THE ENGINEERING AND MINING JOURNAL AND COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LVI. AUGUST 5. No. 6.

RICHARD P. ROTHWELL, C. E., M. E., Editor.

ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.

SOPHIA BRAEUNLICH, Business Manager.

THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTION PRICE: For the United States, Mexico and Canada, $5 per annum; $2.50 for six months; all other countries in the Postal Union, $7.

ADVERTISING RATES furnished on application.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

NOTICE OF DISCONTINUANCE.—The ENGINEERING AND MINING JOURNAL is sent to subscribers until an explicit order for its discontinuance is received by us, and all payment of arrearages is made, as required by law. *Papers returned are not notices of discontinuance.*

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS:
R. P. ROTHWELL, Pres. & Gen'l Mang.
SOPHIA BRAEUNLICH, Sec'y & Treas.

P. O. BOX 1833.
27 Park Place, New York.

Cable Address: "Rothwell, New York." Use A B C Code, Fourth Edition.

LONDON OFFICE:
20 Bucklersbury (Room 366), London, E. C., England.
Edward Walker, Manager.

CHICAGO OFFICE: "The Rookery," Room 531.

HEADQUARTERS AT THE WORLD'S COLUMBIAN EXPOSITION:
Mining Building, Montana Pavilion, Bullion Boulevard.
Machinery Hall, Section K, Aisle 37 (Central Aisle).

CONTENTS.

* Illustrated.

THE revival of interest in gold mining has extended to the South, and the deposits of Georgia and Alabama seem to be in a fair way to renewing their place as factors in our gold supply by the introduction of improved machinery and methods of concentrating and working the sulphurets which constitute a considerable part of the value of the ores. None of these mines have been worked much below the water level, owing to the presence of the sulphurets, which prevented them from being treated economically by the ordinary stamp mill and amalgamator. Until very recently the practice there has been much behind that adopted in the West; but this is likely to be changed in the near future.

WHILE other States are suffering quite as severely as Colorado from the silver depression, they are taking it much more quietly. The feeling on the silver question in Idaho, Utah and Montana is naturally strong, but the mining interests there seem disposed to make the best of the situation, to get what profit they can from their silver, and to turn their attention as far as possible to gold. In all the Rocky Mountain States old gold properties are being examined with a view to reworking, and prospectors are hunting for new ones. There are many old mines, abandoned years ago on account of the low grade or refractory nature of their ores, which could now, with modern improved processes, be worked with reasonable hopes of profit, and it is probable that many of these will be reopened within the next year or two.

THE report of the Alaska-Treadwell Gold Mining Company, an abstract of which is given in another column, shows what can be done with ores of low grade when there is an abundant supply and an economical system of working. This property is able to pay good dividends on ore yielding less than $3 per ton, in spite of its location at a distant point where supplies are difficult to obtain and fuel has to be brought mainly from a distance; although this is offset to some extent by the fact that water carriage is available. The abundant supply of ore and the good mill practice seem to be the main factors of success. The great mill with its 240 stamps was busy throughout the year, and over 237,000 tons of ore were worked. If the yield is small, the expenses are small also, and the reserves in sight are so large that there is no apparent prospect of exhausting the mine for years to come.

THE result of the deep borings with the diamond drill undertaken in the neighborhood of the Witwatersrand gold mines in the Transvaal seems to indicate that those remarkable gold-bearing deposits extend to a much greater depth than many miners have been inclined to believe. The main reef has been found by the drill at a depth of nearly 2,400 ft., and the cores brought up from that depth show that the ore is very nearly as rich as at the points where it is now mined near the surface. Our South African contemporaries are indulging in some extraordinary estimates of the value of the mines and the amount of ore which is to be expected from them. Probably most or all of these go far beyond reality, as such estimates are very apt to do, but there seems to be little or no doubt that these explorations prove that the Witwatesrand will continue to be an important gold producer for a long time to come, and that deep workings may be undertaken with fair prospects of a successful issue.

THE Colorado silver men now propose that the State shall establish a depository or warehouse where mine operators may store their silver bullion, receiving in return certificates of deposit, which may, to some extent, be used as a circulating medium. These certificates could not, of course, be made a legal tender, and their use in private transactions would depend entirely on the willingness of people to take them; but the State could receive them for taxes and so give them some sort of circulation. The Attorney-General of the State has given his opinion that such action can be legally taken. The objection to this scheme seems to be that, while such certificates might pass current in Colorado for a time, people outside of the State would hardly be willing to take them, except as merchandise, in the same way that elevator receipts or oil certificates are sold on the market; and that other producers might in time demand that the State give them certificates for their coal, grain, cattle or other merchandise, which would bring about unpleasant complications. A little consideration ought to show the Colorado silver men that a hearty support of our plan for a Monetary Clearing-House is much more likely to help them than any of the wild schemes they have been bringing forward.

THE Colorado lunatics who have been screaming that Colorado and all the other Rocky Mountain Mining States will be bankrupted unless the rest of the country will continue to buy their silver at some fancy price have, unfortunately, convinced a great many people that this is true, and the effect of this has been—not to continue the purchase of silver that is not wanted—but to influence every creditor to "call" his Colorado loans; to use every effort to realize on his Colorado investments before the collapse arrives, which these insane people assure him is coming. Naturally, no merchant is willing to give credit to those who announce to the whole world their impending bankruptcy. Was there ever such an exhibition of business idiocy as that of some Western silver fanatics?

The Rocky Mountain States are not going out of business because silver

has declined heavily and may decline still further. Even Colorado will work a majority of its mines at a profit by "meeting the situation" and reducing costs, as is being done in every other industry. Western miners can no longer expect to get $3 to $4 a day wages, while Eastern miners are working for $1 to $1.75. The cost of living must come down, and still further improvements in handling and in concentrating ore must and will be adopted.

With the practice of close economy many Western silver lead mines will still pay dividends whatever the price of the white metal may be; and the gold mines will be more remunerative than ever. Copper, nickel, zinc, iron, coal, building stone, petroleum, and other minerals and metals abound in these same States, and many of them are already the basis of profitable industry. These will be further developed, and manufactures of various kinds will spring up, and with the agricultural industry will give steady employment to the now idle miners.

Every part of the country has had, in years gone by, to pass through these sudden convulsions, and the great West, with its boundless resources and the most intelligent, enterprising industries and sanguine people on the face of the globe, is not going out of business; it will still offer perfect safety and large returns for investments. Colorado should "tar and feather" its prophets of evil, and promptly invite them to set out on a quest for a better country, not to return until they had found it.

THE wreckers who are industriously circulating opinions that the country is going to the dogs, and that there will be no recovery for years, are acting from very ignoble motives. When traced to their origin, we find these doleful forebodings come from Republicans and some disgruntled Democrats, who keep on repeating that the financial crisis is due simply to the fact that the administration is Democratic. It is not that many of them believe this, or that they would willingly wreck the industries of the country merely to change the political party in power, but they do not consider the importance in times like these of avoiding the circulation of opinions calculated to disturb confidence. He is indeed an unworthy and unpatriotic citizen who would bring disaster upon the country even for an assured political party advantage, and to endanger it for a distant and uncertain advantage in future elections is senseless as well as unpatriotic.

The "bears" who are accumulating vast fortunes on Wall Street are naturally giving the widest circulation in their power to every opinion and rumor that will depress the prices of stocks. They and the head politicians who are using these unworthy and shameful means to gain personal profit, are really very few in number, and could effect nothing without the help of the countless honest but inconsiderate people who innocently lend themselves to circulate their disturbing stories, and who often destroy confidence in attempting to demonstrate their superior wisdom by repeating the gloomy forebodings which these selfish "bears" are instilling into them.

It is true that in some "trust" bubbles, like sugar refineries, breweries, lead trusts, gas trusts, inflated railroad combinations, manufacturing combinations and the like, where the men who built up profitable industries on the solid foundation of experience, skill and economy, have turned them over at inflated valuations to inexperienced, unskillful and extravagant representatives of "boom" companies, there is now going on a natural and wholesome, though too sudden, expulsion of the "water" or the "gas," with corresponding losses to the simple investors. But it is equally true that the general business of the country, and more particularly the mining business, has not been inflated in recent years, and has been conducted on the whole with prudence and honesty, affording no good ground for the present collapse in values and in confidence.

THE ENGINEERING CONGRESS IN CHICAGO.

The convention or Congress of the Engineers in Chicago this week was a very notable event, chiefly because of the extremely valuable papers presented by the engineers of all countries, and because it brought a certain number of the eminent representatives of the profession together to exchange congratulations and compliments.

Abstracts of a number of the papers were presented in our columns, and we hope to give others at an early date. One of the more notable is Prof. P. POSEPNY'S paper on the "Genesis of Ore Deposits," which is really a treatise on the subject.

The discussion on the papers presented has been extremely brief but interesting, and the meeting, from the reports of the earlier sessions, promises to be full of professional interest.

The attendance of mining engineers is very small. No doubt the pressing financial condition of the country has prevented any large attendance of American engineers, and there are comparatively few foreign engineers at the Fair, so that the meeting is a very small one in numbers, so far as the mining engineering section is concerned. The civil engineers and the mechanical engineers have attended in much larger numbers, and when all are together the number makes a fairly well attended meeting.

The attendance of ladies is the smallest we have noticed at any recent meeting of the engineers.

THE CHICAGO SILVER CONVENTION.

The silver convention was quite largely attended, and it did not degenerate into the roaring farce that was recently held at the Fifth Avenue Hotel in New York to nominate delegates to Chicago.

The members of the convention are a much better lot of men, many of them being evidently honest and sincere, believing in the theories they advocate, however wild and impracticable they may be.

As is always the case, these sincere believers in erroneous and mischievous tenets are led by designing and loud-mouthed demagogues, whose object is the promotion of personal ambition, the applause of the crowd. Such a man, for example, is "TOM" PATTERSON, of Denver, Colo., who certainly does not believe the wild, illogical and many-times disproved statements he makes. Anything to get the applause of those who are supposed to control the votes he desires for election to some political position.

General WARNER, chairman of the misnamed "Bimetallic League," can scarcely be ignorant of the absolute and often-exposed falsity of many of the statements with which he tickles the ears of his disciples. This was not in the least a bimetallic convention, nor is the "league" intended or calculated to promote the cause of bimetalism. It is far more one-sided than any so-called "gold bug" meeting in the East or in London. Every "gold bug" counts on a large use of silver or subsidiary coin, but these "silver bugs" are unanimous in advocating a policy that would drive gold out of the country (at which many of them openly rejoice) and leave us silver alone.

At the bottom, what they want is "cheap money and plenty of it," and the only reason they now advocate silver, where they formerly preached the "fiat money" or "rag baby," is that the old craze is dead beyond resurrection, and silver is still a live question. These men are the worst enemies of silver and of true bimetallism, and though very loud talkers and ready to "ride through blood to the bridles" in pursuit of their "will o' the wisp," they will be blotted out just as they were when they tried to persuade the overwhelming majority of our people that the country would be ruined unless we had "unlimited paper money."

It is an absolute waste of time and good printing ink to argue with people who deliberately state things they know are false. If these men favored *true* bimetallism, which is now only the one thing which can now help silver, but which we believe also is absolutely necessary to prevent the disastrous consequences which would follow the appreciation of gold, they would ask for it, and not for free coinage, which means—as they well know—a mono-silver standard, and the total disappearance of gold from circulation. When we have examples of a free coinage country before our eyes there is no need of argument as to what free-coinage means. Why don't they refer to Mexico or India as what they want? We do not object to people advocating free coinage if they want it and believe in it, but we do object to the wolves masquerading as shepherd dogs.

There seems to be nothing left to hope for bimetallism from these "silver cranks," and since the rest of the country constitutes more than 90 per cent. of the people, let us repeal the Sherman Act, and ask for the submission of the question of the world's money to a commission of experts representing the interests of civilization, and who are not looking for the votes of some interested camp. Brush aside the silver cranks who are palming themselves off as bimetallists, though much less deserving of the name than are even the most bigoted "gold bugs," and let commonsense, honesty and public spirit guide the actions of Congress. Away with free-coinage cranks that would make our money like Mexico, and would have us embark upon a policy that every other nation had and has abandoned. Universal bimetallism on a flexible basis is the only durable bimetallism, and it is necessary to prevent the complete commercial disaster of which we are now feeling the beginning.

NEW PUBLICATIONS.

THE MEASUREMENT OF ELECTRICAL CURRENTS. By James Swinburne and C. H. Wordingham; edited by T. Commerford Martin. New York: The D. Van Nostrand Company. Pages 240; illustrated. Price 50 cents.

This book, which constitutes a number of the well known Van Nostrand Science Series, is made up of two papers prepared originally for the Institution of Civil Engineers, the first on "Electrical Measuring Instruments," by James Swinburne, and the second on "Meters for Electrical Energy," by C. H. Wordingham. They give in compact form the advance made up to the present day in devices for measuring the electrical current, and form together an account of the practicable methods devised to this end. Mr. Swinburne's paper is somewhat broader and more general in its terms, while Mr. Wordingham discusses the question before him more from the standpoint of the consumer. Taken together they form an excellent practical treatise, which ought to be very useful to those who furnish and to those who use electricity.

THE STORY OF MALTA. By Maturin M. Ballou. Boston and New York: Houghton, Mifflin & Company. Pages 320. Price $1.50.

The island of Malta is not of great extent, but it has many interesting points, and few places in the world have a more varied history. Situated directly on the main line of water travel to Egypt and the East, and forming a strategic point which may be said to control the eastern end of the Mediterranean Sea, from the earliest historic age

it has been a possession for which different nations have contended. Its story is a record of battles, sieges, fortifications and change. The book is in part descriptive and part historical; combining with descriptions of the island and the people an account of the past struggles over its possession. Mr. Ballou is an experienced traveler and writer, and he knows how to catch and describe the points which will be likely to interest the reader, while he is generally careful and correct in his statements. As a philosopher he is not strong, and his incidental reflections are neither new nor profound, though fortunately they are generally brief. He has made a very readable book, containing a good deal of information, which is presented in the style we have learned to expect from the Riverside Press.

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 in another page of the Journal.

The Locomotive Catechism. By Robert Grimshaw. New York: Norman W. Henley & Co. Pages 362; illustrated; price $2.

Union of German Engineers: Register of Officers and Members, 1893. Berlin, Germany: Issued by the Society. Pages 256.

The Monetary Situation in Germany. By Walther Lotz. Philadelphia: The American Academy of Political and Social Science. Pages 84; price 25 cents.

Geological Survey of Texas: Notes on the Geology of Northwest Texas. By W. F. Cummins. Austin, Tex.: State Printers. Pamphlet, 60 pages; illustrated.

Transactions of the Institution of Mining and Metallurgy, London. Volume I., Part I. 1893. London, England: Printed for the Institution. Pages 116; with plates.

The Influence on Business of the Independent Treasury. By David Kinley. Philadelphia: The American Academy of Political and Social Science. Pages 82; price 25 cents.

Register of the Engineering Department of Vanderbilt University, 1892-93, *with Announcement for* 1893-94. Nashville, Tenn.: Published by the University. Pamphlet, pages 36; illustrated.

Local Engineering Data for St. Louis. Compiled by the Engineers' Club of St. Louis. St. Louis, Mo.: Published by the Club. Pages 52; with tables; price $1, clothbound, or 75 cents, paper.

United States Department of Agriculture: Report of the Chief of Division of Forestry for 1892. B. E Fernow, Chief of Division. Washington: Government Printing Office. Pages 56; illustrated.

Instructions to United States Deputy Mineral Surveyors for the District of New Mexico. June 15th, 1893. Edward F. Hobart, U. S. Surveyor-General for New Mexico. Santa Fe, N. M.: Printed for the Surveyor-General. Pages 54.

On the Use of Silver as Money in the United States: A Historical Study. By Prof Arthur Burnham Woodford, Ph. D. Philadelphia: The American Academy of Political and Social Science. Pages 60; with tables and diagrams; price 35 cents.

The Banking Question in the United States. Addresses by Horace White, Michael D. Harter, A. B. Hepburn, I. H. Walker, Henry Bacon and W. L. Trenholm. Philadelphia: The American Academy of Political and Social Science. Pages 92; price $1.

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.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents

The Treatment of Refuse Pyrites by Means of Gaseous Hydrochloric Acid.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In your issue of July 1st, page 10, I found reference to recent experiments made in France upon "Treatment of Refuse Pyrites by Means of Hydrochloric Acid Gas." In 1886 and 1889 I made a series of experiments upon treatment of Rio Tinto burnt pyrites with gaseous hydrochloric acid, obtaining various results, in some cases as much as 20 dwt. silver and 3·8 grains of gold per ton, and leaving as little as 0·08% insoluble copper in the residue.

Your Vol. I., "Mineral Industry," is invaluable to me as a book of reference.

WIDNES, ENGLAND, July 13, 1893. JOHN HARGREAVES.

Metallurgy of Nickel.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Nickel-copper matte requires no flux such as a metallurgist understands the term, for its fusion. To Mr. Merry, of the Hafod Isha works, belongs the credit of introducing the process patented by the Orford Company. The English patent laws are considerably different from the United States laws, and to be valid a patent must there be capable of demonstrating its validity before an ordinary court of law, so that the possession of an English patent is not by any means a proof of originality. Such details as I have been able to gather about the Orford process I have laid before Mr. Merry in a private letter.

SUDBURY, Ont., July 25, 1893. HENRY W. EDWARDS-VAUGHAN.

Uses of Molybdenum.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In the "Journal" for July 1st I read a letter from Messrs. Hunt & Robertson, asking information about the uses of molybdenum. I have studied this metal and detected some new applications which can be made if the substance be abundant. I have studied also a special metallurgy for molybdenate which will produce the pure molybdenum at low price.

Consequently, the question is to know: 1st, Are the deposits abundant? 2d. What is the cost price per ton, and the average composition of the ore. Heretofore the use of molybdenum has been quite insignificant as regards the quantity. J.

PARIS France, July 11, 1893

Nickel Production of Canada.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Will you please note that the preliminary summary of the mineral production of Canada for 1892 contained the item of the production of nickel as 6,057,482 lbs., valued at $3,513,339. This, as stated, was based on the export returns of the Customs Department, which, since the completion of our own figures, obtained directly from the producers, proves to be entirely wrong.

It would be well, therefore, to substitute the following figures, which are as nearly correct as can be obtained: 2,413,717 lbs. of fine nickel contained in the matte shipped during the year, which, valued at the market price of the metal, would be valued at $1,327,544.

ELFRIC DREW INGALL,
Mining Engineer to the Geological Survey, in Charge.

OTTAWA, Canada, July 7, 1893.

The Pearce and Allen-O'Harra Roasting Furnace.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: My attention has been drawn to a letter which appeared in your issue of the 22d inst. on "The Pearce and Allen-O'Harra Roasting Furnaces," signed H. C. Bellinger, and from it I should judge that Mr. Bellinger is somewhat interested in advocating the merits of the Allen-O'Harra furnace. I may state that, while I am not responsible for the article referred to, the figures in regard to the cost of roasting by the Pearce furnace, given in that article, are for all practical purposes correct. The cost of roasting a ton of ore by the old system of reverberatory calciners, as practiced at Argo, was in the neighborhood of $1.75, and by the Pearce turret furnace from 60 cents to 75 cents, which shows a saving of from $1 to $1.15 per ton. I have had no experience with the Allen-O'Harra, but the merits of the Brown-O'Harra furnace I have been perfectly familiar with for more than a year. I have had no complaints to make in reference to the character of the roasting in this furnace; it was all that could be desired. The mechanical defects, however, coupled with the great cost of construction, are serious drawbacks to their adoption.

I have no desire to enter into any controversy with Mr. Bellinger on the relative merits of the two furnaces, but if he is really interested in obtaining facts and figures in regard to the construction, cost and capacity of the Pearce furnace, I would refer him to the manager of the Colorado Smelting and Mining Company, at Butte, where the furnace has been in successful operation for some months under conditions, I presume, similar, as regards cost of labor and fuel, etc., to those existing at the works with which Mr. Bellinger is connected. A glance at the furnace in operation will convince Mr. Bellinger that he is wrong in his conjectures in respect to the unequal oxidation of the ore between the inner and the outer circle of the hearth of the Pearce furnace.

I would call attention to the high percentage of sulphur which Mr. Bellinger gives (40 to 45%) as contained in the ore which is fed to the Allen-O'Harra furnace under his supervision. I have had a long experience with copper ores in the Butte district, and Mr. Bellinger's figures are higher than any I have met.

ARGO, Colo., July 31, 1893. RICHARD PEARCE.

Phosphorus and Silicon in Iron.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have read in the "Journal" of July 15th an article on "The Reduction of Phosphorus in Pig Iron," which concludes as follows: "The great difficulty in the way of utilization of non-Bessemer ores for steelmaking is not in the reduction of the phosphorus in the pig iron, but the silicon. This is the bugbear, and the question is how to make low silicon iron of ores containing from 10 to 20% of silver, and coke from 8 to 15% of ash. This can be successfully done, and basic open-hearth stock of not more than 1% of silicon be furnished regularly and in large quantities, the phosphorus will take care of itself." I would state that such a result was attained six or seven years ago at the Bay State and Cedar Point furnaces, Port Henry, N. Y., under precisely the conditions mentioned, or more difficult. This iron was made from Old Bed and New Bed lean ore, with perfect regularity, and also from Cheever and New Bed lean ores under a limit of 1% of silicon, afterward changed to under 1% and not less than 0·75%. In fact, it would not be so very difficult to guarantee it under 0·5%. I remember one analysis of 0·14%, also one of 0·09% of silicon, and the iron regularly turned out was not white but usually graded No. 3 and No. 4 mill. In this connection I would say that, according to my experience, when the silicon exists in the ore as free silica (quartz), as in the New Bed lean, it is much more difficult to keep the silicon down in the pig than when it is in the form of a silicate, as it mostly exists in Chateangay ore, which would naturally be expected. I was told recently at Port Henry that in using New Bed concentrate in the Cedar Point furnace, the pig iron did not usually have all the phosphorus that the analysis of all the materials would have given it, and that the materials blown out of the stack or caught in dust-catcher and flues showed more, so that a sort of mechanical separation of iron oxide and lime phosphate had been caused by the strong rush of gases at the funnel-head. The amount blown over was given as about 10% of the ore, and quite a notable reduction in phosphorus was made. In my opinion, it should not be difficult to keep phosphorus under 1% in any case, especially as "everything goes" in the basic-Bessemer process, white iron and all, if sulphur is not too high, and fortunately much of that can be fluxed off. T. F. WITHERBEE.

DURANGO, Mexico, July 20, 1893.

"The Mineral Industry" for 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The first volume of the "Mineral Industry" reflects great credit on the compiler, and we consider the review to be of a very full and exhaustive character, so much so that we shall use it as a standard book for reference. We notice that you will continue the issue in

future years, and shall be glad if you will keep our names on your list of subscribers.

JAMES & SHAKSPEARE,
Metal Dealers.

LONDON, England, May 19, 1893

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I was prepared by the previous statistical numbers of the "Engineering and Mining Journal" to expect something equally valuable this year, but I must confess that the beautifully printed and bound book of 651 pages just received, giving the statistics for 1892, strikes me as little short of amazing. Such enterprise deserves the highest praise, and the most unhesitating encouragement. The live statistics you give cannot fail to furnish effective encouragement to all our mining industries, to our manufacturing enterprises and to our business men generally.

JOHN C. BRANNER,
State Geologist of Arkansas.

PALO ALTO, Cal., May 19, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I wish to congratulate you upon the excellent result you have attained in the publication of such a mass of information relating to mining. That a work of this size should have been undertaken in connection with a technical weekly journal is remarkable, and an examination shows that the material has been so well arranged, and is accompanied by such a full index, that all parts are readily accessible for reference. The chapters on the South American countries are of great interest, presenting historical and statistical information of a character not easily obtained from other sources. In addition to these, the monographs upon the various minerals themselves contain facts and figures regarding production from these countries, together with mining and metallurgical information of great value to all who are interested in South American enterprises. My attention is attracted also by the chapter on platinum and its associated rare metals, an excellent historical and technical resume, showing much painstaking research, and accompanied by full records of production. The "Journal" has my best wishes for the continued success of its annual statistical number.

R. PEELE, Jr.,
Mining Engineer Columbia College School of Mines.

NEW YORK, May 19, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: A few days ago I received the "Mineral Industry," the pioneer of a series that must prove of the greatest use and interest to all of us professional men, whose duty and aim it is to make Mother Earth cease to act as a "fence" for grand Mother Nature. I am confident of being one of a large community of intelligent men when I bring, among the rest, my thanks and my slight tribute of admiration; for you have been able, you and your staff, to accomplish, as it were in a day, what the many-handed government idol has been unable to accomplish in much over a year and a day—notwithstanding Day's utmost efforts. The volume is a masterpiece of modern co-operation, and it would be both interesting and instructive to read an article telling tersely how it was done. One more noteworthy fact is, I think, established by the perusal of its many articles, and that is the homogeneity of thought and expression that is characteristic of our educated engineers. This points to a thorough, comprehensive education, attained not only by instruction (wherever that may have been obtained), but by the subsequent training, theoretical or practical, pedantic or original, experimental of assimilated which the practice of an American engineer, who works to-day with everything in his favor, to-morrow a thousand miles away from civilization with everything against him, necessarily entails. This education it is that permits him to answer, without too much presumption, when required to solve some new problem: "I have never done it, but I'll try!" and therein much of the history of our country is epitomized. At this distance I cannot criticise in detail; taken as a whole, the book is a model of its kind.

JOHN HEARD, Jr.

PARIS, France, May 14, 1893.

Alkali Trade of Great Britain.—The exports of alkali from Great Britain in May were 551,453 cwt., against 540,974 cwt. in May, 1892, and 499,864 cwt. in May, 1891. The exports to the United States in May were 324,015 cwt. this year, against 350,642 cwt in 1892, and 239,074 cwt. in 1891.

The total quantity of alkali exported during the first five months of the present year compares very favorably with previous years, the figures for the corresponding years of 1893, 1892 and 1891 being 2,932,572 cwt., 2,350,041 cwt. and 2,540,062 cwt., respectively. Only two countries show a falling off so far this year, as compared with last year, in their demand for alkali—namely, Spain and Anstralasia. Although the quantity shipped to the United States in May was below that of May last year, the total shipments so far this year show the increase of nearly 500,000 cwt. A point worth noticing is the steady decline in the value of the alkali. The 551,453 cwt. exported in May last were only valued at £169,425, while the 540,974 cwt. exported in May, 1892, were valued at £194,782.

Metallurgy of Lead.—At the annual meeting of the Royal Society, held in London, June 1st, a memoir on the metallurgy of lead was presented by Mr. J. B. Hannay. He described several new volatile compounds of lead, the discovery of which gave the key to the solution of many of the difficulties which had hitherto beset the path of the investigator, and by examining all the furnace reactions of lead compounds in the light of those discoveries he was enabled, he said, for the first time, to present a true explanation of the metallurgy of lead, founded upon accurate knowledge. The process consisted in passing a stream of air through the lead ore in a Bessemer converter, by which simple means the whole of the ore was converted into pig lead, or litharge, or sulphate of lead, as might be required—thus enabling the manufacturers to make the product bringing the best price in the market. The oxidation of the ore supplied all the heat required to conduct the process, so that no fuel was required. The importance of this new process, Mr. Hannay declared, might be judged from the fact that not only was the whole of the lead obtained as finished products without loss, as against a 20% loss by the old method, but every ounce of silver was separated and collected without any expense, no matter how little silver might be present.

ABSTRACTS OF OFFICIAL REPORTS.

ALASKA-TREADWELL GOLD MINING COMPANY, ALASKA.

The report of this company for the year ending May 31st, 1893, shows receipts from bullion sold, $694,659; interest, etc., $11,285; a total of $705,942. The expenses were: Mining, $145,159; milling and concentrating, $104,333; chlorination, $41,221; general expenses at mine, $15,498; San Francisco office, $5,694; freight, insurance, etc., on bullion, $10,465; total, $320,328. This makes the net profit $385,614, from which dividends amounting to $375,000, or 7½% were paid. The surplus balance of $10,614, added to balance of $130,189 on hand at beginning of year, leaves a surplus of $140,803.

The general account shows assets as follows: Cost of mines, reduction works and canals, $5,059,014; fuel and stores, $87,514; cash, $64,629; total, $5,191,157. The liabilities are: Capital stock, $5,000,000; current accounts and balances, $50,354; profit and loss, surplus, $140,803; total, $5,191,157. The mines are at Douglas Island, in Alaska.

The ore crushed was 237,235 tons, yielding an average of $2.13 per ton in free gold. There were 4,276 tons of sulphurets saved by concentration, and 4,584 tons treated, giving an average of $41.28 per ton. The average for all the ore treated, including yield from sulphurets, was $2.94 per ton. The total quantity of ore crushed since the mine was first opened in 1882 has been 1,314,666 tons, and the average yield $3.43 per ton.

The cost of work last year is given very fully in the report. Mining (237,235 tons), cost for labor, 39·60 cts.; supplies, 20·74 cts.; total, 60·34 cts. per ton. Milling (237,235 tons), cost for labor, 18·37 cts.; supplies, 25·60 cts.; total, 43·97 cts. per ton. Chlorinating concentrates (4,584 tons), cost for labor, $5.3432; supplies, $3.649; total, $8.9922 per ton Averaging all costs on the ore mined, the result was: Mining, $0.60; milling and concentrating, $0.44; chlorination, $0.17; general expenses at mine, $0.07; San Francisco office, $0.02; bullion charges (freight, insurance, etc.), $0.05; total, $1.35 per ton.

The report of the superintendent, Mr. Robert Duncan, Jr., says: "During the year there was mined from adit level, 193,136 tons; 110-ft. level, 44,099 tons, making a total of 237,235 tons of ore mined, at a cost of 55 cts. per ton. There was also mined and trammed to waste dump during the year 67,274 tons of slate from slate horse, adit level, at a cost of 19 cts. per ton, making a total of 304,509 tons mined during the year, at a cost of 47 cts. per ton. The slate or waste was trammed a distance of about 3,000 ft. Development work on the adit level included: Drives, 185 ft.; shoots, 195 ft. On the 110-ft. level, drives and crosscuts, 526 ft.; shoots, 55 ft.; upraises, 359 ft.

"On the night of September 21st, 1892, the ore which was left on the side of the pit to keep the foot-wall standing in place, slid off the inner vein foot-wall. This occasioned about four months' delay in this part of the mine, also a great deal of extra mining cost in exploiting ore from the 110-ft. level, as it entirely filled the pit on this level; to get at the ore a crosscut had to be driven from No. 2 drift to connect with the old prospect shaft, which has since been used as a shoot, and around which a pit is now being made. This slide was caused through an error being made in opening the ground above the adit level, as a raise was driven partly in the foot-wall and partly in the slate, through which the ore was to drop; the No. 2 drift, adit level, was also partly driven in the slate, and when the open pit was being sunk to the 110-ft. level, it necessarily left the quartz standing on the foot-wall above the adit level without any support underneath; the result was the above slide, which will continue to come down as we extend the pit west on the 110-ft. level. The quartz on the foot-wall is in value above the average, but so much slate will come down with it that it will not be possible to separate all the slate from the quartz, therefore a quantity of slate will have to be milled with the quartz, thus reducing its value.

"The estimate of ore in sight is: Adit level, 338,000 tons; 110-ft. level, 1,430,000 tons; making a total of 1,768,000 tons. The ore on the 110-ft. level is calculated from the present ends of drifts Nos. 1, 2, 3, 4 and east drift; the faces of all these drifts being in ore of average value. The general appearance of the mine in the 110-ft. level is very encouraging, especially in the east drift. There is also a large body of low-grade ore on the adit level west of the present workings on the outer vein, which will not pay to work at the present costs; but, as it is not in the way of our present workings, its removal is not necessary. By first assay it is worth about $1 per ton, asd can be mined at a later date at a profit. In removing the slate horse, adit level, a body of ore of about 250,000 tons was developed in Section 16, 17, 18, 19 and 20 B, C and D, which is not included in foregoing estimate. I expect that this body of ore will extend to the 110-ft. level, thus making 613,000 tons of ore developed by the removal of the slate horse.

"The 240-stamp mill has done excellent work throughout the year, running a total number of 342 days; of this time it was driven by water 240 days, and 102 days by steam. The repairs, however, appear high, as 48 new Frue belts were put in, and one new Pelton wheel for driving mill, also the repairing of a number of battery foundations. The old Pelton wheel was the cause of a great deal of anxiety and stoppages by being constructed entirely too light for the work it had to do. The new one has now been driving the mill about two months, and so far has given entire satisfaction. The chlorination works have run steadily throughout the year, part of the time with four furnaces and the remainder with three. The stopping of one furnace was caused by the supply of concentrates on hand in sheds being all worked. We have now again about 55 tons of sulphurets stored in sheds, which will go toward starting the other furnace when we get more concentrates on hand."

During the year an average of 130 white men and 40 Indians were employed, wages of white labor ranging from $3 to $6 per day, white Indians were paid $2 per day.

Iron in Germany.—During May the output of pig iron in Germany was 402,874 tons against 408,896 in May, 1892, and 393,365 tons in May, 1891. The output for the first five months of the year was 1,931-121 tons, against 2,006,436 tons during the same period of 1892.

THE SADO MINES IN JAPAN.*

The Sado gold and silver mine in Japan is one of the principal gold and silver mines of that country, yielding also a considerable amount of copper and lead. The accompanying illustration is from a photograph showing the principal working, known as the Tokato shaft, and in the background a remarkable formation known as the Doga outcrop. Below the entrance to the shaft are shown portions of the mill buildings in which the ores are worked. The mine, it will be seen, is in one of the mountainous regions of Japan and is upon the island of Sado, which is on the 38th parallel of latitude and near the eastern coast of the main island of Hondo, the Nippon, as it is sometimes called. The gold veins are found throughout the whole island, but have been generally abandoned with the exception of two groups which are now worked. The mines were first discovered as long ago as 1593, and were worked after the old Japanese fashion from about 1601. During the first half of the seventeenth century large quantities of gold and silver were produced. At that time the ore was pulverized slowly and laboriously by means of hammers, was then concentrated in tubs, roasted and smelted in charcoal furnaces. In 1872 the introduction of modern improvements began and is still in progress, although the mines are already fitted with machinery.

The dressing of the gold and silver ores is done by means of rock breakers, Huntington mills and Frue vanners. The argentiferous copper ore is worked through rock breakers and chrome rolls, a classifier, jiggers, Huntington mills and Frue vanners. For the pan amalgamation Duncan concentrators and conical buddles are used.

A portion of the ore is worked through a stamp mill which has one rock breaker, 30 stamps, each weighing 850 lbs., and Duncan concentrators. The crushed ore from the stamps passes over amalgamated copper plates and the concentrated ores are sent to the pan-amalgamation works. Some of the concentrated ores and the cupriferous iron sulphides are sent to the smelter, which is provided with two water-jacket furnaces, one for ore smelting and the other for matte smelting. In connection with these furnaces there are several calciners and Freiberg kilns.

The pan amalgamation works have a rock breaker, 25 stamps, each weighing 650 lbs., 15 amalgamation pans and 7 separators. The chief ores worked here are the second-rate gold and silver ores. There is also a barrel amalgamation plant for working the slime from the pan-amalgamation process and also the tailings from the old works which were in existence before the reconstruction.

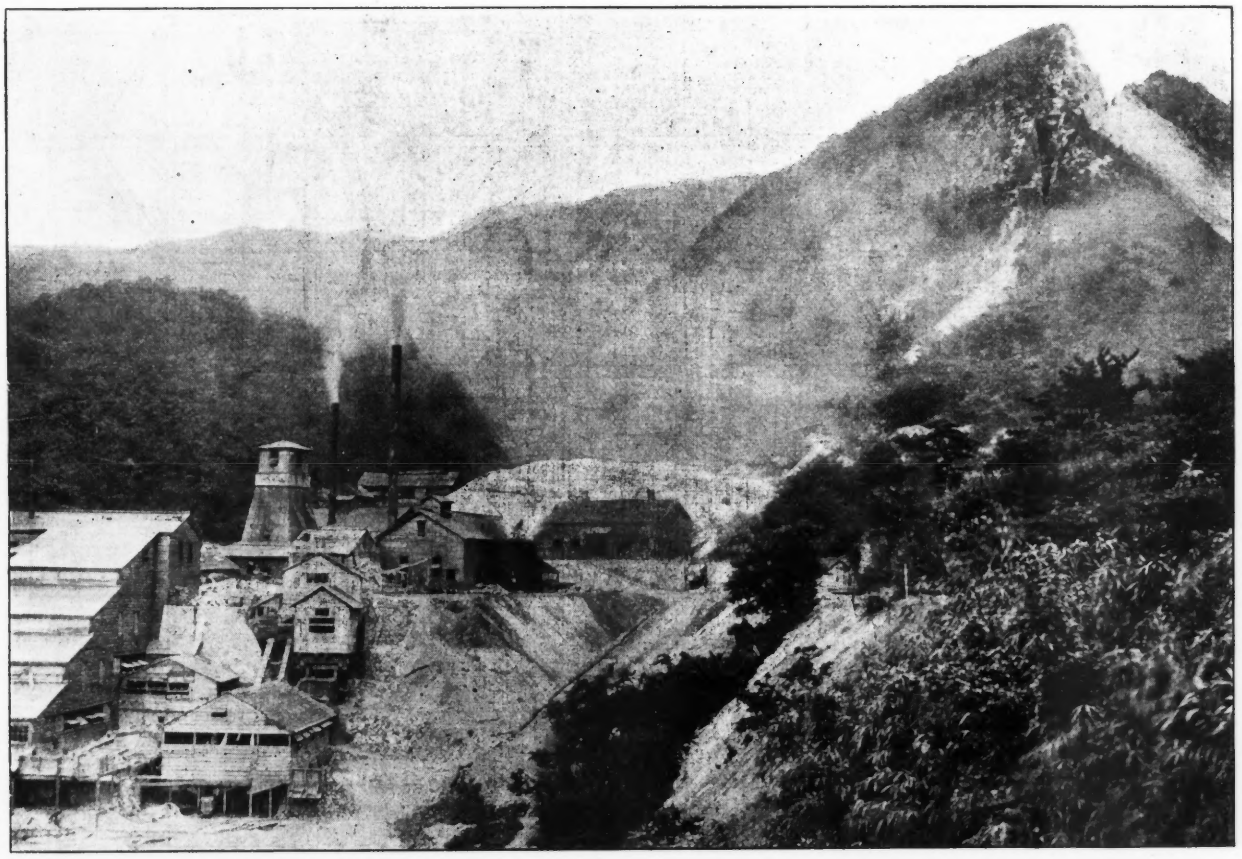
Coal is used for the steam boilers and roasting furnaces and coke for the smelting furnaces. A small quantity of charcoal is also used which is obtained from the neighboring forests. The coal is brought from the Aburado mines in Yamagata. The steam engines used have 560 H. P., of which 185 H. P. is used for pumping and hoisting in the mines and 375 H. P. for the mills.

In 1891 the mines were worked from April to December inclusive, nine months in all, with the following output: Gold, 5,715 oz.; silver, 95,125 oz.; copper, 31,200 lbs.; lead, 7,998 lbs.; blue vitriol, 587,000 lbs.

The Sado mines include two special groups, the first called Aikawa, which has three fissure veins, running from east to west, the first and second containing gold and silver; the third very little gold, but much silver and copper. The width is variable. Two of these veins have been worked for nearly a mile and a half and the third for about a half a mile. In the second group, known as Tsurushi, there are four veins, generally narrow, bearing silver, gold and copper in different proportions. Five shafts have been sunk on these two groups at different periods and are now in use. The great shaft, which is 900 ft. deep; the Torigoe, 350 ft.; the Ogiri, 350 ft.; the Hyakumai, 340 ft., and finally the Tokato, which is shown in the engraving, and which is 850 ft. deep. The total length of the different levels run has been 42,496 ft.

In the levels wooden mine cars holding about 1,000 lbs. each are used, running on steel rails brought from Germany. In some of the older levels horses are used, but in others the cars are pushed by men. Hoisting machines are used at the main shafts, and in several places there are horse-whims for vertical transportations between the levels. Outside the mine tramways are provided for carrying ores to the mill. They are laid with Krupp steel rails and horses are used in drawing the wagons. A Bleichert wire tramway has been constructed for carrying tailings, rubbish, ashes, etc., to the sea coast, as there is no available dumping-ground near the mine.

