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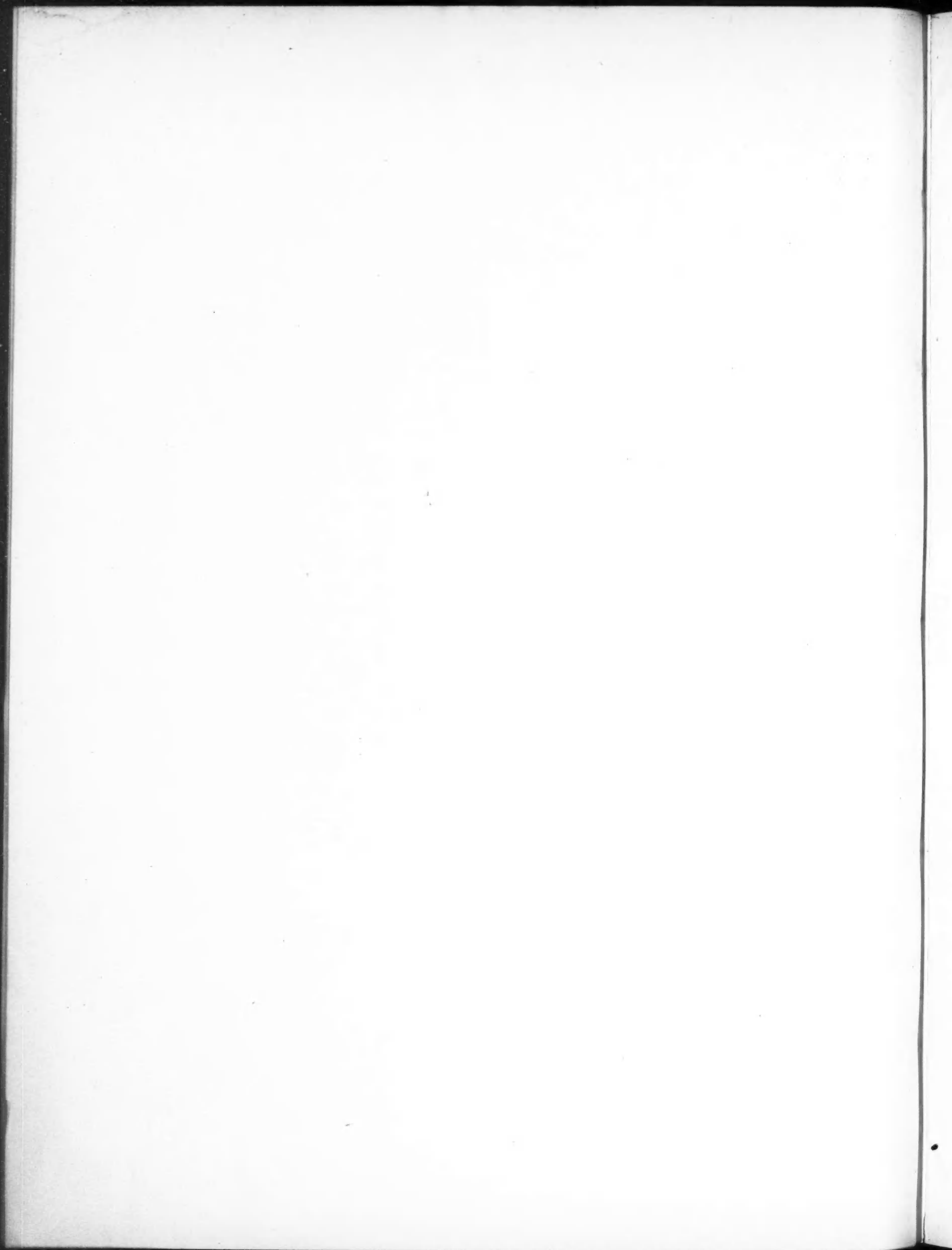
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 Denver Eng. Wks. Co.  
 Denver Eng. Wks. Co.  
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 Ellison, Wm., & Son.  
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 (See Machinery.)

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 Crandall & Huff.  
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 Dodge Mining Machinery Co.  
 Gates Iron Works.  
 Park's & Wilkinson.  
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 Stieren, William E. (See Machinery.)

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 American Dev. & Mfg. Co.  
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 Eureka Co.  
 Hinkle  
 Canadian Copper Co.

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 Truax Mfg. Co.

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 Cummer, F. D. & Sons Co.  
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 Montana Ore Purchasing Co.  
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 Jenkins Bros.  
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 State Ore Sampling Co.

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 Fraser & Chalmers.  
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 Perseide of Soda.  
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 Ingersoll-Sergeant Drill Co.

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 Atlantic Dynamite Co.  
 Atlas Powder Co.  
 Ingersoll-Sergeant Drill Co.

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 Connorsville Blower Co.

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 Denver Republican.  
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 El Minero Mexicano.  
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 Blake, Geo. F. Mfg. Co.  
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 Farm Works.  
 Denver Eng. Wks. Co.  
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 Ransell Drill Co.  
 Sullivan Machinery Co.

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 Eureka Co.

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 Fraser & Chalmers.

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**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.

**1456 WANTED—A DRAUGHTSMAN WHO** has had experience in designing and building blast furnaces. State qualifications, references, etc. Address P. Z., ENGINEERING AND MINING JOURNAL.

**1459 WANTED—A FIRST-CLASS AS-**sayer and thorough ore sampler to take charge of a branch office in the Mexican Republic, through which ores are purchased and bullion sold, and a general mining and milling supply business done. Promptness, system, accuracy and thoroughness essential qualities. Address CARBON, ENGINEERING AND MINING JOURNAL.

**1462 WANTED—BY A FINANCIAL COM-**pany, to represent them in western Australia, a thoroughly qualified mining engineer, with a large experience in gold mining. Liberal terms will be arranged. Address, giving copies of testimonials as to character and ability, MINING, ENGINEERING AND MINING JOURNAL.

**1463 WANTED—A GENTLEMAN FA-**miliar with railway supplies and specialties, knowing the manufacturers and comparative merits of their products. Address H. G., ENGINEERING AND MINING JOURNAL.

**1464 WANTED—COMPETENT MAN TO** go to Sidon, Syria, to introduce artesian well-boring apparatus. Must have good references, and be willing to stay a year or longer if necessary. Address ISLAM, ENGINEERING AND MINING JOURNAL.

**1465 WANTED.—A YOUNG MINING EN-**gineer who has had some experience in the field to take a position with an important company as one of their engineers. Proof of ability and trustworthiness will be required. Address EXPLORATION, ENGINEERING AND MINING JOURNAL.

**1466 WANTED—ELECTRO-METALLUR-**gist. An important recently organized copper-mining company is considering the advisability of erecting electrolytic works, and would like to correspond with electro-metallurgist capable of designing and running the same. A liberal salary will be paid if, after investigation, it is decided to refine by this process. Address RIO GRANDE, care of ENGINEERING AND MINING JOURNAL.

**SITUATIONS WANTED.**

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

**GRADUATE MINING ENGINEER.—**Young man, wishes position, any country, as assayer assistant to manager or superintendent of mines. One year's experience in topography, hydrography and chemistry. Address C. H. K., 652 Cass St., MILWAUKEE, WIS. No. 17,452, July 18.

**YOUNG MAN, THIRTY YEARS OF AGE,** desires position as foreman or assistant superintendent of copper or lead-silver smelter. Has practical knowledge of reverberatory and blast furnace work; practical builder of both furnaces. Address COPPER, ENGINEERING AND MINING JOURNAL, No. 17,448, July 25.

**A MINING ENGINEER, AGE 22, GRADU-**ate of Mass. Institute of Technology, '95, desires a position with gold mining company, willing to go anywhere. Address COB, ENGINEERING AND MINING JOURNAL, No. 17,447, July 18.

**WANTED—POSITION AS RESIDENT** manager or superintendent; 15 years' practical experience; now with the largest company in Northern Mexico as mine superintendent; Spanish American country preferred; highest recommendations. Address AMERICANO, ENGINEERING AND MINING JOURNAL, No. 17,432, July 4.

**YOUNG MAN, GRADUATE C. E. '91, WITH** experience, Ph. D. in chemistry '96, Yale, desires position in chemistry or chemical engineering. Best references as to ability and energy. Address CHEMICAL ENGINEER, ENGINEERING AND MINING JOURNAL, No. 17,453, June 27.

**WANTED—BY A CAPABLE MINING EN-**gineer, a position by the 1st of August as manager with a first-class gold, silver or copper mining company in Mexico or elsewhere; age 52 years; 27 years' practical experience; also a thorough knowledge of chemistry and bookkeeping in English and Spanish. Presently engaged with the largest mining and metallurgical company in the Republic of Mexico. Object change of location. Address, for 30 days, MEXICO, ENGINEERING AND MINING JOURNAL, No. 17,438, July 4.

**A TECHNICAL GRADUATE, WHOSE EX-**perience has been in the construction of apparatus for, and the manufacture of Soda by the Ammonia Process, desires to connect himself either with parties contemplating the erection of such plants, or as chemist with some one already in the field. Address NaHCO<sub>3</sub>, Box 953, N. Y. City. No. 17,451, July 4.

**GRADUATE CHEMIST WANTS POSITION** as assistant. Not afraid of hard work and willing to accept small salary at start. Best references as to ability, character, etc. Address J. P. LA BARRER, 1427 William St., Baltimore, Md. No. 17,450, July 11.

**CHEMIST AND ASSAYER, SIX YEARS** in responsible positions, now in charge of a Lake Superior laboratory, desires position in Southwest. Refers to present employers. Address "V," Box 399 Ironwood, Mich. No. 17,437, July 25.

**MINING ENGINEER, GERMAN, GRADU-**ate Academy of Mines, Berlin, 17 years' experience in mining (also gold), good millman and assayer, wants position. References. Address SURVEYOR, ENGINEERING AND MINING JOURNAL, No. 17,442, July 4.

**WANTED.—POSITION BY A MACHINIST** and electrician. Address E. A. PORTER, 652 Cass St., Milwaukee, Wis. No. 17,445, July 11.

**CHEMICAL ENGINEER.—A MERICAN** young man, technical graduate, with long and successful experience as assistant manager and engineering and chemical expert with large manufacturing concerns, is open for engagement. Has a record as a pushing organizer and manager of manufacturing work. Special experience with compressed gases and electro-chemical work. Address EXCELLENT REFERENCES, care of ENGINEERING AND MINING JOURNAL, No. 17,446, July 11.

**Contracts Open.**

**WATER-WORKS.**

**Board of Commissioners.**

DECKERTOWN, N. J., June 8, 1896.

Sealed proposals will be received at the office of this Board until July 6th, 1896, for building water-works complete, or for any of the following parts thereof:

- (a) For furnishing about 1,078 tons of cast-iron pipe and specials of sizes between 8 and 4 in. diameter.
- (b) For furnishing forty-five hydrants, sixty 4-in., twenty 6-in., and seven 8-in. valves with boxes, also relief and reducing valves, and one 8-in. meter.
- (c) For distributing and laying about 47,000 ft. of cast-iron pipe, sizes 8 to 4 in.

Distributing and setting 87 valves with boxes, sizes 8 to 4 in.

Distributing and setting 45 hydrants, also setting relief and reducing valves, building manholes, etc.

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A certified check for three per cent. of the total amount of bid, payable to the President and Treasurer of the Board of Water Commissioners, must accompany each proposal.

The bidder whose proposal is accepted must be prepared to enter into a contract within five days thereafter, giving bonds acceptable to said Commissioners for an amount equal to one-half the bid.

Plans and specifications may be seen, and forms of proposals can be procured on application at the office of the Secretary of the Board of Water Commissioners, Deckertown, New Jersey, or at the office of C. C. Vermeule, Civil Engineer, 71 Broadway, New York City.

Proposals must be endorsed "Board of Water Commissioners, Proposals for Water-Works." The said proposals will be publicly opened by the Board and announced on the 6th day of July, 1896, at the hour of 12 o'clock noon. George A. Wilson, William S. Vanderhuff, Charles C. Kyte, Board of Water Commissioners. Attest: William S. Vanderhuff, Secretary.

**COAL.—**Sealed bids, addressed to the board of water commissioners, Atlanta, Ga., and indorsed "Bids for coal," will be received until July 1st, 1896. The bids invited are for, approximately, seven thousand (7,000) tons, or as much as is needed for a year's supply, delivered to Chattahoochee station No. 1, and Hemphill station No. 2, as ordered (not over ten (10) cars at one time at either station). Coal to be paid for as per weights of our track scales at the stations and weights certified to by the engineer in charge. Bids submitted must be for both run of mine and screened coal. PARK WOODWARD, Supt. Atlanta Waterworks.

**THE CONTRACT FOR THE MASONRY AND** superstructure of a bridge over the Jackson River at Iron Gate will be let by the Board of Supervisors of Allegheny County (Virginia) on WEDNESDAY, JULY 15, 1896, at 10 o'clock A. M., at the County Court House at Covington.

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A. H. FOWLER, Secretary

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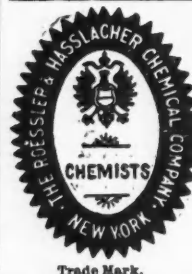
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\* Illustrated.

Table listing contents with page numbers: Personal, Obituaries, Industrial Notes, Trade Catalogues, Machinery and Supplies Wanted, Mining News, United States, etc.

The Newton Coal Mine Accident.

The waste of coal in mining and preparing anthracite has been determined to be on an average about 60 per cent. of the whole of the coal mined over, and from 25 to 35 per cent. of the bed is lost in the pillars and fine coal left in the mine...

No serious effort has ever been made to work out all the coal of the bed and allow the roof to fall, or to fill with waste material the space excavated, as the work proceeds, and allow the roof to settle down on this filling.

In order to lessen the heavy loss of coal in the pillars they are reduced in size as much as possible before abandoning the mine and this operation is called "robbing the pillars." When the pillars are reduced to a certain size, which depends on the depth of the mine and the character of the coal, they become insufficient to support the overlying rock...

At the Twin shafts, near Pittston, Pa., the roof had given full warning, and efforts were being made to support it by building cribs and putting in timber props under it, but as events have unfortunately shown, all in vain, and there is no doubt that about 60 men have lost their lives.

The so-called accident was probably not chargeable to unusually bad mining, but to the bad system of mining in universal use in the anthracite regions.

British Columbia Mining Laws.

The increasing attention, to which we have already referred, being paid to investments in mining property in British Columbia and the fact that the greater number of the prospectors and probably the majority of the investors are from the United States makes the mining laws and regulations a matter of interest to our readers.

The laws seem to us to be clear and distinct and in no respect unfair or oppressive. The leading features are that priority of discovery holds a location, under the condition of \$100, annual assessment work, or a fee of same amount to the Government. The tax on output is estimated on the gross amount of all ores sold, and is at the rate of one per cent.

Any person over 18 years of age or any joint stock company or foreign company can obtain a free miner's certificate for one or more years on payment of a fee of \$5 a year. A mineral claim must not exceed 1,500 feet in length by 1,500 feet in breadth, and all angles must be right angles except where impossible by a previously surveyed claim.

A free miner may cut timber for mining purposes upon any Crown lands or timber leasehold or on any lands the timber whereon has been reserved by the Crown.

These conditions are fair and liberal, and we note that the Dominion authorities have made up their minds to have no claim grabbing, such as has frequently ruined development in our Western and Southwestern States and Territories. "A free miner may hold not more than one mineral claim on the same vein or lode except by purchase."

One of the most interesting features of these mining laws is to note that the vertical boundary following the old Spanish mining law is adopted, and this we believe to be sound, as the means of avoiding much litigation. The actual wording of the clause is, "The holder of a mineral claim is entitled to all minerals within his claim, but he is not entitled to mine outside the boundary lines of his claim continued vertically downward."

The Prospect for Silver Production.

So much capital has been put into gold mining in the last two or three years, and so much interest has been aroused in the pursuit of the yellow metal that silver has almost been lost sight of, and there is a general public impression that many of the mines have been closed down, and that the output has largely diminished. This is far from being the case, however. The statistics collected for Volume IV, of THE MINERAL INDUSTRY put the total production of silver in the world in 1895 at 181,850,731 fine ounces (5,651,982 kilograms). An actual increase of 3,182,630 fine ounces (97,818 kilograms) over 1894. In the United States, while there was a small decrease last year—3,515,640 ounces, the total for 1895 being 46,381,235 ounces—in the silver produced from native ores, there was a large increase in the silver smelted or refined from imported ores and bullion, and the total quantity of metal put into marketable shape in this country last year was 76,437,071 ounces, or actually 6,247,485 ounces more than the similar total for 1894. These figures show that the silver producers have not been idle and warrant the presumption that they have not universally been working at a loss.

This increase in the world's production of silver is, however, contrary to the anticipations of some close observers, as well as to the general impression; as is also the fact that the average price increased in

1895 in the face of a continued large output. The accumulation of silver in the East was less in 1895 than for several previous years, and the only increase in requirements that can be noted was a small one in connection with the Italian operations in Abyssinia. So far as the monetary use of silver is concerned very little change is to be noted in the situation. Bi-metallism is gaining some strength in European, especially English opinion, but no active measures have been taken to adopt it. In the United States the cause continues to suffer serious injury from the so-called silvermen, who demand free coinage independent of other countries.

The production of silver is evidently not continued on hope alone, since some of our own larger mines were able not only to keep at work, but to pay dividends also, and the same thing can be said of a number of the Mexican mines. While it is entirely impossible to fix on any average of the cost of producing silver, it is evident that for an output of, say, 45,000,000 ounces in the United States it is at present below 65 cents an ounce.

While no very large increase in the production of silver is probable under existing conditions, and while these have very much discouraged prospecting for and opening new mines, it is altogether likely that the present rate of production will be maintained for a time. There is, at any rate, no reason to look for a material decrease for some years to come, while the Mexican and South American mines continue to be worked at the present rate; the Broken Hill mines in Australia are arranging to increase their output by working on a large scale the sulphide ores, which have hitherto been neglected; and, finally, while the important part of the silver output which is won in connection with copper, lead and other metals is increasing.

Perhaps the adoption of new processes for working ores is the most important element in the question of the future of silver production. If, for instance, the Broken Hill mines have really at their command a cheap and efficient method of working the lower grade ores, as has been claimed, their production will be largely increased, and might continue to be profitable, even at a low price for silver. As long as there is an actual surplus over cost the mines will be worked, and probably would continue even at a loss in the hope of an early change for the better.

So far as production is concerned, it is evident that an abundant supply must be one of the conditions to be reckoned with, and there is no probability of an appreciation of the metal on account of inability to meet any demand for it which is likely to arise.

Whether the present value ratio with gold is to be maintained, whether there is to be a further rise or a disastrous fall, depends upon events which no man can at the present time clearly foresee or predict.

#### NEW PUBLICATIONS.

DIE DECKUNG DES ERZBEDARFS DER DEUTSCHEN HOCHOFEN IN DER GEGENWART UND ZUKUNFT (THE SUPPLY OF THE ORE REQUIREMENTS OF THE GERMAN BLAST FURNACES IN THE PRESENT AND FUTURE). By E. Schrodter. Dusseldorf, Germany, August Bagel. Pages, 38; with nine maps.

This excellent monograph was prepared and presented originally to the Verein Deutscher Eisenhüttenleute, and its republication in book form has put it into fitting shape for preservation. It is a very condensed, but at the same time a very complete, review of the German blast furnaces, giving their number, capacity, location, grouping by districts and the sources from which their ore-supplies are drawn. To this the author has added a few comparative notes on the blast furnaces and ore production of the United States and Great Britain. It is illustrated by nine maps, showing the location of the German furnaces; their relation to the ore and coal deposits; several of the more important iron ore districts in detail; the location and extent of the coal and iron ores of Great Britain and the United States; and finally a sketch map showing the iron production of the world.

Naturally the location of the German furnaces has been largely determined by that of the ore deposits, and Herr Schrodter shows the sources from which each district draws its raw materials. It was, of course, impossible to describe all the ore deposits in detail within the limits of such a paper, but condensed sketches of the more important ones are included and in a table there are given typical analyses of a number of different ores. Most of the German ores are not very rich and some of the deposits which are extensively worked are of rather low tenor in iron. Thus the *thoneisenstein* of Upper Silesia has from 36 to 37% iron; the spathic ores of Sugerland from 32 to 38% iron; and the minette ores, upon which the great iron industry of Luxemburg is largely based, carry from 35 to 38% iron. Among the richer ores are the brown ores of the Dill Lahn district, which carry from 50 to 57% iron.

The German blast furnaces are depending each year to an increasing degree upon imported ores. Thus, in 1885, the total ore mined in Germany (including Luxemburg) was 9,157,869 tons, while the imports were 853,006 tons; in 1894 the figures were 12,392,065 tons mined and 2,093,007 tons imported. On the other hand there were 2,558,729 tons exported in 1894, but these exports were chiefly minette ores from Elsass and Luxemburg, sent to the French and Belgian furnaces just over the border. The imported ores 10 years ago came chiefly from Spain and the Mediterranean, but at the present time Sweden furnishes a large proportion, the Gellivara mines contributing the greater quantity. In the five years from 1891 to 1895, the imports from Spain decreased slightly, and those from Algeria, Elba and Greece showed very little change, while the arrivals from Sweden increased from 76,814 tons to 464,056 tons. The increasing cost of production in many of the older German mines, as their workings extend to greater depths, and the gradual exhaustion of some of the ore-beds, will probably lead to an increase in the

imports from year to year. As might be expected, since it would hardly pay to import lean ores, the foreign ores used in Germany are generally of a high class; the Gellivara ores, for instance, average from 62 to 65% iron. The nature of the available ores has, of course, had a determining effect upon the direction of the iron industry; and the fact that many of the German ores are high in phosphorus accounts for the extent to which the Thomas-Gilchrist basic process for steel-making has been adopted in that country.

Herr Schrodter has given us in this paper a great deal of information which must be of great service to the German iron-masters, and is also very interesting to their competitors. He has also succeeded in avoiding the tendency to prolixity and too great minuteness of detail which is one of the faults apt to beset the monograph. The maps are well done, and serve to illustrate the text in a very clear way.

STEEL. A MANUAL FOR STEEL USERS. By William Metcalf, New York J. Wiley & Sons. Price \$2.

This is a little book by one who knows whereof he speaks, and whose facility of expression is a familiar pleasure to metallurgists and engineers. It does not pretend to treat exhaustively of the different methods of making steel, giving hardly more than a definition of the processes for the benefit of those who know nothing at all of the subject.

Neither does it give any attention to the qualities of structural material or to the common methods of testing such steel for chemical and physical qualities. But it does aim to say how all steel in general, and hard steel in particular, should be handled after it is made.

The laws governing the treatment of steel are the same for boiler plate and for watch springs, and these laws are founded on well-defined phenomena of crystallization, occurring at different temperatures and under different kinds of manipulation.

Mr. Metcalf has made a thorough study of these laws. In a long business career, numberless problems were propounded by different users of material. As he states in the preface, blacksmiths, edge-tool makers, die makers, machine builders and engineers were continually asking questions, but he does not enlarge as he might upon the transcendent importance of this system of education.

No mere scientist, no recluse, can ever see his subject from as many sides as the practical steel manufacturer. It sometimes seems as if his office were the lens of a kaleidoscope, and that his customers were amusing themselves in making new combinations of difficulties.

This is particularly true in the case of tool steel makers, and Mr. Metcalf has been one of the leaders in publishing his experience, and in making public the fundamental principles governing the treating, the working, the annealing and the tempering of such metal. In addition to the full discussion of all points connected with these subjects, one chapter is devoted to the different alloy steels and to the effect of the ordinary metalloids upon the physical qualities with particular reference to the harder varieties of tool steels.

These matters are the only ones which the author attempts to treat at length. To other subjects he has devoted much less space, and unfortunately much less care. On page 137, for instance, a wild open-hearth heat is explained by supposing that some insufficiently roasted magnesite was used in making the bottom.

Inasmuch as raw limestone, and sometimes magnesian limestone, is often put in large quantities into open-hearth furnaces beneath the charge of metal, and inasmuch as such limestone sometimes sticks fast to the bottom throughout the whole heat, and sometimes rises at any and all periods of the operation, the theory propounded is utterly unable to account for the facts. The exact cause in this particular case cannot be stated at this distance, although over-oxidation is the most probable, but it is certain that the reason given is insufficient. The collateral evidence, that the trouble ceased when only thoroughly burned stone was used, would hardly be received by Mr. Metcalf as conclusive in any other field of investigation.

In the same way on page 139 the positive statement is made that "Bessemer or open-hearth steel of less than .08% of carbon is almost certain to be equally worthless."

Now this is a complete mistake. It probably arises from the fact that Mr. Metcalf has considered ordinary color determinations on low steels to be trustworthy, when, as a matter of fact, they are usually valueless. Thousands of tons of basic open-hearth—yes, and of acid open-hearth—steel, are produced every year, having less than this proportion of carbon, and the use of such metal for firebox plates, for rivets, and for numberless other purposes, answers this dictum so thoroughly that further discussion may be dropped.

The author, however, contradicts himself on the very next page by stating that "there are tough good-working steels in the market of carbon below .05% and manganese below .20%"; but he says that they are "made in small furnaces and worked with great care"; also "that the product is expensive, and unless it is wanted for welding is in no case as good as well made steel of .12 to .20% carbon."

The first statement as to the existence of good soft steel is reassuring and is correct, but the implication that it is necessarily made in small furnaces or that it is extraordinarily expensive is not correct. At Steelton such steel can be made in fifty-ton furnaces, and to make extra low carbon and extra low manganese at only a nominal advance over current market rates.

The third clause of the above quotation, "that it is in no case as good as harder steel," is also incorrect. If it had been said that for most purposes it is not as good, there would then have been differences of opinion and that Mr. Metcalf's opinion was as good as others, but in the form in which the case is put we can only regret such a dogmatic statement.

In comparing high-carbon steels as made by the crucible and by the open hearth, Mr. Metcalf naturally exalts the crucible as undeniably superior. His experiments and his conclusions are important contributions to the great argument that is now being carried on in many shops and tool rooms.

It is true that most crucible steel is superior to most open-hearth steel, and that this superiority cannot always be explained by the chemical formula; but, on the other hand, it is just as true that many a mechanic who would scoff at the idea of using open-hearth steel, as being an inferior metal, and who will testify that he has "tried the stuff and failed," is really using the very kind of steel that he derides.

On page 133 are given some very forcible remarks on the relation of so-called segregation phenomena to what Mr. Metcalf styles "inertia." This page is worth the careful consideration of every metallurgist, for, as the author states, "segregation covers a multitude of sins."

Briefly, then, we may say of this new and valuable contribution to our literature, that wherever the subject matter is the study of crucible steel and the laws that govern its heat treatment, the dicta laid down may be accepted as final. The errors in other directions are small and are no more than must inevitably be made by every man who tries to formulate exact metallurgical laws from the numberless factors of general experience.

H. H. C.

#### 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 supersede review on another page of the Journal.

*Kindell's African Market Manual for 1896.* London, England; Mathieson & Sons. Pages, 312; with map. Price (in New York), \$1.25.

*Tenth Annual Report of the Commission of Labor; Strikes and Lockouts. 1894, Volume I.* Washington, D. C.; Government Printing Office. Pages, 1,373.

*Jahrbuch der Elektrochemie über die Jahres 1895.* By W. Nernst and W. Borchers. Halle, Germany; Wilhelm Knapp. Pages, 300; illustrated. Price (in New York), \$1.40.

#### 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.

Choco, Colombia

Sir: Having seen in your esteemed columns so many notes regarding the gold fields of the world, I thought it might be of interest to your readers to hear from the "Choco District," one of the sources of the ancient Spaniards' wealth.

Geographically and geologically this country has been so well described that I will confine myself to a few statements regarding the mining conditions as I have found them and the history of the mining operations of the past few decades.

In the time of the ancient Spaniards gold was easily obtained here in all the gulches and creeks as in California's "palmy days." By the forced labor of negro and Indian slaves great quantities of gold were produced. The thoroughness and extent of their workings even to-day is apparent from the number and size of the ancient workings and ditch lines clearly traceable. Their labor cost them nothing but its feed and this was worked to an extent impossible in modern times. Tradition has it that the Spaniards worked ground as long as it would give a daily yield of 25c. to the slave, and the results of those who have attempted to continue their abandoned workings seem to show that they did indeed work ground at this low limit.

To-day the only gold producers in the Choco are negroes, who live on plantains and fish, raising the former and catching the latter. If they and their wives and children can pan out enough colors in their wooden bowls, or "bateas," as they are called, to buy an occasional handkerchief, which constitutes their only article of clothing, all their wants in life are provided for.

It is said that about half a century ago an American named Stine worked a mine here for four years and took out several thousand dollars, but this I cannot vouch for, as no one who knew him here is now living.

But evidence is easily obtainable regarding a number of intelligent efforts of more recent dates to establish mining operations on a larger scale, by foreign corporations. Seven different and distinct attempts have been made to obtain gold by using dredges of various kinds in the river beds, and the rotted and rusty remains of these dredges can be seen strewn throughout the whole district, with a net result for the whole seven of \$40 in gold.

Eight years ago about \$40,000 was spent by an American company in establishing a hydraulic mining plant, which was abandoned with a total yield of but a small fraction of its cost. Three years ago a California miner came here, and, after a number of months prospecting, secured a property over which he and some associates among the native merchants became highly enthused. The mine was equipped with a monitor, and after a year's work our California friend is leaving the country sick and disgusted, with the conviction that there is no money for a white man in mining here.

Last year another American company came here with much blowing of trumpets to exploit a property that was a "sure thing," but to-day nothing remains but debts and old machinery.

The writer was one of a party of five from one of our Western States who have been the latest victims of the Choco, and who, after a few months' exploring and a liberal experience with the deadly fevers that infest this neighborhood, have laid parting wreaths on the graves of the poor Anglo-Saxons who dropped before they reached the "Californian's convictions."

C. D. JENSEN.

QUIBDO, COLOMBIA, June 8, 1896.

**Soldering Glass.**—Recent investigations by Margot have established the fact that an alloy, composed of 95 parts of tin and 5 of zinc, melts at 200° C., becomes firmly adherent to glass, and is unalterable and exhibits an attractive metallic luster. An alloy, consisting of 90 parts tin and 10 of aluminum, melts at 393° C., becomes strongly soldered to glass, and is possessed of a very stable brilliancy. With these two alloys it is possible, it is claimed, to solder glass as easily as it is to solder two pieces of metal, and this operation may be done by soldering the pieces of glass, when heated in a furnace, by rubbing their surface with a rod of the solder, the alloy as it flows being evenly distributed with a tampon of paper or a strip of aluminum, or an ordinary soldering iron can be used for melting the solder.

#### CRIPPLE CREEK GOLD PRODUCTION.

Written for the Engineering and Mining Journal by Edward Skewes.

"A writer inditing at Denver," says in a recent issue of the *Pull Mall Gazette* about Cripple Creek, "that something like \$8,000,000 worth of gold was taken from the district last year, while at least twice that amount was sunk in mining properties."

The output of the camp as shown by the New Year's edition of this paper—the *Engineering and Mining Journal*, and which was the most conservative estimate at that time—was \$7,225,000. The official, and supposedly correct, report as furnished by the Superintendent of the Denver mint within the past few days for 1895 "was \$6,879,137 gold and \$90,878 silver, total \$6,970,015, an increase over 1894 of \$3,970,435 in gold." The shipping ore last year amounted to 78,000 tons of an approximate value of \$75 per ton, or \$5,850,000; the local mills treated about 65,000 tons, or, say, 200 tons a day of \$18 ore, making a total for milling ore of \$1,170,000 and a grand total of \$7,020,000.

I had for some time been gathering statistics respecting the growth of the camp, and comparing the same with the three months of 1895, when the recent fires in this town could not resist the temptation, but must consume a few hard-earned notes. The figures given are approximately correct, and are, as a rule, rather unfavorable to the camp than otherwise.

"Sixteen millions sunk in mining properties in 1895." Your paper of January 4th last estimates the amount of development at 125,950 ft., which may be a trifle low, and so we will estimate the development at 140,000 ft., which, at \$12 per foot—the ground not being hard—most of the work being single hand, would be \$1,680,000, which, with the cost of improvements, \$276,800, would make a total of \$1,956,800; or, to put the expenditure in another light, the mines and prospects of the camp last year gave employment to 1,900 men at \$3 per day, including explosives, light, etc., etc., say \$3.50 per day, an estimate surely high enough for the *Pull Mall Gazette* correspondent, and there is a total of \$6,650 per day, or for 300 days, \$1,995,000, which, together with the surface improvements, as above stated, would make a total of \$2,271,800; including all extras, the total expenditure could not possibly exceed \$2,500,000.

Of the 1,900 men employed 1,350 were employed on mines that were shippers, and some, at least, if not the majority, were dividend payers. The remaining 550 were composed, or, at least, 65%, or 357 of prospectors who were being "grubstaked" or working on shares, leaving 200 men on day's pay, involving an outlay of \$210,000. Of the \$77,100 required to grubstake prospectors fully 80% came from the operatives of Cripple Creek, who showed their faith in the future of the camp by their works, leaving a balance of \$15,300 to be contributed by outsiders. We will estimate that 10% of the improvements at surface were made from outside the mines. We have only a total outlay of \$252,900, or, in round numbers, \$300,000; \$16,000,000 represents an expenditure of \$114.28 per foot for 140,000 ft. of development, or \$100 per foot, leaving \$2,000,000 for surface improvements, whereas the whole of the surface improvements can be duplicated for \$1,000,000. Instead of \$16,000,000 being sunk in mining properties, there was not \$2,000,000, and I entertain doubts whether \$300,000 for the development of prospects and mines was sunk or even spent by parties living on the "outside," or beyond the Cripple Creek limits.

Cripple Creek to date has produced in round numbers 800,000 oz. (not quite that) of gold (and that is the only place known to me where the \$16,000,000 comes in); and the total cost of producing that gold has been less than \$14 per oz., including all legitimate expenditures. The cost of mining that quantity of gold to the outside public, as before stated, has not been \$16,000,000; it has not been \$1 per oz., but we will say \$800,000. The rest of the money for development purposes came from Cripple Creek, as perhaps in no section of the world did so many mines pay for themselves. In fact, only one mine in the camp ever made an assessment. The prospects since developed into mines paid, as a rule, from the word "go." Again I repeat, Cripple Creek has not been enriched by outside capital \$800,000, whereas it has contributed to the world's wealth \$16,000,000, with reserves blocked out in our mines of approximately \$7,000,000. True, a French syndicate has just paid over \$1,000,000 for the Victor, \$300,000 for the C. O. D.; an English syndicate \$120,000 for the Lucky Guss, etc., etc. These amounts were not spent in developing Cripple Creek; it represents so much cash finding its way into the pockets of the fortunate owners of those claims and cannot, by any means, be regarded as "sunk."

Just for a second we will take the case of the Portland (my notes of the other mines being burned), a mine which produced last year 85,000 oz., or \$1,700,000, and yielded a profit of 50,737 oz., or \$1,014,745. The cost of producing the gold was \$8.06; mining, \$3.09; treatment and freight, \$4.97; profit, \$11.93; total, \$19.99 per oz.

The Portland ore was low grade; the average of the 31,516 tons was \$48.63 per ton, and the freight and treatment \$13.39, leaving net returns from the smelter and mill of \$35.24.

In looking over the matter very carefully I cannot see where the "\$16,000,000 was sunk in mining properties," as the producing area is often humorously termed a "two-by-four"—twelve square miles. Cripple Creek should not be responsible, either, for the failure or success of outlying camps, such as West Creek, Marigold, High Park, Freshwater, etc. If the above amount was spent in development here the output would in all probability have been \$50,000,000. I cannot believe that \$16,000,000 was sunk in mining properties in the whole State of Colorado in 1895.

