests. The stock will be divided equally.

Mayflower & Alpha.—An expert representing Eastern parties, is expected February 1st to make an examination with a view of building a 200-ton concentrator.

Mountain Boy.—Helena parties have a 30-day option. The figures are secret, but as \$6,000 was refused some months ago it is safe to say the present figures are higher.

Pilot.—This property is near Cole's Camp. A combination mill was built two years ago by Chicago parties. Henry Burrell will sink a 600-ft. shaft. One of the big Butte copper companies is behind the deal.

War Eagle.—A winze from the tunnel is down 46 ft.; 12 to 14 in. of ore have been continuous. The Michigan parties who have this under bond will erect a steam hoist.

Meagher County.

(From Our Special Correspondent.)

Great Eastern.—Sixty tons per day are being shipped to East Helena; 40 men are employed. Superintendent Shakespeare expects to increase his force.

Judge.—Mr. King is sinking the shaft to the 400 ft. level, and is installing a five-drill air compressor.

Yellowstone.—This mine will begin shipping a car a day on February 1st. Development work has been going forward until a large body of ore has been blocked out.

Silver Bow County.

(From Our Special Correspondent.)

Anaconda.—The company is putting in new safety cages, as required by law.

Butte & Boston.—East Gray Rock has been closed down for shaft repairs nearly a month. The point where the ledge crosses the shaft always gives trouble. Two unexpected veins have been encountered, on which the company has done some drifting, but without any results. At the West Gray Rock, at the 700, the company is drifting and crosscutting, but no ore has been found up to date.

Colorado Mining and Smelting Company.—At the Gagnon the company is drifting east and west. On the east side it has to go 350 ft. before striking the end line of the property. Drifting is being done at the 700, 1,000, 1,200. In all these drifts machine drills are used.

Ella.—At this mine, in Meaderville, directly east of the Colusa, stopping on the 200 ft. level, is getting out ore that runs as high as 200 oz. per ton.

Negotiations are on for the purchase of some very valuable properties in Park Canyon, which lies almost due east from the Atlantic shaft of the Boston & Montana. This district with proper development will, by the present indications, give good results.

Parrot.—The company has a force of men re-tilt portions of the shaft.

NEVADA.

Storey County—Comstock Lode.

Sierra Nevada.—At the annual meeting in San Francisco on January 19th the company re-elected the old board of directors, with Charles H. Fish as president, E. L. Parker secretary, and Roger Prendergast superintendent.

NEW MEXICO.

Bernalillo County.

Albemarle.—Contracts for the steel mill buildings have been let. The mill is on the same general plan as the Mercur mill in Utah. The ore will be crushed by rolls and treated by the cyanide process. The capacity is to be about 100 tons daily. It is thought the mill may be in operation by May 1st. The ore is a hard quartz carrying gold in fine particles, and is well adapted for cyaniding. J. A. Coran will be president of the company, O. S. Posey managing director and J. S. Merrill superintendent.

Colfax County.

Gold Coin Consolidated Mining and Milling Company.—This company is about to erect a 10-stamp mill near Springer. The mill was made by the Colorado Iron Works, of Denver.

Santa Fe County.

Coal Railroad Company.—The Cerillos mines at Madrid, about four miles from Cerillos, employ about 450 men. The camp now turns out 1,000

tons of soft coal and about 300 tons of hard coal daily. James Duggan is superintendent. The soft coal is worked the year round, but the hard coal will be shipped only till April, though development will continue through the summer.

Ortiz.—About 30 men are employed, under Manager L. C. Erman. The shaft is down 300 ft. and may be sunk that much deeper. A 5-ft. Huntington mill is to be added to the two already in use. The mine is near Dolores and eight miles from Cerillos.

OREGON.

Union County.

Sanger.—The 10-stamp mill is working constantly. Two shifts are employed in the mine, 50 men altogether.

PENNSYLVANIA.

Anthraccite Coal.

The Delaware & Hudson breaker at Jermyn was partly burned on January 21st, the tower, the engine house, and part of the trestle being destroyed. The mine was not damaged. About 800 men and boys will be out of work until the breaker is in operation again, which may be several months. The daily capacity of the breaker was about 1,000 tons. The loss is heavy.

SOUTH CAROLINA.

Phosphate Industry.—State Phosphate Inspector A. W. Jones in his annual report for the year ending December 31st, 1897, says that since the storm of 1893 the prices of phosphate rock have continued to decline without any reaction, and on January 1st, 1897, they had sunk as low as 9½c. per unit, delivered cost, insurance and freight paid by the seller. The average price was 10c. per unit. The average freight is about \$3.12 per ton. Thus phosphate rock analyzing 57 per cent. bone phosphate of lime would net the companies, f. o. b., \$2.23 per ton. Out of this must be paid the State's royalty, cost of towing, mining, drying, etc. Freight during the year have fluctuated from \$2.65 to \$4.03 per ton, a difference of \$1.43 per ton. It will therefore be seen that the State, in reducing the royalty to 25c. per ton, has placed it at a nominal figure, as compared with the fluctuations in freights. The low prices and distressed condition of the phosphate interests have been brought about by the strong competition of Florida, Tennessee and Algeria, coupled with the depression in agricultural products. It will be observed that the shipments have decreased from 249,338 tons in 1893 to 95,237 tons in 1897.

The detailed shipments for 1897 are as follows:

	Foreign.	Domestic.	Total.
Coosaw Company	34,984	.....	34,984
Farmers' Company	30,845	1,313	32,158
Beaufort Phos. Co.	21,199	.....	21,199
James Reid	4,930	.....	4,930
James O'Hear	623	.....	623
Empire Company	1,343	.....	1,343
Total tons	65,829	29,408	95,237

The amount of royalties due the State under the act of 1893, at 50c. per ton for actual shipments, without regard to the price of the rock per ton, is as follows: Coosaw Company, 34,984 tons shipped, \$17,492 royalties; Farmers' Mining Company, 19,759 tons shipped, \$9,879 royalties; Beaufort Phosphate Company, 7,126 tons shipped, \$3,563 royalties; James Reid, 1,718 tons shipped, \$859 royalties; James O'Hear, 623 tons shipped, \$31 royalties; totals, 64,210 tons shipped, \$32,105 royalties.

No royalties accrued to the State for excess of value over \$4 per ton, f. o. b. Royalties due the State on rock mined and shipped since April 1st, 1897, at the rate of 25c. per ton, as fixed by the resolution of the Board of Phosphate Commissioners, April 1st, 1897, were: Farmers' Mining Company, 9,998 tons shipped, \$2,499 royalties; Beaufort Phosphate Company, 14,073 tons shipped, \$3,518 royalties; James Reid, 3,212 tons shipped, \$803 royalties; Empire Company, 1,343 tons shipped, \$336 royalties; receiver for Farmers' Mining Company, 2,401 tons shipped, \$600 royalties; totals, 31,027 tons shipped, \$7,756 royalties.

No additional royalties accrued to the State for excess of value over \$3 per ton net, f. o. b. The above statement does not include the James Reid and Empire Company for December. The total royalties due the State were \$39,861. The phosphate rock on hand December 31st, 1897, is estimated at 26,659 tons, distributed as follows: Coosaw Company, 10,920 tons; Farmers' Mining Company, 3,183 tons; Beaufort Phosphate Company, 9,858 tons; James Reid, 800 tons; Empire Company, 1,898 tons; total, 26,659 tons.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Box Elder Creek.—On a group of claims worked near Custer Peak by a syndicate of men from Leadville and Sioux Falls a 50-ft. shaft has been sunk. There is also a group of claims three miles north of Custer Peak which is opening up well. A ledge 14 ft. thick, lying between slates and quartzite, gives assays of from \$2 to

\$8 free gold to the ton, besides carrying considerable value in concentrates.

Spokane.—Investigations made by the Crown Hills Company prove satisfactory. Active work will begin soon.

Lawrence County.

(From Our Special Correspondent.)

Belle Fourche.—It is announced that the company has let a contract for a 500-ton smelter at Belle Fourche, work to begin as soon as possible. The company has purchased 2,600 acres surrounding Belle Fourche, the Gunnison group of claims at Portland, and 100 acres of choice land in Two-Bit.

Deadwood & Delaware.—This company, in Ruby Basin, has a solid block, nearly two miles wide and three miles long. The company is erecting a large steam hoist at the Aztec station, and will sink a shaft. The company also owns a large tract of land near Galena, and the Uncle Sam on Elk Creek. This mine has been worked to the 300 ft. level. It is now abandoned, and is to be sold to a Philadelphia syndicate.

Forestry Reserve.—People in the Black Hills are anxiously waiting the report of the General Land Commissioner in regard to the extension of time, in order to complete the survey of the reserve, which is now about two-thirds done.

Homestake.—Some improvements are contemplated. More attention will be given to the concentrates. More water is needed. It is hoped to get sufficient from the deserted Greenback shaft. The large silm table, constructed recently, is a success, but takes more water than can be obtained at present. If sufficient water can be obtained the output of concentrates will be increased one-half.

Homestake Timber Case.—Superintendent T. J. Grier and ex-Senator Moody, attorney for the company, are in Washington now for the purpose, it is reported, of making a settlement with the Government by a cash payment before it comes to trial in February. The company is charged with cutting \$600,000 worth of timber on Government land.

Horseshoe.—This company has developed, in the Mogul shaft, one of the largest and most valuable bodies in the Ruby basin district. The vein has been crosscut 55 ft. and the ore is the highest grade yet found in that portion of the Hills.

Incorporated.—The Cleopatra Gold Mining Company has been incorporated at Aberdeen, S. D. The incorporators are J. M. Lawson, president, Aberdeen; Frank McLaughlin, vice-president, Deadwood; R. B. Hughes, secretary, treasurer and general manager, Huron, S. D. The capital stock of the company is \$100,000. The company owns the Cleopatra group of claims in the Ida Gray district.

Kicking Horse.—This mine, on Blacktail Divide, has closed down, owing to the increased treatment charges. It will probably cause the Deadbroke mill to close also, for it depends on the Kicking Horse mine for water.

Milliken Park Group.—It is reported that this large group of claims, owned for some time by a New York company, has been purchased by another Denver syndicate. The property has been worked for a number of years and is considered valuable.

Ragged Top.—A new ore body on the property of the Ragged Top Mining Company is 4 ft. thick and assays well. Regular shipments are made from the Balmoral group. The shaft is down 130 ft.

Two-Bit.—The machinery has arrived for the Hardin Standard mine in Two-Bit, and is being put in. The Hercules Company has put in an electric light plant. The large hoisting house of this company will be ready for the machinery this week.

Pennington County.

(From Our Special Correspondent.)

Little Blue Mining Company.—This company is developing a newly discovered vein on its property in Yellow Creek. A shaft sunk from the main drift has crosscut 12 ft., all in good ore.

Palmer Gulch.—A number of Northern Hills men have taken a lease and bond on the Dolcode, U. P., and Tributary Fraction, in Palmer Gulch. A 10-stamp mill, formerly operated on the Lady Gray, has been purchased and will be started on the Dolcode. The great drawback to thorough development is the thick body of barren ground that must be passed through.

Rochford District.—A party of Denver capitalists have been several days looking over the district. It is stated that options were taken on several properties and an unusual amount of work will probably be done this spring.

TENNESSEE.

Maury County.

Mount Pleasant Phosphate Field.—The shipments in November aggregated 9,302 tons, of which 3,223 tons went abroad, and the balance was for domestic consumption. On December 1st the stocks on hand were estimated at 20,000 tons. Continued bad weather has hindered act-

ive mining operations in this field, but as prices are becoming much better the prospects of the industry are more encouraging. There is very little cheap rock on the market. Concerning the legal difficulties of the Compagnie Generale des Phosphats de la Floride, which has been operating the properties of the Blue Grass and Columbian Phosphate companies, the "American Fertilizer" says that the French company has worked these properties under a contract to mine 30,000 tons at a royalty of 40c. per ton, and had had at one time an option to purchase the stock of the two latter companies. The option of purchase expired July 1st, 1897, while the right to mine said 30,000 tons was to expire October 1st. At the expiration of the purchase option the Compagnie Generale des Phosphats de la Floride decided not to take the stock of the two companies, and the option was retaken by some other parties. On November 10th, while the French company was engaged in loading a shipment of 2,800 tons for the European market, its entire stock of phosphate rock, sheds, tram-cars and tracks, together with about \$8,000 which they had on deposit in bank, were all attached by Mr. G. M. Fogg of Nashville, and other stockholders of the Blue Grass and Columbian companies, pending suit brought by them against the French company, asking for judgment for \$105,000, being the purchase price of stock of said companies. Messrs. Fogg and associates claim in their bill that the French company agreed to take up the options at the price named, and that they afterward refused to pay the money. On the other hand, the French company claims that it had nothing whatever to do with the renewal of the option, and that its only connection with the matter was its contract to mine the 30,000 tons, and pay the royalty therefor. The company had in the meantime leased part of the property of J. H. Carpenter & Co., and was mining there, with the intention of transferring all its operations to that place as soon as the 30,000 tons were mined on the Blue Grass and Columbian properties. No counter legal steps have yet been taken by the French company, and the matter so far awaits the January term of the Chancery Court for settlement. In the meantime the French company is proceeding with the work at the Carpenter property.

The experimental plant at the depot of Cajot & Co. is ready for operation.

J. H. Carpenter & Co. have completed their dry sheds, and are laying their tramway tracks. In connection with the French Company they are putting in a pair of track scales. A new railroad station has been established at this place, called Solita.

There is a rumor to the effect that all of the small miners intend to combine under one head, or rather one general agency, through which all quotations will be made, and if this is done much better prices and a cessation of the past ruinous competition may be looked for.

H. D. Ruhm & Co. have made arrangements to handle the product of ground rock of the Elk Mineral Company for direct use as fertilizer, and have moved their main office from Nashville to Mount Pleasant, where, in addition to the above, they will engage in a general engineering and manufacturers' agency business.

J. R. Bryan is operating on the property formerly leased by Hardy & Bryan, and his former partner, Mr. Hardy, is operating an adjoining property belonging to his wife's family.

TEXAS.

Dallas County.

Petroleum is reported to have been found at Oak Cliff, a suburb of Dallas, on the west side of the Trinity River, by Edward G. Patton, at a depth of 300 ft., while sinking an artesian well.

Navarro County.

Corsicana Oil Field.—It is reported that J. S. Cullinan of Washington, Pa., and associates have closed a big deal in this oil field by which they will have full control of the output. For a time the Texas Petroleum Company was opposed to entering into such a deal, but the stockholders have recently voted to go in it, and so it is believed the combination is complete.

UTAH.

(From Our Special Correspondent.)

Owing to bad roads, a condition characteristic of this season of the year, deliveries of ore to smelters are limited, and the latter are operating considerably under their capacity. The small tempest that threatened after the inauguration of the "spot" and "thirty days" quotations on silver seems to have passed. The heavier producers that closed when the smelters announced their determination as to prices have resumed operations, and all seems smooth. The present year promises at this date to be the best that the State has experienced in the way of mines, and the development of co-ordinate industries. In the Tintic district renewed vigor has gone into the operations of the older companies, while the younger concerns that are searching for the south continuation of the Western ore zone are putting more energy into their movements. The Camp Floyd region will undoubtedly make a new record in gold pro-

duction, as shortly the mammoth cyanide plant being erected by Captain De La Mar on the Golden Gate will be completed and in operation. Two other mills in the same region are nearing completion, those of the Chloride Point and of the Boston & Mercur, and by the middle of the season the tonnage of the district promises to be more than doubled.

Juab County.

(From Our Special Correspondent.)

Homestake.—This company has decided to commence the extraction of some of the ores that it has cut in developing the mine. Shaft is down 350 ft. and arrangements are being made for deeper work, but in the meantime ore will be stoped from the 350 level and up to the old upper workings. The Homestake ores carry an important copper percentage.

Vulcan Mining Company.—Articles of incorporation filed January 18th. Capitalization, 150,000 shares, of the par value of \$1 each. Officers: G. C. Whitmore, president; J. A. Hyde, vice-president; C. S. Tingey, secretary-treasurer. Company owns the Vulcan lode mining claim in the Fish Springs district, and principal offices will be at Nephi, Utah.

Millard County.

(From Our Special Correspondent.)

Horn Silver.—Main shaft has now reached a depth of 1,600 ft., and a crosscut is being driven to the vein. Company employs 100 men at the mine and mill, and the output continues heavy, with a prospective increase when the lower workings reach the vein.

Salt Lake County.

(From Our Special Correspondent.)

Little Cottonwood Copper.—Some disclosures of copper ore are reported from this district, which first achieved fame as a lead-silver producer, and subsequently became the scene of a gold excitement that has not yet flattened out. The copper discoveries are far up the canyon, and unfortunately they are announced at a season when it is impossible to inquire into their worth.