*Abstract from "The Mining Industry of Japan," by Wadr Tsunashiro.



TOKATO SHAFT AND DOGA OUTCROP, SADO MINES, JAPAN.

THE SOUTH WILKES-BARRE COAL BREAKER.

(*Continued from Page 101.*)

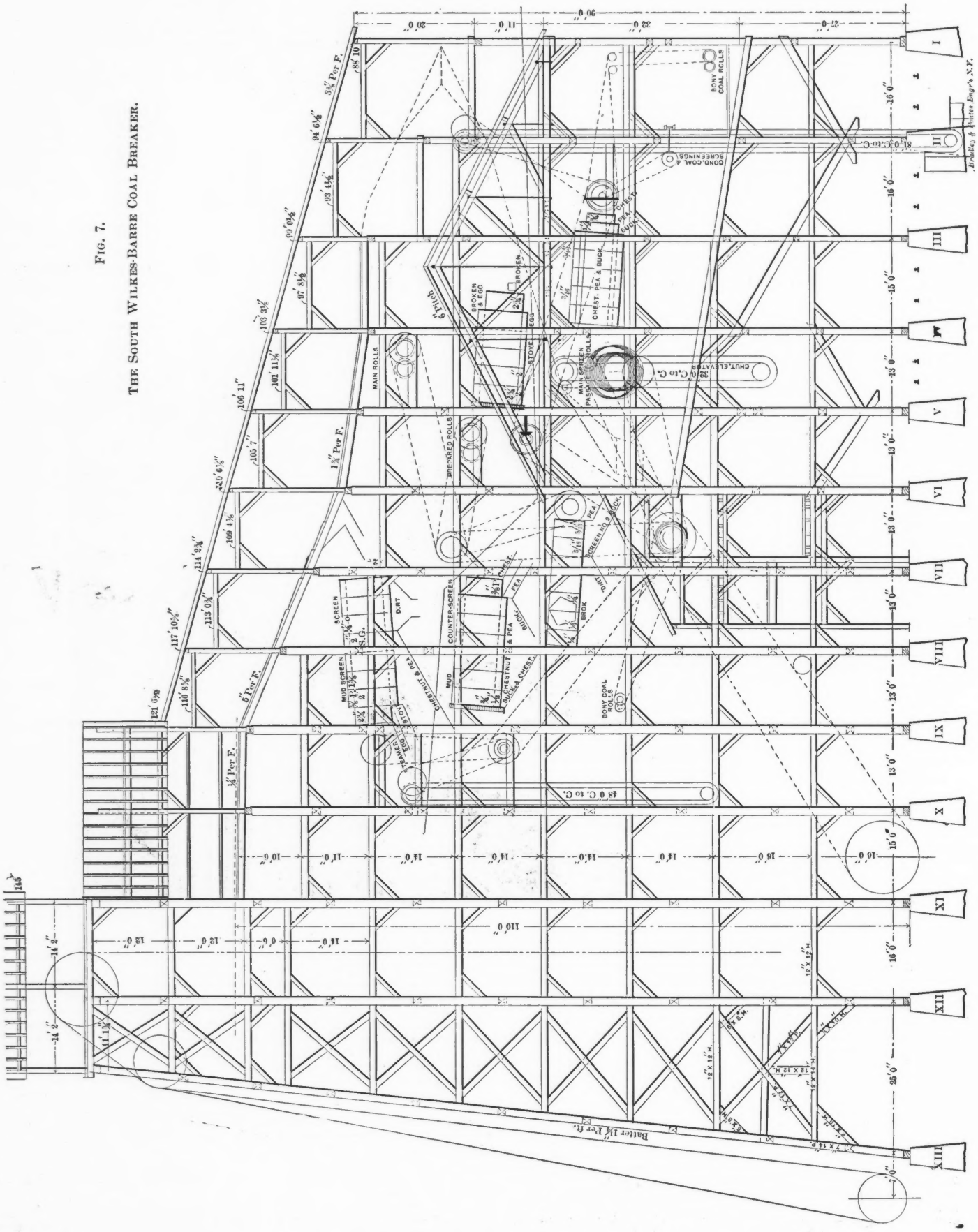
The general plan of the structure is a wooden trestle, as shown in Figs. 6 and 7, the former showing in detail one of the 13 bents which form the frame. The method of framing and bracing is shown by these figures. The framework of the breaker is so constructed that renewals of posts or girts can be easily made. The main posts are double, and can be renewed by taking out one side at a time. The principal posts are Michigan white pine, and all girts and light posts are of hemlock. The sills are of oak. This breaker is considered to be one of the most substantial structures of its kind that has ever been built. The girts, crosswise and lengthwise, being in direct line with one another, make the structure much more stable than it would be if the girts were out of line; and the range timber over the pockets, 72 ft. long, acts as a direct counterbrace through the whole frame. The vibration of the structure is very slight indeed, even when the breaker is running full.

Fig. 7, which is a side elevation of the structure with the sheathing removed, shows the arrangement of the screens and other machinery, which is further shown in plan in Figs. 8 and 9, the former giving the entire plan, while the latter shows a section on the irregular line ab, in Fig. 6. The manner in which the coal is screened and separated is well indicated in these diagrams.

The coal from this colliery comes to the surface in a very dry condition, and its preparation is accomplished without the use of water. The first operation after the coal is dumped in the top of the breaker, separates the coal into three different classes. First, the bars set 2 in. apart take out all the dirt and coal small enough to pass through these bars. This coal all goes to a series of screens specially arranged for it, and after having been sized, the slate and bony coal are removed. Such of this coal as is not in a proper condition for market, can be run

FIG. 7.

THE SOUTH WILKES-BARRE COAL BREAKER.



into one of the other courses and broken down, and then run through the fractured coal department. The coal which goes over the bars set 2 in. apart, and through the bars set 5 in. apart, has all the slate and bony coal which can be removed by hand, separated from it before being put through the rolls, and run through the fractured coal department. The "bony" coal from all the bar coal is broken down to pea and buckwheat sizes, in rolls specially arranged for it, and is returned, by means of an elevator, to the screens where it is sized. All the coal which passes over the bars set 5 in. apart, is carefully prepared by hand before any of it is put through the rolls, the slate being picked out and sent direct to the refuse pocket, and the bony coal being sent direct to the bony rolls. The bony coal picked from all of the picking tables is broken separately, and also has its own screens and picking tables. The coal which is broken in the pockets, is taken out by means of perforated plates set in the bottom of the chutes leading from the pockets to the railroad cars, and is automatically conveyed and elevated to the screens where it is again sized.

FIG. 8.

PLAN OF MACHINERY
FOR NO. 5 BREAKER.
L. & W. B. C. CO.

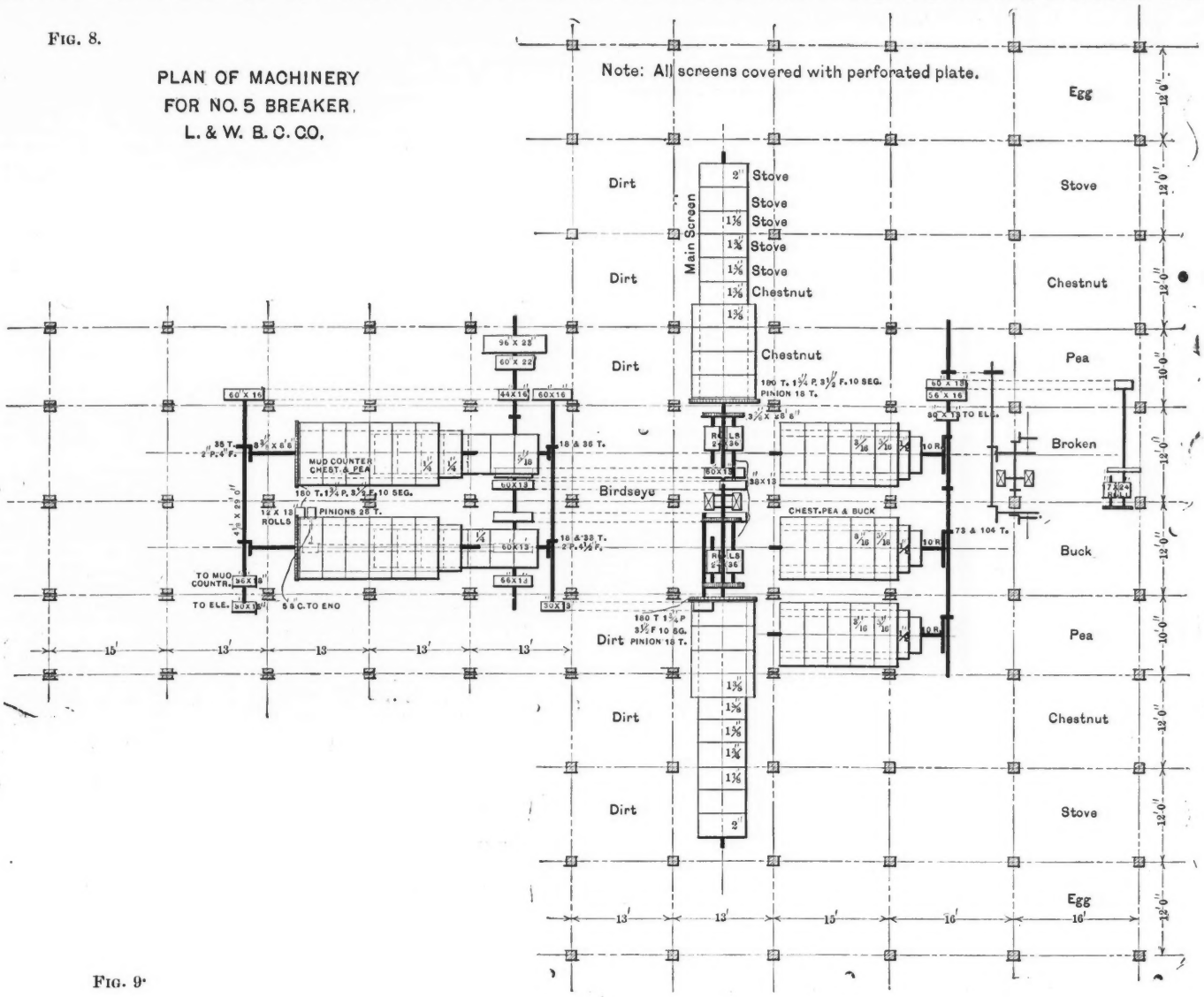


FIG. 9.

Section above "ab"

The speeds at which the screens and rolls in the South Wilkes-Barre breaker are run are as follows: Mud screens make 8¼ revolutions per minute; counter mud chestnut and pea screens, 9¼; pentagonal buckwheat screens, 35; broken and egg screens, 8¼; main screens, 8⅓; counter, chestnut and pea screens, 10⅓ revolutions. The main rolls (32 in. × 48 in.) are run at 92 revolutions per minute; the prepared rolls (32 in. × 48 in.) at 92; the large bony rolls (17½ in. × 24 in.) at 200; the small bony rolls (12 in. × 18 in.) at 235, and the main screen prepared rolls (24 in. × 36 in.) at 140 revolutions. 100 H. P. is required for running the breaker.

The South Wilkes-Barre breaker is not only a double breaker, each side being independent of the other, but each side is also arranged so that all the pure coal as it comes from the mines, can be prepared and conveyed direct to the pockets, separate from the fine stuff, and from the coal that requires to be crushed before its interstratified impurities can be removed.

The screens in this breaker, except two pentagonal buckwheat

screens, are all round-jacketed screens, built in a very substantial manner with heavy Phoenix column shafts. The covering of the screens is principally perforated steel plate. The machinery of the breaker is run by an 18 × 30 in. engine, running 60 revolutions per minute. The main belt is 24 in. wide, run from a 12-ft. pulley on the engine shaft. The breaker hoisting engines are 16 × 30 in., geared 4 to 1, with 8-ft. cast iron grooved drums. The empty-car hoist is made from ordinary punched chain, having 9-16 in. pins, 4-in. pitch, with hooks placed 15 ft. apart which catch the axle of the car, pull the car up, and release it on the apex of the plane.

The work of preparing the frame timber for this breaker was commenced March 15th, 1892, but owing to delay in receiving the white pine post timber, the erection of frame was not commenced until June 20th. The breaker was completed and commenced preparing and shipping coal on September 26th last. Considering the great size of the

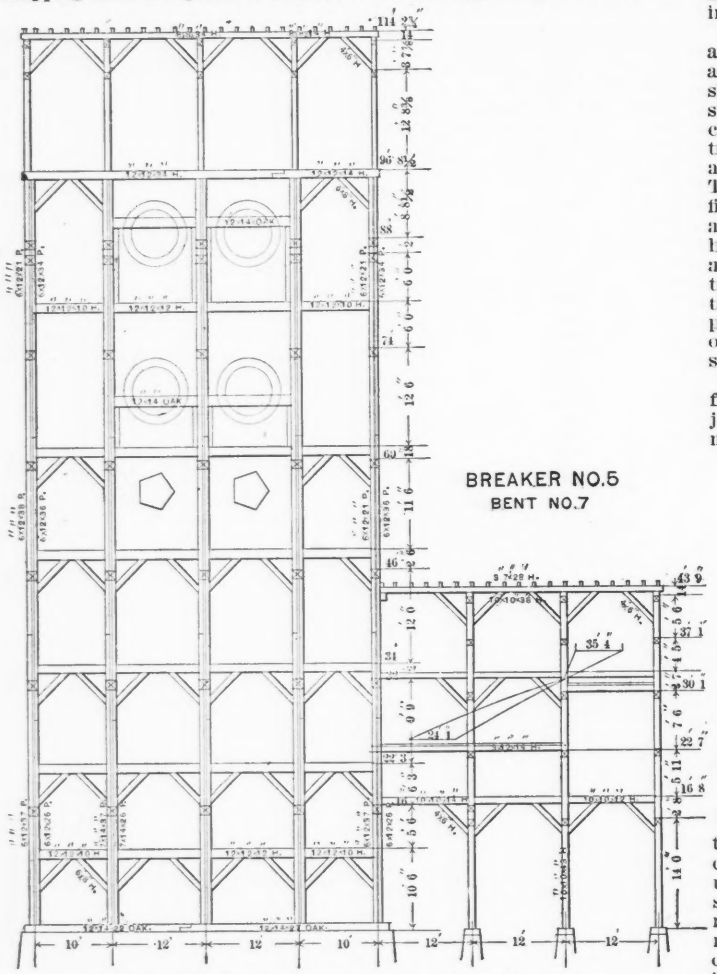


Fig. 6.—The South Wilkes-Barre Coal Breaker.

breaker, and the large amount of lumber (nearly 1,500,000 ft.) required to build it, it must be admitted that the work of construction was very rapid indeed.

Blast Furnaces in Great Britain.—According to the "Iron and Coal Trades Review" there were on June 30th in Great Britain 744 blast furnaces, of which 384 were in England outside of the Cleveland district; 144 in the Cleveland district, 103 in Wales and 113 in Scotland. During the half year two furnaces were pulled down; no new ones were completed, but five are under construction. On July 1st 345 furnaces were in blast and 399 idle.

Russian Petroleum in Western Europe.—The Amsterdam-Baku Standard Petroleum-tank Company, a syndicate, composed of the Baku Standard Company, which owns Russian wells and refineries at Baku and Batoum, and Dutch, German and British capitalists, has been formed in Amsterdam for the purpose of erecting petroleum tanks in Dusseldorf and Frankfort-on-Main, and bringing Russian oil thence on the market. Two reservoirs, each of 25,000 barrels' capacity, to be ready by October, will be established in Dusseldorf.

A Coal Dust Engine.—A novel motive-power engine has been patented by a German engineer, and it is said that Herr Krupp is now constructing an experimental engine to test its practicability. The engine is based upon the fact that very finely divided carbon, floating in the air, readily explodes, and to adapt this to the generation of motive power the inventor proposes to grind coal to an impalpable powder, and, after introducing the dust floating in the air into the cylinder of an engine, explode it, the idea being to follow very much the same lines which are being so thoroughly developed in the use of gas in engine practice. The first difficulty which suggests itself is how the ash is to be got rid of, but Herr Krupp says that his experience in gun manufacture convinces him that this is not a serious obstacle.

MINING AT THE COLUMBIAN EXPOSITION.

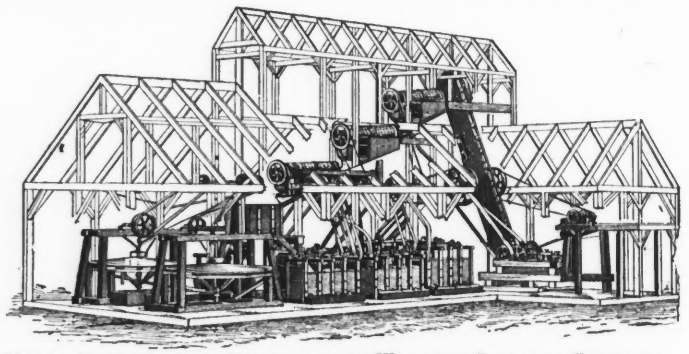
Reported for the Engineering and Mining Journal by John E. Rothwell.

THE WALBURN-SWENSON COMPANY'S EXHIBIT.

The depression in silver and the resulting increase of interest in gold-producing properties naturally turn attention to improved methods of working gold-bearing ores. Both in the West and South there are many properties which have not been worked, owing to the fact that nearly all the gold is in the iron pyrites contained in the ore, and cannot be extracted by the ordinary milling processes. In many cases, however, these ores can be profitably handled by concentrating the pyrites and then extracting the gold by smelting or other special processes. Where the quartz carries enough free gold, the tailings, after concentrating the pyrites, can be crushed and treated by the ordinary milling process, which can be carried in connection with the concentrator, making a combination plant.

The Waiburn-Swenson Company, of Chicago, has given especial attention to concentrating work, and has in the gallery of the Mines and Mining Building a model of a compiete working plant, which is shown in the accompanying engraving. This model, which is one-sixteenth the actual size, represents a plant of 75 to 100 tons daily capacity, the variation depending upon the difference in ore to be treated, depending on the percentage of mineral contained in the ore, and with the different minerais which may have to be separated. To secure a perfect separation of the mineral from the gangue, it is first necessary to crush the ore by means of crushing machinery, such as Blake crushers, Cornish rolls, etc., to such small particles as may be required. The separation of the different sizes of broken ore is accompiished by revolving screens of such sized perforations as may be required, the proper selection of the screen perforations being one of the most important parts of the construction of a plant for the concentration process. Before constructing works the ore to be treated is carefully tested as to sizes, etc., best adapted for separation.

The ore, carefully sized, is delivered to jigs especially constructed for this system. If only one class of mineral is to be separated, a jig with only two sieves is required, the first sieve producing clean mineral, while the second produces middiings, which will be returned



Model Concentration Plant of the Walburn-Swenson Company.

to the second, or fine, crushing rolls (as the model shows) to be recrushed for further separation. In case two different minerals have to be separated, a four-sieved jig machine will be used, the first sieve producing the heavier mineral, and the third sieve the lighter mineral. The second sieve produces middlings consisting of both minerals, and the fourth sieve the middlings of the lighter mineral only, the overflow from the fourth sieve delivering the clean gangue. The middlings are returned to fine crushing rolls by means of spouts, this construction saving considerable labor and expense. While the screens size the crushed ore larger than 1½ or 2 mm., the sizing of the finer grades of ore is done by hydraulic classifiers, the construction of which permits a very close separation of the fine ore, which is then treated in special sand and slime jigs. While all the jigs treating coarse ore are provided with automatic side discharges, the sand and slime jigs discharge the mineral through copper wire sieves, and is drawn off by means of adjustable hutch cocks. The finest slime is eventually treated on the Walburn-Swenson improved rotary slime table; the middlings produced on the first table being carried to the second table and separated there, thus saving all that can be saven economically. The percentage of mineral going out with the waste or separated gangue is very small (not over 0·5%), a most important factor in the concentration of low-grade ore. Settling tanks are furnished whenever the ore may require them.

This machinery is arranged to use as little water as possible without injuring the production of clean minerals. In many places a large supply of water cannot be obtained, and when properly handled the machinery will require only a small amount of water.

A concentrator of the capacity represented by the model will only require for each shift one man at a crusher, one engineer, one jig foreman and one assistant; since the system is mostly automatic, it requires but few men to operate it. The crusher is of the improved Blake style, with jaws made of the best mixture of iron, having heavy chilled faces, less expensive and more lasting than steel jaws. The eccentric shaft is of hammered steel and of such dimensions as to allow for any extra strain. All bearings have anti-friction metal the flywheels are of sufficient weight and size to insure a uniform run of the machine. All parts are easily adjusted, and can be replaced without much labor.

The Cornish rolls are constructed of the best material, shafts made of hammered steel securely fastened to cores. The shells are made of the same material as crusher jaws. The cast framework is strong and durable, having special wearing plates for movable boxes. The journal boxes have anti-friction metal, and are protected by patent collars, which prevent the ore or sand from getting into the journal

boxes. The rolls are driven by extra heavy gearing according to size, and the counter-shaft has either a heavy balance wheel pulley, or pulley and flywheel, as may be required. Shells on rolls are interchangeable and easily adjusted, requiring but little time for replacing. The tension of the rolls is produced by the best quality of rubber springs, and the movable roller is so constructed as to allow very fine crushing without allowing roller faces to come in contact, thus insuring easy running. This construction requires less power than belted rolls.

The elevators are of simple construction, malleable iron cups attached to heavy rubber belts, which carry the crushed ore to the screens. Pulleys carrying elevator belts have extra heavy rims. These belt elevators will last for years where iron elevators will wear out in a short time on account of the grit in the ore. The screens are made of the best material obtainable for that purpose, the perforated sheets being of steel and fastened to trommels or spiders by draw-bands, thus admitting of a change of sheets without much loss of time and labor. The screens are provided with cast iron spouts for receiving sized ore, and have sheet steel mantels for screen hoppers. The jigs, with either graduated adjustable eccentric motion or slide motion, as may be required, are of the best material, cypress lumber well seasoned being used for jig boxes, plungers and screen frames. The frame is made of good yellow pine, and securely bolted together, the shaft is of steel and the eccentric of heavy construction, and easily adjustable to any desired stroke. The sieve frames are covered with double crimped copper wire cloth, made of heavy copper wire, and securely fastened to wooden frames by large copper tacks, which make it easy to repair the cloth. The sieves are large and properly proportioned to admit equal bedding of jigs; the side discharges for drawing off ore are of new construction and admit of quick adjustment, while the bottom discharges or hutch gates admit of free and easy discharge. The plunger compartments are lined with sheet steel preventing the wear of the jig box. Each jig has a water line and one water cock for each plunger compartment, so that the water supply is readily controlled, and water can be used without waste. Hydraulic classifiers and settling tanks are made of best cypress lumber, and well bound with bolts, the faces of the classifier being lined with sheet steel to admit of free settling. The strong construction of the ironwork of the rotary table admits of a steady rotating motion. The framework of the table is made of white pine, and lined with a layer of Portland cement, insuring a smooth and even surface. The sprinkler pipes are conveniently arranged so as to avoid waste of water and give clean products.

These tables have given excellent results in practice, and require but little attention as long as the water supply is kept up regular. In many cases the product of the tables alone has paid the running expenses of the plant. The arrangements for spouting the ore from screen to jigs, the middlings from jigs to rolls, etc., and the general arrangement of the machinery make a smooth running plant, which can be economically worked.

WYOMING IRON ORES.

In connection with the description of the Wyoming State exhibit given in the "Journal" for July 1st, page 6, we have received a number of analyses made of iron ores from the Hartville district, in Laramie County. The analyses were made by different chemists, and an effort was made to select fair average samples. We give below several of the results obtained:

	No. 8.	No. 16.	No. 24.	No. 28.	No. 32.	No. 34.
Iron.....	66·140	68·120	65·860	68·130	66·070	62·650
Silica.....	3·600	.....	1·890	0·700	3·280	1·870
Phosphorus..	0·042	0·069	0·034	0·168	0·550	0·030
Sulphur.....	.....	.....	.....	.....	0·004	.. ...

An average of another lot of analyses of the same ore gave: Iron, 66·130; silica, 2·900; phosphorus, 0·038; sulphur, none. The deposits at Hartville, while they are not near cheap water transportation, as the Lake Superior ores are, have the advantage of an abundance of limestone near by, while coal and coke can be obtained by a short haul. Water power is also near by, in the Platte River. Generally, there has been no difficulty in finding the ore veins. While there are not many actual outcroppings of the ore itself, the outcroppings of the vein walls of slate and quartzite are of frequent occurrence. In many places where the caprock (which at some time covered the whole district) has been eroded or washed away, the signs of ore visible upon the surface of the ground are quite unmistakable; often consisting of quantities of pebbles and boulders of pure ore, which, though indiscriminately called "float," seems here to usually consist of pieces of ore which have retained their places on the vein, while the loose soil originally covering and surrounding them has been washed down into the valleys. In other cases the erosion on the hillsides has so nearly exposed the ore that its red oxide covers the surface in a most conspicuous manner, indicating the location of the ore bodies with unerring accuracy. It is noticeable that pits sunk in places presenting the indications above referred to usually encounter clean ore in from 2 to 10 ft. from the surface. Doubtless, in mining at greater depths, water will be reached, but there will be no difficulty experienced in draining the mines, as the water from any mine in the district can be emptied either into Eureka Gulch or Whalen Canon, down which it will be rapidly carried away by the force of gravitation to the North Platte River. Another feature of this district is the apparent great concentration of ore deposits within a small area. While the developments are, of necessity, quite crude as yet, and the frequency with which ore is encountered where it might fairly be unexpected is somewhat bewildering to one endeavoring to accurately determine the number of separate main vein formations, it is safe to say that at least four distinct parallel formations carrying ore lenses have thus far been discovered, all trending northeasterly and southwesterly. A line drawn at right angles to the trend of these formations, from the most northerly one to the most southerly, would not probably be over a mile in length. Several of these formations have been traced in length from 1 to 3¼ miles. The trend of these formations is the same as throughout the Lake Superior region, and the ore occurs in lenticular deposits of apparently similar nature.

THE ENGINEERING CONGRESS IN CHICAGO.

The first meeting of the great Engineering Congress in Chicago was held in Washington Hall, in the Art Institute, at 10 a. m. on July 31st, when Mr. C. C. Bonney called the meeting to order and welcomed the members in a few well-chosen words. Mr. E. L. Corthell, chairman of the committee on organization of the congress, was kept away by illness, and in his place O. Chanute, vice-president of the committee, was called upon to preside. After welcoming the delegates heartily on behalf of the city, Mr. Chanute said a few complimentary words about their profession, which, according to the language of the constitution of the British Institute of Civil Engineers, "Seeks to utilize the great forces of nature for the use and convenience of man." This congress, he added, is a truly international congress, attended by representatives from Great Britain, France, Germany, Austria-Hungary, Russia, Spain, Portugal, Belgium, Holland, Denmark, Sweden and Norway, Chile, Mexico and South American republics, Australia and Japan. He was glad to see many representatives who have done so much to develop the resources of the country, as well as those from the mother country who had done so much for the grand science of engineering.

Sir Benjamin Baker, builder of the Forth bridge, conveyed the greeting of the British Institute of Civil Engineers to the congress. He explained that during the parliamentary session in England, and when the law courts are in full operation, it is almost impossible for engineers of prominence to absent themselves from London. He extolled the World's Fair as the embodiment of the most wonderful architectural dreams since the creation of man. He also conveyed to the gathering the respects of the Smetonian Society of Engineers, which was organized 118 years ago to extend the usefulness and develop fraternal feeling among the engineers of the old country.

In behalf of France, Baron Ouimette de Rochmont told of the great interest which his government and engineering association are taking in the World's Fair and the congress on engineering. Herr C. O. Gleim, of Hamburg, expressed the appreciation of Germany in similar terms. He hoped the congress would be a thorough success, and the first of a long series of congresses for the benefit and advancement of their noble profession and form a band of union for its followers all over the world.

Hugo Koestler, of Austria, and Alfred Nyberg, of Russia, also saluted the congress in felicitous terms. Celso Capacci, royal Italian commissioner, said he would take back to Italy, besides the memory of their great cordiality, a gratifying memory of this great exposition, where the skill of American engineers reveals itself in a way which commands universal admiration.

Brief responses followed from the chairmen of the respective divisions of the congress. William Metcalf spoke in behalf of the civil engineers, telling of the arrangements made for the entertainment of foreign guests and native delegates. Eckley B. Coxe, for the mechanical engineers, tendered hospitality to the visitors. Hearty words of welcome were uttered by Henry M. Howe, president of the American Institute of Mining Engineers; Ira O. Baker, of the University of Illinois; Lieut. H. L. Harris, of the military division, and Commodore Melville, of the Navy.

The members then withdrew to their several sections, which were, as already stated: Division A, Civil Engineering, where Mr. William Metcalf, of the American Society of Civil Engineers, presided; Division B, Mechanical Engineering, where Mr. Eckley B. Coxe, of the American Society of Mechanical Engineers, occupied the chair; Division E, Engineering Education, with Prof. Ira O. Baker as presiding officer; Division F, Military Engineering, in charge of Major Clifton Comly, U. S. A.; Division G, Marine Engineering, in charge of Chief Engineer George W. Melville, U. S. N. Our attention, of course, is given chiefly to Division C, Mining Engineering, and Division D, Metallurgical Engineering, which met together, with Prof. Henry M. Howe, of the American Institute of Mining Engineers, as president.

In this division Professor Howe made a brief address, after which papers were read by Prof. S. B. Christy on "Mining Schools"; Mr. C. Le Neve Foster on "Mining and Mineral Statistics"; Mr. S. F. Emmons on "Geological Distribution of the Useful Minerals in the United States"; Mr. W. P. Blake on the "Mineral Deposits of Southwest Wisconsin"; Mr. W. P. Jenney, on the "Lead and Zinc Deposits of the Mississippi Valley." Abstracts of these papers are given in our last or in the present number.

At 1 o'clock the several sections adjourned, and the members proceeded to the Exposition. At the meetings of the other sections also a number of papers had been read at the morning session.

THE SECOND DAY'S PROCEEDINGS.

On the second day the list was increased by the meeting of the Congress of Water Commerce, which was opened and organized. The chief subjects for discussion were the Nicaragua Canal and the water lines from the lakes to the ocean.

On Tuesday, in Sections C and D, Prof. H. M. Howe presiding, some papers of great technical interest were read. The first of the papers presented was by James Douglas, of New York, who gave a summary of American improvements and inventions in ore crushing and concentrating. Richard Pierce, of Argo, Colo.; I. R. Krom, Prof. H. O. Hofman and R. H. Richards, of the Massachusetts Institute of Technology; H. S. Monroe, of the Columbia College School of Mines; C. A. Stetefield, of Oakland, Cal., and T. A. Rickard, of Denver, discussed the paper, calling attention to the certain additional characteristic American improvements not touched on by the author. Then followed papers by Henry Louis, of Singapore, on "The Specific Gravity of Gold Contained in Gold-Silver Alloys"; by H. A. Keller, of Butte, Mont., on "Improved Slag Pots," and by T. A. Rickard, of Denver, on "The Limitations of the Stamp Mill." The last mentioned paper led to an interesting discussion by E. E. Olcott and Prof. H. S. Monroe, of New York; R. Rickard, of Berkeley, Cal., and P. Argall, of Denver, on possible improvements in the milling practice of the West. The last paper of the session was by W. P. Blake, of Shullsburg, Wis., and had for its subject "The Separation of Blende from Pyrites."

The Tuesday session was held in the afternoon, and in the morning many members of the Institute joined in the Mechanical Engineers'

discussions, especially in one on a "Uniform System of Testing Metals."

THE MINERAL DEPOSITS OF SOUTHWEST WISCONSIN, BY WM. P. BLAKE.

The lead and zinc ore region of Wisconsin extends through portions of Grant, Lafayette and Iowa counties, and has an area of about 1,776 square miles. The geology is simple. The ore deposits are confined to nearly horizontal strata of dolomite and limestone of Lower Silurian age, which lie between the Potsdam sandstone and the equivalents of the Cincinnati or Hudson River shales. The ores are found in vein-like sheets in vertical and inclined crevices and in cavern-like enlargements along the course of such crevices; also in flats or sheets extending for some distance laterally between the strata.

The ores everywhere present the same general sequence of lead-ore in the upper portions of the diggings, with carbonate of zinc gradually passing into sulphide of zinc below, which last is associated with pyrite of the marcasite variety. The bulk of the blende comes from bedded or horizontally distributed ore.

We may classify the deposits as (1) irregular and brecciated, and (2) regular sheets and beds.

The regular and brecciated include most of the dry-bone derived from the oxidation of the blende in place, which passes downward into unchanged blende. Sometimes the original bedding of the rocks is but little changed, and there is no disturbance, but in other places there is great confusion, irregular masses of rock being surrounded and invested with a coating of ore, by which they are united into one mass.

There are four kinds of ore shipped from the Wisconsin mines, namely, galena, zinc carbonate, blende and pyrite. Of these, the zinc ores largely preponderate. The lead-ore is not now so much sought as formerly, and most of the old deposits are regarded as exhausted, although now and then new discoveries are made. The production may be regarded, however, as chiefly incidental to the exploitation of the zinc-deposits. The total shipments of zinc and lead ores from Benton, the principal station in the southwestern part of the lead and zinc region, amounted in 1892 to 13,800,000 pounds, of which the lead ore was 800,000 pounds. The lead-ores are sent largely to the works of the Pennsylvania Lead Company, at Pittsburg, and some go to Aurora, Ill.

Smithsonite, or "bone," as mined and sent to market, is usually in three grades or sizes, the result of the methods of sorting and cleaning: 1. The large masses or picked bone, culled by hand as mined, and comparatively free from rock or other substances. 2. The washed or jigged bone, in smaller fragments, cleaned as far as possible from iron oxide, blende and rock. 3. The finer portions or "smittems," more or less contaminated with heavy ochery clay and ferruginous rock, which cannot be removed.

The smithsonite or "bone" is sent chiefly to the works of the Mineral Point Zinc Oxide Works, at Mineral Point, Wis., and some now goes to the newly established works of the Lanyon Zinc Oxide and Paint Company, at Waukegan, about 30 miles north of Chicago. A few shipments are made to the St. Louis works of Page & Crouse, and a new establishment at Dubuque, Ia., is projected.

The blende of Wisconsin is very different in its appearance from the ruby-red variety of the Missouri mines. It is, instead, generally of a dark color, and hence appropriately called "black-jack." The proportion of zinc in the clean blende compares well with that of any other locality, ranging from 60 to 64 per cent. or more.

The jack, like the carbonate ore, is prepared for market in three principal grades: 1. The massive, hand-sorted, culled jack, cleaned as far as possible from all rock, pyrite, bone and lead. 2. The medium-sized fragments or "sieved jack," picked out from the mixed and broken stuff of the mine and cleaned by washing. 3. The jigged ore and "smittems."

The chief market for the Wisconsin blende is with the spelter works of Wenona, Peru and La Salle, Ill..

Barite (heavy spar) is an occasional associate of the deposits of blende. It is rarely crystalline, but forms in rounded, snow-white mamillary masses, contrasting sharply with the dark-brown or black of the jack. Any galenite present is usually associated with or planted in the midst of this barite.

Barite is objectionable, commercially, in connection with either the blende or galena. It is so heavy that it is separated with difficulty from galenite in the jigs, and it cannot be separated from the jack; consequently ,in the treatment of mill-stuff containing heavyspar a mixture of jack, heavyspar and pyrites is obtained; and although by the new process now employed the pyrite can be removed, the barite remains. In some of the deposits the barite may be nearly all separated by careful hand-culling, and, when clean, can be sold at a price which pays a little more than the cost of breaking and saving it.

The pyrites, generally known as "sulphur," are chiefly marcasite. It occurs next to the walls of the crevices, or coating the masses of dolomite, and is tightly attached to them, while the blende is superimposed. At the Helena mine large quantities have been saved and sold at $3. Analyses of the piles in bulk show 46% of sulphur. It is a very free-burning pyrite, and does not contain arsenic or antimony.

THE HYDROGEN-OIL SAFETY LAMP, BY PROF. FRANK CLOWES, NOTTINGHAM, ENGLAND.

The lamp here illustrated has been devised to burn oil from a flat wick in the usual way for lighting purposes; and also to burn a hydrogen flame of standard size instead of the oil flame, when delicate and accurate gas-testing is to be carried out. The change from the oil-flame to the hydrogen flame, and vice versa, can be made without opening the lamp or running any risk in the presence of gas.

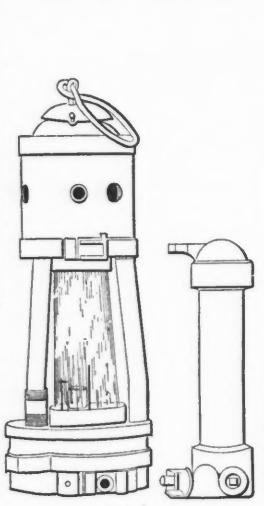


Fig. 1.

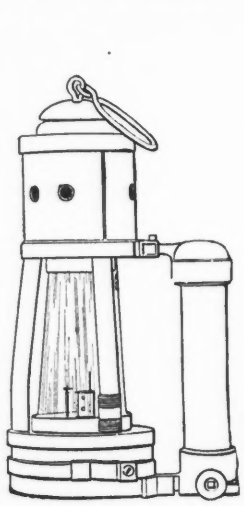


Fig. 2.

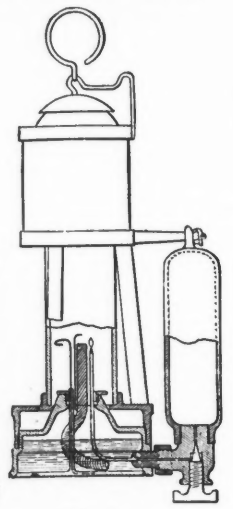


Fig. 3.

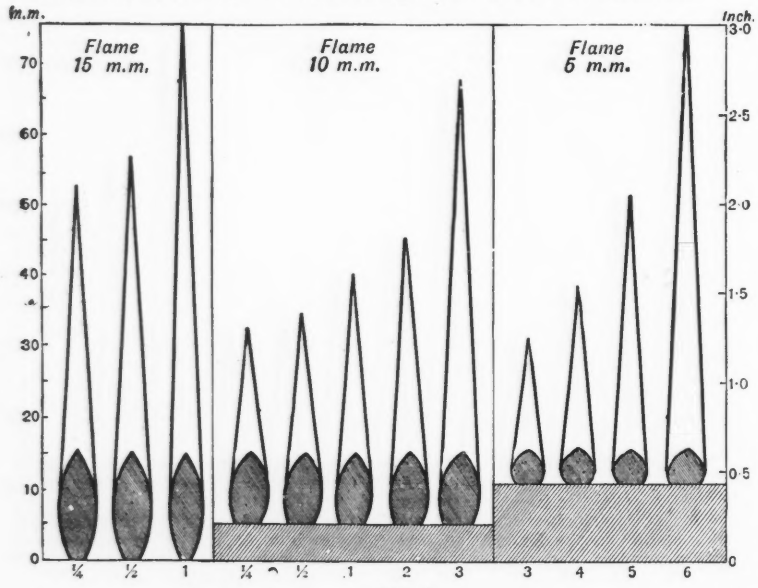


Fig. 4.

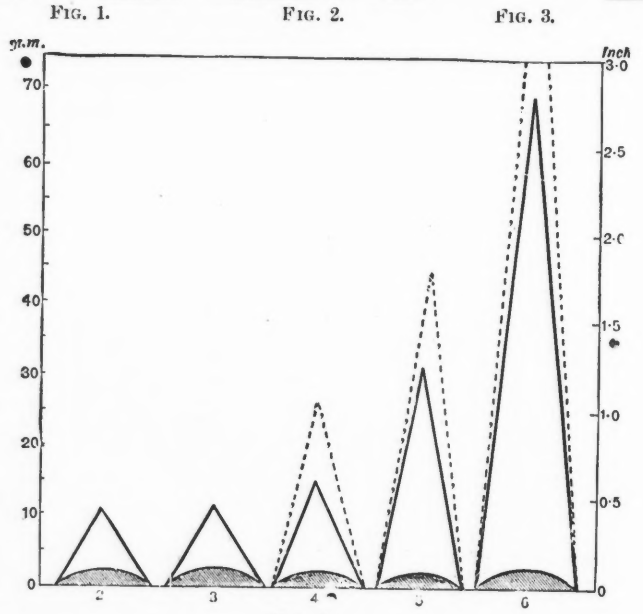


Fig. 5.