"Cripple Creek will," says the Denver writer, "so the practical mining men say, produce less this year than it did last." The practical mining men of Cripple Creek do not think so, but, contrariwise, have reasons to think otherwise. A statement recently published in the *Rocky Mountain News* stated that the production of this camp for the first three months of 1895 and 1896 were respectively \$1,380,000 and \$2,450,000, or an increase of \$1,070,000. The figures may be a little high, but the increase is but little exaggerated. The business men of Cripple Creek do not think the output will be less, as shown by the brick and stone business blocks they are erecting, costing over \$400,000. The Florence and Cripple Creek Railroad do not think so, as they now have 18 locomotives on their 40 miles of track compared with 10 last year. The Midland Terminal Railroad Company's rolling stock 12 months ago consisted of a

dozen hand-cars. Now they have six locomotives. The Brodie Cyanide Mill does not think so, as it is putting in an additional dryer. The United States Economic Reduction Company is increasing the capacity of its mill to 300 tons a day, and the Philadelphia and Colorado Company is erecting a 200-ton chlorination plant for Cripple Creek ores; the old Konemann Mill does not think so, as recently it "has doubled its capacity, etc., etc." Last year 80 steam hoists were erected; the first three and a half months of 1896 saw 63 erected, or an increase of 217%. The first four months of 1896 saw a dozen shippers added to the list. Of course, they are not all dividend payers, as it takes time to make a mine, but some three or four will in all likelihood enter the dividend list before 1896 closes.

Compared with the last quarter of 1895, the first quarter of 1896 showed a "falling off" of nearly \$300,000, largely due to the decreased output from Battle Mountain. All the other hills of the camp have shown an increase, save where there has been a real or fancied grievance between lessees and owners.

The question now is, will the production be \$16,000,000, or will it be \$12,000,000 for 1896? I do not know, as it is too early to figure, I do think that Cripple Creek, even for 1896, will produce close to 50% of the gold yield of Colorado. The last four months of the year will be our best months, but there will be a steady increase all the time. If our output for this year is \$16,000,000 we shall do what but few gold camps have ever done. This is a young camp, in its fifth year; 1892 was its first production, 1893 came with a panic, 1894 with a strike; 1895 passed away pleasantly, save a small cloudburst; 1896 came with two fires such as no city in the United States has ever been inflicted with in the same ratio, involving a loss of over \$2,000,000 above insurance; yet the young camp marches on, and how any writers or any mining engineer can predict that its maximum output was reached in 1895 is, to use a mild phrase, absurd to those who are familiar with the camp. The producing area of the camp is not one-half prospected; no section has so many veins or fractured rocks carrying values, and none of our mines have "played out" with depth, and my impression is, that the volcanic forces which caused the upheaval were so strong that the veins must have great depth.

With the *Pull Mall Gazette* correspondent I am pleased to agree when he writes about stock companies. It is a disgrace, and should be punishable. Under this head I favor the English system, a certain number of shares subscribed for before any allotment, make the directors responsible for statements in their prospectuses, etc. If the writer had said \$16,000,000 was sunk in mining speculations, this would never have been written. Early in 1893 I called attention to the wholesale incorporation of companies in this district through your paper, and condemned it unsparingly. There was a standing advertisement in one of our local papers for 100 claims on the outside of the belt; more acreage was wanted. I am glad the Denver writer called attention in such a powerful paper to that evil, and hope the Cripple Creek pioneers who have already located 60 claims in High Park will read it.

#### THE TWIN SHAFT DISASTER IN PENNSYLVANIA.

The caving of about 65 acres of land, mined by the Newton Coal Company at Pittston, Pa., early on Sunday morning, June 28th, entombed fifty-eight miners who were at work at the time. During the previous week a settling in the lower vein of the Twin colliery had become apparent, and preparations were made to prop up the roof. Though there were evident indications of great danger, a large force of men went to work Saturday evening to put up supports for the settling mass.

In addition to the men so engaged, Inside Superintendent M. J. Langan, Master Machinist Robert Haston and Machinist Daniel Ward went down the shaft at 2 o'clock Sunday morning to remove a pump that was about 800 ft. from the foot of the shaft. They are also entombed.

At 3 a. m. a number of residents of West Pittston were awakened by a series of violent shocks, and at the same instant the engine house and other buildings at the colliery were shaken in a violent manner, followed almost immediately by dense clouds of black dust.

Believing that an explosion had occurred the hoisting engineers sounded the alarm by blowing the shrill whistle.

Just at this time two men came up the shaft and reported that they had just come from the head of No. 3 plane and that the cave-in had occurred at the foot of the plane.

Mr. Langan, brother of the inside superintendent, with three miners descended the shaft and succeeded in going a distance of 600 ft. from the foot. Here they found gas collected in large quantities, and in half an hour were compelled to ascend the shaft. They again descended, and went along the counter gangway, and as the fan had driven out the foul gas they succeeded in reaching the head of No. 3 plane, traveling down which they soon discovered the fall at the foot of the plane. Large rescue gangs of men were organized and willing hands volunteered to descend to ascertain what steps could be taken to rescue the entombed miners.

Efforts have been made ever since to effect this. But little progress has yet been reported because of the continued caving, driving back the rescuers and destroying their work. There now seems little prospect that the men will be found alive, for even if they escaped death by the fall, it is not probable that they can be reached while life remains.

The work of rescue, though conducted by the most experienced men of the region, is at a disadvantage because the officials of the mine are among those entombed. These include Superintendent Langan, Mine Foreman Lynott, Fire Boss McCormick, Driver Boss Murphy and Assistant Foremen Carden, Tenpenny and Howe.

While the main hope of rescue has been in clearing away the falls along a thousand or more feet of gangway, one other plan is being tried, that of cutting through an 85-ft. pillar of solid coal which separates the workings of the ill-fated mine from the Clear Spring mine adjoining. This plan may result in failure, for the same trouble with falls will probably be encountered at this point when the Twin shaft workings are entered.

#### INSOLUBLE PHOSPHORUS IN IRON ORES.

By C. T. Mixer.

Probably the chief bugbear to the chemist in the routine analysis of iron ores is the determination of the insoluble phosphorus, that is, the phosphorus which cannot be extracted by means of boiling acid. The reason for this aversion to the determination of the insoluble phosphorus is that in order to obtain the latter in a soluble form it is generally deemed necessary to fuse the siliceous residues with carbonate of soda in platinum crucibles, dissolve the fusions in hydrochloric acid and evaporate to dryness to dehydrate the silica, then extract the soluble phosphate of soda with water and a little acid and continue in the usual way.

This process requires considerable time and manipulation, as well as the introduction of soda salts, which sometimes prove to be unfavorable to the procuring of a pure phospho-molybdate or ammonium precipitate. Many chemists have tried to find some practical solvent for this undesirable condition of phosphorus, but have, so far as we know, failed. Of course, many have found hydrofluoric acid to work, since it naturally takes into solution almost the entire residue, but the disadvantage in its use is, that it also readily attacks glassware, unless the excess of acid is evaporated off in platinum utensils, the use of which involves time and expense.

Since there has been such an increased demand for siliceous ores in the market, chemists have been more than ever annoyed with the insoluble phosphorus determination, because of the increased amount of siliceous matter in the residues, which requires proportionately more soda, heat, time and patience to fuse.

Owing to the above fact, we began a series of experiments lately, to try and find a suitable solution of the difficulty.

Our first idea was to intimately mix the ore with less than an equal bulk of dry carbonate of soda, and heat to a red heat in a platinum crucible, our expectation being that the phosphorus would all be converted into phosphate of soda, without its being necessary to use sufficient soda to make a liquid fusion. The results were encouraging, the mixture of calcined ore and soda readily dropping from the crucible and being easily broken up by the pressure of a glass rod in the beaker. The mass was then boiled with water alone, in some cases, and in others with weak acids, and the total phosphorus quickly extracted in many ores containing considerable amounts of insoluble phosphorus.

The main objection to this mode of procedure was met when the siliceous ores were attacked in this manner, the difficulty being that owing to the large amount of siliceous residue, no matter how little soda was used, the heat partially fused the mass (silicate of soda), and made it difficult to extract from the crucible. We then substituted calcined magnesia as the base to combine with the phosphorus, and obtained excellent results and, of course, had no trouble with the siliceous ores.

We were, however, somewhat surprised that the magnesia acted so readily, and it occurred to us to try calcining the ore without the admixture of any base. This was done and the ore afterward treated in the usual way with hydrochloric acid and the iron dissolved, when it was also found that the total phosphorus had been extracted. This worked well on most ores, but had the disadvantage of rendering the oxide of iron less readily soluble, and thus increased the time required for the solution.

The next step was to adapt the principle to the treatment of the insoluble residues, and the results were, as expected, all that could be desired. Since the latter would seem to be the most useful application, we will give it more in detail, as well as add some comparative results on different grades of ores, showing its practical accuracy.

The ore is dissolved in the usual manner in hydrochloric acid, filtered into the precipitation flasks, and the paper and residue put in a platinum crucible for ignition. When the paper is burned off the residue is broken up with a platinum rod and calcined at a red heat a couple of minutes longer, when it is removed and dumped back into its beaker. A little water is added and half a dozen drops of hydrochloric or nitric acid and the solution brought up to a gentle boil for from three to five minutes, when it is filtered and is ready for precipitation as phospho-molybdate of ammonium.

As can be readily seen, the above does away with the fusion with carbonate of soda and the evaporation to dryness, and with the introduction of the undesirable soda salts.

Below are some of the many experiments made upon a variety of Marquette range ores:

1. Winthrop.....	051	008	059	A	7. Lake Sup.....	021	006	027	A
	051	008	059	B		020	006	026	B
2. ".....	039	008	047	A	8. ".....	112	022	134	A
	039	008	047	B				135	C
3. ".....	054	014	068	A	9. Salisbury.....	058	009	067	A
	052	015	067	B		058	010	068	B
			067	C	10. ".....	028	019	017	A
4. ".....	051	008	058	A		028	019	017	B
			058	C	11. ".....	046	006	052	A
5. Cambria.....	052	004	056	A		046	006	052	B
	053	003	056	B	12. Clev. Hem.....	022	015	037	A
6. Lillie.....	065	006	071	A		022	016	038	B
	065	007	072	B		021	016	037	B
								038	C

Numbers 1-4 were siliceous ores and the remainder hematites.

A. Solution of ore and fusion of residue.

B. Solution of ore and calcining residue as per above method.

C. Calcination of ore and subsequent solution.

Spanish Imports and Exports.—For the four months ending April 30th Spain imported 509,223 tons of coal and 77,269 tons of coke. Iron imports included 4,456 tons pig iron, 3,522 tons wrought iron and 7,210 tons steels. The exports of minerals were as follows in metric tons:

	1895.	1896.
Iron ore.....	1,476,494	2,183,622
Copper ore.....	158,867	212,376
Zinc ore.....	8,154	9,715
Lead ore.....	2,739	2,359
Salt.....	63,354	100,625

Exports of metals this year included 6,837 tons pig iron, 9,673 tons copper and 49,720 tons lead.

## A NEW TYPE OF MINING LOCOMOTIVE.

Written for the Engineering and Mining Journal by Timothy W. Sprague.

No recent announcement in the electrical field attracted more attention than that of the consummation of a working arrangement between the Baldwin Locomotive Works and the Westinghouse Electric Company. With the enormous field now open for electric traction it was felt that the vast experience of the Baldwin company in the field of steam locomotion would materially advance electric locomotive building, when combined with the successful and practical results of the Westinghouse company in electric construction work. This combination is of interest to the mining interests of the country inasmuch as it was at once announced that electric mining locomotives would be built.

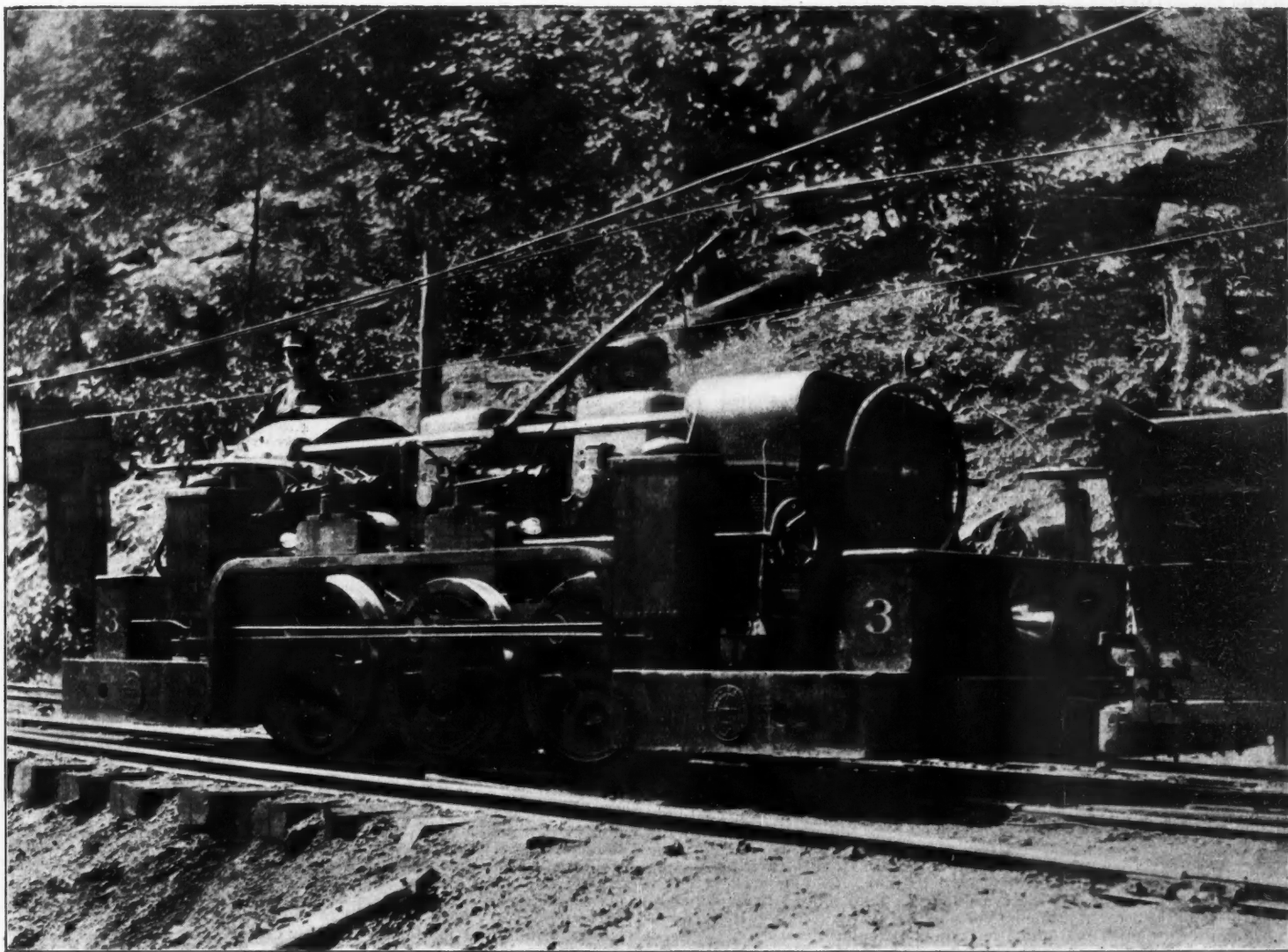
The first of these machines ever turned out has recently been put in operation at the mines of the Crozer Coal and Coke Company at Elkhorn, W. Va., in the Pocahontas coalfield. The work to be done here is very heavy, inasmuch as there is a grade against the loaded trips and a large tonnage per day is handled.

used, the reversal of direction being accomplished by the controller, turning to the right starting forward and to the left backward.

The average speed of the machine under load with the motors in parallel is 6 to 8 miles per hour and the drawbar pull is sufficient to pull 40 loaded cars, each weighing 4 tons, up a 2% grade. Allowing 30 lbs. per ton for friction, etc., on a level track and adding the load due to 2% grade the pull developed must be over 11,000 lbs., which is very high for this weight of locomotive. The ratio between weight and drawbar pull for mining locomotives is usually 8 to 1 or 6 to 1 and the above figures show a ratio of 4 to 1 or even less, allowing that a portion of the power of locomotive becomes ineffective on the grade, being used in pulling the locomotive itself up the grade.

The exertion of 11,000 lbs. pull at a speed of 8 miles per hour means a consumption of about 235 H. P. At present owing to insufficient generating capacity trips of but 25 cars are pulled. The generating station was installed sometime ago for the operation of a smaller locomotive and a number of coal cutters and consists of an 18' x 20' McEwen automatic engine, belted to two 60 kw. Mather generators wound for 500 volts, so that running these in multiple gives but 120 kw., or approximately 160 H. P. for all purposes.

With 25 car trips the locomotive takes 250 amperes in starting on a



A NEW TYPE OF MINING LOCOMOTIVE.

The illustration shows the locomotive just outside the bank mouth headed toward the timple. The machine weighs 22 tons, making it the most powerful electric locomotive yet built for underground work. The total length is 17 ft. 8 in. and the width of this gauge of track (44 in.) is a little over 5 ft. The total height is 6 ft. The driving wheels, of which there are three pairs, with connecting rods on both sides, are 32 in. in diameter and the distance between centres of axles is 3 ft., making the distance between centres of the outside axles 6 ft. The controller is on the end of the machine away from the trip, in the illustration, and the resistance coils are at the other end, with a ventilated covering. The resistance coils are iron strips one inch wide coiled like clock springs arranged in 16 rows.

The driving power is furnished by two series wound motors, with cross connected ring type armatures and two sets of brushes placed 90° from each other. The motors are rated at 100 H. P. each and may be run in series or parallel. The series method is used for heavy loads at slow speed and the multiple for higher speeds. The connections from the controller to the rheostan run under the motors in an iron casing, and the controller can be operated from either end of the locomotive. The switch to change the motor connections from series to parallel or back again is at the side of the controller switch and can be thrown only when the controller is on the center with all current cut out. No reversing switch is

level, and 150 amperes as an average when under way on the level. As soon as sufficient generating power is obtained full trips of 40 cars each will be handled.

The connection between motor pinions and the driving axles is a double reduction train of gearing. Other points of interest about the locomotive are a switch for cutting off all current on the machines except for lights, two electric head lights, one at each end, each carrying a 32-c. p. lamp, two extra lamps on one side of the locomotive as shown in the illustration, two trolley arms, one for locomotion in each direction and but one used at a time; the gearing thoroughly encased, hand brake operating two brake shoes on each wheel, and a Wurts lightning arrester and choke coil.

The use of connecting rods is an interesting feature, and doubtless gives a more effective tractive effort than when each pair of wheels works independently. On the other hand the pound on the track is greater, and on a rough mine track the loss by friction amounts to something. The operator has ample room at each end of the locomotive, and the frame forms heavy and substantial double-buffers.

The Crozer mine is but a short distance from the Elkhorn station, and anyone interested will be well repaid for the trouble of a visit to see this largest underground electric locomotive, and the success it is making in overcoming the difficulties of an exceedingly heavy service.

## THE ELECTRIC LIGHT IN MINING OPERATIONS.

Written for the Engineering and Mining Journal by William Baxter, Jr.

The use of the electric light in mining operations has not been as extensive, up to the present time, as it should have been, considering its superiority, as an illuminant, over the ordinary lamps, but it has been sufficient to show that its value in this field will prove to be as great as in any other. Good illumination is of the greatest benefit in all classes of manual work, and mining is not an exception to the general rule.

It may be that the cost of electric light is believed to be so much greater than that of oil lamps as to make its use prohibitive, and this may account for the slow progress it has made in this field. But that its cost should be so high as to offset its decided advantages is by no means certain. If the actual value of the oil only is taken into account, in calculating the cost of the present method, the comparison would undoubtedly show up in a manner that would be anything but favorable to the electric light, and, in fact, would probably justify the conclusion that the latter can only be regarded as an expensive luxury. If, however, to the cost of material is added the expense of preparing the lamps for use, and that of caring for them afterward, it may, and in all probability can, be shown that the dim and otherwise unsatisfactory oil lamps are not so very much cheaper after all.

Although but little has been done in the way of introducing the electric light into mines up to the present time, it cannot be said that for this purpose it is still in the experimental stage; for enough has been accomplished to demonstrate conclusively that it is thoroughly practical, and all that could be desired. It is safe, and by far more efficient as a means of illumination, than oil lamps, and, judging from the experience obtained in other fields, it should have the effect of enabling the workmen to do more and better work, and with far less danger not only to themselves, but to others as well.

There is one difficulty, however, in adopting electric lights in many places (and this difficulty affords room for the display of ingenuity and the development of improvement over present methods), and that is, that the lamps that are used near the headings when heavy blasting is done would almost surely be destroyed when the blasts are set off. The most common expedient resorted to to get around this difficulty heretofore has been to set up these lamps in a portable manner so that they may be removed whenever necessary. Another plan is to place them where they will be sheltered as much as possible. The former method has been tried with very good success in several places, and there appears to be no reason why it should not be perfectly practical.

It may be raised as an objection to this plan that it cannot be very durable, for the reason that no matter how well protected or how flexible the cables may be, the frequent moving back and forth will soon wear them out. This is true to a very great extent, but just how great an objection this would turn out to be in practice no one can say at the present time, as only the actual results of long usage can throw any positive light upon the subject. This objection, however, applies only to mines where heavy blasting is done, and these, probably, do not constitute so great a proportion of the whole mining industry as to render the prospects of the electric light in this field hopeless, should it be found from future experience that in such cases it is not adaptable. But, even in mines of this class, if the necessity of removing the lamps should prove to be a fatal objection, it would not mean the total exclusion of the electric light, because this difficulty can be overcome by adopting a system of reflecting the light from one part of the mine to another. This system could be made thoroughly practical in every respect; and in point of economy would be ahead of the methods that have been used so far, as with it arc lights could be employed, and these would give a much greater illumination for the same cost than is obtained with the incandescent lamps which have been used almost exclusively up to the present time.

This system, briefly explained, would consist in using arc lights, located in sheltered positions, and projecting their light, by means of suitably disposed reflectors, upon the headings. There are several good arc lamps now on the market, that are adapted to the incandescent light current, and any of these could be used for the purpose. The way in which this system would be arranged would be as follows:

At a distance of say one or two hundred feet from the heading the arc lamps would be located in a place where they would be well protected against injury when the blasts are set off. Back of each lamp a reflector would be located in such a position that it would project the rays of light toward other reflectors from which it would be cast upon the headings where the work was being done. These latter reflectors would have to be in an exposed position, but the lamps would be placed out of harm's way, and, therefore, would not have to be removed.

The reflectors being exposed might be broken occasionally by flying rocks, but this would not be very often, as they would be 100 ft. or more away from the point where the blasting was being done. But if they should be broken even more often than occasionally it would not add much to the cost of lighting the mine because they could be made at a very low price. The advantages of this arrangement would be, that a much greater amount of light could be obtained for the same cost, owing to the fact that arc lights give so much more light from the same power; and also, that a greater amount of light could be concentrated at any desired point. These would be the most conspicuous advantages, but they would not be the only ones; there are several others, which although of a somewhat minor importance, would, when taken collectively, amount to fully as much as the reduction in cost, and increase in quantity of light.

It must not be inferred from the foregoing that it is assumed that this system would furnish the illumination of a mine at a cost lower than that of oil lamps; the comparison is wholly between incandescent and arc lights.

When good illumination is desired it would probably be necessary to use two or more arc lamps to light up a heading, but in many cases one would be sufficient, provided the reflectors were so located that they would properly diffuse the light, and thus avoid shadows as far as possible.

This could always be done, because the light of the lamp could be concentrated in a beam by a suitable reflector, such as are used aboard ship

for search lights, and the reflectors that throw the light upon the heading could be placed in a line one ahead of the other and as far apart as the surroundings would permit. The reflectors, being all in line, would receive the rays reflected by the main reflector, and, being turned to the proper angle, would cast the light upon the heading, and, as the illumination of the latter would come from the several reflectors, shadows would be almost entirely eliminated.

## AMOUNT OF COINAGE EXECUTED IN AUSTRIA.

Written for the Engineering and Mining Journal by R. Helenbacher.

There are two mints in Austria, the larger one in Vienna, the smaller in Kremnitz, Hungary, both of them conducted on a similar scale. Owing to the fact that the currency of money has been again changed in Austria, at the rate, that 1 florin divided in 100 kreuzers becomes equal to 2 crowns divided in 100 farthings (heller), there was a great coinage since the last two years. The relation of one crown to the foreign currencies is the following: 1 crown is equal to 85 pfennig German = 105 francs = 10 pence = 26½ ropjkek Russian money.

It is reported that since the beginning of the meeting of the new currencies, during the two years ending July, 1895, it had been coined in the Vienna mint: Currents of precious metals; 20 gold crown pieces in the amount of 279,698,180 florins (one coin = 10 florins); 10 gold crown pieces (5 florins) for 10,361,580 florins; silver crown pieces (a ½ florin) for 68,037,317 florins. The minor coinage executed was: Nickel change, 20-farthing pieces (10 kr. for 16,522,590 florins, 10-farthing pieces (5 kr.) for 10,442,542 florins; bronze change (98 Cu. + 2 Sn), 2-farthing pieces (1 kr.) for 2,276,563 florins and 1-farthing pieces (½ kr.) for 545,564 florins. The total amount of coinage of crown-currency executed in the Vienna mint up to the date ending July, 1895, is 387,884,257 florins or twice as much in crowns current. The anticipate statement for the minting operations in the year 1896, in order to satisfy the demand, is to coin precious metals: Gold for 80 millions of florins in 20 crown coins (10 florins), for 20 millions of florins in 10-crown coins (5 florins), silver for 12 million florins in 1-crown coins (½ florins); the minor coinage, bronze change ½ million florins of 2-farthing coins (1 kr.) and ¼ million florins, 1 farthing (½ kr.) coins.

But beside the demand for coinage of new crown money, the precious metals are subjected to a further coinage of other currency having but a price as merchandise. It is anticipated to execute in the year 1896 the coinage of about one-fifth million pieces of gold dukats (a 4 fl. 72½ kr.) and about 2,000,000 of pieces of the so-called Levantine silver dollars (or Maria Theresia dollars a 2 fl. 21 kr. with the legend of the coin from the year 1796). The former are mainly absorbed in the oriental (Asia-Minor) trade the latter are exported to Africa, where they are the common current. But the war of Italy with Abyssinia absorbed a large amount of silver dollars and the preliminarily denominated coinage of them is increased and has to respond these inquiries for that sort of coins addressed to the Vienna bureau of mint.

Owing to the reduced coinage to be executed during the year 1896 against the year 1895 the expenditure as cost of supplies and miscellaneous expenses in the year 1896 will diminish at 1,947,000 fl.

The total force employed (administrative and workmen) is 456 men. In the years before 1893 the yearly returns of the Vienna mint were from 27 to 30 millions of florins, but in the year 1893 they reached the amount of 260 million florins. The average daily coinage was 731,000 coins, or 403,000 florins. The average daily returns of each stamping machine in work is stated as follows: There can be coined 3,934 four-fold dukats (at 19 florins), 9,909 simple dukats, 12,256 twenty-farthing nickels, 12,459 ten-farthing nickels, 14,797 one-crown silver pieces, 18,831 one-farthing bronze pieces, 18,858 twenty-crown gold coins, 21,056 two-farthing bronzes and 30,150 coins of Levantine dollars. The ratio of money value to be executed in the Vienna and Kremnitz mints is stated with 23 to 15.

The working results of the coinage executed in the Kremnitz mint and the denomination of money coined shows the following statement: There were coined money at the value of 41½ millions of florins. The weight of pure gold coined to 20-crown (10 fl.) pieces is 17,111.8 kg., to 10-crown pieces 3338.5 kg.; the coined 1-crown silver pieces represents a weight of 60,386 kg. fine silver; the minor coinage for the nickel change 212,930 kg., nickel and the bronze change 14,5018 kg. bronze. The total minting is 128,961,342 coins.

Though the Vienna mint is of larger capacity than the smaller Kremnitz mint, having far less working capacity, both are equipped in the best manner, and they are capable of meeting all ordinary requirements and perform their work in an excellent manner.

The law prescribes that the proportion of copper in the standard gold or silver ingots or alloys used for blanks shall be  $\frac{986}{1000}$  for the legal tender.

But the standard of the Austrian ducats is  $\frac{986\frac{1}{2}}{1000}$  and that of the dollars

with the old legend of the coin  $\frac{833\frac{1}{2}}{1000}$ .

**Metal Refining Apparatus.**—A metal refining apparatus recently patented consists of a combination of a furnace having a chamber for molten matte or slag and provided with a gas-outlet flue, air inlets communicating with an air-pressure supply and adapted to introduce air into the chamber in excess of the quantity required for oxidation of the metal, the air inlets inclining and converging into the chamber to direct the air downward to different points against the upper surface of the molten mass, to produce rotation thereof in the chamber, thereby to bring the oxidizable and consumable and combustible ingredients constantly to the surface, gas inlets communicating with a combustible gas supply and opening into the chamber to mix the gas, and burn it upon the molten mass, with the surplus of hot air, and a slag skimmer in the chamber adjacent to its slag spout, and operating by the rotation of the mass, to remove therefrom the resultant fluid impurities.—*Iron and Coal Trades Review.*

GOLD MINING IN THE APPALACHIAN BELT.

Written for the Engineering and Mining Journal by W. H. Adams.

The reputable journals and newspapers of the country are to be congratulated upon their success in once more attracting attention toward the gold mines of the Appalachian belt, as it is almost wholly due to them that a renewed interest has been excited in fields so long neglected. Notwithstanding the lamentable failures in mining and processes which have left an indelible impress on the landscape of the entire mineral belt, from the Potomac River to the Alabama line, there are successes which are apparent and which prove values of enterprises properly conducted, so that the persistent advocacy of facts, which aim to place the mining of gold ores in the South in the same category with a like business in the Western States, seems to have produced substantial results, for we are promised an influx of prospectors and a wave of excitement which will amply repay us for the idleness of many years.

The question may now be asked, whether the same old time practice and unbusinesslike principles which brought nothing but discouragements and disasters to the majority of those who took up this problem years ago, shall again be introduced and repeated, with possible modifications as to means, but with no differences as to the actual results, leaving the field after a short period of agitation and useless expenditures a barren waste for another generation. Cannot we inaugurate something better in every respect than the boom periods of the past, and, in the light of the successes in winning gold under most unpromising conditions, and in countries remote from all modern conveniences, is it not possible for those who have so long and patiently urged upon the mining world the value of this Southern section, to forcibly impress upon the coming and better trained race of gold miners the necessity of a careful and deliberate study of conditions, thorough testing of property in hand before agreeing to expenditures for mining and milling, and, finally, submitting the entire matter of working ores to men whose known success in other fields is a positive guarantee of success in this case.

There is no master secret in the business of mining and milling gold ores, and there are plenty of men who can be called from successful enterprises in the West to inaugurate like successes along the mineral belt, just as there are men now in the South who can be trusted to win profits from a mine business however large or small. This class of men cannot be gotten into schemes, where the chances are entirely with the stock jobbers, and where the salary account is weighted with loss of reputation, sooner or later.

Every reputable mining and trade journal should be hand in hand in this work of a genuine re-awakening of a Southern gold mining business, and equally agreed to frown upon any and all attempts to handicap the initial work of legitimate mining, by formation of companies and stock sales based upon nothing but prospects, for upon the actual success of the initial operations hinges the possibilities of bringing into the South sufficient capital to properly open the gold-fields.

There is, and has been, altogether too much unwarranted talk, and too many statements which are based upon hearsay, or the unsupported evidence of interested parties, as to the richness of this field or that mining tract. We have outgrown this class of testimony within the past two years, and it is sufficient for the case in hand at the present time to say broadly that we have territory suitable for actual developments on a practical scale; that we are in exactly the condition of every mining region in the world—with some good mines and a lot of poor ones—that we need patient investigators and prospectors, who are sent to us by men of means, who will stay with us until something good is found, and who will return with money and modern machinery for the proper handling of low-grade ores which we know to be abundant in many sections.

We can afford to tell the truth about this Appalachian belt, as it must be told by the best of prospectors very soon, and how much better to tell it at once and have the credit of the statements.

It would be of value to new comers, and lead to a more general understanding of the different sections of the mining belt, if there was a division of the territory into districts, as is the custom in other countries. For the State of Virginia:

THE POTOMAC DISTRICT—Comprising all the mines which lie north of the Potomac River, in the State of Maryland.

THE FAIRFAX DISTRICT—Comprising all the mines which lie between the Potomac and Bull Run.

THE FAUQUIER DISTRICT—Comprising all the mines which lie between Bull Run and the Rappahannock River.

THE CULPEPPER DISTRICT—Comprising all the mines which lie between the Rappahannock and Rapidan Rivers.

THE STAFFORD DISTRICT—Comprising all the mines in Stafford County.

THE ORANGE DISTRICT—Comprising all the mines lying in Orange County.

THE SPOTTSYLVANIA DISTRICT—Comprising all the mines lying in Spottsylvania County.

THE LOUISA DISTRICT—Comprising all the mines lying between the North Anna and South Anna Rivers.

THE GOOCHLAND DISTRICT—Comprising all the mines in that county.

THE FLUVANNA DISTRICT—Comprising all the mines lying in that County.

THE BUCKINGHAM DISTRICT—Comprising all the mines lying between the James and Appomattox Rivers.

Other districts lying to the southward could be named in the same manner, thus fixing localities at all times.

To individualize the known developments of these several districts there are sources of information accessible to all—the latest and best known general digest of this subject being the able paper of Messrs. Wilkins and Nitze, read before the American Institute of Mining Engineers at the Atlanta meeting in 1895.

This paper should be in the hands of every person who is at all disposed to invest in Southern gold properties, and if the conclusions arrived at do not meet the expectations of over-sanguine operators and speculators, it is the truth stated in plain terms and from men who can afford to so state it.

In the light of the cold facts that we have not one paying mine on the gold belt in Virginia; that not one proper development has yet been inaugurated; that not one mine can show to experts sufficient tonnage of ores in a shape for measurement or calculation upon which to base a

proposition for erection of a plant such as is known to be so common in other mining countries, it is our duty to warn the public at large against all statements, from whatever source, which differ from the careful conclusions arrived at by the writers named.

It may be said fairly that a development company with sufficient capital to inaugurate workings on the scale and in the manner as practiced at the Haile mine, under Captain Thies, stands every chance for big winnings, as there are several properties in the State which will supply ores in abundance for a low-grade proposition in milling and there are many locations which would be adapted for the concentration of the ores from different mines and their treatment at a common center. It is at this point, however, that greatest caution should be exercised, as it has been well said that there are not in all the South six mines like the Haile. Why this is stated so positively and why the need of greatest caution in accepting any other statement, especially if it comes from an interested seller, is the argument so admirably made by the writers named above and should be read to be appreciated.

Gold mining and milling is a business as worthy of close attention and study, and as sure to be profitable when rightly conducted, as any business which occupies men's thoughts, and the master operators of the world, in this profession, are as careful to choose their working staff as do banking houses, acknowledging a special aptitude and training to be as necessary in the one case as in the other. We see this very plainly indicated in the South African gold regions, where none but the well-tried engineers of the world are employed, and where successes are won with plants of enormous extent and cost, operating upon ores, low grade and refractory.

We have lived to see brought about within a few years past an almost invariable success in gold extraction processes, but it is due to the bringing together of large capital, skilled workmen and individual ownership. The failures are to be traced to an absence of true business principles.