Old Jordan & Galena.—The closing of the concentrator of this company, due to a question as to silver settlements with the smelters, was very brief in duration, and the mining company, having gained its point, resumed operations at both mine and mills with a full force. The concentrates, in addition to their lead and silver contents, carry an important percentage of iron, and as a result are in much demand with the smelters.

Starlus.—This Bingham property, three-fourths of which was purchased by Chicago capitalists some months ago, is being put in condition for production of the copper ores that characterize it. The main tunnel has been straightened and timbered to the point of the incline, which is down 170 ft., a hoist has been erected and arrangements are being made to sink to greater depth. A pumping plant of moderate capacity will be a necessity in this in the near future. On this ground occur the famous "copper placers" of Bingham, and a Mr. Mueller of Anaconda, Montana, is erecting a series of tanks for the precipitation of the copper that is held in solution in the water springing from the Starlus vein.

San Juan County.

(From Our Special Correspondent.)

Big Indian Copper Mines.—Rumors of a sale of these mines, which are owned by Lester Taylor of Moab and C. E. Loose of Salt Lake have been afloat, but no particulars are to be learned on account of the absence of both the owners. It is known that an option was obtained some months ago by Chicago parties, and it is probable that the sale is near consummation. The copper in these mines, as also in the La Sal Mountains, is in a soft conglomerate.

Tooele County.

(From Our Special Correspondent.)

Chloride Point.—All machinery for the new mill is on the ground and is being set up for use. At the mines good quantities of the high grade ore that has enabled the company to earn a profit while pursuing developments are being extracted, but owing to the wretched condition of the wagon roads shipments have not been so heavy. A carload, the first in three weeks, reached the smelters at the close of the week.

WASHINGTON.

Snohomish County.

Everett Smelter.—One of the largest ore roasters in the country is about ready for work. Its capacity is 75 tons daily. It has two hearths, each 12x139 ft., and is a Bolthoff-Wethey improved calciner. The E. P. Allis Company of Milwaukee is the builder, and Henry Piper of Anaconda is superintending its erection.

Stevens County.

Republic Mining and Milling Company.—The General Gold Extraction Company, operating the Pelatan-Clerici process, with headquarters in Denver, Colo., has just closed a contract with this company of Spokane, to erect a mill at its mines at Eureka, this county. The starting ca-

capacity will be 30 tons daily, to be increased, if satisfactory results are obtained.

WISCONSIN.

Douglas County.

North Wisconsin Copper Mining Company.—This company's property is in the Douglas County Range, on the northerly edge of a syncline along a heavy fault parallel to the beds, which dip southeast at a high angle. The copper is mostly native, accompanied by epidote, prehnite and calcite in bedded amygdaloid veins. Not enough work has been done to establish important deposits, but the company has two pits down on a 6-ft. vein in an amygdaloid bed. The vein is estimated to run from 1 to 1½ per cent. in copper. Considerable work is to be carried on by Superior parties, who hope to find larger deposits.

FOREIGN MINING NEWS

AUSTRALASIA.

New South Wales.

The Broken Hill Proprietary Company, Limited, has declared a dividend for the quarter ending January of 1s. 6d. per share, payable January 26th. The company reports that 22,244 tons of ore were treated for the four weeks ending January 6th, 1898, and that the output from the refinery was 532 oz. gold (estimated), 429,866 oz. silver, 1,969 tons lead, 63 tons antimonial lead (estimated); the copper matte containing 13 tons copper (estimated), and 31,004 oz. silver (estimated).

New Zealand.

The "New Zealand Mines Record" says that the quantity of gold exported for the month of October was 21,833 oz., valued at £83,555, and 19,751 oz. of silver, valued at £2,254. There is a steady increase in the output from the Ohinemuri goldfield, the export from Auckland being the highest for any month recorded during the present year, while it was 6,210 oz. of gold and 9,451 oz. of silver more than was exported during the preceding month. The total gold export from the colony for the eleven months ending November 30th was 233,660 oz., valued at £912,177, and 163,638 oz. of silver, valued at £18,669, making the total value of bullion exported £930,846.

CANADA.

British Columbia.

(From Our Special Correspondent.)

The provincial legislature will meet February 10th. No radical change, it is said, will be made in the present mining laws, but a number of amendments of a local character, relating to the management of mines, are likely to be carried.

BRITISH COLUMBIA.

Trail Creek Division.

(From Our Special Correspondent.)

Ore Shipments.—The shipments of ore from the Trail Creek division from January 1st to January 19th amounted to 3,020 tons, made up as follows: Le Roi, 2,655; War Eagle, 160; Iron Mask, 140; Center Star, 45; Cliff, 200.

British-American Syndicate.—It is too early to give anything definite as to the operations of the company. Much has been promised.

British Columbia.—West Kootenay District.

(From Our Special Correspondent.)

Le Roi.—The annual meeting of the stockholders of this company was held at Spokane on January 14th. Major J. M. Armstrong is treasurer in place of Colonel Ridpath, who retires from active duties. L. F. Williams was retired, and his place as director is supplied by Valentine Peyton. A superintendent to replace the late Captain Hall has not been elected. The board of directors for the present year comprises: W. W. D. Turner, L. N. Peyton, W. M. Ridpath, W. J. Harris, J. M. Armstrong, I. N. Peyton, Frank H. Graves, W. J. C. Wakefield, and D. W. Henley. The president is W. W. D. Turner; vice-president, D. W. Henley; treasurer, J. M. Armstrong; secretary, L. F. Williams; manager, L. N. Peyton.

Mining Machinery.—The estimated machinery so far installed in the various mines of Trail Creek is about \$300,000. One estimate is as high as \$364,000, but these figures have not been verified. The Le Roi plant according to this estimate is placed at \$150,000, the War Eagle at \$30,000, the Columbia and Kootenay at \$25,000, and the Crown Point at \$15,000. The highest valuation is the Le Roi, and the lowest the Velvet on Sophie Mountain.

War Eagle.—It is stated that this company contemplates extensive improvements in the capacity of its plant for the development of the mine this year, but the nature and extent of the proposed improvements have not yet been determined.

Klondike—Yukon District.

(From Our Special Correspondent.)

Claim No. 66, Lower Bonanza, Dec. 12th., 1897. In a letter to you, from the steamer "Queen," dated about August 21st, 1897, I predicted that of the many men who were leaving the ports of the Pacific for Dawson City, by way of St.

Michaels, few if any would reach it, and gave you my reasons why I believed this would be the case. The correspondent of the "New York Herald," who reached here by that route and with whom I have consulted on the subject, tells me that out of a probable 800 men that attempted to reach by that route just 31 succeeded. I also in the same letter gave you my opinions concerning the Cudahy scheme of bringing water on to Miller Creek for the purpose of hydraulic mining, saying that Miller Creek was what was formerly called O'Brien Creek and its banks were thoroughly prospected for hydraulic dirt in the summer of 1887 by at least 150 experienced miners. It contains neither hydraulic dirt, nor opportunities for bringing water on it, if the dirt proved valuable. I find now that Miller Creek is not O'Brien Creek as I supposed it to be, nor indeed, is it a tributary of Forty-Mile Creek at all, but it empties into Sixty-Mile Creek. The portion of it near its mouth, which it was intended to work on this plan, was purchased, claim after claim, by Joseph Budsor and does contain some gold, but whether it is possible to bring water upon it or not is a point on which miners differ.

There is one point in regard to it, however, on which they all agree, and that is, that the purpose of the Cudahy Company attempting to raise the enormous sum of \$25,000,000 for doing it is a gigantic steal, as were it possible not one twenty-fifth of that sum could be used.

In the Klondike gold-fields, I find one of the greatest discoveries of our times. Bonanza and Eldorado Creeks contain ground that is not only rich, but they are extensive; from Hunku and Bear come reports so contradictory that it is difficult to form any opinion concerning them, besides these nothing has as yet been discovered which I believe to possess any value.

But the history of this camp will be a repetition of all other mining camps. Fools and inexperienced men have struck it and sold in many cases to sagacious miners, who in turn will sell to sharp mining manipulators. Next wild speculation will occur, during which hundreds of claims will be unloaded upon the investors that contain no value. Then for a time a period of depression will inevitably follow, during which those claims that have a value will fall into the hands of legitimate mining men, after which they will be worked at a profit in a legitimate way.

I presume you are as well acquainted with the laws relating to the N. W. T. and to the climatic conditions and natural disadvantages in this country to-day as myself, so that I will close by saying that Mr. Murat Masterson is here and leaves for the coast in a few days.

Ontario—Rat Portage District.

(From Our Special Correspondent.)

Caldwell versus Burley Gold Mining Co.—At the end of 1897 J. F. Caldwell, owner of the Sultana Mine, applied to the High Court of Justice for an injunction to restrain the Burley Gold Mining Company from working on the vein, running through the land granted to it by the Ontario Government, under Bald Indian Bay. This application was refused, but Mr. Caldwell's claims came up for trial before Mr. Justice Rose, at Barrie, Ontario, in December. The decision of the court has not yet been given, but the company is continuing operations. It has already spent more than \$20,000, in prospecting the land and building a coffer dam. The title is a Crown patent, and an order-in-council allows the company to build a crib in Bald Indian Bay for the purpose of working the vein. Mr. Caldwell is applying for an act to annul the order-in-council.

Regina.—At the recent meeting in London, Lieut. General Wilkinson said: "At present the vein in the 185 ft. level south is 8 ft. wide and worth about 10 dwts. of gold to the ton. In the 5th or 310 ft. level the vein is from 5 to 9 ft. wide, worth from 12 dwts. to 2 oz. of gold per ton. Mr. Pringle, the manager, estimates a reserve of ore in sight of 24,000 tons, worth on an average \$10 per ton. Since the books of the company closed for the year, over 600 ozs. of gold has been reclaimed, worth about \$11,520, or about \$18.75 per oz." Estimates for a 40-stamp mill are now being prepared.

EUROPE.

Spain.

The year has been one of the most active ever known in the Spanish iron ore mining industry, notwithstanding the fact that the shipments to Great Britain during December were not quite up to the average, amounting to only 402,499 tons, as against 431,449 tons in the preceding month, and 354,780 tons in December, 1896. The grand total of the shipments to British ports for the year is 5,067,148 tons, as compared to 4,740,719 tons in 1896, and 3,807,188 tons in 1895. It will be seen that although there has not been so large an increase as was recorded in 1896, yet there is an advance of no less than 326,429 tons. The largest monthly shipment was in July, with 478,907 tons, while the smallest was in September with 364,192 tons.

The production of quicksilver from the Almaden mines in 1897 is reported by the "Revista Minera" at 47,357 flasks.

COAL TRADE REVIEW.

New York.

Jan. 28.

Anthracite.

There is little change in the general condition of the anthracite coal trade over all the territory tributary to New York. The coastwise traffic is, of course, very light. The ports beyond Cape Cod are taking a little, but not enough to be worthy of note and for points along the Sound and this side the Cape there is even less going forward. The all-rail trade is a trifle better off, though even this does not amount to much. As is always the case when the production of domestic sizes falls off and the demand for steam sizes continues, there is now a growing scarcity of the pea and buckwheat. If the restrictions on production continue, as seems probable, this scarcity is sure to be felt more keenly and the outlook is distinctly unfavorable to consumers. Some of the roads say they are out of the market altogether on steam sizes.

As far as can be ascertained the coal roads have taken to heart the lesson taught by the general demoralization of prices last fall and are in no hurry to increase production. As it is simply a choice between profit and loss, the chances are that the restrictions on production will continue. Some of the mines of the Anthracite Operators' Association are having difficulty in getting cars for tidewater shipments, but as there is no particular demand for coal and prospects favor higher prices in the future, this scarcity of cars does not affect producers much. On the whole, though trade is quiet, the outlook is good. Prices are little changed from last week, though a few companies have advanced quotations. We quote: Egg, \$3.95@4.10; stove, \$3.90@4.10; chestnut, \$3.70@3.95; broken, \$3.50@3.65; pea, \$2.55@2.65; buckwheat, \$1.90@2.05, all f. o. b. New York Harbor.

Bituminous.

The seaward soft coal trade for present shipments is quiet and it is not believed that any of the shipping ports have on hand for present shipment more than 10 orders each. There is little pressure for shipments East, these orders coming from along the Sound and all the New England ports. East of the Cape there is now the least demand. The Sound is taking small amounts from New York harbor ports. The New York harbor shipments are fair, but trade local to the shipping ports is dull. The all-rail trade shows a fair amount going forward. The chief interest in the trade is centered on the season's contracts. A great number have been closed, but they will continue to come on the market for a month and a half to come. The prices seem to range about 5c. under last year's figures. It is difficult to say whether this 5c. comes from the roads or the producers. This year's trade, though at a little lower price than last year's, is really in better shape in that some definite figures are known at which trade can be taken, while last year definite figures were not known till later. Then contracts were not closed much before February 1st. There have been several meetings of the railroad representatives to come to a definite understanding to maintain rates. It is understood, however, that the usual company has stood in the way of any definite agreement, either by absence or otherwise.

Transportation from mines to tidewater is fairly good on most roads. Good dispatch is given in loading, except at Norfolk, where it is understood that vessels in chartering require it specified in the charter that loading shall be in 10 days, with a penalty of 6c. per ton per day for any further delay. Most ports have only a fair amount of coal waiting for loading, except Port Reading, where it is reported two producers have a large amount awaiting orders. Vessels are in poor supply in the coastwise vessel market, but the demand is so small that the rates range at about last week's figures.

We quote current rates from Philadelphia as follows: Boston, Salem, and Portsmouth \$0.90, Sound \$0.70, Portsmouth \$0.95, with 10c. above these rates for further lower ports.

Birmingham, Ala.

Jan. 24.

(From Our Special Correspondent.)

The coal trade in Alabama is as good now, as far as output and shipment is concerned, as it ever was. The coal prices could be improved on, though no orders are being allowed to pass by. The shipments from the district are heavy and the consumption in the district itself is enormous. Walker, Bibb, Tuscaloosa and Jefferson counties all make heavy reports of production. The State Mine Inspector has been unable as yet to get reports concerning the output for last year. He is still confident that the output for the past year was larger than it was the year before. A large tow of coal is being loaded at Greenville, Miss., for a trip down the Mississippi River for Louisiana markets. There will be at least 6,000 tons in the tow and the Southern Railway will handle it down the river. The coal is being carried from Walker

County, Ala., and is not the first lot that has gone down the river to take the place filled heretofore exclusively by the Pennsylvania product. Superintendent A. J. Frazer of the Southern Railway stated that the railroad company carried out its part of the contract in transporting the coal from the mines to the market, while the coal companies in Walker County have to dispose of the product to the trade. He anticipates a good traffic in this business right along and is giving the barge line much attention.

Buffalo. Jan. 27
(From Our Special Correspondent.)

The anthracite coal trade is fairly active at unchanged rates, which are not expected to change for some weeks. Weather, fluctuating; last Sunday a 74-mile-per-hour storm with snow flurries, and previously and on Monday bright days, but on Tuesday and since unsettled, with occasional snow.

The bituminous coal trade is also fairly active at nominally unchanged figures. The fear of renewed troubles in the mining regions has ceased, and consumers are taking matters quietly.

The question of settling upon a minimum rate for coal and iron ore freights on the lakes next season was disposed of at the meeting of the Lake Carriers' Association last week. It was decided that it was not a proper subject for action, accompanied by the suggestion that vessel owners should meet and discuss carrying rates.

To compete with the Grand Trunk Railroad the Michigan Central and Canadian Pacific roads will build a dock at Port Burwell, Canada, and establish a ferry to Conneaut Harbor, Ohio.

Extremely mild weather has prevailed in the Lake Superior region thus far this winter. The lake was comparatively free from ice at last reports.

The total receipts of coal at Toronto, Canada, during 1897 were 534,329 tons, 128,217 tons of which came by water.

The Board of Trade at Montreal at its annual meeting Tuesday last passed a resolution favoring the deepening of the Welland Canal to 30 ft. and lengthening the locks to 500 ft.

Chicago. Jan. 26.
(From Our Special Correspondent.)

Anthracite coal has had a little change for the better, due entirely to colder weather. There is nothing, however, in the present business to warrant satisfaction on the part of the dealers here, as sales are small and the prices obtained are poor. Shipments to the out of town districts have improved but little and do not run much more than carload lots. The retail trade of this city has picked up somewhat because of the colder weather. Quotations on anthracite coal are: Grate, \$5.35; egg, stove, and chestnut, \$5.60. These rates are nominal only.

Bituminous coal continues to be bought in a moderate way, and deliveries on past contracts have increased somewhat. There is an ample supply of all grades of soft coal in town, the railroads appearing to have very large quantities in their yards throughout the city. Prices of soft coal are slightly lower than last week; some quotations are: New River, \$3; Pittsburg, \$2.75; Hocking Valley, \$2.50@2.60; Youghiogheny, \$2.75; Indiana Block, \$2.30@2.40; La Salle, Ill., \$1.50@1.60.