The oil-flame serves for illumination; and when the wick is drawn down by the "pricker,"so as to abolish the light, the pale blue reduced oil-flame serves to detect fire-damp or "gas," in any proportion between 3 and 6%, and to measure such proportions with fair accuracy.

The hydrogen-flame, set to standard size, detects gas when present in proportions varying from 0·2 to 3%, and measures such proportions with precision.

The presence of gas is detected by the presence of the pale "flame-cap"; its proportion is estimated partly by the character of the cap, but mainly by its height. In order to render the cap more easily seen a vertical strip of the interior of the lamp-glass, about an inch in breadth, is smoked by a wax-taper. This is arranged to form a background against which the cap is viewed, and serves to throw up the cap and to prevent its obliteration by cross reflections from the smooth glass-surface.

The hydrogen is contained in a small steel cylinder which can be attached at will.

If the percentage of the gas is to be measured the wick is drawn down by the pricker until the flame just loses its bright tip, and if a cap is seen, its height serves to measure with some approach to accu-

racy the proportion of gas, according to a scale given below. If no cap appears over the reduced oil flame, the absence of gas is not proved, since less than 3% is not indicated by this flame. The pocket hydrogen-cylinder is then attached to the lamp; the cylinder serving as a handle is grasped in the left hand, while the hydrogen gas is slowly turned on by means of a key applied to the cylinder-valve by the right hand passed round behind the lamp. A tongue of flame shoots up from the bright flame as the hydrogen enters; the wick is then drawn down until the oil-flame is extinguished, and holding the lamp with the hydrogen-flame on a level with the eye, the flame is set by means of the cylinder-valve to 10 millimeters by viewing it behind the standard wire scale. The height of the cap, if any, is then noted, and measures the percentage of gas, according to a scale given. If no cap is seen, the gas is less than 0·2% in amount.

To bring back the oil-flame, it is simply necessary to push up the wick, which is at once kindled on touching the hydrogen-flame. The hydrogen gas may then be shut off, and the cylinder detached and replaced in the pocket until it is again required. When using the lamp in the mine for the detection and measurement of gas, the standard hydrogen-flame is thus made to supplement the reduced oil-flame, and the two flames carry the indications from 0·2 up to 6% of gas.

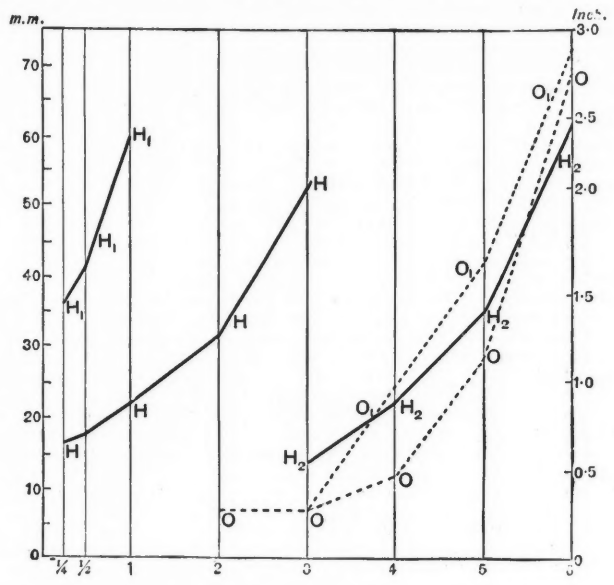


FIG. 6.

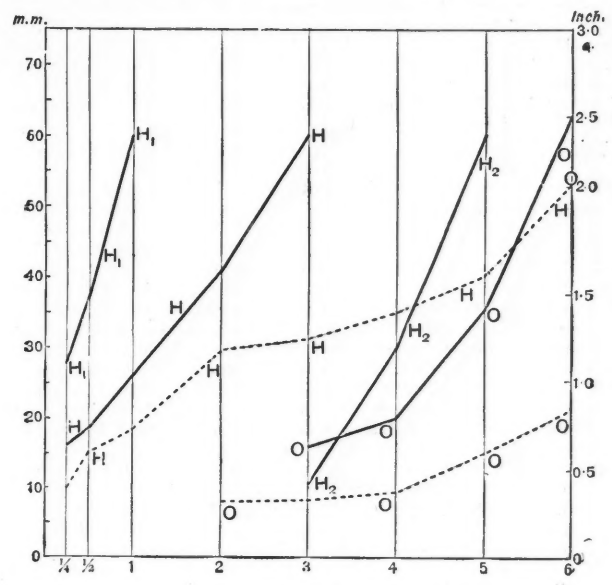


FIG. 7.

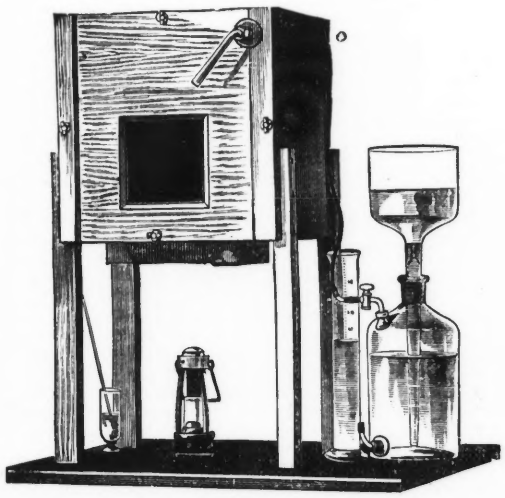


FIG. 8.

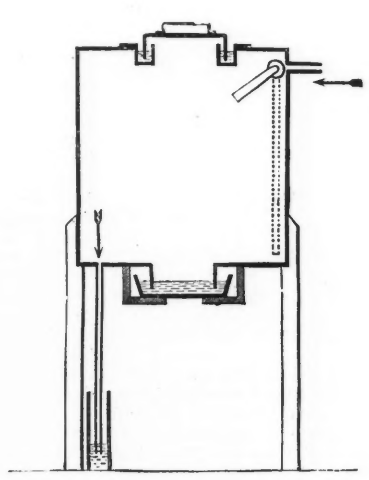


FIG. 9.

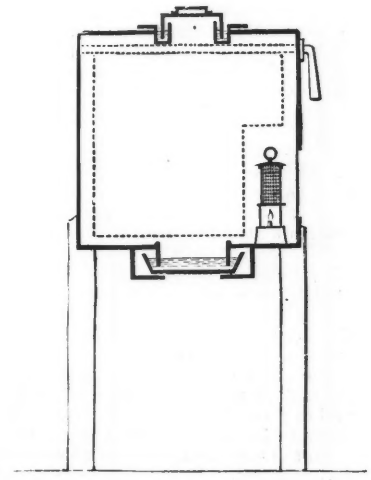


FIG. 10.

The diagrams given Fig. 4 shows the actual height of caps over hydrogen-flames with different percentages of methane or fire-damp; Fig. 5, the actual heights of caps over colza-petroleum flames; Fig. 6 and 7 are diagrams showing percentages of fire-damp as estimated by the hydrogen-flames. In these H_1 is the 15-mm. hydrogen-flame; H the 10-mm. flame; H_2 the 5-mm. flame; O_1 the maximum oil-flame; O the pale blue oil-flame; the dotted lines show water-gas.

In order to enable the cap-heights to be measured in the laboratory a small test-chamber (Figs. 8, 9 and 10) was constructed in wood, of precisely 100 liters capacity. It had a glass window in front for examining the lamp-flame, an opening below for the introduction of the safety-lamp, and an opening above for renewing the atmosphere. The upper and lower openings were closed air-tight by water-seals. When opened simultaneously, they renewed the atmosphere of the chamber in two minutes. When the air inside the chamber was to be charged with a certain percentage of gas, the requisite volume of the gas was introduced from a small gas-holder, and was mixed with the air by means of a large, light flapper, worked by a handle from outside. The mixture was effected in a few seconds by this means. A gas lighter than air was fed into the top of the chamber, a gas heavier than air was introduced near the floor of the chamber. The wooden chamber was blackened on the interior, and was made gastight by brushing over the inside and outside with melted paraffine wax. This test-chamber was found to work very well.

The cap-height was measured by pressing an ordinary flat parallel-ruler against the window of the chamber, and adjusting it until the cap was just included between the rules; the intervening space was then marked on a piece of paper pressed beneath the rule, and the distance was read off on a millimeter scale, and corrected for parallax. By specially-devised apparatus it was proved that the cap-height was independent of the movement of air around the lamp, even when the velocity of the air far exceeded that of the ventilation-current in the mine. The ordinary amount of coal-dust in the air of the mine was also without disturbing effect on the test.

GEOLOGICAL DISTRIBUTION OF THE USEFUL METALS IN THE UNITED STATES, BY S. F. EMMONS.

This paper is a brief sketch of the geological distribution of the deposits of the useful metals in this country, in the light of the latest knowledge. It forms a review of the progress and present ideas in the domain of economical geology in the United States, the worth of which is guaranteed by the name of the author.

In his introduction the author refers to the advance made in the classification of the crystalline rocks, which were formerly grouped indefinitely as Archaean; to the changes in opinion with respect to the eruptive and igneous rocks, the discarding of many of the old theories, and merging into the theory of differentiation of igneous magmas to the abandonment of the theory that the mineralogical or structural character of these rocks is a criterion of their age. He then takes up the geological distribution of the principal metals, beginning with iron, the principal occurrences of which in the older crystalline rocks, the Palaeozoic and Mesozoic rocks, in the Tertiary and recent deposits he describes briefly in consecutive order, concluding with a discussion of the genesis of iron deposits.

Manganese, nickel, tin, copper, lead and zinc, quicksilver and the precious metals are treated in the same manner as iron; antimony, of which the deposits in the United States are more important than those of tin, being omitted, unfortunately. In the chapter on tin the opinion is expressed that "the extensive regions of andesitic eruptions are as likely to prove tin-bearing in the northern as in the southern hemisphere," referring to the tin deposits of Bolivia, which are said to occur in andesitic or trachytic rocks of Cretaceous or

Tertiary age. It may be added that tin has already been found at numerous points in Mexico in rocks of this character, which are probably of about the same age as those of Bolivia, but so far as known at the present time none of these deposits are of economic importance. There are several striking points of difference between the occurrences of tin in Mexico and Bolivia, both of which are unusual, one being that the Mexican tin ores do not seem to be associated with silver, copper, lead or zinc, as is the case in Bolivia.

Mr. Emmons makes some important suggestions for future geological work of scientific and economic importance in directing where much remains to be done, many large fields being practically untouched. The progress which has been made in this science in recent years, and its practical results, have been immense; what more may we not expect in the future with the mental training and manners of thinking that practical geologists now have? "The truly scientific method in the study of such questions at the present day," says Mr. Emmons, "is the reverse of that which was followed in the early days of geology, when, after the observation of a few isolated facts, some great geological mind was led to a general theory, and humbler followers were only too apt to do mild violence to nature in order to make her facts conform to it. It accumulates year after year, a multitude of facts of patient observation supported by studies with the microscope and in the laboratory, avoiding general theories, and only making such deductions in regard to local conditions as are supported by the overwhelming evidence of facts." Our new theories, based in this manner, are likely to be of as much service as the old ones were frequently misleading.

THE CONSUMPTION OF FUEL IN TAYLOR GAS-PRODUCER PLANTS; BY C. A. STETEFELDT, OAKLAND, CAL.

The writer compares the statistics of the gas-producer plant at Aspen, Colo. (recorded by Mr. W. S. Morse, in a paper read at the Montreal meeting, February, 1893), with those at the Marsac mill, Park City, Utah, where such a plant was first introduced by him in July, 1890. In both mills a Stetefeldt furnace is used for roasting; but the Marsac mill has the old-fashioned revolving dryers, while at Aspen, shelf-dryers are at hand. At Aspen, separate Taylor producers are provided for the Stetefeldt furnace and the shelf-dryers; at the Marsac mill one 7-ft. producer supplies gas to both the furnace and the dryers. Hence, in the latter case, the quantity of coal consumed for each apparatus can only be estimated, based upon the relative consumption of wood before gas was introduced. According to Mr. Wilson's statement, the relative consumption of wood in the Stetefeldt furnace and the revolving dryers was as 3 to 2.

In the year 1892 the Marsac mill put through the dryers and the Stetefeldt furnace the following quantities of ore and salt (approximate dry weights): Ore, 22,800 tons; salt, 2,262 tons. There were consumed in the Taylor producer 2,714 tons of Rock Springs coal. We may thus make the comparative estimate as follows:

	Marsac.	Aspen.	Difference.
Drying ore and salt	86·63 lbs.	72·22 lbs.	14·41 lbs.
Roasting ore	142·40 "	117·44 "	24·96 "
Totals	229·03 lbs.	189·66 lbs.	39·37 lbs.

The coals consumed at the Aspen and Marsac mills have nearly the same calorific value as is shown by the following analysis:

The Aspen ore contains 6·15% moisture, and the salt at 1·0%. Accurate statistics regarding moisture in the ore reduced at the Marsac mill are entirely wanting, but the shipping-ore contained 8·4% during 1892; and it is probable that the milling ore runs about the same as the Aspen.

A considerable difference exists regarding the contents of sulphur in the ores treated, Aspen ore containing 8·1% and Marsac ore much less. An analysis of an average battery sample for 1891 gave only 0·7% of sulphur for Marsac ore. For the output of 1892 no sulphur determination has been made, but since the ore of 1892 came from the lower levels of the Daly mine, it is fair to assume that the percentage of sulphur was somewhat higher. The percentage of sulphur is slightly increased by adding pulverized sulphur to the battery pulp before roasting. This, however, is not always done. During 1892, Mr. Lamb says, the average consumption of sulphur in this way per ton of ore was only 3·72 lbs.

The number of tons of ore roasted in 24 hours also plays an important part in the consumption of fuel, an increased output requiring less coal in proportion. The Marsac furnace roasted from 60 to 70 tons of ore in 24 hours, while at Aspen as much as 90 tons was put through.

That the shelf-dryers are more economical in fuel than the revolving dryers is self-evident. The ore remains longer in its passage through the former, and the latter lose a large amount of heat by radiation.

All these facts help to explain the difference in the consumption of fuel in the two plants.

The low consumption of fuel at Aspen for the chloridizing roasting of silver ores is phenomenal in metallurgical history.

In conclusion, the writer would observe that Mr. Morse experienced the same difficulty in running the Taylor gas producers with coal leaving light and infusible ashes (using Sunshine coal alone) as was found in starting the producer at the Marsac mill with coal mined at Coalville, Utah. For this reason the Marsac producer is supplied with the dearer Rock Springs coal.

THE LEAD AND ZINC DEPOSITS OF THE MISSISSIPPI VALLEY: BY WALTER P. JENNEY.

This valuable paper gives the more important economic results of the investigation by the United States Geological Survey upon the lead and zinc deposits of the Missippi Valley, conducted by the author, which was begun in September, 1889. The lead mines of this region have no longer the same relative importance that they had 20 years ago, when their production was more than 50% of the total of the United States, while at present it is less than 21%; but it has, nevertheless, increased from 22,381 tons in 1873 to 37,000 tons in 1892, according to the statistics of the "Mineral Industry" for the latter year, the difference in proportion being due to the immense output from argentiferous ores since the discovery of the mines at Leadville and in the Coeur d'Alene. But as a zinc producing region the Mississippi Valley has been the most important in the United States for many years, and it is the source to which we must look for any needed increase in the domestic supply of spelter, 83½% of the total product of the country at the present time being derived from these mines. Ever since the beginning of the Western zinc industry, however, the mining and prospecting in some of the most important districts have been carried on in a more or less hap-hazard manner, with vague knowledge of the true geological character of the ore deposits. Dr. Jenney's elaborate paper is therefore a welcome addition to the practical literature of the subject which has only recently begun to accumulate.

The level surface of the Mississippi Valley is broken by a number of remarkable areas of uplift. Among these are: The promontory covering the State of Wisconsin and continguous sections of Iowa and Illinois, which has been named the Wisconsin Island; an elevated region in southern Missouri and northwestern Arkansas, called the Ozark uplift; and an area of upheaval extending through central Arkansas and the Indian Territory, which has been called the Onachita uplift. The important deposits of lead and zinc ores of the valley are associated with these uplifts. In the first occurs the lead and zinc mines of Shullsburg and vicinity; in the second the lead mines of southeastern Missouri (Bonne Terre, Doe Run and Mine la Motte), and the lead and zinc deposits of the Joplin district; in the Onachita uplift argentiferous lead and zinc ores are found in several small mining districts irregularly scattered through the region, while similar deposits are known to occur at a number of localities in the Indian Territory.

These uplifts are of early geological origin, the Ozark and Wisconsin dating back to the Archaean age, when they formed a portion of the earliest land of North America, contemporary with the Labrador Continent, the Allegheny Mountains and the Black Hills of Dakota, and other outlying islands and spurs of the Rocky Mountain chain. The Onachita is thought to be younger, the oldest strata exposed to view being of Lower Silurian age.

Different geological formations are productive of lead and zinc in the several districts in the Ozark area. In southeastern Missouri the great lead mines of Bonne Terre and Mine la Motte occur in Cambrian limestone. In these same regions the Lower Magnesian limestones of Calciferous age have contained deposits of lead and zinc ores which have yielded heavily in the past. The zinc mines of northern Arkansas, in the southern part of the Ozark uplift, also occur in the Lower Magnesian limestone. The upper beds of the subcarboniferous formation, designated as the Cherokee limestone and Seneca chert, carry the large deposits of lead and zinc ores in the southwest.

In the Wisconsin-Iowa region the magnesian limestones (calciferous?) carry lead ores in a few localities, but the principal ore-bearing formation is the Trenton limestone, which occurs in the Ozark uplift only in comparatively limited areas along the east and southeast marginal belt, and is not known to carry ores of lead and zinc. The subcarboniferous limestones which form the productive ore-horizon in the mines of southwest Missouri do not occur anywhere in the elevated region of Wisconsin. Limestones of this age cover an extensive area in central Illinois, extending into northeastern Missouri and southeastern Iowa, in the broad interval between the Ozark and Wisconsin elevations, but they appear to be everywhere barren.

The deposition of the ores of lead and zinc in the Ozark area and Wisconsin uplift, says Dr. Jenney, has not been accompanied by igneous disturbances or by intrusions of igneous rocks within the mining areas. The igneous rocks of the Archaean area of southeastern Missouri, included within the Ozark uplift, are far older than the earliest sedimentary deposits of lead and zinc ores, while the eruptive rocks of the northern shore of the Wisconsin Island, in upper Michigan, are all regarded by Van Hise as pre-Cambrian, and therefore cannot have influenced the formation of the deposits of lead and zinc in the Paleozotic rocks of the southern part of the uplift.

The result of this investigation of the deposits of lead and zinc in the Mississippi Valley has made it possible to announce the general law that all workable deposits of ore occur in direct association with faulting fissures traversing the strata, and with zones or beds of crushed and brecciated rock, produced by movements of disturbance. The undisturbed rocks are everywhere barren of ore." Dr. Tenney adds that there are many evidences, which are not set forth in the detail, that the fissures associated with the ore bodies have furnished the channels through which the mineral-depositing solutions were introduced.

The ore deposits of the Ouachita uplift are decidedly different from those of the Ozark and Wisconsin, resembling those of the Rocky Mountains more strongly. Its rocks are highly disturbed and metamorphosed with numerous igneous intrusions; its veins are fissures, and differ furthermore from those of the other districts of the Mississippi Valley in that silver is the most valuable and important constituent of the ores, instead of zinc and lead.

As a result of his investigation the author lays down the following rules for the guidance of miners in the Missouri-Kansas and Wisconsin-Iowa districts:

"1. The old rule 'to follow the ore' holds good in these as in other mining regions.

"2. In all underground prospecting the general rule may be given, to follow the more prominent vertical fissures in the search for ore; for these have been the channels through which the solutions have entered the rocks and formed the ore bodies, and along the course of which, in favorable ground, the deposits of ore occur.

"3. In prospecting new ground, attention should be given to the indication of the course of the fissures and cross-fissures; the work should be concentrated upon the areas of crossing or intersection of the different belts of fissures; for experience has shown that the largest ore bodies are situated at such crossings of different fissure systems. On the surface the course of the fissures may be traced in some localities by the direction of low bluffs, or breaks, or by sags or lines of depression in the even contour of the topography; also by the strike of outcrops of silicified rock, more or less mineralized and stained with iron. When carefully searched, such outcrops often afford traces of the oxidized minerals resulting from the weathering

of galena and blende. Evidences of the disturbances of the rocks should be carefully observed; such as, beds dipping locally at steep angles, or in a direction different from that of the prevailing inclination of the strata in the region; and the occurrence of belts of folded, crushed or brecciated rocks.

"4. An advisory rule may be given, never to sink a shaft without having put down a drill hole in order to ascertain the character of the underlying formations, lest time and money be wasted from striking hard and massive strata or areas of barren rock. The diamond drill is not adapted for this work in prospecting in the Cherokee formation, on account of the loose and open structure of the ground and because the hard chert cuts out the diamonds. In the Cambrian limestone the massive and uniform structure of the beds and the absence of chert are favorable for the successful employment of the diamond drill."

THE "LUNKEN" GATE VALVE.

The accompanying illustrations show a new design of valve recently introduced by the Lunkenheimer company of Cincinnati, and styled by them the "Lunken" gate valve. Fig. 1 is an exterior view of the valve; Fig. 2 is a sectional view; Fig. 3 shows the "by-pass" attachment; Fig. 4 is the shell of the valve, showing the application of the spanner end of the wrench to the seat; Fig. 5 shows the method of introducing a new seat into the shell; Fig. 6 is the renewable seat removed. This valve is very neat in appearance, and of a construction that indicates great strength. The hub or bonnet is held to the shell by a coppered steel clip or strap surrounding the shell, with its ends passing through the ears of the bonnet, and secured by nuts. This clip is held from lateral movement by projections on the shell. The joint is packed by a hard lead washer 1-64 in. thick, the top faces of flanges each having a groove to properly secure the washer. The valve can easily be taken apart without renewing the packing washer. The hub or bonnet is flat and narrow, and just of sufficient size to receive within it the valve disc when entirely raised, and has sectional or part-nut threads in its opposite interior sides. The threaded portion of the stem, by engaging with these part threads, causes the valve to be opened or closed. The disc has a straight flat face or

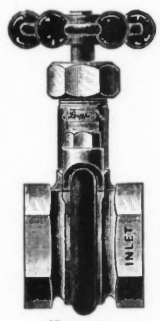


FIG. 1.

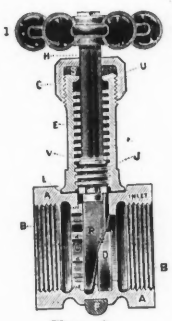


FIG. 2.

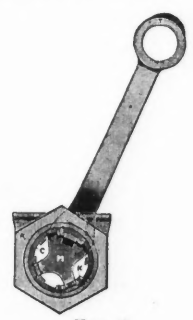


FIG. 3.

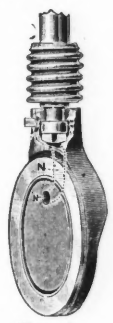


FIG. 4.

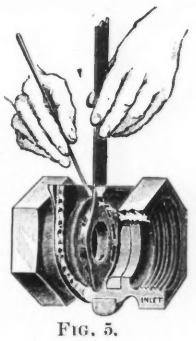


FIG. 5.

FIG. 6.

THE LUNKEN GATE VALVE.

bearing against the renewable seat, and is forced tightly against same by the self-adjusting wedging half-ring or horseshoe secured loosely in the valve shell. The wedging on the disc is applied on two wedging surfaces diametrically opposite to each other, these coming in contact with the beveled ends of the half-ring or horseshoe wedge; thus the wedging process is properly equalized on the entire disc and insures a tight joint on the opposite face. The pressure of the steam or liquid on the back or wedge side of the disc also aids to make a tight closing valve. All valves above 2½-in. size are provided with "by-pass," which arrangement balances the disc before opening same, and thus reduces the friction and wear on seat and disc to a minimum, and makes the valves open easily, regardless of what heavy pressure may be on same. This automatic by-pass attachment is an important movement and makes this valve, it is claimed, the only practical straightway steam and high-pressure valve thus far constructed. The by-pass, briefly explained, is an auxiliary valve formed in the top of the valve disc immediately below the yoke that secures same to the flanged head of the stem, and is operated by the stem of valve automatically, while opening or closing the main valve. A channel passing through the disc connects the inlet or pressure side of the valve with the outlet side, and the end of the stem controls this channel, there being sufficient play in the disc coupling to allow the complete opening of the channel caused by the first one-sixth turn of the wheel in opening the valve. The renewable seat is an exteriorly threaded flanged ring that screws against a face or shoulder of the flange, the opposite side of which flange forms the seat or bearing surface for the disc to close against. The inner periphery of the renewable seat has lugs or teeth for the engagement of the spanner end of wrench, by which means, after taking off the bonnet, the seat is tightened or loosened through the disc opening of the body without disturbing the pipe connections. In iron body valves the renewable seat screws into a second brass ring, permanently fastened in the iron shell; otherwise, owing to the rusting qualities of iron, the removable seat might rust tight in the shell. In a few minutes, and with perfect ease, any person can practically make a worn out valve as good as new, the cost of the renewable seat or a new disc being but trifling. Another important feature is that the stem, when valve is full open, seats itself, thus relieving all pressure on stuffing-box, and permitting repacking of same under pressure. The tie-band surrounding the shell adds greatly to the strength of the entire valve, and permits of its being taken apart easily with a small wrench. The shell is so short and rigid, and the wedging surfaces are so small, that expansion and contraction do not affect it. Thus the disc will never wedge fast. Having but a single disc, and the wedging half-ring taking the place of a second disc as a wedging resistance, this construction overcomes the objection in double disc gate valves, where liquids remain in the shell between the discs, and often freeze or injure the valve. It is impossible for anything to lodge on the seat of this valve, because the disc and seat have a parallel straight face; and as the pressure on the back of disc keeps it tightly pressed against its seat, it actually cuts away (like the action of the blades of a pair of shears) anything in its path. This feature, combined with the renewable seat, commends this valve for blow-off purposes. As regards outside finish, the shape and construction are such that necessitate only the finishing of the stuffing-box, the balance being left a smooth casting, while the steel band and nuts are drop forged and copper plated to prevent rust.

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING JULY 22D, 1893.

12,776 of 1892. Regulating Temperatures in the Manufacture of Metals. R. E. B. Crompton, London.
15,491 of 1892. Galvanizing with Aluminum Zinc. E. H. L. Stürzel, Hamburg.
15,649 of 1892. Apparatus for Continuous Decomposition of Alkaline Chlorides by Electrolytic Fusion. J. Stoerk, Paris.
15,887 of 1892. Obtaining Metals by Electrolysis. H. H. Frei, Zurich, Switzerland.
17,345 of 1892. Safety Hand Rail for Colliery Cages. G. H. Rule, Pentre, Wales.
17,430 of 1892. Miners' Safety Lamps. W. H. Johnson, Manchester.
17,833 of 1892. Automatic Cut-off Apparatus for Colliery Winding Engines. R. Thornewill and A. Davis, Burton.
8,346 of 1893. Method of Smelting and Refining, in which the Sulphur in the Ore is Utilized as a Fuel. C. M. Allen, Butte, Mont.
10,215 of 1893. Manufacture of Steel. J. A. Hunter, Philadelphia.
10,358 of 1893. Manufacture of Mineral Wool from Blast-Furnace Slag. T. E. Halford, London (H. J. White, Brooklyn, U. S. A.).

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office:

TUESDAY, JULY 4TH, 1893.

500,547. Handling Coal Cars in Mines. James A. Anderson, Bedford, O.
500,580. Process of Treating Flue Dust. Malvern W. Iles, Denver, Colo.
500,582. Ore or Feed Pulverizer. John M. Jones, Omaha, Neb.; Assignor of one half to Charles L. Wright and George B. Lasbury, same place.
500,596, 500,597. Crushing Machine. Robert McCully, Philadelphia, Pa.
500,605. Magnetic Ore Separator. Clarence Q. Payne, Stamford, Conn.
500,621. Apparatus for Separating Matte from Slag. Dennis Sheedy and Malvern W. Iles, Denver, Colo.
500,662. Ore Separator. William S. Lockhart, London, England; Assignor to the Automatic Gem and Gold Separator Syndicate, Limited, same place.
500,684. Regenerative Coke Oven. Franz Westermann, Herne, Germany.
500,816. Hopper Bottom Car. Richard Blackstone, Central City, S. D.
500,886. Steam Generator and Smelting Furnace. Joseph L. Giroux, Jerome, Ariz.
500,934. Artificial Fuel. Max Nirdlinger, Milwaukee, Wis.; Assignor to the Fuel Patents Company.
500,935. Gas Generator. James Nolan, Oakland, Cal.
500,970. Forging Hammer. Antonin Sperl, Los Angeles, Cal.
500,973. Electric Welding Machine. Maximilian M. Suppes, Johnstown, Pa.
501,022. Ore Concentrator. John H. McCoy, Ouray, Colo; Assignor of one-half to William Boyd Cunningham, New York, N. Y.
501,038. Metal Working. John H. Bassler, Myerstown, Pa.

DIVIDENDS PAID BY MINING COMPANIES DURING JULY, 1893.

NAME OF COMPANY.	Paid in July.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in July.	Paid since Jan. 1st.
Alaska Tr'dw'll, Alaska	.....	$275,000	Kennedy, Cal.	.....	50,000
American Turquoise	.....	60,000	Maid of Erin, Colo.	.....	150,000
Aspen, Col.	....	20,000	Mayflower Gravel, Cal.	10,000	70,000
Bald Butte	5,000	37,500	Minnesota Iron, Minn.	.....	420,000
Belden Mica, N. H.	5,000	35,000	Mollie Gibson, Colo.	80,000	980,000
Bimetallic, Mont	....	200,000	Morning Star D., Cal.	4,800	48,000
Calumet & Hecla, Mich.	.....	500,000	Napa Cons., Cal.	20,000	60,000
Centennial-Eureka, Utah	15,000	12,500	North Star, Cal.	.....	100,000
Champion, Cal.	3,400	23,800	Omaha, Cal.	3,600	25,200
Cleopatra	37,500	262,500	Osceola, Mich	.....	50,000
Colorado Central, Colo.	.....	27,500	Pacific Coast Borax	.....	15,000
Colorado Fuel Co., Colo.	.....	67,120	Parrott, Mont.	18,000	126,000
Cons. New York, Nev.	....	10,000	Pharmacist, Colo.	12,000	60,000
Copper Queen, Ariz.	.....	200,000	Plumas, Eureka, Cal.	.....	26,367
Daly, Utah	.....	187,500	Quincy, Mich.	.....	150,000
De Lamar, Idaho	160,000	350,000	Red Cloud, Idaho	.....	10,000
Dexter, Nev.	25,000	115,000	Rico-Aspen, Colo.	.....	25,000
Elkborn, Mont.	.....	153,125	Seven Stars, Ariz.	.....	97,500
Enterprise, Colo.	25,000	175,000	Sierra Butte, Cal.	.....	15,313
Golden Reward, S. Dak.	5,000	35,000	Standard, Cal.	10,000	20,000
Great Western Quicksilver, Cal.	12,500	87,500	Tamarack, Mich.	.....	200,000
Hecla Con., Mont.	15,000	115,000	Trinity River Hydraulic, Colo.	2,500	15,000
Homestake, S. Dak.	12,500	87,500	Utah, Utah	.....	5,000
Hope, Mont.	25,000	150,000	Victor	10,000	60,000
Horn Silver, Utah	.....	137,500	W. Y. O. D., Cal.	3,000	21,000
Idaho, Cal.	7,750	62,000	Total	492,550	6,325,425
Iron Mountain, Mont.	15,000	30,000			

Readers of the "Engineering and Mining Journal" will confer a favor on the publishers if they will notify the "Journal" of any errors or omissions in the above table.

PERSONALS.

Mr. Leo von Rosenberg, of New York, has returned from the West, where he has been for the past month on mining business.

Mr. William Hall, of Springfield, has been appointed manager of the Canada Coal Company's mines, at Joggins, N. S., in place of Mr. M. Baird, resigned.

Mr. George W. Maynard, mining engineer and metallurgist, of New York city, has gone to Canada on a professional trip. Mr. Maynard's address may be learned at his office, 75 Cedar street.

Mr. Reyi Kanda, chief mining engineer of all mines in the Sando District, Japan, is visiting the World's Fair. Mr. Kanda is a graduate of the Imperial Engineering College, of Tokyo, Japan. While in Chicago he can be found at the Japanese Building, at the Fair.

Maj. Henry Fulton, the well known engineer, of Boulder, Colo., has been appointed acting dean of the School of Applied Science, of the University of Colorado, at Boulder, and also professor of civil engineering. The University is to be congratulated on securing the services of so capable an occupant of the chair of engineering.

The gold and silver problem, says the New York "Tribune," has already landed one victim in the insane asylum. This is Andrew Dressen, a man 49 years old, hailing from Portland, Me. He has a system by which, with the yolks of eggs, he makes gold out of silver, and insists that there is no need of free coinage. He is so demonstrative at times in his endeavors to convince people of the success of his system that the services of a straitjacket are needed.

OBITUARY.

Ralph Robinson Lee, superintendent of the upper shops of the Philadelphia & Reading Coal and Iron Company, at Pottsville, Pa., died in that place on July 28th, aged 59 years.

W. G. Mellen, general manager of the Northern Pacific Railroad, died suddenly of heart disease, at Victoria, B. C., July 27th, aged 43 years. He had served on the Chicago & Northwestern, the Atchison, Topeka & Santa Fe and the Wisconsin Central before he went to the Northern Pacific in 1889.

Charles F. Washburn, who died in Worcester, Mass., July 26th, aged 66 years, was a son of the late Charles Washburn, and was born in Maine. As a young man he entered the iron works which his father established in Worcester, and had been connected with them all his business life. Since the concern was reorganized as the Washburn & Moen Manufacturing Company he had been vice-president of the company.

John Stephenson, who died at his home in New Rochelle, N. Y., July 31st, aged 84 years, was born in Ireland, but came to New York when only two years old. As a young man he learned the trade of a carriage builder and started in business for himself. In 1832 he built the first street car for the New York & Harlem Railroad, and later followed it up by establishing the firm of John Stephenson & Co., which has sent its cars all over the world. Mr. Stephenson was highly esteemed as a master of his business and an upright man. For some years he had withdrawn from active business, on account of advancing age.

SOCIETIES AND TECHNICAL SCHOOLS.

Society of Chemical Industry.—The annual meeting began in Liverpool, England, July 12th. At the opening session the members were appropriately welcomed to the city. The council's annual report, read by the secretary, stated that the number of members on the register was 2,784, compared with 2,782 at the last annual meeting. During the past session 74 original papers had appeared in the "Journal," precisely the same number as last year. The president then delivered his address, in which he expressed a firm belief that only by cordial co-operation among the different industries of this country, as that which their society had inaugurated, was the commercial position of Great or Greater Britain to be maintained. The voting for the election of officers for the ensuing year resulted as follows: Mr. E. C. C. Stanford, president; vice-presidents, Sir F. A. Abel, Sir John Evans, Sir John Turney, Professor Reynolds, Prof. T. E. Thorpe, Dr. F. Hurter, Dr. W. H. Perkin, Messrs. William Crowder, John Spiller, H. Brunner, H. T. Brown and E. K. Muspratt. At the close of the business, the members inspected the University buildings, and in the evening the members attended a reception given in their honor.

University of Colorado.—A distinct School of Technology has been organized by the Board of Regents, and will be opened at Boulder, next September. This is in accordance with the provisions of the constitution and charter of the University, and owing to the large demand and other circumstances the present time was deemed especially favorable to such an enlargement of the usefulness of the University. No expense is spared to make this department one of the very best. The courses in civil, electrical and mechanical engineering have been modeled after those of the University of Michigan. Since the students of this school come in constant class-room contact with the other students of the University the requirements for admission have been made the same as those for admission to the B. S. course, which is somewhat higher than in most schools. A complete scientific course in a good high-school will meet the requirements. Within guarded limits equivalents will be accepted. An engineering building of the latest and best design, in dimensions 50×100 ft., and three stories high, has been projected, and will, at least in part, be ready for use by next fall. Ample additional room is provided in the new Science Hall, just approaching completion. It is not the purpose to include courses in mining and agriculture, as these departments exist as separate schools in this State. The faculty of the new school includes, among others, Mr. Henry Fulton, who is dean and professor of civil engineering; Dr. Charles Skeele Palmer, professor of chemistry and metallurgy; and Frank R. Y. Moseley, instructor in geology.

INDUSTRIAL NOTES.

The Midland Steel Works and the White River Iron and Steel Works, of Chicago, Ill., will resume work.

The Etna mill, of Spang, Chalfant & Co., Pittsburg, has shut down temporarily, during which time needed repairs will be made.

The entire plant of Jones & Laughlins, in Pittsburg, was put in active operation on Monday last. About 5,000 men have found employment.

The Thomas Iron Company, whose furnaces are located at Hokendauqua, Pa., has made a general reduction of 10% in the wages of all its employees.

At the works of the Champion Iron Company, of Kenton, O., a new foundry building has taken the place of the one destroyed by fire a short time since.

The Pottstown Iron Company, Pottstown, Pa., has enlarged its open-hearth furnace, and has again started its puddling plant, after having made repairs.

Zug & Co., of Pittsburg, Pa., employing 800 to 1,000 iron workers, signed the Amalgamated scale on the 2d inst. The mill will resume in all departments on the 7th inst.

The Bonton Foundry Company, of Chicago, made an assignment on July 15th. Assets, $175,000; liabilities, $200,000. This company is a branch of the Schlesinger syndicate.

The Buffalo Steam Pump Company, Buffalo, N. Y., has moved into and is setting things in order in its new buildings, which have been under construction for a year past.

The Hercules Pipe Works, at Anniston, Ala., which lately resumed operations after a shut-down, are overrun with orders. The present force of men is 90, but will be increased to 150 and the works operated day and night.

The Ingalls Manufacturing Company has been organized at Portland, Me., for the purpose of making machinery, tools and mechanical articles, with $50,000 capital. The officers are: President, K. I. McKenzie; treasurer, S. P. Smith.

The employees of the Eaton, Cole & Burnham Company, at Bridgeport, Conn., have been paid, and operations at the works resumed in full. The works closed down some time since, when the company was overtaken by financial troubles.

The steel mill of the Bethlehem Iron Company, at South Bethlehem, Pa., resumed operations on July 31st, after five weeks' idleness. The old mill resumed on the 1st inst. The starting up of these two mills gives employment to about 1,200 hands.

The plant of the Monongahela Iron and Steel Company, at Hays station, near Pittsburg, has been put in full operation. This plant has an annual capacity of 15,000 net tons of muck bar, and contains 20 single puddling furnaces and one train of rolls.

The General Electric Company announces that it will shut down its foundry, at Lynn, Mass., which employs 300 hands. The reason assigned is that castings can be bought outside cheaper than the company can make them. Works were started only a short time ago.

The Iroquois Furnace Company, of Chicago, Ill., has blown out its stack for relining and other incidental repairs, the directors taking advantage of the present quiet state of the market. The furnace will go into blast as soon as a revival of demand is sufficient to warrant it.

The Carpenter Steel Company, of Reading, Pa., announces that by reason of new contracts, it will put in operation 12 new crucible furnaces on the 7th inst., and give employment to many new hands. It also announces that this week's wages, amounting to $6,000, will be paid in gold.

It will be of interest to Americans to learn that Worthington pumping engines will be used for the water supply of the city of Osaka, Japan. By the placing of this order there is literally a "girdle round the earth" of Worthington pumping engines, these machines having worked their way as far East as China up to the time of the awarding of this last contract.

The Lewis Foundry and Machine Company, Pittsburg, has all departments running full. The company has a number of orders ready for shipment, among which may be mentioned a number of rolls 22×47 in. for the Whittaker Iron Company, of Wheeling, W. Va.; one 8-in. and one 9-in. guide mill, together with one 14-in. merchant bar mill for different concerns throughout the West.

The Siemens & Halske Electric Company of America, which owns the American patents of the original concern, in Berlin, has issued a descriptive catalogue of its electrical motors, describing not only the motors themselves, but also a large number of their applications in driving machinery, with some notes on electric transmission and the points in which it is to be preferred to belt or other methods.