We have the most absolute and undoubted authority for statements of costs, etc., with regard to the class of ores to be met with on this belt, and without wishing to repeat details which have been so often presented, yet to emphasize the foregoing remarks, the costs at the Haile mine may be given:

Mining, per ton of ores on cars at ore pits.....	\$1.10
Transportation, per ton of ore to mill.....	.12
Milling, per ton of ore through stamps.....	.40
Concentration of stamp stock, per ton.....	.12
Chlorination, estimated per ton of milled ore.....	.17

Total cost of mining and working one ton of gold ores, including chlorination of concentrates.....	\$1.91
Value in one ton of mine ore.....	\$4.00
Profit in working one ton of mine ore.....	2.09
	\$4.00 \$4.00

Comparing further, the Alaska Treadwell mine report for the year 1894 is as follows:

Mining, 220,013 tons of 2,000 lbs. each, per ton.....	\$ .60
Milling.....	.44
Chlorination, concentrates from above tonnage.....	.17
Other charges, freights, etc., etc.....	.14

Total cost of mining and working one ton of gold ores, including chlorination of concentrates.....	\$1.35
Value in one ton of mine ore.....	\$3.20
Profit in working one ton of mine ore.....	1.85
	\$3.20 \$3.20

And the Alaska-Mexican gold mine reports as follows for 1894:

Mining, 73,141 tons ore, per ton.....	\$ .70
Mine supplies, on same tonnage.....	.32
Milling, includes labor and supplies.....	.58
Other charges, of all kinds.....	.19
Chlorination, concentrates from above tonnage.....	.18

Total cost of mining and working one ton of gold ores, including chlorination of concentrates.....	\$1.97
Value in one ton of mine ore.....	\$2.79
Profit in working one ton of mine ore.....	.82
	\$2.79 \$2.79

An analysis of these three statements will show that only in the item of mining was there any particular difference in costs, and this is to be expected when it is stated that in the case of the Alaska companies the ores are mined from open cuts, and in so greatly an increased tonnage over the Haile mine, its ores being raised from underground stopes and drifts.

It is possible to further extend this comparison list; but the mines mentioned are almost identical in character of ores, and therefore may be taken as fair examples of the best practice of to-day, from which statements can be drawn the obvious lesson, that only in large quantities and under the most exacting of management is there a profit.

The secondary products of these ores, the sulphurets, are relied upon for the greater part of the profits, and it is a self-evident fact that no ordinary mine can be run at figures which are shown to be produced by ores of this class. Suppose the case of mines located, however favorably, on the Atlantic gold belt, which contain no more than shown in the Haile mine exhibit, \$4 per ton in gold, and less than half of that amount in free gold.

To equal this result it will be necessary to duplicate the plant of the Haile, which in mines and mills stands charged to investment account a sum probably over \$200,000, and showing a development of ores which will cover several years working at the present rate of 100 tons daily. Nothing less in tonnage than this will answer for the low mine and mill cost as shown, and this is the point we should emphasize in strongest language, viz., that no statement of costs on any less scale than the Haile mine, or any less tonnage per day, is proper to be made in determining the outcome of a low-grade mine investment.

It may be that we should qualify this statement so far as individual ore bodies can be proved to be more valuable, but the mine future of this Appalachian belt must rest upon our ability to work low-grade ores, and no other proposition should be admitted.

If I make myself clear in the premises, it will save many an innocent investor the little or much he may put into gold mines in the Southern States, when that investment is a part of a capital insufficient for the purposes and for the problem. As the problem has been settled for him by such mines as the Haile, it would be the greatest of folly to listen to any proposition which promised success on other and assuredly losing lines. No one should be entrusted with the solution of the gold problem of this belt who has not made a success in other fields, and on similar problems,

## HORACE F. BROWN SYSTEM OF ROASTING-FURNACES.

It has long been conceded that the reverberatory type of calcining-furnaces, are the best adapted for thorough and economical metallurgical work, except in the one item of labor expense. It is the aim of the Brown system of roasting-furnaces to take advantage of the best practice attained by experience in the reverberatory furnace, and to reduce the labor expense to a minimum.

In cross section the Brown roaster construction is the counterpart of the modern reverberatory, except as to width. The width between walls is 11 ft.: height above working floor line, 23 in.: height above surface of charge, 15 to 17 in., according to the tonnage being worked. Tilings are built in the hearth equidistant from a center line, forming a roasting hearth 8 ft. 1 in. wide, and about 12 in. deep. These tilings are so constructed and set as to be removable from the outside, so that the whole surface of the roasting hearth can be reached with ease.

Between the tilings and the main wall, the tracks for carrying the stirring carriages are placed, and along one wall grooved wheels are so disposed as to carry the cable. These grooved wheels are so set in the cast-iron door frames, that about nine-tenths of their entire surface is on the outside of the furnace walls.

In construction the Brown furnaces are now built in what might be called a skeleton form. The foundation walls, usually of rock, are built

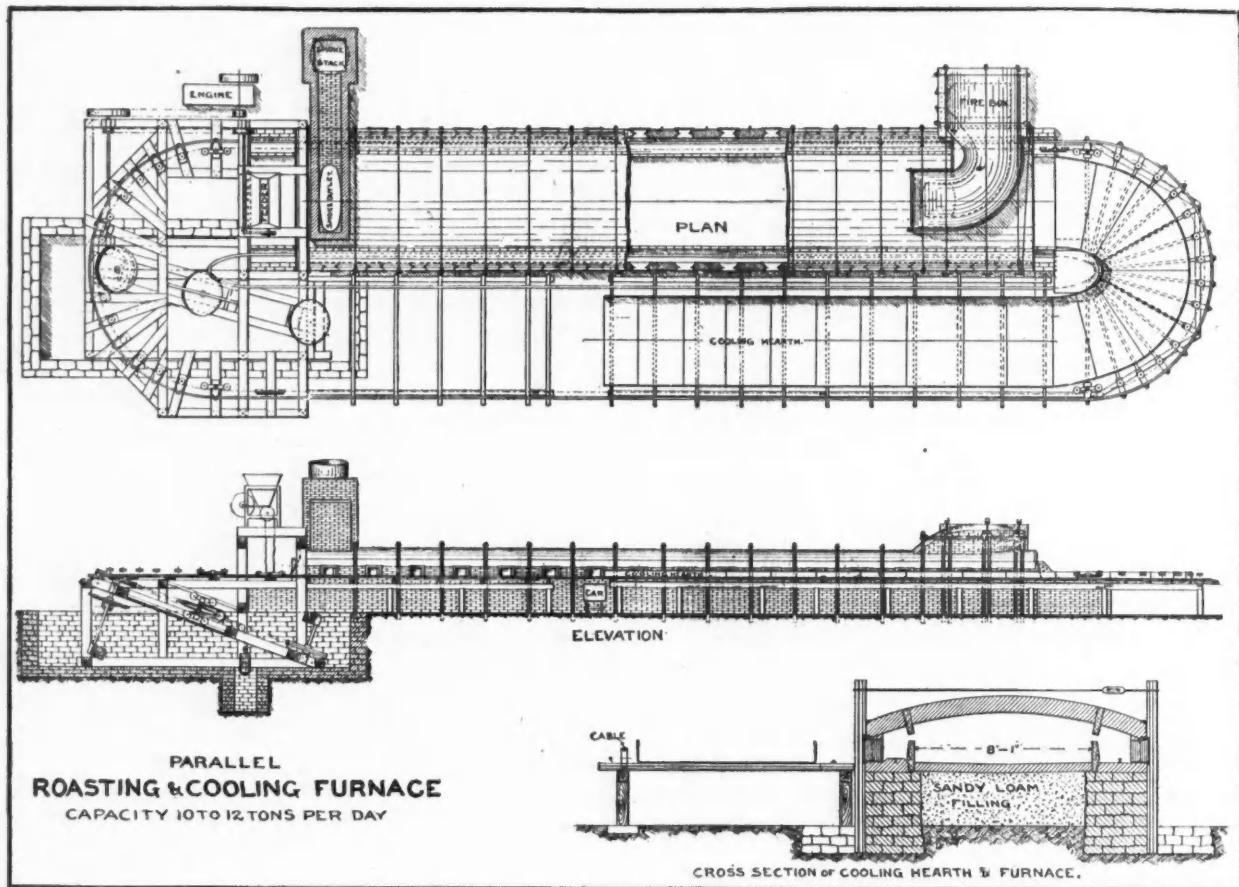
lel hearths connected with curved ends. Where it is necessary to cool the calcined material, it is accomplished by extending the hearth beyond the furnace proper, and overleaching tanks, barrels, or other receptacles for the product, the furnace mechanism acting as conveyors and distributors, and at the same time as a mechanical cooler.

This system of mechanical cooling was first used in the Brown furnaces built for the Cortez Mines, Limited, in 1891, and in 1892, at the Argo Works, at Argo, Colo. In these cases no attempts were made to carry the ore to a receiving hopper outside of the straight line of the furnace, but in 1894 a furnace was planned for the Bi-Metallic Mining Company, of Montana, where the extension hearth carries the calcined material over their system of leaching-tanks.

In this furnace the roasting and chloridizing is done in a "straight line" furnace, 220 ft. long, and the pulp is brought around over the tanks in a sheet-metal extension hearth, having a total length of about 250 ft., and has a capacity of handling 150 tons per day. Owing to the temporary closing of the Bi-Metallic and Granite Mountain mines, this furnace has not been put in operation, although long since on the ground.

For convenience the various types of the Brown furnaces have been called the Horse Shoe, the Elliptical and the Parallel.

The Horse Shoe furnace is circular in ground plan, being simply a reverberatory furnace built in the form of a circle, the adjacent ends being about 30 ft. apart, and connected by track rails. To operate the



2 ft. thick, up to the level of the roasting hearth, which is placed about 3 ft. above the ground line, for convenience. On these walls cast-iron door frames are placed about 4 ft. apart, on which heavy channel beams are secured by the buck stays. The main arch is sprung directly from these channel beams, and is supported entirely by the iron-work.

The spaces between the door frames are filled by a comparatively thin wall, just enough to exclude the air and retain the heat of the furnace. This light wall can be removed at any point, leaving the hearth accessible over its entire surface. By picking out the tiling the hearth can be reached by bars, should it become necessary to remove accretions from any cause.

In constructing the arch a row of tiling, vertically disposed above the lower tiles, is built in, forming the upper half of the partition above referred to, forming a continuous slot on both sides of the roasting-hearth, along its entire length. This diaphragm or wall serves to confine the roasting ore to the central portion of the furnace, and also acts as a shield or protection to the track rails, cable and moving mechanism.

The slot in the walls through which projecting arms extend over the ore bed originated with the inventor of the Brown system of roasting-furnaces, and is the vital element in various modifications of the system as shown in the so called "Pearce Turret" and the "Ropp" furnaces.

By considering the Brown system of furnaces as a simple cable railway, its flexibility will be appreciated, and its operation readily understood. Each stirring carriage is an independent grip car, operated by a continuously running cable, driven by a simple three-wheeled cable drive.

There is no arbitrary shape required in the ground plan, as the hearth can be constructed in circular form, as in the horseshoe type; elliptical, as in the elliptical construction, adapted for large works, or with paral-

lel furnace two or more carriages are required. One carriage is always at rest in the open space between the ends of the roasting-hearth. The moving heated carriage, before quite completing its circuit, strikes the cooled carriage and pushes it forward, until the gripping device is automatically secured to the cable, when it is automatically released and comes to rest and cools until pushed forward in its turn. In this manner the carriages are alternately cooled, so that even with the excessive heat required for calcining zinc blende, they are not injuriously affected.

While the carriage is at rest it is perfectly independent of the furnace, and can be removed and replaced by another, without stopping the work a moment, and ample time is given in which to make any needed adjustment of the rabbles or grip while the moving carriage is making the circuit.

These furnaces are now working under such conditions as to cover about the whole field of metallurgical work. The capacity of a furnace depends entirely on the square feet of roasting area. The tonnage per square foot depends on the nature of the material being treated. In roasting zinc blende averaging 28% of sulphur, crushed through an 8-mesh screen, it requires 50 sq. ft. of roasting area to roast one ton down to .85 of 1% sulphur.

The Horse Shoe furnace at the Collinsville Zinc Company's plant at Collinsville, Ill., and at the Glendale Zinc Works, So. St. Louis, Mo., have 1,000 sq. ft. of effective roasting area, and the average duty for the past two years has been 20,000+ per day of finished product, roasted below 1% sulphur, or one ton for each 50 sq. ft.

The fuel used is the refuse slack from adjacent coal mines, requiring 8 tons per day, or .8 of one ton for each ton of finished product. This fuel carries over 30% ash, but costs but a few cents per ton for switching charges. The saving in labor over hand-roasting is reported by the companies named as six to one in favor of the Mechanical Roaster. The wear and



renewals are less per ton, than in hand-rabbling, and the saving in loss by volatilization and mechanical dust, over hand roasting, more than pays the total cost of operating the Brown Roaster.

At Argentine, Kan., the Consolidated Kansas City Smelting and Refining Company have a horse-shoe furnace roasting rich copper-lead mattes for the sulphate-oxide calcination of the copper for Hunt and Douglas process of extraction.

As compared to the work of hand reverberatories the result is remarkable. This matte is very fusible, and in hand-roasting it was necessary to recrusher the product and re-roast to get the required condition of the copper. The total cost by the hand method was \$3.75 per ton. In the Horse-Shoe furnace the work is accomplished with one roasting, without recrushing, at a cost of 61c. per ton, for fuel and labor, or at a total cost of about 65c. per ton.

The duty gained averages about one ton per each 40 sq. ft. of hearth area, securing a total extraction of about 90% of the copper. In roasting iron and lead sulphides crushed through a four-mesh screen, the duty averages about one ton for each 30 sq. ft. roasted to about 3.5% of sulphur.

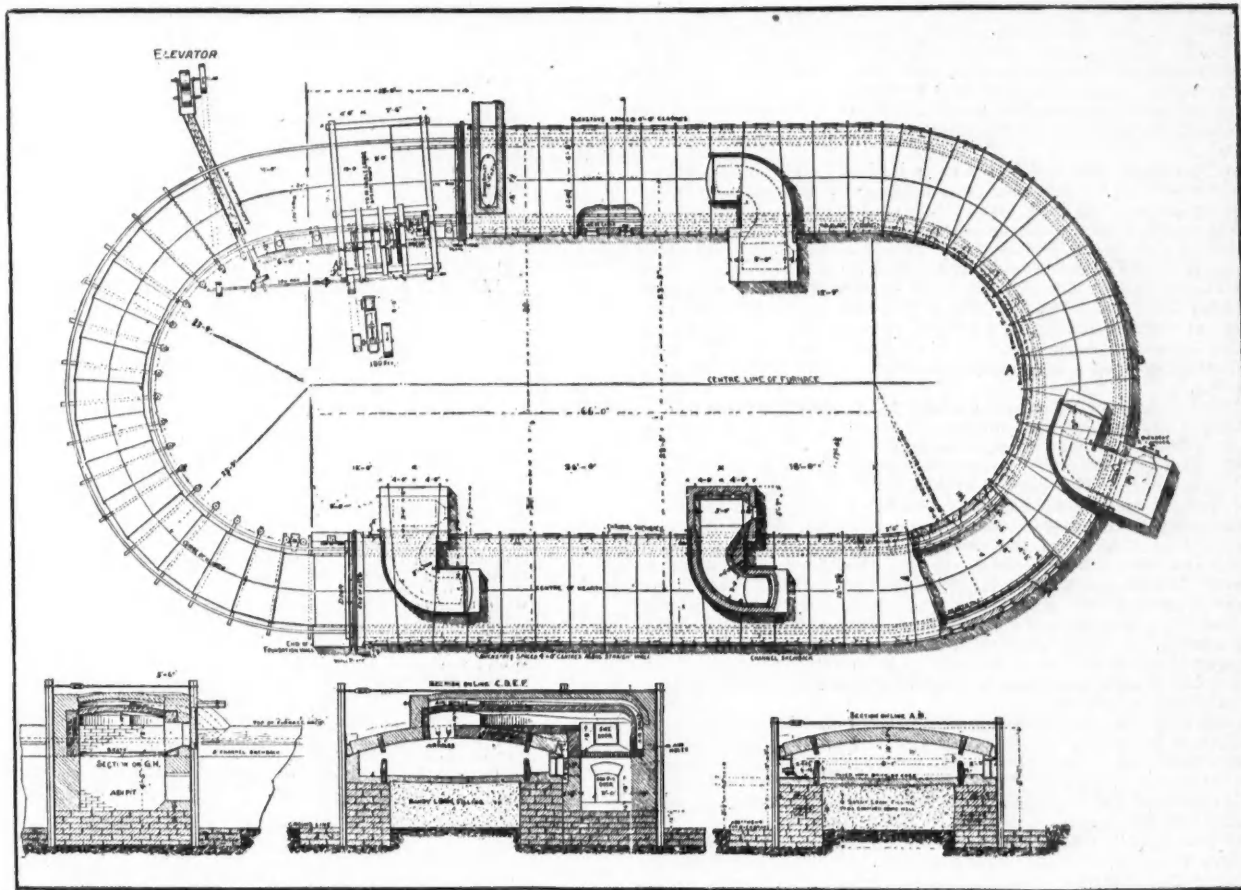
The Elliptical Furnace, recently erected for the Golden Reward Mining Company, of Deadwood, So. Dak., is a good example of the perfection of mechanical roasting. This furnace has a roasting hearth 180 ft. long by 8 ft. wide, or 1,440 sq. ft. of roasting area. The ores worked are what are locally called "blue-ore," a refractory, close-grained, hard

At the West End Company Mill, near Lake City, Colo., 52 tons per day were roasted below .5 of 1% in 800 sq. ft. of hearth, showing the same result as was attained in regular work at the Golden Reward Mining Company Mill.

The Parallel furnace is designed for small plants, and has equal capacity in proportion to area. From its construction it can be built much cheaper than any other mechanically stirred furnace of its capacity. The Standard Horse-Shoe furnace, with a roasting-hearth 8 ft. x 135 ft., costs from \$6,500 to \$7,500, owing to location, erected exclusive of stack. The Elliptical furnace, as built at Deadwood, costs from \$9,500 to \$11,600, the cost at Deadwood. The Parallel furnace can be erected at a cost of from \$3,500 to \$4,000, having a capacity of 10 to 20 tons per day, according to material treated.

ELECTRIC TRANSMISSION OF POWER FROM THE COAL MINES.

The incorporation of the Pacific Transmission Company, of San Francisco, marks the beginning of an interesting project for the electrical transmission of power from the mouth of California coal mines. The company will be controlled by the San Francisco & San Joaquin Valley Coal Company, whose mines are at Corral Hollow in Alameda County, and is one of several important undertakings connected with that corpora-



ELLIPTICAL FURNACE.

quartz, carrying from 2½ to 8% sulphur, \$18 to \$30 in gold, and some silver, arsenic, tellurium, etc. Owing to the close-grained texture of the quartz, it is necessary to crush to a 30 mesh to get a good extraction by chlorination.

In running the furnace three rabbling carriages are used, stirring and advancing the ore each 90 seconds. A charge of 125+ is fed in with each stirrer, or 60 tons per day. The ore has a forward travel of about 22 ft. per hour when three carriages are used.

At a point 110 ft. from the feed door, and after five hours in the furnace, the ore is perfectly oxidized, the sulphur averaging .3%, having a duty of one ton per each 13.3 sq. ft. Adding the fourth carriage gives 50% more material, or 90 tons per day.

Samples taken at a point 160 ft. from the feed door gave returns of .3 of one per cent. sulphur, the ore being perfectly oxidized, and by slightly increasing the speed the ore was worked through at the rate of over 100 tons per day, equally well oxidized.

The hearth of the furnace extends 78 ft. beyond the roasting-hearth, and carries the ore to an elevator, delivering it sufficiently cooled to go directly up to the roasting floor.

Fuel used, wood, 5 cords in 24 hours @ \$3.25.....	\$19.50
Labor, 1 man on each 12-hour shift @ \$2.50.....	5.00
Power 5 H. P. @ 25c. per H. P.....	1.25
Oil, lights, repairs, etc.....	1.50
	<b>\$27.25</b>

Or a total cost of less than 30c. per ton, for roasting, cooling and conveying the ore to the barrels.

With 3 carriages, or 60 tons per day, the cost is exactly the same, except probably a trifle less for power, the same labor and fuel being required, or a total cost of less than 50c. per ton.

The new company will have a capital of \$3,000,000, divided into 30,000 shares of the par value of \$100 each, and will be empowered to build and operate steam and electric plants at the coal mines in Corral Hollow and Alameda County for the purpose of generating electrical power, and furnishing the same by transmission over wires to Oakland by way of Livermore, Haywards, San Leandro and other towns en route, and also to San Jose and to Stockton. It is intended to ultimately extend the service to San Francisco. The cheapest item connected with the generation of the electrical power will be the fuel, which will consist of the waste and refuse screenings, dust, etc., from the coal produced at the extensive Corral Hollow mines. The supply of this kind of fuel will be almost inexhaustible, and as it is extracted from the mines with the merchantable coal it is all paid for by the latter. As the coal company will control the transmission company there will be no charge for this fuel. The plant at the mines will generate at the start 6,400 H. P., of which about 5,000 H. P. will be supplied to San Jose and to Oakland, though the towns en route, and afterward Stockton, will be taken in, and if necessary the supply can be increased so as to extend the service even to San Francisco and other more distant points. The company expects to furnish this power to Oakland, San Jose, Stockton and intervening places at \$60 per H. P. per year. The present cost ranges from \$60 to \$80, according to conditions.

Compressed Air Motor.—Compressed-air motors will be tested on street cars in Chicago for the first time on July 1st. The test is to be made over the tracks of the General Railway Company, and will continue for three months. Already workmen are engaged in completing the first compressor plant to be erected. The cost of the new motive power, it is claimed, will be less than half that of electricity.

## THE COAL BEDS OF CALIFORNIA.

Written for the Engineering and Mining Journal by Harold W. Fairbanks.

California, although enormously rich in deposits of the precious metals, has developed as yet no coal resources at all commensurate with her needs. The coal mined at present in the State is comparatively poor in quality and small in amount compared with that imported from British Columbia, England, Australia and other places. What is the reason of this state of things? Is it because no thorough investigation has been undertaken along this line, or is it because the coal measures are absent from this portion of the Pacific Coast?

In taking up the study of the coal resources of California in such a manner as to reach valuable results we must first have a thorough knowledge of its geology. This statement might be considered a truism, but it would seem that it is necessary to emphasize it very strongly for in actual experience it has been almost completely neglected, with disastrous results in many cases.

The geological structure of the coast ranges, in which the most of the coal of the State occurs, is exceedingly complex, and it is partly because of a lack of appreciation of this fact that at present we know so little about the extent and value of California's coal deposits. In the following notes I shall endeavor to state briefly the occurrence of coal in this State and what the prospects are for the development of the industry.

In the first place there has been found no anthracite in the State, nor is there likely to be. The rocks of the Carboniferous, Triassic and Jurassic periods are here barren of coal. They constitute the gold-bearing rocks through the Sierra Nevadas and Coast Ranges. Conditions were not favorable evidently during their formation for the production of coal beds. A great catastrophic break separates these rocks from the younger unaltered and less disturbed strata belonging to the Cretaceous and Tertiary.

The coal imported into California from British Columbia is obtained from beds of lower Cretaceous age. It belongs to the bituminous variety and is of good quality. In California, however, the strata of this age are for practical purposes barren of coal. Here and there seams have been discovered 2 to 6 in. thick, but it is not probable that any of workable size occur. In the Upper Cretaceous we first meet with coal seams of commercial importance. These are found in eastern Shasta County, extending under the lavas of Lassen's Peak Volcanic ridge. The deposits have not as yet been worked to any extent, owing to inaccessibility, nor is the exact area possessing seams of workable size known. The coal covers several square miles, only a part of which in all probability will pay to develop.

Several small seams of coal are worked to a limited extent on the western slope of the Santa Ana mountains in the southern part of the State. It is probably of Upper Cretaceous age.

The Lower Tertiary (Eocene) has up to the present furnished the most of the coal mined here. The most important of the beds occur in the vicinity of Mount Diablo, where mining has been carried on for many years. The output is at present decreasing while the quality is not, of course, as good as that from the older Cretaceous beds. At Corral Hollow occur coal seams of the same age, but they have been considerably disturbed, and although much has been said about them their value is not yet demonstrated by actual development. Local beds of Eocene age occur near the coast south of Carmelo Bay, Monterey County. They rest on the granite. A large amount of money has been spent here, but it would appear that those investing paid no attention to the geology of the district, while it is certain that if they had done so many thousands of dollars would have been saved.

The Miocene furnishes the most extensive area of coal-bearing rocks in California, but in proportion to the extent is the quality poor. It is nothing more than a semi-bituminous coal, generally crumbling on exposure. It is, however, without doubt, valuable when it can be mined cheaply and does not have to undergo long transportation or much handling. During the Miocene a depression of the coast ranges took place and beds of this age with coal seams of varying thickness were formed here and there over a large area. Following that period a great elevation of the whole coast occurred and the beds were folded, faulted and eroded, so that to-day the coal-bearing portions appear as scattered remnants here and there nearly the whole length of the State. In the southern part of the State the only important coal-bearing rock occurs near Elsinore. A mine has been worked continuously here for a number of years. The vein has a thickness of 8 ft. but the area is small, as it forms merely a local basin surrounded by the basement crystalline rocks.

As we go north no coal beds of any value are known until near the middle of the State in Fresno and Monterey counties. In the Coast Ranges in Western Fresno County many prospects have been obtained, but for some reason no important seams of coal have yet been opened. The most of these deposits are of Miocene age and have been greatly disturbed. Some of the more important seams are so near the base of the series that they are liable to be cut out by the underlying rocks.

North of San Francisco the coal beds are confined to the western slope of the Coast Ranges and are found mostly in the counties of Sonoma, Mendocino and Humboldt. As far as known the coal in this region is of Miocene age, although there is found some lignite probably belonging to the Pliocene. The region is timbered and the rock exposures poor, so that although considerable prospecting has been carried on we know very little as yet as to the extent of the coal deposits. The Miocene occupies chiefly depressions in the older underlying rocks and it frequently happens that very promising outcrops have a limited extent. This is the only portion of the State in which there is much prospect of finding considerable areas of workable coal, but it is not probable that they will possess any better quality than in other portions of the State.

Coal beds of Miocene age have been opened and worked for some years in the vicinity of Lone, southeast of Sacramento, in the edge of the Sierra Nevada foot-hills. These beds have a good thickness, but the coal possesses the usual poor character.

From this brief summary of the known coal areas of California it will be seen that nothing great is to be expected. Of course, thorough exploitation is necessary, particularly in regard to the deposits found in the Miocene. There can, however, be no question of the absence from Cali-

fornia of the important coal measures of other countries. It is important that careful study should be given to the conditions under which coal does occur here in order to prevent the useless expenditure of large sums of money. Unless such geological studies be undertaken things will continue to take their course as in the past. In fact, in so many cases which have come under the writer's observation, the coal beds occur as local remnants in small basins or faulted against the older underlying rocks. If prospectors and intending investors could be brought to see the prime necessity of a thorough knowledge of the geology much misconception would be banished.

**Iron Production in Japan.**—Although the Japanese propose in the meantime to import the materials required for the making of locomotives and the building of ships, they do not mean to be content with that, but intend to go into the manufacture of iron and steel. According to a recent announcement in the *Official Gazette*, the Imperial Diet has approved of the appropriation of over four million yen (nominally £800,000) for establishing an iron foundry, or, more correctly, a works for the production of steel. It is expected that the works will be completed by March, 1899, and that it will be started in the following month. The *Gazette*, with the usual Eastern exactitude, gives the numbers and salaries of the members of the staff, from the president, with a salary of 4,000 yen per annum, down to the clerks with 30 yen per month. Altogether there are to be 82 officials of various grades, so that the establishment ought to be well looked after. Two foreign experts are to be engaged for a period of four years. The estimated output of the works is 60,000 tons a year at first, to be gradually increased as the works develop. The 60,000 tons will consist of 35,000 tons of Bessemer steel, 20,000 tons of Siemens-Martin steel, 4,500 of wrought iron, and 500 tons of crucible steel. It is expected that the establishment will not be in full working order until April, 1900. The enterprise is being undertaken with great deliberation, and there can be little doubt that in the not very distant future Japan will be able to supply the iron and steel which is required for the numerous engineering projects which are being put forward, and of which the Japanese have already given proof of their ability successfully to carry out.—*Engineering*.

## 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 JUNE 23D, 1896.

- 562,401. APPARATUS FOR GENERATING ACETYLENE GAS. William R. King and Francis Wyatt, New York, N. Y. Filed January 29th, 1896. An apparatus which consists of a U-shaped generator revolvably mounted on a shaft and provided with a removable cap at one end wherein the solid material can be introduced and a sealed other end wherein the liquid material may be introduced through a suitable valve and the liquid and solid substances to be brought together at the middle of the U-shaped generator by inverting the same, pipes leading from each end of the generator and so connected thereto that the generator may be inverted whereby the gas generated is discharged, when required.
- 562,602. OIL-WELL PUMPING POWER. George W. Grimes, Bluffton, Ind. Filed October 22d, 1895. Combination of a vertical rotary shaft, and an eccentric on the shaft consisting of an eccentric-plate, two strap-sections having flanges to engage the periphery of the plate and having spaced lugs outside of said flange, the lugs of one section being coincident with the lugs of the other section, and fastening-bolts passing through certain of the lugs.
- 562,785. PROCESS OF REDUCING ALUMINUM. Heinrich F. D. Schwahn, Kansas City, Mo. Filed January 31, 1895. The process consists in purifying the aluminous ores, minerals and compounds and in mixing the same with nitric acid, hydrochloric acid, sulphuric acid, suitable alkali-metal salts such as chloride of sodium, nitrate of sodium or potassium, suitable alkaline-earth-metal salts such as native sulphate of barium, chloride of lime and chloride of magnesium, and suitable carbonaceous matter such as sawdust, and in expelling the waste acids from the mixture, and in subjecting the remaining mass to heat to glow, and in powdering the resultant mass representing then a bath, and in mixing the same with carbon and in subjecting the bath consisting then chiefly of alumina, alkali metal oxides, alkaline-earth-metal oxides and carbon, to the action of an electric current and the action of external applied heat to the containing vessel composed of a suitable metal, such as iron or steel, until reduction takes place.

## Great Britain.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

## WEEK ENDING MAY 6TH, 1896.

- 8,328 of 1895. C. Hoepfner, Giessen, Germany. Treating zinc lead sulphides with chlorine or chlorides of iron or copper, so dissolving out the lead and leaving the zinc.
- 8,449 of 1895. C. Hoepfner, Giessen, Germany. Making zinc chloride by treating zinc oxide with sulphurous acid, oxidizing to sulphate and treating with an alkaline chloride.
- 11,219 of 1895. W. O. Wood, Durham, England. In oil safety lamps, an apparatus for making the flame non-luminous, so as to make it suitable for testing for firedamp.
- 206 of 1896. R. P. Rothwell, New York. Apparatus for sinking shafts and driving tunnels in the shield or caisson system.

## WEEK ENDING MAY 23D, 1896.

- 6,337 of 1896. F. J. Woods, Chicago. Dry placer amalgamator.

## WEEK ENDING MAY 30TH, 1896.

- 4,806 of 1896. J. P. Wetherill, Bethlehem, Pa. A magnetic separator which can treat iron compounds, such as hematite of very low magnetizability.
- 6,242 of 1896. J. Mait, Oakland, Cal. Concentrator for refractory gold ores.

## WEEK ENDING JUNE 6TH, 1896.

- 12,018 of 1895. L. Mond, London, England. Reducing metallic oxides by treating them with sodium amalgam formed in electrolytic baths.
- 13,536 of 1895. R. Keck, Colorado Springs, Colo. In treating slimes with cyanide, throwing down the earthy particles by adding common salt.
- 2,254 of 1896. F. Walker and W. C. Sanderson, Barnsley, Wales. Electrical contrivance for extracting broken drills from bore holes.
- 5,907 of 1896. F. A. Huntington, San Francisco, Cal. Improvements in crushing-mills.
- 7,123 of 1896. A. Von Siemens, Berlin, Germany. Electrolytic decomposition of sulphides of arsenic, antimony and mercury.

PERSONAL.

MR. PERCY L. FEARN, of Olcott, Fearn & Peele, mining engineers, New York, left last week for Mexico on professional business.

MR. J. E. McMANUS, of Everett, Wash., who has been appointed mineral land inspector, has been appointed to service in Montana and Idaho.

M. EDOUARD LEVAT, civil and mining engineer, of Paris, France, has gone to Blagoviestchensk, Siberia.

MR. P. R. ROBERT has resigned as superintendent of the North Star Mining Co., and MR. A. D. FOOTE, who has been the engineer in charge at Massachusetts Hill, will have full charge of both properties.

MR. HORACE F. BROWN, mining engineer of Chicago, Ill., has gone to Arizona with Dr. E. D. PETERS, JR., to erect an automatic mill of the Brown system for the Planet-Saturn Mining Company.

MR. W. P. PALMER, of the Carnegie Steel Company, has been elected second vice-president of the Illinois Steel Company. MR. PALMER will leave the Pittsburg company and have headquarters with the Illinois company in Chicago.

MR. CHARLES FRAZIER and MR. HENRY G. MARSHALL, heretofore doing business in banking under the firm name of LAWRENCE, FRAZIER & CO., will continue the business, at 93 Nassau street, New York, under the name of CHARLES FRAZIER & CO.

MR. GEORGE H. ROBINSON, the well-known mining expert, recently accompanied a party of railroad officials and mining men to Deep Creek, Utah. While driving down a steep incline his team ran away, throwing him out and breaking his leg.

M. FERNAND ROBELLAZ, a distinguished French scientist and mining engineer, is at Cripple Creek, Colo., studying the formation and mines from a scientific standpoint and gaining knowledge of the camp that will enable him to report intelligently on the opportunities for the investment of French capital.

MR. H. V. CROLL, the well-known engineer who has charge of the Smelting Department of the Denver Engineering Works, of Denver, Colo., has been appointed superintendent of the entire works. MR. LEWIS SEARING has charge of the Electrical and MR. FRANK E. SHEPARD of the Mechanical Department.

MR. SOL HAAS, it is reported, has been elected president of the Sloss Iron and Steel Company, of Birmingham, Ala., in place of the late THOMAS SEDDON. MR. HAAS was formerly traffic manager of the Richmond & Danville Railroad Company, and more recently assistant to President SPENCER, of the Southern Railway.

MR. JOHN BARKER, an American mining engineer formerly connected with the Village Main Reef, South Africa, is en route for Calaveras County, to examine the properties of the California Exploration Company. He will be assisted by MESSRS. JANSON AND PERCY TARBUTT, JR., mining engineers, who are expected to arrive in San Francisco via Australia, about July 3d.

OBITUARY.

GEN. RUFUS L. HOWARD died at his home in Buffalo, N. Y., on June 27th. General Howard had been connected with many successful business enterprises in Buffalo, and at the time of his death was president of the Howard Iron Works.

THEODORE D. WILSON, formerly Chief Constructor of the Navy at the Boston Navy Yard, died June 29th. THEODORE DELEVAN WILSON was born at Brooklyn, N. Y., May 11th, 1840, and served a full term of apprenticeship as a shipwright in the Brooklyn Navy Yard, under Naval Constructor B. F. DELANO. At the occurrence of the war he enlisted in the volunteer service. In December, 1863, he was ordered to New York on special duty with Rear Admiral F. H. GREGORY, and under his orders received direction of the building of many vessels. On May 17th, 1866, he was examined and appointed Assistant Naval Constructor in the Navy and detailed in charge of the Construction Department of the Pensacola Navy Yard. He became Chief Constructor of the Navy March 1st, 1882, and held that position till July 13th, 1891, when he resigned as Chief Constructor, owing to ill health, and secured two years' sick leave. Mr. Wilson was the first American to be elected a member of the English Institute of Naval Architecture.

INDUSTRIAL NOTES.

The Carnegie Steel Company, it is reported, has closed an option on forty acres of land, to be used as the site for the new forging plant, belonging to the Oliver estate in Duquesne. The consideration mentioned is \$5,000 per acre, or \$200,000 for the whole.

The Aetna Standard Iron and Steel Company, of Bridgeport, O., manufacturers of iron and steel in various forms, and also of tinplate, has decided to erect an open-hearth steel plant adjacent to its

present works, and plans for the same are now being drawn.