Pittsburg. Jan. 27.
(From Our Special Correspondent.)

Coal.—The river district is enjoying a boom these days. All mines are running full this week, although at some tipples the movement of loaded and empty barges was somewhat interfered with by the high stage of the water in the Monongahela River. Industrial consumption remains large, but local demand has not been as large as usual, owing to the mild weather. Some of the Pittsburg operators are already making contracts for this year's delivery, and it is said that prices are fairly steady.

At Reynoldsville, Pa., several thousand acres are involved in a deal in Clearfield and Jefferson counties. Eastern capitalists are closing negotiations for the purchase of the tract between the Buffalo, Rochester & Pittsburg and the Pennsylvania & Northwestern railroads.

Connellsville Coke.—There has been no decided change in the trade this week. The production held its own, though there was a falling off in shipments caused by the scarcity of cars. There was no change in the list of idle or active ovens and the plants averaged a little over five days for the week. There is announcement of a change in price which is believed to be \$1.65@1.75 a ton at the oven. Of 18,608 ovens 15,961 are active. Estimated output is 155,665 tons, against 156,094 the previous week. The Dunbar Furnace Company has reduced its active ovens at Pariah to 35. The company is now erecting a 3,000-gallon tank to store tar recovered from its by-product ovens. The same company will soon erect also a 30,000-gallon tank for water storage. The H. C. Frick Coke Company made an even five days run at all of its 27 plants in blast. The McClure Coke Company made an even five days run at its eight plants in blast. The Coch-

rons made six days at all their plants. The shipment in tons from shipping points amounted to 146,663 tons, against 149,978 tons the week previous; decrease, 3,315 tons. Shipments were distributed as follows: To Pittsburg, 3,018 cars; shipped West, 3,965 cars; sent East, 1,056 cars; total, 8,039 cars.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan 28, 1898.

Pig Iron Production and Furnaces in Blast

Fuel used.	Week ending				From	
	Jan. 29, 1897.	Jan. 28, 1898.	Jan., '97.	Jan., '98	Tons.	Tons.
Anthracite..	20	19,150	28	18,825	79,336	75,300
Coke..	117	136,690	146	202,950	565,914	811,800
Charcoal...	20	5,850	16	5,375	24,256	21,500
Totals.....	157	161,600	190	277,150	669,456	908,500

The iron trade generally continues in about the same condition as was reported a week ago. The volume of business is large, but prices continue low, and there seems no present prospect of any increase. All talk about heavy demand and possible scarcity is met by references to the large production, and the ease with which it can be still further increased, in case of necessity.

Bessemer pig has shown some weakness, though the sales continue good. In foundry iron there has been a somewhat better demand, but no change in prices is apparent.

Southern iron continues to sell well, but the prices remain about the same, and the Birmingham price for No. 1 foundry is still \$7.50. It is understood, however, that offers of \$7 for No. 2 foundry and \$6.25 for gray forge, for June-August delivery have been declined. It is reported that quotations have been asked for on 100,000 tons by a speculative interest; but movements of this kind are hard to trace.

No change can be reported in steel billets, and there are even reports of concessions in price, though none have been made openly.

Finished iron continues in very good demand, but the conditions are the same as with raw iron and steel, prices do not advance. The sales of structural material continue on a considerable scale, while bar and plate orders are satisfactory in quantity.

There is nothing especially new with regard to the wire combination. Nothing more has been heard of the rumored agreement among the rail mills, though it is still said that some kind of an understanding has been reached.

Mr. E. J. Buffington, President of the American Wire Nail Company of Anderson, Ind., has been appointed Secretary of the Wire Trust, and will have his office in New York.

The American Iron and Steel Association's statement of pig iron production in 1897, will be found on another page of this paper. It is received too late for the full analysis and comment which we hope to give next week.

New York. Jan. 28.

The market shows a slow but steady improvement as regards both inquiries and orders, and trade is fairly brisk, except in structural material and rods. There is as yet little prospect of higher prices. The prevalent opinion is, in fact, that prices in most lines will rule low during the year, but the volume of business done is going to be very large.

In the export trade there are orders and inquiries from the Argentine Republic for a considerable amount of electrical material and for rails and mining machinery from Mexico. Trade with Cuba is falling off, and a number of orders have been canceled during the week.

Pig Iron.—There is a good deal of iron being offered, and consumers evidently feel that things are coming their way, for but few contracts have been closed during the week. As a result the furnaces are making still more liberal concessions on desirable orders, and the price is not yet reached. We quote as follows: Northern brands, No. 1 X foundry, \$11.50@12; No. 2 X foundry, \$10.75@11.50; No. 2 plain, \$10.50@11; gray forge, \$10.25@10.50. Southern brands, same delivery, No. 1 foundry, \$10.75@11.25; No. 2 foundry, \$10.25@10.75; No. 1 soft, \$10.75@11; No. 2 soft, \$10.25@10.75; No. 3, \$10@10.50; Basic, \$10.50@11.

Steel Billets and Rods.—The market for rods continues fair, the combination among the mills holding up prices. There are inquiries for billets, but the prices have fallen off. Quotations are: Rods, \$22.75; billets, \$15, f. o. b. mills.

Plates.—The market holds good, with numerous small orders coming in. Some of the large Eastern mills are looking for orders, and quotations are consequently shaded. We quote: Steel plates, tidewater delivery, 1.30@1.40c. for No. 10 to 3-16, and 1.18@1.20c. for heavier. Universal mill plates, 1.15@1.20c. Flange is 1.35@1.40c.; shell, 1.30@1.35c. Charcoal iron plates, 2.25c. for shell, 2.75c. for flange, and 3.25c. for firebox. Rivets are 2.25@2.50c. for iron and 1.75@1.85 for steel.

Structural Iron and Steel.—There is a very fair

amount of business in structural material. Some large contracts are likely to be in the market soon. There is no change in quotations, but it is reported that the recently formed pool may decide to advance prices on beams soon. Quotations are: Beams, 1.30@1.35c.; angles, 1.15@1.20c.; tees, 1.35@1.40c.; channels, 1.30@1.35c.

Steel Rails and Rail Fastenings.—The agreement between the mills continues to stimulate buying, and a very fair tonnage has been booked during the week. Prices show no change, but remain at \$18@19 f. o. b. mills for standard sections. Track fastenings are quoted as follows: Angle bars, 1.10@1.15c.; spikes, 1.45@1.55c., and bolts, 1.70@1.80c.; fish plates, 1.20@1.25c.

Wrought Iron Pipe.—There is but little business in pipe for the local market, though expert inquiries and orders continue to come in good numbers. There is continued cutting and shading, but nominal discounts are, for butt welded pipe, black, 57 per cent., galvanized, 50 per cent. Very liberal additional discounts are given on carload lots, so that although the nominal discounts are less than a few weeks ago, pipe is cheaper.

Old Material.—There is a steady gain in inquiries and orders, and the market, which has been pretty dead for a month and more, shows considerable movement. Quotations are: Old steel rails, \$9@10 f. o. b. Jersey City; old iron rails, f. o. b. Jersey City, \$12@12.50; railroad scrap, delivered, \$11.50@12.50; hammered car axles, delivered New York, \$14@18; machinery cast, delivered at works, \$9@10.

Birmingham, Ala. Jan. 24.
(From Our Special Correspondent.)

There is absolutely nothing new to report concerning the condition of the pig iron market in this district. There does not seem to be any change either in the rate of shipments or the demand for pig iron, while the quotations do not show any signs of improvement. There are many inquiries being made, but there is no increase in the shipments, indicating that few large orders are being filled. The furnaces continue to turn out large quantities of iron. The Woodstock Furnace Company's furnace at Aniston is the only one reporting as banking fires, while the Clifton Company's furnace at Ironton will take its place. In the Birmingham district there are no furnaces anticipating banking their fires, while none are preparing to go into blast. The rolling mills and pipe works, besides the numerous iron-using foundries, are handling large amounts of pig iron and supplying a demand that would be missed were they not existing. No. 1 foundry pig iron is quoted at \$7.50 per ton. This is the price that has prevailed since the first of the year and there is now no anticipation of an immediate improvement.

The demand for finished iron was never so brisk in this district as it is now. As a consequence, both the mills in Birmingham and at Gate City are working to their fullest capacity. The Birmingham rolling mills are so rushed for their product that with two puddling departments in full blast the muck iron made does not supply the other departments with steady work. Every piece of machinery is working in the mills, a fact that has not been true in some time. In the Gate City mills last week more finished iron was handled and shipped than for any week in the history of the mills. They are shipping quantities of bar and guide iron.

The Birmingham mills are handling some steel and a ready sale is being found for it also. The steel mill constructed at this place several months since is turning out about 60 tons a day. There are many rumors afloat here concerning the erection of another large steel mill in this district, but there is doubt in the rumors. Mr. Burns, the English representative, who was here a few weeks back, trying to arrange for the erection of a mill to manufacture steel for sharp-edged ware is now in Chattanooga. It is stated that he is making the same propositions there he did here.

Buffalo. Jan. 26.

(Special Report of Rogers, Brown & Co.)

The local market has been very quiet for the past week and is now feeling the effects of the abnormally large business during December and the early new year. Ordinarily, December and the fore part of January are dull months here, but this year foundries were so crowded with work that their 1897 business ran into the new year and gave an unusual tonnage. Prices have not been affected locally by the talk of lower prices elsewhere, except on Lake Superior charcoal iron. It is so hard to put your finger on the market price of this metal that we refrain from quoting, simply stating that a consumer desirous of placing his order for Northern charcoal iron would be accommodated. With prices on local iron unchanged, with the sales very light and shipments continuing at the usual rate, we quote for cash f. o. b. cars Buffalo; No. 1 strong foundry coke iron, Lake Superior ore, \$11.25; No. 2 strong foundry coke iron, Lake Superior ore, \$10.75; Ohio strong softener No. 1, \$11.75; Ohio strong softener No. 2, \$11.25; Jack-

son County silvery No. 1, \$14; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.35; Niagara malleable, \$10.75.

Chicago. Jan. 26. (From Our Special Correspondent.)

Pig Iron.—Sales of pig iron during the past week have been quite large, a number of orders having been received for quantities above a couple of thousand tons. The situation looks decidedly good, and further large orders are in contemplation. Inquiries are coming in from all quarters, and would indicate a very good run of orders between now and the middle of February. The Northern furnaces have booked the larger part of the business of the week, and in consequence are firmer in their views. Most of them are sold away ahead. The Southern furnaces have had a good run of business during the past few weeks and they have stiffened somewhat in prices. Quotations on pig iron are: Lake Superior charcoal, \$12.50@13; local coke foundry No. 1, \$11@11.50; No. 2, \$10.50@11; No. 3, \$10.25@10.50; local Scotch foundry No. 1, \$11.50@12; No. 2, \$11@11.50; No. 3, \$10.50@11; Southern coke No. 1, \$10.60@10.85; No. 2, \$10.35@10.85; No. 3, \$10.10@10.35; Southern No. 1 soft, \$10.60@10.85; No. 2 soft, \$10.35@10.85; Southern silveries, \$11.25@11.50; Jackson County silveries, \$12.50@14.50; Alabama car wheel, \$16@17; coke Bessemer, \$11.50@12.

Bar Iron.—There continues to be a good business in bars and prospects are for a good run of orders for some time to come. Car builders and agricultural machinery manufacturers are the main buyers at the present time, and both combined are taking a considerable tonnage. Quotations are: Common iron 1.05@1.10c.; guaranteed 1.10@1.15c.

Steel Rails.—A number of small orders were booked by the local mills during the past week. Quotations are unchanged at \$20@22.50, Chicago.

Billets and Rods.—There is a considerable inquiry for billets and rods. The local mills have booked a few orders for the week, but quick delivery is impossible, the mills being filled with work for months ahead. Billets are quoted \$17.50 and rods \$25.50.

Structural Material.—Business in both bridge shapes and building material was somewhat less than last week. There are a number of fair sized contracts in view. A few large structures in Chicago and railroad bridges outside of the city are now in the market. Quotations are: Beams and channels, up to 15 in., 1.30@1.35c., and 18 in. to 24 in., 1.40@1.45c.; tees, 1.35@1.40c.; plates, 1.15@1.20c.; angles, 1.15@1.25c.

Cleveland. Jan. 26. (From Our Special Correspondent.)

Iron Ore.—While no definite decision has yet been reached by the owners of the iron mines, it is practically settled that the prices of iron ore for the season of 1898 will be from 15 to 20c. higher than they were last year. Several meetings have been held during the past week, which were attended by representatives of the companies which were interested in the Ore Association of last year, and prices for the current year were discussed informally. It is expected that a formal meeting will be called within a few weeks. It is the prevailing opinion among those interested that the prices for the season will be fixed much earlier this season. Only a few sales were made during the week, at the following prices: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@2.75; hematite ores, Bessemer quality, \$2.50@3; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—The market has been quiet during the past ten days. A few sales of foundry iron have been reported, but practically nothing has been done in Bessemer and other grades. On account of the quiet market the quotations are a shade lower this week. They follow: Lake Superior charcoal, \$12.25; Bessemer, \$10.25@10.50; No. 1, strong foundry, \$10.65@10.75; No. 2, \$10.25@10.50; No. 1, Ohio Scotch, \$10.75@11; No. 2, \$10.25@10.50; gray forge, \$9.50@9.75.

Lake Freight Rates.—The members of the Lake Carriers' Association will do business on the lakes this year under the same system which has prevailed for years. During the depressed condition of the business last summer it was proposed by some of the members that they hold a meeting and fix a minimum rate for carrying ore from the upper lake ports to the Lake Erie docks. Accordingly a meeting was held in Detroit, at which there was a representative gathering of the vessel owners of the Lakes. A proposition to fix a minimum rate, however, was defeated, on the ground that such action might disrupt the organization. It is still too early to predict with any degree of certainty the rates which will prevail during the year. The vessel owners say, however, that they cannot afford to carry ore any cheaper this year than they did last year.

Pittsburg. Jan. 27. (From Our Special Correspondent.)

The market is considerably mixed, and not altogether satisfactory to the selling interests,

Pig iron prices are unsettled and show weakness on certain grades, and prices are pretty much as may be agreed upon in each individual transaction; in many cases without regard to market quotations. It is asserted that prices have been shaded in order to effect sales. Deliveries are not as well taken as could be desired, consequently there is more pressure to sell than has been noticed for some time past. The general situation is, however, quite favorable, and in a couple of weeks it is believed that increased consumption will check the declining tendency, and possibly bring about a reaction toward better prices. Pig iron makers are hopeful in regard to the outcome. As compared with former years the amount of business now being done shows no falling off, but there is such a large and continuous growth in productive capacity that a very large increase in consumption is required each year to keep pace with the output. The growth in demand hardly keeps the market steady, so far as crude iron is concerned.

Steel Billets.—We can report a fair trade demand, prices being fairly maintained, with sales showing a variety of prices; the supply on the market was fair.

Steel Rails.—The trade is reported active. The outlook is said to be flattering. Large orders already booked have been increased within the week.

Wire Nails.—Prices show no change. January sales so far are said to be large, present prices \$1.40@1.45.

Wire Rods.—There has been a steady demand for some time, with liberal transactions. Prices range \$22.75@23.

Sheet Bars.—The activity in the market previously noted has been maintained at \$17.60@18, delivered.

Wrought Iron and Steel Pipe.—The demand is improving, with a fair amount of business; prices unchanged.

The Latest.—The market remains quiet, presenting nothing of importance. Prices are without change. Consumers generally have a moderate supply of the raw material, and are disposed to wait and take the chances of the market. Pittsburg furnaces are all running full; most of them are well sold up, and can afford to wait, being confident that their time is not far off.

Table with columns for COKE, SMELTED LAKE AND NATIVE ORE, MUCK BAR, STEEL WIRE RODS, SKELP IRON, SKELP STEEL, BLOOMS, BILLETS, BAR ENDS, FERRO MANGANESE, OLD RAILS, and SCRAP MATERIAL. Includes various grades and prices.

Philadelphia. Jan. 28. (From Our Special Correspondent.)

Pig Iron.—Iron is weaker. Brokers and agents refuse to say anything for print. There is evidently a feeling of disappointment. Some concerns are willing to sell, others do not care. Two or three makers have refused offers for either present or late delivery. While outside markets are doing better ours is quiet, though consumption is heavy and prospects for still greater consumption good. Buyers have an idea that prices will be lower, yet makers are living in daily expectation of a breaking out of a heavy demand to save them. Quotations are: No. 1 foundry, \$12@12.25; No. 2, \$10.75@11.25; No. 2 plain, \$10.50; standard mill irons, \$9.75@10; basic, \$10.50; low phosphorus, \$16.