The Springfield Coil Boiler Company, recently organized in Springfield, Mass., has for its president and treasurer M. O. D. Adams, and among its directors are O. H. Smith, R. F. Hawkins, B. F. Steel, T. L. Haynes, W. O. Collins and Dr. A. M. Cushing. The boiler which the company proposes to manufacture is one which, in less-improved form, has met with a large sale, and has given satisfaction.

The latest of the long series of catalogues issued by Fraser & Chalmers, of Chicago, are: No. 2, Hoisting Engines and Appliances; No. 7, Perforated Sheet Metal; No. 12, Improved Corliss Engines; and No. 24, Riedler Pumping Engines. As usual with the publications of this firm, the catalogues are fully illustrated, and each one is complete in itself. In addition to these catalogues, the company has issued a pamphlet with an interesting account of the great Morro Velho mine, in Brazil, owned by the St. John del Rey Mining Company, which is supplied with a 100-stamp mill of Fraser & Chalmers' standard pattern.

The latest edition of the general catalogue of pumping engines and hydraulic machinery, issued by Henry R. Worthington, of New York, is dated July 1st, and has special reference to the Chicago exhibits of the company. It contains illustrated descriptions of a number of the pumps of various classes, the condensers and other machinery which are on exhibition, and of the great vertical pumping engines which supply the water used upon the grounds. We need hardly add that the catalogue is very complete in its descriptions.

H. L. Hollis & Co., chemists and mining engineers, of Chicago and Cleveland, have added to their business a new department which will include the remodeling and improvement of blast furnace plants and practice. They have associated with them Mr. E. C. Potter, formerly of the North Chicago Rolling Mill Company, and the Illinois Steel Company, and Mr. F. A. Emmerton, formerly of the Joliet Steel Company and the Illinois Steel Company, whose reputation in this filed is well known. For this work they have also secured the services of Mr. Michael Smith, for 16 years a furnace manager of the North Chicago Rolling Mill Company.

Following up recent decisions of the United States Circuit Court, in the matter of the Edison incandescent lamp patent, the General Electric Company, on July 28th, secured restraining orders, under a decision of Judge Ricks, of the United States Circuit Court for the Northern District of Ohio, against the Buckeye Electric Company and the Packard Lamp Company, of Ohio, both manufacturers of incandescent lamps infringing the famous Edison patent. The orders of the court close the factories of the two companies in question and the immediate effect will, without doubt, be a large increase in the lamp orders of the General Electric Company, as nearly all the factories in which infringing lamps have been made have now been closed by the courts.

The American Tube and Iron Company, one of the largest pipe concerns in the country, and having its headquarters in Pittsburg, decided to ask for a receiver. The company owns large pipe mills, at Youngstown and Middletown, Pa., employing between 4,000 and 5,000 men. It has offices in New York, Chicago, St. Louis, Cleveland, Boston and Pittsburg. The liabilities are $1,250,000, and the assets $2,700,000. Of the latter $1,200,000 is invested in plants, and $800,000 in finished and unfinished product on hand. The bills receivable amount to $700,000. The indebtedness is for two weeks' wages for the employees, and bills payable. Application was made at Harrisburg for the works at that point, and similar action was taken at Youngstown. The business is good, amounting to $5,000,000 annually, and if the mills are continued in operation all creditors will be paid. The receivers appointed by the Dauphin County Court are: A. S. Matheson and A. W. Mompyer, of Middletown, and Robert C. Neel, of Harrisburg.

The Lidgerwood Manufacturing Company has is-

sued from its headquarters, New York, the sixth of its series of Sketch Books. It bears the title, "Cableway Sketches," and contains 64 pages of valuable information regarding cableways, tastefully illustrated by a large number of deftly executed pen-and-ink sketches and several fine half-tone engravings, probably 50 illustrations in all. A portion of the matter contained in the last sketch-book, "Open Pit Mining," is reproduced in "Cableway Sketches," treatiug as it does of a very important branch of cableway service. With this exception the pamphlet is wholly devoted to the construction of dams and the operation of quarries using the Lidgerwood cableways. The Sodom, Austin, Butte City and Coosa dams are profusely illustrated, different stages in their construction being shown. Several views are also shown illustrating the great advantage of the cableway for stripping quarries as well as for general quarry use. The longest cableway ever sold for quarrying was 1,200 ft., span load, 10 tons. The heaviest weight handled up to the present time is 12 tons on an 800-ft. span. "Cableway Sketches" is intended for free circulation, and copies of it may be had by addressing the Lidgerwood Manufacturing Company, at New York, Boston, Chicago, St. Louis, Pittsburg, or Portland, Ore. The pamphlet reflects credit upon all interested in its preparation and publication.

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.

ALABAMA.

Clay County.

(From our Traveling Correspondent.)

This county, situated near the southwestern extremity of the Appalchian chain, is probably the most mountainous in the State. The loftiest range, locally known as the Talladega Mountains, forms the western boundary line between Clay and Talladega, also the divide between the Tallapoosa and Coosa rivers. The gold fields of both Georgia and Alabama are drained by the first-named river and its tributaries, while the Brown iron ore districts and a portion of the coalfields are drained by the Coosa and its tributaries. Some years back the industry of gold mining was quite actively carried on, especially in the Idaho district, near the center of the county. On the Chinco-Pino, California and Franklin mines, considerable work has been done in the past, but at the two first-named, the present conditions of the openings are in such a state as to render it impossible to estimate the value of the properties from the ore in sight. A 10-stamp mill with 350-lb. stamps was operated on the California, until about two years ago, but when the ore became sulphuretted, mining and milling were discontinued and the working tunnel caved in. The openings at the Chinco-Pino were in better condition and I was enabled to examine the vein matter, which is of the same character as the ore in the Cleburne County to the northeast, being very rich in garnets and being found in a sand rock formation. It is impossible to estimate the extent of the ore body, because sufficient work has not been performed in a systematic manner; what has been done consists of prospect holes, showing the existence of rock in place, but without exposing sufficient of the vein to enable any estimate as to its continuity in length, or depth to be made. At the Chinco-Pino property the surface to a depth of 3 or 4 ft. pans quite richly, in fact, yields much more than the vein matter, and would probably prove a valuable property for hydraulic mining, if sufficient water supply could be brought to it. The Franklin has been worked extensively, but at present it is idle, because of litigation. The ore body at this mine is an immense deposit of undetermined extent as to depth, length, or breadth. From its general appearance and the high percentage of iron in combination with the quartz, as well as the masses of garnets, probably only a small percentage of its value had been extracted by the amalgamation process. The surface soil at this property is said to be quite rich in coarse gold, like the Chinco-Pino, to a depth of about 3 ft. where the slate cap of the ore body encountered. This cap rock in places on this property changes from a slate to an iron rock, rather resembling the rough stuff found in the brown iron ore banks in other sections of Alabama. The richest ore I saw in this district came from the Horn property, which is probably an extension of the Chinco-Pino ledge, being in direct southwest course from that property, or rather an extension of the Laurel, which in its turn is an extension of the Chinco-Pino. At both the Horn and Laurel mines prospect work is being carried on, and the intention of the owners, who have engaged a good, practical miner to carry on the work, is to demonstrate fully the extent of the ore bodies by sinking, cross-cutting and drifting. The most work has been done at the Laurel, where the ore body, consisting of a number of stringers of pay-ore, separated by narrow strata of decomposed slate, has been cut at about 40 ft. below the outcrop on the side hill. As these stringers are followed on their dip they develop into a series of pockets of irregular extent which pinch out, but never entirely disappear, although in some places the stringers connecting them have narrowed down almost to the thickness of a knife blade. Pan prospecting shows some fairly good placer ground which has never been worked in this district, which is inaccessible to the prospector because no government land remains in the county, and to a large extent the knowledge is valueless to the present occupants of the land because all mineral rights were reserved by the original owners several years ago. With the exception of the properties mentioned, but little prospecting has been done.

Cleburne County.

(From our Traveling Correspondent.)

The industry for mining for mica has been revived in the southern portion of this county by the arrival of the representative of a Pennsylvania firm which handles large quantities of this mineral, and which advertises its desire to buy 75 tons of mica; consequently, the owners of mica properties are busily engaged. The workings on these properties are more extensive than on the gold-bearing ledges, and in some cases there are pits covering an area of as much as half an acre which must have been worked several years since; oak trees measuring 12 to 15 in. through have grown in the waste dumps, and on the sides of the excavations. On one property, comprising 200 acres, are an outcrop of 11 distinct veins of mica-bearing schist, from some of which lumps of mica weighing as much as 100 lbs. have been dug, which, when split into sheets and trimmed, returned a yield of 7 lbs. of first-grade mica, suitable for use in stoves. At one point on this property a shaft 80 ft. deep has cut through four veins of mica running from 4 to 5 ft. thick. Between these veins are strata of feldspar and kaolin, one stratum of the latter being 14 ft. in thickness, and of very superior grade. In 1876 when copper mining and smelting was carried on extensively in this portion of the county, large quantities of kaolin were used as lining for the furnaces, with more satisfactory results than was obtained by the use of English firebrick. These veins of mica-bearing rock can be traced in a direction slightly east of north and west of south for a distance of about three miles by the outcrop, and extending across the county line into Randolph County, near the Pinetuckey gold mine.

Talladega County.

(From our Traveling Correspondent.)

The best grade of brown iron ore probably known in the South occurs in this county, and a large quantity of it on the property owned by the Clifton Iron Company, in the vicinity of Ironaton, on a branch of the Louisville & Nashville Railroad. This company's property extends over 2,500 acres, about half of which contains brown ore, and has been thoroughly prospected. The property also includes two hot blast charcoal furnaces, one of 50 and the other 70 tons daily capacity; a McLanahan & Stone ore washer of 300 tons daily capacity not only washes the ore for the company's furnaces, but also a large quantity for shipment to other places. A steam shovel is kept in constant use at the ore banks, and the average cost of mining, washing and charging into the furnace is only 90 cents per ton. Analyses of ore and iron made by Wm. Makemson, analytical chemist for the Woodstock Iron Company, of Anniston, show from eight samples 50·45 to 55·46% iron; 0·589 to 1·158% manganese; 0·114 to 0·179% phosphorus; 6·77 to 8·70% silica, and 4·77 to 5·71% alumina. Analyses of iron made from this ore show 0·299 to 1·587% silicon; 0·441 to 0·859 manganese; 0·225 to 0·257 phosphorus. Two samples out of eight showed graphite, one 3·141, and the other 3·350%. Physical tests showed tensile strength of as high as 35,000 lbs.

ARIZONA.

Carga Muchacho.—Some rich finds are reported in these placer mines, 12 miles from Yuma. A shaft has been sunk to bed rock, 40 ft. Most of the gold is found on or near the bedrock, but gold has been found all through the gravel.

Gila County.

Old Dominion Copper Company.—This company started up both its mine and smelter July 25th.

Yuma County.

Harquahala Gold Mining Company, Limited.—After being thoroughly overhauled, the mill commenced working early in July. Mr. Theo. Allen (late assistant to Captain Plummer, at the De Lamar mines, Idaho) has been appointed manager, and is now at the mines.

CALIFORNIA.

Amador County.

(From our Special Correspondent.)

Kennedy Mining Company, Jackson.—It is reported that the ore which has been struck on the 1,650 and 1,750 levels, is the continuation of the lode which the company has been following down from points above, and that the cutting of this ledge means at least $2,000,000 in the enhanced value of the property.

Calaveras County.

(Reported for the "Engineering and Mining Journal.")

Carson Creek Mining Company.—This company's mine is located on what is known as the West branch of the great Mother lode, about four miles from Angel's Camp and one and a half miles east of the main lode, on Carson Hill. There is an enormous outcrop of a whitish quartz colored in places with a light green tinge. In this outcrop an incline shaft has been sunk, following the foot-wall distance of 240 ft.; at 140 ft. a level has been made, and drifts extended north and south, about 150 ft. each. In the south, two cross-cuts have been made 75 ft. apart, one showing a width of vein of over 70 ft., the second one over 90 ft. No upraises have been made, and no stoping has been done. The ore on the footwall, for a width of 10 to 18 in. carries a small percentage (½ to ¾) of blue telluride sulphurets, assaying from $250 to $1,500 per ton, from drifts extended several hundred feet on the hanging wall side. Many hundreds of tons of ore has been extracted and milled, carrying free gold and from 1 to 3% of iron pyrites varying in value from $65 to $117 per ton. The telluride sulphurets on the footwall side of vein carry a high percentage of silver often as great as one-half to two-thirds the entire value. As stated, the shaft is 240 ft. deep. A station has been cut and drifts are being extended north and south from this point. On the footwall the character of the ore is much the same as on the level above; blue telluride sulphurets, sometimes massive, generally evenly distributed throughout the ore grade high. No cross-cutting has been done on this level, but no doubt exists of the vein carrying its size. The motive power used is water under 360 ft. head, running hoisting works, duplex air compressors and Ingersoll drills; it also runs a 40-stamp mill, where all the ore is reduced. There are in use Tulloch concentrators with canvas belts; these have given excellent satisfaction, the percentage of concentrates saved being about 96%.

San Bernardino County.

(From our Special Correspondent.)

Center Mine.—The property is situated in the Morongo district, and the ore body is now about 6 ft. wide and runs from $50 up in the milling tests. The main shaft is down 165 ft., in a body of low-grade ore 12 ft. in width, running from $10 to $20 per ton. The stockholders have subscribed money for development and withdrawn the stock from the market.

Spaulding Mine.—This property was recently discovered in the Cerscent district. At a depth of 40 ft. the vein has opened out to a width of 4 ft., showing silver sulphide ore averaging, it is said, 200 oz. without sorting.

San Francisco County.

(From our Special Correspondent.)

Colonel Mendell, Lieutenant-Colonel Benyuard and Major Huer, United States Debris Commissioners, accompanied by Superintendents Spalding, of the South Yuba Company, and Conrath, of the Excelsior Company, have returned to San Francisco, after a visit of inspection to the hydraulic mining regions of Northern Nevada, Sierra, Plumas and Yuba counties. Gravel claims, both large and small, were viewed, and full and accurate information as to the situation and extent of mining claims and prospects of effectually impounding debris from them was obtained.

The following mining companies have filed incorporation papers:

Alma Gold Mining Company.—Organized for general mining purposes, with a capital stock of $400,000, of which $2,500 has been subscribed. The directors are Geo. Heazelson, John B. Francis, J. K. Wells, William B. Hamilton and H. H. Bodwell.

Sierra Gravel Mining Company.—Incorporated with a capital stock of $125,000, and $5,100 subscribed. The purpose of the corporation is to work gravel claims in Sierra County, more particularly the Texas gravel claim and the World's Fair claim. The directors are C. H. Whitten, W. H. Beatty, Joel Mason, J. E. Barry and A. Hoogs.

Siskiyou County.

About 30 miles from Sisson, on the north side of Eddy Mountain, a rich strike has been made. The first discovery was made some years ago by Harvey Maxwell. The ore was sent to Portland for assay, after which the mine lay idle for one year. The assayer understood the value of the find, and, with Wm. Dale, sought to find Maxwell, the original finder of the mine. Failing in this an effort was made to relocate the property, and last winter the lead was discovered after considerable prospecting, during which the float was traced for over two miles. This summer a shaft 8 ft. wide was sunk over the ledge, which is widening out, with a pitch of about 30°. The ore is very rich, consisting of sulphurets and free gold. Those interested in the mine are W. Dale, P. Kiernan and the latter's two sons. There is a quantity of ore now on the dump, but will not be worked until a mill is put up.

Yuma County.

(From our Special Correspondent.)

Good Hope Mine, Wheatland.—The owners have opened up the ledges down to the 100-ft. level.

The assays at 40 ft. show $21.30 to the ton. At 100 ft. a still better showing is made. The ledge is well defined, extending from the surface with a slight southward slant at an angle of 15° and varies in width from 8 to 20 in.

COLORADO.

Colorado Fuel and Iron Company.—The financial statement of this company for the eight months ending on June 30th has been issued. It shows: Net earnings, fuel and iron departments, $695,110; stock and bonds, $37,923; total, $733,033. The payments were: Sinking fund for coal and iron mined, $89,931; proportion of bond interest for eight months, $212,725; proportion of preferred stock dividends for eight months, $106,666; proportion of taxes for eight months, $25,925; interest and exchange, $25,117; total fixed charges and expenses, $460,366; balance applicable to dividends on common stock, $272,667; a dividend on common stock was paid May 15th, amounting to $115,625, leaving a surplus balance of $157,318.

Rocky Mountain Oil Company.—The news of the sale of this company's business at Denver and Overton is confirmed. This ends a senseless oil war which has cost the oil industry of Colorado considerable money. It is reported that the pipe line and Overton refinery will be abandoned and that the product of crude oil will all be refined at Florence by the United Oil Company and the Florence Oil and Refining Company.

El Paso County.

Pharmacist Mining Company.—It is reported that a good strike has been made in this company's property in the cross vein, on the second level. The width of the vein is 12 ft. and the high-grade seam 8 to 12 in. Assays run very high.

Gilpin County.

Ore Cache Mining Company.—At the annaul meeting recently 185,000 shares of the capital stock were represented. The old board of directors was re-elected. Superintendent Dave Short reported having sunk the shaft 45 ft. during the past year, the shaft being 140 ft. deep now. The vein, which is 5½ ft. thick, has been followed from the surface, and the ore is high-grade carrying both gold and silver.

Gunnison County.

Advices from Pitkin state that the Quartz Creek mill, contrary to general opinion, is still running, and the Cleopatra low-grade ore is being sent to it constantly. There are seven 4-horse teams which haul about 28 tons per day. The force on the Cleopatra is now 23 in all. They are working two 10-hour shifts and take out from 30 to 35 tons of ore per day. This with the 300 tons already on the dump will keep the mill going. At present it treats about 30 tons of ore every 24 hours. The work at the Cleopatra is being done in the lower level. There are also four men on the Fairview running a tunnel from the fifth level east in that mine to connect with the Cleopatra.

Jefferson County.

On Clear Creek, just above Golden, some gravel washing is doing. It is reported that while the returns are not highly remunerative they are sufficient to insure the laborer a fair living. Some, experts in the business, claim to be making considerable money.

Lake County.

Reed National.—Final notice has been filed of the sale and transfer of this mine to Amos Henderson in virtue of an attachment for $14,589.

(From our Special Correspondent.)

The conference between E. R. Holden, of the Holden Smelting and Refining Company, and his creditors, has finally ended, and the matter is now in the hands of the trustees. The smelter has not yet blown in, and whether it will or not has not been definitely decided. In case a start-up is made, Mr. Holden states that it would not be necessary to buy much ore, as the company has on hand 750,000 tons of slag, which is valued at a net profit of $1 per ton. The trustees who are looking after the interests of the creditors are A. V. Hunter, W. R. Harp and J. M. Maxwell.

The numerous shafts on the Morning and Evening Stars, 13 of which were shipping mineral six weeks ago, have finally ceased operations. Contracts had been made with the Valley and Leadville smelters, but the lessees were recently notified that the smelters would take no more ore, so work of shipping ceased.

At the Mahala the work of mining and shipping has ceased entirely. The capacity of the pumping plant is 200 gallons per minute. Of course, just as soon as the Maid pumps are pulled the Mahala will be drowned out, as it will be impossible to keep other water down with the present pumping facilities.

At the Penrose ore production has ceased entirely, and a fierce battle with water is now being carried on; 1,400 gallons of water per minute are being handled. The closing down of the Sixth street shaft has caused this greatly increased flow of water.

On the Wolcott but one shift is at work and shipments of lead ore averaging 40 tons daily are being made.

At the Arkansas Valley smelter five lead furnaces are in operation, also two matte furnaces, five reverberatories and four Bruckners. The important point with this smelter is to secure lead, and this is quite a scarce article at present.

Pitkin County.

Favorable reports continue to come in from Difficult Gold camp, and many prospectors are leaving Aspen for there. Some 150 men are now in the camp and it is believed that before snow flies there will be a large mill in operation there, treating the ores of the camp.

Saguache County.

Deep Creek Mining and Milling Company.—The annual meeting of the stockholders was held in Jimtown recently, and the following directors were elected: M. P. McArthur, D. M. Sponsilier and J. W. Lecky, of Creede, and Milton Moore, W. H. Winants, L. E. Prindle, Fred T. Durrant, C. F. Mussey and C. H. Clarke, of Kansas City.

Schuylkill Mining Company.—This company has let a contract for a tunnel to run in 500 ft. on its claim, which adjoins the Holy Moses mine at Creede.

CONNECTICUT.

Hartford County.

Bristol Copper Mine.—Work has been suspended for the present on account, it is said, of the low price of copper and difficulty in raising money. The pumps will be kept at work and the mine kept in readiness to resume work.

Middlesex County.

Connecticut Freestone Company.—This company has been taking some very large stone out of its quarry, at Cromwell.

Shaler & Hall Quarry Company.—This company's quarries at Portland, Conn., are busy on some heavy contracts for New York.

FLORIDA.

In the case of the State versus the Black River Phosphate Company, the Supreme Court on July 25th reversed the decree of the Circuit Court, Justices Raney and Taylor holding that the company must pay for all the phosphate taken by it out of the waters of Black Creek while the act of June 7, 1887, was in force, at prices prescribed by that act, and for all phosphates taken subsequently to the passage of the act of June 9, 1891, at the price fixed by it. Justice Mabry confines the right of the State to recovery for the phosphates taken subsequent to the approval of the act of 1891 at prices prescribed by it. A large number of Jacksonville people are involved in this suit.

GEORGIA.

Lumpkin County.

Lockhart.—The Dahlonega "Nugget" says that the 12-ft. chute at Lockhart has been struck at last from the new tunnel, and as soon as the pump, which is now running day and night, gets the water down so the old works can be timbered and made safe, ore will be taken out from this celebrated vein.

IDAHO.

Alturas County.

Advices from Hailey state that the Buttercup Mining Company, of Detroit, Mich., has closed down entirely. The Red Cloud Company is working but a small force. The Red Elephant Company will also close down. Leasers are quitting their workings. Silver meetings are being held in all the towns.

The War Dance is still running a small force.

The Pass Mining Company are also working a small force. The sampler has nothing to do.

Boise County.

Bella Mining Company.—This company, which is running a long tunnel to tap at the depth of over 300 ft. the Edna mine, in Beaver District, is considering the closing down work on account of the low price of silver.

Boise Mining Company.—The new 50-H. P. boiler and 4-in. pump for this company has arrived. The work of sinking the shaft for the purpose of going through the false bed rock to the granite to ascertain whether there is pay gravel beneath it commenced last year, but after getting down 112 ft. work had to be suspended on account of the flow of water being too great to be handled by the pumps in use. It is reported that the company will not cease sinking at present.

Illinois Mine.—A recent clean-up gave $900 from nine tons of ore. A shaft is now down about 50 ft. The owners have a Blaine five-stamp mill working, and claim that there is a large amount of good milling ore in sight.

Coeur d'Alenes.

The Helena "Independent" states that according to John A. Finch, secretary of the Coeur d'Alene Mine Owners' Association, the Coeur d'Alene mines will start up for at least part of the time. A limited amount of work will be done, such as is necessary to keep the machinery in good repair and the mines in good condition, and some ore will be shipped until the action of Congress on the silver question is decisive.

Idaho County.

Consolidated Virginia Placer Company.—These claims are located on the Clearwater River, 30 miles from Grangeville. The depth of the gravel is 20 ft. A ditch two miles long gives a pressure of about 100 ft., and, it is said, that by extending the ditch 2½ miles, 200 ft. pressure could be obtained.

MAINE.

Knox County.

Dix Island Granite Company.—This company was the lowest bidder on the heavy contract for stone for the new cathedral in New York. The contract has not been awarded.

Washington County.

Chandler's River Granite Company.—This company has been organized at Machias, for the purpose of quarrying, cutting and dressing granite, with $8,000 capital stock, of which $2,000 is paid in. The officers are: President, Edward B. Curtis, of Machias; treasurer, John W. Chandler, of Machias.

MASSACHUSETTS.

Berkshire County.

Richmond Iron Company.—At the recent annual meeting at Great Barrington the following officers were elected: President, George Church; vice-president, M. H. Robbins; treasurer and general manager, R. A. Burget; secretary, John H. C. Church.

MICHIGAN.

Copper.

Atlantic Mining Company.—This company produced 236 tons in July, as against 234 in June and 205 tons in July last year.

Centennial Mining Company.—It has been decided, says the Calumet "News," to stop all work at this mine for the present. The water will, however, be kept out of the workings. It is a pity, says the "News," that President Hiusdale did not decide upon sinking the No. 7 shaft on the Calumet conglomerate deeper. Persons who should know all about the mine say that should be done, and it would pay, as it would soon strike the shoot which was encountered in No. 6, and which dips to the north, and would necessarily be struck by No. 7 when sunk a little deeper.

Franklin Mining Company.—The July production of this company was 175½ tons, as against 175 tons in June, and 190½ tons in July, 1892.

Huron Mining Company.—This company produced 63 tons of copper in July. A dispatch from Houghton says that the mine was expected to close down this week. The lease having expired the property goes into the hands of the lake creditors. About 120 hands will be thrown out of employment.

Quincy Mining Company.—This company produced 738 tons of copper in July, as against 701 tons in June and 501 tons in July, 1892.

MINNESOTA.

Duluth.

(From our Special Correspondent.)

The total ore shipments from the Mesaba and Vermillion ranges for the season to July 29th had been as follows: Vermillion range, 433,388 tons, of which the Minnesota sent 193,931, the Chandler, 237,446, and the Zenith, 2,011. From the Mesaba total shipments are about 90,000 tons, of which the Canton sent 17,500, Cincinnati, 9,900; Biwabik, about 20,000; Minnewas, 7,500; Franklin and Commodore, 10,400; Mountain Iron and Lowmoor, about 20,000; Mesaba Mountain, 3,000; Hale, 1,200. Ore freights from Duluth and Ashland are still very low, ore going from both ports to Cleveland at from 50 to 60 cents a ton. Ashland shipments are light, the Wisconsin Central docks being 50% behind last year. On the contrary, Vermillion range shipments are larger than ever before in the same length of time. Duluth is crowded by idle men, hundreds having come here from the Michigan iron district, while the latest action of the Minnesota Iron Company has increased the number by 1,000. The usual exodus to the North Dakota and Minnesota harvest fields will, however, begin in early August. The Great Northern railroad, in surveying for the last link in its transcontinental line, a short cut across Northern Minnesota to the lakes, at Duluth, is running its lines along the Mesaba for some distance, and evidently intends to become an ore carrier.

Iron—Mesaba Range.

(From our Special Correspondent.)

The Biwabik, Berringer, Oliver (Mesaba Mountain) and Mountain Iron are each mining not far from 1,000 tons daily. The Franklin, Commodore, Minnewas (Biwabik), Hale Canton, are shipping from 30 to 10 cars daily.

Chicago & Minnesota Ore Company.—This company, part of the Minnesota Iron Company, has found iron in 9 and 19-58-19, on lands leased from the Duluth Iron Mining Company.

Iron King.—N. D. Moore, an old time Gogebic boomer, has leased this property in 58-17. Extensive bodies of high-grade ore have been uncovered. The same explorer has a large find in 10-58-19.

New York & Mesaba.—The Lone Jack mine and the Mesaba Chief as well, one in 58-17, and the other in 57-21, are under negotiation for sale to

the New York syndicate that has taken most of the Mesaba properties. The price for the two is understood to be not far from $400,000. All the properties of the syndicate are to be put under a new corporation to be listed in New York.

Shaw.—This mine is negotiating for the sale of a large quantity of soft Bessemer ore at $3.75 f. o. b., Cleveland. If the contract is made it will be worked extensively.

Iron—Vermillion Range.

(From our Special Correspondent.)

Minnesota Iron.—This company, on Friday, discharged half of the 900 men left and is now running but two shafts in addition to stockpile and crushing crews. At its Chandler mine only 200 men are left, and mining is suspended. Next year the Minnesota crushed ore will be loaded from stockpiles by steam shovels.

MISSOURI.

Coal.

A press dispatch from Kansas City states that the delegate convention of Missouri miners, in session in that city, framed an ultimatum on the 1st inst. It is a demand for arbitration settlement before August 5th, with the penalty of a general sympathy strike in Missouri in case of a refusal. The sympathy strike is billed for August 7th. The meeting was attended by more than 40 delegates from the mines in Western and Southern Missouri. The session was secret, but the fact of the ultimatum was gained from reliable sources. The Rich Hay miners have already struck.

Jasper County.

(From our Special Correspondent.)

Joplin, July 31.

There has practically been no improvement in the lead and zinc mining industry of this district for the past two weeks. The zinc ore market has been on the decline and closed last Saturday evening at an average of $18 per ton. The price of lead ore has been very unsatisfactory to the producers and closed at $17.50 per thousand, however; operators with good producing lead mines are working a full force of miners and hope for an advance in the price of lead. The coal strike of Southeast Kansas may be said to be over, while the miners and operators have come to no terms of agreement; the operators have imported negroes from Alabama and Colorado, and put them to work in the mines. Following are the sales of ore from our lead and zinc mines for the past two weeks: Joplin mines, 1,782,100 lbs. zinc ore and 583,460 lead, value $36,958; Webb City mines, 440,910 lbs. zinc ore and 49,510 lead, value $4,866; Carterville mines, 1,756,440 lbs. zinc ore and 133,310 lead, value $18,656; Oronogo mines, 36,660 lbs. of lead, value, $3,479; Granby mines, 553,590 lbs. zinc ore value, $3,479; Franby mines, 553,590 lbs. zinc ore and 56,100 lead, value $5,410; Wentworth mines, 44,000 lbs. zinc ore, value, $380; Galena, Kan., mines, 1,408,000 lbs. zinc ore and 223,000 lead, value $11,178; district's total value, $81,478; Aurora, Lawrence County, mines, 1,659,780 lbs. zinc ore and 318,480 lead, value $16,500; lead and zinc belt's total value, $97,978.

Prospecting and development are still being pushed in the Spring City district, south of Joplin; there are several hundred tons of zinc ore piled up at the mines and held for better prices. Much new development is being made by drilling and sinking shafts.

MONTANA.

Deer Lodge County.

Montana Mining Company, Limited.—The superintendent's June report says that the total assay value of the output for June was $53,800, which is estimated to realize $40,946 at the present price of silver—say, 75 cents per ounce. The tonnage of ore milled during the month was 5,067 tons, 75 stamps having been in operation. The treatment of dam tailings has been discontinued, the recent results having been unsatisfactory. The expenditure for the month was as follows: Working expenses on revenue account, $27,800; outlay on shaft and developments, $13,000; outlay on machinery, etc., $100; payments chargeable to the lawsuit, $9,200; other extraneous expenses, $800; total, $50,900. In view of the present unprecedented fall in the price of silver, it will be reassuring to the shareholders to remind them that the Drumlummon mine comes under the designation of gold for the past 10 years, being 62% of the total produce.

Jefferson County.

Elkhorn Mining Company, Limited.—The manager's report for the first week in July is as follows: Mill has been closed down for half-yearly clean-up and repairs; commenced working again July 6th; crushed 58 tons; amalgam in pans and settlers estimated to contain 2,000 oz. Return for June: Mill worked 26½ days, and crushed 906 tons. Bullion produced in the mill, $27,573; 243 tons of smelting ore sold, $15,920. Total produce, $43,493. Total expenses, $23,457. Estimated profit for the month, $20,036.

Missoula County.

(Reported for the "Engineering and Mining Journal.")

Nine Mile Mining Company.—This company is incorporated under the laws of Montana, with a capital stock of $500,000, in shares of $1. The officers are: Peter Lawson, Helena, Mont., president; W. M. Bickford, Missoula, Mont., vice-president; John M. Keith, Missoula, Mont., secretary and treasurer; J. Milton Martin (formerly superintendent of Anchor Mining Company, Park City, Utah), general manager. The principal office of the company is at Missoula. The company's mines are located at Martena, in Missoula County, about 50 miles northwest of Missoula City and 20 miles west of Nine Mile station, on the Coeur d'Alene branch of the Northern Pacific Railroad. The mining property covers an area of 2,500 ft. in width by 6,000 ft. in length. The veins or ore bodies are exposed on the surface for 3,200 ft., the formation in which they are found being an aluminum and magnesium shale with occasional reefs or dikes of igneous rock; these fissures contain large bodies of chalcopyrite. The mining is done through tunnels and adits. The fissure vein or ore bodies are now opened up for a depth of 350 ft. on the dip and 3,200 ft. on the strike, and is said to average 4 ft. in thickness. The ore is free milling, quite soft and easily milled. This property is easy of access and can be worked with economy, as there is abundance of timber, wood and water on the ground for all mining and milling purposes. The ore bodies can be worked by tunnels and adits to a depth of 1,200 ft. As this is a close corporation, it is difficult to ascertain the value of the ore, but it is generally understood that it mills $15 per ton net. The ore is conveyed from the mine to the mill over an automatic tramway 1,050 ft. in length. The milling plant consists of a 20-stamp wet crushing free-milling quartz mill run by steam power. This mill has been running continually for the past six months; it is believed to be a fact that the company is highly pleased with the returns.

Martina, the mining camp, in which the Nine Mile mill is situated, was discovered in 1874, and since that time over $700,000 worth of placer gold has been taken out. Strange enough, no attention was paid to quartz mining until Nine Mile mines were discovered in 1890. The mountains surrounding this district abound in deposit of metalliferous rock and numerous promising veins of pay-ore have been discovered since that time. Aside from the Nine Miles Company's property, there are several promising prospects. The San Martina Mining Company owns a group of very valuable claims. The Lone Star is another promising mine and the Beecher mine, owned by Stillwater mine people, bids fair to become a producer in the near future.

All the veins thus far discovered in this district contain free milling gold ores, and there is as yet no indication of the ore changing as depth is attained.

Silver Bow County.

Anaconda Mining Company.—Recent advices state that the mines of this company are in operation with a full force of men at each property. In a few weeks ore will be hoisted from another producer for the company, called the Never Sweat. The Humboldt mine is another producer. It is said the company ships about 35 cars of ore each day, and the other properties of the company are shipping about the same amount. Copper matte has sold 8 cents per pound for copper contents.

Boston & Montana Consolidated Copper and Silver Mining Company.—This company has redeemed $48,000 of the first mortgage 7% bonds, first issue. The company has now outstanding $521,000 first mortgage 7% bonds, first issue; $358,000 first mortgage 7% bonds, second issue, and $600,000 general mortgage, 7% third issue; total outstanding, $1,479,000. The annual fixed charges of the company are approximately $253,530.

Butte District.—In spite of the drop in the price of the metal new silver mines are constantly being developed in this district, says the Butte "Miner." One of the richest silver strikes in the camp in a good while was made in the Gold Hill in the new workings. The property is owned by Charles Bielenberg, H. S. Clark and W. A. Clark, but Mellville & Mungresser have an 18-months' lease on it and still a year to run. A shaft 100 ft. deep has been sunk and a 90-ft. crosscut run. At a distance of 55 ft., the hanging wall was struck and the next 35 ft. are in the lead. The same paper states that a great many prospectors and miners have left Butte since the decline in silver and have gone in search of gold. A number have scattered out over the old placer grounds that were abandoned years ago. A party of miners left some time ago for French Gulch, where millions of dollars were washed out in the 60's and 70's, and reports come from there that there is still enough gold left in the sand to pay a few men.

Niagara-Black Rock.—In the suit which has been pending for some time, a decision was reached in the Montana court last week. The Anaconda "Standard" says the substance of this contest is that W. A. Clark, the defendant, with J. K. Clark and others, is the owner of the Black Rock, a rich producing mine that has been worked for a number of years. W. A. Clark also owns one-third interest in the Niagara, which adjoins the Black Rock on the north. Both properties are located some distance north of the Bell and Speculator mines. The other owners in the Niagara are James W. Forbes, William P. Forbes, Meyer Geuzberger and William Fitzgerald, and their suit against W. A. Clark, who committed the alleged trespass while he was working the Black Rock under a lease, was in the nature of an accounting for their two-thirds interest in the ore taken by him from the vein on its dip after it had passed across the side lines into the Niagara. The plaintiffs maintained that there was one large vein, which, under the well known mining law, belonged to them after it had crossed entirely into their ground from the Black Rock. This vein has an apex 80 ft. wide. When the action was brought for an accounting and injunction, the defendant went into court and acknowledged that the vein claimed by the plaintiffs belonged to them, but alleged that there were two distinct veins, and that he was not trespassing on the one claimed by the plaintiffs. The plaintiffs presented their proof and established the fact that the trespass had really been committed on their vein. The defendant then, instead of sustaining his claim of two veins, admitted that there was but one large vein, but alleged that the top of the vein had faulted off but had not been moved far enough to break the connection with the main vein, and that therefore, as long as he had any part of the apex, he was entitled to the whole vein, his location, the Black Rock, being the prior location. The defendant tried to establish the fact that a fragment of a vein in the Black Rock to the south several hundred feet belonged to and connected with the main ore body, and, this fragment being entirely within the Black Rock, that the whole large vein therefore belongs to him. He tried to prove that the original 80-ft. vein was now 250 ft. wide and consequently the greater part of it within the Black Rock. As against this theory of faulting the plaintiffs showed that there is no similarity between the faulted portion and the portion not faulted, and as a consequence the one could not be the top of the other. The lower portion was shown to be full of black manganese ore, while the fragment had no trace of it. The defense acknowledged this dissimilarity, but insisted that there was a connection between the two, it being the only defense that could be made. The plaintiffs further controverted the theory of the defense with the claim that the faulted portion should have had a companion similar to two streaks found in the main vein, but this has not been found. There is an entire separation between the two ore bodies, say the Niagara people, and, therefore, it would make no difference where the fragmentary vein came from, and the ore taken out by Mr. Clark was taken from the main vein where it is in place, and where the apex remains and unfaulted within the Niagara ground. If the defendant's theory would hold good, it would make valueless several presumably rich locations adjoining the Black Rock. Mr. Clark took advantage of the statute of limitations, which says the plaintiffs can recover only for ore taken within two years prior to the commencement of the suit, and, therefore, he need not account for some 11,000 tons alleged to have been taken prior to that time, but only for 8,835 tons valued at some $35,000. The verdict of the jury awards $19,351 to the plintiffs. Aside from the money consideration, the verdict will establish a precedent of importance.

NEVADA.

Storey County—Comstock Lode.

According to the Virginia City "Chronicle," the Union Consolidated & Sierra Nevada joint west drift, on the 900 level, of the Union shaft, has been stopped, after having been run for a distance of about 3,370 ft. At a point some 1,600 ft. east of the shaft a north drift will be started to explore a promising quartz formation that was cut through by the west drift. Work in the Crown Point and Justice mining companies has not yet been resumed, and the mines are still entirely closed down.

Belcher Mining Company.—The latest official weekly letter says: On the 200 level, from the top of raise between Nos. 1 and 2 cross-cuts, a west cross-cut was started which is out 10 ft.; the face shows porphyry. Southeast cross-cut No. 2 on the same level is out 30 ft.; the face is in porphyry. On the 350 level the east cross-cut, 100 ft. north of the north winze, is being repaired. On the 400 level the southwest cross-cut is out 357 ft.; the face shows porphyry. The north drift on the same level is up 14 ft. The face is in porphyry. On the 600 level the work of cutting out the station has been going on all the week. There has been no ore hoisted during the week.

Savage Mining Company.—The latest weekly official letter from the superintendent says: On the 1,100 level, east of the old stopes, we continue to extract ore of fair grade from the fifth floor up to the sixteenth floor. During the week we have hoisted 118 cars of ore from this level; shipped to the Nevada mill 210 tons and milled 210 tons; car samples average $23.44; battery samples average $26.42. Bullion yield for the week, $3,882.90. We have men on repairs and prospecting, from the 1,100 to 950 level; also have a force of men employed retimbering the main shaft above this level to the 750 station.

Segregated Belcher Mining Company.—The superintendent of this company writes as follows: We have been stoping on the east and west streaks on the 1,100 level, and have saved from there about 30 tons of fair grade ore.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the car and battery assays, bullion shipments, etc.:

Mines.	Tons h'sted.	Car spl. assay.	Tons milled.	Av. Bty. assay.	Bill for work.	Bullion shipped.
Con. Cal. & Va	188	$28.69	....	.....	.....	.....
Kentuck.....	210	9.00*	....	.....	.....	.....
Occidental....	35	27.00	....	.....	.....	.....
Potosi.....	581	29.17	580	$22.69	.....	$789†
Savage.....	210	23.44	210	26.42	$3,882.90	.....