New York State Superintendent of Public Works George W. Aldridge has awarded the following contracts: For iron bridge over the Black River at Carthage, sub-structure to Dunfee, Belden & Co., Syracuse, for \$4,916; superstructure, Buffalo Bridge & Iron Works, for \$15,170.

The Seymour Manufacturing Company, of Seymour, Conn., is enlarging its boiler-house, and the new portion of the building will be constructed entirely of steel in order to make it absolutely fire-proof. The contract for the steel work has been let to the Berlin Iron Bridge Company, of East Berlin, Conn.

The New York Car Wheel Works, of Buffalo, N. Y., have established a branch of their works in Buda Pesh, Austria-Hungary, and the making of wheels on the "Griffin system" has already commenced. The plant employs, at present, 150 men and it is expected to increase the number at an early date. Mr. Griffin is now in Buda Pesh.

The Nail Association, which is known as the Nail Trust, recently purchased the Boackes Mill, of New York and Philadelphia, for \$600,000, and the Pittsburg Wire Company for \$750,000, thus securing a practical monopoly of the wire nail industry, and enabling it to regulate the price and output. The association has advanced the price from 70 cents a keg to \$3.20 in the two years of its existence.

The Denver Engineering Works, of Denver, Colo., are building five Bruckner roasting furnaces, 8 1/2 ft. in diameter and 23 ft. long, for the Germania Lead Works of Salt Lake City. They have shipped to the Metallic Reduction Company, of Florence, Colo., two Argall four-tube ore dryers 8 ft. in diameter, and one for the Gold and Silver Extraction Company, of Leadville, and have about completed the machinery for the large sampling works of Taylor & Brunton, at Cripple Creek.

TRADE CATALOGUES.

Theo. Altenecker & Sons, Philadelphia, have published their 1896 catalogue of "Imperial German" drawing instruments, a copy of which is at hand. The quality of these instruments is well known, and as their safe delivery by mail is guaranteed by the sellers, purchasers are sure to obtain satisfaction.

The Lunkenheimer Company, Cincinnati, O., manufacturers of brass and iron valves, lubricators and steam specialties, have issued their 1896 Pocket Edition Catalogue, which is a valuable little book of 119 pages. The various articles manufactured are well illustrated, in many cases their construction is carefully described, and in such cases where it seems desirable accurate directions how to use them are also given. These features make the little book valuable for more purposes than merely as a catalogue.

The Taylor Iron and Steel Company, of High Bridge, N. J., has issued a pamphlet relative to shoes and dies of manganese steel, this material being used because of its combining the desirable qualities of hardness, malleability and toughness. As manganese steel does not chip nor spall off, shoes and dies made of it wear evenly and do not cup. They are highly spoken of by many prominent millmen in published testimonials, and we also hear them very highly spoken of by those who have used them. Manganese steel is also an excellent material for car wheels, crushing rolls and other things used at the mines.

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 manufacturers 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 or selling goods of any kind.

GENERAL MINING NEWS.

ALASKA.

ALASKA GOLD LAKE MINING COMPANY.—This company was organized recently at Ashland, Wis., by ex-Gov. A. P. Swineford of Alaska and local men. The property of the company is located about 14 miles from Sitka. Operations will be commenced at once. They have a stamp mill concentrator and other necessary mining machinery on the ground ready for business, and it is reported that they have already mined 800 tons of \$9 ore. The capital stock is \$80,000.

ALASKA-WILLOUGHBY COMPANY.—This company, on the west side of Admiralty Island, on Funtner Bay, has completed a 10-stamp mill, and will start up at once. This company has five distinct ledges and large ore bodies have been exposed.

BERNER'S BAY MINING AND MILLING COMPANY.—This company is operating quite extensively at Berner's Bay 60 miles north of Juneau. Most of the ore is being reduced by a 40-stamp mill, mines and mill giving employment to 150 men.

ARIZONA.

COCHISE COUNTY.

DOS CABEZAS.—In these mines Casey Brothers have struck a vein of high-grade ore over 12 ft. wide and apparently widening on the east drift of the 200-ft. level. They had run a drift just above the lode and then sunk a winze with the above result.

PIMA COUNTY.

ROSEMONT.—The sale of this copper mine was effected June 27th to Lewisohn Bros., of New York, owners of the Old Dominion mine at Globe.

PINAL COUNTY.

MONARCH, NATIVE COPPER AND MINERAL CREEK.—C. E. Taylor, of Globe, is developing these claims, located on Mineral Creek, of which he is the owner. These claims are about half a mile [north] of the Ray property and contain native copper.

YAVAPAI COUNTY.

(From an Occasional Correspondent.)

PLANET-SATURN MINING COMPANY.—Mr. Horace F. Brown is at Congress with Dr. E. D. Peters for the purpose of erecting an automatic mill of the Brown system for this company. This mill will be completely automatic, consisting of Brown Elliptical Roasters, Automatic Pulp Distributors, etc., and is to have a capacity of 75 tons per day. The process will be cyanide, and exhaustive experiments show that by roasting, as high as 95% of the gold can be saved, as against about 65% by treating without roasting.

It is expected to have the mill in operation about September 1st.

UNITED VERDE COPPER COMPANY.—The new furnace of this company at Jerome has been started up. The furnace in its workings embodies a new process of roasting ores, which was originated by the men now in the employ of W. A. Clark, and the process is being perfected by them.

CALIFORNIA.

BUTTE COUNTY.

(From Our Special Correspondent.)

MAGALIA.—At this mine, 2 1/2 miles from Center-ville, the shaft has struck the old Pershacker works and emptied the large body of water from it without accident. The work on the channel will be commenced at once. The deposit in this mine is known to be rich and extensive.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

CALAVERAS CONSOLIDATED.—At this mine, on the south slope of Carson Hill at Robertson's Ferry, the tunnel has been re-opened about 1,000 ft., and when in about 300 ft. more an upraise will be made for ventilation.

EL DORADO COUNTY.

(From Our Special Correspondent.)

BIG SANDY.—This mine, near Kelsey, is owned by Toledo, O., parties, who are pushing the development work. The double compartment shaft is down 200 ft., sinking at the rate of 10 ft. per day. It is thought the ledge will be struck at 500 ft.

FRESNO COUNTY.

COALINGA.—It is reported that more than 5,000 acres of oil claims in the Coalinga district have been filed in the County Recorder's office in two days.

KERN COUNTY.

(From Our Special Correspondent.)

IVY M. PLACER.—On this claim, in the Red Rock District, a nugget weighing 34 ounces, valued at \$600, has been picked up. Some half a dozen others, ranging in value from \$25 to \$400, had been found previous to this. The gold shipments from Mojave station this month will exceed \$20,000. All the camps to the north and east are doing well.

NAPA COUNTY.

AETNA CONSOLIDATED QUICKSILVER MINING COMPANY.—The gross earnings of this company for the quarter ending May 1st were \$35,000; expenses, \$14,510. A dividend of \$10,000 was paid on the 10th, so there was \$10,490 to be carried forward to profit and loss account.

NAPA CONSOLIDATED QUICKSILVER MINING COMPANY.—For the quarter ending June 1st the gross earnings of this company were \$45,500, while the expenses were \$23,457. The usual dividend of \$10,000 and an extra one of the same amount will be paid on July 1st. This will leave \$2,000 to be carried forward.

NEVADA COUNTY.

PENNSYLVANIA.—A pocket of fine ore is reported to have been struck in the 600 ft. level of this mine.

(From Our Special Correspondent.)

NORTH BLOOMFIELD DISTRICT.—The old Watt, Blue Coat, Backbone and several other gravel properties to the north of the Derbec, have been bonded to an English syndicate represented by M. Simianson. Work will be commenced within 30 days on a tunnel which will be run some 800 ft. to tap the channel. It is known at just what depth the channel can be tapped and the whole ridge worked. Water power is plentiful. This is con-

sidered one of the largest gravel mining enterprises on the coast.

## PLACER COUNTY.

(From Our Special Correspondent.)

**JOSEPH BYRNE ESTATE CLAIM.**—This drift mine, lying between the Morning Star and the Big Dipper mines at Iowa Hill, has been sold at referee's sale to Waterhouse & Lester for \$41,000. The channel of this claim is about 2,000 ft. long.

**GOLD BLOSSOM.**—This mine, located 1½ miles northwest of Ophir, comprising 6,000 ft. on the vein, is being reopened. The shaft will be sunk 200 ft. as soon as the mine is freed from water.

## SHASTA COUNTY.

**CONANT.**—It is reported that a large body of rich ore has just been exposed in this mine at Harrison Gulch.

**FORBES.**—Rahn & Schmidt, of Sacramento, who recently purchased this mine from Mrs. Josephine Forbes, have completed the building of a good road, which replaces the old one. At the mine they have a force of 12 men employed under the foremanship of John H. Cox of Stillwater, formerly foreman of the Iron Mountain mine.

## SISKIYOU COUNTY.

(From Our Special Correspondent.)

**COLUMBIA.**—This mine, six miles east of Scott's Bar, has 40 men at work building a road from the mine to the mill. A concentrator has been put in and additional stamps will probably be required.

## TRINITY COUNTY.

(From Our Special Correspondent.)

**MINERSVILLE HYDRAULIC GOLD MINING COMPANY.**—This company owns about 3,500 acres of gravel one mile and a half east of Minersville. The mine is well equipped, employing about 100 men. A new ditch and two new reservoirs are being built, which will give the company enough water to extend its operations this summer.

## COLORADO.

## ARAPAHOE COUNTY.

**DEER CREEK.**—A streak of free gold in a prospect on Mineral hill, south of this town, has just been uncovered.

## BOULDER COUNTY.

**PRUSSIAN & LITTLE PITTSBURG.**—Samuel Newhouse has sold all of his interest in the Prussian mine and mill site, the Little Pittsburg mine and all other properties in the Prussian deal. One-half interest was sold to James R. Hutchinson, of London, and the other half to Matt I. Newhouse, of New York City.

## CHAFFEE COUNTY.

**SALIDA.**—Another ledge of silver ore has been discovered on Brown Creek, said to be fully 75% crystallized lead, running 50 oz. in silver. The property is owned by Bertschy and Bosham. Arrangements are being made to erect a concentrator on the ground.

## EL PASO COUNTY.

**HOOSIER BOY.**—A contract has just been let for an additional 100 ft. of tunnel work on this mine on Beacon Hill. This will put the tunnel 200 ft. into the hill.

**MAY CLAIM.**—The south 600 ft. of the May claim, located between the Moose and Carbonate Queen, in Aréqua Gulch, has been sold for \$20,000. The purchasers were the Anglo-American Gold Exploration syndicate.

**ORPHAN BELL.**—R. M. Maloney is putting in a new 35 H. P. double hoist and boiler on his lease on the Orphan Bell, on Bull Hill. The new double compartment shaft where the machinery is being installed is down over 40 ft.

## EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

**ANCHORIA LELAND.**—The new machinery is at work, and is the best in the camp to-day. The new three-compartment shaft has a depth of 425 ft. The machinery and shaft thus far have cost over \$20,000, and the treasury still shows a surplus of \$40,000. With a trainload of narrow-gauge cars on the way to the smelters, at the present writing dividends may soon be expected. A station has been cut at the 350-ft. level. The capacity of the car is 1 ton, and was raised and dumped in 22 seconds.

**ELKHORN.**—This mine, on Tenderfoot Hill, adjoining the Hayden Placer subdivision, is again being worked by that veteran successful miner, Mr. Hall. The depth of the shaft is 100 ft., but all the work has been done at the 80 and 40-ft. levels. This claim is an 1891 location. Early in 1893 the whole of the vein "panned well," the quartz being very white and porous, but below the 40-ft. level the vein was thoroughly unoxidized and composed largely of iron pyrites, carrying values of from \$8 to \$15 per ton. In addition to the regular Elkhorn vein two crosscuts exposed two other veins and on these Mr. Hall intends to make the development. The district north of town has thus far been unprofitable work.

**GENEVA.**—This shaft, on Gold Hill, has been sunk 400 ft., and it is reported that the vein in the shaft is rich. The shaft has been sunk on a barren spot in the vein for nearly 200 ft.

**INGHAM.**—This mine, on Raven Hill, is being worked by the owners and employs 16 men, largely on development. Returns from 25 tons gave the following results: Twelve tons, \$55 per ton, and 13 tons, \$28 per ton. This property was worked for

several months by Messrs. Proudfit & Co., of Colorado Springs, with an option to purchase.

**LAST DOLLAR.**—This mine, on Bull Hill, is owned by Messrs. Eiders, of the Colorado Smelter, Dickson & Codman. They have sunk the new working shaft and intend to continuously sink until 500 ft. has been reached. The output for the week was 70 tons of smelting ore and 80 tons of milling ore sent to the cyanide mill.

**LONE STAR.**—This property of the Arcadia Company, situated in Poverty Gulch, has wonderfully improved during the last three weeks. Returns from a 30-ton shipment gave \$64.40 per ton and was extracted from the sinking of the shaft. The present depth is 140 ft. Drifts have been started both ways and the vein assays well. The next shipment is expected to yield about 4½ oz. per ton. Some beautiful specimens of telluride ores were found the past week and the vein or the pay streak of the phonolite dyke is fully 2 ft. wide.

**MAY QUEEN TUNNEL.**—The Cripple Creek Consolidated Company has penetrated Womack Hill a distance of 222 ft. with this tunnel. The objective vein is still, or supposed to be, 80 ft. ahead. Three veins have already been intersected and assays show values of from \$5 to \$9 per ton.

**MOON ANCHOR.**—At this mine, on Gold Hill, a crosscut has been started from the fifth level for the ore shoot, which is about 60 ft. away from the shaft. The output is gradually increasing and is now 12 tons of shipping ore daily. Thirty-eight men are employed.

**PHARMACIST.**—This mine, on Bull Hill, is slowly sinking its new shaft, having now reached a depth of 60 ft. The new machinery for the deep shaft is being erected, and consists of an 80-H. P. boiler and 10 x 12 engine. The returns from a 10-ton lot gave 11 oz. per ton, which came largely from the 250-ft. level.

**REPUBLIC.**—This claim, adjoining the town of Anaconda, and located early in 1891, bids fair to become a shipper in the hands of the present lessees. Returns from a car lot gave 4 oz. Already two steam hoists are in process of erection.

**SWEET MINE.**—This is again being worked under lease and bond by Moses Brothers, of Pueblo. This property has had a chequered career for four years; worked repeatedly under lease and bond, shipping to-day, idle to-morrow, grand specimens of telluride ore, there unproductive, always lots of water, depth only 150 ft. Another attempt is to be made to unwater the shaft. In the meanwhile a shaft is to be sunk 100 ft. deep on the vein north of the old shaft. This vein, more than any other vein in the camp, is distinctively an altered granite, carrying often rich values between granite walls.

**TRACHYTE.**—This mine, on Bull Mountain, recently made a shipment from its 175-ft. level, the first grade of which sampled a trifle over 10 oz. and the second grade \$22 per ton. The company have had a very good offer to purchase a new hoisting plant. An adjoining lessee has offered to sell his plant, which was had less than three months' use, for \$500 less than it cost to take stock in the company at 4c. per share for the money.

**UNION MINING COMPANY.**—The properties of this company on Bull Hill continue to yield increasing shipments of fairly good grade. One ton of selected ore gave returns of \$1,520 per ton, and came from a rich seam from the bottom of the Orpha May claim. The five cars shipped last week netted \$110 per ton. About four tons of low-grade ore are treated daily at one of the local stamp mills.

## GARFIELD COUNTY.

**ELK CREEK.**—Reports from Elk Creek are that a gold vein has been found there.

## GILPIN COUNTY.

(From Our Special Correspondent.)

**COEUR D'ALENE.**—The water is being hoisted from this mine and the levels being put in shape with a view to a sale.

**CONCRETE-GUNNELL.**—The hearing of the suit between these companies has been postponed, by consent of both companies, until next January.

**CORYDON.**—A contract has been let to sink the shaft, now 600 ft. deep, a further depth of 100 ft.

**EGYPTIAN.**—Preparations are being made to rework this property on Quartz Hill. The work of retimbering the shaft to the 700-ft. level has already been commenced.

**GILPIN COUNTY TRAMWAY.**—A change has taken place in the management of this company, Mr. F. Kruse being succeeded by Mr. J. Bostwick, at one time superintendent of the Gregory-Bobtail. The change is expected to lead to considerable alterations in the rates charged for haulage.

## GUNNISON COUNTY.

**CARPENTER.**—Mr. Clark, superintendent of the Carpenter group, has employed an additional force of men to push forward the big tunnel started last winter.

## HINSDALE COUNTY.

**BIG INDIAN.**—An opening made in the side of the shaft, about 30 ft. above the 100-ft. level, exposed a vein of gold ore, 14 in. in width.

**GOLDEN FLEECE.**—This company, in its report for May, shows that the shipments of first-class ore amounted to 13,158 lbs., which returned \$27,028.68, or better than \$2 per lb. The amount of dump ore shipped was 1,912,828 lbs., which returned \$5,485.67. The entire expenses for the month, including work

on the Colorado City claim, were \$19,123.78. The profits for May were \$19,123.52. The surplus in the company's treasury on June 15, after deducting dividend No. 42 of \$18,000, is \$33,228.01.

**YANKEE BOY AND LEGAL TENDER.**—Messrs. Grant & Fulton have bonded the property for one year, and operations will commence upon both levels of the Legal Tender and upon the lower level of the Yankee Boy at once.

## LAKE COUNTY.

**WINAN.**—The winze sunk about 125 ft. from the mouth of the Winan tunnel, on Printer Boy hill, has reached a depth of 82 ft. and a body of lead ore has been broken into.

## PARK COUNTY.

**HOCK HOCKING.**—These mines, located 8 miles from Fairplay, near the London mines, are getting in shape to ship ore. The mines have been in litigation for five years, but the Hale Company has secured all rights and will proceed to develop. The mines in question are the Weston, Hock Hocking, Echo, Elegant and Nesbitt.

## PITKIN COUNTY.

**DURANT.**—This mining company, of Aspen, has leased the Schiller property of James H. and H. K. Devereaux.

**MAYFLOWER.**—Joseph Brown and Paul Caley have obtained a lease on the Mayflower.

**PERCY CONSOLIDATED.**—This company has bought a sixth interest of George S. Newman in the Stillwell.

**SAN JACINTO.**—Samuel McClellan has leased some blocks in the San Jacinto.

## SAN MIGUEL COUNTY.

**CARRIBEAU.**—Excavating work has commenced for the mill of this company. It will be large enough to contain 20 stamps. Ten stamps will now be placed.

## ROUTT COUNTY.

**HAHN'S PEAK.**—Owners of claims at Hahn's Peak have united to sink a common shaft for the purpose of developing the blanket vein.

## FLORIDA.

## DE SOTO COUNTY.

**CONSOLIDATED PHOSPHATE COMPANY.**—This company is running its mines and its plant at Fort Ogden steadily, and employs about 200 men.

## IDAHO.

## CASSIA COUNTY.

**WOMAN'S RIGHT.**—An important strike is reported in this claim, in Willow Creek District, an ore body, 23 ft. wide, having been opened up.

**BLUE BUCKET.**—A strike has been made in this claim, on Rock Creek, opening 7 ft. of free-milling ore of good grade.

## LEMHI COUNTY.

**SALMON GOLD MINING COMPANY.**—This company started their first clean-up this week. An experimental washing of ¾ of an acre made late last season showed \$7,000 gold to the acre.

The mine comprises 3,800 acres of land. There are three pits now in operation working six giants. The company's hydraulic plant cost exceeding \$150,000; their electric light plant enables constant working by day and night. The capital is \$1,000,000, divided into 300,000 shares of \$5 each, of which 100,000 shares are issued to date. The property is in process of being patented. Mr. Leopold Schlegelmilch, of Spiedel & Co., is president of the company; Edward A. Clark, of the United States Oil Company, is treasurer. William B. French, William H. Coolidge and Charles H. Cole, of the Globe National Bank, are among the directors.

## SHOSHONE COUNTY.

**FORMOSA.**—This property, situated a mile below Gem, completed its flume bed as nearly as possible until the creek goes down enough to put in their dam opposite the Granite mill. Considerable work has been done on the foundation for the concentrator, and some timber is now on the ground for it. Work will not be rushed, but will go steadily forward until it is finished.

**GEM.**—This mine on the 22d inst. shut down, but expects to resume with one crew in a few days.

**MAMMOTH.**—This mine is running steadily, working 30 to 40 men, shipping all its high grade ore and leaving its low grade on the dump.

## OWYHEE COUNTY.

**BOONVILLE.**—The drift from the lower crosscut (Black Jack) has cut a chute of ore, the vein being nearly 10 ft. in width. Work on the new mill is being pushed as rapidly as possible. It will have a capacity of 80 tons per day.

**PAUPER.**—A steam fan was erected on the property recently for ventilation in the tunnel.

## KANSAS.

## CHEROKEE COUNTY.

(From Our Special Correspondent.)

**COCK-ROBIN.**—At present this company is drifting at 80 ft. on a large face of lead and jacking and making over 40 tons of zinc ore and 7,000 lbs. of lead each week. They have a good run of lead at 90 ft., but are not working it at present.

**EMPIRE CITY AND GALENA.**—The following facts are interesting, as they show the wonderful growth of these mining camps. There are in the territory surrounding Empire City and Galena over 310 pro-

ducing mines which have 74 pumps to drain them and furnish water to wash the ore. There are over 200 prospect shafts going down, drained by 11 pumps. There are 26 steam concentrating plants, 3 hand jig plants and 2 sludge mills running, some of them day and night. It is estimated that there are about 3,100 miners, or a total of 3,500 in all employed to get the ore on the cars for market, and this would make a population for the two camps of about 13,500. These figures are very conservative, as there are a large number living in tents because they cannot get houses to live in.

**KIRBY & COMPANY.**—G. Schmuck is the General Manager of the R. O. Kirby & Co.'s lease. This company has leased 14 acres of the Mastin land and is one of the largest producers from the same number of acres in the district. There are eight mines producing from one to two hundred thousand pounds of lead and over a half million pounds of free and rough ore each week. Warren Bros. & Co. own one of these rich mines, which has been a large producer for over two years and now are working at 110-ft. level on rich dirt. Schemerhorn, Huff & Co. are drifting at 100 ft. on a large face of ore. Pickett & Allen are hoisting rich dirt from the 80-ft. level. J. H. Baker & Co. are drifting at 110 ft. The Erie is hoisting rich dirt from 108 ft. Wood, Huff & Co. and Moore & Co. are drifting at 110 ft. on a large face of ore. At the Sunflower they have a rich run of lead at 60 ft. and a large face of zinc ore at 115 ft.

**NORTH EMPIRE COMPANY.**—This company has put in another steam jig and two more sets of rolls. They take out every particle of ore and clean their sludge. This is one of the most complete steam plants in the district. They are running on very rich dirt that makes about 20 tons of zinc ore every 10 hours.

**WELDY & COMPANY.**—On the North Empire lease Col. Weldy & Co. have struck a fine lead and zinc prospect at 101 ft. in open ground. Three faces of ore have been run onto their lot from three different directions, and from the present showing it looks as though there is a large body of ore on their lot which they will work at once.

MICHIGAN.

COPPER.

**TAMARACK MINING COMPANY.**—This company began work recently on a superstructure for a new stamp mill near the present mill. The new mill will be of steel all through above foundations, and absolutely fire-proof, and will have capacity for stamping 500 tons of rock daily. It is expected stamping will begin in the fall.

IRON—MARQUETTE RANGE.

**PITTSBURG & LAKE ANGELINE IRON COMPANY.**—Stockholders of this company met last week at Cleveland, O., and elected the following directors for the ensuing year: James Laughlin, Jr., John W. Chalfant, George M. Laughlin, B. F. Jones, Jr., William G. Mather, W. G. Pollock, D. C. Phillips, E. R. Perkins and Alfred Kidder. The board of directors elected the following officers: President, James Laughlin, Jr.; vice president, John W. Chalfant; secretary and treasurer, W. G. Pollock; mine agent, A. Kidder.

MINNESOTA.

(From Our Special Correspondent.)

**MINE VALUATIONS.**—The town assessor of Biwabik has returned the assessed valuation of the mines in his district as required under the new ruling that proposes the taxation of the mines in the customary way and not by the former 1c.-a-ton method. The mines are put as follows: Biwabik, \$60,080; Canton, \$38,000; Duluth Williams, Cincinnati, Hale, McKinley, each \$30,040. While no other mining district in the county has made its return, the Biwabik assessor states that all are to be assessed, he learns from the county officials, on the same scale, and all are to be confirmed by the board. To anyone who knows of the conditions, the inequality of this assessment, especially for the smaller mines, is most apparent. Not only will mines entirely idle be forced to pay half as much as others producing from 300,000 to 500,000 tons a year, but the total to be received will be hardly more than under the present arrangement. In the case of the large shippers it will be less even if figured on the high-tax rates of the mining towns. The State Board is likely to make very decided changes in these assessments. Already there is great dissatisfaction among range and county interests.

**THE DULUTH IRON MINING COMPANY.**—This company has given an option on all its 12,000 acres of fee lands scattered over the Mesabi Range, to one of the big corporations, and explorations are now under way. The amount of the option price is not stated, but it may be set down as somewhat less than the \$1,000,000 for which the same company gave an option about two years ago. There is known to be very considerable ore deposits on the lands.

**TWO HARBORS.**—Shipments of iron ore from Two Harbors last week were 100,000 tons on 44 vessels, the largest amount ever sent out in any week at this time of the season. The movement from mines to dock is very large, and is accomplished without friction or loss, the most admirable system of executive management being that of President Greatsinger and his corps of assistants. The quietness and machine-like precision of management of affairs under President Greatsinger in this line is some thing remarkable.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

**JOPLIN ORE MARKET.**—The output of ore last week was a little larger than the week before, but at Webb City and Cartersville there are a large number of plants and mines that are not mining, as the water is still up in the drifts and they cannot be worked at present. The sales of ore were less than last week and the top price paid for zinc ore was \$20.50, with an average of \$18 per ton. There is at present in the different camps about 2,000 tons of zinc ore which has not been sold. The top price paid for lead ore last week was \$16.25, with 50c. added for hauling. The following was turned in from the different camps: Joplin zinc, 1,389,950 lbs.; lead, 244,940 lbs.; value, \$15,902. Webb City zinc, 205,320 lbs.; lead, 21,630 lbs.; value, \$2,214. Cartersville zinc, 890,900 lbs.; lead, 221,730 lbs.; value, \$11,727. Galena, Kan., zinc, 2,710,000 lbs.; lead, 515,000 lbs.; value, \$33,875. Zincite zinc, 24,150 lbs.; value, \$242. Wentworth, zinc, 173,570 lbs.; value, \$1,642. Totals for the district: Zinc, 5,393,890 lbs.; lead, 1,003,300 lbs.; value, \$64,612.

**BUSHBY & COMPANY.**—J. H. Bushby, of Joplin, Mo., and four capitalists of Providence, R. I., have leased 80 acres of Mrs. Jones and 80 acres of Charles Schifferdecker, located 8 miles east of Joplin and 2 miles south of Scotland, just north of Newton County line. They are prospecting the lease with a steam drill and in the second drill went through 5 ft. of rich dirt in open ground at 45 ft., and then after going through 88 ft. of hard limestone struck rich lead and zinc ore at 138 ft. in blue flint, and have drilled through 26 ft. of rich dirt and are still drilling in the rich ore. The strike has caused considerable excitement in the adjoining camps and a large number of miners who have visited the lease were surprised to find the drillings so rich in ore. The nearest producing shaft is over 2 miles.

**BLANTON & COMPANY.**—In Chitwood Hollow, on the Leonard land, Blanton & Company have been sinking a prospect shaft and at 100 ft. they struck a rich lead and zinc ore prospect in open ground with strong water which they hold with an 8-in. pump. They are taking out a large quantity of the finest kind of soft Missouri lead free from chatts or mundic and will make their first turn in this week. They have had considerable trouble in sinking, on account of the strong water, but are now getting some fine zinc ore.

**GRAMBY COMPANY.**—This company is developing deep ore on their land at Oronogo. Nine drill holes have been drilled, in one of which 22 ft. of pay dirt was penetrated at 217 ft. and in another 26 ft. of rich dirt at 220 ft. These developments have been made on the west 40 acres of the Gramby Company's land.

**LA TOSCA COMPANY.**—This company, comprised of Monett capitalists, has nearly finished a \$3,000 steam concentrating plant at Oronogo, and expects to start up Monday after the Fourth of July. They have leased 17 acres on the flat of the Gramby land, which the Gramby Company is now draining with a 15-in. lift pump that throws a very large stream of water. They have a large face of ore in shooting ground on the 115-ft. level.

**LITTLE JEWEL.**—The Little Jewel plant is running steadily on rich dirt and is making about 7 tons of zinc ore and 4,000 lbs. of lead ore every 10 hours. They are drifting at 130 ft. on a large face of lead and zinc ore in open ground, with plenty of water to run the plant. This plant is located two miles west of Joplin on the Wright lease.

**RABBIT'S FOOT COMPANY.**—The Rabbit's Foot mine on the Joiner land west of Joplin has passed through the usual trying ordeal of "becoming" and now promises to be a good steady producer. A face of zinc ore 30 ft. high has been developed running east and the entire drift is now nearly 100 ft. long and has been cut over very rich ore. There is not found a sluice of mundic or lead and they get the top price for it. A concentrating plant recently erected is now completed and will start up this week.

MONTANA.

JEFFERSON COUNTY.

**FREE COINAGE.**—The lower levels of this mine are showing up well, indicating that the ore gets richer with depth and the ore bodies larger. The upraises being cut through to connect the different levels will be completed this week.

**IRON MASK.**—This mine, which is situated on the top of the White Horse range, at the head of Whipcracker Gulch, six miles from Bedford, was recently sold, says the Butte Miner, to Helena and Eastern capitalists, of whom E. W. Bach is the head, for \$49,000.

**LITTLE NELL.**—The shaft on this property has now reached 450 ft. A sump is being dug and a station put in at that point, and drifting both east and west from the shaft will be commenced at once. Sinking will be continued 100 ft. deeper, when another drift will be started. The shaft which is being sunk on a slight incline has a vein of good ore.

MADISON COUNTY.

**MORRIS AND ELLING GROUP.**—The sale of these mines, at Pony, is now assured, and the pending negotiations will all be closed up before August 1st. Under the new arrangement Messrs. Morris & Elling will retain a one-half interest in the company, which will be incorporated on a basis of \$1,000,000.

MEAGHER COUNTY.

**MORNING STAR.**—This mine is showing up a large body of copper ore.

SILVER BOW COUNTY.

**BOSTON AND MONTANA MINING COMPANY.**—It is reported that this company will pay an extra dividend shortly. The company is said to be earning nearly \$3,000,000 per annum net.

**ORIGINAL BUTTE MINING COMPANY.**—Attachment proceedings have been commenced in the District Court by the Colorado Smelting Company against this company for the sum of \$65,748.84, according to the *Western Mining World*. The complaint alleges that the defendant company is indebted to the plaintiff in the above named sum for money laid out and expended for the use of the defendant at the latter's special instance and request. An attachment was placed in the hands of the sheriff, who levied on all the property of the defendant. It is understood that this is an old business transaction growing out of money expended on the old Original claim just west of the Gagnon. Further particulars cannot be learned, but the suit is no doubt brought to settle up some old matters.

**MACARONA.**—A rich strike is reported to have been made on this mine, in Horse Cañon, Butte District. The shaft on this property had been sunk 200 ft., at which point a short crosscut was run, tapping the lead, which is of considerable size. The pay streak is 2 ft. in width, and of a good grade of copper ore. The shaft will be sunk another 100 ft.

NEVADA.

ELKO COUNTY.

**DEXTER.**—The management of this company, whose properties are at Tuscarora, have given an order for two Kinkead mills that have a capacity equivalent to 10 stamps, a 16-H. P. engine that will be operated with crude oil, crushers and such other items as are necessary to make the plant a complete one.

LINCOLN COUNTY.

**DE LAMAR.**—The daily production of these mines is said to be \$18,000.

STOREY COUNTY—BRUNSWICK LODE.

The following are extracts from the latest weekly report of the superintendents:

**CHOLLAR.**—The south drift on the 200-ft. level is out 121 ft.; the face is in porphyry. At a point 115 ft. in, an east crosscut has been started and extended 51 ft. When in 18 ft. it cut a streak of ore 14 in. wide assaying \$7 to \$28 per ton, and when in 24 ft. another one 10 in. wide was cut, which assayed \$25 to \$30 per ton. The face is in porphyry with stringers of quartz through it. On the 300-ft. level the joint Hale & Norcross and Chollar south drift is out from the station 64 ft., skirting the foot-wall, which is well defined at that point. Have resumed sinking No. 1 incline, which is down 469 ft. Have shipped from the Brunswick lode 24 tons of ore saved in running the 200 level south drift to the Nevada mill for reduction, the average car sample assay of which was \$68.68 per ton.

**CONSOLIDATED CALIFORNIA AND VIRGINIA, BEST & BELCHER AND GOULD & CURRY.**—Shaft No. 2.—This shaft was sunk 10 ft. on the incline; total depth, 247 ft.; bottom in hard porphyry. Gould & Curry tunnel—Have resumed work in the face of the tunnel and extended it 25 ft., passing through porphyry and quartz; total length, 767 ft. Also resumed work in east crosscut No. 4, which was 750 ft. from the mouth of the tunnel, and extended it 11 ft.; total length, 33 ft. face; in porphyry and stringers of quartz.

**HALE & NORCROSS.**—Shaft No. 1—Resumed sinking in the shaft and have made 5 ft., passing through quartz and porphyry; total depth, 469 ft. Two hundred-foot level—The north drift from station passed into Savage Company's ground at date of last weekly report. Completed timbering the station and winze on the south boundary and resumed sinking on the 17th, and sank the same 11 ft. in porphyry and quartz of low value; total depth, 26 ft. Three hundred-foot level—Advanced south drift from station 48 ft.; total length 64 ft.; face in porphyry with stringers of quartz of low value. Started a north drift from the station on this level and advanced it 23 ft., face in porphyry.

**OCCIDENTAL CONSOLIDATED.**—The east crosscut on the 550 level from the lower tunnel which is being run to connect with the Edwards shaft is now in 261 ft., having been extended 50 ft. during the week. The face of the crosscut is in soft porphyry. 650 level—West crosscut No. 2, which was started 25 ft. south of the main winze, is in 450 ft., having been extended 44 ft. The face is in shelly porphyry. 750 level—The upraise started from the north drift is up 66 ft. and shows ore on the hanging wall all way up. The north drift is in 90 ft., extended during the week 19 ft., face in fair-grade ore. The south drift from west crosscut has been extended 15 ft.; total length, 81 ft.; face in ore assaying \$14 in gold.

**SAVAGE.**—In shaft No. 1 have finished the station for the 300 level and started a north drift therefrom. The joint north drift, 200 level, is now advanced 271 ft. to the company's south boundary; face in porphyry and quartz.

STOREY COUNTY—COMSTOCK LODE.

**CONSOLIDATED CALIFORNIA & VIRGINIA.**—The latest official weekly report of this company is as follows: On the 1,750-ft. level no ore has been extracted during the week. Our men working in the stope have been employed in filling with fine rock

the open stope or square sets at the south end of the openings above this level, where the gas was escaping last week. We have water turned into the stope in several places from the 1,650 ft. level, and we also convey water under pressure through pipes and hose to all the floors of the stope. The working part of the mine is free from gas now, and we expect to resume the extraction of ore some time during the coming week. Have shipped to the Morgan mill 611 tons and 1,500 lbs. of ore, assaying per railroad car samples, \$60.64 per ton. The average assay value, per battery samples, of all ore worked at that mill during the week (599 tons) was \$56.76 per ton.