Billets.—Prices are weaker, though sellers deny it. Prompt shipment steel can be had at \$17, though some buyers will not even pay that. There are rumors of a sudden demand, but it appears to be based on the fact that a good many large consumers have not covered.

Merchant Bars.—There is a somewhat better demand for bars from all quarters. Car load lots are quoted at 1.12 1/2c. for best refined, common, 1.10c.

Sheet Iron.—The mill owners all feel encouraged as to early spring trade, but do not look for much activity except in a retail way, during the month of February. The average consumption continues heavy, and is more likely to increase than diminish.

Pipes and Tubes.—To-day's reports from several agents of manufacturers, is to the effect that business is gradually getting better, though there have been no large contracts placed this week.

Plate and Tank.—This department is very active. Business, more or less, is heard of every day. Prices keep low. A great deal of new work is coming up. Tank is 1.15c.; universals, 1.20c.; flange, 1.25c.; fire-box, 1.50c. up.

Structural Material.—Every day we hear of new work. Angles 1.20c.; beams and channels, 1.30c.

Steel Rails.—There are inquires on the market for about 120,000 tons, but part of it is dependent on financial negotiations now pending. Quotations are \$18.

Old Rails.—Old rails are quiet at \$12.50.

Scrap.—Scrap of all kinds is moving a little more freely. Choice railroad sold at \$12.50; heavy steel scrap at \$10.50.

Cartagena, Spain. Jan. 15.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—Shipments during the month past from this port have been 16 cargoes of dry iron ore, 8 of manganiferous ores, and one of 60 per cent. magnetic iron ore. Freight rates have fallen very considerably during the last few weeks, so that a good amount of chartering has been done, and we may expect to see the greater amount of the stocks of ore accumulated during the past six months shipped off by the end of January. A group of mines in this province, situated about four miles from Mazarron Bay, has lately been acquired by a Glasgow syndicate, the ore being of a very pure campanil quality, and it is expected that when a wire cable has been put up about 100,000 tons of ore per annum will be produced. The mines have been surveyed by two well-known engineers from the Bilbao district, both of whom report very favorable on the properties.

We quote ordinary 50 per cent. Portman ore, 5s. 10d.@6s. 4d.; special low phosphorus, 6s. 2d.@ 6s. 6d.; extra quality, 6s. 10d.; special iron ore, 7s. 4d.; specular, 60 per cent., 9s. 6d.; magnetic iron ore, 60 per cent., 10s. 9d. All prices are per ton f. o. b. shipping port. Manganiferous iron ore is quoted as follows: No. 1 (20 Fe. and 20 Mn.), 14s. 6d.; No. 1 B (25 Fe. and 17 Mn.), 11s. 6d.; No. 2 (30 Fe. and 15 Mn.), 10s. 4l.; No. 3 (35 Fe. and 13 Mn.), 9s. 3d.

Other Minerals.—Exports from Cartagena in December were 5,100 metric tons blende to Antwerp, 280 tons calamine and 155 tons ochre to United Kingdom, 315 tons copper pyrites to Marseilles.

METAL MARKET.

NEW YORK, Friday Evening, January 28, 1898. Gold and Silver.

Price of Silver per Ounce Troy.

Table showing Price of Silver per Ounce Troy with columns for January, St. Ex., London Pence, N. Y. Cts., Value of Sil. in \$., and Value of Sil. in \$.

The price of silver hung for a while about 26 1/2d., owing to the disinclination of the banks to do much. But covering of shorts in London, by the speculative element strengthened the market, and with more inquiry from the banks the quotation has advanced to 26 3/4d.

The United States Assay Office in New York reports the total receipts of silver at 117,000 oz. for the week.

Gold and Silver Exports and Imports

At all United States ports, December, 1897, and years from January 1st, 1897 and 1896:

Table showing Gold and Silver Exports and Imports with columns for Coin and Bullion, In ores, and total excess Exp. or imp.

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.

Gold and Silver Exports and Imports, New York.
For the week ending January 28th, 1898, and for years from January 1st, 1898, 1897, 1896, 1895.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Impor s.	Exports.	Imports.	
Week	\$1,194,750	\$51,529	\$474,482	\$15,804	E. \$1,601,899
1898..	2,530,335	1,823,760	4,908,395	2,032,573	E. 3,582,397
1897..	186,620	228,211	3,906,881	226,302	E. 3,638,988
1896..	9,183,473	6,112,143	3,241,744	155,835	E. 5,157,539
1895..	25,548,166	520,742	2,975,800	161,089	E. 27,842,135

The gold exported for the week, this year, went to the West Indies; the silver went principally to London. The gold and silver imported came chiefly from Central and South America, and the West Indies.

Average Monthly Prices of Silver.

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Month.	1897.		1896.		1895.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January...	29.74	64.79	30.69	67.13	27.36	59.69
February...	29.68	64.67	31.01	67.07	27.47	59.90
March.....	28.96	63.06	31.34	68.40	28.33	61.98
April.....	28.36	61.85	31.10	67.92	30.39	66.61
May.....	27.85	60.42	31.08	67.85	30.61	66.75
June.....	27.58	60.10	31.46	68.69	30.47	66.64
July.....	27.36	59.61	31.45	68.75	30.48	66.75
August....	24.93	54.19	30.93	67.34	30.40	66.61
September	25.66	55.24	30.19	65.68	30.54	66.90
October...	26.77	57.57	29.68	65.05	30.89	67.64
November	26.87	57.93	29.46	64.98	30.79	67.40
December.	26.83	58.41	29.70	65.24	30.40	66.47
Year.....	27.55	59.79	30.67	67.06	29.53	65.28

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce or for metal 925 fine.

Financial Notes of the Week.

General business continues a little unsettled, and does not improve as it should. The volume of trade is large, but there is still enough uncertainty to make people cautious and hold them back from new enterprises. The Klondike craze has had an unfavorable effect and will result in diverting a considerable amount of money into an unprofitable field.

The bank statement shows that money is accumulating at New York, which is not a favorable sign. The very large deposits of the city banks show that money is not in demand at interior points and is coming to New York in the hope of finding some employment there.

The meeting of the National Association of Manufacturers in New York this week has suggested several plans for increasing business with foreign countries—but has not touched on the only one which can be permanently successful, the encouragement of reciprocal trade.

The meeting of the Monetary Conference at Indianapolis this week was a large one, delegates being present from all parts of the country. The conference voted to endorse the plan of currency and banking reform prepared by its Commission, and urged upon Congress the necessity for action.

A bill to authorize the coinage of subsidiary silver coin from silver bullion purchased under the act of July 14, 1890, and the recoinage of uncurrent subsidiary silver coin in the Treasury has been introduced in the House by Charles W. Stone of Pennsylvania. It authorizes the Secretary of the Treasury to coin any such silver bullion in the Treasury into such denominations of subsidiary silver coin as may be necessary to meet the public requirements and any gain of seigniorage arising from such coinage is to be accounted for and paid into the Treasury. An amount of Treasury notes issued under that act equal to the cost of the bullion so used is to be canceled and not reissued.

Another bill introduced by Mr. Stone amends the Revised Statutes fixing the amount that may be allowed the coiner and melter and refiner of the coinage mints and assay office at New York city for the wastage of gold. Both of these bills were introduced at the urgent request of Secretary Gage.

Imports of specie at San Francisco for the year ending December 31 included the following:

Gold bullion.....	\$1,680,869
Gold coin.....	9,927,134
Silver bullion.....	1,580,328
Silver coin.....	593,361
Total.....	\$13,782,292
Total, 1896.....	11,864,424

The total gold in 1897 was \$11,608,003; silver, \$2,174,289. The sources of these imports in 1897 were: Mexico, \$2,637,793; Central America \$16,192; British Columbia, \$327,189; Australia, \$10,760,858; miscellaneous, \$40,260. All this specie went through the Customs House. A much

larger quantity was received overland, which did not pass through that agency.

The statement of the United States Treasury, on Thursday, January 27th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Jan. 20.	Jan. 27.	Changes.
Gold	\$162,964,254	\$163,697,785	I. \$733,531
Silver	16,861,751	18,950,268	I. 2,088,517
Legal tenders.....	30,793,972	26,225,892	D. 4,568,080
Treas. notes, etc..	2,691,032	3,806,327	I. 615,295

Totals

\$213,311,009	\$212,180,272	D. \$1,130,737
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Treasury deposits with national banks amounted to \$48,452,557, an increase of \$136,066 during the week.

The statement of the New York banks—including the sixty-six banks represented in the Clearing House—for the week ending January 22nd gives the following totals, comparison being made with the corresponding weeks in 1897 and 1896:

Loans and discounts..	\$447,859,900	\$490,338,700	\$623,470,100
Deposits	489,740,800	543,479,600	714,472,800
Circulation	13,810,500	18,479,800	14,593,600
Reserve:			
Specie	76,160,900	79,134,100	110,649,600
Legal tenders.....	83,952,800	118,803,600	99,245,800

Total reserve.....

\$160,113,700	\$197,937,700	\$209,893,400
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Legal requirement.....

122,435,200	140,869,900	178,618,200
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Surplus reserve.....

\$37,678,500	\$57,067,800	\$31,275,200
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Changes for the week, this year, were increases of \$12,477,500 in loans and discounts, \$22,859,900 in deposits, \$2,008,600 in specie, \$9,012,800 in legal tenders, and \$5,306,425 in surplus reserve, and a decrease of \$497,700 in circulation.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding dates last year:

Banks.	1897.		1898.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Asso..	\$79,134,100	.....	\$110,647,600	.....
England ..	85,530,610	.....	162,818,680	.....
Germany ..	221,280,000	.....	241,290,000	.....
Austro-Hun.	151,760,000	\$61,185,000	182,116,000	\$61,988,000
Netherlands.	13,170,000	34,105,000	13,145,000	33,945,000
Belgium ..	20,570,000	.....	21,031,800	.....
Spain.....	42,640,000	50,390,000	47,155,000	51,570,000
Italy.....	59,780,000	11,985,000	60,585,000	11,315,000
Russia.....	465,385,000	.....	587,910,000	.....

The returns for the Associated Banks of New York are of date January 15th, the Bank of Italy, December 30th, 1897; the Bank of Russia, December 16-25th; the Banks of Spain and the Netherlands, January 8th; and the others are of date January 25th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to January 13th, are reported by Messrs. Pixley & Abell's circular as below:

	1897.	1898.	Changes.
India	£213,000	£93,400	D. £119,600
China .....	.....	.....	.....
The Straits.....	.....	.....	.....
Totals	£213,000	£93,400	D. £119,600

Arrivals for the week, this year, were £228,000 in bar silver from New York and £26,000 from Chile; a total of £254,000. Shipments for the week were £93,400 in bar silver to Bombay.

Indian exchange continues to rule over 16d. per rupee, and the demand for money in India is still great, though the action of the Council in authorizing the issue of bills against gold has somewhat relieved the pressure. It is now announced that steps will be taken to put the Indian currency on a gold basis; action which was generally expected.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$.45	\$.46½
Peruvian soles and Chilean pesos.....	4.39½	.41
Victoria sovereigns.....	4.84	4.87
Twenty francs.....	3.84	3.87
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.78	4.80

Other Metals.

Copper.—The firmer tendency which characterized the market last week has more or less disappeared, and dullness prevailed during the greater part of the week just ended. Consumers who have bought quite freely during the past few weeks, appear to be fairly well covered for the moment, and refrain from buying. All the smaller Lake companies refuse to book orders at 11c., but it is understood that the Calumet is still selling at that price, and therefore the quo-

tation has to stay. Not much business has been doing in electrolytic copper, but prices are firm at 10.75@10.80c. for cakes, wirebars and ingots; and 10.50@10.55c. for cathodes. The casting copper quotation remains nominal at 10½c. No business is reported as having been done for export, as the prices asked are above the ideas of buyers abroad.

Great activity prevailed in the g. m. b. market in London, and the transactions from day to day have been large. Prices have given way slightly from those established last week, but the difference is not great, the closing quotations being £48 17s. 6d.@£49, for spot and £49 5s.@£49 7s. 6d. for three months prompt. Consumption abroad is said to be very good, but buyers strenuously oppose buying copper at the high prices now asked. For refined and manufactured we quote: English tough, £50 15s.@£51 5s.; best selected, £51 15s.@£52 5s.; strong sheets, £57 10s.; India sheets, £55 10s.@£56; yellow metal, 4 15-16d.

Tin.—There is constantly a good demand from consumers. The stocks in New York have of late dwindled down somewhat, but heavy arrivals came in this week bringing much needed supplies. Somewhat higher prices have been established, and we quote 13.90@13.95c. for spot and 13.95@14c. for futures.

No change took place during the week in the market abroad, and the quotations are the same as last reported, £63 2s. 6d.@£63 5s. spot and £63 15s.@£63 17s. 6d. three months prompt. Shipments from the East continue rather heavy.

Lead.—The pressure to sell on the part of refiners continues, but in spite of further inducements having been offered buyers, there is no desire shown to operate on a larger scale, and the market remains flat. Sales have taken place during the last few days at 3.60c., at which figure there are further sellers of round quantities. The London market has declined, for Spanish lead to £12 7s. 6d. and English to £12 12s. 6d., and the market is cabled as being weak.

Spelter continues irregular. Some second hand lots have been sold somewhat below the market, but we have still to quote 3.72½@3.75c., St. Louis and 3.97½@4c., New York.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Our lead market has as yet shown no signs of improvement, and prices seem to be on the down grade. Common lead is selling in a retail way at 3.42½c., and occasionally as low as 3.40c. Refined is worth nominally 3.45c. at East St. Louis.

Imports and Exports of Metals.

Port.	Week, Jan. 20.		Year, 1898.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum, boxes.....	31	.....	112	.....
Antimony ore...short tons	.....	35	.....	59
..... regulus...casks	.....	.....	.....	6
Brass, old...short tons	.....	.....	.....	.....
Chrome ore.....	.....	.....	.....	.....
Copper, fine.....long tons	\$1,727	.....	6,215	231
..... ore.....	.....	.....	.....	.....
..... matte.....	\$270	18	1,357	176
..... sulphate.....	100	.....	300	.....
Ferro-chrome.....	.....	.....	.....	163
Ferro-manganese.....	.....	.....	.....	33
Ferro-silicon.....	.....	.....	.....	5
Iron ore.....	.....	.....	.....	20
..... old.....	.....	.....	224	.....
..... pipe.....	.....	.....	297	.....
..... pig, bar, rod.....	164	153	1,311	5,749
Lead, antimonial.....	.....	.....	.....	.....
..... bullion.....	\$652	.....	2,945	5,596
Lead ore.....	.....	.....	.....	370
Manganese ore.....	.....	1,155	.....	2,061
Nails.....	.....	.....	.....	.....
Nickel.....	.....	15	.....	185
Rails, old.....	.....	.....	.....	70
Spiegelisen.....	.....	59	.....	.....
Steel billets, rods.....	.....	242	.....	1,805
Tin.....	.....	525	.....	600
..... dross.....	.....	.....	.....	.....
..... and black plates, boxes	.....	21,063	.....	121,155
Zinc.....long tons	.....	.....	.....	440
..... dross.....	6	.....	.....	132
†Baltimore.				
Brass scrap.....long tons	.....	.....	.....	.....
Chrome ore.....	.....	.....	.....	.....
Copper, fine.....	351	.....	1,543	.....
..... matte.....	.....	.....	.....	.....
..... sulphate.....	50	.....	.....	59
Ferro-manganese.....	.....	.....	.....	137
Ferro-silicon.....	.....	.....	.....	160
Iron ore.....	.....	3,248	.....	25,378
..... pig, bar, etc.....	.....	.....	.....	27
..... pipe.....	79	.....	.....	319
Lead.....	.....	.....	.....	.....
Manganese.....	.....	.....	.....	89
Rails, steel.....	3,039	.....	3,070	.....
Silicon.....	.....	.....	.....	10
Spiegelisen.....	.....	.....	.....	517
Steel.....	147	.....	.....	806
..... wire.....bundles	.....	.....	.....	2,720
Tin.....long tons	.....	.....	.....	1,000
..... and black plates, boxes	.....	.....	.....	2,220
Zinc.....long tons	.....	.....	.....	.....
..... dross.....	.....	.....	.....	.....

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending Jan. 27.

The European market is easier, good ordinaries being quoted £17 18s. 9d., and specials 2s. 6d. higher.

Antimony continues dull and is pressed for sale. We quote: Cookson's, 8c.; Hallett's, 7½c.; U. S. Star, 7½c.; Japanese, 7½@7¼c.

Nickel.—Business continues on unchanged lines and no alteration in prices can be reported. We quote for ton lots 33½@36c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are now quoted at \$15@16 per oz. New York. The London quotation is 58 @60s. per oz. Supplies are not large and prices are firm.

For chemical ware, best hammered metal, Messrs. Elmer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 199 grams: Crucibles and dishes, 57c., 58c.