* Gold. † Crude bullion.

NEW MEXICO.

Grant County.

The Carpenter district, in the eastern part of this county, has been entirely abandoned, says the Silver City "Southwest Sentinel." Considerable development work has been done on the mines there within the past two years, and there are large bodies of ore in sight, but the ore is so low-grade that the mines could not be worked at present prices of silver. The Carpenter district is difficult of access, but if there was any encouragement for the owners of the mines there to work them, a good road would be built to the mines.

According to the local papers, work has been commenced in the placers in different parts of this county within the past fortnight. Enough rain has fallen to furnish plenty of water for placer mining in nearly all the gulches in which placer gold is fouud, and rockers are to be fouud in all of them. There are more men at work washing out gold in this part of the territory now than there have been at auy time before within the past 10 years. Some of the placer miners make big wages, while others make only from $1.50 to $2 a day. If the rainy season contiuues for the usual length of time, placer mining can be carried on to good advantage for two or three months yet, and a good many of the miners who have been thrown out of employment can make a living out of the placers.

It is reported that the Manhattan Gold Mining and Milling Company and the Pacific Gold Mining Company, both operating gold mines at Pinos Altos, have decided to pipe water from a point above Fort Bayard to the mines. If this is done both mills will be removed from Silver City to the vicinity of the mines, at Pinos Altos. The expense of bringing the water to the mines and removing the mills to Pinos Altos, will be about $45,000. The mills have a capacity of about 55 tons of ore each daily, and the expense of bringing this amount of ore from Pinos Altos is over $170 daily. This would all be saved if the mills were at the mines.

Sierra County.

Since the rainy season commenced quite a number of prospectors have gone to the Cuchillo region, where there was some excitement two or three years ago over the finding of some rich float. Some small gold leads were discovered at the time, but the main lead was not found, and the excitement died out. Prospectors who have gone there hope that the recent heavy rains may have made it easier to discover the lead. This region is about 30 miles north of the Hillsborough district, which is one of the principal gold districts in the territory.

NORTH CAROLINA.

Edgecombe County.

Maun-Arrington.—The recent sale of this mine, we are informed, was under proceedings intended to readjust the ownership and place it in the hands of those stockholders who advanced the working capital. It is proposed to begin work on the development of the property at once.

NEW JERSEY.

Morris County.

A quarry of remarkable granite is being opened on the east side of Federal Hill, near Pompton Junction. The stone is wonderfully brilliant, the prevailing color being rose pink, mottled with milky quartz. Only surface stone has been taken out thus far, but when the ledge is cleared further down, it is expected to develop fine building stone and probably monumental granite of fine quality.

Hurd Mine.—This mine closed down for the present on August 1st, on account of the blowing-out of the furnace at Glendon, where the iron ore is sent.

Sussex County.

Lehigh Zinc Company.—The new shaft near the Green Spot mine, at Franklin Furnace, is now down over 500 ft., and some trouble has been had from water.

NEW YORK.

Clinton County.

Chateaugay Iron and Ore Company.—This company's mines, at Lyon Mountain, are closed for the present.

Essex County.

Crown Point Iron Company.—This company has closed down its mines at Crown Point, for the present.

OHIO.

Knox County.

Chicago Brownstone Company.—This company, which has quarries in this county, has been placed in the hands of a receiver. The claims are said to amount to $30,000.

OREGON.

Baker County.

Virtue Mine.—Some very rich ore has been taken from this mine, the quartz containing free gold.

First Creek.—Prospectors have found a quartz vein 4 ft. wide and promising very well. The ore is free milling.

PENNSYLVANIA.

Anthracite Coal.

The West Shenandoah colliery, which had been idle for the past six months undergoing general repairs, resumed operations August 1st, giving employment to 600 men and boys.

It is reported that arrangements are nearly perfected whereby shipments from the Cranberry mines, of Pardee & Co., will be diverted from the Lehigh Valley Railroad to the Delaware, Schuylkill & Susquehanna line. It will cause a loss of about 1,000 tons per day to the Lehigh Valley. There is said to be considerable dissatisfaction among the individual miners in the Hazelton District, because the combination allows them to work only four days in the week, while shippers by the Susquehanna & Schuylkill line are working full time.

The average of anthracite coal prices at Schuylkill-Haven in July was $2.47 as against $2.46 in June, $2.50 in July last year and $2.35 in July, 1891. Wages are all 1% below the $2.50 basis.

Dodson.—A cave-in aud explosion occurred at this colliery, situated near Plymouth, aud operated by Haddock & Co. Eight miners were slightly burned and injured. The mine is reported to have sustained damages to a considerable extent, but it will resume operations shortly.

Philadelphia & Reading Coal and Iron Company.—This company reports gross earnings for June of $4,166,559, an increase of $134,318, as compared with the same month last year, and deficit $127,128, an increase of $20,572. Both the Railroad and the Coal and Iron companies show for the month an increase in gross of $191,769, a decrease in net of $107,823, and a surplus after charges of $100,929, a decrease of $102,288. For the seven months ending June 30th, the Railroad company has earned over all charges $465,262, a decrease of $886,054, as compared with the previous year. Out of net earnings for the seven months $799,583 were paid for equipment. The Coal and Iron company for the seven months failed to earn charges by $735,334, an increased deficit of $266,202. Both companies failed to earn charges for the seven months by $270,071, a loss of $1,152,255. The Lehigh Valley Railroad reports gross earnings for June of $1,490,780, a decrease of $76,682, as compared with the same month of last year, and net $446,778, a decrease of $77,809.

SOUTH DAKOTA.

Lawrence County.

Carbonate District.—The principal silver district of the Black Hills is, like nearly all other silver mining sections, nearly deserted. A few prospectors, however, continue their labors and some have been successful in the discovery of gold-bearing silicious ores of good grade. Their size and extent must be shown by future development work.

Golden Reward Mining Company.—At the annual meeting of the Golden Reward Mining Company the following board of directors for the ensuing year were elected: Harris Franklin, S. W. Allerton, J. C. Spencer, S. V. Noble, Ben. Baer, W. C. Fawcett, C. W. Carpenter.

At the reduction works the last two weeks' run produced 1,600 oz. refined gold. This is equivalent to $32,000 or $64,000 for a month.

Gregory Mining Company.—There is a possibility of this property being again in operation. It is the mine formerly known as the Montana. Since work was stopped on the property a few years ago, the owners have merely done the necessary annual assessment work, during the progress of which some discoveries have been made which, through development work, might become valuable. The style of mill, however, says the "Black Hills Times," now upon the prospect, is not adapted for the treatment of the ore, the latter, what there is of it, being free milling, and requiring the ordinary stamp mill for its reduction.

Hardscrabble.—The owners of this mine have begun shipping ore to the Union Ore Sampling Works, at Denver. They hope to be able to ship about two cars a week.

National Gold and Silver Mining Company.—The 50-ft. shaft on this property, situated in Ruby Basin, has been finished by the contractors. It is a double compartment with square sets. During the progress of the work a 2½-ft. vein of ore was cut through, supposed to be a stringer from the main body which, from developments on adjoining properties, is known to exist at a lower depth. The bottom of the shaft is now in a highly mineralized porphyry. At the 100-ft. level it is the intention of the company to run drifts to the shale and porphyry contact, where it is expected the pay-ore will be struck. The last assessment was levied on May 24th last.

Pennington County.

Minnesota Mining Company.—This mine is now being examined by E. H. Johnson, A. M. Kimball and other directors, with a view to enlarging operations. At present there is only a Huntington mill employed.

TENNESSEE.

Bradley County.

Blue Springs Mining Company.—This company, says the "Tradesman," has struck auother vein of lead ore on its property at Blue Springs. This company owns 320 acres of mineral land in the neighborhood named, and is turniug out a ton of lead daily. The ore is easily worked. Up to the present time 150,000 lbs. of the metal have been sold in Chattanooga. The company intends to increase its product to two tons per day, which will necessitate the smelting of 50 tons of ore.

McMinu County.

The Thomas ore banks, near Athens, are now being opened, and as soon as the spur from the Nashville, Tellico & Charleston Railroad to the ore fields is completed, which will be done shortly, a large force of hands will be put to work, and as fast as the ore is mined it will be placed on the market. The output for some time will be shipped to the furnaces at Chattanooga.

UTAH.

Salt Lake County.

Well Annie Mining Company.—At a meeting of the stockholders, in Salt Lake City, July 28th, the following directors were elected: H. B. Clawson, Jr., James P. Freeze, George Romney, Jr., Walter P. Jennings and D. W. James. Provisions for the disposition of treasury stock were made.

VERMONT.

Washington County.

Vermont Granite Company.—This company is filling some contracts for large stone.

Wetmore & Morse Granite Company.—This company has made a new openiug in its quarry, at Barre, and has found a fine vein of dark granite near the surface.

WASHINGTON.

Stevens County.

Kootenai Hydraulic Placer Mining Company.—This company has begun washing gold from the Waneta gravel bars. The company is said to have expended a large sum in preparation.

WEST VIRGINIA.

McDowell County.

Work with the diamond drill, at Welch, where tests of large bodies of coal land are being made, has been suspended while new machinery is put in the place of some which was broken down. Already the drill has passed through four seams of workable coal, the thickest being 9 ft., this seam being so located that it can be worked from the water levels. The tract being tested includes 70,000 acres.

Peerless Coal and Coke Company.—This company has 40 new coke ovens well under way, and has the foundations laid for as many more.

Shawnee Coal and Coke Company.—This company is shipping coal to the West, and has commenced the construction of a double block of coke ovens, numbering 120.

WISCONSIN.

Green Lake County.

Berlin & Montello Granite Company.—This company has reduced the force at its quarry, at Berlin, but has still 100 men at work.

Jackson County.

A company has been formed, according to "Stone," to take out a peculiar white building stone from what is known as Silver Bluff, near Black River Falls. The bluff was the scene of very extensive mining operations by the race that probably inhabited this couutry before the Mound Builders. Of this there can be little doubt because of the hardened copper implements found in the old shafts and caves, and what is supposed to be mining tools. The work was doubtless done by the same race that worked the copper mines of the lake regions, and who built the stone ruins found in various places in this country. There are a large number of caves where the early miners lived, but no one has explored them because so filled with earth.

WYOMING.

Anglo-American Oil Company.—According to the Casper "Derrick," Mr. T. S. Mehaffey, who was employed by this company when the well started by them was down 700 ft., coutinued the same with great success. At a depth of 876 ft. a stratum of coarse sand was struck which proved to be 129 ft. in thickness. When 8 ft. in this sand a streak of oil with a slight gas pressure was found, and at 28 ft. in the sand another oil and gas-producing level, longer than the first, was tapped. From that point down to a depth of 1,005 ft., where the bottom of the sand was reached, it gradually became coarser and the oil heavier. It is claimed also that the oil is a fine lubricant, but this had not been decided.

Fremont County.

It is reported that a large deposit of auriferous cement has been discovered near Lander, and that a number of business men of that place have formed a syndicate to do prospecting work. It is said to run $6 per ton, free milling.

The ores lately discovered in the old camp, at South Pass, are being tested for a proper method of treatment. They are to a greater or lesser extent free milling; a certain part is refractory.

FOREIGN MINING NEWS.

CHINA.

Muho Gold Mines.—The latest report (1891) of the little known Muho gold mines, in the Chinese portion of the Amur regions, has recently been issued by the manager, Yuan Ta-hua, an official deputed for the purpose by the Tientsin Viceroy. This report is the third that has been issued since the formation of the company, under the auspices of Li Hung-chang, to work the mines in question, about six years ago. From the report it would seem that the mines are both alluvial and rock, gold from the last named being obtained by means of machinery procured from the United States, transported at infinite cost and difficulty overland by way of Shinking. The total output for the year under review, 1891, was 20,595 taels weight of gold; but owing to the gold obtained from the Ch'ien mine being a poorer quality and color, only the sum of Tls. 281,660 was realized at the sales. Added to this amount is the sum of Tls. 62,160 realized from the sale of subsidiary ore and other minerals, and we have a total net receipt of Tls. 343,820 for 1891. After deducting 60% of the gold sales, contract pay to the miners, and dividends on shares, as well as the expenses of the military force at the mines, there is still a balance of Tls. 80,190.

Reports made by independent observers who visited these mines three years ago, says the "North China Herald," indicate that they are the richest mines that China, so far, is known to possess. These regions were peopled and colonized by a band of escaped Russian convicts and desperate characters, who, under laws of their own, flourished well and took out of the country immense quantities of gold, but eventually were driven out by Chinese troops sent for the purpose. The mines are seemingly exhaustless, notwithstanding the first picks made by the Russians, over 250,000 taels weight of gold having been extracted within the last four years, and still there are rich places not yet explored.

MEXICO.

The importation of silver ore into the United States from Mexico continues very heavy, despite the financial depression. Statistics just prepared show that in the fiscal year from July 1, 1892, to July 1, 1893, there was imported through the port of Laredo 38,924,219 lbs. of silver ore, which came from the following districts: Districts tributary to the City of Mexico, 1,894,706 lbs; from the district tributary to Saltillo and Catorce, 32,255,928 lbs.; from the district tributary to Guanajuato, 1,209,589 lbs.; from the district tributary to San Luis Potosi, 3,370,000 lbs.

NOVA SCOTIA.

The Provincial Manganese Mining Company.—This company has been organized at Windsor, N. S. Its officers and directors are: D. C. Fraser, M. P., president; Geo. E. Boak, vice-president; W. F. Jennison, manager; J. T. Burgess, secretary and treasurer; and Lewis W. DesBarres. The property contains 300 acres in the heart of the manganese belt near Walton, and the ore is said to be of the best. Several shafts are being put down; ore is now being taken out, and in a short time regular shipments will be made. A large force of men will be employed and mining will be done on a more extensive and systematic scale than ever before. The capital is $75,000, in shares of $2 each. The headquarters are at Halifax.

SPAIN.

The inquiry for iron mines well situated as regards the export of ores to England continues. During the six months ending June 30th Spain exported 1,950,891 tons of iron ore to Great Britain, as compared with 1,633,546 tons in the corresponding period of last year.

(From our Special Correspondent.)

The long threatened collapse of silver has at last come, the result being most disastrous to miners and smelters in Cartagena, Magarron, Almagrera and other argentiferous districts. The latest liquidation for silver at Cartagena was 4 pesetas per ounce.

SOUTH AFRICA.

Transvaal.

Witwatersrand.—The diamond drill borings which were started last October to determine the existence of gold at great depths have just reached the main vein at a depth of over 2,300 ft., and assays of cores brought up from that depth show an average of 23.5 dwts. gold to the ton. The report of the engineer in charge, Mr. A. Adair, says: The deep prospecting bore on Tracey & Beatty's claims on Elandsfontein, which is 4,000 ft. distant from the outcrop of the Main Reef, has just passed through the south beds of the Main Reef series, at the depth of a little over 2,300 ft., thus confirming the general opinion put forward by Mr. Hamilton Smith, that the Main Reef beds are persistent to a great depth. The claims on which the bore is situated lie south of that section on the Main Reef taken up by the Stanhope Company, Geldenhuis Main Reef, Simmer & Jack, and Primrose companies, where the dip of the strata is very considerably less than the general inclination of the Main Reef outcrop. It might have been expected that the Main Reef series would have been struck in the bore at a much shallower depth than elsewhere in the same line, but owing to the shallow depth of the outcrop it is pretty certain there has been a local vertical tilt of the strata on the above section of the Main Reef which has flattened the surface outcrop, without disturbing the ground to the south. Consequently the Main Reef series had to be sought for in a position agreeing with the general dip of Mr. Ras' strata. Generally speaking, the inclination of the strata on the Witwatersrand Range gradually decreases from the Main Reef, proceeding southward, or, to put it approximately in figures, the outcrop of the Main Reef series is 45° to 85°, the outcrop of the Bird Reef series 40° to 45°, the outcrop of the Kimberley series 30° to 35°, and the outcrop of the Ras series 20° to 25°. Taking a section of the strata, south from the Simmer & Jack through the bore, the outcrop dips are: Main Reef series 26°, Bird Reef series 42°, Kimberley Reef series 32°, Ras Reef series 30°. The dip of the Main Reef series here alone differs sensibly from the general rule, and it may be fairly attributed to a local flattening of the outcrop which extends but a short distance south. According to calculations based on the surface distances between the outcrops on neighboring ground east and west of the local disturbance referred to, and commencing from the line of the bore, the Bird Reef should have been struck at a vertical depth of 280 ft.; the Livingston Reef at 1,580 ft., and the Main Reef series at 2,300 ft. These distances agree very well with those actually ascertained. The journal of the bore shows the Bird Reef at 300 ft., the Livingstone beds at 1,585 ft., and the south leader of the Main Reef series at 2,343 ft., the present depth of the hole. The boring is now attended with very considerable risk, as the machine is not guaranteed by the makers to go below 1,700 ft.

Witwatersrand Gold Mining Company.—At a meeting held in London, July 20th, after a long discussion, in which the directors' action was sharply criticised, the stockholders voted that a committee of five shareholders be appointed to inquire into the proposed sale by the board of 60 claims to Messrs. Barnato Brothers & Co. for £60,000, and to take such steps as they think advisable in the interests of the shareholders.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 154, 155 and 156.]

NEW YORK, Friday Evening, Aug. 4.

The mining stock market has reached a degree of dullness unparalleled in its history. It was doomed years ago, and the financial difficulties which the country at large is undergoing have only hastened an end which was inevitable. During the past week the total sales amounted to only 800 shares. This is the smallest volume of business during any one week that is recorded on the official lists of the Consolidated Stock and Petroleum Exchange. The only stocks traded in were Leadville Consolidated, of which 500 shares at 10@12c. were sold; 100 shares of Consolidated California & Virginia at $1.10 and 200 Lacrosse at 4c. It will be seen that the stagnation in mining stock circles which we have been reporting for some months past has grown worse than ever. Unless the public takes some interest in mining stocks we fear the New York market for such securities will become a thing of the past.

Boston. Aug. 3.

(From our Special Correspondent.)

The market for copper stocks during the past week has shown a little firmer feeling, and the tendency is to higher prices. There has been a good steady demand for the dividend-paying stocks, and about 300 shares of Calumet & Hecla has been marketed at $250, only a few small lots selling below this price.

Tamarack has also been more inquired for, and shows an advance from $112 (the lowest last week to $121.

Quincy advanced from $80 to $94, reacting only to $92.

Osceola was a little heavy early in the week, and sold at $20. There was a better demand for it later, and it advanced to $22.

The Montana stocks were in better demand, Boston & Montana advancing from $16 to $19 per share and Butte & Boston from $5 to $5¼. It is reported that $2 was bid for the 1894 dividends of the Boston & Montana company. The company is now in good condition financially and producing copper at paying figures.

Centennial sold quite freely at $2, one lot bringing $2¼. There is considerable dissatisfaction expressed by some of the stockholders at the closing of the mine, many believing that the management should have continued the explorations and assessed the stock if need be to furnish means.

Atlantic sold at $7⅛, a decline of ⅛, Franklin in a small way at $9@$9⅛, and Kearsarge at $6@$5¼.

Wolverine advanced from 75c., at which price it sold on the 17th ult., to $1⅛, and declined to $1¼.

San Francisco. July 29.

(From our Special Correspondent.)

The closing down of many of the silver properties and the consequent stagnation of the mining stock market have had at least one good effect. Attention is being given to the development of the gold mines in California particularly, and along the Pacific Coast. From June 22d to date, a total of $1,900,000 has been paid into banks here, representing deposits of fine gold made at the mint.

The San Francisco Stock Exchange proposes to try and have some of the dividend paying gold properties listed in the Board. In 1892 the Pacific Exchange made an effort in the same direction, but with little success. The Mayflower was listed in the latter Board, however, and from December of that year to date, a period of seven months, dividends have been paid amounting to 85 cents per share. There is now a large balance in the company's treasury and bullion shipments are being regularly made.

If gold mining properties were listed, the business of the stock market would undoubtedly revive, but the methods of both exchanges have not been such as to encourage the listing of properties that are doing well, paying regular dividends and need no assistance from the Pine Street clique to make the venture a success.

The market during the current week has been absolutely stagnant. When the Miners' Union at Virginia City decide whether they will accept the 25% cut in wages, some relief may be afforded; that is, if the union's answer to the demand be in the affirmative. With a reduction along the entire line of the mining industry on the Comstock, work can be carried on, but it is stated openly that if the miners do not fall into line, some, at least, of the mines will be closed down.

To-day Consolidated California & Virginia stock sold at the opening for $1.10, closing at 5c. off. Ophir sold for 65c., Mexican for 35c., and Union Consolidated for 35c.

In the middle group of Comstocks Best & Belcher sold for 55c.; Challar for 25c.; Gould & Curry for 30c.; Hale & Norcross for 45c.; Potosi for 35c., and Savage for 35c.

Of the south end Comstocks and Gold Hill stocks Belcher was the most active, selling for 30 c.; Bullion for 15c.; Challenge for 5c.; Confidence for 45c.; Overman for 10c.; Justice for 7c., and Yellow Jacket for 40c.

No outside stocks were dealt in at all during the week. The market closed to-day dull and heavy.

London. July 27.

(From our Special Correspondent.)

Last week I mentioned that the prevailing feeling in the stock market here was one of anxiety with regard to the next settlement commencing July 26th and ending July 28th. This feeling of anxiety has not been since relieved and it still continues.

As it is, one important house and several minor houses have been declared defaulters. The consequence is that transactions are at a standstill, and that all new ventures are lying dormant. The outlook is decidedly black, and the truth is that we are only as yet on the threshold of calamities.

There are no favorable changes in the prices of American mining stocks to report. The stocks dependent on silver have declined fractionally with the recurrence of the fall in silver from 31 to 32, for example Elkhorns, De Lamars, Jay Hawks, Maid of Erin, Montana, American Belle, Yankee Girl, Palmarejo. There is absoluteiy no inquiry for low priced speculative shares such as Holcomb, and the price of all such are declining to the minimum limit.

Last week I mentioned that the directors of the Yankee Girl silver mines were recommending a reconstruction of their company. The proposition was brought before the shareholders, at a meeting held July 25th, and unanimously adopted. The scheme is to give one share of £1 17s. paid, in exchange for a fully-paid £1 share in the old company; thus there will be 3s. remaining to be paid on each £1 share.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 4, 1893.

Prices of Silver per Ounce Troy.

July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.	Aug.	St. Ex.	London Pence	N. Y. Cts.	Value of sil. in $1.
29	4·82¼	32⅛	69¾	0·539	2	4·82¼	32¾	70⅜	0·544
31	4·81¾	32⅛	69¾	0 539	3	4·83¼	33	71	0·549
1	4·82	32 1/16	70¼	0·543	4	4·83¼	33¼	71¾	0·555

London has been very steady, with rising tendency, owing to scarcer supplies. Market closes firm at the advance.

The amount of silver offering is very small, the smelting companies having placed ahead their output in the London market.

The United States Assay Office at New York reports the total receipts of silver for the week to be 133,000 oz.

During the five days ending August 4th the exports of gold and silver, as far as ascertained, have been as follows: Exports—gold, none; silver, $545,838.

Coinage at the Mints of the United States.

The following statement shows the coinage executed at the mints of the United States during the month of July, 1893:

Denomination.	Pieces.	Value.
Double eagles	500	$10,000.00
Eagles	22,000	220,000.00
Half-eagles	3,000	15,000 00
Quarter-eagles	30,0 0	75,000 00
Total gold	55,500	$320,000 00
Quarter-dollars	132,000	33,000.00
Total silver	132,000	$33,000.00
Five cents	478,003	$23,900.00
One cent	1.500,000	15,000.00
Total minor	1,978,000	$38,900.00
Total coinage	2,165,500	$391,900.00

NOTES OF THE WEEK.

We have the pleasure of noting and acknowledging an article approving the "Journal's" plan for an International Monetary Clearing House in the columns of our influential contemporary, the New York "World," whose advocacy of a financial plan carries weight.

For the 10 days ending July 31st the payments of duties at the New York Custom House were made as follows: In gold coin, 12·5%; gold certificates, 4·6%; silver certificates, 12·3%; United States notes 55·6%; Treasury notes, 15%. The total proportion in gold was 17·1%, showing a large increase over the the earlier days of the month, when the proportion in gold was only 10%.

It is stated that several of the large New York banks, which have for years had only a nominal amount of circulation, now propose to deposit bonds and take out as large an amount as they can under the law. Some of them have been able to secure a large amount of government bonds—chiefly from the savings banks, which have been providing themselves with currency—and believe that under present circumstances they can use these to advantage as basis for circulation.

The week in the stock market has been one of sharp fluctuations, but on the whole an upward tendency is noted except for some of the industrials. To-day money is reported somewhat easier than at any time through the week.

On August 2d the gold reserve in the Treasury once more passed above the $100,000,000 limit, below which it passed April 20th. On August 2d the gold in the Treasury, exclusive of that held as a basis for gold certificates, amounted to $100,791,370. This gold has come into the United States from Europe, Mexico and the West Indies, much of it being the gold sent out from the United States during the late spring and early summer months. Information received here in Treasury circles indicates that $10,000,000 in gold is now on its way from Europe to the United States and most of this, it is expected, will find its way as usual to the Treasury.

The Treasury Department's monthly circulation statement shows an unusually large net increase in the circulation during last month, amounting in the aggregate to more than $17,000,000. There was during July a decrease of $5,358,990 in gold certificate circulation, $4,080,000 in currency certificates, $1,393,139 in subsidary silver and $805,754 in standard silver dollars. On the other hand gold coin circulation increased $13,276,241; National Bank notes, $5,403.858; silver certificates, $3,699,225; United States notes, $3,518,721, and silver Treasury notes, $3,112,144.

The total circulation of the country on August 1st is placed at $1,611,099,017, a per capita of $24.02 or $10.149,692 more than on August 1st a year ago. The changes in the circulation of the various kinds of money, together with the amounts in circulation on July 1st and August 1st, are shown by the following table:

	July 1st, 1893.	August 1st, 1893.
Gold coin	$107,633,700	$116,900,941
Standard silver dollars	57,029,743	56,223,989
Subsidiary silver	65,400,268	64,007,129
Gold certificates	92,970,019	87,611,020
Silver certificates	326,459,165	330,186,399
Silver Treasury notes	140,661,094	143,774,138
United States notes	320,875,683	324,394,404
Currency certificates	11,935,000	7,855,000
National bank notes	174,731,139	180,131,997
Totals	$1,593,726,411	$1,611,099,017

The Treasury store of gold bullion on August 1st was $83,450,336; of silver bullion, $119,277,735, and of standard silver dollars, $363,108,461. The general stock of money coined or issued and in the Treasury on August 1st is shown by the following table:

	Coined and issued.	In Treasury.
Gold coin	$520,273,567	$103,333,626
Standard silver dollars	419,332,450	363,108,461
Subsidiary silver	76,563,878	12,556,749
Gold certificates	87,704,739	93,710
Silver certificates	333,031,504	2,843,114
Silver Treasury notes	148,786,348	4,512,210
United States notes	346,681,016	22,286,612
Currency certificates	8,340,000	485,000
National bank notes	183,755,147	3,620,150
Totals	$2,123,968,649	$512,869,632

The general feeling of distrust has been shown by the fact that many of the depositors in the savings banks in New York and elsewhere desire to withdraw their deposits. Anything like a run was checked in New York by the action of the banks in requiring the legal 60 days' notice on all considerable amounts asked for. On Monday and Tuesday there was some excitement, but later in the week this had subsided.

Several causes, among which may be counted the desire of the saving banks to put themselves in readiness to meet demands, the calls from the country banks and the general hoarding which is inevitable in times of distrust, have produced an unusual scarcity of currency, especially of small bills and on Thursday and Friday premiums varying from $1 to $7.50 per $1,000 were offered for currency in large amounts. In some cases difficulty in securing small bills for pay rolls and the like were reported. This currency scarcity exists with a somewhat easier general money market.

The New York Clearing-House issued August 2d $2,800,000 more loan certificates. The total amount now outstanding is therefore $33,050,000. None were issued by the Boston Clearing-House, which now has outstanding $10,090,000. This is about the same relative proportion, as the Boston banks now hold $120,000,000 deposits, against $382,000,000 in New York.

In spite of a sharp advance in sterling exchange, the Bank of England continues to sell American gold coin. August 2d $2,435,000 more was taken for export to New York. This may be the last withdrawal for the present; but the advance in the bank's minimum discount rate on the same day was less than had been anticipated, and the simultaneous rise in Paris exchange on London opens the possibility of a drain for our benefit on the gold fund of the Bank of France. It is not to be supposed that such a movement will necessarily be immediate and heavy. London's gold shipments of the present week are largely anticipative, based as they are to a considerable extent on sales of exchange against grain purchases for future months. The French importers may not choose thus to anticipate their bargains, but it is certain nevertheless that sooner or later an exceptional inquiry for our fodder crops will come, and this less from England than from the European continent. The Bank of France has $16,000,000 more gold than it held a year ago, and $69,000,000 more than it held in 1891. It is therefore in that quarter that the real supply for our future accommodation rests.

The silver convention in Chicago met August 1st, with 810 delegates present. Mr. Allen W. Thurman, of Ohio, presided. The convention was in session two days, and was devoted largely to speech-making, the principal addresses being made by Mr. Thurman, Mr. A. J. Warner, of Ohio, Mr. Donnelly, of Minnesota, Senator Hill and Governor Waite, of Colorado, the latter repeating his "blood and liberty" speech, which caused so much excitement in Denver. The convention was for silver only, and an attempt of some survivors of the old greenback party to take a prominent place and advocate paper was suppressed.

The resolutions adopted include a very long preamble setting forth the injury done by the demonetization of silver and repeating the charges that it was secured by bribery, and call for the repeal of all legislation against the full use of silver; free coinage of silver at the ratio of 16 to 1 of gold; the maintenance of the silver purchase clause of the Sherman law; the purchase of the full amount of silver required by that law; ending with the charge that the present disturbed situation is chiefly due to the banks, their action against silver, and their attempts to influence legislation.

Many of the delegates to the convention have gone to Washington with the intention of exercising all the influence possible on members of Congress.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	$.59	$.60
Peruvian solcs and Chilian pesos	.52½	.54
Victoria sovereigns	4.87	4.88
Twenty francs	3.86	3.89
Twenty marks	4.74	4.78
Spanish 25 pesetas	4.75	4.80

The general depression in trade is continuing, and is becoming worse almost from day to day. After another tremendous decline in prices on Monday last, the Stock Exchange was rather better on Wednesday, but the advance was partially lost later on. From all over the country come discouraging reports: a great many mills have had to close down, several have gone into receivers' hands, others have no orders, and a great many more cannot procure the necessary working capital. It is natural that under the circumstances, the market for all metals is weak and prices somewhat lower.

Copper.—Hardly any business has been done, as the demand is very slack indeed, but it is understood that ssveral hundred thousand pounds of lake copper have been sold below 10c. At this price there are sellers all over, but no buyers. Electrolytic copper is held for 9⅝c., and casting copper for 9½c., but these prices are more or less to be considered nominal; the export of all descriptions of copper continues on quiet an unprecedented scale, and Europe has, so far, bought quite heavy quantities on every decline. G. M. B. copper, which ruled steadily until the end of last week, is now also quoted lower, spot being quoted at £41 15s., and three months at £42 5s. For refined and manufactured we quote as follows: English tough, £46@£46 10s.; best selected, £47@£48; strong sheets, £53@£53 10s.; India sheets, £52@£52 10s.; yellow metal sheets, 4¾d.

It is reported that lake copper is being offered and sold abroad at £47. According to our cable, the statistics for the second half of July have increased 800 tons, and considering the very heavy quantities shipped from this side during the last few weeks, this must be considered a very good showing.

The exports of copper from the port of New York during the past week were as follows:

Copper:				
Rotterdam—Amsterdam	693 pigs	207,036 lbs.		$20,670
" "	642 bars	88,081	"	10,000
" "	54 casks	67,500	"	7,000
" "	1 case	202	"	20
" Sparndam	88 casks	110,200	"	12,500
" "	345 pigs	40,038	"	4,000
" "	1,473 plates	187,792	"	18,365
" Didam	385 plates	44,809	"	4,463
Hamburg—Wieland	90 bbls.	112,500	"	12,375
" Suevia	254 casks	140,079	"	15,500
" "	23 pigs	4,520	"	450
" Amalfe	20 casks	25,600	"	3,816
" "	151 casks	25,031	"	2,753
Liverpool—Bovic	90 casks	112,500	"	12,000
" Britannic	180 casks	224,750	"	22,800
" "	777 pigs	172,781	"	17,000
" Runic	45 casks	56,000	"	5,530
Hull—Martello	80 casks	100,000	"	11,000
Swansea—Monomoy	785 bars	224,056	"	20,725
Havre—Red Sea	270 casks	321,570	"	36,950
" La Britagne	69 casks	86,000	"	9,750
" "	508 plates	56,021	"	5,750
Genoa—San Giorgio	180 bbls.	225,000	"	24,750
Copper matte:				
Swansea—Wells City	169 casks	228,721	"	10,000
Liverpool—Bovic	2,476 bags	294,945	"	13,000

Tin is perhaps the only metal for which there is a ready sale, and although the demand is not quite up to the average, it cannot, under the present circumstances, be considered bad. The ruling price has been about 19c. for spot, but in the middle of the week a few distressed lots were sold at considerably lower prices; but this cannot be considered as any guidance. Most of the tin is held in very strong hands, who are waiting for better times. We quote spot, 19@19¼c.; September, 19¼@19⅜c., and October, 19¾c.

From London it is reported that the statistics have decreased for the second half of July 800 tons, and prices are ruling at £81 5s.@£81 10s. for spot, and £81@£81 5s. for three months prompt. The consumption in Europe is said to be quite up to the average.

Lead.—The market is rather irregular. There is not much metal offered, and carload lots are not obtainable below 3⅜ to 3·40, but for larger quantities somewhat lower prices have been accepted. The transactions have been rather small.

The foreign market continues steady, with Spanish lead at £10 2s. 6d. and English lead at £10 5s. A material falling off in the shipments from Australia is reported.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Lead weak and lower; last sales are at 3c. per pound, and at the close to-day there are more sellers than buyers at this price.

Spelter.—The strike appears to be dying out, but as far as we can make out the production has not been increased, and this is on account of the impossibility to sell the refined metal. Most galvanizers in the Pittsburg and Cleveland districts have closed down, and the demand is very light indeed. Prices are entirely nominal, and must be quoted 3·90 to 3·95 New York. In London the quotations are unaltered at £17 10 for ordinaries, and £17 12s. 6d. for special brands.

Antimony is dull, without any noticeable change.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 4, 1893.

Pig Iron Production.

Fuel used.	Week ending Aug. 4, 1892.		Week ending Aug. 4, 1893.		From Jan., '92.	From Jan., '93.
Anthracite	74	32,000	64	28,860	1,091,699	1,039,534
Coke	140	127,700	125	121,330	4,193,069	4,077,044
Charcoal	42	10,700	36	7,845	303,415	274,465
Totals	256	169,700	225	158,025	5,588,183	5,391,043

Pig Iron.—August opens with the dullness in the pig iron market greater than ever. Consumers generally are buying only enough iron to supply their most pressing needs, and in many cases they have asked for a postponement in the deliveries of iron contracted for months ago. The financial troubles are as yet unrelieved, and the uncertainty which prevails at large has not been dispelled. In the mean time the pig iron market grows duller; a marked curtailment in the production of both iron ore and pig iron is taking place. It is difficult to say how soon this market will resume its normal level; probably not before commercial and financial conditions throughout the entire country are changed for the better.

Pig iron quotations at New York may be put ahout as follows for Northern hrands: No. 1, $14.50@$15; No. 2, $13.75@$14.50; gray forge, $12.25@$12.50. For Southern iron we quote: No. 1. $13.75@$14.75; No. 2 F., $12.75@$13.50; No. 1 soft F., $12.25@$14; gray forge, $11.75@$12.50—all at tidewater. Scotch irons are quoted: Coltness, $21.50@$22; Eglinton, $19.50@$20; Summerlee, $20.

Billets and Rods.—There is no demand of consequence. We quote: Steel billets, tidewater, $23.50@$24.50; foreign, $28.50@$29; wire rods, $31.50@$32; foreign, $40@$40.50; Swedish, $52@$53.

Manufactured Iron and Steel.—What business has been done in manufactured iron and steel this week has heen in small sized orders. Not a single sale of consequence is reported. We quote: Angles, 1·75@2c.; axles, scrap, 1·80@2·10c., delivered; steel, 1·75@2c.; hars, common, 1·45@1·60c.; refined, 1·65@1·9c. on dock; beams, up to 15 in., 1·80@2c.; 20 in., 2·10@2·30c.; car truck channels, 2@2·10c.; channels, 1·90@2c. on dock; steel hoops, 1·8@1·9c., delivered; links and pins, 1·85@2·10c.; plates, flange, 2@2·10c.; firehox, 2·5@2·8c.; flange, 2·10@2·25c.; marine, 2·50@2·75c.; sheared, 1·85@2·10c.; shell, 1·95@2·10c.; tank, 1·75@1·90c.; universal mill, 1·75@1·90c.; tees, 1·95@$2·15c., all on dock.

Merchant Steel.—The market continues dull. Quotations are: Tool steel, 6·50@6·75c. and upward; tire steel, 2@2·10c.; toe calk, 2·20@2·30c.; Bessemer machinery, 2·10@2·20c.; Bessemer bars, 1·80@2c.; open hearth machinery, 2·20c.; open hearth carriage spring, 2·10@2·20c.; crucible spring, 3·75@4c.

Old Material.—There is nothing doing in this market. Quotations are nominally as follows: Old iron rails $15.50@$16; steel rails, $11.50@$13; car wheels, $11.50@$13.50.

Rail Fastenings.—The market for rail fastenings continues lifeless. Quotations remain: Fish and angle plates, 1·55@1·60c. at mill; spikes, 1·9@1·95c.; holts and square nuts, 2·45@2·50c.; hexagonal nuts, 2·55@2·60c., delivered.

Spiegeleisen and Ferromanganese.—This market continues dull. We hear of no new sales of any consequence. Quotations are nominally as follows: 10 to 12% Spiegel $22@$22.50, 20% $25@$25.50; Ferro, $56@$57.

Steel Rails.—There is no change to report in the rail market. It continues very dull. No sales are reported. Quotations are unchanged at $29 mill or tidewater. Girder rails, $31@$33.

Tubes and Pipe.—Business in tuhes and pipes continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 57½, 10 and 5%; hutt, galvanized, 50, 10 and 5%; lap, hlack, 67½, 10 and 5%; lap, galvanized, 57½, 10 and 5%.

Buffalo. Aug. 3.

(Special Report of Rogers, Brown & Co.)

There is no change in the conditions which have prevailed during the past few weeks. The movement of pig iron is at its minimum. Prices are steady, but transactions are all small, buyers taking only what is required for immediate consumption, and quite a large proportion of the foundries are shut down.

The prices quoted helow represent the nominal range of the market.

We quote for cash f. o. h. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, $14.50; No. 2 X foundry strong coke iron, Lake Superior ore, $13.25; Ohio strong softener No. 1, $14; Ohio strong softener No. 2, $13.25; Jackson County silvery No. 1, $17@$17.30; Jackson County silvery No. 2, $16.30@$16.80; Lake Superior charcoal, $16; Tennessee charcoal, $16; Southern soft No. 1, $13.65; Alahama car wheel, $18; Hanging Rock charcoal, $20.50.

Chicago. Aug. 3.

(From our Special Correspondent.)

The last week of July was probahly the culminating point in the iron trade, as it unquestionably was the dullest on record. Inquiry, demand, and sales were at the minimum, and the market is spiritless to the last degree, with little hope of an early return to its wonted activity. It is evident that many perfectly solvent concerns have been forced to the wall by the present stringency and lack of confidence which are everywhere prevalent. This has caused curtailment in production of raw material, iron ore, coal, etc., and that again by restricted output from blast furnace, foundry and mill. This week shows hut little easement of the extreme depression, but there is a more hopeful feeling that August will show improved conditions as to demand for iron, but at this writing there is no evidence of it.