**HALE & NORCROSS.**—The latest official weekly report states that on the 900-ft level, the north drift, heretofore called the northwest drift, is in 115 ft; face in porphyry and stringers of quartz; the drift has connected with the stopes from the 975-ft. level. Extracted from 975 stopes during the week 22 carloads of ore, assaying, per car sample, \$20.82 in gold and 20.27 oz. of silver per ton. Stopped Dazet mill on night of 18th, the crank shaft of the engine having been disabled. Have on hand 21 lbs. of crude bullion.

#### PENNSYLVANIA.

##### ANTHRACITE COAL.

**FIFTH INSPECTION DISTRICT.**—A peculiar question has been raised in the Department of Mine Inspection which promises to develop complications of an embarrassing character. James Roderick, appointed by Governor Hastings to that position last fall, resigned the position of inspector a month ago. At the same time he arranged with A. S. Van Wickle to take charge of his mines in this district, assuming the duties shortly after. No successor having yet been appointed as inspector, Mr. Roderick continued to conduct the affairs of the office. A few days ago a laborer was killed by accident in the Jeddo mines. Mr. Roderick instructed the deputy coroner to hold an inquest. Mr. John M. Lewis, superintendent of the Coxe Companies, has informed the coroner that the witnesses would not appear because there was no mine inspector, and the coroner must first be notified by that official before proceeding to make an inquiry. Mr. Lewis passed his opinion on the mine law, which specifically states that no mine inspector shall in any way be pecuniarily interested in any mining enterprise during his term in office. Deputy Coroner McCoombs did not hold the inquest, although Mr. Roderick still insists that he is the inspector. The question has now been submitted to Coroner McKee for his opinion in the premises, and the State authorities will also be asked to give an opinion in the matter.

**SHAMOKIN.**—J. B. Corliss, of Detroit, and C. N. Shipman, of Buffalo, are the principal shareholders of the Shipman Coal Company, which has been chartered with a capital stock of \$300,000. A new breaker will be constructed upon the tract.

##### NORTHUMBERLAND COUNTY.

**UPPER AUGUSTA TOWNSHIP.**—Justice of the Peace Emanuel Wilvert, of Sunbury, has discovered a vein of gold and silver in this township. Justice Wilvert has a lease and will develop the ore.

Assays by the Penn Smetting and Refining Works, at Philadelphia, show from \$5 to \$15 gold and from \$3 to \$5 of silver per ton in the surface ore. Other assays taken from ore further down show from \$10 to \$20 in gold and a small quantity of silver.

##### WASHINGTON COUNTY.

**GORDON FARM.**—The Gordon farm has been sold to the People's Light and Heat Company for \$51,000. What is known among oil men as the Gordon sand had its origin from this farm.

##### SOUTH DAKOTA.

##### CUSTER COUNTY.

**GRAY COPPER.**—Mr. G. W. R. Pettibone, of Lincoln, Neb., has bought an interest in the Gray Copper mine, situated near the town of Pringle, on the B. & M. R. R., 12 miles south of Custer. A shaft is to be sunk on the mine to the depth of 100 ft. to crosscut the vein from wall to wall. The vein is said to be 60 ft. in width, with a pay streak of about 40 ft. The average of 14 assays obtained from the streak is reported to amount to \$108 per ton.

##### LAWRENCE COUNTY.

**CLINTON MINING COMPANY.**—The new tunnel in the property of this company will soon make connection with the old workings. It will be 325 ft. in length, and will greatly facilitate the handling of the ore. In the Leopard lode, one of the claims owned by the company, a fine shoot of ore is being worked from which 20 to 25 tons per day is extracted by hoisting from a 50-ft. shaft sunk on the ore shoot. Drifts from this shaft are now being run to connect with the workings on other claims in which several other ore shoots have been opened up.

**DEAD BROKE MINING COMPANY.**—This company has the framework for their new stamp mill all up and nearly enclosed. The machinery is being put in place and it is expected on or before July 1st the plant will be in operation. The owners, Godfrey Bros. & Nelson, are now sinking a shaft from the surface at a point 1,000 ft. beyond the face of their present workings to intersect the ore body and afford ventilation for the lower workings.

**WAR EAGLE MINING COMPANY.**—At the annual meeting of the stockholders of this company, held in Deadwood last week, the following board of directors was elected for the ensuing year: John A. Blatt, Fred Roetzel, W. J. Ringley, Wm. Roetzel and Alvin Brooks. The board met and

elected W. J. Ringley, president; Alvin Brooks, vice-president; Ferdinand Roetzel, secretary and treasurer. A stock dividend was announced of 10,172½ shares now in the treasury. An assessment, No. 1, of five mills per share was levied upon the capital stock, to become delinquent July 20th, and if not paid on or before August 20th, such delinquent shares will be sold. The company own a group of claims in the Carbonate Camp, the workings of which show several small fissure veins of ore of good grade.

**WOODSTOCK GROUP.**—This group of claims, south of Lead, has been bonded for \$45,000 by Eastern men. There are 12 locations in the group.

##### UTAH.

##### JUAB COUNTY.

**EVA MINING AND MILLING COMPANY.**—This company has selected the location for their buildings and whim. They have just purchased a whim of a new design, and it will be put in place at once and the property actively worked.

**SUNBEAM.**—Professor Marcus E. Jones, of Salt Lake, who has a bond and lease upon this property, near Silver City, started a force of men at work.

**UNCLE SAM.**—Work has been started upon the tunnel development on this property, recently incorporated.

(From Our Special Correspondent.)

**FOUR ACES.**—At this mine a gasoline engine is doing the hoisting work, which is a very desirable way in this district, as water is very scarce, it being sold in the town at 1c. per gallon. The Swansea mine, where steam is used, gets its supply of water from the Mammoth mine, at Mammoth, which has the largest supply in the district, bringing it by pipe line a distance of about 20 miles, from a very large never-failing spring. At Eureka and Mammoth the country rock consists mainly of limestone, while around Silver City porphyry is predominant. Both the Rio Grande Western Railroad and the Union Pacific have an excellent service between the different camps in this district, running several trains daily.

**SOUTH SWANSEA.**—This mine produces some fine galena ore, and is being worked with a large whim.

**SWANSEA.**—Considerable activity is at present noticeable around Silver City, in the Tintic District, where lately a number of important discoveries have been made. At the Swansea mine a fine new hoisting plant has just been completed. This mine is now being worked to a depth of about 425 ft., and is at present shipping two or three cars of high-grade ore weekly, running about 125 oz. silver and 60% lead, a very desirable ore.

**TINTIC.**—The Tintic District of Utah promises within a few years to become one of the largest producing districts in the mining world. Two railroads now connect it with the smelting centers in the valley and its old mines and mills, the capacity of the latter being constantly increased, are doing splendidly. At Mammoth, the mill of the Mammoth mine, with its 60 stamps, alongside of the Sioux mill with 20 stamps, are working night and day on nearly 200 tons daily of ore from the respective mines. The Mammoth ore has lately averaged about 80% of its value in gold. A new town called Robinson is now being built in the vicinity of these mills and some of the owners of the Mammoth are taking a great interest in its growth. Besides the concentrates and the bullion from the above mentioned mills, a number of mines are shipping large quantities of ore, the Ajax being prominent among these. Denver capitalists have lately secured the Southern Eureka Consolidated group, consisting of a territory of about 40 acres near the south line of the world-famed Centennial Eureka, and have commenced operations at a point about 700 ft. from the north line. They are only about 40 ft. down at present, but expect to erect hoisting machinery, electric, if the power can be secured on satisfactory terms, and to sink several hundred feet, then to crosscut and explore for the large bodies of valuable ores which have produced so much wealth on the other side of the hill in the workings of the Centennial-Eureka mine. This mine continues to be operated on a large scale, a depth of about 1,500 ft. having been obtained, while the supply of ore seems to be inexhaustible. At the Eureka-Hill mine, now being worked to a depth of 1,100 ft., the mill is being enlarged, 40 new stamps and the necessary amalgamating machinery being put in place. About July 5th Mr. Arthur Buckbee, the superintendent, expects to start the mill up again, which will then be able to handle about 200 tons per day. The Bullion-Beck Mining and Milling Company continues the even tenor of its way. The Gemini at present 1,000 ft. deep, is shipping right along, while to the Godiva a new road is being built, previous to the hauling up of a plant of machinery. When this is erected sinking will be continued, the present depth being somewhat over 300 ft. In this entire district no water whatever is encountered in any of the mines, so that no expensive pumps or pumping is necessary. The water is brought about 20 miles by large pipe line to the Mammoth mill, whence it is distributed through the town of that name and through Robinson. A railroad from the Mammoth mine to the mill, a distance of about a mile, is now being constructed to do away with the hauling by team.

At Eureka the supply of water is brought from a distance of only a few miles, but is not as large as

that just mentioned. Silver City, a third camp in this district, is at present in its infancy, but promises well. Altogether the Tintic District promises in this near future to be a prominent factor in the production of the precious metal, a large percentage of its ores lately carrying high values in gold. With two railroads, the Rio Grande Western and the Union Pacific into its leading camps, a number of producing mines, no water to contend with and capital for development gradually coming in, it may certainly be considered to have a bright future before it.

##### MILLARD COUNTY.

**IBEX.**—Superintendent S. F. Mount, of this mine, in Detroit Mining District, reports that in the tunnel of this property a 3-ft. body of good shipping ore has been uncovered.

##### PIUTE COUNTY.

**DESERET.**—This property is now being cleaned out, preparatory to starting work.

##### SALT LAKE COUNTY.

**BUTTERFIELD MINING COMPANY.**—Northern Chief mine, in Bingham, embraced in the holdings of this company, is now shipping about a carload a week of first-class ore, with occasional lots of concentrates. The tunnel in the Queen mine, owned by the same company, is showing up the continuation of the Northern Chief vein, and work in this property will soon be resumed. This ledge, uncovered in the Chief and Queen, comprises a large body of ore that is said to average about \$20 in gold, 18 oz. silver, and 40% lead to the ton, but in it are found frequent chutes of high-grade ore.

**SALT LAKE COPPER MANUFACTURING COMPANY.**—It is reported that the claim against this company ("Copper Plant"), filed by those who donated the site of 160 acres, has been settled by Receiver Mason for \$10,000 cash. The original claims aggregated \$80,000. The prospect for the completion and operation of the plant does not seem to be very bright.

##### SUMMIT COUNTY.

**WEST ONTARIO VS. BLACK DIAMOND.**—The trouble between these companies has been settled, the suit withdrawn and work resumed on the latter. The adjustment is final and binding, according to the court record, upon all parties interested in both properties, their heirs, assigns, etc., which fact frees both properties from present and future litigation. The suit was filed in 1892 by the West Ontario company to prevent Black Diamond company from extracting ore from a portion of the vein crossing both properties and claimed by the defendants through right of apex. Beginning at the 200 level, where the ore was encountered, the plaintiffs traced the vein to the surface and thus established their rights, which were conceded by the defendants. Several meetings were held recently, which resulted in a compromise stipulating that a settlement should be made according to original lines, thus giving the West Ontario the disputed territory, the latter company agreeing to waive its claim for \$6,000 damages for ore extracted, and each to bear one-half the expense of litigation to date. The agreement was submitted to the court, which ordered a decree entered in conformity therewith, and thus what might have been a stubborn and costly fight was amicably settled.

##### TOOELE COUNTY.

**ELMA & SCRIBBLER.**—Work has commenced on these claims, the contract calling for 60 ft. of vertical shaft work. This property adjoins the August group, and is near the Cannon property.

**HILLSIDE.**—Work has been started again on this property, owned by J. B. Thompson and Capt. McFarland of Salt Lake City, a contract having been recently let for 100 ft. of tunnel.

**HEFNER QUEEN.**—C. J. Garber, of the Hefner Queen tunnel, in the Ophir district, has secured a lease on the property which lies to the west of the camp at Ophir and fronts on Rush Valley from the side hill. The present workings consist of a straight tunnel running into the hill for about 1,100 ft., together with drifts and upraises running from it. A vein of silver and lead ore carrying good values was encountered at a distance of 300 ft. from the entrance of the tunnel.

##### UTAH COUNTY.

**EARLY HARVEST CONSOLIDATED MINING AND MILLING COMPANY.**—This company has filed articles of incorporation with the clerk of Utah County. The object of the company is to own, sell and operate mining property. The principal place of business is Lehi. The capital stock is \$300,000, of \$1 per share. The officers are as follows: T. R. Cutter, president and director; W. E. Racker, vice-president and director; John Roberts, Jr., treasurer and director; Prime Evans, secretary, and J. J. Thomas, J. A. Thomas, Charles Crismon and Richard Bradshaw, directors. The mining property of the company consists of three claims in Fish Springs district, the Early Harvest, Comstock and Victor.

##### WASHINGTON.

##### KITTITAS COUNTY.

**SWAUK.**—A rich discovery of quartz is reported from Swauk. Several assays have been made, and it is said none shows less than \$166 in gold to the ton.

##### OKANOGAN COUNTY.

**IVANHOE.**—Alf. C. Cowherd will commence active work on this mine. The property is said to run

from 300 to 600 oz. in silver with a little gold. Mr Cowherd's partner, Mr. Westron, goes to Portland where he will open a mining office.

PIERCE COUNTY.

TACOMA SMELTING AND REFINING COMPANY.—Manager W. R. Rust, of this company, has returned from New York, where it is reported he made arrangements to procure \$250,000 to be expended in enlarging the smelter. Two new stacks, six roasters and a refinery are to be built, increasing the capacity of the plant over 200 tons per day.

STEVENS COUNTY.

CLEVELAND.—This mine is about to be incorporated. The owners of the mine have shipped 60 carloads of ore. There are 3,000 tons of ore on the dump almost all of which will be shipped.

COMBINATION MINING COMPANY.—This company has been incorporated with the following trustees, all of Spokane except the last, who is a resident of Victoria: Cyrus Happy, president; F. Whaley, Knox Johnston, J. C. H. Reynolds and James L. Forrester. The capital stock is \$600,000 with 200,000 shares in the treasury. The ore is said to average \$200 a ton. The company proposes to begin shipping ore to the smelter at once.

WEST VIRGINIA.

HENRY OIL COMPANY.—During the winter Col. J. H. Riley, of Marietta, O., secured leases on 80,000 acres of land in Putnam, Roane, Jackson, Mason and Kanawha counties. He transferred 20,000 acres last week to this company, of Chicago, and gave them an option on 20,000 acres more.

UNITED STATES OIL COMPANY.—One of the largest deals in oil recently consummated is reported to have been closed between C. D. Greenlee and this company, of Boston. Mr. Greenlee has sold his individual interests in the Cecil pool in Washington County, and the Ogden pool in this County, to the Boston syndicate for \$100,000. The transaction involves leases on 4,000 acres of territory, with 12 wells and a production of 300 bbls. a day.

MARSHALL COUNTY.

NORTH PENN OIL COMPANY.—This company, it is reported, has made two new locations, one on the Griffith farm and one on the Rogerson. The No. 3 Rogerson is running smoothly at about 8 bbls. an hour and is a good well. The No. 2 is doing about 15 bbls. a day and No. 1 about 65 to 75 bbls. a day.

WYOMING.

ALBANY COUNTY.

(From Our Special Correspondent.)

The mines lately discovered on the Big Laramie prove on development to be rich in gold and copper. Assays made on several of the ore bodies at a depth of 10 feet give from 86.50 gold and 13% copper to 825 gold and 41% copper. Two of the properties have been developed to a depth of 60 and 100 ft. and arrangements have been completed to market the ore in Denver until such time as the necessary reduction works can be erected on the ground.

It is estimated by Mr. Boswell, who lives at the crossing of the Big Laramie, that more than 5,000 people have crossed there the present season enroute to North Park and the surrounding mining camps.

The Boswell ranch is situated in the center of the mineral belt and experts in large numbers are coming in from Colorado, Idaho, Montana, Utah and South Dakota. Arrangements are being made for the immediate erection of a 100-ton concentrator.

Considerable is being done in placer mining in a small way; it is reported that several miners are making from \$5 to \$7.50 a day with the ordinary long tom and sluice box.

CARBON COUNTY.

BATTLE CREEK COPPER MINES.—The owners of these mines are taking in a big outfit of supplies and machinery and will place the mines in shape to make a large and continuous shipment of copper ore. The erection of a smelter at the mine is one of the improvements contemplated.

NORTHERN BELLE.—The tunnel on this mine is now in over 100 ft.

WEST SIDE PLACER COMPANY.—The plant of this company is about completed and the owners expect to begin work at once.

(From Our Special Correspondent.)

HERMAN DISTRICT.—A large amount of ground is being located by parties from Colorado and Montana. The ore bodies in this district are very large, a majority of the veins being from 25 to 40 ft. wide between well-defined walls of granite. Gold and copper are the leading metals found in this district.

During the past week several thousand acres of placer ground have been located along the north and south forks of Cooper Creek and the south fork of Dutton Creek. From the best information obtainable it is estimated that the gravel will run from 50 to 75c. per cubic yard. The gravel is about 20 ft. to bedrock with only a slight amount of soil on the surface. Some 1,600 acres have also been located on Rock Creek by the Breitung Chrysler Syndicate, where the formation and general characteristics are similar.

LARAMIE COUNTY.

(From Our Special Correspondent.)

GRANITE CANON.—Work is being actively carried on here and as depth is attained the properties improve rapidly. Some very fine gold and copper ore is now being taken out that gives good returns by fire assay.

SILVER CROWN.—A company has recently been organized for the purpose of developing the gold and copper properties in this district, some 20 miles west of Cheyenne.

FOREIGN MINING NEWS.

CANADA.

BRITISH COLUMBIA.

C. & C.—It is said that the recent strike in this property at Rossland is the most important one which has been made in the district since that made in the Jumbo a few months ago. The opening was made on the C. & C. and the incline is now on the ground of the Evening Star. In view of these developments the Evening Star people have increased their force and will go on with active work. There are 12 men now employed on the property.

CROWN POINT.—A short time ago a contract was let to run a tunnel 350 ft. This will take several months to complete. There are said to be about 3,000 tons of ore on the dump from the old workings and a large amount in sight for stopping. Shipments will commence as soon as the road to the tramway is completed. Three eight-hour shifts are working on the property night and day.

RANDOLPH GOLD MINING COMPANY.—Articles of incorporation of this company, to work the Randolph claim near the Butte and Commander claim, Rossland, have been drawn up. Capital stock, \$750,000. The vein shows a surface outcrop for 300 ft. A contract for development work will be let. One shaft is down 18 ft. and averages from \$6 to \$18 in gold.

The Ohio syndicate represented by W. A. Ritchie have made purchases of mining property in the Rossland District aggregating \$85,000. So far they have purchased the following five claims: The Enterprise, on Monte Cristo Mountain; Mabel, on Red Mountain; Climax, Consol and Camp Bell, on Deer Park Mountain.

RED POINT.—H. McRae, representing Ottawa capitalists, recently purchased this property, which is located on the west side of Lookout Mountain, from Benjamin Perkins. The claim is full-sized and has three ledges, one of which is 50 ft. wide. J. K. Clark effected the sale.

TIGER.—The vein on this mine has been stripped and opened for a distance of 300 ft. by surface cuts and shows a large body of good ore.

VANCOUVER.—Five claims on Siwash Creek, in the Yale district, were sold June 26th to London mine investors for \$100,000.

VIEW.—An opening has been made between this mine and the Southern Belle and a ledge exposed from 5 to 7 ft. wide, says the Rossland Miner. A tunnel is to be driven in on the vein. Assays of this ore is said to show as much as 10% in copper. The gold value is also good.

MEXICO.

LOWER CALIFORNIA.

(From Our Special Correspondent.)

FORTUNA GOLD MINING & MILLING COMPANY.—The Salt Lake Company, which has been incorporated at Ensenada with a capital of \$1,000,000, divided into 100,000 shares of \$10 each, is to be listed on the Consolidated Exchange of New York. Gay Lombard is president and general manager; B. L. Harding, vice president; W. H. Dale, secretary and treasurer. The property which is being developed by the company is located at Aqua Dulce Canyon in the Zaragoza district.

SOUTH AFRICA.

TRANSVAAL.

MARICO SALTPETER COMPANY, LIMITED.—This company was incorporated in London with a capital stock of \$125,000 to enter into an agreement with John L. McKim, to acquire any mines, mining rights, and metalliferous deposits in Marico District, South African Republic, or elsewhere, and to prepare for market nitrate of potassium, or any ore, metal or mineral substances.

LATE NEWS.

(Special to the Engineering and Mining Journal.)

LEADVILLE, COLO.—BY TELEGRAPH, JULY 2d, 1896.—No change in strike situation; over 2,000 men out and everything quiet. The smelters still running and buying all ore they can get. The mine managers have so far not even consented to talk to the Miners' Union on the subject of the strike. An endeavor is being made by business men to get both sides together to discuss the situation by July 4th.

The Belgian property is one of the fine properties working here. A 3-ft. streak of ore was opened up to-day running marvelously high in chlorides. Some assays gave 5,000 oz., and average assays run 500 oz. silver.

CALUMET & HECLA MINE.—The latest reports from the mine in Michigan say that at the greatest depth ever attained by miners in the history of the world sinking has been stopped in the Red Jacket vertical shaft at a depth of 4,900 ft. This shaft, which is a six-compartment affair, has a capacity four times that of the old shaft.

Connections are made with No. 4 shaft Calumet as follows: The first cross-cut connects the shaft at a depth of 2,106 ft., and has a length of 1,568 ft., and intersects No. 4 at the 36th level.

The second crosscut at a depth of 2,206 ft. intersects the lode at the 39th level, while the third crosscut at a depth of 2,463 ft. connects the shaft again at the 42d level. The fourth strikes it again at 2,655 ft. and so on down. The levels are uniformly 90 ft. apart, and from each level three openings are made at the shaft, the main entrance being on the east side of the shaft.

On the north and south sides openings are made, which curve until they meet the main drift at a distance of 178 ft. from the shaft. The machinery at this shaft is not only the finest of its kind in the world, but presents elements of novelty that will repay any person interested in mining the cost of a visit of inspection.

They are the twin engines, the Minong and Lis-cowit and the Mesnard and Pontiac. Each engine is double and of the triple expansion type. Some conception of their size may be gained from the weight of some of their parts as follows: Engine bed, 76,107 lbs.; cylinder, 25,500 lbs.; engine beam, 64,020 lbs.; main pedestal bed plate, 150,722 lbs.; end piece for bed plate, 19,486 lbs.

General Manager Whiting's endless iron rope system is the method employed in hoisting, and the engines are designed to hoist a load of 10 tons, 50 ft. per second. Miners are lowered down in the bowels of the earth by a system of steel cages, the man-engine being impracticable in perpendicular shafts.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 3.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending June 27th, 1896, compared with the corresponding period last year:

	1896.		1895.	
	Week.	Year.	Week.	Year.
Pennsylvania Railroad.....	70,895	1,695,068	1,771,534	

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending June 27th, and for years from January 1st, 1896 and 1895:

	1896.		1895.	
	Week.	Year.	Week.	Year.
Shipped East and North:				
Allegheny, Pa.....	45,859	1,171,187	2,080,482	
Barclay, Pa.....				
Beech Creek, Pa.....				
Broad Top, Pa.....				
Clearfield, Pa.....	69,082	2,503,686	2,751,176	
Cumberland, Md.....	77,858	1,566,414	1,455,798	
Kanawha, W. Va.....	76,792	1,545,374	1,186,801	
Phila. & Erie.....	613	32,803	27,823	
Pocahontas Flat Top.....				
Totals.....	272,274	6,879,164	7,502,014	

† Week ending June 21st.

	1896.		1895.	
	Week.	Year.	Week.	Year.
Shipped West:				
Monongahela, Pa.....	23,365	510,122	409,732	
Pittsburg, Pa.....	30,686	924,398	949,541	
Westmoreland, Pa.....	20,062	987,231	952,715	
Totals.....	81,493	2,421,751	2,311,988	
Grand totals.....	353,767	9,300,915	10,114,002	

Production of coke on line of Pennsylvania Railroad for the week ending June 27th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 77,244 tons; year, 2,211,561; to corresponding date in 1895, 2,776,223 tons.

Bituminous.

In the soft coal trade things are comparatively active and most of the companies are working on full time at their mines. The orders that are coming in are sufficient to take care of the product as it arrives from the mines. Consumers are apparently beginning to need coal, and it is considered by the trade only a matter of time when the demand will be heavy. The improved condition of the soft coal market is attributed to the strength of the combination.

Contracts are being taken quietly, and although they have been coming in slowly it is said that the total amount of tonnage on the books of the producers is gradually increasing and is relieving the anxiety which has existed among the operators. The terms and conditions outlined by the "Association" are being maintained generally, though it is said that in a small number of cases the contracting parties have cut rates.

The far East continues to take the most coal. Sound ports are beginning to wake up a little, and it is thought that they will now feel that their supplies of coal are not enough to take proper care of their wants. New York Harbor trade is good, and shipments are made freely.

All-rail business is fair, and there seems to be a slight improvement in the amount of tonnage taken. Shipments at various points of the main-line roads are good, vessels getting prompt dispatch on reaching the wharves to load. There is a small

amount of transient trade and spot business doing. South American business is quiet, and shipments are few and far between.

Transportation from mines to tide on all main-line roads is good, and it is said that in some instances there is a shortage of coal. The Baltimore & Ohio Railroad Company is making some changes in its clerical methods, one being quite satisfactory to shippers, namely, the issue of its statements so much per net ton instead of so much per gross ton.

In the coastwise vessel market there are signs of an improvement, and a great number of charters have been made during the week for coal at the shipping ports, accruing principally to the larger class of vessels.

We quote current rates of freight from Philadelphia: To Boston, Salem and Portland, 60c.; Providence, New Bedford and the Sound, 60c.; Wareham, 80c.; Lynn, 75c.@80c.; Newburyport, 70c.@75c.; Portsmouth, 65c.; Dover, \$1@1.10 and towage; Saco, 80c. and towage; Bath, 60c.@65c.; Gardiner, 65c. and towage; Bangor, 65c. Five and ten cents above these rates are asked from Baltimore, Newport News and Norfolk.

The Association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

#### Anthracite.

The mid-summer season now confronts the anthracite coal trade, and as is usual at this time of the year only a limited amount of business is being done. The market is likely to continue in this condition for the next six weeks, possibly till September 1st, unless the consumers send in their orders earlier than usual.

The recent advance in the price of coal does not seem to have stimulated consumers to the buying point. The fact is the users of coal are a little incredulous as regards the determination of the producing interests to hold firmly to the list prices. The retailers appear to be well stocked with coal and therefore cannot order from the producers until there customers purchase, hence there is a waiting policy prevalent. In the better qualities of coal some business has been done during the week at the July circular. For ordinary coal, however, there is no new business to report. The producing companies have some orders on hand at the old prices, which will probably keep them busy until the middle of this month.

Among middlemen there is talk of a shortage of coal, and, it is said, this is due to the fact that they are sending their supplies West, where a better business can be done than that which they could expect from the East.

Stocks of coal at tidewater are easy, while line business is considered good.

We quote current f. o. b. price as follows: Broken, \$3.85; egg, \$4; stove, \$4.25; chestnut, \$4. These prices are subject to the usual commission of 15c.

The disastrous accident in the Twin Shaft colliery at Pittston, Pa., has been a general topic of discussion among the coal fraternity of New York, and much regret is expressed on account of the many persons who have perished. While this sad occurrence does not affect the business of the anthracite coal market, it is nevertheless considered a loss to the producing interests.

#### NOTES OF THE WEEK.

The Retail Coal Dealers' Exchange of New York held a meeting on July 1st for the purpose of advancing the price per ton for all sizes of anthracite coal. The meeting was well attended and it was unanimously voted to increase the price of white ash coal delivered to customers to \$5.25, and of red ash coal to \$5.75.

We have received the following letter from an esteemed correspondent. It explains itself.

July 1st, 1896.

Sir: In your issue of June 27th under Coal Trade Review I find this statement: "Taking the annual output at 50,000,000 long tons this \$1 advance would realize a profit of \$50,000,000 for the producers."

I submit that this is a statement that to those not well informed will create a very unfair impression toward coal producers and as this item is likely to be repeated by newspapers all over the country the effect will be certainly such as to arouse unjust antagonism toward all those engaged in the trade and to be particularly hurtful to retail dealers, who supply the largest number of ultimate customers.

Permit me to say that while your figures are correct as to the advance of the size you name, yet the percentage of coal mined included in broken, egg, stove and chestnut is not over 45% of the entire output and in many cases is not over 40%, perhaps less. I know that the three collieries in which I am somewhat interested, mining about 350,000 tons per annum, do not produce more than 45% in coal that is affected by the advanced prices. Our furnace coal is about 30%, which remains unchanged from one year to another, and fully 25% is made up of pea and smaller sizes, prices of which are even less than they were a year ago, which offset to a considerable extent the higher prices charged for domestic sizes. I think in such a sweeping statement that you make it is only fair that you give us credit for what we are doing with half of our output that is consumed for manufacturing purposes.

Very respectfully, Wm. C. TAYLOR.

#### Buffalo.

July 1.

(From Our Special Correspondent.)

There is nothing new to report in relation to the anthracite coal trade excepting that the advance of

25c., long expected, came at last, much to the disgust of consumers, who would not believe that figures this season of the year could possibly be so high. But few orders are given, as nothing is to be gained by doing so at present quotations.

The bituminous coal trade continues quiet, buyers taking only for immediate requirements, or watching for a drop in prices when dealers endeavor to save demurrage charges.

The coal movement by lake continues to be good, but lighter shipments are expected by vessel men during July and August; no indications of change in freight rates.

The shipments of coal from this port by lake westward from June 21st to 27th, both days inclusive, aggregated 87,699 net tons, distributed as follows: 27,330 tons to Chicago; 25,750 tons to Milwaukee; 20,800 tons to Duluth; 4,400 tons to Superior; 1,100 tons to Toledo; 500 tons to Gladstone; 1,500 tons to Ashland; 301 tons to Bay Mills; 325 tons to Hancock; 2,650 tons to Green Bay; 1,944 tons to Fort William; 800 tons to Marinette, and 300 tons to Manistigue. The rates of freight were 50c. to Chicago and Racine; 45c. to Milwaukee, Green Bay, Marinette and Portage; 30c. to Duluth, Superior, Gladstone, Ashland and Fort William. Closing quiet and steady.

Experiments on the new hot-water motor under enormous pressure for railroad use are progressing favorably. Final tests are to be made this week. News items relative to the coal trade are very scarce and are as hard to collect as debts. It seems strange that the feeling for "hoarding" is so prevalent; persons and firms able to "shell out" postpone payment with every kind of flimsy excuse, causing depression in trade and consequent anxieties. Your readers know the story of the active dollar.

#### Chicago.

July 1.

(From Our Special Correspondent.)

**Anthracite.**—The advance of 25c. per ton to take effect July 1st has caused a considerable number of small buyers to come into the market, and consequently anthracite coal has been in much better demand than the preceding weeks. The heavy buying is yet to come, and dealers look for but little change in the market yet. Anthracite coal receipts by the lakes are only of medium proportion. Prices are f. o. b. Chicago: Grate, \$5.10; egg, stove and chestnut, \$5.35.

**Bituminous.**—Soft coal has had a better week than for some time in consequence of some of the railroads and the city having contracted for supplies. The prices made to obtain these contracts are said to be ridiculously low. General business is very slow.

**Coke.**—There is only small demand, buyers evidently waiting for reduced prices and decreased freight rates.

#### Pittsburg.

June 30.

(From Our Special Correspondent.)

**Coal.**—In our last report we said a June run was certain; it came on time—being the first June shipment in three years. To Cincinnati, 23 tows went out; 31 coal boats, 262 barges, containing 4,150,000 bu. To Louisville, 35 tows; 170 coal boats, 290 barges, with 7,885,000 bu. coal. Total, 12,035,000 bu. The run was a fairly successful one. Along with the outgoing fleet were two immense barges owned by the Consolidated Wire and Steel Company filled with wire and nails for Louisville, and with them will go barges containing 4,500 tons of cotton ties for Vicksburg and Memphis from I. Painter & Sons' plant. The mining situation in the Fourth pool may be summarized as follows: The Rostraler miners are on a strike against a reduction from \$2.12 per 100 bu. for lump coal to 85c. for the run of mine. Charleroi miners are working at the district price. Dunlevy is working at a reduction. Verta mines are working full at the district price. The Clipper has started to work after being idle three months; the men are working at \$1.75 per 100 bu. O'Neil's Fayette City mines are working on contract at 30c. per wagon.

Apollo mines are doing nothing. Little Rudstone miners have been offered 42½c per 100 bu., run of mine, but have not accepted. Washington miners are out against a reduction to 85c. per 100 bu., run of mine. Acme, Allen and Fidelity are working at \$2 per ton, lump coal. Snow Hill is not working. Wood's mines are doing very little. The Eclipse is working full. Forsyth mines, at Coal Center, are working at \$1.50. Chamont is working full at 85c run of mine. Beaumont mines are working at \$1.50; Albany is not working. Anchor is working at \$1.08, run of mine. The Kanawha coal run aggregated 20,000,000 bushels.

**Connellsville Coke.**—No change in prices for July. Rumor of a break denied; the demand is expected to show a falling off. It is officially announced that the price of Connellsville furnace coke for July will be \$2. A rumor has been floating round from some unaccountable source that the Oliver Coke Company will reduce the price, and, as a matter of fact, the company had furnished a certain furnace at \$1.75 within the present month. The Oliver Company says the report has no foundation; in fact the company has little coke to put on the market; the product of its 629 ovens is almost entirely consumed by the company's three furnaces. Summary of the region for the week shows 10,699 ovens

in blast, with 7,248 idle, being 50 ovens less in blast than week previous. The feeling is against blowing out any more ovens at present. The production of the region, estimated upon the ovens drawn, was 101,547 tons as against 98,530 tons the week previous. In the running order of the ovens in blast, 4,761 made six days, 5,253 made five days, and 685 ovens four days, an average of 5.37 days as against 5.35 days the week previous. The shipments of coke from the region for the week amounted to 6,144 cars, distributed as follows: To Pittsburg, 1,956 cars; to points west of Pittsburg, 3,132 cars; to points east of Pittsburg, 1,056 cars. The shipments amounted to 110,592 tons, against 109,728 tons the week previous, a slight increase. Dull trade has no effect on the price of coke; the H. C. Frick Coke Company continues to hold out for the \$2 rate.

The Reid Coke Works, near Dunbar, were partially ruined, June 29th, by some unknown culprits. The large reservoir above the works was drained and flooded over the ovens and yards. The valves at the pumps were also taken. The works had to close down and the damage will be considerable. There is no clue to the perpetrators.

#### IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 3, 1896.

#### Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending				From	
	July 5, 1895.	July 3, 1896.	July 5, 1895.	July 3, 1896.	Jan., '95.	Jan., '96.
Anthracite.	32	20,124	41	25,900	555,898	755,738
Coke....	122	131,800	135	161,170	3,612,040	4,465,649
Charcoal...	18	3,961	19	6,130	107,523	112,410
Totals....	172	155,885	195	193,200	4,305,461	5,361,797

The absence of sales of finished material and the approach of a holiday have combined to intensify the dullness of the iron market generally. The predicted rush to buy raw materials has not begun and buyers are still holding off. The steel combine and its lesser imitators are apparently hesitating. The talk of higher prices has had no effect, and some of the managers seem to be wavering in their belief that increases in quotations were all that is needed to stimulate the market. The volume of business reported everywhere is small, with no immediate prospect of improvement.

The question over the adoption of the new wages scale proposed by the Amalgamated Association of Iron and Steel Workers has not been settled. No agreement has been reached in the conferences so far held, and another meeting is appointed for next week. Meantime most of the rolling mills shut down July 1st, beginning then their usual midsummer stop for repairs. There seems to be a general understanding that they will continue closed until the new wages scale is settled. It seems probable that some compromise will be arranged, and no strike is anticipated. The mill men claim that they cannot pay the Association scale unless there is a marked improvement in the trade.