Quicksilver.—The New York quotation remains at \$38.50 per flask. The London price is £7 per flask, with £6, 180.9d. named from second hands.

The Minor Metals.—Quotations are given below for New York delivery:

Aluminum:	Alum-Nickel, ½ lb. 33@39c.
No. 1, 98% ingots,	Bismuth, ½ lb. \$1.30@1.80
½ lb. 34@40c.	Phosphorus, ½ lb. 40@50c.
No. 2, 90% ingots,	Tungsten, ½ lb. 70c.
½ lb. 31@34c.	Tungstic acid 45c.
Rolled sheets, ½ lb. 38c. up	Ferro-tungsten, 60% 60c.

Variations in price depend chiefly on the size of the order.

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½ lb. 31@34c.	Tungstic acid 45c.
Rolled sheets, ½ lb. 38c. up	Ferro-tungsten, 60% 60c.

Variations in price depend chiefly on the size of the order.

Average Monthly Prices of Metals.

In New York, for the years 1898 and 1897; in cents per pound.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1898.	1897.	1898.	1897.	1898.	1897.	1898.	1897.
Jan.	10'90	11 75	13'87	13'44	3'65	3'64	3'96	3'91
Feb.	11'92	11 80	13'59	13'43	3'28	3'28	4'02	4'02
March.	11'80	11 48	13'43	13'34	3'41	3'41	4'12	4'12
April.	11'48	11 03	13'34	13'44	3'32	3'26	4'13	4'21
May.	11'03	11 11	13'44	13'77	3'26	3'33	4'21	4'24
June.	11 11	11 11	13'77	13'89	3'33	3'72	4'24	4'32
July.	11 11	11 16	13'89	13 80	3'72	3'84	4'32	4'26
August.	11 16	11 30	13 80	13'98	3'84	4'30	4'26	4'18
Sept.	11 30	11 15	13'98	13 89	4'30	4'00	4'18	4'17
October.	11 15	10 82	13 89	13'79	4'00	3'76	4'17	4 03
Nov.	10 82	10 72	13'79	13'71	3'76	3'70	4 03	3 89
Dec.	10 72	11 26	13'71	13'67	3'70	3'53	4 03	4'12
Year.	11 26	11 26	13'67	13'67	3'53	3'53	4'12	4'12

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 154.)

New York. Jan. 28.

Heavy Chemicals.—Business has been broader, and prices are in buyers' favor. Caustic soda has been sold at \$1.45 per 100 lbs. to a large consumer, and chlorate of potash is also weak in price. It is reported that the well-known works of the Oldbury Alkali Company (Messrs. Chance) and those of W. Hunt & Sons, Wednesbury, England, have been amalgamated with the United Alkali Company. The Oldbury concern was established over 60 years ago. Mr. Chance, it will be remembered, perfected the sulphur recovery process bearing his name and is associated with the sulphur trust of Sicily. Prices are generally quoted as follows: Caustic soda, domestic high test, \$1.60@1.70 per 100 lbs. f. o. b. works; foreign, \$1.80@1.90, according to test and quantity. Powdered caustic soda, 98 per cent., 3½@3¼c. per lb., according to make and test. Alkali, domestic, 58 per cent., 50@55c., for bags f. o. b. works; foreign, 55@60c., f. o. b. seaboard delivery, as to style of package. Carbonated soda ash, 90@95c. per 100 lbs. for 58 per cent., basis of 48 per cent. Bleaching powder, English, prime brands, \$1.80@1.85 per 100 lbs.; Continental F brands, \$1.70@1.85. Bicarb soda, domestic, \$1.50 per 100 lbs. for ordinary and \$3.50 for extra grade f. o. b., less the usual discounts; foreign, \$2.25@2.50 per 100 lbs., according to brand and style of packing. Sal soda, domestic, 55c. per 100 lbs. f. o. b. works, less usual discounts; English, 60c. for spot and 62½c. to arrive. Concentrated sal soda, \$1.40@1.60 per 100 lbs. f. o. b. Chlorate of potash, \$8.75@9.00 per 100 lbs.

Acids.—Dealing in acids has been fair, with prices steady. Contract-taking for muriatic acid is in order and so far is larger than a year

ago. Quotations are, per 100 lbs. in New York and vicinity, in lots of 50 carboys or over, as follows: Acetic acid, commercial, No. 8, \$1.40@1.55; redistilled, 28 per cent., \$2@2.15; muriatic acid, 18 degrees, \$1@1.50; 20 degrees, \$1@1.75; 22 degrees, \$1½@2, according to make and quantity. Nitric acid, 36 degrees, \$3¼@4¼; 40 degrees, \$3¾@4¾; 42 degrees, \$4¼@5. Oxalic acid, \$6.62½@6.75 ex-dock and \$7.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66 degrees, \$1@1.25. Chamber acid, 50 per cent., \$6.50@7.50 per ton at factory. Blue vitriol, \$3.37½@3.62½, according to grade and order.

Brimstone.—The spot market is short of supplies, and in view of this \$22 per ton is asked for best unmixed seconds. The 1,210 tons of sulphur which arrived late last week have nearly all been contracted for. Quotations for nearby arrivals are, \$21.50 for best unmixed seconds, and \$20.75@21 for futures; thirds are \$1 less per ton. Demand is limited, and consumption is regular in character.

Nitrate of Soda.—The recent arrivals continue to ease the market, but a slight reaction has taken place in the price of spot goods; these are quoted now at \$1.70@1.72½ per 100 lbs. Near arrivals are offered at \$1.65, and future shipments range from \$1.50 upward. The January European statement of the Permanent Nitrate Committee shows total exports to Europe in December, \$3,091,000 quintals; loading, January 1st, 1,100,000 quintals; imports, 97,340 tons; deliveries, in December, 62,610 tons, and visible supply with stocks and afloat, 644,090 tons.

Fertilizing Chemicals.—Trade continues quiet, and prices, especially for sulphate of ammonia, are higher owing to the scarcity of supplies on the London market, which are less than normal. Potash salts remain unchanged in price, and the intimation is that the German Kali Works' schedule will soon be fixed for the ensuing year. We quote: Sulphate of ammonia, gas liquor, \$2.50@2.55; bone, \$2.40@2.45 per 100 lbs. Dried blood, high grade Western, \$1.92½@1.95 per unit; New York, \$1.70@1.72½ per unit f. o. b. Chicago. Azotine, \$1.80@1.85; basis New York. Concentrated phosphate (30 per cent. available phosphoric acid), 57½c. per unit. Acid phosphate, 13@15 per cent., av. P₂O₅, 55@60c. per unit at sellers' works in bulk. Dissolved bone black, 17@18 per cent. P₂O₅, \$16@16.50 per ton. Acidulated fish scrap, \$10@10.50, and dried scrap, \$18@18½ f. o. b. fish factory. Tankage high grade, \$14@14½ per ton f. o. b. Chicago; concentrated tankage, \$1.55 per unit f. o. b. Chicago; low grade, \$1.3@1.35. Bone tankage, \$19 @20; ground bone, \$20@23. Bonemeal, \$1.40@1.50 f. o. b. Chicago.

Sulphate of Potash: 90 per cent., New York and Boston, \$1.99½; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48@49 per cent., less than 2½ per cent. chlorate, are 1.01@1.01½c., to arrive, and 1.02@2.02c. on spot; basis of 48 per cent. High grade, 90@98 per cent. sulphate of potash, 1.96½@2.00½c., to arrive; sulphate of 90 per cent. In bulk, 24@36 per cent., 36½@37½c. per unit phosphoric acid.

Muriate of Potash: We quote: New York and Boston, 1.75@1.78c.; Philadelphia and Norfolk, 1.76@1.79½c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85 per cent., basis of 80 per cent., 1.78½@1.81c., in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12.4 per cent. actual potash, equivalent to 23 per cent. sulphate of potash, \$8.80@8.90.

Keiserit.—Future shipments are quoted at \$7¼ @7½ per ton.

Phosphates.—South Carolina, ground rock, \$5½ @5¾ per 2,000 lbs.; undried, \$3 per 2,400 lbs. f. o. b. Ashley River; dried, \$3¼@3.45 f. o. b. same place.

MINING STOCKS.

Complete quotations will be found on pages 150, 151 and 152 of mining stocks listed and dealt in at:

Baltimore.	Los Angeles.	London.
Boston.	New York.	Mexico.
Cleveland.	Philadelphia.	Paris.
Colo. Springs.	Pittsburg.	Rossland.
Denver.	Salt Lake.	Shanghai.
Helena.	San Francisco.	Valparaiso.

New York. Jan. 28.

The market for mining stocks continues dull, and trading is confined principally to the professional element. Prices are low, and, with but few exceptions, are falling.

The Comstocks are depressed, notwithstanding the report that a movement is on foot to drain the lower levels of that lode, preparatory to the resumption of deep mining. This matter, however, has caused some interest in different Comstock properties, but the investing public in the East entertains much doubt as to the ultimate outcome. Consequently Crown Point went off at 25c.; Gould & Curry sold at 30c.;

Consolidated California and Virginia dropped to \$1.10 at the opening, but rose to \$1.25 at the close, while Ophir is up to 60c. On the other hand Chollar gained 7c. in price, notwithstanding the 20c. assessment just levied. Potosi and Sierra Nevada each rose 3c., though the latter company has recently levied an assessment of 20c., delinquent February 23d.

The Colorado stocks make up the major part of the total transactions reported, and of these the "prospects" are receiving most attention at the Mining Exchange. Of the dividend payers Elkton Consolidated lost 2½c. since the opening of the week, selling at 85c.; Golden Fleece dropped to 51c.; Lillie, which has declared another dividend of 1c. per share, payable on February 1st, rose from 65c. to 67½c., and Mt. Rosa, which paid its second dividend (\$10,000) this year on January 25th, sold at 13c. Portland receded to 79c.; Isabella sold at 31½@31¾c.; Union sold at 14@15c., against 13½@14¾c. last week and George Bernard, president of the Elkton Company, and James S. Burns, president of the Portland Company, have purchased a block of 83,093 treasury shares of the Union Gold Mining Company, at 12½c. per share. In consequence of this sale work will be resumed on the Orpha May property of the Union Company. At the annual meeting of the stockholders of this company Messrs. Burns and Bernard were elected directors to succeed Messrs. Adams and Pomroy, resigned. Of the other Colorado stocks there is a demand for Lacrosse, which seems to come from parties desiring to control the property.

Sales of Deadwood-Terra of South Dakota are reported at \$1.10, or 15c. less than last week. Homestake is up to \$46.50—a price higher than any, we believe, since the first calling of the stock on the local market.

Utah stocks are dormant, with Ontario bid for at \$2.50, and Horn silver selling at \$1.20.

The California stocks are devoid of speculative interest. Of Standard Consolidated 200 shares were sold at auction on January 26th at \$1.65. Brunswick Consolidated receded to 12c. in two days. Quicksilver, common, sold at \$2, the first transaction since December last.

Kingston & Pembroke of Ontario was sold at 21c.

The British Columbia stock, St. Francis Cariboo, on the Mining Exchange tends upward, and as high as \$2.75 was quoted on it this week.

Mr. William F. Daniel has been chosen chairman of the Consolidated Stock and Petroleum Exchange, to succeed Mr. A. W. Peters, resigned owing to his election as president of the Borough of Manhattan.

In Philadelphia there were sold at auction this week, 200 shares Little Schuylkill at 54½; 50 shares at 54½, and 50 shares at 54; Bethlehem Iron Company, 20 shares at 55; Pennsylvania Railroad, 12 shares at 57½; United Gas Improvement Company, \$18,500 sixes of 1902, at 106½, and Lehigh Valley, \$2,000 consolidated sixes of 1923 at 116½.

Boston. Jan. 27.
(From Our Special Correspondent.)

A steady market for copper stocks has ruled during the past week, with the exception of Tuesday, when they declined somewhat, in sympathy with the pronounced weakness in the New York and local stock markets. A material recovery in prices set in the following day, and the week closes with the whole list buoyant, and Boston & Montana the feature at \$157, its record price. Atlantic also, was very strong, selling up to \$28, ex-dividend of \$1, compared with \$26½, dividend (one earlier) in the week. After selling at \$9½ during the week, Baltic advanced to-day to \$11. The advance in Atlantic is stated to be on the improved chances of finding the Six Mile Hill lode in section 16, as the favorable opening of No. 4 pit on the Baltic property brings the exploration 900 ft. nearer the southern line of section 16 on the Atlantic. Calumet & Hecla has sold in a moderate way at \$499@500. Butte declined from \$25½ to \$24½, with subsequent rally to \$26, closing about the top price. The stock is not well distributed, one interest claiming to hold 80,000 shares, which is not considered a good feature. Not much Osceola comes on the market, the stock holding steady at about \$42. Old Dominion has been dull, opening at \$24½, declining to \$24, and selling up to-day to the opening price. Centennial hangs around \$10½, with not much activity. Arnold has been quite steady at \$4¼@4½. To-day it sold with assessment of \$3 paid and the highest price was \$7½, with lowest \$7; closing at \$7½@8. More Franklin than usual has come out during the week, and the price declined to \$12, with fractional rally. The agent writes of the Franklin, Jr., that the fourth and fifth level stopes are now in fair copper ground, and what copper they get from the sixth level stope is heavy; the shaft is now down to the tenth level. Quincy has been rather quiet at \$110, and Tamarack steady at \$141@142. Wolverine has been active with little change in price, the highest being \$19, and the lowest \$18¾. A dispatch from the agent to-day says the January product will not fall far short of 200 tons, or practically double the output of a year ago.

A few shares of Napa Quicksilver came out at

\$8½, which is fractionally better than last week's price.

The gold stocks have been extremely dull, with prices unchanged, Santa Ysabel selling at \$5½ @ \$6; Gold Coins at \$1½ @ \$2, and Cochiti \$6½ @ \$7.

Salt Lake City. Jan. 22.

(From Our Special Correspondent.)

While the volume of business in local mining shares during the past week has been the greatest ever witnessed in this market, a decidedly unsatisfactory condition tones the trading, and it is difficult to avoid the conclusion that the bulk of the business has had its origin in a desire to sell and liquidate. It is true that Northern Light, slumping heavily, has had much to do with this condition, but other stocks have sold too freely, and there has been a general breaking of prices. The selling epidemic has affected some of the best shares in this market, and Mercur is selling at about the same figures that it brought when its earning capacity was 30 per cent. less than now. The total business of the week on the Salt Lake Stock Exchange aggregated nearly 80,000 shares, of which Northern Light furnished nearly half.

The contention in the directory of Ajax being disposed of for the time, the stock took on a more healthy tone, and some shares went at 45c., leaving the stock above that figure at the close. Very little inquiry is reported for either Anchor or Alliance. The stock of the Beaver Lake Copper Company, a concern operating near Frisco, has been offered at 15c. per share, former investors being now anxious to realize. Bullion-Beck is somewhat behind its recent strength. Centennial Eureka will hold its annual meeting on February 1st. Chloride Point has been an active figure in the daily sessions of the Exchange, but in spite of a better demand and better figures the transactions were very limited. Dalton was a heavy seller in the week. Daly and Daly-West were both inactive. Dalton & Lark continues an offering at 12½c., but bids seldom exceed 2c. Geyser-Marion again sold heavily within a range of 10c. At the monthly meeting held to-day a dividend of 3c. per share, or \$9,000, was declared. The annual meeting will be held on the 31st. At its monthly meeting held yesterday, Mammoth declared a dividend of 5c. per share, or \$20,000, the first since November, 1896. Annual meeting will be held February 1st. Mercur has been decidedly weak, though the reasons are not apparent.

Northern Light furnished the sensation of the week, and it was not until the last day that the stock failed to record sales. Selling at 23c. on Monday, the shares declined regularly until on Friday they went at 13½c. On that date the directors met and voted an assessment of 10c. per share, payable March 1st., and to-day the stock was an offering at 8½c., without visible buyers. The company is in debt about \$60,000, and the assessment was intended to wipe out a large part of this.

Overland continues the object of flattering bids since the new management took hold, but the stock is held firmly. The same is true of Malvern, a near neighbor in the Mercur region. Swansea was in good demand all week, and did a small amount of business, but South Swansea declined, having passed its January dividend.

San Francisco. Jan. 22.

(From Our Special Correspondent.)

The early part of the week showed about the smallest amount of business that could well be recorded and show any market at all. Prices showed no special decline, because no one took any special pains to run them down.

The market continued dull all the week and the amount of business was very moderate. Towards the close of the week there was a little show of firmness, but without much increase in prices.

Some prices noted are: Occidental, \$1.50; Hale & Norcross, \$1.25@1.30; Consolidated California & Virginia, \$1.10@1.15; Confidence, 75c.; Sierra Nevada, 60c.; Best & Belcher, 46@47c. Some business was done in Standard Consolidated at \$1.45, and Eureka Consolidated brought 25c.