Pig Iron.—The amount of business done during the past week was the lightest on record for many years, there being less doing than the preceding one. Local coke iron sells mostly in carloads up to 50 or 100 tons, and the conservatism shown by agents grows each day. There is now very little soliciting done; if a consumer wants iron he comes into the market and pays regular quotations. Southern coke iron is almost flat, hut inquiry, though very light, shows a hetterment this week. Some of the bids made hy consumers are so ahsurdly low as to excite ridicule, and agents are determined to ohtain a fairly reasonable price for their iron or keep it. Lake Superior charcoal iron is without change and very dull.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.00@$16.50: Lake Superior coke, No. 1, $13.50@$13.75; No. 2, $12.75@$13.25; No. 3, $12.25@$12.50; Lake Superior Bessemer, $14.00; Lake Superior Scotch, $14.50@$15; American Scotch, $15.50@$16.50; Southern coke, foundry, No. 1, $14.00; No. 2, $12.35; No. 3, $12.00; Southern coke soft, No. 1, $12.50; No. 2, $12.00; Ohio silveries, No. 1, $16.50; No. 2, $16.00; Ohio strong softeners. No. 1, $16.25; No. 2, $16.00; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $18.50@$19.

Structural Iron and Steel.—For bridge and huilding material there is a very moderate demand, which is mostly filled from warehouses, and there is no large business in sight. Quotations, car lots, f. o. h. Chicago, are as follows: Angles, $1.75@$1.85; tees, $1.95@$2.05; universal plates, $1.75@$1.85; sheared plates, 75c.@$1.85; heams and channels, $1.80@$1.90.

Plates.—An inquiry for 200 tons of pipe steel for California is the heaviest business reported. Warehouse trade continues quiet and orders are small. The outlook for an early revival in the hoiler and tank trade is disappointing. Steel sheets, 10 to 14, $2.25@$2.35; iron sheets, 10 to 14, $2.20@$2.30; tank steel, $1.90@$2; shell iron or steel, $2.50@$2.75; firebox steel, $4.25@$5.25; flange steel, $2.74@$3; hoiler rivets, $4@$4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—The implement trade continues to place orders for soft steels, and the movement and tonnage placed are fully up to the average, hut will not eclipse that of last year. Quotations are: Tool steel, $6.50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2.40. Bessemer machinery, $2.10@$2.20; Bessemer bars, $1.60@$1.70; open hearth machinery, $2.25@$2.30; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Agents report that sales from warehouse though small are steady, hut that mill orders are rare. Discounts are easy at 70, 10 and 5% off on Juniata and 70, 10 and 10% off on charcoal, and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—There is no improvement in the situation, and some mills, on account of the continued shut down, are out of the market. Prices are unchanged at 2·85c. for No. 27 common, and 2·90@2·95c. for steel. Jobhers quote 3c. for iron and 3·10@3·15c. for steel, same gauge.

Bar Iron.—With the exception of season's contracts from the implement makers, inquiry and demand for iron and steel bars are light. Many Western car shops are closed entirely, and some are working short time, and as railroads are retrenching in every possible manner, the outlook, from these consump ive sources, is poor. Mills in the neighhorhood are accepting orders at figures which Ohio mills refuse to meet. Regular quotations are 1·45c.@1·50c., base, 60 days, 2% for cash, to best huyers. Warehouse trade is more moderate at 1·65@1·75c. for iron and steel bars.

Nails.—Steel cut nails are in a little better inquiry from mill for August delivery for opening of fall trade, and price is easy at $1.20 hase. Jobbers quote $1.35 in less than carloads from stock. Wire nails, though still quiet, are in hetter demand locally and from nearby towns, and price is unchanged at $1.40. Jobhing quotation is $1.55 in small lots.

Steel Rails.—There is no noticeable change, hut while the situation is no worse there is little prospect of a speedy revival of husiness from railroads during the continuance of the retrenchment policy now in force on most of the Western trunk lines. Orders are for pressing needs at $30@$31. Demand for other track repair material is light.

Scrap.—Business is extremely dull and dealers are much discouraged. Prices are nominal only. Railroad, $13.50; No. 1 forge, $12; No. 1 mill, $9.00; fish plates, $14.50; cast horings, $5.00; wrought turnings, $7.50; axle turnings, $9.25; machinery castings, $10; stove plates, $7.50; mixed steel, $9; coil steel, $15; leaf steel, $15; tires, $14.50.

Old Material.—Actual demand none, inquiry slight and $15.50 would be nominal for iron rails. Old steel rails are very dull at $9.50@$13, according to condition and length. Car wheels nominal at $14.

Pittsburg. Aug. 3.

(From our Special Correspondent.)

Iron and steel trade continues in a dull and featureless condition, the prevailing tone in financial circles dominating all branches of the metal market. Sales are in small lots for immediate consumption, and in this respect the trade is no different from the conditions that have been prominent for months past. The tightness in the money market has, however, hrought an additional factor in the trade that has seriously handicaped hoth buyer and seller. Several receiverships of perfectly solvent concerns have heen forced hy the difficulty of ohtaining prompt payments of outstanding accounts and the practical impossibility of securing accommodations from the banks.

It is helieved that there is nothing worse in store than the conditions that now prevail. As previously remarked, no efforts are heing made to force business; all that any one cares to do is to meet such demand as there is, hoping that in the near future operations may be conducted on a larger scale, and with more confidence than is possible under the present circumstances.

It is fortunate that the ground floor of iron and steel prices has been reached by a slow process, otherwise there would be something more than a panic; as it is, every one realizes that whatever else may happen, iron and steel cannot yield to any appreciable extent. A little shading for spot cash may he made, and possihly a little on some kinds of finished material, but such a thing as a general slump is out of the question. The worst that can happen is a postponement of improvement, and that probably defines the situation to-day.

The situation in the manufactured iron trade remains unchanged; the demand is of small proportions and the competition for business keeps prices extremely low. Most of the mills are idle and will remain so for some time, at least until business presents a brighter appearance. Most of the works that signed the scale are idle from necessity, not choice; those who have not signed show no disposition to do so. That is the true situation at Pittsburg.

Coke Smelted Lake and Native Ores.

Tons.	Cash
500 Bessemer, City furnace, Aug.	13.20
500 Bessemer, City furnace, Aug., Sept.	13.20
500 Bessemer, Aug.	13.00
500 Grey Forge.	12.00
500 Grey Forge, spot	12.00
300 Grey Forge.	12.00
200 Off Bessemer.	12.75
200 No. 1 Foundry	14.00
200 No. 2 Foundry	13.00
100 White Iron, at furnace	11.50
100 No. 2 Foundry, at Valley furnace	12.00
25 No. 1 Foundry	14.00
25 No. 2 Foundry	13.00
25 Grey Forge	12.00
25 No. 1 Silvery	15.5.

Muck Bar.

150 Neutral	21.80

Steel Billets and Slabs.

Tons.	Cash.
500 B. & S., Aug., at works	21.00
480 B., prompt, at works	21.25
200 B., Aug., at works.	21.25
200 B., Aug., Sept., at works	21.00
200 B., Aug., Sept., at works	21.00

Charcoal.

100 Cold Blast.	26.00
50 No. 2 Foundry	18.50
25 No. 1 Foundry	19.00
25 No. 2 Foundry	18.50
25 Cold Blast.	26.50

Scrap Material.

700 Heavy melting stock, Aug., Sept., Oct., Nov., gross	12.80
100 Sh'red Wrought scrap, net	14.50
25 Hammered iron axles, net	22.50

NOTES.

At H. Douglass' Furnace Company, Sharpsville, Mercer County, Pa., the following sales of pig metal were made on July 26th, to Corrigan, Ives & Co., Cleveland, O., f. o. b. cars Sharpsville: 3,590 tons grey forge, $6.15, cash; 2,950 tons No. 1 foundry, $8.95, cash; 2,850 tons No. 2 foundry, $6.05, cash.

Ore has been carried from Northern ports to Cleveland for 45@55c. per ton. Vessel owners say there is no money in the husiness and several of them laid up in consequence.

Philadelphia. August 3.

(From our Special Correspondent.)

Pig Iron.—The condition of the Eastern Pennsylvania iron market has not improved in any respect; dullness prevails in every branch of the trade. Inquiry is very light; sales are of very small lots, for immediate use. No one feels like doing business under present circumstances. No concessions that can he offered are sufficient to induce consumers to place orders. Quotations to-day are $14.75 to $15.25 for standard hrands of foundry; $14.50 for No. 2, and from $12.50 to $13.25 for forge, according to quality. Bessemer is very quiet, and quoted nominally at $16, delivered.

Steel Billets.—Manufacturers of steel billets report a lifeless market; nothing is being done except in small lots, and the prices range from $23.25 to $24, delivered. Consumers ahsolutely refuse to place orders for large quantities at this time and it is questionable whether any offers that manufacturers would feel justified in making would lead to husiness now.

Muck Bars.—Very little business has been done in muck hars; asking prices are $22.50@$23; offers are made at less, but so far as known, have not heen taken.

Manufactured Iron.—Mill men report a very discouraging state of affairs; orders are for trifling lots only, and the aggregate of business is very light. There is no prospect of an early resumption of full time at the mills, and prices are very weak. Manufacturers are so anxious for enough work to run their mills that they are willing to hook orders at prices harely clearing cost limits. Car iron is said to have sold as low as 1·40 at interior mills; prices range from that up to 1·70 for hest puddled bars, from store.

Skelp.—There are no orders coming in, and even inquiry has fallen off. Prices are nominally 1·55 for grooved, and 1·65 for sheared.

Plate and Tank.—The mills have very little work, and manufacturers find little to encourage them in the outlook; no large orders are in sight, and in their anxiety to keep running, they accept what little husiness comes along, at ruinously low figures. Bridge plates are quoted at 1·75; tank plates, 1·75 for steel, and 1·80@1·85 for iron; shell, 2@2·15; firehox, 3@4c.

Structural Material.—The same discouraging state of things prevails in structural material, as in most other kinds; orders are for the smallest possible quantities; work in hand is dwindling to narrow limits; inquiry is light, and manufacturers are filled with anxiety as to the next few months. Prices are not quotably different, hut it is well known that a good order would he eagerly accepted on terms very favorable to the huyer. To-day's quotations are given nominally as follows: Universal plates, 1·75; heams, tees and channels, 1·80@1·90; angles, 1·75@1·80.

Sheet Iron.—The demand for sheet iron is a little more active than for other kinds, but the aggregate of business would be considered very light in ordinary times, and except for best qualities, prices are very weak. Quotations for best refined, Nos. 14 to 28, range from 2·75 to 3·50.

Steel Rails.—Railmakers are booking only very few and small orders for standard sections at $29. There has been some talk about large purchases being made now to take advantage of the low prices prevailing, but so far it has come to nothing. To effect such sales it is understood that considerable concessions would have to be made, and makers claim that these are out of the question. Light sections are quoted at from $33 to $35, with but little business.

Old Rails.—Business is of small proportions; quotations to-day are $16 to $16.50, delivered, for iron; $18 for old street rails; $13.50 to $14 for old steel rails.

Scrap.—Quotations are $13 to $13.50 for No. 1, $11 to $12 for machinery, and $20 for old fish plates. There is no business of moment.

Cartagena. July 20.

(Special report of Barrington & Holt.)

The market for Spanish iron ores shows a slight improvement since our last report, but unfavorable freights have put a check on any volume of business. Both buyers and sellers have been led astray in their calculations of freights, expecting same to drop considerably during this month, but they have continued as high as they were two months ago owing to the trade with the Black Sea and Baltic markets, which has been exceptionally active at this season compared with past years. The rates of freight paid during July from Cartagena were, to Stockton, 8s. 3d.; to Barrow, 8s. 6d. No ore has been shinped to United States during first half July.

Quotations for August are: Ordinary 50% ore, 0·05 phosphorus, 5s 5d @5s. 11d.; special low phosphorus, 50% iron, 0·3 phosphorus, 5s 11d.@6s. 5d; Campanil Sud, 48% iron, 0·01 phosphorus, 6s. 9d.@7s.; No. 1 manganiferous, 25% iron, 20% manganese, 0·03% phosphorus, 12s. 6d.; B manganiferous, 25% iron, 17% manganese, 9s.@9s. 6d.; No. 2 manganiferous, 30% iron, 15% manganese, 8s. 6d.; No. 3 manganiferous, 35% iron, 13% manganese, 8s. 6d.; low grade, 45% iron, 6% manganese, 6s.; manganese ore, 35% iron, 10d. per unit.

Iron pyrites. 40% iron and 46% sulphur, are quoted at 11s.; low grade, 48% iron, 5% sulphur and 7% silicon, 7s. 6d. Stocks ready for shipment are not large.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 4.

Statement of shipments of anthracite coal (approximated) for week ending July 29th, 1893, compared with the corresponding period last year:

	July 29, 1893. Tons.	July 30 1892. Tons.	Difference.
Wyoming region	437,758	491,917	Dec. 54 159
Lehigh region	135,533	145,669	Dec. 10,136
Schuylkill region	233,929	279,465	Dec. 45,536
Totals	807,220	917,051	Dec. 109,831
Total for year to date	24,206,116	23,028,311	Inc. 1,177,805

PRODUCTION OF BITUMINOUS COAL for week ending July 29th and year from January 1st:

Shipped East and North:	1893. Week.	1893. Year.	1892. Year.
Phila. & Erie R. R.	1,527	52,123	51,290
Cumberland, Md.	82,342	2,327,454	2,097,636
Berclay, Pa	781	34,761	113,917
Broad Top, Pa	10,5 9	386.157	331,561
Clea field, Pa.	59,697	2,394,377	2,290 055
Allegheny, Pa.	20.211	741.194	725.612
Beach Creek, Pa	28.731	92-,210	1,102.035
Pocahontas Flat Top	47,907	1,653.504	1,344,989
Kanawha, W. Va.	55,791	1,803,821	1,328,085
Total	307,586	10,321,014	9,725.290
Shipped West:	**1893. Week.**	**1893. Year.**	**1892 Year.**
Pittsburg, Pa.	21,696	746,384	745.651
Westmoreland, Pa.	35,895	1,165,287	956,181
Monongahela, Pa.	6,287	431,283	354,365
Totals	63,878	2,342,954	2 0 6,197
Grand totals	371,464	12,664,555	13,527.684

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending July 29th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 59.57? tons; year 2,996,983 tons; to corresponding date in 1892. 3,172,225 tons.

Anthracite.

Absolutely nothing worthy of comment has occurred in the anthracite market during the past week. It has been very dull and bids fair to continue so for some weeks to come. Altogether it is more than probable that August will be the dullest month of 1893. The more prominent companies seem to have at last realized the error of their ways insomuch as regards production. Their representatives declare unanimously that they see the folly of attempting to force any coal on the market, in view of the present financial troubles. The companies will therefore vigorously adhere to the policy of a restriction in the output which was determined on at the last agents' meeting

It is stated by the same persons that the circular prices are not being cut. If this is so, it is easy enough to account for it in the fact that practically no sales have been made this week. Buyers are unwilling to lay in supplies at this time, and many producers are equally disinclined to sell, owing to the financial stringency throughout the country. A hand-to-mouth business has been done of late. We hear from good authority that there is less coal in buyers' yards just now than at the same time last year, and that the stocks in the possession of the companies are probably not any heavier than for the corresponding period of 1892. Pea and buckwheat are exceedingly scarce all over, especially in the Eastern market, where, indeed, all sizes of anthracite coal seem to be in poor supply.

These facts make many of the producers sanguine of a good business next month, but it is well to take into consideration the scarcity of money. Although the consumption of anthracite for the first six months of 1893 exceeded that of the first half of 1892, it is doubtful whether such an increase will be maintained during the second half of this year. The fact that the country at large is undergoing a period of commercial depression must also be taken into consideration when prices come to be fixed. Otherwise there will be cutting, and a good deal of it, on the part of the independent operators and probably of some of the companies themselves.

The Reading official circular rates, subject to the usual commissions, are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash	$4.00	$4.25	$4.60	$4.60
Free white ash	3.90	4.15	4.60	4.60
Shamokin	....	4.50	4.80	4.60
Schuylkill red ash	....	4.50	4.95	4.75
Lykens Valley	5.00	5.80	6.20	4.45

Pea, $2.50@$2.75; No. 1 Buckwheat, $1.75@$2; No. 2 Buckwheat, $1.50.

The Reading Railroad system reports that its coal shipment (estimated) for last week, ending July 29th, was 435,000 tons, of which 48,000 tons were sent to Port Richmond and 44,000 tons to New York waters. Attention to the financial statement of the Reading Company for June, which appears in our mining news columns.

The Schuylkill Coal Exchange sends us its usual monthly circular statement as follows: The following colleries, all belonging to the Philadelphia & Reading Coal and Iron Company, drawn to return prices of coal sold in July, to determine the rate of wages to be paid, make the following returns: Turkey Run, $2.511; Girard, $2.37; Knickerbocker, $2 434; Alaska, $2.511; Richardson, $2.526; average, $2.47. The rate of wages to be paid for last two weeks' work in July and the first two weeks in August, 1893, is one per cent. below the $2,50 basis.

Bituminous.

The soft coal trade continues exceedingly quiet. The market has undergone no change from last week, unless it is that the dullness has grown still more. Most of the trade is still done at the lower ports, shipments from the New York shipping ports continuing dull. All rail business throughout the entire country is being reduced to some extent. The continued shutting down of the mills in various sections is being felt by the best of the producers as well as by the poorest. There have been some reports of cutting, which, however, have been exaggerated. It is true that some cutting of prices has been done, but certainly not to the extent that the various rumors now afloat would make it appear. The big cuts that we have heard of would, if true, necessitate a reduction of tariff by the railroads; the latter fact cannot be verified and is probably untrue.

If mills continue to shut down no recourse will be left to many of the mines but to follow their example. Even now the production is being restricted somewhat.

The blockade on the Pennsylvania Railroad mentioned in this column last week continues; indeed, it seems to be growing worse. It looks as if the soft coal trade were going to have a repetition of last fall's experience, when consignees were unable to get coal. The car supply, owing to the blockade, suffered some interuption on the Pennsylvania Railroad. The supply ou the line of the Baltimore & Ohio Railroad is up to the requirements that are made upon it.

The vessel market is in rather a disorganized condition. Vessels were taken during the week at Philadelphia for points on the other side of the Cape at 50c. We quote ocean freight rates from Philadelphia as follows: To Boston, Salem and Portland, 60c; to Portsmouth, 60c. to 65c. Sound ports, 55c. From Baltimore, Newport News and Norfolk, the rates are 5c. above Philadelphia. The prolonged dullness in both anthracite and bituminous has caused the present demoralization in the vessel market.

Chicago. Aug. 3.

(From our Special Correspondent.)

A strong effort is being made at the present time by two or three of the anthracite shippers' agents here to maintain July circular for rail and yard coal. It is too early to say how successful their efforts will be, but with the large amount of coal sold by certain agents to dealers in Chicago at May prices, and even better, to be taken as required by the said dealers, we are inclined to think they have an uphill task before them. Large orders and contracts have been taken by the few favored dealers within the past two weeks at less than May prices in the yard, or with cartage added, delivered. With the stringent money market trade has been and is dull, and the efforts of these dealers to place the coal they had bought, the charges and countercharges of bad faith in maintenance of prices, result in a badly demoralized condition of affairs in this market just now.

Lake trade is quiet, stocks on hand are large, as they should be in August, and some shippers have requested Buffalo people to hold up for awhile as they have no wish to overcrowd their docks and yards.

Circular prices are at the following rates: Lehigh lump, $6.25; large egg, $5.85; small egg, range and chestnut, $6.10. Retail prices per ton are: Large egg, $6.75; small egg, range and chestnut, $6.75.

Bituminous coal, more particularly domestic and harvest trade, is not only in good shape but in those two lines the condition is healthy. The hesitation, lack of confidence, and irregularity of prices, which are such prominent features in anthracite coal, are entirely lacking in the soft varieties. The advance in northern Illinois coal exemplifies this, as, notwithstanding the general depression in commercial circles, the market has been able to sustain the 10c. raise which went into effect August 1st. Wilmington lump is $1.60 and Streator $1 50 at mine, and shippers are complaining only so far as regards steam coal for industrial works, so many being shut down. Indiana block coal will be advanced in September, and shippers note a measurable increase in tonnage going to the Northwest.

There is at present only a light inquiry for Hocking in the line of new business, and agents are not pressing the market. At ports in the upper lake regions Hocking proceeds slowly, attributable solely to the monetary depression. The tonnage so far is much less than it was at the corresponding period last year.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.35; Hocking Valley $3.10; Youghiogheny, $3 25; Illinois block, $2.60; Brazil block, $2.50.

Connellsville coke operators have, on account of the depressed condition of trade, reduced their price on all grades 30c. a ton. Foundry is now quoted $4.75 for Frick's, but Rainey offers same grade at $4.65, and it is said that largest shippers are shading these figures.

Quotations are: $4.35 furnace; $4.65@$4.75 foundry, crushed; $5.10 Connellsville; West Virginia: $3.90 furnace, $4.10 foundry; New River Foundry, $4.50; Walston: $4.50 furnace, $4.60 foundry.

Pittsburg. Aug. 3.

(From our Special Correspondent.)

Coal.—As near as can be ascertained there is mined, loaded and ready for shipment about 16,000,000 bushels coal. All boats and barges are loaded; fully 6,000 miners are idle, as there is nothing for them to do. As the Ohio River is extremely low from Pittsburg to Cairo, when the rise does come the run will be a small one, and many coal men express the opinion that no Pittsburg coal will reach New Orleans this year. A coal land deal has been closed between a syndicate and Cox, Strong and other owners between Lazerville and Cross Creek. The deal takes in 400 acres, and involves 1,000 acres contingent to the 400-acre tracts. The buyers are authority for the statement that developments will begin at once.

Connellsville Coke.—The last week of July and first week in August will long be remembered for blowing out more active ovens and the large decrease in shipments. The C. C. Frick Coke Company pasted notices at all its works in the Connellsville region announcing the basis of wages to be paid in the future at $1.75 per ton. This is the minimum price of last year's sliding scale. This is a reduction from $1.90, which has been the basis of the coke makers for some time. A dispatch from Connellsville says it is rumored the Illinois Steel Company has signed a five-year contract with the Frick Coke Company for its supply of coke. It is stated that the West Virginia coke company is not yet able to fulfill its contract with the big steel company, which is the largest buyer outside of Pittsburg. The week's shipments aggregated 81,282 tons distributed as follows: To Pittsburg, 1,487 cars; Points east of Pittsburg, 933 cars; to points west, 1,858 cars; total, 4,278 cars; week's decrease, 782 cars.

The prices of coke, Pittsburg delivery, per ton are: To furnaces, $2 30; foundry coke, $2.55; to consumers, $2.70; crushed, $2.90; to consumers, crushed, $3 05. For price at ovens deduct 70c. freight.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, August 4.

Heavy Chemicals.—There is nothing new to report of the heavy chemical market. It continues rather dull, although there has been an improved inquiry for some of the chemicals. Few sales of any importance have been made. The shipments of heavy chemicals from Liverpool to the United States for the first six months of 1893 and 1892, respectively, were as follows: Caustic soda, 13,540 tons against 12,103 tons; Carbonated soda ash, 38,355 tons against 27,119 tons; salt cake, 8,901 tons against 3,612 tons; sal soda. 3,356 tons against 2,610 tons; crystal carbonate, 1,356 tons against 973 tons; bleaching powder, 25,765 tons against 21,498 tons. Prices are nominally quoted as follows: Caustic soda, 60%, 2·95@3·10c.; 70%, 2 70@2·90c.; 74%, 4·72½@2·92½c.; 76%, 2·90@3·00c. Carbonated soda ash, 28%, 1·25@1·30c.; 58%, 1·15@1·25c.; Alkali, 48%, $1.15@$1.20.; 58%, $1.16@$1.20, according to package. Sal soda, English, to arrive, 0·95c.; American

·95@1c.; bleaching powder, 2·25@2·37½c.; we hear of small sales at lower figures than the above, but it is difficult to ascertain exact prices, or the conditions that influence the sales.

Acids.—Manufacturers continue to report a very fair demand for the various acids, which is somewhat remarkable when the present financial trouble is taken into account. Prices show no change of any consequence and we quote as follows: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, $1.87½; in carboys, $2.25; muriatic, 18°, 90c.@$1.10; 20°, $1@$1.25; 22°, $1.10@$1.35; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 80c.@$1.15. Mixed acids, according to mixture, oxalic, $6.30@$6.50. Blue vitriol is quoted all the way from $3.50 to $3.75; glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The market for Sicilian brimstone continues as dull as ever. Prices are low owing to the lack of demand. We quote this week: Best unmixed seconds, $72; thirds, $16.50; both spot and futures.

Fertilizing Chemicals.—Generally speaking the fertilizing market continues quiet. There is, however, an improvement in the demand from the South. Stocks of ammoniates are not very large in first hands, but they can be bought under the market quotations from second hands. Sulphate of ammonia (gas liquor) has advanced, and $3.25 is asked for goods on the spot, while $3.50 is asked for imports. Bone goods are held at $3@$3.05; this advance is due to the scarcity of sulphate which exists in Europe. Other quotations are as follows: Dried blood, $2.15@$2.25 per unit for high grade, and $2.10@$2.15 for low grade; azotine, $2.20@$2.30. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P_2O_5 @60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18%, P_2O_5@82·5 to 85c. per unit in bulk. Double superphosphate, 40% and above, soluble and 5% av., say, total of 48%, av. P_2O_5 @85c. per unit in bags. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at $25 f. o. b. fish factory. Tankage, high grade, $24 50@$25.50; low grade, $22@$23. Bone tankage, $23@$24; bone meal, $24@$25.50.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, $1.12; Philadelphia, $1.14½; Charleston and Savannah, $1.17 cwt., basis 48@50%, in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis 90%: New York and Boston, $2.07; Philadelphia, $2.09½; Charleston and Savannah, $2.127, sulphate of potash, 96-99%, basis 90%, is 4% higher.

Phosphates.—Quotations for high grade land rock, f. o.b. Charleston are $4.50@$4.75. Freights are $2 25.

Muriate of Potash.—The market is without features. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, $1.78; Philadelphia, $1.80½; Southern ports, $1.83. During the past week there were no arrivals.

Kainit.—Practically nothing is doing in kainit. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, $8.75 for foreign, invoice weight and test, and $9 for actual weight; Charleston, Savannah and Wilmington, $9.50 for invoice weight and test, and $9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of soda.—Nitrate continues very dull indeed. Prices are as low as ever. We quote spot at $1.62½@$1.65 and futures at $1.80@$1.85.

Messrs. Mortimer & Wisner, the well known brokers of this city, send us the following interesting monthly statement of nitrate of soda, issued under date of August 1st:

	1893.	1892.	1891.
	Bags.	Bags.	Bags.
Imported into A. ports f. West Coast S. A., Jan. 1, 1893, to date.....	450,764	446,447	351,517
Imported into Atlantic ports from Europe.....	16 712	.....	18,802
	467,476	446,447	370,319
Stock in store and afloat Aug. 1, New York.....	76 442	46,977	66,729
Boston.....	450	1,000	1,600
Philadelphia.....	.....	....	....
Baltimore.....	3,800	8,300	6,500
To arrive, actually sailed	184.300	164,000	204,000
Visible supply to Nov. 1..	264.992	220,277	278,829
Additional charters.....	341,000	70,000	200,000
Total supply, when shipped.....	605,992	290,277	478,829
Stock on hand, Jan. 1, 1893	15.454	53,585	36.454
Deliveries past month..	69,929	68 908	36.383
Deliveries Jan. 1 to date.	402,238	443,755	331,944
Total yearly deliveries..	.....	685,158	634,207

Included in the deliveries of 1893 are 9,500 bags shipped to European ports. Prices current August 1st, 1893, are 1⅝@1·65, against 1¾ in 1892 and 1·80@1·85 in 1891.

Liverpool. July 25.

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

The principal topic here at present is the coal crisis, and the prospect seems to be that by the end of this week a strike on a large scale will have commenced which may last for some weeks. So far the prospect has had little influence on chemicals, with the exception of chlorate of potash, but a protracted coal strike would disorganize business generally, sooner or later.

Soda ash is dull and only wanted to a limited extent. Quotations vary considerably according to market, quantity, make, etc., and for Leblanc makes the nominal range is about as follows: Caustic Ash, 48%, £4 10s.@£5 per ton; 57 to 58%, £5 10s.@£5 15s. per ton. Carb. Ash 48%, £4 15s.@£5 per ton; 58%, £5 5s.@£5 15s. per ton net cash. Ammonia Ash, 58%, is without a special feature and quoted at £4 7s. 6d.@£4 10s. per ton, less 2½%.

Soda crystals are quiet at £2 17s. 6d.@£3 per ton, less 5%.

Caustic soda does not receive much attention from buyers, and the maximum price for outside markets has been reduced by 5s. per ton. Nearest spot range we quote: 60%, £8@£8 15s. per ton; 70%, £9@£9 15s. per ton; 74%, £10@£10 15s. per ton; 76%, £11 10s.@£11 15s. per ton, according to export market, net cash. For parcels under 10 tons, 5s per ton extra is charged.

Bleaching powder is firm at £8 10s.@£8 15s. per ton net cash for hardwood packages. If the demand for this article should improve, coupled with a coal strike, higher prices may be looked for.

Chlorate of potash continues to improve and is in very small compass. For prompt delivery 8¼ is now quoted, although this figure might possibly be slightly shaded with an order firm in hand. For August delivery, 8d. is asked, while for August-December 7¾d. is nearest value. For all 1894 we quote 6¾d. less 5%.

Bicarb. of soda is in request at £6 15s. per ton, less 2½% for 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is scarce and £13 8s. 9d.@£13 12s. 6d. per ton less 2½% is about nearest spot range for good gray 24-25%, in double bags f. o. b. here, according to quality.

Nitrate of Soda.—There is very little on the spot, but at the same time there is only a retail demand and quotations are again slightly in buyers' favor, at £10@£10 5s. per ton, less 2½% for double bags, f. o. b. here. For August delivery a reduction of 10s. per ton on spot quotations would be accepted.

Carbonate of Ammonia.—Lump 3¼d. per lb.; powdered, 3½d. per lb.; less 2½%.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure.....17@.19
Commercial, in bbls. and cbys...01¾@.02
Carbonic, liquefied, ℔ lb.....18@.25
Chromic, chem pure, ℔ lb 1.00
for hatteries.....40
Hydrobromic, dilute, U. S. P....25@.30
Hydrocyanic, U. S. P.....45@.50
Hydrofluoric.....20@.30
Alcohol—95%, ℔ gall.....$2.30@$2.40
Absolute.....$3.80
Ammoniated.....$2.80
Alum—Lump, ℔ cwt..... $1.75@$1.85
Ground, ℔ cwt..... .....$1.85@$1.90
Powdered, ℔ lb..... .....04½@.05
Lump ℔ ton, Liverpool..... £5
Aluminum Chloride—Pure, ℔ lb.$1.25
Amalgamating solution, ℔ lb.....60
Sulphate, ℔ cwt ..... $1.90@$2.50
Ammonia—Sal., in bbl. lots. ℔ lb.....07½@.08
Carbonate, ℔ lb., English and German, 07½@.08
Muriate, white, in bbls., ℔ lb..... .08¼
Aqua Ammonia—(in cbys) 3°℔ lb.03@.04
20°, ℔ lb.....04@.05
26°, ℔ lb..... 04¾@.05
Antimony—Oxymur, ℔ lb..... .04@.05
Regulus, ℔ lb..... .10@.11¼
Argols—Red, powdered, ℔ lb..... .1
Arsenic—White, powdered ℔ lb.03@.03¾
Red ℔ lb.....06@.07
Yellow.....08@.09
White at Plymouth, ℔ ton.....£12 2 6
Asbestos—Canadian, ℔ ton.....$50@$300
Italian, ℔ ton, c. i. f. L'pool.....£18@£20
Ashes—Pot, 1st sorts, ℔ lb.....4.75@5
Pearl.....05¾@.06¼
Asphaltum—
Prime Cuban, ℔ lb.....04@.05
Hard Cuban, ℔ ton.....$28.00@$30.00
Trinidad, refined, ℔ ton...$30.00@$35.00
Egyptian and Syrian, ℔ lb.....05@.07½
Californian, at mine, ℔ ton$12.00@$26.00
at San Francisco, ℔ ton.$15.00@$29.00
Barium—Carbonate, pure, ℔ lb..... .45
Carbonate, commercial, ℔ lb.... .05@.10
Chlorate, crystal, ℔ lb..... .75
Chloride, commercial, ℔ lb..... .05@.10
pure, ℔ lb..... .16
Iodide, ℔ oz..... .40
Nitrate, ℔ lb..... .06¼@.07
Sulph., Am. prime white, ℔ ton$17.50@$19
Sulph., foreign, floated, ℔ ton.....$21@$24
Sulph., off color, ℔ ton.... .$11.50@$15.00
Carb., lump, f. o. b. L'pool, ℔ ton.....£6
No. 1, Casks, Runcorn, " " .. £4 10 0
No. 2, bags, Runcorn, " " .. £3 15 0
Bauxite—℔ ton.....$10.00
Bichromate of Potash—Scotch, ℔ lb.....11@.12
American, ℔ lb..... .....11@.12
Bichromate of Soda—℔ lb....09½@.10
Borax—Refined, ℔ lb., in car lots.08@.09
San Francisco.....08@.08¾
Concentrated, in car lots..... .07½@.08
Refined, Liverpool ℔ ton..... £2
Bromine—℔ lb..... .25@.35
Cadmium Minion—℔ lb..... $2.00
Cadmium Iodide—℔ lb..... $5.50
Chalk—℔ ton..... .....$1.50@$2.25
Precipitated, ℔ lb..... .04@.06
China Clay—English, ℔ ton..$13@$18.00
Domestic, ℔ ton..... .$9@$11
Chlorine Water—℔ lb..... .10
Chrome Yellow—℔ lb..... .10@.25
Chrome Iron Ore—℔ ton, San Francisco.....$10.00
Chromalum—Pure, ℔ lb..... .35@.40
Commercial, ℔ lb..... .02½
Cobalt—Oxide, ℔ lb..... $1.60@$1.70
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary, ℔ lb. 03¾@03¾
" extra..... .04½
Nitrate, ℔ lb..... .40
Copperas—Common, ℔ 100 lbs.. .85@.95
Best, ℔ 100 lbs..... .$1.35@$1.50
Liverpool, ℔ ton, in casks...£2@£2 10s.
Corundum—Powdered, ℔ lb.. .04½@.06
Flour, ℔ lb..... .03
Cryolite—Pow., ℔ lb., bbl. lots....07@.08
Emery—Grain, ℔ lb. (℔ kg.).... .04½@.05
Flour, ℔ lb..... .02½@.04
Epsom Salt—℔ lb..... .01@.01½
Feldspar—Ground, ℔ ton..$6.00@$10.00
Crude..... .$2.00@$3 00
Fluorspar—Powdrd, No. 1, ℔ ton.$20@$30
Lump, at mine..... .$6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton. $16@$20
Glauber's Salt—in bbls., ℔ lb...01@.01¼
Glass—Ground, ℔ lb ..... .09@.10
Gold—Chloride, pure, crystals, ℔ oz. $12.00
pure, 15 gr., c. v., ℔ doz. $5.40
liquid, 15 gr., g. s. v., ℔ doz..... $5.50
Chloride and sodium, ℔ oz $6.00
15 gr., c. v., ℔ doz. $2.75
Oxide, ℔ oz..... .....$27.25
Gypsum—Calcined, ℔ bbl... $1.25@$1.50
Land Plaster.....
Iodine—Resublimed, ℔ oz..... .30@ 33
Iridium—Oxide ℔ lb..... .$90
Iron—Nitrate, 40°, ℔ lb ..... .01@.01½
47°, ℔ lb..... .02@.02½
Kaolin—*See China Clay.*
Kieserite—℔ ton..... .$9@$10
Lead—Red, American, ℔ lb ...06¾@.07½
White, American, in oil, ℔ lb. .06½@.07½
White, English, ℔ lb., in oil.. .08½@.08¾
Acetate, or sugar of, white.... .06@.06½
Granulated.....
Nitrate..... .....09@.12
Lime Acetate—Am. Brown.....90@.95
" Gray .$1.75@$1.87½
Litharge—Powdered, ℔ lb.. .05½@.07½
English flake, ℔ lb..... .06@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos.....$14.75
Calcined, ℔ ton of 2,240 lbs.....$22.00
Brick, ℔ ton of 2,240 lbs.....$47.50
Manganese—Ore, per unit.....23@.28
Oxide, ground, ℔ lb ..... .02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb..... .62@.64
Powdered, ℔ lb..... 65
Marble Dust—℔ bbl.....$1.25@$1.50
Metallic Paint—Brown ℔ ton. $20@$25
Red..... $20@$25
Mineral Wool—Ordinary slag... .01½
Ordinary rock..... .02½
Ground, ℔ ton.....
Mica—In sheets according to size.
1st quality, ℔ lb..... .25@$6.00
Naphtha—Black.....
Nitre Cake—℔ ton..... .$10.00
Ochre—Rochelle, ℔ lb..... .01¼@01¾
Washed Nat Oxf'rd, Lump, ℔ lb.06½@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb.07@.07½
Golden, ℔ lb..... .03@.05
Domestic, ℔ ton.. ..... $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal... .14@.16
Dark filtered, ℔ gal... .10@.13
Extra cold test, ℔ gal. .20@.24
Dark steam refined, ℔ gal., .07½@.12
Phosphorus—℔ lb..... .50@.55
Precip., red, ℔ lb..... .80@.85
white, ℔ lb..... .85@.90
Platinic Chloride—Dry, ℔ oz $7
Plumbago—Ceylon, ℔ lb..... .04@.06
American, ℔ lb..... .05@ 07
Potassium—Cyanide, ℔ lb., C. P. 67%, ℔ lb.... .52@.70
mining... .28@.30
Bromide, domestic, ℔ lb..... .28@ 32
Chlorate, English, ℔ lb.. .....18@.18¼
Chlorate, powdered, English, ℔ lb. .18½@..19
Carbonate, ℔ lb., by casks, 82% .04½@.05
Caustic, ℔ lb., pure slick..... .05½@.06
Iodide, ℔ lb..... .$2.58@$2.80
Nitrate, refined, ℔ lb..... .06@.07
Bichromate, ℔ lb..... .10@.11½
Yellow Prussiate, ℔ lb..... .21½@ 22½
Red Prussiate, ℔ lb..... .39@.45
Pumice Stone—Select lumps, ℔ lb03½@.12
Original cks., ℔ lb..... .01½@.02
Powdered, pure, ℔ lb..... .01½@.01¾
Pyrites—Non-cupreous, p. units. .12@.15
Quartz—Ground, ℔ ton.... .$6.00@$10.00
Rotten Stone, Powdered, ℔ lb.03¼@.03½
Lump, ℔ lb..... .06@.07
Original cks, ℔ lb..... .04½@.05½
Rubbing stone, ℔ lb.. .....03½@.04
Sal Ammoniac—lump, in bbls., ℔ lb.80½
Salt—Liverpool, ground, ℔ sack.... .70
Domestic, fine, ℔ ton.....$7@$7.50
Common, fine, ℔ ton.....$4.50@$4.75
Turk's Island, ℔ bush..... .26@.28
Salt Cake—℔ ton..... .....$10.00@$15.00
Saltpeter—Crude, ℔ lb..... .03½@.04
Soapstone—Ground, ℔ ton..... $6@$8
Block and slab according to size.
Sodium—Prussiate, ℔ lb..... .22@.24
Phosphate, ℔ lb..... .....04@.05
Stannate, ℔ lb..... .....06@.12
Tungstate, ℔ lb..... .....30@.35
Hyposulphite, ℔ cwt., in casks $1.70@$1.80
Strontium—Nitrate, ℔ lb.... .08½@.09
Sulphur—Roll, ℔ lb..... .01½@.02¼
Flour, ℔ lb..... .....01¾@.02
Sylvinit, 27@35%, S.O.P., per unit, 3.75
Talc—Ground French, ℔ lb....01¼@.01¾
American No. 1, ℔ lb..... .01¾@.01¼
American No 2..... 006
Terra Alba—French, ℔ lb..... .65@.80
English, ℔ lb.. ....60@.80
American, No. 1, ℔ lb..... .60@.80
American, No. 2, ℔ lb..... .40@.50
Tin—Crystals, in kegs or bbls.... .14@.15
feathered or flossed. .20
Muriate, single..... .07@.12
Double or strong, 54° B.. ..... .10@.15
Oxymur, or nitro..... .19
Vermilion—Imp. English, ℔ lb. .80
Am. quicksilver, hulk..... .57 @.59
Am. quicksilver, bags..... .58 @ .60
Chinese..... .85 @$1.00
Trieste..... .90 @ .95
American..... .11½@ .12
Zinc White—Am., Dry, ℔ lb 04½@ .05
Antwerp, Red Seal, ℔ lb.....06¼@.07
Paris, Red Seal, ℔ lb..... .07⅝@.08
Muriate solution..... .06
Sulphate crystals, in bbls., ℔ lb.03@.03¼

THE RARER METALS.