There has been a little stir in the rail market. The receivers of the Baltimore & Ohio Company have ordered 16,000 tons of heavy rails from the Carnegie Company, and inquiries have been made for one or two other large lots. The Baltimore & Ohio order, it is understood, was a necessity, the company having neglected or postponed repairs, which must now be made at once.

#### NOTES OF THE WEEK.

The suit to foreclose the mortgage for \$2,000,000 on the Penokee & Gogebic Consolidated mines, on the Gogebic Range in the Lake Superior region, which has been pending in the United States Circuit Court for Wisconsin since January, 1894, has been finally settled. The complainant in the case, the Farmers' Loan and Trust Company of New York, trustee under the mortgage, dismisses the suit and the court has directed the receivers to turn the property over to the Tilden Mining Company.

The Pennsylvania State Bureau of Industrial Statistics has completed a report on the tin-plate industry in Pennsylvania. It will show that there are 11 plants in the State, turning out black plates, and 19 that buy the black plates and finish them by dipping or coating them with tin. All but two of the black-plate manufactories—one in Philadelphia and the other in Harrisburg—are located in Pittsburg and other parts of Western Pennsylvania. The State has one third of the black plate manufactories in America and over 50% of their entire capacity. The concern at New Castle is the largest in the world, the annual output being 750,000 boxes.

#### New York.

July 3.

The local market is devoid of all excitement and business has been almost entirely in small orders, with not as many of those as could be desired. Dealers and brokers are more occupied with the coming holiday than anything else. This is not unwelcome to most of them, and it will be practically a double one, as very few expect to do any business on Monday. Politics is also having an effect and a good many are looking rather anxiously to what will be done at Chicago next week.

The old familiar complaint of slow collections is quite frequently heard, so often, indeed, that there is probably a good basis for it. It is noticeable also



that sellers are looking pretty sharply after customers' standing, while other signs of want of confidence are apparent.

The pipe-men and the architectural iron works are the only people who have much work ahead. In most other branches there is a general feeling that it is best to keep quiet and wait developments.

**Pig Iron.**—Nominally everybody is maintaining prices; really there is a disposition to press sales and prevent unsold stocks from accumulating, which has made prices very uncertain. There has been no change in prices which is quotable, but there is very little doubt that a large order could be filled at a low price. The near-by foundries are not very busy as a rule, and most of them have stocks of pig iron already laid in. Unless some unexpected change should take place, it is quite possible that another week may see a general reduction in nominal as well as real quotations. The prices given below are with the reservations noted, and are the same as last week's.

We quote for large lots, tidewater delivery, Northern brands: No. 1 foundry, \$12.25@13; No. 2 foundry, \$11.25@12; gray forge, \$11@11.50. For Southern irons, same delivery, we quote: No. 1 foundry, \$12.50@12.75; No. 2 foundry, \$11@11.50; No. 1 soft, \$10.75@11.25. No. 2 soft, \$10.25@10.75; forge, \$10@10.50.

**Cast Iron Pipe.**—There are still some small contracts to be placed, but makers complain that buyers expect very low prices. The foundries are not very anxious for business apparently, as most of them have work on hand.

**Spiegeleisen and Ferro-Manganese.**—Only a few small sales of ferro-manganese are reported. Prices are unchanged at \$19.50@20.50 for imported spiegeleisen and \$47@47.50 for ferro.

**Steel Billets and Rods.**—There is no business doing here. The pool price continues \$21.75 for New York delivery. Rods are quoted \$27. Buyers seem in no hurry.

**Merchant Iron and Steel.**—Business is on a small scale, and there is no quotable change. We quote for common bars 1 1/2@1 3/4; refined bars, 1 1/2@1 3/4; soft steel bars, 1 1/2@1 3/4. Other quotations are: Steel hoops, 1 5/8@1 7/8; steel axles, 1 5/8@1 7/8; links and pins, 1 5/8@1 7/8; tire steel, 1 5/8@1 7/8; spring steel, 2@2 1/4. All prices are for delivery on dock, New York.

**Plates.**—Some buying of boiler plates has been done by the Paterson locomotive people; otherwise business is quiet and prices are about the same as for some weeks past. Universal mill plates are 1 1/4@1 1/2. For other sorts we quote: Tank, 1 1/4@1 1/2; boiler shell, 1 1/4@1 1/2; good flange, 1 1/4@1 1/2; fire-box, 2@2 1/4. Charcoal iron plates are 2 1/2@2 3/4 for shell, 2 1/2@2 3/4 for flange, and 3 1/2@3 3/4 for best firebox. Rivets are 2 1/2@2 3/4 for steel and 3@3 1/4 for iron.

**Structural Iron and Steel.**—No new business of importance has developed this week. Some people are wondering what has become of all the new street railroad work, cable and electric, which was promised this summer, but has not yet been begun. We quote for angles, 1 1/2@1 3/4; channels, 1 1/2@1 3/4; tees, 1 1/2@1 3/4; beams, 1 7/8 @1 3/4 for large orders and 2@2 1/4 for small lots.

**Nails.**—The combination price for steel wire nails continues unchanged at \$2.55 per keg, carload lots, Pittsburg delivery. Cut nails are \$2.30 per keg, car-load lots, at Pittsburg. Very little is doing, as buyers are taking only what they are obliged to have and are putting in no stocks.

**Steel Rails and Rail Fastenings.**—Nothing is doing here at the pool price, which continues to be \$28.75 per ton at tidewater. Girder rails are \$28@32 per ton at tidewater.

Little is doing in rail fastenings. We quote for fish and angle-plates, 1 1/2@1 3/4; spikes, 1 1/2@1 3/4.

**Old Rails.**—There is a little demand for old steel rails, and they are quoted \$11@12.50 New York harbor or Sound port delivery. For old rails suitable to relay quotations are \$19@22, New York. There is no market for old iron rails here.

**Scrap Iron.**—A little more scrap is offered, but it has been nearly all taken up and prices are about the same. We quote \$10@11.50 per ton for good machinery scrap; \$9@10 for ordinary cast scrap, and \$6@7.50 for stove-plate and mixed.

**Buffalo.** July 1.  
(Special Report of Rogers, Brown & Co.)

The week has been a quiet one in pig-iron circles with only a light inquiry and very little buying. Iron appears to be going forward freely on old contracts, but on new business buyers are evidently waiting to see farther in the future before committing themselves to anything beyond immediate requirements. We quote below on a cash basis f. o. b. cars Buffalo: No. 1 foundry strong coke iron, Lake Superior ore, \$13.50; No. 2 foundry strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.50; Ohio strong softener, No. 2, \$13; Jackson County silvery No. 1, \$15.25@15.50; Southern soft No. 1, \$12.40; Southern soft No. 2, \$11.90; Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14@14.50.

**Chicago.** July 1.  
(From Our Special Correspondent.)

The iron market at this point shows no improvement. There is no buying of any consequence in any line; though there is somewhat of a tendency on the part of consumers to test the market more

than for some time past. Prices are in many lines unsteady, particularly in pig iron and structural material.

**Pig Iron.**—The business transacted during the past week has been on about a par with the preceding one. About 3,000 tons in all were sold, most of it being from the Northern furnaces. There is but little steadiness noted in prices. Inquiry is rather large, with some fair-sized contracts in sight. We quote as follows: Lake Superior charcoal, \$13.50@14; Local coke foundry No. 1, \$11.75@12; No. 2, \$11.25@11.75; No. 3, \$11@12.25; Local Scotch foundry, No. 1, \$11.75@12; No. 2, \$11.25@11.75; No. 3, \$11@11.25; Southern coke No. 1, \$11.60@12.10; No. 2, \$10.85@11.35; No. 3, \$10.60@10.85; No. 1, soft, \$10.85@11.35; No. 2, soft, \$10.60@10.85; Southern Silveries No. 1, \$11.85@12.35; No. 2, \$11.60@11.85; Jackson County Silveries, \$14.50@16; Ohio Strong Softeners, \$15@15.50; Alabama Car Wheel, \$16.85@17.35; Bessemer, \$13@13.50.

**Bar Iron.**—There is yet a hesitancy on the part of consumers to place contracts, though there has been some improvement during the week. Inquiry is fair. Common iron is quoted 1 3/4@1 3/8c., and guaranteed 1 3/8@1 4/8c.

**Billets and Rods.**—But little business has been booked during the week. Inquiry is small, and prospects are not good for any early improvement. Billets are quoted \$21.25.

**Steel Rails.**—Small sales remain in vogue, footing up an aggregate of from 2,000 to 3,000 tons per week. Rails are quoted \$29 and up.

**Structural Material.**—There has been somewhat more business transacted in bridge shapes. Railroad bridges requiring small quantities are fairly numerous. Building shapes are in small demand. Prices are as follows: Beams and channels, 1 7/8@1 7/8c.; angles, 1 4/8@1 4/8c.; plates, 1 4/8@1 5/8c.; tees, 1 6/8@1 7/8c. Small lots from stock are quoted 1/8c. @ 1/4c. higher.

**Cleveland.** June 30.

(From Our Special Correspondent.)

**Iron Ore.**—There has been practically no change in the market during the past week. But few sales have been reported, and at present but few cargoes of ore are being brought from the upper lake region. The furnacemen, it is said, are well provided with material and the majority of them will close their establishments within a few weeks to make the usual annual repairs. The small movement of ore sales is thus explained by the brokers. Standard Bessemer are quoted at \$4, but a sale of a small quantity of an extraordinary good quality is reported by one dealer at a few points above that. Standard non-Bessemer hematites bring from \$3 to \$3.25, and the market is firm at that price. Mesabi non-Bessemer hematites are quoted at \$2.50, the price fixed early in the season. There is no change in the price of the other ores.

The ore freight rates have suffered terribly during the past week. The indications are that they will drop still lower, as there are practically no charters at the present price. Last week the rate from the head of the lakes was 80c., a decline of 20c. from the rate at the opening of the season. This week there has been a further decline of 10c. M. A. Hanna & Co. took a charter from the head of the lakes Monday at a 65c. rate. The Marquette rate is 65c., a decline of 10c. from last week. The Escanaba rate of 55c. of last week has been pounded down to 50c.

**Pig Iron.**—The quotations are the same as last week, as follows: Lake Superior charcoal, \$13.50@14; bituminous coke, No. 1 foundry iron, \$13.25; No. 2, \$12.75; Ohio Scotch No. 1, \$12.75; No. 2, \$12.25; Bessemer pig, \$12.75. The dealers and shippers are of the opinion that after the annual repairing of the mills and foundries there will be a few minor changes in the market.

**Pittsburg.** June 30.

(From Our Special Correspondent.)

**Raw Iron and Steel.**—Business conditions during the week show but little change; trade has increased somewhat in certain departments, but as a general thing the merchandise distribution has reflected the reduced requirements of the between seasons period. Business in iron and steel products shows but slight improvement, and if there has been any increase in transactions it has been generally secured at the expense of price concessions. Distrust in the stability of combination prices, the unsettled financial situation and the contemplated summer stoppage of mills have combined to restrict demand from consumers. The iron and steel trade is in a waiting position, which will probably continue until the wage question is satisfactorily arranged and stock-taking and repairs have been completed, which will occupy some time. Although plenty of business is in sight, the amount coming upon the market is limited, and, so far as can be seen, there is no immediate prospect of a change for the better. Stocks of pig iron in consumer's hands are light, and the same is true of steel billets, but it seems to be the policy not to increase them at the present time. In the local market there was a fair inquiry for No. 2 Foundry. Dealers generally admit that prices are as low as they can go.

At Youngstown the general impression is that the wage question will soon be adjusted; business at other industries in and about that city is in fairly good condition. An important event, of interest to

every ironworker, operator and business man, took place, and it will result in all of the mills being closed down for a time at least; it was the failure of the operators to have the wage question settled. The next conference will be held July 9th. Those blast furnaces which have been blown out are all being relined, rebuilt and otherwise improved. News from Niles states that all the mills, with one exception, are running steadily. On June 1st the number of furnace stacks in the Mahoning Valley was 11; the number in blast was eight, and the weekly capacity of the same was 9,506 tons. The number out of blast was three, with a weekly capacity of 3,252 tons.

**Latest.**—Prices show no change. To-night at midnight the mills will close for repairs and stock-taking; it is estimated that fully 100,000 mill workers will be idle. The scale generally has been signed and in a short time the plants will again be in full operation.

COKE SMELTED, LAKE AND NATIVE ORE.		BLOOMS, BILLETS AND SLABS AT MILL.	
Tons.	Cash.	Tons.	Cash.
5,000 Bessemer, July, Nov., Valley	\$11.65	1,500 Billets, July, Aug., Sept., at mill	\$20.25
2,500 Bessemer, Spot, Valley	11.70	550 Billets, July, at mill	19.90
2,000 Bessemer, Aug., Sept., Valley	11.75	350 Billets, July, at mill	20.10
1,500 No. 2 Foundry, July, Aug., Pitts.	12.00	300 Billets, spot, at mill	19.85
1,000 Bessemer, July, Pitts.	12.35	300 Billets, spot, at mill	19.85
1,000 Bessemer, July, Valley	11.75	250 Billets, July, at mill	20.00
800 Gray Forge, July, Aug., Pitts.	10.70	300 Billets, spot, at mill	19.50
500 No. 2 Foundry, July, Pitts.	12.00	SKELP IRON.	
500 No. 2 Foundry, July, Pitts.	12.25	550 Wide grooved, Pitts.	\$1.20 4 m.
500 No. 2 Foundry, July, Pitts.	12.30	400 Sheared, Pitts., 1.40 4 m.	
500 Special No. 1 High Silicon, Pitts.	14.30	325 Narrow grooved, Pitts.	1.20 4 m.
500 Special No. 1 High Silicon	14.30	300 Sheared, Pitts., 1.30 4 m.	
500 Special No. 1 High Silicon	14.30	290 Wide grooved, Pitts.	1.10 4 m.
500 Gray Forge, July, Pitts.	10.60	200 Narrow grooved, Pitts.	1.10 4 m.
500 Bessemer, July, Aug., Pitts.	12.50	MUCK BAR. Cash.	
500 Southern Gray Forge, Pitts.	12.40	350 Neutral, deliv'ed, Pitts.	\$21.00
100 No. 1 Foundry, prompt, Pitts.	13.00	BLOOMS, BILLETS, BAR ENDS.	
50 No. 2 Foundry, spot, Pitts.	11.75	400 Bloom and billet ends, Pitts.	\$13.40
		STEEL WIRE RODS.	
		1,000 5-gauge, delivered, Pitts.	\$26.00
		SHEET BARS.	
		1,000 Delivered, Pitts.	\$22.25
		FERRO MANGANESE	
		300 80% delivered, Pitts.	\$49.60
		SCRAP MATERIAL.	
		350 Cash scrap, gross, Pitts.	\$10.25
		200 No. 1 Wrought scrap, net, Pitts.	12.50
		100 No. 1 Wrought net, Pitts.	12.00

**Philadelphia.** July 2.

(From Our Special Correspondent.)

**Pig Iron.**—The crude iron market presents no interesting features. Foundries are melting less and mills are in many cases idle. Trade in general is backward, and agents have made no effort to sell. Some local business is done, to make deliveries on existing contracts, but no one thinks of making a new contract. Brokers pretend to argue prices will be stronger as the summer advances, but be this as it may, there is no disposition to move among buyers. Prices are \$12.75 for No. 1; \$12 for No. 2, \$11 for gray forge.

**Steel Billets.**—Until the market is cleared of speculative holdings and the billet makers are in a position to act independently there will be no particular movements in billets. Consumption has temporarily fallen off. Quoted \$21.25.

**Merchant Bars.**—The summer suspension of work may be longer than usual, but though prices are lower there is an anxiety to resume as soon as possible. Refined, in large lots, \$1.25; stove, \$1.40@1.45.

**Skeip.**—There is no movement in skeip worth speaking of.

**Sheet.**—Manufacturers feel comfortable over the situation, in view of the correspondence had a short time ago with large users of sheet iron. Just now there is nothing going on to speak of.

**Pipes and Tubes.**—Inquiries have been answered for pipes of large size, which the mill people count on beginning to make about August 1st.

**Merchant Steel.**—Manufacturers are counting on a good business in a short time. The expectation is that at current low rates there will be a general sorting up during mid-summer.

**Plates.**—The market is dull at this hour. Repairing will be attended to, and there is a great deal of fixing in most of our mills. There is an improving prospect in general boiler work and machine shop demand; also in tank work, as well as heavy plates.

**Structural Material.**—After a week or two there will be an increased production of structural material for small jobs, but there is as yet no very positive information regarding big orders for some enterprises that have been more or less talked of for a month or two past.

**Steel Rails.**—Small orders are dropping in all the time.

**Old Rails.**—There is no business to report. Quoted at \$14.

**Scrap.**—The scrap dealers have quit buying scrap unless a very choice lot which they know they can turn into cash soon.

**METAL MARKET.**

New York, Friday Evening, July 3, 1896.

**Gold and Silver.**

**Prices of Silver per Ounce Troy.**

June	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. to \$1.	July	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. to \$1.
27	4 87 3/4	31 1/2	69	533	1	4 87 3/4	31 1/4	68 3/4	532
28	4 87 3/4	31 1/2	68 3/4	532	2	4 87 3/4	31 1/2	68 3/4	531
30	4 87 3/4	31 1/2	68 3/4	532	3	4 87 3/4	31 1/2	68 3/4	531

Very little silver has been shipped to Europe the past week and very few transactions in bullion of an international character have taken place. The silver tide has been arrested by speculation and about 1,750,000 oz. have been held back. The situation is now more quiet and nearer to a normal condition, with the prospect that shipments to the other side will be resumed.

The United States Assay office in New York reports the total receipts of silver at 24,000 oz. for the week.

**Gold and Silver Exports and Imports.**

At all United States ports, May, 1896, and years from January 1st, 1896 and 1895:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
<b>GOLD</b>					
1896..	\$19,103,913	\$610,204	\$7,022	\$101,570	E. \$18,399,161
1895..	36,020,185	24,354,634	217,509	614,293	E. 11,319,064
1896..	35,069,797	23,899,555	314,562	627,106	E. 10,897,698
<b>SILV.</b>					
May.	51,159,331	564,332	35,807	1,386,140	E. 3,244,465
1896..	2,579,452	4,936,084	589,916	7,230,945	E. 13,982,319
1895..	19,809,591	3,352,821	.....	4,999,891	E. 11,466,879

This statement includes the exports and imports at all United 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 July 2d, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1896..	\$1,252,625	\$87,392	\$88,500	\$4,044	E. \$1,212,789
1895..	23,802,052	17,206,930	18,248,146	1,151,438	E. 33,692,130
1894..	32,516,347	21,026,452	16,896,265	821,921	E. 27,594,479
1893..	65,739,913	9,673,605	18,659,815	783,681	E. 73,932,452
1892..	62,872,345	6,558,774	15,851,225	1,294,338	E. 70,873,938
1891..	43,108,993	6,279,115	11,695,481	828,577	E. 47,996,782

Of the gold exported during the week \$550,000 went to Germany, and the balance to the West Indies, while the silver went to London. The specie imported came chiefly from Central and South America.

**Average Monthly Price of Silver**

in New York and London, per ounce Troy, from January 1st, 1896, and for corresponding months, 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.
January	30 69	67 13	27 36	59 69	30 81	66 63
February	31 01	67 67	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 28	59 49
April	31 10	67 92	30 39	66 61	28 95	62 92
May	31 08	67 88	30 61	66 75	28 60	62 96
June	31 16	68 69	30 47	66 61	28 68	62 59

**FINANCIAL NOTES OF THE WEEK.**

The completed Treasury returns for the fiscal year give receipts of \$326,189,226. This exclusive of the postal service.

The expenditures of the fiscal year have been \$352,231,470, of which \$139,434,046 has been for pensions, \$35,386,488 for interest, \$87,268,558 for civil and miscellaneous purposes, \$50,830,981 for the War De-

partment, \$27,148,231 for the Navy and \$12,163,166 for Indians. The deficit for the year thus stands at \$26,042,244, as compared with a deficit of \$12,325,448 in 1894 and \$46,558,909 in 1895. The cash balance of the Treasury stands at \$267,432,096, and the bonded debt at \$847,363,890. The entire proceeds of the bond sale of February have been covered into the treasury and the principal of the bonds added to the public debt.

The coinage at the mints during the fiscal year which has just closed reached a total value of \$71,188,468 and the number of pieces coined was 78,330,773. The gold represented the greater value, as usual, and the minor coins the greater number of pieces. The gold coinage was 3,584,760 pieces, of a value of \$58,878,490, of which the largest item was 2,593,723 double eagles, of the value of \$51,874,460. The silver coinage was represented by 20,424,529 pieces, of a value of \$11,440,611. The coinage of standard silver dollars was \$7,500,822 and the next largest coinage in value was that of quarters to the amount of \$2,005,705. The minor coinage was 54,321,484 pieces, with a value of \$869,337. The coinage for six months, which was compiled for the purposes of Secretary Carlisle in writing a letter on the silver coinage, showed a total value of \$31,846,372, of which \$22,523,572 was in gold, \$8,856,714 in silver and \$466,086 in minor coins. The coinage of standard silver dollars during the year has been almost wholly within the past six months, the amount during that period being \$7,400,112.

The striking feature in the silver market has been the reduction in export, and the increased number of ounces deposited for certificates, which now amount to 1,776,242 oz.

The net gold balance in the Treasury to-day is \$101,648,103 and would have been considerably less had it not been for large purchases of stocks here on European account, and the important sales of large blocks of securities already referred to by us.

The foreign merchandise trade of the United States for the 11 months of the fiscal year from July 1st to May 31st is reported as follows by the Bureau of Statistics of the Treasury Department:

	1894-1895.	1895-1896.
Exports	\$752,570,335	\$815,971,764
Imports	670,307,921	723,260,747
Excess exports	\$82,262,414	\$92,711,017
Add excess of exports, gold	.....	72,951,929
silver	.....	29,927,662
Total excess of exports	.....	\$195,590,608

The gold and silver movement in detail is given in the tables at the head of this column.

The statement of the United States Treasury on Thursday, July 2d, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	June 25.	July 1.	Changes.
Gold	\$102,241,036	\$101,648,103	D. \$592,933
Silver	35,545,199	37,147,729	I. 1,602,530
Legal tenders	89,141,835	88,938,226	D. 103,609
Treasury notes, etc.	31,509,456	34,574,064	I. 64,608
Totals	\$261,437,526	\$262,308,222	I. \$870,696
Govt bank deposits	16,500,425	16,974,476	I. 474,051

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$129,903,280. Against these are held in the Treasury 11,477,582 coined standard silver dollars, and the silver bullion purchased at a cost of \$118,425,698, making a total of \$129,903,280.

The following statement from the Bureau of the Mint shows the coinage executed at the mints of the United States during the month of June, 1896:

Denominations	Pieces	Value
Double eagles	115,670	\$2,313,400.00
Eagles	6,265	62,650.00
Half eagles	19,020	95,100.00
Quarter eagles	27	67.50
<b>Total gold</b>	<b>140,982</b>	<b>\$2,471,217.50</b>
Standard dollars	1,510,125	1,510,125.00
Half dollars	339,048	169,524.00
Quarter dollars	1,004,125	251,031.25
Dimes	300,125	30,012.50
<b>Total silver</b>	<b>3,143,423</b>	<b>1,960,692.75</b>
Five cent	2,676,425	133,821.25
One cent	6,819,785	68,197.85
<b>Total minor</b>	<b>9,496,210</b>	<b>\$202,019.10</b>
<b>Total coinage</b>	<b>12,780,615</b>	<b>\$4,623,929.35</b>

The coinage of gold for the month was smaller than for several months past.

The demand for Indian exchange continues very strong. In addition to the proposed new issue of rupee paper there was a good demand for transfers both on Chinese and Japanese account, due to the heavy purchases of Indian cotton which both countries have made this season. The full amount of 60 lakhs of Council bills offered in London was disposed of, the average price being 14 0/6d per rupee. The Council has sold exchange so liberally thus far during the present fiscal year that it is somewhat

ahead of its requirements, and it is announced that the amount of bills will be reduced to 50 lakhs weekly until further notice.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending June 27th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

	1894.	1895.	1896.
Loans and discounts	\$170,944,100	\$513,422,300	\$171,999,300
Deposits	373,337,800	570,436,300	496,974,700
Circulation	9,688,600	13,159,000	11,584,900
Specie	92,486,400	65,231,000	62,015,300
Legal tenders	125,651,400	111,603,600	84,145,700
<b>Total reserve</b>	<b>\$218,137,800</b>	<b>\$176,834,600</b>	<b>\$146,161,000</b>
Legal requirement	143,333,475	142,669,075	124,243,675
Surplus reserve	\$74,804,325	\$34,224,925	\$21,917,325

Changes for the week this year were increases of \$215,700 in loans and \$1,644,900 in deposits, \$460,700 in specie, \$1,949,600 in legal tenders and \$1,909,675 in surplus reserve; also decreases of \$2,700 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:

	Gold.	Silver.	Total.
<b>Asso. Banks of New York</b>	.....	.....	\$62,015,300
1895	.....	.....	65,231,000
<b>Bank of England</b>	\$249,139,075	.....	249,139,075
1895	189,669,190	.....	189,669,190
<b>Bank of France</b>	409,575,500	\$251,421,300	660,996,800
1895	478,532,291	251,650,182	650,181,478
<b>Imp. Bank of Germany</b>	.....	.....	233,620,000
1895	.....	.....	268,250,000
<b>Austro-Hungarian Bank</b>	136,590,000	64,226,000	200,816,000
1895	99,692,000	67,595,000	167,087,000
<b>Netherlands Bank</b>	13,177,000	35,148,000	48,325,000
1895	21,474,000	35,418,000	56,892,000
<b>Belgian National Bank</b>	.....	.....	20,183,000
1895	.....	.....	21,009,000
<b>Bank of Spain</b>	42,028,000	56,242,000	98,270,000
1895	40,021,000	62,253,000	102,274,000
<b>Bank of Italy</b>	60,625,000	10,350,000	70,975,000
1895	60,105,000	10,230,000	70,335,000
<b>Imp. Bank of Russia</b>	472,715,000	.....	472,715,000
1895	309,815,000	.....	309,815,000

The return for the Associated Banks of New York is of date June 27th; all the others are of date July 2d, except the Bank of Italy, which is dated May 31st, and the Bank of Russia, whose return is dated May 16th-28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports its gold only, not considering silver at all. 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 June 18th are reported by Messrs. Pixley & Abell's circular as below:

	1895.	1896.	Changes.
India	£1,943,380	£1,771,798	D. £171,582
China	1,100,767	492,869	D. 607,897
The Straits	335,035	500,532	I. 165,497
<b>Totals</b>	<b>£3,379,182</b>	<b>£2,765,199</b>	<b>D. £613,982</b>

Arrivals for the week this year were £121,000 in bar silver from New York, £30,000 from Chile and £5,000 from New Zealand; a total of £156,000. Shipments for the week were £23,500 in bar silver to Bombay and £17,500 in Mexican dollars to China; a total of £41,000.

**Domestic and Foreign Coins.**

The following are the latest market quotations for the leading foreign coins:

	Bid	Asked
Mexican dollars	\$0.53 1/2	\$0.54 1/2
Peruvian soles and Chilean pesos	48 1/2	49 1/2
Victoria sovereigns	4.90	4.91
Twenty francs	3.88	3.92
Twenty marks	4.76	4.85
Spanish 25 pesetas	4.74	4.85

**Other Metals.**

**Copper.**—The market continues very firm, but little business has been done. Consumers do not care to pay the very high figures asked by the producers, and the latter are so well sold ahead that they do not see the justice of making any concessions whatever. Stocks are light and consumption is heavy, and it is anticipated that both home trade and export will soon have to buy again. In the absence of larger transactions we have to quote lake, 11 1/2 @ 11 1/2; electrolytic cakes, wirebars or ingots, 11 1/2 @ 11 1/2; and cathodes 10 1/2 @ 11c. For casting copper there has been a better demand, and 10 1/2 @ 11c. has been made according to quantity and brand. The exports for last month amounted to 9,764 tons, and

this month too are likely to be very heavy. The wire mills are reported to be especially busy, and cannot book new orders for the next two months.

The London market varied somewhat, but on the whole prices are well maintained. G. m. b's opened at £19 7s. 6d., and declined during the week to £18 17s. 6d., but subsequently regained their footing and the market closes £19 5s. @ £19 7s. 6d. for spot and £19 7s. 6d. @ £19 10s. for three months prompt. According to our cable the visible supplies for the second half of June again show a decrease of 1,200 tons, which is an excellent showing, considering the heavy shipments from this side.

**Tin.**—Early in the week prices fell off somewhat, but with the better demand for home trade, this was soon checked, and the close is rather firm at 13'40 for spot and futures.

The market abroad is well supported in spite of the increase in the visible supplies of 500 tons for the month of June, and prices close at £61 5s. @ £61 7s. 6d. for spot and £61 17s. 6d. @ £62 for three months prompt.

The New York Metal Exchange estimates the total consumption of tin in the United States for the half-year ending June 30th at 9,100 tons. The visible supply on July 1st is estimated as below in tons of 2,240 lbs.

	Store.	Afloat.	Total.
London.....	16,878	3,034	19,912
Holland, Hunker and Billiton.....	4,260	1,500	5,760
Holland, Straits.....	628	658	1,287
U. S., exc. Pacific ports.....	1,928	2,310	4,238
Totals.....	23,635	7,502	31,137

The visible supply shows an increase of 294 tons over July 1st this year, and of 5,593 tons over July 1st, 1895.

**Lead.**—Although the strike in Colorado continues, the market has been very dull, and no inclination was shown on the part of buyers to operate in a larger way. In consequence, prices have eased off somewhat, and we have to quote to-day 3c. @ 3.02%. The same state of affairs appears to prevail in the West, where quotations are also easier, viz., 2.7 1/2 @ 2.80c. St. Louis.

In London prices are firm, Spanish lead being quoted £11 @ £11 1s. 3d., and English lead 5s. higher.

**Smelter.**—Consumption is far from what it ought to be, and the galvanizing business especially has been rather poor of late. Consequently, the market remains flat and irregular. We have to reduce quotations to 4c. @ 4.05.

The English market has also declined somewhat, and good ordinaries in London are quoted £18 and specials £18 5s. These prices are only obtainable for nearby delivery, while futures are to be had at 5s. @ 7s. 6d. below.

**Antimony** continues dull, Cookson's, 7 1/2 c., Hallett's, 6 1/2 c. and U. S. French Star, 7c.

**Nickel.**—Demand is not active, but prices are firm at 34 @ 35c. per lb. for ton lots and 36 @ 38c. per lb. for smaller orders. London prices are 13 @ 14d. for larger orders and 14 1/2 @ 15 1/2 d. per lb. for small lots.

**Platinum.**—The demand is somewhat in excess of supply and quotations are higher, \$14 @ \$15 per oz., New York, being asked. London prices are 57s. @ 58s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotation, 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 100 grams: Crucibles and dishes, 50c., 51c., and 52c. per gram. Wire and foil are 47c., 48c. and 49c. per gram. The current retail price for crucibles is 60c. per gram.

**Quicksilver.**—The New York quotation continues unchanged at \$37 per flask. The London price is £6 10s. per flask, with £6 8s. 9d. named from second hands.

**Imports and Exports of Metals.**

Baltimore.**	Week, June 25.		Year, 1895.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases.....	10	17	40	43
Chrome ore.....	904	15,161	4,594	
Copper, fine..... long tons				
" matte..... "				
" sulphate..... "	101	1,689		
Iron ore.....		6,749	195,810	
" pigs, bars, ingots, blooms, "				2,012
Iron oxide..... bags				300
" pyrites..... long tons			150	
Ferro-manganese.....				1,357
Ferro-silicon..... "				70
Lead.....	150	2,016		
Limestone..... short				2,743
Manganese ore..... long		70		3,818
Spiegeleisen..... "		16		364
Steel.....				10
Steel wire, bundles.....		473		3,772
Tin, long tons.....		43		95
Tin and black plates, boxes		1,575		93,970
Zinc (spelter) long tons.....			117	

\*\*From our special correspondent.

**New York.\***

	Week, June 25.		Year, 1896.	
	Expts.	Impts.	Expts.	Impts.
Aluminum..... lbs.				
Antimony ore..... short tons		264	10,900	2,171
" regulus, casks		34		1,137
Brass, old..... short tons	4		122	59
Copper, fine..... long tons	11,551	68	38,164	1,363
" matte..... "	1423		8,714	1,256
" ore..... "				
" sulphate..... "	130		4,417	
Iron ore.....				
" pigs, bars, rods..... "		20		3,167
" sulphate..... "		262		
Iron pyrites..... "				
Ferro-manganese..... "		69		
Ferro-silicon..... "				
Manganese ore..... "				
Spiegeleisen..... "		86		19,593
Lead ore..... "				
" pigs and bars..... "	1670	715	19,096	19,876
Magnolia metal..... "		47		
Nickel..... "		20	447	30
Steel, billets, rods..... "		369		14,168
Tin..... "	50	370	265	7,331
Tin and black plates, boxes.....		10,311		
Zinc (spelter)..... long tons	1224	9	672	121

\*Metal Exchange Reports. †Week ending July 2.

**Philadelphia.††**

	Imports.	
	Week, June 26.	Year, 1896.
Antimony, casks.....		102
Copper ore, long tons.....		11,481
Ferro-Manganese, long tons.....		380
Ferro-Silicon.....		60
Iron ore, long tons.....	7,300	129,535
" pig.....		400
" and steel scrap, long tons.....		618
Manganese ore, long tons.....		4,564
Spiegeleisen.....		134
Tin.....	40	303
Tin and black plates, boxes.....		27,073

††From New York Metal Exchange Reports.

**Average Monthly Prices of Metals**

In New York since January 1st, 1896, and for the corresponding periods in 1895, 1891, 1893 and 1892, in cents per pound.

Month.	1896.	1895.	1891.	1893.	1892.
<b>Copper:</b>					
January.....	9'87	10'00	10'13	12'13	11'09
February.....	10'34	10'00	9'63	12'00	10'09
March.....	11'03	9'75	9'81	11'88	10'38
April.....	10'98	9'75	9'50	11'38	11'50
May.....	11'15	10'25	9'80	11'00	11'63
June.....	11'67	10'63	8'94	11'00	11'86
<b>Tin:</b>					
January.....	13'02	13'25	20'16	19'99	20'50
February.....	13'44	13'35	19'66	20'30	20'00
March.....	13'30	13'20	19'09	20'71	20'25
April.....	13'34	14'00	19'75	20'81	20'50
May.....	13'54	14'65	20'21	19'96	20'80
June.....	13'59	14'15	19'75	19'76	22'00
<b>Lead:</b>					
January.....	3'08	3'10	3'19	3'87	4'70
February.....	3'19	3'12	3'31	4'22	4'12
March.....	3'14	3'12	3'37	3'96	4'21
April.....	3'07	3'08	3'43	4'08	4'15
May.....	3'03	3'16	3'39	3'89	4'22
June.....	3'03	3'25	2'31	3'77	4'16
<b>Spelter:</b>					
January.....	3'75	3'28	3'56	4'39	4'69
February.....	4'03	3'20	3'85	4'39	4'69
March.....	4'20	3'23	3'89	4'28	4'89
April.....	4'19	3'30	3'62	4'38	4'68
May.....	3'98	3'50	3'47	4'41	4'79
June.....	4'10	3'65	3'40	4'27	4'71

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Aluminum:	
No. 1, 98% pure rolling ingots, per lb.....	50@55c.
No. 1, ingots for re-melting, per lb.....	48@53c.
No. 2, 94% pure.....	38@42c.
Ingots from scrap, per lb.....	35@40c.
Aluminum-nickel casting metal, per lb.....	40@45c.
Bismuth, per lb.....	\$1.30@1.75
Phosphorus, per lb.....	50@55c.
Platinum, per oz.....	\$14@15
Tungsten, pure, powder per lb.....	70c.
Tungstic acid, per lb.....	45c.
Ferro-tungsten, 60% in ton lots, per lb.....	60c.