Thomas Watson, L. Reckless and I. Steuart have sued the Cadmus Gold Mining Company, Andreas Goetz, Adolph H. Weber and Joseph Straub to invalidate certain assessments upon the stock of the mining company and to restrain the sale of plaintiffs' stock. The plaintiffs pray that assessment No. 2 of 10 cents a share, levied October 25th, 1897, be annulled and set aside and that it be adjudged that defendants have no right to sell any stock held by plaintiffs as delinquent.

The California Debris Commission has received new applications to mine by the hydraulic process from O. M. Henry, in the Murphy diggings, near Volcano, Amador County, to deposit tailings in Rancheria Creek; from George A. Gritton, in the Clapboard Gulch mine, near Volcano, Amador County, to deposit tailings in Sutter Creek; from Frank J. Goyan, in the Cox mine, near Placerville, El Dorado County, to deposit tailings in a ravine; from J. M. Longnecker, in the Hull placer mine, near Genesee, Plumas

County, to deposit tailings in a ravine; and from E. Becker and Robert Mooney, in the Homestake mine, near Amador City, Amador County, to deposit tailings in Rancheria Creek.

London. Jan. 19.

(From Our Special Correspondent.)

Much disappointment is being felt in city circles at the doings of the British America Corporation, floated in December by Mr. Whitaker Wright. In previous letters I have referred to this corporation and commented on the misleading prospectus which would cause the casual reader to believe that the corporation had actually acquired a number of valuable assets, but now it appears that nothing of the sort has been done. One of the properties to be acquired was the Alaska Commercial Company, but it is now announced that the terms proposed by the vendors of the latter were too onerous, and so the negotiations are off. The Josie mine was also mentioned in the prospectus, but it turns out that it is only an interest that has been purchased, and not the whole mine. Now I hear that the Le Roi purchase is not to be completed, and that the town lots at Dawson are not to be acquired. Thus for the £1,000,000 subscribed to the corporation by the public all that there is to show is an interest in the Josie. Surely Mr. Whitaker Wright must have known the terms of purchase required by the owners of the Le Roi and the Alaska Commercial Company when he obtained options on them. Why, also, did he write the prospectus in such a manner as to lead the average reader to think the properties had been actually secured and were to be paid for by the money subscribed? As matters now stand Mr. Whitaker Wright has £1,000,000 to do what he likes with.

This absurd fiasco has rather frightened other promoters, and the publications of their prospectuses are being delayed for a short time. There are plenty of Klondike and British Columbian companies, for the most part worthless, ready to come out, especially of the former. The English papers of the lower class are booming Klondike in a very injudicious manner, for this sort of literature excites the imagination of the ignorant. Numberless parties of young men, mostly of the artisan class, are being organized and many are already on the way.

Last week I mentioned that the White Water mine of Slovan had been acquired by the London & British Columbia Goldfields, Limited. This property is being divided round among the other parent companies belonging to the same group of promoters. These various companies will probably combine forces in floating a company to acquire the mine, and by the time they have all made their profit there will be precious little left of the mine for the outside shareholder.

The most active part of the mining market has been the companies working in the Mount Lyell district of Tasmania. The great Mount Lyell attracts much attention, but the shares are too high for much active buying. Consequently attention is paid to the other companies which are not so far advanced—North Mount Lyell, South Mount Lyell, and the copper mines of Mount Lyell West. Of these the first named is most in favor, owing to the excellent prospects. The reports that I hear from this mine are astonishing as regards the extent and richness of the copper deposits, so no wonder there is a demand for the shares. However, the figures of quantity and quality of the ore are only estimates, and much depends on the judgment of the engineer and of Mr. Crotty, the promoter. Later on, no doubt, more exact information will come to hand.

A very strong section in the stock market is that of copper shares. Unfortunately this copper section is not a section of the market at all, but the stocks of various companies are dealt in in different parts of the market. For instance, the Rio Tinto and Cape Copper are on the foreign market, not the mining market at all, while Anaconda and Mount Lyell are relegated to the inconspicuous miscellaneous mining section. Rio Tintos have advanced strongly on French buying, and Cape Copper has risen to £4½, as compared with £2 a year ago. Anacondas have been quite free from excitement this week and no developments of any sort have occurred. The quotation stands at about £5½, and probably this will remain stationary for some time now.

Paris. Jan. 16.

(From Our Special Correspondent.)

Upon the whole the new year is opening well, and its first month is showing more promise than we had hoped for only a short time ago.

The metallurgical shares continue very strong. Few of the societies of this class have increased their dividends; but most of them have paid off debts, extended their works, or otherwise put themselves in stronger positions. The Russian group continues in much favor, though the price for rails or contracts for the government railroads has been reduced from 250 fr. to 170 fr. per ton. The latter rate, however, seems to afford a sufficient profit.

The Transvaal gold stocks are firmer and much more attention is being paid to them than has been the case for a year past. There has

been an attempt to excite interest here in the new deep level mines, but they are still regarded with some doubt.

Nickel still continues high and the shares are selling for 90 fr. more than a year ago. The demand for the metal in steel manufacture seems hardly enough to warrant this increase; and its use does not grow in other directions.

The copper stocks continue to hold up well. There has been an active movement in Boleo which has been again higher. Some effort was made to depress Cape Copper on the ground that its African mines are being exhausted; but the company has important reserves in its Newfoundland property.

A new stock on the market is the Societe Secretan d'Electro-Metallurgie, which is using the Secretan process for making tubes, plates and other forms of copper electrolytically. It meets with favor, and the shares are already quoted at 615 fr., a good premium.

The Societe Francaise des Charbonnages de Tonkin announces that its sales in 1897 reached a total of 143,151 metric tons of coal and 38,630 tons of briquettes, or 181,781 tons in all. This is an increase of 33,196 tons of coal and 25,372 tons of briquettes over 1896. The briquettes especially are finding favor as steam fuel.

We are still uncertain as to the new developments in the East, and do not see exactly what our part in the play is to be. It is something of a comedy, this assemblage of robbers in the Eastern seas—though perhaps the Chinese do not appreciate the humorous side. Azote.

MISCELLANEOUS DIVIDENDS.

Central Railroad of New Jersey, quarterly dividend of 1 per cent., payable February 1st.

Delaware & Hudson Canal Company, quarterly dividend of 1¼ per cent., payable March 15th.

National Lead Company, dividend of 1 per cent. on the common stock, payable February 15th.

Pennsylvania Coal Company, quarterly dividend of 1 per cent., payable February 1st.

MEETINGS.

Cannelton Coal Company of West Virginia, annual meeting at 115 Broadway, New York, on February 2d, at 12.30 p. m.

Hortense Gold Mining and Milling Company, annual meeting at the office, No. 247 Equitable Building, Denver, Colo., on February 1st, at 3 p. m.

Keystone Gold Mining Company, special stockholders' meeting, at the office, Keystone, S. Dak., on February 5th at 3 p. m., to ratify the action of the board of directors in granting to Philip M. Ranney an option to purchase all the company's property.

Mammoth Mining Company, annual meeting, at the office No. 310 Atlas Building, Salt Lake City, Utah, on February 1st, at 2 p. m.

Maryland Coal Company, annual meeting, at the office, No. 1 Broadway, New York City, on February 1st, at 11 a. m.

LATE NEWS.

Late dispatches from Quebec report that arrangements have been made by the Canadian Government for a steamboat and rail line to the Klondike gold region. The plan includes the construction of a line of railway from the head waters of the Stickeen River to the head waters of the Yukon River.

Seattle dispatches say that on January 27th, three crowded steamers sailed for Dyea and Skaguay, within a few hours of each other. Five hundred people left Seattle for the North, and from other Sound ports almost as many more are booked.

The festivities of the Golden Jubilee, which began in San Francisco on Monday, a day made a legal holiday, continued throughout the week. The city was decorated with flags and bunting, and with portraits of James Marshall, who picked up the first gold nugget in California in 1848. The city is crowded with visitors from all over the State. The culmination of the jubilee is the opening of the Mining Fair, where will be shown the mining products of every county in the State. This fair opens on Saturday.

BY TELEGRAPH.

(From Our Special Correspondent.)

Denver, Colo., January 27.—The fire which started a few days ago at the Hesperus coal mine, in La Plata County, Colorado, destroying the tramway, tippie and blacksmith shop, and then moving slowly against the draft into the mine, caused much anxiety and it was feared that the mine would be ruined. It is now, however, completely under control.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Anaconda Gold, and others with columns for location, par value, and dates from Jan 22 to Jan 28.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Alamo, Anaconda Gold, and others with columns for location, par value, and dates from Jan 21 to Jan 27.

Official quotations Boston Stock Exchange. Ex-dividend. Total sales, 46,906.

BALTIMORE, MD. Week ending Jan. 26.

Table of stock quotations for Baltimore, MD, listing companies like Atlantic Coal and others with columns for location, par value, and bid/ask prices.

Official quotation Baltimore Stock Exchange.

CLEVELAND, O.

Table of stock quotations for Cleveland, O, listing companies like Aurora and others with columns for par value, bid/ask, and dates.

From our special correspondent.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, and others with columns for par value, bid/ask, and dates.

Official quotations Colo. Springs Mining Stock Exchange. Sales: Listed stocks, 389,557; unlisted, 212,541; total, 602,097.

By Telegram.

Table of stock quotations received by telegram, listing companies like Alamo, Anaconda, and others with columns for par value, bid/ask, and dates.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Central of N.J., and others with columns for par value and dates.

Official quotations New York Stock Exchange, mining, 6,160 shares; other stocks 152,703 shares; Consolidated Stock and Petroleum Exchange, mining, 14,675 shares; Mining Exchange, 2,000,620 shares. Total shares sold, 2,174,158. Bid and ask quotations. Ex-dividend.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Choctaw pref, and others with columns for location, par value, and dates.

Official quotations Philadelphia Stock Exchange. Bid and ask quotations. Total sales, 55,832.

PITTSBURG, PA.

Table of stock quotations for Pittsburgh, Pa., listing companies like Allegheny, Carboniferous, and others with columns for location, par value, and bid/ask prices.

Official quotations Pittsburgh Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.:

Table of stock quotations for Denver, Colorado, listing various mining and industrial companies with their par values and prices for different dates from Jan. 18 to Jan. 24.

Official Quotations Denver Stock Exchange. Sales: Mines, 85,140 shares; prospects, 416,700 shares; grand total, 481,840 shares.

HELENA, MONT. Week ending Jan. 23.

Table of stock quotations for Helena, Montana, listing companies like Am. Dev. & M. Co., Bald Butte, and others with their par values and prices.

* Special Report of Samuel K. Davis. Total shares sold, 2,600.

SAN FRANCISCO, CAL.:

Table of stock quotations for San Francisco, California, listing various companies with their par values and prices for different dates from Jan. 21 to Jan. 27.

* Official telegraphic quotations, San Francisco Stock Exchange.

LOS ANGELES, CAL.:

Table of stock quotations for Los Angeles, California, listing various mining and industrial companies with their par values and prices for different dates from Jan. 11 to Jan. 16.

* Official quotations, Los Angeles Mining and Stock Exchange. * Bid and ask quotations. Total shares sold, 442,000.

SALT LAKE CITY, UTAH. Week ending Jan. 22.

Table of stock quotations for Salt Lake City, Utah, listing various companies with their par values and prices for different dates from Jan. 15 to Jan. 22.

* From Our Special Correspondent. † Utah companies. ‡ Mines in Vanderbilt, Cal. § Mines in Tuscarora, Nev.

ROSSLAND, BRITISH COLUMBIA. Jan. 19.

Table of stock quotations for Rossland, British Columbia, listing various companies with their par values and prices for different dates from Jan. 19 to Jan. 20.

* From Our Special Correspondent.

MEXICO. Week ending Jan. 18.

Table of stock quotations for Mexico, listing various companies with their par values and prices for different dates from Jan. 18 to Jan. 27.

Note.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares the total value not being named. Many newer companies have a nominal par value, usually \$50 or \$100. Prices are in Mexican dollars.

STOCK QUOTATIONS.

Main table containing stock quotations for LONDON, PARIS, and VALPARAISO, CHILE. Includes columns for company names, countries, products, capital, and prices.

DIVIDENDS table with columns: NAME OF COMPANY, Current dividends, Paid since Jan 1, 1898, Total to date, NAME OF COMPANY, Current dividends, Paid since Jan 1, 1898, Total to date.

ASSESSMENTS table with columns: NAME OF COMPANY, Location, No., Dlnq., Sale, Amt.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the "Engineering and Mining Journal" will confer a favor on the publishers if they will notify the "Journal" of any errors or omissions in the above table. * January dividend paid.

* Special Report of Jackson Bros. Values are in Chilean pesos or dollars. * Special Report of J. P. Blissett & Co. The prices quoted are in Shanghai taels.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. Includes entries for Adams, Alameda, Alaska, etc.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,330,000. | Dividends paid since consolidation. § Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. ¶ Previous to consolidation Bodie paid \$1,677,572, Bulwer paid \$190,000, and Mono \$12,500. †† Dividends have not been paid in several years. ††† Dividends have not been paid in several years. Note.—This table is corrected up to January 6. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

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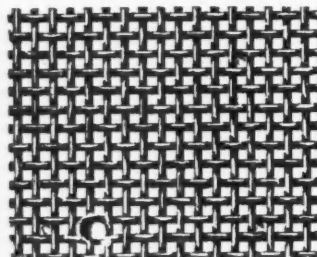
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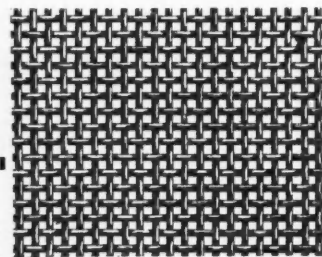


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 Burleigh Rock Drill Co., Fitchburg, Mass.
 Bullock, The, M. C. Mfg. Co., Chicago
 Clayton Air Compressor Works, N. Y.
 Colorado, The Iron Works Co., Denver
 Davis, The F. M. Iron Works Co., Denver
 Fraser & Chalmers, Chicago, Ill.
 Gates Iron Works, Chicago, Ill.
 Ingersoll-Sergeant Drill Co., N. Y.
 Laidlaw-Dunn-Gordon Co., N. Y.
 Mine & Smelter Supply Co., The, Denver
 Norwalk, The Iron Works Co., South Norwalk, Conn.
 Rand Drill Co., The, New York, N. Y.
 Sullivan Mach. Co., Chicago, Ill.
Amalgam Plates.
 Mine & Smelter Supply Co., The, Denver.
 Western Plating and Mfg. Co., Denver.
Anti-Friction Metals.
 Besly, C. H. & Co., Chicago, Ill.
 Chester Steel Castings Co., Philadelphia.
 Illinois Smelting and Refining Co., Chicago, Ill.
 Magnolia Metal Co., New York.
 Phosphor Bronze Sm. Co., Philadelphia.
Armor.
 Bethlehem Iron Co., So. Bethlehem, Pa.
Assayers' and Chemists' Supplies.
 Alsworth, W., Denver, Colo.
 Baker & Co., Newark, N. J.
 Baker & Adamson Chemical Co., Easton, Pa.
 Becker, Christian, New York.
 Bullock & Crenshaw, Philadelphia, Pa.
 Denver Fire Clay Co., Denver, Colo.
 Elmer & Amend, New York.
 Fair Drug and Assay Supply Co., Butte, Mont.
 Fuerst Bros. & Co., New York, N. Y.
 Hill, Henry, Chemical Co., St. Louis, Mo.
 McCandless Chemical Laboratory, Atlanta, Ga.
 Pennsylvania Salt Mfg. Co., Philadelphia.
 Roessler & Hasslacher Chemical Co., N. Y.
 Sargent, E. H. & Co., Chicago, Ill.
 Solvay, The, Process Co., Syracuse, N. Y.
 Standard, The, Fire Brick Co., Denver.
 Taylor, John & Co., San Francisco, Cal.
 Troemner, Henry, Philadelphia, Pa.
 Western, The, Chemical Co., Denver.
Attorneys, Corporations.
 Curtis, Smith, Rossland, B. C.
 Daly & Hamilton.
B.
Babbitt Metal.
 Besly, C. H., & Co., Chicago, Ill.
 Illinois Smelting and Refining Co., Chicago, Ill.
 Magnolia Metal Co., New York.
Bankers and Brokers.
 Bannison, W., & Co., Roseland, B. C.
 Breitung, E. N., Marquette, Mich.
 Dabney & Parker, Roseland, B. C.
 Dignowity, C. L., & Co., Salt Lake City, Idaho & Harman, New York, N. Y.
 Hedburg, E., Joplin, Mo.
 Kennedy Bros. & Purgold, Roseland, B. C.
 Peery & Lowe, Salt Lake City, Utah.
 Plewman, R., Roseland, B. C.
 State, The, Trust Co., New York, N. Y.
 Timmis & Clapp, Chicago, Ill.
 Wynn, Johnson & Co., Roseland, B. C.
Bearing Metal.
 Besly, C. H. & Co., Chicago, Ill.
 Chester Steel Castings Co., Philadelphia.
 Illinois Smelting and Refining Co., Chicago, Ill.
 Magnolia Metal Co., New York.
Belting.
 Hendrie & Bolthoff Mfg. Co., Denver.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Link-Belt Machinery Co., Chicago, Ill.
 New York Belting and Packing Co., N. Y.
Belt Lacing.
 Bristol, The, Co., Waterbury, Conn.
Blasting Caps.
 Metallic, The, Cap Mfg. Co., New York.
Blasting Batteries, Caps and Fuse.
 Lau, J. H., & Co., New York, N. Y.
 Macbeth, J., & Co., New York, N. Y.
 Metallic, The, Cap Mfg. Co., New York.
Boilers.
 Allis, The E. P. Co., Milwaukee, Wis.
 Billen, C. E., & Co., Chicago, Ill.
 Bacon, E. C., N. Y.
 Colorado, The, Iron Works Co., Denver.
 Davis, F. M., Iron Works Co., Denver.
 Denver, The, Eng. Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Lambert Hoisting Engine Co., Newark, N. J.
 Follock, W. B., & Co., Youngstown, O.
 Risdon Iron Works, San Francisco, Cal.
 Stilwell-Bierce & Smith-Valle Co., The, Dayton, O.
Boiler Fronts.
 Vulcan Iron Works Co., Toledo, O.
Brass Goods.
 Besly, Chas. H., & Co., Chicago, Ill.
 Eddy Valve Co., Waterford, N. Y.
 Detroit Lubricator Co., Detroit, Mich.
 Lunkenheimer Co., Cincinnati, O.
 Powell Wm. Co., Cincinnati, O.
Brattice Cloth.
 Besly, C. H., & Co., Chicago, Ill.
Brick Machinery.
 Freese, E. M., & Co., Gallion, O.
 Harrington & King Perf. Co., Chicago.
Bridges.
 Berlin Iron Bridge Co., East Berlin, Conn.
 Gillette-Herzog Mfg. Co., Minneapolis, Minn.
Buckets.
 Link-Belt Machinery Co., Chicago, Ill.
 Brown Hoisting and Conveying Machine Co., Cleveland, O.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Hunt, C. W., & Co., New York.