Aluminum—℔ lb.....80@.85
Arsenic—(Metallic), per lb..... .40
Barium—(Metallic), per gram.... $4.00
Bismuth—(Metallic), per lb..... $2.00
Cadmium—(Metallic), per lb. $1@$1.50
Calcium—(Metallic), per gram....$10.00
Cerium—(Metallic), per gram..... $7.50
Chromium—(Metallic), per gram. $1.00
Cobalt—(Metallic), per lb..... $6.00
Didymium—(Metallic), per gram. $9.00
Erbium—(Metallic), per gram..... $7.50
Gallium—(Metallic), per gram...$140.00
Glucinum—(Metallic), per gram..$12.00
Indium—(Metallic), per gram..... $9.00
Iridium—(Fused), per oz..... $12.00
Lanthanum—(Metallic), per gr..$10.00
Lithium—(Metallic), per gram....$10.00
Magnesium—(Powdered), per lb. $4.00
Manganese—(Metallic), per lb..... $1.10
Chem. pure, per oz..$10.00
Molybdenum—(Metallic), per gm 50
Niobium—(Metallic), per gram... $5.00
Osmium—(Metallic), per oz.....$65.00
Palladium—(Metallic), per oz.....$20.00
Platinum—(Plate), per oz.....$11.25
Potassium—(Metallic), per lb.....$5.00
Rhodium—(Metallic), per gram.. $5.00
Ruthenium—(Metallic), per gm.. $5.50
Rubidium—(Metallic), per gram. $2.00
Selenium—(Metallic), per oz..... $1.80
Sodium—(Metallic), per lb.....50@.75
Strontium—(Metallic), per gm.... .60
Tantalium—(Metallic), per gram. $9.00
Telurium—(Metallic), per lb..... $5.00
Thallium—(Metallic), per gram.. .20
Titanium—(Metallic), per gram.. $2.25
Thorium—(Metallic), per gram...$17.00
Tungsten—(Metallic), per lb..... .80
Uranium—(Oxide), per lb.. ..... $5.00
Metallic, per gm..... .00
Vanadium—(Metallic), per gm...$22.00
Yttrium—(Metallic), per gram.... $9.00
Zirconium—(Metallic), per oz.... $6.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	July 29. H.	July 29. L.	July 31. H.	July 31. L.	Aug. 1. H.	Aug. 1. L.	Aug. 2. H.	Aug. 2. L.	Aug. 3. H.	Aug. 3. L.	Aug. 4. H.	Aug. 4. L.	Sales.
Adams, Colo.													
Alice, Mont.													
Amador, Cal.													
Atlantic, Mich.													
Belcher, Nev.													
Belle Isle, Nev.													
Bodie Cons., Cal.													
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.													
Caledonia, S. Dak.													
Catalpa, Colo.													
Chrysolite, Colo.													
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.									1.10				100
Crown Point, Nev.													
Deadwood, Dak.													
Enterprise,													
Eureka, Cons., Nev.													
Father de Smet, Dak.													
Freeland, Colo.													
Gould & Curry, Nev.													
Grand Prize, Nev.													
Hale & Norcross, Nev.													
Homestake, Dak.													
Horn-Silver, Utah.													
Independence, Nev.													
Iron Hill, Dak.													
Iron Silver, Colo.													
Leadville Cons., Colo.	.10								.12				500
Little Chief, Colo.													
Martin White, Nev.													
Moulton, Mont.													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah.													
Ophir, Nev.													
Overman, Nev.													
Plymouth, Cal.													
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.													
Savage, Nev.													
Sierra Nevada Nev.													
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Min. of L. Valley													
Small Hopes, Colo.													
Standard Cons., Cal.													
Yellow Jacket, Nev.													

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	July 29. H.	July 29. L.	July 31. H.	July 31. L.	Aug. 1. H.	Aug. 1. L.	Aug. 2. H.	Aug. 2. L.	Aug. 3. H.	Aug. 3. L.	Aug. 4. H.	Aug. 4. L.	Sales.
Alpha., Nev.													
Alta, Nev.													
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.													
Augusta, Ga.													
" bonds.													
Barcelona, Nev.													
Belmont, Cal.													
Best & Belcher, Nev.													
Bonanza King, Cal.													
Brunswick, Cal.													
Bullion, Nev.													
Butte & Bost., Mont.													
Castle Creek, Idaho.													
Chollar.													
Comstock T., Nev.													
Con. Imperial, Nev.													
Con. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.													
Emmett, Colo													
Exchequer, Nev.													
Independence, Nev.													
Julia, Nev.													
Justice, Nev													
King & Pembroke													
Lacrosse, Colo.											.04		200
Lee Basin, Colo.													
Mexican, Nev.													
Minnesota Iron.													
Monitor, Colo.													
Monte Cristo, Rep. of C.													
Nevada Queen, Nev.													
N. Standard, Cal.													
N. Commonwealth, Nev.													
Overman, Nev.													
Oriental & Miller, Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.													
Potosi, Nev.													
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santiago.													
Scorpion, Nev.													
Seg. Belcher, Nev.													
Shoshone, Idaho.													
Silver Hill, Nev.													
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate, Cal.													
Tornado Con., Nev.													
Union Cons., Nev.													
Utah, Nev.													

*Ex-dividend. †Dealt in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 600 Non-dividend shares sold, 200. Total shares sold, 800.

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	July 28.	July 29.	July 31.	Aug. 1.	Aug. 2.	Aug. 3.	Sales.
Atlantic, Mich.	7.13		7.13				200
Bodie, Cal.							
Bonanza Development.							
Bost. & Mont., Mont.	18.00 16.50	17 25	17.50	17.00	17.00	18.25 17.50	19.00 17 75	1,722
Breece, Colo.							
Calumet & Hecla, Mich.	250	250	250	247	250	249	250	278
Catalpa, Colo.							
Central, Mich.							
Cœur d'Alene, Id.							
Con. Cal. & Va., Nev.							
Dunkin, Colo.							
Eureka, Nev.							
Franklin, Mich.	9.50					9.50 9.00		23
Honorine, Utah.							
Horn Silver, Utah.							
Kearsarge, Mich.	6 00		5.50			5.50 5.38		185
Lake Superior, Iron.							
Little Pittsburg, Colo.							
Minnesota Iron, Minn.							
Napa, Cal.							
Ontario, Utah.							
Osceola, Mich.	21.50 20.13	21.50 20.00	21.50	22.00	22.00	23.00 22.00		650
Quincy, Mich.		92.00	94.00	92 00	92.00			72
Ridge, Mich.								
Sierra Nevada, Nev.								
Silver King, Ariz.								
Stormont, Utah.								
Tamarack, Mich.			120	119	120	121		80
Tecumseh, Mich.								

Name of Company.	July 28.	July 29.	July 31.	Aug. 1.	Aug. 2.	Aug. 3.	Sales.
Alloues, Mich.							
Arnold, Mich.							
Aztec, Mich.							
Brunswick, Cal.							
Butte & Boston, Mont.	5.25 5.00	5.00			5.00	5.50 5.25	5.75 5.50	820
Centennial, Mich.	2.00	2.00				2 25 2 00	2.00	1,830
Colchis, N. Mex.								
Copper Falls, Mich.								
Crescent, Colo.								
Dana, Mich.								
Don Enrique, Mex.								
Geyser, Colo.								
Hanover, Mich.								
Humboldt, Mich.								
Hungarian, Mich.								
Huron, Mich.								
Mesnard, Mich.								
National, Mich.								
Native, Mich.								
Oriental & M., Nev.								
Phœnix, Ariz								
Pontiac, Mich.								
Rappahannock, Va.								
Santa Fe, N. Mex								
Shoshone, Idaho.								
South Side, Mich.								
Tamarack, Jr., Mich.								
Washington, Mich.								
Wolverine, Mich.			1.50	1.25			1 25		350

Dividend shares sold, 3,210. Non-dividend shares sold, 3,000. Total shares sold, 6,210.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
1	Adams, s. L. o.	Colo..	$1,500,000	150,000	$10	*	$687,500	Jan.. 1892 .05
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25		1,500,000	April 1893 .25
3	Alice, s.	Mont.	10,000,000	400,000	25	*	975,000	Nov.. 1891 .06¼
4	Alma & Nel Wood., g	Idaho	300,000	30,000	10	*	60.000	Jan: 1889 .50
5	Amador, g.	Cal.	1,250,000	250,000	5	*	31,250	Aug.. 1890 .12½
6	American, g.	Colo..	3,000,000	300,000	10	*	225,000	Mar.. 1892 .05
7	American Belle, s. g. c	Colo.	2,000,000	400,000	5	*	50,000	April 1891 .12½
8	Americ'n & Nettie, g. s	Colo..		300,000			175,000	Mar.. 1892 .05
9	Atlantic, c.	Mich.	1,000,000	40,000	25	280,000 April 1875	$1.00	700,000 Feb.. 1891 1.00
10	Argenta, s.	Nev..	10,000,000	100,000	100	335,000 July. 1889	.10	40,000 Feb.. 1890 .20
11	Argyle, g.	Colo..	1,000,000	1,000,000	1	*		20,000 Mar. 1892 .01
12	Aspen Mg. & S., s. L.	Colo..	2,000,000	200,000	10	*		780,000 June 1893 .10
13	Aurora, I.	Mich.	2,500,000	100,000	25			650,000 Feb.. 1893 2.00
14	Badger, s	Ont..	250,000	50,000	5			37,500 Mar. 1890 .25
15	Bald Butte	Mont.	250,000	250,000	1	*		110,000 July. 1893 .02
16	Bates Hunter, s. g.	Colo..	1,000,000	1,000,000	1			Dec.. 1891 .00¾
17	Belle Isle, s.	Nev..	10,000,000	100,000	100	230. 00 Aug. 1892	.10	300,000 Dec.. 1879 .25
18	Belcher, s. g.	Nev..	10,400,000	104,000	100	3,16 . 000 May 1892	.25	15,397,000 April 1876 1.00
19	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	1: 000 Dec.. 1889	.25	200,000 Jan.. 1890 .10
20	Best Friend.	Colo.	1,000,000	1,000,000	1			90,000 Feb.. 1892 .01
21	Bi-Metallic, s. g.	Mont.	5,000,000	200,000	25			2,300,000 April 1893 .20
22	Bodie Con., g. l.	Cal..	10,000,000	100,000	100	50,000 June 1890	.25	1,602,572 April 1895 .50
23	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*		520,000 June 1886 .15
24	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*		2,075,000 Nov.. 1891 1.00
25	Brooklyn Lead, L. s.	Utah.	500,000	50,000	10			127,000 July. 1887 05
26	Brotherton, I.	Mich.	2,000,000	80,000	25	*		120,000 Mar.. 1893 .50
27	Bulwer, c.	Cal..	10,000,000	100,000	10	130,000 Aug.. 1889	.25	190,000 Oct.. 1892 .05¾
28	Bunker Hill & S. s. L.	Idaho	3,000,000	300,000	10	*		150,000 Oct.. 1888 .06
29	Caledonia, g.	Dak..	10,000,000	100,000	100	505,000 May. 1885	.15	192,000 Oct.. 1890 .08¾
30	Calliope, s.	Colo..	1,000,000	1,000,000				140,000 Jan.. 1891 .00
31	Calumet & Hecla c.	Mich.	2,500,000	100,000	25	1,200,000		39,350,000 May. 1893 5 00
32	Centen'l-Eureka, s. L.	Utah.	1,500,000	30,000	50			675,000 June 1893 .50
33	Central, c.	Mich.	500,000	20,000	25	100,000 Oct.. 1861	.65	1,970,200 Feb.. 1891 1.00
34	Champion, g	Calif.	340,000	34,000	10	*		132,900 May. 1893 .10
35	Chrysolite, s. L.	Colo..	10,000,000	200,000	50	*		1,650,000 Dec.. 1884 .25
36	Clay County, g.	Colo..	200,000	200,000	1	*		56,000 Nov.. 1891 .02
37	Clinton Con, g.	Cal..	5,000,000	100,000	5			80,000 Nov.. 1891 .10
38	Cœur D'Alene, s. L.	Idaho	5,000,000	500,000	10			310,000 Nov.. 1891 .02
39	Colorado Central, s. L.	Colo..	2,750,000	275,000	10	*		530,000 April 1893 .05
40	Commonwealth, s.	Nev..	10,000,000	100,000	100	190,000 Sept. 1892	.10	20,000 Nov.. 1890 .20
41	Confidence, s. L.	Nev...	2,496,000	24,960	100	1,589,550 Aug.. 1892	.50	199,680 April 1889 1.00
42	Cons. Cal. & Va., s. g	Nev...	21,600,000	216,000	100	108,000 Jan.. 1885	.20	3,682,800 Aug. 1891 .50
43	Contention, s.	Ariz..	12,500,000	250,000	50			2,637,500 Aug. 1892 .20
44	Cook's Peak, s.	N. M.	2,000,000	200,000	10			114,532 Nov. 1892 .05
45	Cop. Queen Con., c.	Ariz..	2,000,000	200,000	10			1,460,000 May. 1893 .50
46	Coptis.	Nev..	10,000,000	100,000	100			67,000 July. 1892 .13
47	Cortez, s.	Nev.	1,500,000	300,000	05	*		687,000 Mar.. 1892 .50
48	Crescent, s. L. g.	Utah.	15,000,000	600,000	25	60,000 Oct. 1892	.10	238,000 Oct.. 1888 .03
49	Crown Point, g. s.	Nev...	10,000,000	100,000	100	2,700,000 Sept. 1892	.25	11,898,000 Jan.. 1875 2.00
50	Cumberland, L. s.	Mont.	5,000,000	500,000	10	*		15,000 Nov. 1889 .03
51	Daly, s. L.	Utah.	3,000,000	150,000	20			2,900,000 June 1893 .25
52	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*		20,000 June 1889 .05
53	Deadwood-Terra, g.	Dak..	5,000,000	200,000	25	*		1,150,000 Oct.. 1892 .05
54	DeLamar, s. g.	Idaho	2,000,000	400,000	5			800,000 April 1893 .37½

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.
1	Alliance, s. g.	Utah.	$100,000	100,000	$1	$120,000 Feb.. 1891 .20
2	Alloues, c.	Mich.	2,000,000	80,000	25	737,000 Jan.. 1890 .70
3	Alpha Con., g. s.	Nev..	3,000,000	30,000	100	209.000 Sept. 1892 .10
4	Alta, s.	Nev..	10,080,000	100,800	100	3,369,880 Jan. 1892 .10
5	American. c.	Idaho	5,000,000	500,000	100	
6	American Flag, s.	Colo..	1,250,000	125,000	1	300,000 June 1887
7	Amity, s.	Colo..	250,000	250,000	20	
8	Anchor, s. L. g.	Utah.	3,000,000	150,000	5	410,000 June 1890 .20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	125	
10	Appalachian, g.	N. C .	1,750,000	1,400,000	20	
11	Arizona, c.	Ariz..	3,575,000	160,000	2	
12	Astoria, g.	Cal..	200,000	100,000	5	
13	Atlanta, g. s.	Idaho	3,250,000	650,000	25	
14	Barcelona, g.	Nev..	5,000,000	200,000	5	*
15	Bear Creek	Idaho	100,000	20,000	1	
16	Belmont, g.	Cal..	500,000	500,000	100	*
17	Belmont, s.	Nev..	5,000,000	50,000	100	735,000 April 1886 .10
18	Best & Belcher, s. g.	Nev..	10,080,000	100,800	10	2,405,275 Aug.. 1892 .25
19	Black Oak, g.	Cal..	3,000,000	300,000	100	*
20	Boston Con., g.	Cal..	10,000,000	100,000	1	170,000 Nov.. 1883 .25
21	Brownlow, g.	Colo..	250,000	250,000	5	
22	Brunswick, g.	Cal..	2,000,000	400,000	2	
23	Buckeye, s. L.	Mont.	1,000,000	500,000	100	
24	Bullion, s. g.	Nev..	10,000,000	100,000	100	2,890,000 Aug. 1892 .25
25	Burlington, g. s.	Cal..	10,000,000	100,000		
26	Butte & Boston, c. s.	Mont.	5,000,000	200,000	10	
27	Butte Queen, g.	Cal..	1,000,000	100,000	1	6,000 Jan.. 1892 .04
28	Calaveras, g.	Cal..	500,000	500,000	5	
29	Calaveras Con., g.	Cal..	800,000	160,000	10	
30	California, g	Cal..	1,000,000	100,000	5	9,000 Mar.. 1892 .03
31	California Con. I. Q.	Cal..	2,250,000	450,000	10	
32	Camille, g	Ga	1,500,000	150,000	5	
33	Carisa, g.	Wy..	500,000	100,000	2	*
34	Carupano, g. s. L. c.	Ven..	200,000	100,000	2	
35	Cashier, g. s.	Colo..	500,000	250,000	100	*
36	Challenge Con., g. s.	Nev..	5,000,000	50,000	10	
37	Cherokee, g.	Cal..	1,500,000	150,000	100	
38	Chollar, s. g.	Nev..	11,200,000	112,000	2	1,820,000 May.. 1892 .50
39	Cleveland, t.	Dak..	1,000,000	500,000	10	*
40	Colchis, s. g.	N. M.	500,000	150,000	5	
41	Colorado, s.	Colo..	1,625,000	325,000	1	
42	Comstock, s.	Utah.	1,250,000	250,000	100	
43	Comstock Tun.	Nev..	10,000,000	100,000	100	35,000 Mar.. 1887 .15
44	Con. Imperial, g. s.	Nev..	5,000,000	50,000	50	2,062,500 Jan.. 1892 .25
45	Con. New York, s. g.	Nev..	5,000,000	100,000	100	110,000 Mar.. 1893 .10
46	Con. Pacific, g.	Cal..	6,000,000	60,000	10	198,000 June 1890 10
47	Con. Silver, s.	Mo..	2,500,000	250,000	5	
48	Cordova Union, g.	Cal..	1,000,000	200,000	10	
49	Crescent, s. L.	Colo..	3,000,000	300,000	100	*
50	Crocker, s.	Ariz..	10,000,000	100,000	1	165,000 Aug. 1892 .05
51	Crowell, g.	N. C..	500,000	500,000	1	
52	Dahlonega, g.	Ga..	250,000	250,000	10	*
53	Dandy, s.	Colo..	5,000,000	500,000		
54	Decatur s	Colo..	1,000,000	300,000		

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied	Date and amount of last.			Dividends. Total paid.	Date & amount of last.		
5	Derbee B. Grav., G.	*J.	10,000,00	100,000	0	100,000	Sept.	1892	.10	60,[illegible]	Aug.	1891	.10
56	Dexter, g. s	Nev.	1,000,000	100,000	10					80,000	Aug.	1892	.25
	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*				390,000	Oct.	1889	.05
58	Elkhorn, s. L.	Mont.	1,000,000	200,000	5	*				1,038,670	June	1893	.37½
59	Enterprise, s.	Colo.	2,500,000	500,000	5					850,000	May.	1893	.05
60	Eureka Con., s. L. G.	Nev.	1,000,000	50,000	100	550,000	June	1889	.50	5,017,500	Jan.	1892	.25
61	Evening Star, s. L.	Colo.	500,000	50,000	10	*				1,450,000	Dec.	1889	.2
62	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
63	Franklin, C.	Mich.	1,000,000	40,000	25	220,000	June	1871		1,100,000	July	1892	2.00
64	Freeland, s. G.	Colo.	5,000,000	200,000	25	*				190,000	July.	1886	.10
65	Garfield Lt., G. s.	Nev.	500,000	100,000	5					90,000	April	1888	.12½
66	Glengarry	Mont.	1,000,000	100,000	10					10,000	June	1891	.10
67	Gold Rock	Colo.	500,000	500,000	1						Dec.	1891	.01
68	Golden Reward	S.Dak	1,250,000	250,000	5					85,000	April	1893	.02
69	Gould & Curry, s. G.	Nev.	10,800,000	108,000	100	4,591,200	June	1892	.25	3,826,800	Oct.	1870	10.00
70	Grand Prize, s	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	495,000	Mar.	1884	.25
71	Granite, s. L.	Idaho	500,000	500,000	1	*				83,400	Nov.	1890	.02
72	Granite Mountain, s.	Mont.	10,000,000	400,000	25					12,120,000	July.	1892	.20
73	Great Western, L. Q.	Cal.	5,000,000	50,000	100					444,861	May.	1893	.25
74	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
75	Hale & Norcross, G. s.	Nev.	11,200,000	112,000	100	5,534,800	Aug.	1892	.50	1,822,000	Aug.	1888	.50
76	Hecla Con., s. G. L. C.	Mont.	1,500,000	90,000	50					1,980,000	Apr.	1893	.50
77	Hel'a Mg.& Red, s.L.G.	Mont.	3,315,000	663,000	5	*				197,970	July.	1886	.06
78	Helena & Frisco, s.L.	Idaho	2,500,000	500,000	5					170,000	July.	891	.02
79	Helena & Victor	Mont.	1,000,000	200,000	5					80,000	May.	1892	.05
80	***Holmes, s.	Nev.	10,000,000	100,000	100	370,000	May.	1890	.25	75,000	Apr.	1886	.25
81	Homestake, G	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00	5,003,750	June	1893	.10
82	Honorine, s. L.	Utah.	500,000	250,000	2	37,500	April	1889	.05	125,000	Sep.	1887	.05
83	Hope, s.	Mont.	1,000,000	100,000	10	*				483,252	July.	1893	.25
34	Horn-Silver, s. L.	Utah.	10,000,000	400,000	25	*				4,700,000	Mar.	1893	.12½
85	Hubert, G	Colo.	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
86	Idaho, G.	Cal.	310,000	3,100	100					5,450,250	April	1893	2.50
87	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
88	Iron Hill, s	Dak.	2,500,000	250,000	10	134,000	July.	1889	.03	156,250	Nov.	1887	.07½
89	Iron Mountain, s	Mont.	5,000,000	500,000	10	*				245,000	July.	1893	.03
90	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
91	Jack Rabbit, G.	Cal.	10,000,000	100,000	100	100,000	Sept.	1892	.10	260,000	Aug.	1891	.10
92	Jackson, G. s.	Nev.	5,000,000	50,000	100	237,500	Nov.	1880	.20	60,000	Jan.	1891	.10
93	Kearsarge, C.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
94	Kennedy	Cal.	10,000,000	100,000	100					387,000	May.	1892	.15
95	Kentuck, s. G	Nev.	3,000,000	30,000	100	454,180	Oct.	1891	.15	1,350,000	Dec.	1886	.10
96	La Plata, s. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept.	1882	.30
97	Leadville Con., s. L.	Colo.	4,000,000	400,000	10	*				316,500	Feb.	1892	.03
98	Lexington, G. s.	Mont.	4,000,000	40,000	100	*				609,000	Jan.	1890	2.00
99	Little Chief, s. L.	Colo.	10,000,000	200,000	50					820,000	Dec.	1890	.05
100	Little Rule, s.	Colo.	500,000	500,000	1					220,000	Dec.	1891	.02
101	Maid of Erin	Colo.	3,000,000	600,000	5					708,900	April	1893	.25
102	Mammoth, s. L. C.	Utah	10,000,000	400,000	250	110,000		1882	.25	1,040,000	Dec.	1891	.10
103	Martin White, s.	Nev.	10,000,000	100,000	100	1,275,000	Jan.	1892	.25	140,000	Dec.	1886	.25
104	Mary Murphy, s. G.	Colo.	350,000	3,500	101	*				175,000	May.	1888	5.00
105	Matchless, s. L.	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
106	Maxfield	Utah	3,000,000	300,000	10					117,000	April	1892	.03
107	Mayflower, D. gravel	Cal.	1,000,000	100,000	10					160,000	July	1893	.10
108	May Mazeppa, s. L.	Colo.	1,000,000	100,000	1					205,000	Oct.	1891	.03¾
109	Minas Prietas, G. s.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
110	Minnesota, C.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
111	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5					3,680,000	July.	1893	.08
112	Monitor, G.	S.Dak	2,500,000	250,000	10					45,000	Oct.	1890	.03
113	Mono, G.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1886	.25
114	Montana, Lt., G. s.	Mont.	3,300,000	660,000	5	*				2,619,075	June.	1891	12½
115	Morning Star, s. L.	Colo.	1,000,000	100,000	10					925,000	April	1891	.25
116	Morning Star Drift, G	Cal.	240,000	2,400	100					140,600	April	1893	3.00
117	Moulton, s. G.	Mont.	2,000,000	400,000	5	*				410,000	Nov.	1892	.07½
118	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	210,000	July.	1891	.20
119	Napa, Q.	Cal.	700,000	100,000	7					580,000	July	1893	.20
120	Navajo, G. s.	Nev.	10,000,000	100,000	100	520,000	May.	1891	20	229,950	April	1889	.10
121	Newton	Cal.	‡10,000,000	100,000	100					10,000	May.	1891	.05
122	New California, G.	Colo.	800,000	160,000	5	*				48,800	May.	1890	.12½
123	New Guston, s.	Colo.	550,000	110,000	5					1,877,500	April	1892	.75
124	North Banner Con.	Cal.	1,000,000	100,000	10					20,000	July.	1891	.05
125	North Commonw'th	Nev.	10,000,000	100,000	10					25,000	June.	1891	.25
126	N. Hoover Hill, G. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
127	North Belle Isle, s.	Nev.	10,000,000	100,000	100	474,689	Nov.	1892	.10	230,000	May	1888	.50
128	North Star, G.	Cal.	§1,000,000	100,000	10					450,000	June	1893	.50
129	Omaha Cons., G	Cal.	2,400,000	24,000	100					30,000	May.	1892	.15
130	Ontario, s. L.	Utah	15,000,000	150,000	100					13,175,000	Oct.	1892	.50
131	Ophir, G. s.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan.	1888	1.00
132	Original, s. C.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
133	Oro, s. L. G.	Colo.	500,000	100,000	5					95,000	July,	1890	.20
134	Osceola, C.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,747,500	May.	1893	1.00
135	Pacific Coast, B.	Cal.	1,500,000	15,000	100					360,000	Dec.	1892	1.00
136	Parrot, C.	Mont.	1,800,000	180,000	10					1,748,000	April	1893	.10
137	Petro	Utah.	10,000,000	10,000	100					17,500	July	1891	.75
138	Plumas Eureka, G.	Cal.	‡1,406,250	140,625	10					2,669,926	April	1893	.19
139	Plymouth Con, G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
140	Poorman, G. s.	Idaho	375,000	300,000	125	*				68,260	Sept.	1892	
141	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,823,911	June	1891	1.25
142	" com., Q	Cal.	5,700,000	57,000	100					643,867	July.	1882	.40
143	Quincy, C.	Mich.	1,250,000	50,000	25	200,000	Dec.	1862		6,620,000	Aug.	1893	3.00
144	Red Cloud	Idaho	1,000,000	200,000	5					153,000	Dec.	1892	.10
145	Reed National, s. G.	Colo.	500,000	500,000	1	*				50,000	Dec.	1890	.01
146	Retriever, L.	S.Dak	1,250,000	250,000	5					20,000	Aug.	1891	.03
147	Rialto, G.	Colo.	300,000	300,000	1	*				50,250	April	1892	.01½
148	Richmond, s. L.	Nev.	1,350,000	54,000	25	*				4,346,3[illegible]	Aug.	1891	.25
159	Rico-Aspen	Colo.	‡5,000,000	1,000,000	5					25,000	May.	1893	.02½
150	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar.	1886	50	99,785	Feb.	1880	.50
151	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
152	Running Lode, G.	Colo.	‡1,000,000	1,000,000	1	*				36,000	May.	1892	.00 1-10
153	Savage, s.	Nev.	11,200,000	112,000	100	6,772,000	Feb.	1892	.50	4,460,000	June	1869	3.00
54	Sheridan, s. G.	Colo.	300,000	3,000	100	*				300,000	Oct.	1891	2.50
55	Shoshone, G.	Idaho	150,000	150,000	1					7,500	April	1883	.01
156	Sierra Buttes, G.	Cal.	2,225,000	122,500	10					1,544,620	April	1893	.12½
157	Sierra Nevada, s. G.	Nev.	10,000,000	100,000	100	6,411,910	June	1892	.25	102,000	Jan.	1871	1.00
158	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000	1	*				40,000	May.	1889	.02
159	Silent Friend	Colo.	500,000	500,000	1					60,000	Aug.	1891	.02½
160	Silver Cord, s. L. G.	Colo.	4,500,000	450,000	10					265,000	April	1889	.10
161	Silver King, s.	Ariz.	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
162	Silver Mg. of L.V., s.L.	N. M.	500,009	500,000	1					300,000	Dec.	1891	4.05
153	Slide	Colo.	500,000	5,000	100					20,000	Nov.	1891	4.00
164	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*				32,00,000	Nov.	1892	.15
165	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
166	Standard, G. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,665,000	July.	1893	.10
167	Stormont, s.	Utah.	500,000	500,000	1	*				155,000	Nov.	1881	.05
178	St. Joseph, L.	Mo.	‡1,500,000	150,000	10	*				1,974,000	Dec.	1890	.02
169	Swansea, g. s.	Colo.	600,000	60,000	10					27,000	Mar.	1893	.10
170	Tamarack, C.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	3,160,000	Oct.	1892	.00
171	Teal & Poe	N. M.	150,000	150,000	1					9,000	Nov.	1891	.01½
172	Tombstone, G. s. L.	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
173	Trinity Riv'r Hydr., G	Colo.	500,000	500,000	1	*				10,000	May.	1893	.00½
174	United Verde, C.	Ariz.	3,000,000	300,000	10	*				207,500	Jan.	1892	.10
175	Victor, G.	Colo.	11,000,000	200,000	5					40,000	June	1893	.05
176	Viola Lt., s. L.	Idaho	750,000	150,000	5					337,500	Nov.	1888	.37½
177	Ward Con., s.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
178	Woodside, s. L.	Utah	100,000	100,000	10					25,000	Oct.	1889	.25
179	W. Y. O. D.	Cal.	30,0,00	15,000	4	22,500	May.	1891	.10	58,500	July.	1893	.10
180	Yankee Girl, s.	Colo.	1,300,000	260,000	5					1,405,000	April	1891	1.50
181	Yellow Jacket, G. s.	Nev.	12,000,000	120,000	100	5,808,000	Sept.	1892	.25	2,184,000	Aug.	1871	1.50
182	Yosemite No. 2	Utah.	1,000,000	100,000	10					25,000	Oct.	1891	.05
183	Young America, G.	Cal.								175,000	Jan.	1889	1.00

NON DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
55	Denver City s.	Colo.	5,000,000	500,00	11	*			
56	Denver Gold, G.	Colo.	300,000	60,000	5				
57	Dickens-Custer, s.	Idaho	2,100,000	420,000	5				
58	Durango, G.	Colo.	500,000	500,000	1	*			
59	Eastern Dev. Co., Lt	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
60	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
61	El Talento, G.	U.S.C.	1,000,000	500,000	2				
62	Emma, s	Utah.	625,000	500,000	125				
63	Emmons, s. L.	Colo.	2,000,000	2,000,000	1				
64	Empire, s.	Utah	10,000,000	100,000	100				
65	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*			
66	Exchequer, s. G.	Nev.	10,000,000	100,000	100	940,000	Jan.	1892	.25
67	Found Treasure, G. s.	Nev.	10,000,000	100,000	100	130,500	Jan.	1892	.50
68	Gogebic I. Syn., I.	Wis.	5,600,000	200,000	25				
69	Gold Bank, g. s.	Colo.	250,000	250,000	1	*			
70	Gold Cup, s	Colo.	500,000	500,000	1	*			
71	Golden Era, s.	Mont.	2,000,000	200,000	10	*			
72	Gold Flat, G.	Cal.	1,000,000	100,000	10	5,000	Mar.	1892	.05
73	Gold King, g.	Colo.	1,650,000	350,000	5				
74	Gold Rock, G.	Cal.	1,000,000	500,000	2				
75	Golden FeatherCn., g	Cal.	900,000	180,000	5				
76	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
77	Goodyear G. s. L	Mont.	1,000,000	200,000	5	13,000	Feb.	1892	.01
78	Grand Belt, C	Tex.	12,000,000	120,000	100				
79	Grand Canyon, s.	Ariz.	375,000	75,000	5				
80	Grand Duke, s.	Colo.	800,000	80,000	10				
81	Gregory Con., G.	Mont.	3,000,000	300,000	10				
82	Harlem M. & M. Co., G.	Cal.	1,000,000	200,000	5				
83	Hartery Con., G.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
84	Hartshorn, g s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept.	1891	.00½
85	Head Cent. & Tr., s. G	Ariz.	10,000,000	100,000	100	16,981	Mar.	1892	.03
86	Hector, G.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
87	Highland, C.	Mich.	500,000	25,000	20				
88	Himalaya, g. s l.	Utah.	1,800,000	80,000	10	12,800	Oct.	1892	.00½
89	Holywood	Cal.	200,000	100,000	2				
90	Hortense, s.	Colo.	2,000,000	200,000	10				
91	Huron, C.	Mich.	,000,000	40,000	25	280,000	May.	1887	3.00
92	Idaho, g. s	Idaho	1,250,000	250,000	5				
93	Inez, s. L	Idaho	1,000,000	1,000,000	1				
94	Ingalls, g	Colo.	100,000	20,000	5				
95	Ironton, I.	Wis.	1,000,000	40,000	25				
96	Iroquois, C.	Mich.	1,250,000	50,000	25				
97	Kentuck Con	Nev.	10,500,000	105,000	00	57,750	July.	1892	.10
98	J. D. Reymert, s.	Ariz.	16,000,000	100,000	100				
100	Julia Con., G. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
101	Justice, g. s. c.	Colo.	500,000	500,000	1	*			
102	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
103	La Cumbre, g. s.	Mex.	150,000	3,000	50	*			
104	Lee Basin, s.	Colo.	5,000,000	500,000	10	*			
105	Little Josephine, s.	Colo.	250,000	50,000	5				
106	Lone Star Cons., G.	Cal.	500,000	500,000	1	10,000	April	1892	.00½
107	Lynx Creek, g.	Ariz.	237,500	147,500	5				
108	Madeleine, G. s. L.	Colo.	750,000	50,000	1	4,500	Feb.	1892	.00½
109	Mammoth Gold, G.	Ariz.	2,500,000	500,000	5	*			
110	Mayflower Gravel, G.	Cal.	1,000,000	100,000	10	*			
111	Medora, G.	Dak.	250,000	250,000	1	585,000	Mar.	1890	.56
112	Merrimac Con., G. s.	Colo.	5,000,000	500,000	10				
113	Mexican, G. s.	Nev.	10,000,000	100,000	100	2,917,560	Oct.	1892	.50
114	Michigan, g s	Mich.	2,500,000	100,000	25	40,000	Mar.	1892	
115	Middle Bar, G.	Cal.	400,000	200,000	2	*			
116	Mike & Starr, s. C.	Colo.	1,000,000	200,000	5	*			
117	Milwaukee, s.	Mont.	500,000	500,000	1	*			
118	Minah Cons	Mont.	1,250,000	250,000	5				
119	Modoc Chief, l. s. g.	Idaho	1,000,000	200,000	5	5,000	Jan.	1892	.00½
120	Monitor, G.	Colo.	100,000	100,000	1	12,500	May.	1891	.01
121	Montreal, G. s. L.	Utah.	750,000	150,000	5	4,500	Feb.	1892	.00½
122	Mountain Ledge, g.	Cal.	500,000	100,000	5				
123	Mount McClellan	Colo.	1,500,000	300,000	5				
124	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*			
125	Native, C.	Mich.	1,000,000	40,000	25				
126	Neath, G.	Colo.	1,000,000	100,000	10				
127	Nelson	Cal.	50,000	10,000	5				
128	Nevada Queen, s.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
129	New Germany, G.	N. S.	100,000	100,000	1	*			
130	New Gold Hill	N. C.	1,750,000	350,000	5				
131	New Pittsburg, s. L.	Colo.	2,000,000	200,000	10	*			
132	New Queen Gold, s.	Colo.	800,000	160,000	5				
133	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov.		
134	Occidental Con., g.s		10,000,000	100,000	100	245,000	April	1892	.25
135	Oneida Chief, G.	Cal.	500,000	125,000	100	*			
136	Oriental & Miller, s.	Nev.	10,000,000	400,000	100				
137	Original Keystone, s.	Nev.	10,000,000	100,000	100	250,000	Mar.	1892	.10
138	Osceola, G.	Nev.	5,000,000	500,000	10	*			
139	Overman, G. s.	Nev.	11,520,000	115,200	100	4,001,840	May.	1892	.10
140	Park, s.	Utah.	2,000,000	200,000	10				
141	Parker, g.	N.C.	750,000	180,000					
142	Pay Rock, s.	Colo.	1,000,000	200,000	5				
143	Peer, s.	Ariz.	10,000,000	100,000	100	190,000	Feb.	1892	.10
144	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
145	Pennsylva'a Cons., G	Cal.	5,150,000	515,000	10	36,050	Feb.	1892	.10
146	Phœnix, g.	Ariz.	500,000	500,000	1	*			
147	Phœnix Lead, s. L.	Colo.	100,000	100,000	1	*			
148	Pilgrim, G	Cal.	600,000	300,000	2	*			
149	**Pioche M.&R., s.G.L.	Utah.	20,000,000	2,000,000	10				
150	Poorman, Ltd., s. L.	Idaho	250,000	50,000	5				
151	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
152	Proustite, s.	Idaho	250,000	250,000	1	*			
153	Puritan, s. G.	Colo.	1,500,000	150,000	10	*			
154	Quincy, C	Colo.	3,000,000	300,000	10				
155	Rainbow, g.	S.Dak	‡1,250,000	250,000	5	4,250	July.	1892	.00½
156	Rappahannock, G. s.	Va.	250,000	250,000	1	*			
157	Red Elephant, s.	Colo.	500,000	500,000	1	*			
158	Red Mountain, s.	Colo.	300,000	60,000	5				
159	Ropes, G. s.	Mich.	2,000,000	80,000	25	167,200	Feb.	1891	.50
160	Ruby & Dun., s. L. G.	Nev.	25,300	506	50	*			
161	Russell, G.	N. C.	1,500,000	300,000	5				
162	Sampson, G. s. L.	Utah.	10,000,000	100,000	100	288,15[illegible]	July.	1888	1.08
163	Seal of Nevada, g.s.	Nev.	5,000,000	100,000	50				
164	Silver Age, s. l. g.	Colo.	2,000,000	200,000	10	*			
165	Silver Bell, s.	Ariz.	850,000	170,000	5				
166	Silver King, s.	Cal.	12,000,000	400,000	5				
167	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
168	Silverton, s.	Colo.	300,000	60,000	5				
169	Siskiyou Con., L.	Cal.	2,000,000	200,000	10	13,000	May.	1892	.01½
170	South Bulwer, G	Cal.	10,000,000	100,000	100	100,000	May.	1881	.25
171	South Hite, g.	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
172	South Pacific, g.	Cal.	500,000	100,000	5				
173	Stanislaus, G.	Cal.	2,000,000	200,000	10				
174	St. Kevin, s. G.	Colo.	100,000	100,000	1	*			
175	St. Louis & Mex., s.	Mex.	,000,000	500,000	10	*			
176	St. Louis & St. Elmo	Colo.	000 000	200,000	10				
177	St. L. & St. Felipe, G.s.	Mex.	[illegible],000	150,000	10				
178	St. L. & Sonora, G. s.	Ariz.	3,000,000	300,000	10	*			
179	Stemwinder, l. s.	Idaho	500,000	500,000	1				
180	Sunday Lake, I.	Mich.	1,250,000	50,000	25				
181	Sullivan Con., G.	Dak.	600,000	200,000	3	*			
182	Sylvanite, s.	Colo.	5,000,000	500,000	10	*			
183	Taylor-Plumas, G.	Cal.	325,000	65,000	5	3,575	Mar.	1892	.01½
184	Telegraph, g. s.	Cal.	325,000	65,000	5	3,575	Mar.	1892	.01½
185	Telegraph, G. s.	Mex.	100,000	100,000	1	70,000	Feb.	1892	.10
186	Teresa, G. s.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.10
187	Tioga Con., G.	Nev.	10,000,000	100,000	10	295,000	May.	1888	.25
188	Tornado Con., G. s.	Nev.	100,000	100,000	1	*			
189	Tuscarora, s.	Nev.	10,000,000	500,000	20	385,000	Jan.	1892	.25
190	Union Con., G. s.	Nev.	10,000,000	100,000	100	370,000	June	1892	.25
191	Utah, s.	Nev.	10,000,000	100,000	100	245,000	Aug.	1890	.25
192	Ute & Ulay, s. L.	Colo.	1,000,000	500,000	2	1,500	Mar.	1892	.0018
193	Valley, g.	Cal.	575,000	460,000	125				
194	Wall Street, G. s. L.	Colo.	500,000	500,000	1				
195	Washington, C.	Mich.	1,000,000	40,000	5				
196	West Argentine, s.	Colo.	750,000	150,000	5				
197	West Granite Mt., s.	Mont.	500,000	100,000	5	*			
198	Whale, s.	Mont.	5,000,000	500,000	10	*			
199	Wood River, g.	Idaho	2,000,000	200,000	10	3,000	Aug.	1891	.00½
200	Yuma, C. s. G.	Ariz.	10,000,000	400,000	2				
120	Zelaya, G. s.	C. A.	600,000						

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Cons. Virginia $42,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ This company paid $190,000 before the reorganization in 1880. ** This company acquired the property of the Raymond & Ely Company which had paid $3,075,000 in dividends. *** Previous to this company's acquiring Northern Belle, that mine declared $[illegible] in dividends against $[illegible] in assessment.