The variations in price are chiefly on size of order.

**CHEMICALS AND MINERALS.**

NEW YORK, Friday Evening, July 3.

**Heavy Chemicals.**—We have now entered upon the second half of 1896, and still the heavy chemical market is in a very quiet condition. With but few exceptions wholesalers continue to deliver on yearly contracts, and the new business that is received at long intervals is not considered large in the aggregate. In bleaching powder we do not hear of any special inquiries; the market consists principally of deliveries on contracts which were made in October last year. Caustic soda is in some

request with prices pretty firm. The market for Alkali and carbonated soda ash is steady. We quote current prices as follows: Caustic soda, 80% @ \$2.21 1/2 @ \$2.42 1/2; 70 @ 74% @ \$2.12 1/2 @ \$2.25; 76% @ \$2.20 @ \$2.25 per 100 lbs. Alkali, 58%, 80 @ 85c. for 50-ton lots and over, and 90 @ 95c. for smaller quantities. Bleaching powder, prime brands, \$1.87 1/2 @ \$1.90; Continental, \$1.70 @ \$1.80 per 100 lbs. Bicarb. soda, English, 1'50 @ 1'60c.; American, bulk, \$1'50 @ \$3.50 per 100 lb.; Sal-soc'a, English, 70 @ 72 1/2 c.; American, 65c. (in barrels), 80c. (in kegs), per 100 lbs.

**Acids.**—As we reported last week so must we mention this week that the acid market will show no material change until after the national holiday, July 4th. Trade in sulphuric acid has been rather light during the last few days owing in part to the coolness of the closing day of June. Besides, the mills have not started active operations yet. As soon as they do; however, a good outlook awaits the sulphuric acid manufacturer, as the mills will make many fancy-colored dyes and black. As yet there is no buying which dates ahead; inquiries consist of immediate supplies to be paid for at the regulation period. We quote as follows in New York and vicinity, in lots of 50 carboys or over: Acetic acid (in barrels), \$1.25 @ \$1.40; muriatic acid, 18°, 75c.; 20°, 75 @ 85c.; 22°, \$1.10 @ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.25 @ \$4.36; 40°, \$4 @ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75 @ 95c.; 10 @ 15c. higher for small quantities; chamber acid, \$6 @ \$6.50 per ton at factory. Blue vitriol, \$4 @ \$4.25, according to grade and order.

**Brimstone.**—The arrival of 1,500 tons of Sicilian brimstone last week has caused much shopping among the traders in this article. We understand that there will be no arrival of brimstone from Sicily for at least a fortnight, and as the quantity which was imported last week has nearly all been disposed of, there are no fixed prices in this direction. Middlemen, nevertheless, quote \$18.50 for best unmixed seconds and \$18 for thirds for July shipment. The so-called Sicilian Brimstone Syndicate is awaiting July 31st, when it is expected to have all its arrangements made and agreement signed by the mine owners and producers.

**Fertilizing Chemicals.**—There is only a small amount of business doing in fertilizing chemicals at the present time, although the ammoniates show an improved demand. We quote: Sulphate of ammonia, gas liquor, \$2.30; bone, \$2.20 @ \$2.30. Dried blood, high grade, \$1.37 1/2 @ \$1.42 1/2; low grade, \$1.25 @ \$1.35 per unit f. o. b. Chicago. Azotine, \$1.75. Concentrated phosphate (80% available phosphoric acid), 60c. per unit. Acid phosphate, 13% to 15%, av. P<sub>2</sub>O<sub>5</sub>, \$4 @ 65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P<sub>2</sub>O<sub>5</sub>, 87 1/2 @ 90c. per unit. Acidulated fish scrap, \$10 @ \$11 and dried scrap with few or no sales, nominally \$16.50 @ \$17.50 f. o. b. fish factory. Tankage, high grade, \$19 @ \$20; low grade, \$18 @ \$19. Bone tankage, \$21; ground bone, \$22 @ \$22.50. Bonemeal, \$19.50 @ \$23.

Sulphate of Potash: 90-95%, New York and Boston, \$1.90 1/2; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03 1/2.

Muriate of potash remains inactive. The new prices are 1'75c. at New York and Boston; 1'79 1/2 c. at Philadelphia, Baltimore and Norfolk, and 1'81 1/2 c. at New Orleans for 80 @ 85% (basis of 80%), in lots of 50 tons and upward.

**Kainit.**—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 30 1/2 c., 37 1/2 c. and 38c., respectively.

**Nitrate of Soda.**—The liberal offerings of this article have caused the market to wobble, but the bids of 1'72 1/2 c., ex-ship, were not taken up. Some sales were made, ex-ship, at 1'75c. Forward shipments are quiet at 1'75 @ 1'80c., according to position.

**Liverpool.**

June 23.

(Special Correspondence of Joseph P. Brunner & Co.)

The chemical market is still as dull as ever, and nothing to indicate any immediate improvement.

Soda ash is slow to move, while quotations are nominally without change, the nearest spot range for tierces being about as follows: Leblanc ash, 48%, \$4 @ \$4 5s.; 58%, \$4 5s. @ \$4 10s. per ton, net cash. Ammonia ash, 48%, \$3 2s. 6d. @ \$3 10s.; 58%, \$3 7s. 6d. @ \$3 12s. 6d. per ton, net cash; bags 5s. per ton less. Soda crystals remain steady at \$2 7s. 9d. per ton, less 5% for barrels and 7s. less for bags.

Caustic soda hangs fire, orders being scarce. We quote spot range, as to market, about as follows: 60%, \$6 5s. @ \$6 10s.; 70%, \$7 5s. @ \$7 10s.; 74%, \$8 5s. @ \$8 10s.; 76%, \$9 @ \$9 5s. per ton, net cash.

Bleaching powder is in limited demand, and is quoted at \$7 @ \$7 5s. per ton, net cash, for hard-wood packages, as to market. Chlorate of potash is offering at 4 1/2 d. per lb., but it is difficult to find buyers. Bicarb. soda is well maintained at \$6 15s. per ton, less 2 1/2 % for the finest quality in 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is quiet at \$8 5s. @ \$8 8s. 9d. per ton, less 2 1/2 % for good gray, 24% @ 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is dull at \$3 2s. 6d. @ \$3 5s. per ton, less 2 1/2 % for double bags f. o. b. here, as to quality. Carb. ammonia, lump, 3d. per lb.; powdered, 3 1/2 d. per lb., net cash.

MINING STOCKS.

Complete quotations will be found on pages 22 and 23 of mining stocks listed and dealt in at:

New York.	Aspen, Colo.	St. Louis.
Boston.	Colorado Springs.	Paris, France.
Philadelphia.	Duluth, Minn.	Mexico.
Baltimore.	Helena, Mont.	Shanghai, China.
Pittsburg.	Salt Lake, Utah.	Valparaiso, Chile.
Denver, Colo.	San Francisco.	London, England.
Chicago and Cleveland, page 20.		

NEW YORK, Friday Evening, July 3.

The uncertainties in the political factions as regards the monetary question, coupled with the depressed condition of the stock markets in general, have caused the market for mining shares to assume a downward tendency. It has been noted that dealings in certain stocks have been merely of a professional character, and on the whole the speculating public is not in a mood to buy at the present time. No material change is expected to take place until political matters are settled and in such a shape as to make clear the position of gold and silver in our monetary system.

The volume of business done in mining stocks during the week at the Consolidated Stock and Petroleum Exchange and the New York Stock Exchange amounted to 26,900 shares, a decrease of 1,820 shares from last week.

The Comstocks have ruled lower this week. Comstock Tunnel opened at 8c. and was steady at this price until the close of the week, when it fell to 7c., showing sales of 4,800 shares. There were also sales of two \$2,000 Comstock Tunnel bonds at 8%. Hale & Norcross closed at \$1.70 last week, dropped to \$1.45 on June 30th and then receded to \$1.35 on July 2d, with sales of 200 shares. Ophir, which was quoted at \$1.50 last week, fell off 25c. at \$1.25 this week, with sales of 300 shares. Sierra Nevada receded from 70c. in the middle of the week to 63c. at the close, sales amounting to 300 shares. Transactions in Union Consolidated were 100 shares at 65c., a falling off of 25c. in price over the middle of last week. Yellow Jacket was dealt in at 50c., with sales of 200 shares. Other stocks to show sales were Chollar, with 100 shares at \$2.20; Potosi, with 100 shares at \$1.05; Consolidated California & Virginia, with 200 shares at \$1.95; Gould & Curry, 100 shares at \$1, and Mexican, 100 shares at 70c.

Of the California stocks Brunswick Consolidated was the only one dealt in this week. Sales were made to the extent of 8,000 shares at 20@21c. An official of the Brunswick Consolidated Mining Company, said to a representative of the *Engineering and Mining Journal*, "During the month of June the five stamps of our mill produced \$6,000. We will start up in a few days with five stamps more, making 10 stamps in all. We have gone in on the 800-ft. level, the ore body being 130 ft. The vein averages 3 ft. We believe this ore body extends up to the surface."

The miners' strike in the Leadville district has had a depressing effect upon the local market for Colorado mining stocks and the following have been traded in this week: Golden Fleece, 400 shares at \$1.65; Portland, 200 shares at \$1.70; Isabella, 600 shares at 66c.; Little Chief, 900 shares at 16@18c.; Cripple Creek Consolidated, 1,100 shares at 15@16c.; Iron Silver, 200 shares at 19c.; Mount Rosa, 700 shares at 13@14c.; Pharmacist, 1,100 shares at 9c.; Creede & Cripple Creek, 1,500 shares at 5c. By courtesy of the Colorado Mining Bureau we are enabled to publish the following information concerning the Victor Gold Mining Company: "Since January 1st, 1896, there has been opened the 6th and 7th levels from the new shaft (No. 2), all of which show very large and well-defined veins of ore, carrying very largely of high grade, besides the usual veins of low-grade ore which is sent to the mill. In the 7th level, which has just been opened, the vein has been crosscut, which shows from 4 to 5 ft. in width, with considerable ore running from \$60 to \$250 per ton. The shaft is down 430 ft. The vein is developed 1,000 ft. The earnings for the month of May were \$38,765 at a cost of \$17,737, of which \$1,991 were paid in enlarging the plant. After paying dividend No. 38 of \$20,000 (10c. per share), the surplus balance amounts to \$47,789. Under date of June 24th, the following has been received: 'The ore has been running higher for some time past. There has been shipped to-day several cars of ore which assay between 20 and 25 oz. From the condition of the 7th level, the last one started) it is fair to assume that the ore body continues as good as any encountered in the mine. The following is the May statement: Balance cash on hand May 1st, 1896, \$46,462; ore sales, \$38,765; insurance account, \$293; total, \$85,525. The disbursements were: Operating expenses, \$15,745; permanent improvement, \$1,991, dividends paid, \$20,000; balance on hand June 1st, 1896, \$47,789; total, \$85,525."

Kingston & Pembroke, an Ontario stock, was traded in to the extent of 700 shares at 15@16c.

Boston. July 1.

(From Our Special Correspondent.)

The market for mining stocks has been heavy all the week and prices, with now and then a feeble rally, have tended downward. The whole interest in the market has centered in Boston & Montana and Old Dominion Copper. The former, after sell-

ing at \$86%, gradually declined to \$80%, from which there was a sharp rally on covering of shorts to \$85%. This was followed by a further decline to \$82%, at which price it sold to-day. There was some talk of an extra dividend in the near future, but there is no good reason for the rumor. Old Dominion was slightly firmer early in the week, and sold up to \$15%, but under the persistent hammering of the bears, it yielded to \$13%, recovering to \$14% and closing at \$13%. The lake stocks have sympathized with the weakening tendency and nearly all show declines for the week. Calumet & Hecla declined \$12 to \$303; Quincy from \$120 (June 18) last sale, to \$112 on moderate transactions, and Tamarack from \$87 to \$82.

Oscuela sold ex-dividend at \$25, a decline of \$2. Franklin & Kearsarge were both heavy, the former selling at \$8% and the latter at \$10%. Atlantic, which sold at 20% on June 17th, declined to 17%, with a slight rally to 18%. Butte & Boston declined to \$2, and Wolverine worked off to \$6%. Tamarack, Jr., declined \$1, to \$10. Allonez sold at 25c. The gold stocks have been quiet, with very little disposition to trade in them on the present outlook. Pioneer holds steadily at \$5@8%, with small sales. Gold Coins sold at 47% c. Merced was quoted assessment \$2 paid at \$9, and declined to \$7%. Aetna Quicksilver sold at \$4. The market closed dull and inactive at about the lowest prices for the week.

Cleveland. June 30.

(From Our Special Correspondent.)

A few sales of stocks were reported during the past week, but they created no flurry on the market. The channels of business are resuming a normal condition, it is said by the brokers, and it is expected that the stocks will be much more desirable property in the near future. Following are the quotations:

Name of Company.	Par val.	June 30.	
		Bid.	Ask.
Aurora.....	\$25	36	38
Chandler.....	25	34	35
Cleveland-Cliffs Iron Co.....	100	45	..
Jackson Iron Co.....	25	70	75
Lake Superior Iron Co.....	25	30	31
Lake Superior Consolidated.....	100	20	21
Pittsburg & Lake Angeline.....	25	75	..
Republic Iron Co.....	25	17.50	..

Chicago. June 30.

(From Our Special Correspondent.)

Trading in mining stocks has been quiet throughout the week. The only special changes to note in prices are in the two dividend payers, Delaware Chief and Imperial Preferred. The former advanced from 41% c. to 47c. and the latter from 31c. to 38c. with very little of either now for sale. Chicago & Montana has been in excellent demand and orders for large blocks have been filed at the advertised price of 8c. Subscriptions for this stock close to-day and it is said that no more of the Treasury stock will be sold except at an enhanced price.

The transfer books of the Imperial close to-day and the June dividend of 1% will be payable to stockholders of record through the secretary of the Chicago Mineral and Mining Board on July 10th.

The advance guard of silver delegates from the West to the great political convention to be held next week is now here and some of them were interested spectators on the floor of the Exchange during the call to-day.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending June 30th:

Stocks.	June 24	June 25	June 26	June 27	June 29	June 30	Sales.
Capazone.....	..	..	..	.02%	..	..	2,000
C. C. & C. C.....	.08%	.08%	.08%	..	.08%	..	8,900
C. C. Golden Group.....	.10%	.10%	..	.10	.10	.10	15,000
C. C. G. M. B. & L. Co.....	..	..	..	..	..	..	..
Chi. & G. Mt. Chi. & Mont.....	.08%	.08	.08	.08	.08	.08	123,300
Chula Vista.....	.08%	.08%	.08%	..	.08%	..	8,000
Cosmopolitan.....	.06	.06	.06%	..	..	.05%	11,000
Delaware Cf.....	.41%	.43	.44%	.41%	.46%	..	7,600
Finance.....	.04	.04	..	..	..	..	4,900
Great Fissure.....	..	..	.12%	..	.12%	..	9,500
Hawkeye.....	..	..	..	..	..	..	15,500
Imperial Pfd.....	.31	.32%	.35	.37%	.37%	.38	8,800
Investors' and Prospectors' Lion's Gold.....	..	..	.10	..	..	..	5,000
Little Gem.....	..	..	..	..	..	..	..
Lucille.....	..	..	.10%	..	.10%	.10%	7,000
Medina G. M. Co.....	.08%	..	.08%	.08%	.08%	.08%	12,000
Peerless G. M. Co.....	.14%	..	.14	.14	.14	.14%	26,500
Rhyolite.....	..	..	..	..	..	..	..
Royal Age.....	..	..	..	..	..	..	..
Squaw Mt.....	.02	..	..	..	..	..	..
Sumpter.....	.04%	..	.04%	.04%	.04%	.04%	34,000
Sunnyside-Gilpin.....	..	..	.11	..	..	..	2,000
Union Gold.....	..	..	..	..	..	..	..
Utah Mercur.....	.05	..	.05%	.05%	.05	.05	85,000

Total shares sold, 371,300.

Colorado Springs, Colo. June 27.

(From Our Special Correspondent.)

The mining stock market during the past week has shown but a moderate activity considering the heaviness of trading last week. On the whole, business has been of a steady character, and the market closes firm in some of the leading stocks.

The big chlorination mill which is being erected by the Colorado-Philadelphia Reduction Company at Colorado City is making good headway, and when completed I understand will be among the largest of its kind in the United States.

I am informed that the machinery for the new vertical three-compartment shaft of the Lee claim of the Isabella Gold Mining Company has been ordered and will be put in place within a few weeks. The regular dividend of this company was paid on the 25th inst., amounting to \$22,500, making a total of \$135,000 paid so far. The stock closed strong at 65 bid, with an offering at 65% c., ex-dividend. In the cheaper Cripple Creek stocks some activity was noticeable, but there was not a very large amount of selling.

The transactions recorded on the Colorado Springs Mining Stock Association during the past week amounted to 347,350 shares as against 334,200 shares the week before and 674,639 shares a fortnight ago.

The members of the association are comfortably located in their new building, and are working with renewed vigor, in harmony with the secretary, Mr. D. V. Donaldson, and the other officials.

Business on the Colorado Springs Board of Trade and Mining Exchange amounted to 518,810 shares for the week, which compares with 952,675 shares the week before and 274,314 shares a fortnight ago.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending June 25th, as follows:

Name of Company.	June 25	June 26	June 27	June 28	June 29	June 30	July 1
Alamo.....	.04%	.04%	.04%	.04%	.04%	.04%	0.4%
Anaconda.....	.59	.59	.59	.59	.58	.58	.60
Argentum-Juniata.....	.58%	.59	.58	.57	.57	.57	.56
Blue Bell.....	.04%	.04%	.04	.04	.04	.04	.04
Cripple Creek Con.....	.19%	.19%	.19%	.19%	.14%	.14%	.14%
Golden Fleece.....	1.69	1.55	1.53	1.50	1.50	1.50	1.50
Isabella.....	.64%	.64%	.65	.64%	.65	.65	.65
Mollie Gibson.....	.78%	.78	.77	.77	.76	.76	.76
Mount Rosa.....	.13	.13%	.13%	.14	.13%	.13%	.13%
Pharmacist.....	.09%	.10%	.10%	.10%	.10%	.10%	.10%
Portland.....	1.80	1.80	1.80	1.77	1.77	1.77	1.77
Silver State.....	..	..	..	..	..	..	..
Union.....	.36%	.36%	.37	.36%	.36%	.36%	.36%
Work.....	.12	.12	.12	.12	.12	.12	.12

Denver, Colo. June 27.

(From Our Special Correspondent.)

It is apparent that the cheaper stocks have been the most active during the week, and at the close the Colorado Mining Stock Exchange records a large sale of prospect stock.

Business among brokers is moving quietly. The Exchange continues to report a satisfactory volume of transactions, and in some cases there has been a material advance in the price of stocks.

Salt Lake City, Utah. June 27.

(Special Report of James A. Pollock.)

The week in the local mining stock market has not been all that was expected, and at the close nearly all the stocks on the list were somewhat lower, though there were a few notable exceptions. Ajax has resumed operations at the mines and everything is now in first-class condition. The stock did considerable business, but remaining practically unchanged from the previous week's quotations. Neither Alliance, Gas, Anchor nor Bogan did any business worthy of mention. Anchor was offered quite freely slightly above the \$1 mark, but there were buyers in. Bullion Beck continued strong, with the demand quite active, and offerings fairly light. The output from the properties is making a very creditable showing.

News regarding the outcome of the Centennial deal is still unobtainable and it is hardly likely that anything definite will be known before July 10th, the date upon which the option expires. There is very little of the stock on the market and none except in small odd blocks. Dalton & Lark was offered quite freely at 50c. per share and early in the week showed a tendency to break, but the stock closed at about the usual quotation. Only a limited amount of business was done in Daly stock and quotations were not materially changed. Daly West was quite strong, with few sellers in the field. Galena continued strong and was in fair demand, with quotations about as during the previous week. The Geyser-Marion suit is now on in the courts and the fight promises to be a protracted one. Horn Silver was in good demand at somewhat advanced quotations. Little of the stock is now being offered. The properties are in good condition and making regular shipments.

As was stated would be the case, Mammoth has resumed the payment of dividends and on July 1st will pay 5c. per share, with every prospect of an extra dividend about the middle of the same month. The company has just let contracts for a new and improved hoisting plant and has sufficient money in the treasury to pay for the same, together with at least a

couple of dividends and still have a surplus of something over \$100,000. The stock was very strong during the entire week, and held its own at the close, the trading being very heavy. The rumor that the Mercur would not pay the June dividend caused a material decline in that stock, and this, taken with several forced sales, made the stock weak. The company is in good condition financially and the earnings for May and thus far in June have been very satisfactory. It is not yet absolutely certain that the dividend for this month will not be paid.

Ontario failed to regain the strength lost during the previous week. It is announced that this month's dividend will be paid on the usual date. Rover made slight gains. Silver King continued very strong with but little of the stock offered. Sunshine remained practically unchanged, although the demand for the stock was fairly heavy, with only a limited amount offered. Swansea sold up to \$2.40, but at the close was materially weaker, being offered again very close to \$2. There seems to be no good reason for this decline. Utah did some business at about the previous week's quotations.

San Francisco. June 27.

(From Our Special Correspondent.)

The reaction from the flurry of the past few weeks has now full control of the market. The opening on Monday was rather quiet and prices were not strong. On Tuesday there was a pressure of small orders to sell and prices broke badly; all sorts of rumors were started, and there was a general collapse. One or two stocks held out for a time and Chollar even went up to \$3.10, but from that point it began to drop. The downward movement was aided by the fact that the weekly official reports were not very favorable.

The close shows a weak market, a slight upward reaction having run only a very brief course. After all, the changes have been mainly on small transactions, very few large operators making their appearance.

We are to have a long holiday next week, the San Francisco Stock and Exchange Board having voted to adjourn from Friday, July 3d, at noon, over to the next Wednesday. There is some grumbling at this, but a rest in the present state of the market will be a good thing.

Prices have settled down nearly to the old level which prevailed before the recent spurt, with one or two exceptions. Chollar is still the highest stock, being quoted \$2.70@2.75; Consolidated California & Virginia is \$1.80@1.85; Hale & Norcross, \$1.60@1.70; Ophir, \$1.25@1.30; Potosi, \$1.20@1.25; Gould & Curry, \$1.20@1.25; Savage, \$1.10@1.15; Occidental, 85c.@\$1; Confidence, 97c.@\$1; Mexican, 70@73c.; Crown Point, 45@46c. The Bodies have hardly been dealt in; Bodie Consolidated is quoted about 47c.

THE NEW EXCHANGE.

Business has been rather quiet on the Gold Mining Exchange. No new stocks have been listed and the fluctuations in the old ones have been small. The list at present is hardly large enough to keep up interest, and the addition of more companies would be advantageous. Some quotations are: Amalie, \$2.25; Sebastopol, 48@50c.; Savannah, 41@45c.; Edna, 38@40c.; Lockwood, 34@36c.; Grant, 13@14c. Thorpe and Champion put in no appearance this week.

Los Angeles, Cal. June 25.

(From Our Special Correspondent.)

The Los Angeles Mining and Stock Exchange is making good progress toward the establishment of a legitimate business foundation, and I am informed by the secretary, Mr. F. J. Cooper, that a number of reliable mining stocks will be listed shortly. Some very interesting specimens of gold-bearing quartz are being exhibited at the Exchange, one a specimen from the Hillsborough District in New Mexico which was displayed at the World's Columbian Exposition in 1893, securing the first prize.

British Columbia. June 19.

(From Our Special Correspondent.)

The present week has been about the same as last, so far as mining stocks are concerned. When it is considered that stocks of mining enterprises in the Trail Creek and Slocan countries are sold at Spokane, Victoria, Vancouver and New Westminster as well as at Rossland and Trail, it may be inferred that continued activity in sales is not to be expected. In the exploitation of mining companies Spokane takes the lead, and the figures given elsewhere are those which prevail there. The camp has probably seen its greatest activity for this season in the matter of selling prospects, but the activity coming directly from the output and shipment of ore has only begun. The Columbia & Western narrow gauge to Trail is now carrying ore not only from Le Roi, but from other mines near and around Rossland, and this output is becoming a steadily increasing factor in the prevailing activity of this part of the camp. As yet there is scarcely any diminution in the traffic over the Northfort road by teams, though the stages have been reduced in number and travelers are showing a decided preference to the route via the Columbia, Trail and the Columbia & Western.

It is said that the sale of the California to Montreal parties is to be followed by active operations. This property lies close to the Le Roi group.

The camp continues to progress in every direction and the reports to the effect that Barney Barnato

and other capitalists are to visit this portion of the mining world during the present summer are regarded here with much satisfaction.

The following table gives the prevailing quotations for Trail Creek mining stock. Though there is not much activity on the part of buyers, at present, an improvement is looked for shortly.

Name.	Selling price.	Name.	Selling price.
Center Star.....	\$1.25	Jumbo.....	\$1.05
Commander.....	.25	Le Roi.....	5.00
Crown Point.....	.20	Lily May.....	.12
Deer Park.....	.10	Little Darling.....	.05
Diamond Dust.....	.03	May Flower.....	.15
Evening Star.....	.15	Monte Christo.....	.20
Eureka Con.....	.06	Nest Egg.....	.12
Fresburn.....	.10	O. K.....	.35
Georgia.....	.35	Palo Alto.....	.10
Gertrude.....	.10	Phoenix.....	.10
Gold Hill.....	.06	Poorman.....	.14
Good Hope.....	.09	St. Elmo.....	.14
Great Western.....	.15	St. Mary.....	.10
Helen.....	.12	Silverine.....	.12
High Ore.....	.09	Virginia.....	.30
Homestake.....	.06	Vulcan.....	.02½
Imperial.....	.05	War Eagle.....	1.00
Iron Mask.....	.80	W. Le Roi & Josie.....	.15
Josie.....	.35	White Bear.....	.15

Par value of above stocks is \$1, excepting Le Roi, which is \$5.

Paris. June 21.

(From Our Special Correspondent.)

Perhaps the most marked feature of our stock market this week has been the continued revival of interest in the Southern African stocks. The better report of gold production on the Witwatersrand in May, which has just been received, has helped in this, and people are beginning to hope that the political operators of London and Johannesburg have decided to let matters alone, and permit the miners once more to do their best. At the same time we are beginning to see the folly of those talkers who last year so confidently predicted that the Transvaal would be turning out at least 500,000,000 fr. in gold a year by 1897.

The fact, shown by the statements in the *Engineering and Mining Journal*, that in 1895 the gold production of the world for the first time in history exceeded 1,000,000,000 fr., has been variously commented upon; but no paper here has yet, I think, called attention to the fact that the Transvaal mines contributed only about one-fifth of this great total and not more than one-half of the increase in the past 10 years. This is worth considering, when we hear the extravagant talk which is beginning to be current again here.

The Chartered Company's stock is in disfavor here just now, and our investors who hold its shares are looking for an opportunity to get out. To say nothing of the false politics of its managers, it begins to look as if the territory it controls has been overrated. Besides, there is a general impression that the Matabele troubles are really more serious than the reports which we receive would indicate. The copper shares continue active and strong, and really there seems for the time to be no limit to the demand for the metal. Undoubtedly the shares of these companies have reached a high point, but if the copper market continues as it is now their profits this year must be great.

The metallurgical stocks are somewhat less active, but their prices are well maintained. In other stocks there is little worth noting this week.

The death of M. Jules Simon has removed another of our great publicists, and will be much felt here, where his name had great authority. Our present generation of public men hardly seems to be maintaining the standard, even if we make all allowances for contemporary jealousies and misrepresentations.

The fact that your Republican party, which, we are told, stands the best chance of electing its candidate this year, has resolved in favor of maintaining the gold standard, has a favorable effect here. It is pointed out, however, that such a resolution will avail little unless it is accompanied by some plan of enforcing it, and of reforming your currency system. Upon the whole the general feeling is in favor of waiting, before taking up your securities, to see what the results of the election in November are. For myself, I make no comment; I simply chronicle what our financiers say. There is a general belief here that your country presents the best opportunities for investment, if you will only put your money system upon a sound and stable basis; but until then—it is best to have one's money here. The risk at present is too great. I can only wish you success in the work which must be done if you are really to be prosperous.

AZOTE.

MISCELLANEOUS DIVIDENDS.

United Gas Improvement Company, quarterly dividend of 2% on the capital stock, payable July 15th.

American Steel Casting Company, dividend of 7% on the preferred stock, payable June 29th. Transfer books will be closed June 15th at 3 o'clock p. m., and reopen July 1st.

Cerrillos Coal Railroad Company, coupons No. 9, due July 1st, from the first mortgage 4% bonds, payable on and after that date.

MEETINGS.

Name of Co.	Location of office.	Date.	Time.
Anaconda Cop- per.....	Anaconda, Mont ...	July 13	11 a. m.
Arvilla Tunnel...	505 Mining Exchange Building, Denver, Colo.....	" 14	3 p. m.
Bankers Gold....	205 Earnest & Cran- ner Building, Den- ver, Colo.....	" 10	10 a. m.
Cactus.....	Salt Lake City, Utah	" 14	10 "
Candelaria.....	New York, N. Y.....	" 16	2 p. m.
Gurney.....	619 Boston Building, Denver, Colo.....	" 13	11 a. m.
Prospect.....	117 South Mill St., Aspen, Colo.....	" 14	2 p. m.
Stanley Con.....	11 East First South St., Salt Lake City, Utah.....	" 14	2 "

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Diq.	Sale.	Amt
Bay State.....	Cal.....	32	July 7	July 30	.03
Belle Isle.....	Nev.....	20	" 15	Aug. 12	.10
Bogart Silver...	Utah...	3	" 16	July 6	.05
Camp Floyd Gold.....	Utah...	2	June 27	" 13	.01
Central Eureka...	Cal.....	1	" 22	" 18	.03
Channel Bend...	Cal.....	3	July 31	Aug. 27	.05
Chollar.....	Nev.....	42	" 14	" 4	.25
Emerald.....	Utah...	"	" 6	July 27	.01
Eureka Con.....	"	"	" 8	Sept. 5	.10
Fogus.....	Nev.....	"	" 11	Aug. 15	.10
Gibraltar Con...	Cal.....	9	June 25	July 10	.01
Gold Belt.....	Utah...	"	July 20	Aug. 10	.00½
Horseshoe Bar. Con.....	Cal.....	1	June 22	July 14	.50
Kentuck Con...	Nev.....	12	" 22	Aug. 12	.05
Leo.....	Mont...	"	" 23	" 14	.00½
Lucky Hill.....	Utah...	19	June 13	July 11	.02
Mabelle.....	Ore.....	2	July 13	Aug. 3	.08
Monie Gold...	Cal.....	37	July 6	July 27	.10
Mt. Diablo...	Nev...	4	" 2	" 23	.05
North Banner Con.....	Cal.....	39	June 23	" 14	.05
North Belle Isle	Nev.....	24	July 13	Aug. 10	.10
Occidental Con..	"	"	" 7	July 25	.15
Overman.....	"	75	June 5	June 25	.10
Peabody.....	Cal.....	6	" 3	" 24	.10
Peruvian Con...	Utah...	"	" 22	July 8	.02
*Pine Hill G. & S	Cal.....	8	July 13	Aug. 10	.06
Reward Gold...	"	13	" 2	July 20	.03
Silver King...	Ariz..	14	" 16	" 14	.25
Skagit Cumb'r'd Coal.....	Wash..	1	" 12	" 11	.03
Thorpe.....	Cal.....	2	June 22	" 13	.10
*Utah State Gold	Utah...	1	July 20	Aug. 5	.00½
Ybarra Gold....	Mex...	4	June 21	July 9	.15

\*New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Divi- dends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
*Aetna Con.....			\$20,000	\$60,000
Alaska-Mexican..			34,200	157,031
Alaska-Treadwell			150,000	2,825,000
Anaconda.....			750,000	
Aurora Iron.....			50,000	700,000
Big Six.....			2,500	2,500
Boston & Mont.			600,000	4,025,000
*Bullion Beck & Ch			95,000	2,045,000
Calumet & Hecla..	July 13	\$500,000	1,500,000	45,850,000
Cariboo.....	" 7	16,000	32,000	95,000
Centennial-Eureka			210,000	1,740,000
C. O. D.....			5,000	25,000
*Dalton & Lark...			62,500	62,500
Dominion Coal...			600,000	
*Kikton Con.....			20,000	65,000
Florence.....			54,390	89,348
Galena.....			16,000	36,000
Gold Coin.....			45,000	60,000
Golden Fleece...			90,000	491,179
*Gold & Globe Hill.			19,500	28,875
Hecla Con.....			30,000	2,190,000
Highland.....			25,000	3,159,918
*Homestake.....			188,500	5,904,000
Horn Silver.....			50,000	1,130,000
*Iowa.....			10,000	20,000
Iron Mountain...			30,000	440,000
*Isabella.....			112,500	135,000
*Le Roi.....			100,000	175,000
Mammoth.....	July 1	20,000	20,000	1,000,000
Mercur.....			100,000	450,000
Minnesota Iron...	July 15	247,500	495,000	3,240,000
*Mont. Ore Pur. Co.			240,000	400,000
*Moon-Anchor....			18,000	18,000
Moose.....			6,000	180,000
Napa Con.....	July 1	20,000	20,000	790,000
*Ontario.....			50,000	13,265,000
Oceola Con.....	July 25	50,000	125,000	2,072,500
Otaqueachy.....			1,000	1,000
*Portland.....			120,000	743,000
Quincy.....			400,000	8,070,000
Silver King.....			225,000	675,000
Slocan Star.....			100,000	100,000
Small Hopes.....			25,000	3,275,000
Smuggler-Union..	July 1	50,000	100,000	100,000
*Union.....			23,500	73,000
Utah.....			13,000	145,000
*Victor.....			120,000	585,000
*Victor M. & L...			12,000	42,000
War Eagle.....			25,000	157,500
Totals.....			\$903,500	\$7,200,500

\* June dividend paid.

STOCK QUOTATIONS.

BOSTON, MASS. Table with columns for Name of Company, Location, Par value, and dates from June 25 to July 1. Includes companies like Allouez, Arnold, Atlantic, etc.

NEW YORK. Table with columns for Name of Company, Location, Par value, and dates from June 26 to July 2. Includes companies like Adams, Ajax, Alamo, etc.

\* Official quotations Boston Stock Exchange. + ex-dividend. Total sales, 13,473.

\* Official quotations N. Y. Stock and Con. Stock & Petroleum Exchanges. Total shares sold, 26,900.

INDUSTRIAL COAL AND COAL RAILROAD. Table with columns for Name of Company, Par value, and dates from June 26 to July 2. Includes companies like Balt. & Ohio, Ches. & Ohio, etc.

ST. LOUIS, MO., STOCKS. Table with columns for Name of Company, Company's Office, Par value, Bid, Asked, and Last Dividend. Includes companies like Central Lead, Con. Coal, etc.

\* Official quotations N. Y. Stock Exchange. Total shares sold, 113,900.

\* Official telegraphic quotations, San Francisco Stock Exchange.

COLORADO SPRINGS, COLO. Table with columns for Name of Company, Par value, and dates from June 22 to June 27. Includes companies like Ajax, Alamo, Am'rican, etc.

SAN FRANCISCO, CAL. Table with columns for Name of Company, Location, Par value, and dates from June 26 to July 2. Includes companies like Alta, Belcher, Best & Belcher, etc.

\* Official quotations and sales Colo. Springs Mfg. Stock Assoc. \* Board of Trade Exchange.

\* Official quotations Baltimore Stock Exchange.

BALTIMORE, MD. Table with columns for Name of Company, Location, Par value, Bid, Asked, and Last Dividend. Includes companies like Balt. M. & S. N. C., Conrad Hill, etc.

\* Official quotations Baltimore Stock Exchange.