Carbons.
 Lexow, T., New York.
C.
Cars (Dump and Mine).
 Allis, The, E. P. Co., Milwaukee, Wis.
 Colorado, The, Iron Works Co., Denver.
 Davis, F. M., Iron Works Co., Denver.
 Denver, The, Eng. Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Gillette-Herzog Mfg. Co., Minneapolis.
 Hendrie & Bolthoff Mfg. Co., Denver.
 Krupp, Fried, Magdeburg-Buckau, Germany.
 Mine and Smelter Supply Co., Denver.
Castings.
 Bethlehem Iron Co., So. Bethlehem, Pa.
 Chester Steel Castings Co., Philadelphia.
 Chrome Steel Works, Brooklyn, N. Y.
 Vulcan Iron Works, Toledo, O.
Chemical Engineers.
 Dearborn Drug Co., Chicago.
 Dunbar & Son, R., Buffalo, N. Y.
Chemicals.
 Baker & Adamson Chemical Co., Easton, Pa.
 Bullock & Crenshaw, Philadelphia, Pa.
 Elmer & Amend, New York.
 Fair Drug and Assay Supply Co., Butte, Mont.
 Fuerst Bros. & Co., New York.
 Hill, Henry, Chemical Co., St. Louis, Mo.
 McCandless Chemical Laboratory, Atlanta, Ga.
 Pennsylvania Salt Mfg. Co., Phila., Pa.
 Roessler & Hasslacher Chemical Co., N. Y.
 Sargent, E. H. & Co., Chicago, Ill.
 Solvay, The, Process Co., Syracuse, N. Y.
 Western Chemical Co., Denver.
Chemical Plumbers.
 Vollmer & Beaton, Roxbury, Mass.
Coal.
 Berwind-White Coal Mfg. Co., New York.
 Gastner & Curran, Philadelphia, Pa.
 Consolidation Coal Co., Baltimore, Md.
 Davis Coal and Coke Co., New York.
 Maryland Coal Co., New York, N. Y.
 Potts & Co., F. A., New York, N. Y.
 Stickney, Conyngham & Co., New York.
 Ward & Olyphant, New York, N. Y.
Coal Cutters.
 Ingersoll-Sergeant Drill Co., New York.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Link-Belt Machinery Co., Chicago, Ill.
Coal Washing Machinery.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Link-Belt Machinery Co., Chicago, Ill.
Cocks.
 Besly, C. H., & Co., Chicago, Ill.
 Lunkenheimer, The, Co., Cincinnati, O.
 Powell Wm. Co., Cincinnati, O.
Compressed Air Shop Tools.
 Clayton Air Compressor Works, N. Y.
Concentrators, Crushers, Pulverizers, Separators, etc.
 Allis Co., E. P., The, Milwaukee, Wis.
 Bacon, E. C., N. Y.
 Blake, Theo. A., New Haven, Conn.
 Bradley Pulverizer Co., Boston, Mass.
 Colorado Iron Works Co., Denver, Colo.
 Davis, F. M., Iron Works Co., Denver.
 Denver Eng. Works Co., The, Denver.
 Fraser & Chalmers, Chicago, Ill.
 Gates Iron Works Co., Chicago, Ill.
 Hendrie & Bolthoff Mfg. Co., Denver.
 Krom, S. R., Jersey City, N. J.
 Krupp, Fried, Magdeburg-Buckau, Germany.
 Link-Belt Machinery Co., Chicago, Ill.
 McCully, R., Philadelphia, Pa.
 Mecklinger Iron Works, Charlotte, N. C.
 Montgomery, J. H., Machinery Co., Denver.
 Raymond Bros. Impact Pulverizer Co., Chicago, Ill.
 Stedman's Foundry and Machinery Works, Aurora, Ind.
 Sturtevant Mill Co., Boston, Mass.
 Surman, J. E., & Co., New York, N. Y.
 Walburn-Swenson Co., Chicago, Ill.
Conveying Belts.
 Lidgerwood Mfg. Co., New York, N. Y.
 Link-Belt Machinery Co., Chicago, Ill.
 Robins Conveying Belt Co., New York.
Conveying Machinery.
 Bacon, E. C., N. Y.
 Brown Hoisting and Conveying Machine Co., Cleveland, O.
 California Wire Works, San Francisco, Cal.
 Colorado, The, Iron Works Co., Denver.
 Cooper, Hewitt & Co., New York, N. Y.
 Fraser & Chalmers, Chicago, Ill.
 Hunt, C. W., & Co., New York, N. Y.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Lidgerwood Mfg. Co., New York, N. Y.
 Link-Belt Machinery Co., New York.
 Nelsonville Foundry and Machinery Co., Nelsonville, O.
 Ropeways Syndicate, Ltd., London, Eng.
 Robins Conveying Belt Co., New York.
 Trenton Iron Co., Trenton, N. J.
 Vulcan Iron Works, San Francisco, Cal.
 Vulcan Iron Works Co., Toledo, O.
Copper Dealers and Producers.
 American Metal Co., The, New York.
 Arizona Copper Co., Clifton, Ariz.
 Atlantic Mining Co., Atlantic Mine P. O., Mich.
 Balbach Smelting and Refining Co., Newark, N. J.
 Baltimore Copper Works, Baltimore, Md.
 Bath, Henry & Son, London, Eng.
 Bridgeport Copper Co., Bridgeport, Conn.
 Canadian Copper Co., The, Cleveland, O.
 Copper Queen Con. Mfg. Co. of Arizona, New York, N. Y.
 Detroit Copper Mfg. Co. of Arizona, Morenci, Ariz.

Elliott's Metal Co., Burry Port, S. W.
 James & Shakespear, London, Eng.
 Lambert's Wharfage Co., Swansea, Eng.
 Lewisohn Bros., New York, N. Y.
 Mountain, The, Copper Co., New York.
 Orford Copper Co., The, New York.
 Pass, C. & Son, Bristol, Eng.
 Pennsylvania Salt Mfg. Co., Philadelphia.
 Phelps, Dodge & Co., New York, N. Y.
 Saunders, Fielding & Bond, New York.
 Vivian, Younger & Bond, London, E. C.
Crucibles, Graphite, Etc.
 Baker & Co., Newark, N. J.
 Denver, The, Fire Clay Co., Denver.
 Dixon, Joseph, Crucible Co., Jersey City, N. J.
Cyanide.
 Fuerst Bros. & Co., New York, N. Y.
 Roessler & Hasslacher Chemical Co.
 Williams Mfg. Co., Kalamazoo, Mich.
D.
Diamonds.
 Lexow, Theo., New York, N. Y.
Diamond Drills.
 American Diamond Rock Drill Co.
 Bullock, The, M. C., Mfg. Co., Chicago.
 Lexow, Theo., New York, N. Y.
 Sullivan Machinery Co., Chicago, Ill.
 Yawger, C. W., N. Y.
Drawing Materials.
 Altener, Theo., & Sons, Philadelphia.
 Besly, C. H., & Co., Chicago, Ill.
 Bull & Berger, Boston, Mass.
 Fauth & Co., Washington, D. C.
 Gurley, W. & L. E., Troy, N. Y.
 Keuffel & Esser Co., New York, N. Y.
 Lietz, The, A. Co., San Francisco, Cal.
 Mahn & Co., St. Louis, Mo.
 Queen & Co., Philadelphia.
 Saegmuller, G. N., Washington, D. C.
 Wittstock, P. & R., Berlin, Germany.
Dredging Machinery.
 Bucyrus, The, Co., So. Milwaukee, Wis.
 Jeffrey Mfg. Co., Columbus, O.
 Lambert Hoisting Engine Co., Newark.
 Marion Steam Shovel Co., Marion, O.
 Olsen, C. H., Gold Dredge Co., Tacoma, Wash.
 Risdon Iron Works, San Francisco, Cal.
 Vulcan Iron Co., Toledo, O.
Drills (Rock).
 American Diamond Rock Drill Co., N. Y.
 Allis, The, E. P. Co., Milwaukee, Wis.
 Bullock, The, M. C., Mfg. Co., Chicago.
 Burleigh Rock Drill Co., Fitchburg, Mass.
 Fraser & Chalmers, Chicago, Ill.
 Ingersoll-Sergeant Rock Drill Co., N. Y.
 Rand Drill Co., New York, N. Y.
 Sullivan Machinery Co., Chicago, Ill.
 Yawger, C. W., N. Y.
Dryers.
 Brown, H. F., Chicago, Ill.
 Cummer, F. D., & Son Co., Cleveland.
 Denver, The, Eng. Works Co., Denver.
 Dunbar, R., & Son, Buffalo, N. Y.
Dump Cars.
 Colorado, The, Iron Works Co., Denver.
 Davis, F. M., Iron Works Co., Denver.
 Denver, The, Eng. Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Gillette & Herzog, Minneapolis, Minn.
 Hendrie & Bolthoff Mfg. Co., Denver.
 Hunt, C. W., Co., New York, N. Y.
E.
Educational Institutions.
 Columbia University, New York, N. Y.
 Columbian University, Washington, D. C.
 Chicago School of Assaying, Chicago, Ill.
 International, The, Correspondence School, Scranton, Pa.
 Lehigh University, So. Bethlehem, Pa.
 Massachusetts Institute of Technology, Boston, Mass.
 Michigan College of Mines, Houghton, Mountain Summer, N. Y.
Electrical Batteries.
 Macbeth, James & Co., New York, N. Y.
Electrical Machinery Supplies.
 Besly, C. H., Co., Chicago, Ill.
 Chicago Edison Co., Chicago, Ill.
 General Electric Co., Schenectady, N. Y.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Link-Belt Machinery Co., Chicago, Ill.
 Okonite, The, Co., New York, N. Y.
 Westinghouse Electric Co., Pittsburg.
 Weston Electrical Instrument Co., Newark, N. J.
Elevators, Conveyors.
 Bacon, E. C., N. Y.
 Brown Hoisting and Conveying Machine Co., Cleveland, O.
 California Wire Works, San Francisco, Cal.
 Colorado, The, Iron Works Co., Denver.
 Cooper, Hewitt & Co., New York, N. Y.
 Davis, F. M., Iron Works Co., Denver.
 Denver, The, Eng. Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Hunt, C. W., Co., New York, N. Y.
 Jeffrey, The, Mfg. Co., Columbus, O.
 Lambert Hoisting Engine Co., Newark, N. J.
 Link-Belt Machinery Co., Chicago, Ill.
 Montgomery, J. H., Machinery Co., Denver, Colo.
 Nelsonville Foundry and Machinery Co., Nelsonville, O.
 Vulcan Iron Works, San Francisco, Cal.
 Vulcan Iron Works, Toledo, O.
Emery and Buhr Mills.
 Sturtevant Mill Co., Boston, Mass.
Emery Wheels.
 Besly, C. H., Co., Chicago, Ill.
 New York Belting and Packing Co.
Engineers and Chemists.
 See pages 4, 5 and 6.

Engineers' Instruments.
 Altener, Theo., & Sons, Philadelphia.
 Brandis, F. K., Sons & Co., Brooklyn.
 Bull & Berger, Boston, Mass.
 Bullock & Crenshaw, Philadelphia, Pa.
 Fauth & Co., Washington, D. C.
 Gurley, W. & L. E., Troy, N. Y.
 Keuffel & Esser Co., New York.
 Lietz, The, A. Co., San Francisco, Cal.
 Mahn & Co., St. Louis, Mo.
 Queen & Co., Philadelphia.
 Saegmuller, G. N., Washington, D. C.
 Wittstock, P. & R., Berlin, Germany.
Engines.
 Bacon, E. C., N. Y.
 Jeffrey Mfg. Co., Columbus, O.
 Bullock, The, M. C., Mfg. Co., Chicago.
 Colorado, The, Iron Works Co., Denver.
 Davis, F. M., Iron Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Hercules Gas Engine Works, San Francisco, Cal.
 Lambert Hoisting Engine Co., Newark.
 Lidgerwood Mfg. Co., New York, N. Y.
 Risdon Iron Works, San Francisco, Cal.
 Stilwell-Bierce & Smith-Valle Co., The, Dayton, O.
 Tod, W., & Co., Youngstown, O.
 Union Gas Engine Co., San Francisco.
 Union Iron Works, San Francisco, Cal.
 Weber Gas and Gasoline Engine Co., Kansas City, Mo.
 Webster, Camp & Lane Machine Co., Akron, O.
Excavators—See Steam Shovels.
 Bucyrus, The, Co., So. Milwaukee, Wis.
 Jeffrey Mfg. Co., Columbus, O.
 Marion, The Steam Shovel Co., Marion, O.
 Olsen, C. H., Gold Dredge Co., Tacoma, Wash.
 Risdon Iron Works, San Francisco, Cal.
 Vulcan Iron Works, San Francisco, Cal.
 Vulcan Iron Works Co., Toledo, O.
Explosives.
 Atlantic, The, Dynamite Company of New Jersey, New York, N. Y.
 Lau, H., & Co., New York, N. Y.
 Macbeth, J., & Co., New York, N. Y.
 Metallic, The, Cap Mfg. Co., New York.
F.
Fire Brick and Clay.
 Chur, Walter, New York, N. Y.
 Denver, The, Fire Clay Co., Denver.
Fluorspar.
 Fuerst Bros. & Co., New York, N. Y.
Forgings.
 Bethlehem Iron Co., So. Bethlehem, Pa.
Fuel Economizers.
 Detroit Lubricating Co., Detroit, Mich.
 Fuel Economist Co., Matteawan, N. Y.
Furnaces.
 Allis, The E. P. Co., Milwaukee, Wis.
 Billen, C. E., & Co., Chicago, Ill.
 Brown, H. F., Chicago, Ill.
 Denver, The, Fire Clay Co., Denver.
 Hoskins, W., Chicago, Ill.
 Moore, S. L., Son's Co., Elizabeth, N. J.
 Pollock, W. B., & Co., Youngstown, O.
 Sargent, E. H., & Co., Chicago, Ill.
G.
Gas Engines.
 Hercules Gas Engine Works, San Francisco, Cal.
 Union Gas Engine Co., San Francisco.
 Weber Gas and Gasoline Engine Co., Kansas City, Mo.
Gauges, Recording, Etc.
 Bristol, The, Co., Waterbury, Conn.
Gearing.
 Besly, C. H., & Co., Chicago, Ill.
 Chester Steel Casting Co., Philadelphia.
 Denver, The, Eng. Works Co., Denver.
 Fraser & Chalmers, Chicago, Ill.
 Link-Belt Machinery Co., Chicago, Ill.
Grease, Graphite, Etc.
 Besly, C. H., & Co., Chicago, Ill.
 Dixon, J., Crucible Co., Jersey City, N. J.
Grease Cups.
 Besly & Co., C. H., Chicago, Ill.
 Detroit Lubricator Co., Detroit, Mich.
 Lunkenheimer Co., Cincinnati, O.
 Powell Wm. Co., Cincinnati, O.
Grinding Mill Machinery.
 Sturtevant Mill Co., Boston, Mass.
H.
Hoisting Machinery.
 Bacon, E. C., New York, N. Y.
 Bullock, The, M. C., Mfg. Co., Chicago.
 Colorado, The, Iron Works Co., Denver.
 Davis, F. M., Iron Works Co., Denver.
 Denver Engineering Works Co., Denver.
 General Electric Co., Schenectady, N. Y.
 Hendrie & Bolthoff Mfg. Co., Denver.
 Hercules Gas Engine Works, San Francisco, Cal.
 Jeffrey Mfg. Co., Columbus, O.
 Lidgerwood Mfg. Co., New York, N. Y.
 Mine & Smelter Supply Co., Denver, Colo.
 Nelsonville Foundry & Mach. Co., Nelsonville, O.
 Stearns-Roger Mfg. Co., The, Denver.
 Union Gas Engine Co., San Francisco.
 Union Iron Works, San Francisco, Cal.
 Vulcan Iron Works, Toledo, O.
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.
 Westinghouse Electric & Mfg. Co., Pittsburg, Pa.
Hose Rubber, Etc.
 New York Belting and Packing Co., N. Y.

POSITIONS VACANT**Free Advertising.**

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column **WITHOUT CHARGE**, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the **ENGINEERING AND MINING JOURNAL**.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1565 WANTED—A MAN TO MAKE plans and estimates on the cost of a five-ton alum plant in the South. State qualifications, references, etc. Address **ALUM, ENGINEERING AND MINING JOURNAL**.

1567 WANTED—A THOROUGHLY COMPETENT, RELIABLE FOREMAN for lead blast furnace. Give full particulars as to age, experience, reference and salary expected. Address **FURNACE, ENGINEERING AND MINING JOURNAL**.

1568 WANTED—PLACER MINE FOREMAN for Montana. Property already opened. Good position for young man of some experience, and ability to handle men. Address **PLACER FOREMAN, ENGINEERING AND MINING JOURNAL**.

1570 WANTED—SALESMAN, TECHNICAL graduate, as expert on hoisting machinery, rock drills, compressors and exploring outfits. Must have A1 references as to character, experience, etc. Address, with list of references, Box 20, **ENGINEERING AND MINING JOURNAL**.

1571 WANTED—A YOUNG, ENERGETIC and practical mining engineer (with some experience and good credentials) by a man about to invest in legitimate gold mining enterprise. A liberal arrangement might be made with a satisfactory man. Address **ENERGETIC, ENGINEERING AND MINING JOURNAL**.

SITUATIONS WANTED.

Advertisements for **SITUATIONS WANTED** will be charged only 10 cents a line.

EXPERIENCED SAMPLER, ASSAYER AND analyst desires position with mining, milling or smelting company; excellent references. Address **SAMPLER, ENGINEERING AND MINING JOURNAL**, No. 18,173, Feb. 12.

SITUATION WANTED AS MINE FOREMAN by a practical miner; 15 years manager; gold, copper, iron and other metals. Best of references. Address **MINE FOREMAN, ENGINEERING AND MINING JOURNAL**, No. 18,172, Feb. 6.

A COLLIERY MANAGER AND GRADUATE E. M. in charge of large plant desires change; 15 years' practical experience, energetic and progressive, up to date and successful in getting good results. Address **COAL, ENGINEERING AND MINING JOURNAL**, No. 18,176, April 2.

WANTED—POSITION AS ACID MAKER and lead burner; 25 years' experience in the manufacture of sulphuric acid. References if required. Address **SULPHURIC, ENGINEERING AND MINING JOURNAL**, No. 18,177, Feb. 19.

POSITION WANTED—HAVE SIX YEARS' experience lead refining, two in zinc, some in engineering, assaying and chemistry. Make offer. Address **ANACONDA, ENGINEERING AND MINING JOURNAL**, No. 18,179, Feb. 5.

A YOUNG MAN (29) THERMICAL GRADUATE, with a thorough knowledge of the cyanide process, lately in charge of the cyanide department of large mill, desires a position. Can also do assaying, and have some knowledge of machinery and surveying. Excellent references. Address **K. C. N., ENGINEERING AND MINING JOURNAL**, No. 18,180, Feb. 5.

A N EXPERIENCED MINING ENGINEER and metallurgist desires a position with a mining or metallurgical company. Will go anywhere. Best of references. Address **M. E. M., ENGINEERING AND MINING JOURNAL**, No. 18,168, Feb. 5.

MINING ENGINEER, AMERICAN, AGE 31, desires employment as manager with mining company, or other suitable engagement. Technical education. Experience in America and abroad, embracing organization and management of mining operations, examinations and reports, general engineering and metallurgical work. Familiar with mine and general accounts. References. Address **KAZBEC, ENGINEERING AND MINING JOURNAL**, No. 18,169, Feb. 5.

MILL SUPERINTENDENT, EXPERT MILL-MAN. Thoroughly competent to erect or assume charge of amalgamation, chlorination or concentration plant. Treatment of refractory ores by the cyanide process a specialty. Desires position in Mexico or South America. Numerous references, including present employers. Address **CYANIDE, ENGINEERING AND MINING JOURNAL**, No. 18,170, Feb. 5.

A BLACKSMITH, FIRST-CLASS IN ALL kinds of mine and mill work, from diamond drill setting to the heaviest or most complicated forgings, desires a permanent situation in a healthy locality, where he can have educational advantages for his children. Highest recommendations from employers. Refers to the **ENGINEERING AND MINING JOURNAL**. Address **BLACKSMITH, ENGINEERING AND MINING JOURNAL**.

METALLURGIST, 10 YEARS' PRACTICAL experience with gold, silver, lead and copper, now superintendent of large smelting works, desires to make a change. Will accept position of superintendent or manager under contract in any part of the world. Address **METALLURGIST, ENGINEERING AND MINING JOURNAL**, No. 18,174, Feb. 12.

CONTRACTS OPEN.

WATER AND LIGHT PLANT.—Sealed proposals will be received by the Mayor and Council of the City of Gallatin, at the office of the City Clerk, in the City of Gallatin, Mo., until 1 p. m., February 10th, 1898, for the pumping machinery, boilers, and all fittings and trimmings for the engine, dynamo, exciter, switchboard and all apparatus and instruments, for the poles, wire, cross arms, pins, insulators and supplies for the lamps and equipment, for the cast-iron water pipe and special castings, lead and jute packing, for the stone, brick, cement, lime, sand and lumber for the cornice, cresting, ladder and platform eye beams holding down bolts, and for all materials for the water and light station pumping plant, water tower, pipe line and electric light plant, free on board cars, Gallatin, Mo., or delivered on the ground, and for any and all parts of the work in divisions and in detail according to "Form of proposals" and specifications (which may be had on application) and maps, plans and drawings, which may be seen at the office of the City Clerk, in Gallatin, or at the office of George Cadogan Morgan, Engineer, 1012 New York Life Building, Chicago. All proposals must be made out on "Form of proposals," sealed and addressed to the Hon. I. Mann, Mayor, and Council, care Mr. H. Y. Tarwater, City Clerk, and marked "Proposals for water and light plant," or any division or part bid upon, and must be delivered to the Clerk on or before the time stated above. A certified (clearing house) check for 10 per cent. of the amount bid on each detail or division, or for the entire plant, made payable to the City Treasurer of Gallatin, Mo., must accompany each proposal, which shall be considered liquidated damages for breach of agreement if the requirements in the way of contract and bond shall not be complied with, within ten days. The Mayor and Council of Gallatin reserve the right to reject any and all proposals.

JETTIES.—Sealed proposals for furnishing the materials and constructing jetties and shore protection in Edgewater Park, will be received by the Board of Park Commissioners of Cleveland, Ohio, until 12 m. of Wednesday, February 9th, 1898. Plans, specifications and information regarding work, materials and supplies may be obtained at the office of C. W. PRATT, JR., chief engineer of said board, 719 Hickox Bldg., No. 185 Euclid avenue, Cleveland, Ohio.

WATER-WORKS.—Sealed proposals will be received by the President of the Water-Works Trustees, Monroeville, Ohio, up to 12 o'clock noon, standard time, January 26th, 1898, for furnishing materials and constructing a system of water-works. Each bid must contain a certified check, or its equivalent, made payable to said President, in a sum equal to at least 5 per cent. of the amount bid. Plans may be seen, specifications and blank form of proposals procured at the office of said board or at the office of Paul Voorhees, Engineer, Room 1,210 Guaranty Building, Buffalo, N. Y. The right is reserved to reject any or all bids.

WATER PIPE.—Sealed proposals for "Laying Cast Iron Water Pipe and Appurtenances" will be received by the Board of Water Commissioners at Town Hall, Westfield, Mass., until 12 o'clock noon, February 23d, 1898, and at that time will be publicly opened and read. Each bid must be accompanied by a certified check for one thousand dollars (\$1,000). Plans can be seen and blank forms of proposals and specifications obtained at the office of Town Engineer. The Water Commissioners reserve the right to reject any and all bids, or to accept any bid should they deem it for the interests of the town of Westfield so to do.

STREET LIGHTING.—Binghamton, N. Y.—Sealed proposals will be received by the City of Binghamton, N. Y., up to February 10th, 1898, for lighting the city with 175, or more, naphtha lamps every night in the year from dusk until daylight, the city to furnish and set lamp posts, the contractor to furnish lamps, supplies, and care for same. Bids to be for one, two and three-year contract and to name price for ordinary naphtha burner and Welsbach burner. Contractor shall guarantee ordinary burner to furnish light of 25 c. p.; Welsbach burner, 75 c. p. All proposals shall be directed to Burr W. Mosher, City Clerk, and shall be marked "Proposals for Lighting." The city reserves the right to reject any or all bids. The city also reserves the right, in case it establishes a municipal lighting plant, to terminate the naphtha-lighting contract on 60 days' notice. **BURR W. MOSHER, City Clerk.**

DREDGING.—U. S. Engineer Office, Mobile, Ala.—Proposals for construction of shore protection at Fort Morgan, Mobile Point, Ala., and for hire of dredging plant for Mobile River and Bay, Ala., will be received until 12 m. February 15th, 1898, and then opened. Information furnished on application to **WM. T. ROSSELL, Major, Engrs.**

PUMPING ENGINE.—Sealed proposals for an eight million gallon Pumping Engine will be received by the Commissioners of Water Works, in the city of Erie, Pennsylvania, until 3 o'clock, p. m., Wednesday, February 23d, 1898. Specifications can be obtained from **WILLIAM HIMROD, Secretary.**

PUMP.—Bids will be received at once by the Water Commission of the city of DeKalb, Ill., for sinking a well which will be 15 inches in diameter for 200 ft. and 7 inches for 600 or 800 ft. more. Surface of water will be about 70 ft. from the surface of the ground and when pumping 400 gallons per minute it will probably sink to about 190 ft. from the surface. We want a pump which will get the largest quantity of water with the greatest economy of operation.

ELECTRIC PLANT.—The board of inspectors of the Western Penitentiary of Pennsylvania will receive sealed proposals until 2 o'clock p. m., Thursday, February 17th, 1898, for furnishing material for the erection of an electric plant. Specifications can be seen at any time at the prison. The board reserves the right to reject any or all bids.

PIPE.—Sealed proposals, addressed to Frank T. Dodge, Clerk of the Water Committee, will be received at the office of the City Water-Works, Portland, Oregon, until 3 p. m., Tuesday, March 15th, 1898, for furnishing and laying a submerged pipe of steel, 24 inches in diameter and 2,100 feet in length, across the Willamette River at Portland, Oregon. Plans may be seen and specifications and forms of proposals obtained at this office. Proposals for said work must be accompanied by a certified check for five per cent. of the amount of the proposal, payable "To the order of the Clerk of the Water Committee of the City of Portland, Oregon," as liquidated damages in case that the bidder, if awarded the contract, should fail or neglect to execute the contract and furnish the required bonds within five days after notice of the award. The right to reject any or all bids, or to call for new proposals, is expressly reserved by the Water Committee. By order of the Water Committee of the City of Portland, Oregon.

STEEL TOWERS AND END SPANS.—Proposals will be received by the Commissioners of the New East River Bridge, at their office, at No. 49 Chambers street, in the city of New York, at 2 o'clock in the afternoon of Monday, February 28th, 1898, endorsed "Proposal for Construction of Steel Towers and End Spans of the New East River Bridge," for furnishing the materials for and constructing the steel towers and the end spans of the New East River Bridge, in accordance with the proposed form of contract and the drawings and specifications therefor. All bids shall be inclosed in sealed envelopes, addressed to Lewis Nixon, President of the Board of Commissioners of the New East River Bridge, and presented to him on that day and at that hour at said office, and such bids will be opened in public meeting by the said Commissioners on that day at 2 o'clock. Copies of the specifications and the general drawings of the work, with the proposed form of bid and contract, may be seen, and further information will be given, at the office of the Chief Engineer, No. 84 Broadway, Borough of Brooklyn, New York City, on and after February 5th, 1898. Proposals will be made upon a form provided therefor, and only those proposals will be considered which are complete, in proper form, comply with the requirements herein stated, and are offered by parties of known reputation, experience and responsibility. Each bidder will be required to deposit, with his proposal in the office of the Commissioners, a certified check for \$10,000, payable to the order of Julian D. Fairchild, as Treasurer of the New East River Bridge Commissioners, as security for the execution by him of the contract and the giving of the required bond, if his bid is accepted, within two weeks after notice of the acceptance of his bid. The contractor will be required to give a bond in the penal sum of \$350,000, in the form annexed to the proposed form of contract, with two approved sureties or an approved surety company, conditioned for the prompt and faithful performance of the contract and its covenants and the work thereunder. The Commissioners reserve the right to reject any and all of the proposals offered, and to accept any proposal offered.

STEEL BRIDGE.—Sealed proposals will be received until 12 o'clock noon, February 14th, 1898, by the Committee on Streets and Bridges of the City of Woonsocket, R. I., for building a Steel Bridge on Wood Avenue, over the Peters River. Each proposal must be accompanied by a certified check for five hundred (\$500) dollars, drawn to the order of the City of Woonsocket, R. I., as surety that a contract will be entered into. Plans and specifications can be seen at the office of the City Engineer. The right is reserved to reject any or all bids, as the interests of the City may appear. Bids will be received until 12 o'clock noon, February 14th, 1898, addressed to Jonathan Battye, Chairman of Committee on Streets and Bridges, Woonsocket, R. I., and marked "Proposal."

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MEETINGS.

THE ANNUAL MEETING OF THE STOCK-HOLDERS OF THE COLORADO SMELTING COMPANY.

for the election of directors, will be held at the company's office, at Pueblo, Colo., on Monday, February 14th, 1898, at 12 o'clock noon. H. SUHR, Secretary. New York, Jan. 11, 1898.

UNITED STATES CONSULATE.

The Government of the United States has established a Consular Agency for the entire Kootenay District, at Rossland, B. C. All official and other business will receive prompt attention.

FREDRICH B. BLOCHBERGER, LL.B., Consular Agent.

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DIVIDENDS.

ISABELLA GOLD MINING COMPANY, COLORADO SPRINGS, COLO., June 10, 1897. DIVIDEND NO. 11.

A dividend of ONE-HALF CENT PER SHARE (\$1.250) has been declared, payable June 25th, 1897, to stockholders of record June 15th, 1897. The stock transfer books will be closed June 15th, 1897, at 3 o'clock p. m., and will be reopened on the morning of June 26th, 1897.

PERCY HAGERMAN, Vice-President and Treasurer.

JAMISON MINING COMPANY OF CALIFORNIA.

ROOMS 50 AND 54, 121 SUTTER STREET, SAN FRANCISCO, Cal., January 25, 1898. DIVIDEND NO. 1.

At their meeting of January 25th, 1898, it was resolved by the Board of Directors of the Jamison Mining Company to pay to the stockholders of the company from the surplus funds in the treasury a dividend of Nineteen Thousand Five Hundred Dollars (\$19,500), being Five Cents (5 cents) per share on the capital stock of the company. The dividend will be payable at the office of the company on the fifteenth (15th) day of February, 1898, to all stockholders of record on the fifth (5th) day of February, 1898.

Transfer books will be closed at the close of business on the 5th of February, and reopened on the morning of February 16th, 1898. SAM W. CHEYNEY, Secretary.

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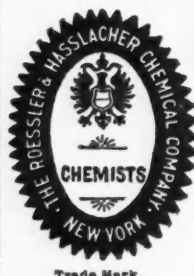
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