MISCELLANEOUS SECURITIES. Table with columns for Name of Company, Location, Par value, Bid, and Asked. Includes companies like American Coal, Chattanooga Ore & Iron, etc.

LONDON.

June 20.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like N'th Americans, Alaska-Mexican, etc.

DENVER, COLO.\*

Table with columns: NAME OF COMPANY, Par val, June 22, June 23, June 24, June 25, June 26, June 27, Sales. Lists companies like L'd Mines, Cannonball, Bankers, etc.

PARIS. Week ending June 12.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices (Op'ning, Closing). Lists companies like Acleries de Creusot, Agues Tenidas, etc.

PHILADELPHIA, PA.\*

Table with columns: NAME OF COMPANY, Loc'n, Par Val, June 24, June 25, June 26, June 27, June 28, June 29, June 30, Sales. Lists companies like Actev L.H. & P., Bethlehem Ir., etc.

MEXICO. Week ending June 25.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices (Opening, Closing). Lists companies like Amistad y Concordia, Angustias, etc.

SALT LAKE CITY, UTAH.\* Week ending June 27.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price. Lists companies like Ajax, Alliance, Am. Nat. Gas, etc.

PITTSBURG, PA.\*

Week ending June 30.

Table with columns: NAME OF COMPANY, Loc'n, Par val, Bid, Ask, Sell price. Lists companies like Mansfield, N.Y. & C. Gas Co., etc.

HELENA, MONT.\*

Week ending June 17.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price. Lists companies like Am. Dev. & M. Co., Bald Butte, etc.

DULUTH, MINN.\*

Week ending June 27.

Table with columns: NAME OF COMPANY, Par value, Bid, Asked. Lists companies like Adams Iron, Bwabik, Cincinnati Iron, etc.

VALPARAISO, CHILE.\*

June 18.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices (Bid, Asked, Last sale). Lists companies like Arturo Prat, Caracoles, Descub. de Huanajaya, etc.

SHANGHAI, CHINA.

May 29.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jolebu Mg. & Trad., Panjun Mg. Co., etc.

Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

Special Report of Samuel E. Davis. Total shares sold, 20,250.

Special Report of James A. Pollock. All the companies are located in Utah.

Official quotations Philadelphia Stock Exchange. Ex-dividend. Total sales, 3,437.

Official quotations Denver, Colo. Mg. St'k Exch. Sales, listed, 1,508,725; unlisted, 817,750; total, 1,326,475.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

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 \$31,300,000 in dividends and the Cons. Virginia \$42,390,000.

Note.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.



CLASSIFIED LIST OF ADVERTISERS.

**Air Compressors and Rock Drills**  
 Bullock, M. C., Mfg. Co.  
 Burlington Rock Drill Co.  
 Clayton Air Compressor Works.  
 Fraser & Chalmers.  
 Ingersoll-Sergeant Drill Co.  
 Laidlaw-Dunn-Gordon Co.  
 (See Diamond Drills)

**Air Hoists.**  
 Whiting Foundry Equipment Co.

**Aluminum Bronze**  
 Fairbanks Co.

**Amalgamators**  
 Bucyrus Steam Shovel & Dredge Co.  
 Fraser & Chalmers.

**Amalgam Plates.**  
 Western Plating and Mfg. Co.

**Anti-Friction Metals**  
 Besley, Chas. H., & Co.  
 Chester Steel Cast. Co.

**Architects and Builders**  
 Berlin Iron Bridge Co.  
 Pittsburg Bridge Co.  
 Pollock, Wm. B., & Co.  
 Walker Co.

**Assayers' and Chemists' Supplies**  
 Almsworth, Wm.  
 Baker & Adamson.  
 Baker & Co.  
 Becker, Christian.  
 Bullock & Crenshaw.  
 Denver Fire Clay Co.  
 Elmer & Amend.  
 Henry Hill Chem. Co.  
 Penn. Sm. & Ref. Wks.  
 Penna. Salt Mfg. Co.  
 Roessler & Hasslacher  
 Chemical Co.  
 Sargent, E. H., & Co.  
 Solvay Process Co.  
 Taylor, John, & Co.  
 Troemer, Henry.  
 Western Chemical Co.

**Attorneys, Corporation**  
 Emig, C. E.  
 Hammersley, Hamilton & La Matre.

**Automatic Boiler Feeds**  
 Penberthy Injector Co.

**Babbit's Metal**  
 Besley, Chas. H., & Co.

**Bankers and Brokers**  
 Artzell, E., & Co.  
 Bartlett & Co.  
 Bonbright, W. P., & Co.  
 Breitung, N. N.  
 Crandell & Huff.  
 Crisp, Cr. Syn. Inv. Co.  
 Decker, L. B.  
 Duer, G. A. C.  
 Dorsey Investment Co.  
 Elfts, G. W., & Sons.  
 Fletcher, C. S., & Co.  
 Freyschlag, Kirby & O'Grant, E. K.  
 Handy & Harman.  
 Hendrickson, W. J.  
 Heron Bros.  
 Hodgins, L. W.  
 Hicks & Benzie.  
 Johnson, L.  
 Keith, F. M.  
 Key, J. J.  
 Kinney, M.  
 Krellander, C. F., & Co.  
 Lelphelmer, N.  
 Letts, John S.

**Belting**  
 Carpien, Geo. B., & Co.  
 Hendrie & Bothoff  
 Mfg. Co.  
 Jeffrey Mfg. Co.

**Belt Lacing.**  
 Bristol Co.

**Blasting Caps.**  
 Metallic Cap Mfg. Co.  
 Rhenish Westphalian Explosive Co.  
 Schroeder, Fr.

**Blasting Batteries Caps and Fuse**  
 Climax Fuse Co.  
 Lau, J. H., & Co.  
 Metallic Cap Mfg. Co.

**Blowers, Pressure.**  
 Connorsville Blower Co.

**Boilers**  
 Denver Eng. Wks. Co.  
 Enterprise Boiler Co.  
 Fraser & Chalmers.  
 Heine Safety Boiler Co.  
 Philadelphia Eng. Wks. Co.

**Brattice Cloth**  
 Besley, Chas. H., & Co.

**Brewers.**  
 Pabst Brewing Co.

**Brick Machinery**  
 Freese, E. H., & Co.

**Bridges**  
 Berlin Bridge Co.  
 Pittsburg Bridge Co.

**Buckets**  
 Scaife, Wm. B., & Sons.  
 (See Machinery.)

**Car Wheels.**  
 Whiting Foundry Equipment Co.

**Carbons**  
 Bishop, Victor, & Co.  
 New York Diamond Drill Co.  
 Lexow, Theodor.

**Chain and Link Belting (See Belting.)**

**Chemicals**  
 Baker & Adamson.  
 Bullock & Crenshaw.  
 Elmer & Amend.  
 Henry Hill Chem. Co.  
 Penn. Salt Mfg. Co.  
 Roessler & Hasslacher  
 Chemical Co.  
 Solvay Process Co.  
 Western Chemical Co.

**Coal**  
 Maryland Coal Co.  
 Fozz, F. A., & Co.  
 Steadman, Conyngham & Co.  
 Ward & Olyphant.

**Chemists.**  
 Simonds & Wainwright.  
 Whiting Foundry Equipment Co.

**Coal Cutters**  
 Ingersoll-Sergeant Drill Co.  
 Jeffrey Mfg. Co.  
 Leyner, J. Geo.  
 Link Belt Machinery Co.

**Compressors.**  
 Clayton Air Compressor Works.  
 Norwalk Iron Works Co.

**Concentrators, Crushers, Pulverizers, Separators, Etc.**  
 Allis, F. D., & Co.  
 Rippe, Theo. A.  
 Bradley Pulverizer Co.  
 Colorado Iron Works.  
 Denver Eng. Works Co.  
 Dodge Mining Machinery Co.  
 Engelbach Mach. Mfg. Co.  
 Fraser & Chalmers.  
 True Vaner Concentrator.  
 Hendrie & Bothoff Mfg. Co.  
 Krupp, F.  
 Link Belt Machinery Co.  
 McCully, R.  
 Scoville, H. H., & Co.  
 Stedman Foundry & Mach. Co.  
 Walburn-Svenson Mfg. Co. See Machinery.

**Contractors. (See Machinery.)**

**Copper Dealers and Producers.**  
 American Metal Co.  
 Arizona Copper Co.  
 Atlantic Mining Co.  
 Balbach S. & Ref. Co.  
 Baltimore Cop. Wks.  
 Bath, H., & Son  
 Bridgeport Copper Co.  
 Canadian Copper Co.  
 Copper Queen Mfg. Co.  
 Detroit Cop. Mfg. Co.  
 Elliott's Metal Co., Ltd.  
 Corrugated Iron.  
 Berlin Iron Bridge Co.  
 Cincinnati Corrugating Co.  
 South, W. B., & Sons  
 Sikes Steel Roofing Co.  
 Whiting Foundry Equipment Co.

**Crucibles, Graphite, Etc.**  
 Denver Fire Clay Co.  
 Dixon, Jos., Cruc. Co.  
 Cyanide.  
 Roessler & Hasslacher Chemical Co.

**Diamonds**  
 Bishop, Victor, & Co.  
 Lexow, Theodor.  
 New York Diamond Drill Co.  
 Diamond Drills.  
 Bishop, Victor, & Co.  
 Bullock Mfg. Co., M. C.  
 Lexow, Theodor.  
 New York Diamond Drill Co.  
 Sullivan Machinery Co.  
 (See Air Compressors and Rock Drills)

**Draughtsmen**  
 Young, Wm. R.

**Drawing Materials**  
 Heer, Peter.  
 Alois, A. S. Co.  
 Besley, Chas. H., & Co.  
 Dietzgen, E., & Co.  
 (See Engineering Instruments.)

**Dredges**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Southern & Co.

**Dryers.**  
 Brown, Horace T.  
 Cummey, F. D., & Son Co.  
 Denver Eng. Wks. Co.  
 Hunt Co., C. W.  
 Fraser & Chalmers.  
 Truax Mfg. Co.

**Educational Institutions**  
 Arizona School of Mines.  
 Columbian University.  
 Chicago School of Assaying.  
 Correspondence School of Mines.  
 Lehigh University.  
 Mass. Inst. of Technology.  
 Michigan Mining School.  
 Rose Polytechnic Institute.  
 Worcester Polytechnic Inst.

**Electrical Batteries**  
 Macbeth, James, & Co.  
 Electrical Machinery and Supplies.  
 Besley, Chas. H., & Co.  
 Card Electric Co.  
 Denver Eng. Wks. Co.  
 Electrical Engineer-  
 ing Co.  
 General Electric Co.  
 Jeffrey Mfg. Co.

**Elevators, Conveyors and Hoisting**  
 Hunt, C. W., & Co.  
 Jeffrey Mfg. Co.  
 Joplin Machine Works  
 Link Belt Mach. Co.  
 Nelsonville Foundry  
 & Machine Co.  
 Scaife, Wm. B., & Sons.  
 Vulcan Iron Works.  
 Walkins, L. E.

**Emery Wheels**  
 Besley, Chas. H., & Co.  
 New York Belting & Packing Co., Ltd.  
 Engineers & Chemists, Manufacturers  
 See Directory Pages 1, 5 and 6.

**Engineers' Instruments and Supplies.**  
 Alois, A. S. Co.  
 Buff & Berger.  
 Bullock & Crenshaw.  
 Cooper, Hewitt & Co.  
 Fauth & Co.  
 Gurley, W. & L. E.  
 American Engine Co.  
 Buckeye Engine Co.  
 Bullock, A. C. Mfg. Co.  
 Enterprise Boiler Co.  
 Ellison, Wm., & Sons.  
 Fraser & Chalmers.  
 Heine Safety Boiler Co.  
 Lidgerwood Mfg. Co.  
 (See Machinery.)

**Excavators**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Southern & Co.  
 Vulcan Iron Works.

**Fire-Brick and Clay**  
 Chur, A. T.  
 Furnaces.  
 Brown, Horace.  
 Dodge Mining Mach Co.  
 Hoskins, Wm.  
 (See Machinery.)

**Fuses, Powder**  
 Ingersoll-Sergeant Drill Co.  
 Fuse, Safety.  
 Climax Fuse Co.

**Gas Engines.**  
 Norman, J. J., & Co.

**Gas Works.**  
 Pollock, Wm. B., & Co. | Wood, R. D., & Co.  
 Gauges, Recording, Etc.  
 Bristol Mfg. Co.

**Gearing**  
 Besley, Chas. H., & Co. | Denver Eng. Wks. Co.  
 Chester Steel Cast. Co. | Fraser & Chalmers.  
 (See Machinery.)

**Grease, Graphite, Etc.**  
 Besley, Chas. H., & Co. | Dixon, Jos., Cruc. Co.

**Harveyed Steel.**  
 Pierce & Miller Engineering Co.

**Heavy Machinery**  
 Denver Eng. Works Co.  
 Fraser & Chalmers.

**Hose, Rubber, Etc.**  
 New York Belting & Packing Co., Ltd.

**Injectors.**  
 Penberthy Injector Co.

**Insulated Wires and Cables**  
 Okonite Co., Ltd. The

**Insurance Companies**  
 Hartford Steam Boiler Inspect'n and Ins. Co.  
 Mutual Life Insurance Co.  
 Joint Fitting.  
 Tight Joint Co.

**Lead Linings for Chlorination Tubs.**  
 Richmond Lead Co.

**Locomotives**  
 General Electric Co.  
 Hunt, C. W. Co.  
 Porter, F. F., & Co.  
 Asbestos Paraffine Co.  
 Lubricators.  
 Detroit Lubricator Co.

**Machinery.**  
 Dealers in Mining, Milling and Other Machinery.  
 Link Belt Mach. Co.  
 Krupp, F.  
 McCully, R.  
 McKiernan Drill Co.  
 Mecklenburg Ir. Wks.  
 Mach. Co.  
 Montgomery, J. H.  
 Mach. Co.  
 Moore, Sam. L., & Son.  
 Nelsonville Foundry  
 & Machine Co.  
 New York Diamond  
 Drill Co.  
 Norwalk Iron Wks. Co.  
 Parke & Lacy Co.  
 Philadelphia Eng.  
 Wks. Co.  
 Pollock, Wm. B., & Co.  
 Rison Iron Works.  
 Scaife, W. B., & Sons.  
 Stedman Fdy. & M. Co.  
 Scrabble, H. H., & Co.  
 Stearns, Roger Mfg. Co.  
 Sullivan Mach'y Co.  
 Tod, Wm., & Co.  
 Truax Mfg. Co.  
 Union Iron Works.  
 Vulcan Iron Works.  
 Walburn-Svenson Mfg.  
 Co.  
 Walker Co.  
 Webster, Camp & Lane  
 Mfg. Co.

**Manganese Steel.**  
 Taylor Iron & Steel Co.

**Metal Dealers**  
 American & Dev.  
 Johnson, Matthey & Co.  
 Lambert's Wharf, Co.  
 Lewisohn Bros.  
 Mathison Sm'ling Co.  
 Mathiessen & Hegeler  
 Co.  
 Montana Ore Purchasing  
 Co.  
 Orford Copper Co.  
 Pass, O., & Son, Ltd.  
 Phelps, Dodge & Co.  
 Picher Lead Co.  
 Raymond Lead Co.  
 State Ore Sampl'g Co.  
 Tod, William, & Co.  
 Vivian, Y'nger & Bond.  
 American Dev. & Mfg.  
 Co.  
 Amer. Zinc Lead Co.  
 Baker & Co.  
 Bath, Henry & Son.  
 Besley, Chas. H., & Co.  
 Bridgeport Copper Co.  
 Cherokees - L A N Y on  
 Spelter Co.  
 Cookson & Co.  
 Elliott's Metal Co., Ltd.  
 Eureka Co.  
 Foster, Blackett &  
 Wilson.  
 James & Shakspeare.  
 Metallurgical Works and Ore Pur-  
 chasers, Processors.  
 American Dev. & Mfg.  
 Co.  
 Amer. Zinc Lead Co.  
 Baker & Co.  
 Balbach Sm. & Ref. Co.  
 Bridgeport Copper Co.  
 Canadian Copper Co.  
 Cookson & Co.  
 Denver Eng. Wks. Co.  
 Elliott's Metal Co., Ltd.  
 Eureka Co.  
 Electro Cyanide Gold  
 & Silver Extr. on Co.  
 Foster, Blackett &  
 Wilson.  
 Fraser & Chalmers.  
 General Gold Extrac-  
 tion Co.  
 Hendrie & Bothoff Mfg. Co.  
 Hunt, C. W., Co.  
 Nelsonville Foundry & Machine Co.  
 Sheffield Car Co.  
 Whiting Foundry Equipment Co.  
 (See Machinery.)

**Mine, Mill and Smelters Supplies.**  
 Brown, Horace T., & Co.  
 Crandall & Huff.  
 Denver Eng. Wks. Co.  
 Dodge Mining Machinery Co.  
 Gates Iron Works.  
 Park's & Wilkinson.  
 Roessler & Hasslacher Chemical Co.  
 Stieren, William E.  
 (See Machinery.)

**Mining and Land Companies**  
 American Dev. & Mfg. Co.  
 Clark Land & Mines Co.  
 Copper Queen Mfg. Co.  
 Detroit Copper Mfg. Co.  
 Eureka Co.

**Ore Cars.**  
 Truax Mfg. Co.

**Ore Hoists.**  
 Brown, Horace T., & Co.  
 Cummey, F. D., & Sons Co.  
 Davis-Colby Ore Roaster Co.

**Ore Testing Works**  
 Hunt, F. F.  
 Ledoux & Co.  
 Montana Ore Purchasing  
 Co.  
 State Ore Sampling Co.  
 A. L. Weston Paraffine Co.  
 Brandt, Randolph.  
 Jenkins Bros.  
 Hine & Robertson.  
 Refined Metals.  
 Aitchison, B., Perf. Metal Co.  
 Fraser & Chalmers.  
 Harrington & King Perforating Co.  
 Peroxide of Sodium.  
 Roessler & Hasslacher Chemical Co.

**Phosphor-Bronze**  
 Phosphor-Bronze Smelting Co.

**Pile Drivers**  
 Bucyrus Steam Shovel and Dredge Co.  
 Ingersoll-Sergeant Drill Co.

**Pipes**  
 Bowes, F. K.  
 Pollock, Wm. B., & Co. | Wyckoff, A., & Sons.

**Platinum**  
 Baker & Co.  
 Johnson, Matthey & Co.

**Powder**  
 Atlantic Dynamite Co. | Ladin & Rand Pow  
 ders Powder Co.  
 Ingersoll-Sergeant  
 Drill Co.  
 Pressure Blowers  
 Connorsville Blower Co.

**Pressure Regulators**  
 D'Eate & Seeley, (Curtis).

**Pulverizations**  
 American Fertilizer.  
 Indian Engineer

**Arms and Explosives.**  
 Australian Mfg. Stand.  
 Bullionist.  
 Colliery Guardian.  
 Denver Republican.  
 Economic Mining.  
 El Merero Mexicano.  
 Electrical Plant &  
 Electrical Industry  
 Pumps.  
 Blake, Geo. F., Mfg. Co.  
 Cameron, A. S., steam  
 Pump Works.  
 Denver Eng. Wks. Co.  
 Fraser & Chalmers.  
 Goude Mfg. Co.  
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 Rand Drill Co.  
 Sullivan Machinery Co.

**Quicksilver**  
 Eureka Co.

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 Fairbanks Co. | (See Machinery.)

**Registers, Dampers, Heat, Etc.**  
 D'Eate & Seeley Co.  
 Eddy Valve Co.  
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 Berlin Iron Bridge Co. | Pittsburg Bridge Co.  
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 New York Belting & Packing Co., Ltd.

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 Fairbanks Co.

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 Link Belt Machinery Co.  
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**Sheet and Machinery**  
 Robinson & Orr.

**Separators**  
 Dodge Mining Machinery Co.

**Shoes and Dies**  
 Chester Steel Cast. Co. | Fraser & Chalmers  
 Coram Steel Works | Pierce & Miller Eng  
 Crescent Steel Co. | neering Co.  
 Denver Eng. Wks. Co. |

**Shovels (Steam)**  
 Bucyrus Steam Shovel & Dredge Co.  
 Marion Steam Shovel Co.  
 Southern & Co.

**Smelting and Refining Works**  
 Balbach S. & Ref. Co.  
 Baltimore Cop' Wks.  
 Bridgeport Copper Co.  
 Elliott's Metal Co., Ltd.  
 Kan. City Sm. & Ref. Co.  
 Mathison Smelting Co.  
 Orford Copper Co.  
 Penna. Salt Mfg. Co.  
 Refining Works.  
 Phosphor-Bronze  
 Smelt. Co.

**Steam Traps.**  
 D'Eate & Seeley, (Curtis).

**Steel Rails, Castings, Rolls, Drill**  
 Steel.  
 Bethlehem Iron Co.  
 Carpenter Steel Co.  
 Chester Steel Cast. Co.  
 Chrome Steel Works.  
 Crandall & Huff.  
 Crescent Steel Co.  
 Moore, S. L., & Sons Co.  
 Taylor Iron & Steel Co.  
 Jessop Wm. & Son  
 Ltd.  
 Walker Mfg. Co.  
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**Telegraph Wires and Cables**  
 Okonite Co., Ltd. The.

**Temperature Regulators**  
 D'Eate & Seeley, (Curtis).

**Testing Laboratories**  
 Fairbanks Co.

**Taps**  
 Besley, Chas. H., & Co.  
 Pratt & Whitney Co.  
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**Tubes**  
 Besley, Chas. H., & Co. | Pollock, Wm. B., & Sons  
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 New York Belting and Packing Co., Ltd.

**Turbine Water-Wheels**  
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 Bullock Mfg. Co. | Tod, Wm., & Co.  
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 Leffel, James, & Co.  
 Pelton Water Wheel Co.  
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**Well Drilling Machinery**  
 Sullivan Mach'y Co. | Williams Bros.

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 Chester Steel Cast. Co.  
 Sheffield Car Co.  
 Taylor Iron & Steel Co.

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 Cookson & Co.  
 Foster, Blackett & Co.

**Wire Cloth**  
 Aitchison, R., Perf. Metal Co.  
 Barnum, E. T.  
 Harrington & King Perforating Co.

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 Besley, Chas. H., & Co.  
 Broderick & Bascom  
 Hope Co.  
 California Wire Wks.  
 Carpenter, G. E., & Co.  
 Charbonnet Steel Co.  
 Channon, H. Co.  
 Cooper Hewitt & Co.  
 Brown Hoist & Conv.  
 Machinery Co.  
 California Wire Wks.  
 Colorado Iron Works.  
 Denver Eng. Wks. Co.  
 Fraser & Chalmers.

advertisin out in the wrong direction—missed the Engineering and Mining Journal.

**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.

**1456 WANTED—A DRAUGHTSMAN WHO** has had experience in designing and building blast furnaces. State qualifications, references, etc. Address P. Z., ENGINEERING AND MINING JOURNAL.

**1459 WANTED—A FIRST-CLASS AS-** sayer and thorough ore sampler to take charge of a branch office in the Mexican Republic, through which ores are purchased and bullion sold, and a general mining and milling supply business done. Promptness, system, accuracy and thoroughness essential qualities. Address CARBON, ENGINEERING AND MINING JOURNAL.

**1462 WANTED—BY A FINANCIAL COM-** pany, to represent them in Western Australia, a thoroughly qualified mining engineer, with a large experience in gold mining. Liberal terms will be arranged. Address, giving copies of testimonials as to character and ability, MINING, ENGINEERING AND MINING JOURNAL.

**1463 WANTED—A GENTLEMAN FA-** miliar with railway supplies and specialties, knowing the manufacturers and comparative merits of their products. Address H. G., ENGINEERING AND MINING JOURNAL.

**1464 WANTED—COMPETENT MAN TO** go to Sidon, Syria, to introduce artesian well-boring apparatus. Must have good references, and be willing to stay a year or longer if necessary. Address ISLAM, ENGINEERING AND MINING JOURNAL.

**1465 WANTED.—A YOUNG MINING EN-** gineer who has had some experience in the field to take a position with an important company as one of their engineers. Proof of ability and trustworthiness will be required. Address EXPLORATION, ENGINEERING AND MINING JOURNAL.

**1466 WANTED—ELECTRO-METALLUR-** gist. An important recently organized copper-mining company is considering the advisability of erecting electrolytic works, and would like to correspond with electro-metallurgist capable of designing and running the same. A liberal salary will be paid if, after investigation, it is decided to refine by this process. Address RIO GRANDE, care of ENGINEERING AND MINING JOURNAL.

**1467 WANTED—ASSAYER AND ASSIST-** ant Chemist, by a firm of refiners of precious metals. Address, stating age, experience and wages expected, REFINERS, ENGINEERING AND MINING JOURNAL.

**1468 WANTED—A MAN WHO IS A THOR-** oughly competent Mechanical Draftsman and Chemist, who is willing to start with low wages, where chances for advancement are good; steady position. Address, stating references, experience and salary expected, XY, ENGINEERING AND MINING JOURNAL.

**1469 WANTED—A THOROUGHLY EX-** periented furnace man who understands manufacturing Ferro-Manganese and Spiegel. Address, with full particulars, O. R. E., ENGINEERING AND MINING JOURNAL.

**1470 WANTED BY AN ENGLISH COM-** pany a competent and experienced mine manager, to open up gold mine near Rat Portage, Ontario, Canada, and to erect stamp mill. Must assay and have chemical knowledge. Age not less than 35. References to persons in London, England, desirable. State salary. Address R. E., ENGINEERING AND MINING JOURNAL.

**SITUATIONS WANTED.**

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

**GRADUATE MINING ENGINEER.—Young** man, wishes position, any country, as assayer assistant to manager or superintendent of mines. One year's experience in topography, hydrography and chemistry. Address, C. H. K., 652 Cass St., MILWAUKEE, WIS. No. 17,452, July 18.

**YOUNG MAN, THIRTY YEARS OF AGE,** desires position as foreman or assistant superintendent of copper or lead-silver smelter. Has practical knowledge of reverberatory and blast furnace work; practical builder of both furnaces. Address COPPER, ENGINEERING AND MINING JOURNAL. No. 17,448, July 25.

**A MINING ENGINEER, AGE 22, GRADU-** ate of Mass. Institute of Technology, '95, desires a position with gold mining company. Willing to go anywhere. Address COB, ENGINEERING AND MINING JOURNAL. No. 17,447, July 18.

**GRADUATE CHEMIST WANTS POSITION** as assistant. Not afraid of hard work and willing to accept small salary at start. Best references as to ability, character, etc. Address J. P. LA BARRER, 1427 William St., Baltimore, Md. No. 17,450, July 11.

**CHEMIST AND ASSAYER, SIX YEARS** in responsible positions, now in charge of a Lake Superior laboratory, desires position in Southwest. Refers to present employers. Address "V," Box 393 Ironwood, Mich. No. 17,457, July 25.

**WANTED.—POSITION BY A MACHINIST** and electrician. Address E. A. PORTER, 652 Cass St., Milwaukee, Wis. No. 17,445, July 11.

**CHEMICAL ENGINEER.—A MERICAN** young man, technical graduate, with long and successful experience as assistant manager and engineering and chemical expert with large manufacturing concerns, is open for engagement. Has a record as a pushing organizer and manager of manufacturing work. Special experience with compressed gases and electro-chemical work. Address EXCELLENT REFERENCES, care of ENGINEERING AND MINING JOURNAL. No. 17,446, July 11.

**WANTED—POSITION AS RESIDENT** manager or superintendent; 15 years' practical experience; now with the largest company in Northern Mexico as mine superintendent; Spanish American country preferred; highest recommendations. Address AMERICANO, ENGINEERING AND MINING JOURNAL. No. 17,432, July 4.

**MINING ENGINEER AND METALLURGIST** of high standing is open to engagement. Large properties or works preferred. Specialties made of successfully treating low-grade ores. Address CONCENTRATOR, ENGINEERING AND MINING JOURNAL.

**GRADUATE M. E. WANTS POSITION** as assistant manager or superintendent. Eight years' experience. Two years' engineering experience. AHORA, ENGINEERING AND MINING JOURNAL.

**CHEMIST, AT PRESENT EMPLOYED BY A** well-known iron company, desires chemical work in or near a city or in a large town. Is a rapid and accurate analyst; sober and industrious. Best recommendations from present employers. Would accept college or high-school position as instructor. Address C. H. E., ENGINEERING AND MINING JOURNAL. No. 17,454, July 18.

**Contracts Open.**

**LAKE TUNNELS, Cleveland, O.**—Sealed proposals will be received at the office of the Board of Control, No. 105, City Hall, until July 31, 1896, for furnishing the material for and building a brick tunnel nine (9) ft. internal diameter under Lake Erie, from a point on the Lake Shore, between Coe St. and Kirtland St., in a westerly direction to an inlet protection crib, located about 26,000 ft. distant and about four (4) miles from shore. There will be four (4) shafts connected with the building of this tunnel: One shore shaft from 10 to 10 1/2 ft. inside diameter and about 112 ft. deep; two temporary shafts, each 8 ft. in diameter in the clear and about 118 ft. deep; one inlet shaft 10 ft. in diameter in the clear and about 122 ft. deep. Sealed proposals will also be received for furnishing the material for and building a brick tunnel 8 1/2 ft. internal diameter to extend from our present intake crib in a northwesterly direction, a distance of about 15,000 ft. There will be two shafts connected with this tunnel; one temporary shaft 8 ft. in diameter in the clear and about 111 ft. deep, and one inlet shaft 10 ft. diameter in the clear and about 122 ft. deep. Plans and specifications may be seen and blank proposals can be obtained at the office of the Superintendent of Waterworks, after July 12, 1896. Each proposal must contain the full name of the party or parties making the same, and all parties interested therein, and each bidder must deposit with his bid or bids a certified check for thirty-five thousand (\$35,000) dollars, on a solvent bank in the city, as surety that if his proposal, or either of his proposals, shall be accepted, he will enter into contract and will properly secure the performance thereof; such check to be surety for the bid or bids that may be accepted. The city proposes to build but one of said tunnels, and will determine, after receipt of bids for both, which, if either, will be built. No proposals will be entertained unless made on the blanks furnished by the Superintendent of Water Works and delivered at the office of the Board of Control, No. 105 City Hall. D. E. WRIGHT, Director of Public Works.

**LAYING 48-IN. WATER PIPES.**—Sealed proposals will be received at the office of the Metropolitan Water Board, 3 Mt. Vernon street, Boston, Mass., until July 23, 1896, for laying about 18,300 ft. of 48-in. cast-iron water pipes in the cities of Cambridge and Somerville. The contractor for laying the water pipe will also be required to furnish and lay about 4,800 ft. of vitrified sewer pipe, from 8 to 15 in. in diameter. Pamphlets containing further information for bidders, forms of proposal, contracts and specifications, will be mailed to contractors who apply to FREDERICK P. STEARNS, Chief Engineer, 3 Mt. Vernon street, Boston, Mass. Plans may be seen at the office of the Chief Engineer. The printed forms must be used in making proposals.

**ENGINE AND BOILER.**—Office of Lighthouse Engineer, Ninth and Eleventh Districts, Detroit, Mich.—Sealed proposals will be received at this office until the 22d day of July, 1896, for furnishing the boilers, machinery, etc., for six complete steam fog signals, in sets of two, delivered at the Lighthouse Depot, at Detroit, Mich. Plans, specifications, forms of proposal and other information may be obtained on application to the undersigned. The right is reserved to reject any or all bids and to waive any defects. M. B. ADAMS, Major of Engineers, U. S. A., Lighthouse Engineer.

**THE CONTRACT FOR THE MASONRY AND**

superstructure of a bridge over the Jackson River at Iron Gate will be let by the Board of Supervisors of Allegheny County (Virginia) on WEDNESDAY, JULY 15, 1896, at 10 o'clock A. M., at the County Court House at Covington.

Specifications may be had of  
J. E. JOHNSON, JR.,  
Longdale, Allegheny Co.,  
Virginia.

**PLANS FOR BRIDGE.**—Bridge Engineers are requested to submit designs for the superstructures of a new bridge over Newtown Creek, between Manhattan avenue, in the City of Brooklyn, and Vernon avenue, in Long Island City, to the Joint Bridge Committee of the Board of Aldermen of the City of Brooklyn and the Board of Supervisors of Queens County, at a meeting to be held at Common Council Chambers, City Hall, Brooklyn, on the 23d day of July, 1896. These designs are to be for the superstructures of a bridge to replace the present Vernon avenue bridge. The style and dimensions of the new structure, the method of moving the same and the clear waterway are to be determined by each designer, and are to be in accordance with the regulations of the United States War Department. Each competitor is to submit drawings showing the general design of the proposed structures, with length of movable span or spans, and of stationary, if any, width of clear waterway, width of roadway and footways, loads proposed to be sustained and carried, dimensions of all the parts and modes of construction, and strain sheets showing the forms and construction of typical members with strains sustained; also the metals proposed to be used, style of flooring and motive power, with sufficient detail to indicate the manner of the application and operation of the same, and a typewritten description of the proposed structures. The length between the bulkhead lines measured on a line from the intersection of the center of Manhattan avenue and the bulkhead to the intersection of the center of Vernon avenue and the bulkhead is 290 ft. The angle of intersection of this line with the bulkhead lines taken down stream, on the Queens County side, measured from south to west, is 74 degrees 39 minutes. The width of Manhattan avenue is 70 ft., and of Vernon avenue is 80 ft. The grade of the avenue at the bulkhead line is 7 ft. above high water. The committee will make no compensation to any engineer competing excepting to the one whose designs are accepted and approved. Each engineer will be requested to submit in writing with his designs the price of the same, and by submitting his designs each engineer agrees to make no charge therefor, or for any work done or expense incurred, unless his designs are approved and adopted, and in no event shall such charge or price exceed the price submitted with the design.

Any desired detail or site not herein contained may be had upon application to JOHN J. McLAUGHLIN, County Engineer of Queens County, N. Y.

**BRIDGE.**—The contract for the masonry and superstructure of a bridge over the Jackson River at Iron Gate will be let by the Board of Supervisors of Allegheny County, Virginia, on Wednesday, July 15, at the County Court House in Covington. Specifications may be had of J. E. JOHNSON, JR., Longdale, Allegheny Co., Va.

**THE ENGINEERING AND MINING JOURNAL**

**ADVERTISING RATES.**  
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	24	2 1/4	8	24	46	66	89	113
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Correspondence from Owners of Mining Properties and Parties Seeking Mining Investments solicited.

—References on Application.—

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### DIVIDENDS.

#### SMUGGLER UNION MINING COMPANY,

804 BOSTON BUILDING, Denver, Colo.

A dividend of ONE (\$1) DOLLAR PER SHARE has been declared, payable at the office of the company July 1st.

Transfer books will be closed on the 20th inst for 12 days.

A. H. FOWLER, Secretary

#### ISABELLA GOLD MINING COMPANY.

COLORADO SPRINGS, Colo., June 10th, 1896.

DIVIDEND NO. 6.

A dividend of ONE CENT PER SHARE (\$22,500) has been declared, payable June 25th, 1896, to stockholders of record June 18th, 1896.

The stock transfer books will be closed June 18th, 1896, at 3 o'clock p. m., and will be re-opened on the morning of June 26th, 1896.

PERCY HAGERMAN,  
Vice-President and Treasurer.

### MEETINGS.

**NOTICE.—A GENERAL MEETING OF** Stockholders of the United States Sulphur & Chemical Company will be held at Room 205 Postal Telegraph Building, 253 Broadway, New York, at noon on Tuesday, July 28th, 1896, to elect Directors, adopt by-laws, and transact any other business that may lawfully be brought before it.

July 7th, 1896.

By order of the Incorporators.

#### WYOMING MINING BUREAU.

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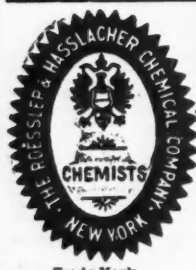
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