COAL AND COAL RAILROAD STOCKS.

Names of Stocks.	July 29.		July 31.		Aug. 1.		Aug. 2.		Aug. 3.		Aug. 4.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....
Balt. & Ohio	56¾	....	57	55	60	58¾	60¾	60	65¾	62	65	....	2,917
do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....
Buff., R. & P.	....	....	....	....	....	....	....	....	23	....	....	....	100
do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....
Cambria Iron	....	....	....	....	....	....	....	....	....	....	....	....	....
Ches. & Ohio	14	13	13½	12¾	14	13⅝	14⅞	14⅛	15¼	14⅜	15⅛	14¼	11,210
do. 1st pref	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. C. & I.	7	....	....	....	....	....	....	....	9⅞	....	....	....	160
Col. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....
Colorado Fuel	20	....	....	....	21	....	23½	22	22½	....	21½	....	610
do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....
Col., H. V. & Tol.	16	15¾	16	14¾	14½	12½	14⅞	11¾	14¾	13¾	14	13¾	10,315
do. pfd	....	....	....	....	55	....	59½	....	....	....	....	....	125
Col. & H. Coal	....	....	5	....	5½	....	....	....	6¼	....	....	....	550
do. pfd	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & Hud. C.	109¼	105	106⅛	105	109	107½	111	110	111	....	113½	111¼	6,186
Del., L. & West.	131	129	131¼	127	133½	130⅛	140	132	139¾	136	141	138	31,854
Hunt. & B. Top.	....	....	33	29	33	....	32	....	32¾	....	....	....	600
do. pref	....	....	48	....	48½	47¼	47¼	47	47½	....	....	....	1,545
Lake Erie & Wes	13	....	13¼	....	14¼	13¾	14⅛	14	14¼	14	15	....	2,680
do. pref.	55	....	53¾	53	55¾	55	57¼	56½	58⅛	58	58	57½	2,998
Lehigh C. & N.	47⅜	47	47	46⅞	47½	....	47¾	47½	47¾	47½	....	....	635
Lehigh Valley	33⅝	32¼	35¼	33⅛	36	35	35⅝	35⅝	38¼	36	....	....	9,304
Maryland Coal	....	....	....	....	....	....	....	....	....	....	....	....	....
do. pref	....	....	....	....	55	....	....	....	....	....	....	....	100
Morris & Essex	140¾	....	....	....	....	....	....	....	....	....	....	....	85
New Cent. Coal	....	....	....	....	6½	....	....	....	....	....	....	....	209
N. J. Central	88¾	88	88⅝	....	90½	89½	92	90½	95½	92	96	91	3,039
N. Y., L. & W.	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., L. E. & W	9¼	8¾	9½	8⅞	10½	10	11½	10½	11⅝	11	11¾	11	24,095
do. pref	21	20½	20½	20	21¾	21½	23	....	24½	24¼	24¾	....	2,130
N.Y., Susq. & W	9	....	9½	8½	10	9½	10¼	10	10½	10	10½	10⅜	3,975
do. pref	42	....	....	....	....	....	....	....	....	....	....	....	100
do. pref., new	33	....	....	....	....	....	40	39½	40	39½	40	39½	1,150
N. & West	....	....	5⅛	....	....	....	....	....	....	....	....	....	110
do. pref	19½	19	19	....	19	....	21	....	21½	....	....	....	694
Penn. Coal	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. R. R.	49	48⅝	49	48⅝	49	48¼	49⅞	48⅝	49⅞	49¼	....	....	11,868
Phil. & Reading	12⅝	12	12¼	12	13⅛	12¼	14	13⅛	13⅝	13¼	13¾	13½	10,952
Tenn. C. & I.	12	11	12½	11	12¾	11¼	13¼	12½	13¾	12¾	13¼	13	6,041
do. pref	....	....	59	....	....	....	....	....	....	....	....	....	100
Wheel. & L. E.	12¼	11⅝	11	....	12½	11¼	12½	11½	12⅝	....	12¾	12⅜	1,407
do. pref	37½	36⅝	36¾	35¾	38⅛	36⅞	39	37	41¼	40⅜	43⅜	37⅝	2,575

Total shares sold, 150,711.

INDUSTRIAL AND TRUST STOCKS.

Name of Stocks.	July 29.		July 31.		Aug. 1.		Aug. 2.		Aug. 3.		Aug. 4.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
dams Express	....	....	....	....	....	....	....	....	....	....	....	....	....
m. Cotton Oil	25	24	25	24½	28⅜	25	27¾	26½	28½	27	31	26½	7,065
do. pref	53¾	....	55	52½	56	54¼	57½	55½	56	....	59	57	2,927
Am. Dist. Tel.	....	....	....	....	....	....	....	....	....	....	....	....	....
Am Express	105	....	....	....	105	100	106	....	107	104¼	....	....	119
Am. Sugar Ref.	68½	65	65	61¾	68	64½	73¼	67	74	69⅛	75⅛	69	301,638
do. pref	70	68¼	68	66½	70	68	72⅝	70	75½	73	75	73	6,468
Edison E. Ill. Co.	....	....	90	....	....	....	....	....	....	....	....	....	33
Edison Gen. El.	39	30	41	35½	43½	40	49	41¼	51½	46	51½	44½	92,070
Nat. Cord. Co.	....	....	....	....	....	....	....	....	11¾	11	....	....	475
do*	12	....	11¾	11	11⅛	11	11	10	....	....	11	10	406
do. pref	....	....	....	....	....	....	....	....	....	....	....	....	....
do.*	....	....	....	....	....	....	....	....	....	....	....	....	....
Nat. Lead Co.	19½	19	20½	19	22½	21½	24⅛	21½	24⅞	23	25⅜	24	7,547
do. pref	50	....	51	48	53	....	56½	54	60	58	60¾	59½	6,375
Nat. Linseed Oil.	14½	....	14½	....	15	....	....	....	19⅞	....	15⅛	....	1,279
U. S. Express	49	....	49	....	....	....	49	....	....	....	....	....	40
U. S. Rubber	25	....	....	....	24¾	....	23	....	24¾	23¼	....	....	1,020
do. pref.	....	....	....	....	....	....	65	62½	....	....	....	....	45
Wells, Fargo Ex	130	127½	....	....	....	....	139	....	....	....	....	....	79
Western Union.	69⅝	68	72½	67⅛	75½	72⅛	78	74½	78	75	78⅛	74½	126,760

*First assess. paid. Total sales, 514,337.

CALIFORNIA.

San Francisco.

Names of Stocks.	Closing Quotations.					
	July 28.	July 29.	July 31.	Aug. 1.	Aug. 2.	Aug. 3.
Alpha	....	....	....	....	....	....
Alta	.10	.10	.10	.10	.10	.10
Belcher	.25	.25	....	.15	....	.20
Belle Isle	....	....	....	....	....	....
B. & Belch	.60	.50	.45	.45	.50	.55
Bodie	....	....	....	....	....	....
Bulwer	....	....	....	....	.15	....
Chollar	.25	.20	....	.15	.15	.20
Com'w'lth	....	....	....	....	....	....
Con. C. & V.	1.00	1.00	.95	1.00	1.00	.95
Con. Pac.	....	....	....	....	....	....
Crown Pt.	.30	.30	.25	.25	.25	.25
Del Monte	....	....	....	....	....	....
E'rekaCon	....	....	....	....	....	....
G'ld & C'y	.30	.30	.25	.25	.30	.25
Hale & N.	.45	.45	.45	.45	.45	.50
M. White	....	....	....	....	....	....
Mexican	.35	.40	.25	.25	.25	.25
Mono	....	....	....	....	....	....
Mt. Diablo	....	....	....	....	....	....
Navajo	....	....	....	....	....	....
Nev. Qu'n.	....	....	....	....	....	....
N. B'lleIsle	....	....	....	....	....	....
N. Co'w'th	....	....	....	....	....	....
Ophir	.60	.50	.40	.45	.50	.45
Potosi	.45	.35	.30	.35	[illegible]	.30
Savage	.30	.30	.25	.25	.25	.30
Sierra Nev	.35	.40	.30	.25	.25	.30
Uni'n Con	.30	.30	.25	.25	.25	.25
Utah	.10	....	....	.10	....	.10
Yel. Jack	.40	.30	.30	.35	.30	.40

COLORADO.

Aspen. July 1.

	Bid.	Asked
Argentum Juniata	$0.69	$0.70
Aspen Contact	1.10	1.12
Aspen Deep Mining	.11	.11½
Best Friend	.07½	.08
Bi-Metallic	.07½	.08
Bushwacker	.14	.15
Delia S.	1.90	2.00
Gold Valley Placer	.20	.20
Little Annie	.07½	.08
Mollie Gibson	5.50	6.00
Pontiac	.09	.09½
Smuggler	35.00	38.00
St. Joe & Mineral Farm	.10½	.11
U. S. Paymaster	....	....

Colorado Springs. July 29.

	Bid.	Asked.
Anaconda Gold	...	.15
Antlers P. K. Reg	...	.10
Calumet	...	.02¾
Cleopatra	...	.09½
C. O. D	.02	.03½
Cook's Peak	...	.40
Del Monte	.03	.04½
Enterprise	.02½	.05
Fanny Rawlins	.06	.08½
Golden Dale	.01	.02
Isabella	...	.10
Lemhi	.80	.90
Mollie Gibson	1.75	1.80
Mount Rosa	.00¾	.01⅛
Pharmacist	.21½	.23
Summit M. & M.	...	.14
Work	.2½	.03
World	...	.02¾

Denver.

Prices and sales for the week ending July 4:

	High.	Low.	Sales.
Anaconda	$.26	$.21	500
Bangkok-Cora Belle	.02¾	.02	....
Diamond B.	.03	.02	6,500
Gold Rock	.01½	.03	400
Justice	.01½	.01¼	300
Puzzler	.04	.03	....
Work	.03	.02¾	42,3.0
Total sales			50,000

MONTANA.

Helena.

Prices for the week ending July 29:

	Bid.	Asked.
Bald Butte (Mont.)	$2.00	$2.50
Benton Group (Neihart), Mont.	.10	.15
Combination (Phillipsb'g), Mont	.75	.90
Cumberland (Castle), Mont	...	....
Elizabeth (Phillipsb'g), Mont.	...	.30
Florence (Neihart)	...	....
Helena & Victor, Mont	...	.75
Iron Mountain (Missoula), Mont	.55	.60
Piegan (Marysville), Mont	...	.50
Peorman (Cœur d'Alene), Idaho	...	.50
Whitlach Union & MacIntyre.	.35	.40
Yellowstone	...	....

MARYLAND.

Baltimore. Aug. 3.

Company.	Bid.	Asked.
Balt. & N. C.	....	$0.04
Conrad Hill	....	...
Cons. Coal	....	.32
Diamond Tunnel	....	.15
George's Creek Coal.	$1.07	1.07@1.11
Howard C. & C.	1.10	....
Lake Chrome	.01@.02	....
Silver Valley	.30	....

MINNESOTA.

Duluth. July 28.

LISTED STOCKS.

	Par.	Bid.	Asked
Biwabik M. Iron Co.	100	$18.00	$19.50
Cincinnati Iron Co.	25	.35	.45
Clark Iron Co.	100	.40	.60
Cosmopolitan Iron Co.		....	....
Great Northern Min. Co.	100	2.25	3.00
Kanawha Iron Co.	100	.20	.35
Keystone Iron Co.		.20	.40
Lake Superior Iron Co.	25	1.00	2.00
Lincoln Iron Co.		....	.50
Little Mesaba Iron Co.	100	....	....
Mesaba Moun. Iron Co.	100	11.50	14.00
Minneapolis Iron Co.	100	.05	.20
Mountain Iron Co	100	45.00	55.00
Shaw Iron Co.	100	.75	1.25
Security Land & Exp. Co.	10	14.00	17.00
Washington Iron Co	100	....	....

UNLISTED STOCKS.

	Par.	Bid.	Asked
Adams Iron Co.		$8.00	$9.00
Agate Copper Mining Co.		....	1.00
Allegheny Iron Co.	10	....	....
Aurora Iron Co.		....	....
Buckeye Iron Co	100	....	2.50
Buffalo Land & Exp. Co.		....	.50
Camden Iron Co		....	.25
Chandler Iron Co		....	50.00
Chicago Iron Co	100	.15	.50
Charleston Iron Co.	100	.15	.35
Champion Iron Co.	100	.11	.40
Cleveland Iron Co.		....	....
Columbia Iron Co	100	....	....
Commodore Mining Co.		....	....
Comstock Iron Co.	100	....	....
Dayton Iron Co.	100	....	....
Detroit Iron Co.	25	.01	.03
Elmira Land & Iron Co.		.10	.25
Great Western Mining Co.	100	1.00	1.25
Hall Iron Co		....	....
Homestead Iron Co.	25	.00½	.03
Horton Mining Co.	10	....	....
Imp. Iron Mt. Mining Co.		....	....
Internat'l Development		....	22.50
Kakina Iron Co	25	....	....
Kentucky Iron Co.	100	....	....
Lackawanna Iron Co.	100	.30	.60
Macomber Mining Co.		....	....
McCaskill Mining Co.		.01	.05
McKinley Iron Co	100	....	24.50
Mesaba C., L. & Ex. Co.	10	....	6.00
Mesaba Chief Iron Co.	100	1.80	2.25
Mesaba Iron Co.		....	.20
Mesaba Mineral Co.		....	....
Minnesota Iron Co.		45.00	60.00
Myrna Iron Co.	10	....	....
Northern Light Iron Co.	100	....	.25
New England Iron Co.	100	....	..
Ohio Mining Co.	100	....	6.00
Oneota Iron Co	100	....	....
Ophir, gold		1.00	1.50
Pennsylvania I. & S. Co.	100	.04	.10
Pioneer		....	1.00
Putnam		....	.80
Rouchleau Iron Co	100	.30	.50
Republic Iron Co.	25	....	.50
Red Hematite Iron Co.	100	....	.15
Sheridan Iron Co.		....	.20
Standard Ore Co	25	.25	.50
Stowell Iron Co.	10	....	....
Towanda Iron Co.	100	1.50	2.00
Ver. & Mesaba Iron Co.		....	1.00
Zenith Iron Co.	25	....	1.25

MISSOURI.

St. Louis. Aug. 2

Closing quotations:

	Bid.	Asked.
Adams	$0.40	....
American & Nettie, Colo.	.30	.35
Bi-Metallic, Mont	....	4.00
Elizabeth, Mont	.15	.25
Granite Mountain, Mont.	1.20	1.50
Hope	....	2.50
Leo	.01½	.03
Pat Murphy	....	....
Small Hopes	....	.50

PENNSYLVANIA.

Philadelphia. Aug. 3.

(Special report by Sam'l K. Davis.)

	Bid.	Asked.
Bloomington C. & C.	....	....
Buck Mountain C.	...	....
Cambria	64	....
Connellsville Gas Co.	...	....
Edison E. Light Co.	115	121
Excelsior B. & S.	....	....
Locust Mt. C. & I.	....	....
Penn. Salt	...	100
Penn. Steel	....	54
Penn. Gas Coal	.47	....
Royal Gas	....	....
Westmoreland C.	.50	

Pittsburg. Aug 2.

	Bid.	Asked.
Bridgewater Gas Co.	$35.00	....
Chartiers Val. Gas.	....	$10.00
Con. Gas.	45.00	....
Enterprise Mining Co.	....	1.50
Hidalgo Mining Co.	1.75	...
La Noria Mining Co.	7.75	8.38
Luster Mining Co.	7.13	8.50
Manufacturers' Gas	29.00	30.00
N. Y. & Clev. G. C.	....	51.00
Ohio Valley Gas	....	32.00
Pennsylvania Gas	....	9.00
People's N. G. & P. Co.	13.88	...
Philadelphia Co.	18.88	19.13
South Side Gas	....	....
Tuna Oil	....	....
Wheeling Gas Co.	15.00	19.00
W'house Air Brake Co.	....	118.00

London Quotations.

July 19, 1893.

	Buyer. £	s.	d.	Seller. £	s.	d.
Alaska Treadwell, Alaska Ter	1	15	0	2	0	0
Almada & Tirito, Mex.			10½			1½
American Belle, Colo.		1	0		1	6
Big Creek, Nev		8	9		11	3
De Lamar, Idaho		13	9		16	3
Elkhorn, Mont		9	6		10	6
Emma, Utah			9		1	3
Flagstaff, Utah			7½			10½
Golden Feather, Cal.			6		10	6
Golden Gate, Cal		2	6		3	6
Golden Leaf, Mont. & N. M.			3			9
Holcomb Valley, Cal.			6			9
Jackson Gold Fields			7½			10½
Jay Hawk & Lone Pino, Mont		5	6		6	6
Maid of Erin, Colo.		1	3		2	9
Mammoth Gold, Ariz.			6		9	0
Mesquital del Oro, Mex., P.	3	0	0	4	0	0
Mesquital del Oro, Mex., D.		15	0	1	5	0
New Eberhardt, Nev.	......					3
New Guston, Colo.		5	0		7	6
New Montana, Mont.		2	0		2	3
Palmarejo, Mex			6		9	0
Pinos Altos, Mex.		1	0		1	6
Poorman, Idaho		5	6		6	6
Rajah Gold, Can		6	3		8	9
Richmond Con., Nev.		2	6		7	6
Seven Stars, Ariz.	1	5	0	1	10	0
Sierra Buttes, Cal.		6	0		8	0
South Poorman, Idaho	1	2	6	1	5	0
Springdale Gold, Colo.		3	0		4	0
United Mexican, Mex.		2	0		3	0
Yankee Girl, Colo.			3		9	0

Paris. July 20.

	Francs.
Belmez, Spain	665.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	630.00
Lexington, Mont	82.50
" parts	2.00
Nickel, New Caledonia	735.00
Rio Tinto, Spain	372.50
" " oblig	530.00
" " " 2d	535.00
Tharsis, Spain	118.75
Vieille-Montagne, Belgium	485.00

New York Mining Stocks.

(Latest quotations.) Aug. 4.

	Bid.	Asked.
Adams	....	....
Alice	....	....
Alta	....	....
Amer. Flag	....	....
Aspen	....	....
Belcher	....	....
Best & Belcher.	....	....
Bodie	....	....
Breece	....	....
Brunswick	....	....
Bulwer	....	....
Caledonia, B. H.	....	....
Carth Creek	....	....
Chollar	....	....
Chrysolite	....	....
Comstock Tunnel	....	....
Colo. Central	....	....
Con. C. & Va	....	$1.20
Crown Point	....	..
Deadwood	...	....
El Cristo	....	....
Enterprise	....	....
Gould & Curry	....	....
Hale & Nor	....	....
Horn Silver	....	....
Iron Silver	....	....
Kingston & Pem	....	....
La Crosse	....	....
Leadville.	....	....
Little Chief	....	....
Mexican	....	....
Mono	..	....
Ophir	....	....
Phœnix of Ariz	....	....
Plymouth	....	....
Savage	....	....
Sierre Nevada	....	....
Union	....	....
Yellow Jacket	....	..

ASSESSMENTS.

Company.	No.	Dlnqt. in office.	Day of sale.	Amt. per sh're
Alh'mbra, Nev.	17	Aug. 18	Sept. 11	.25
Alta, Nev.	43	Aug. 4	Aug. 25	.15
Bodie Con., Cal.	16	Aug. 28	Sept. 25	.15
Bulwer, Cal.	8	Aug. 31	Sept. 22	.10
Calumet, S. Dak	1	July 24	Aug. 14	.32
Crown Pt., Nev	61	July 18	Aug. 8	.25
Darboy, S. Dak	3	July 25	Aug. 14	.002
Exchcq'er, Nev	36	Aug. 1	Aug. 29	.10
Gold Mt., Cal.	5	Aug. 16	Sept. 4	1.50
H'le & Nor., Nev	101	July 25	Aug. 18	.50
Justice, Nev.	54	July 11	Aug. 2	.10
Lady Washington, Nev.	9	Aug. 9	Aug. 30	.10
Mexican, Nev.	48	Aug. 22	Sept. 12	.25
Occid'ntal, Nev	13	Aug. 16	Sept. 6	.10
Potosi, Nev.	38	Aug. 15	Sept. 5	.25
Savage, Nev.	81	July 25	Aug. 14	.05
Seg. Belcher & Mides, Nev.	12	Aug. 29	Sept. 18	.10
Weldon, Ariz.	7	July 16	Aug. 9	.05
Yosemite No. 2, Utah	....	Aug. 18	Sept. 5	.05

CLASSIFIED LIST OF ADVERTISERS.

Adders and Calculators
Smith, R. C.

Air Compressors and Rock Drills
American Diamond Rock Boring Co.
Bullock, M. C., Mfg. Co.
Burleigh Rock Drill Co.
Clayton Air Compressor Works.
Hasenzahl, W.
Ingersoll-Sergeant Rock Drill Co.
Morris County Machine & Iron Co.
Norwalk Iron Works Co.
Penn Diamond Drill & Mfg. Co.
Rand Drill Co. (See Diamond Drills.)

Aluminum
Cowles Electric, S. & A., Co.

Amalgamators
Bucyrus Steam Shovel & Dredge Co.
Gates Iron Works.

Architects and Builders
Berlin Iron Bridge Co.
Pencoyd Bridge & Const. Co.
Pennsylvania Steel Co.
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Son.

Arms and Ammunition
Hartley & Graham.

Asbestos
Leofred A.

Assayers' and Chemists' Supplies
Ainsworth, Wm.
Baker & Adamson.
Baker & Co.
Berge, J. & H.
Bullock & Crenshaw.
Denver Fire Clay Co.
Greiner, Emil.
Henry Heil Chem. Co.
Hoskins, Wm.
Overbrook Chem. Co.
Penn Sm. & Ref. Wks.
Penna. Salt Mfg. Co.
Queen & Co.
Richards & Co.
Roessler & Hasslacher Chemical Co.
Sargent, A. H., & Co.
Snelson, W. H., Assay. & Engineering Co.
Socorro Fire Clay Co.
Solvay Process Co.
Taylor, John, & Co.
Troemner, Henry.
Voland & Van Zelm.

Bankers and Brokers
Bandell, E. H.
Bieber & Sohne.
Billings, Robt. & Co.
Chisolm, A. R., & Co.
Cochran, A. M.
Gelder, Bailey & Co.
Grant, F. R.
Handy & Harman.
Hyde, Geo. A.
Nevin Commission Co.
Pacific Mining Agency & Trust Co.
Peabody & Koiff.
Pullman, J. W.
Smith, C. H.
Trenholm, Paul C.
Von Rosenberg, Leo.

Belting
Hendrie & Bolthoff Mfg. Co.
Jeffery Mfg. Co.
Link Belt Machinery Co.
New York Belting & Packing Co., Ltd.

Blasting Caps and Fuse
Lan, J. H., & Co.
Macbeth, James, & Co.
Metallic Cap Mfg. Co.

Blowers
Sturtevant, B. F. Co.

Boiler Compound
American Fluoride Co.

Boilers
Babcock & Wilcox Co.
Buckeye Engine Co.
Heine Safety Boiler Co.
Lidgerwood Mfg. Co.
Orr & Sembower, Inc.
Pollock, Wm. B., & Co.
Scaife, Wm. B. & Sons.
Star Boiler & Sheet Iron Works.
Stirling Co.
(See Machinery.)

Brake Shoes
Sargent Co.

Brick Machinery
Freese, E. M., & Co.

Bridges
Berlin Bridge Co.
Pencoyd Br. Con. Co.
Penna. Steel Co.
Scaife, W. B., & Sons.

Buckets
Clark, W. J., & Co.
Scaife, Wm. B. & Sons.
(See Machinery.)

Calculators
Smith, R. C.

Carbons
Bishop, Victor, & Co.

Car Wheels
Whitney, A. & Co.

Chain and Link Belting (See Belting)

Chemicals
Baker & Adamson.
Bullock & Crenshaw.
Henry Heil Chem. Co.
Overbrook Chem. Co.
Penn. Salt Mfg. Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Vandenbergh Lab'tory

Coal
Berwind-White Coal Mg. Co.
Castner & Curran
Consolidation Coal Co.
Coxe Bros. & Co.
Haddock, Shonk & Co.
Maryland Coal Co.
Meeker & Co.
Potts, F. A., & Co.
Stickney, Conyngham & Co.
Ward & Olyphant.

Coal Cutters
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co. (See Machinery.)

Coke
Rainey, W. J.

Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. P. & Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Blake, Theo. A.
Bradley Fertilizer Co.
Colorado Iron Works.
Copeland & Bacon.
Dimon & Adams.
Fraser & Chalmers.
Frisbee-Lucop Mill Co.
Frue Vanner Concentrator.
Gates Iron Works.
Hendrie & Bolthoff Mfg. Co..
Krom, S. R.
Mechanical Gold Extractor Co.
Pierce & Miller Engineering Co.
Risdon Iron Works
Sturtevant Mill Co.
Totten & Hogg Foundry Co.
Walburn-Swenson Mfg. Co.
(See Machinery.)

Copper Dealers and Producers
Abbott, Jere., & Co.
American Metal Co.
Atlantic Mining Co.
Balbach S. & Ref. Co.
Baltimore Cop. W'ks.
Boston & Mont. M. Co.
Central Mining Co.
Copper Queen Mg. Co.
Chicago Cop. Ref'g Co.
Detroit Copper Mg. Co.
Lewisohn Bros.
Orford Copper Co.
Osceola Con. Mg. Co.
Penn. Salt Co.
Phelps, Dodge & Co.
Quebrada R. R., L. & C. Co.
Tamarack Mg. Co.

Contractors' and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Carpenter, Geo. B., & Co.
Lidgerwood Mfg. Co.
Pollock, Wm. B., & Co.
Pratt & Whitney Co. (See Machinery.)

Corrugated Iron
Berlin Iron Bridge Co.
Scaife, W. B., & Sons.

Couplings
Lake Co., J. H. & D.

Desks, Chairs, Etc.
Audrews, A. H. & Co.

Diamonds
Bishop, Victor, & Co.

Diamond Drills
American Diamond Rock Boring Co.
Bishop, Victor, & Co.
Bullock Mfg. Co., M. C.
Hasenzahl, W.
Locke & Hazenzahl.
Penn. Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
(See Air Compressors and Rock Drills.)

Drawing Materials
Alteneder, Theo. & Son.
Heller, Chas. S.
Kenffel & Esser Co.
Schwenke, Kirk & Co.

Dredges
Bucyrus Steam Shovel & Dredge Co.
Figee Bros.
Souther & Co.

Dump Cars
Hunt Co., C. W.
Thacher Car & Con. Co.

Dynamos
National Electric Mfg. Co.

Educational Institutions
Corcoran Scientific School.
Harvard Univ. (Lawrence Scientific School)
Michigan Mining School.
Pennsylvania Military College.
State School of Mines.
University of Arizona.
Woodside Seminary.

Electrical Machinery and Supplies
General Electric Co.
Jeffrey Mfg. Co.
National Electric Mfg. Co.
Okonite Co., Limited.
Thomson-Houston International Co.

Elevators, Conveyors and Hoisting Machines
Brown Hoisting and Convey. Mach. Co.
Clark, W. J., & Co.
California Wire Works.
Cooper, Hewitt & Co.
Davis, F. M., Iron Works.
Hunt, C. W., Co.
Jeffrey Manufacturing Co.
Lidgerwood Mfg. Co.
Link Belt Machinery Co.
Orr & Sembower, Inc.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Works.
(See Wire Rope Tramway and Machinery.)

Emery Wheels
New York Belting & Packing Co., Ltd.

Emery Mill Stones
Sturtevant Mill Co.

Employment Bureaus
Engineering Employment Bureau.
Enterprise Employment Agency.

Engineers, Chemists, Metallurgists
Adams, J. N.
Adams, W. H.
Argall, Philip.
Askew & Russell.
Baker & Co.
Blandy, John F.
Blauvelt, Harrington.
Blow, A. A.
Boggs, W. R., Jr.
Boss, Clarence M.
Boss, M. P.
Brodie, Walter M.
Burfeind, J. H.
Burlingame, E. E.
Butters, Charles.
Campbell-Johnston R. C.
Carpenter, Franklin R.
Cary, J. Stockly
Cazin, Franz.
Chandler, W. H.
Channing, J. Parke.
Chanute, O.
Chatard, Thomas M.
Clark, C. H.
Clark, Ellis.
Clement, Victor M.
Collins, J. H. & Sons.
Comstock, Theodore B.
Constant, C. L.
Courtis, Wm. M.
Cramer, Stuart W.
Darling, L. B.
De la Bouglise, Geo.
Dewey, Frederic P.
Dickerman, Aiton L.
Donald, J. T.
Emmens, Stephen H.
Endlich, F. M.
Everette, Dr. W. E.
Farish, John B.
Farish, Wm. A.
Fearn, Percy L.
Fisk, W. W.
Freeland, Francis T.
Froehling, Dr. Henry.
Fulton, Henry.
Furlonge, W. H.
Furman, H. Van F.
Genth, F. A., Jr.
Godfrey, W. S.
Goudie, James H.
Hahn, O. H.
Hall Bros.
Hammond, John Hays
Hampton, W. Huntley
Hardman, John E.
Hastings, John B.
Hedburg E.
Herndon, J. H.
Hofman, Ottokar.
Hollbaugh, J. R.
Hollis, H. L. & Co.
Hooker & Lawrence.
Hunt & Robertson.
Jennings, E. P.
Jones & Jones.
Kendall, E. Dwight
Kennedy, Julian.
Kent, William.
Kerr, Mark B.
Keyes, W. S.
Kirby, E. B.
Lammers, T. L.
Lavagnino, G.
Ledoux & Co.
Leggett, Thomas H.
Loring, Frank C.
MacTeague, J. J.
Mariner & Hoskins.
Maynard, George W.
McCulloch, E. A.
McDermott & Dufheld.
Modjeski, Ralph.
Moeblus, Bernard.
Moore, Gideon E.
Newberry, W. E.
Nicholson, Frank.
Olcott, Eben E.
Osgood, J. O.
Page, Wm. Byrd.
Parker, R. A.
Penrose & Barringer.
Peters, Edward D.
Phillips, W. B.
Platt, Joseph C.
Poole, Robt., & Son Co.
Porter, J. A.
Potter, William B.
Price, Thomas & Son.
Radford, Wm. H.
Randolph, John, C. F.
Raymond, Rossiter W.
Rickard, T. A.
Ricketts & Banks.
Robinson, G. H.
Rothwell, John E.
Rothwell, Richard P.
Saunders, W. L.
Schwarz, Theodore E.
Shapleigh, W.
Shaw, Thomas.
Skewes, Edward.
Smith, F. H.
Smith, R. C.
Squire, Jos.
Stoiber, E. G.
Taylor & Brunton
Thies, A.
Vandenbergh Lab'tory
Van Slooten, Wm.
Vermeule, C. C.
Vezin, H. A.
Wannemaker, J. F.
Wills, J. Lainson
Wilson, J. Howard.
Woodman, Durand.
Wyatt & Saarbach.
Young & Park.

Engineers' Instruments
Alteneder, T. & Son.
Brandis' Sons.
Bullock & Crenshaw.
Everhardt, J. M.
Gurley, W. & L. E.
Heller, Chas. S.
Keuffel & Esser Co.
Queen & Co.
Woolman, G. S.

Engines
Barr Pump. Eng. Co.
Buckeye Engine Co.
Bullock, M.C., Mfg. Co.
Lidgerwood Mfg. Co.
Morris Co. Mach. & Iron Works.
Orr & Sembower, Inc.
Phil. Eng. Wks., Ltd.
Union Iron Works.
(See Machinery.)

Excavators
Bucyrus Steam Shovel & Dredge Co.
Souther & Co.

Fire-Brick and Clay
Chur, A. T.
Denver Fire-Clay Co.

Forges
Foos Mfg. Co.

Furnaces
Hoskins, Wm.
Moore, S. L., & Son Co.
Pollock, W. B. & Co.
(See Machinery.)

Furniture Office, Etc.
Andrews, A. H. & Co.

Gas Works
Pollock, Wm., B. & Co.
Wood, R. D. & Co.

Gauges, Recording, Etc.
Bristol Mfg. Co.
Everhardt, J. M.

Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.

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

Hotels
The Cochran.
Owen House.
The Shoreham.

Inspection and Tests
Hunt, The Robert W. Co.

Insulated Wires and Cables
Crescent Insulated Wire & Cable Co.
Okonite Co., Ltd.

Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.

Letters Duplicated
King, Albert B.

Lamps, Miners'
Everhardt, J. M.

Locomotives
Hunt, C. W. Co.
Porter, H. K., & Co.
Thomson-Houston International Co.

Lubricants
Dixon, Jos., Crucible Co.

Manganese Steel
Taylor Iron & Steel Co.

Mats, Rubber
New York Belting and Packing Co., Ltd.

Machinery.

Dealers in Mining, Milling, ing and Other Machinery
Acton, John.
Allentown Foundry & Machine Co.
Allis, Edw. P., & Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Bullock, M. C., Mfg. Co.
Carbon Steel Co.
Chicago Iron Works.
Colorado Iron Works.
Contractors' Plant Mfg. Co.
Copeland & Bacon.
Davis, F. M., Iron Works Co.
Dimon & Adams.
Fraser & Chalmers.
Fulton Iron Works.
Griffith & Wedge Co.
Hendrie & Bolthoff Mfg. Co.
Jeffrey Mfg. Co.
Lidgerwood Mfg. Co.
Mechanical Gold Extractor Co.
Mecklenburg Iron Works.
Moore, Samuel L., & Son.
Morris County Mach. & I. Co.
National Electric Mfg. Co.
Oil Well Supply Co.
Orr & Sembower, Incorp.
Penn Diamond Drill & Mfg. Co.
Pierce & Miller Engineering Co.
Pollock, Wm. B., & Co.
Poole, Robt., Son & Co.
Risdon Iron Works.
Scaife, W. B., & Sons.
Sullivan Machinery Co.
Thomson-Houston International Co.
Totten & Hogg Foundry Co.
Trenton Iron Co.
Union Iron Works.
Vulcan Iron Works.
Walburn-Swenson Mfg. Co.
Webster, Camp & Lane Machine Co.

Metal Dealers
Abbott, Jere., & Co.
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Cookson & Co.
Cowles Elec. S. & Aluminum Co.
Eureka Co.
Lewisohn Bros.
Mathison Sm'lting Co.
Orford Copper Co.
Phelps, Dodge & Co.
Picher Lead Co.
Pullman, J. W.

Metallurgical Works and Ore Purchasers' Processes
American Zinc Lead Co.
Baker & Co
Balbach Smelting & Refining Co.
Baltimore Copper Works.
Boston & Colorado Smelting Co.
Cowles Elect. Smelt. & Aluminum Co.
Hallowell, John K.
Kansas City S. & Ref. Co.
Ledoux & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works.
Walburn-Swenson Mfg. Co.

Mining and Land Companies
Atlantic Mg. Co.
Boston & Mont. Mg. Co.
Central Mg. Co.
Copper Queen Mg. Co.
Detroit Copper Mg. Co.
Eureka Co.
Mollie Gibson Con. Mg. & M. Co.
Osceola Con. Mg. Co.
Quebrada R. R. L. & C. Co.
Rose Lee Mining Co.
Tamarack Mg. Co.

Ore Cars
Star Boiler & Sheet Iron Works.

Ore Sacks
Morrison, T. J.

Ore Testing Works
Hunt & Robertson.
Ricketts & Banks.
Snelson, W. H., Assaying & Engineering Co.

Packing and Pipe Coverings
Brandt, Randolph.
Jenkins Bros.
Keasby, Robt.
New York Belting & Packing Co., Ltd.
Wyckoff & Son, A.

Patents
Catlin, Benj. R.

Perforated Metals
Clinton Wire Cloth Co.
Harrington & King Perforating Co.
Mundt & Sons.

Periodicals
Arms and Explosives.
El Minero Mexicano.
Electrical Plant & Electrical Industry.
Financial Times.
Iron & Coal Trades Review.
Indian Engineering.
Weekly Bulletin.

Phosphates
Trenholm, Paul C.

Phosphor-Bronze
Phosphor-Bronze Smelting Co.

Picks, Miners'
Collins & Co.

Pile Drivers
Lidgerwood Mfg. Co.
Bucyrus Steam Shovel and Dredge Co.

Pipes
Drummond, M. J.
Pollock, Wm. B., & Co.
Wyckoff & Sons, A.

Platinum
Baker & Co.

Powder
Ajax Powder Co.
Atlantic Dynamite Co.
Laflin & Rand P. Co.
Macbeth, J., & Co.

Pumps
Barr Pump. Eng. Co.
Blake, Geo. F., Mfg. Co
Boston & Lockport Block Co.
Cameron, A. S., Steam Pump Works.
Jeanesville Iron Wks.
Knowles Steam Pump Works.
Maslin & Son, John.
McGowan, John H., & Co.
Morris Co. Mach. & I. Co.
Pulsometer Steam Pump Co
Stillwell - Bierce Smith-Vaile Co.
Worthington, Henry.

Publications
Allison Coupon Co.
Arms & Explosives.
Bartlett, Wallace A.
Electrical Plant & Electrical Industry
Financial Times.
Iron & Coal Trades Rev.
Patentable Inventions.
Weekly Bulletin.

Pyrites
Adams, W. H.

Quarrying Machines
American Diamond Rock Boring
Ingersoll-Sergeant Rock Drill Co
Rand Drill Co.
Steam Stone Cutter Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co

Railroad Supplies and Equipment
Carpenter, Geo. B., & Co.
Hunt, C. W., Co.
Porter, H. K., & Co
Robinson & Orr.
(See Machinery.)

Recording Gauges
Edson, Jarvis B.

Refrigerating Machines
De la Vergne Ref. Machine Co.

Regulators, Damper, Heat, Etc.
Acton, John.
Eddy Valve Co.
Mason Regulator Co.
Powell, Wm., & Co.

Rock Drills. (See Air Compressor.)

Roofing
Berlin Iron Bridge Co.
Lee Composite Co.
Pencoyd Bridge and Const. Co.
Penna. Steel Co.
Phelps, Dodge & Co.
Scaife, Wm B., & Sons.

Rubber Goods
New York Belting & Packing Co., Ltd.

Sacks, Ore
Morrison, T. J.

Screens
Clinton Wire Cloth Co.
Harrington & King Perforating Co.
Mundt & Sons.
Tyler, W. S., Wire Works Co.
(See Machinery.)

Screen Plates
Harrington & King Perforating Co.

Separators
Harrison Safety Boiler Works.

Shaft Sinking
Poetsch-Sooysmith Freezing Co.

Shoes and Dies
Chrome Steel Works.
Crescent Steel Co.
Pratt & Letchworth.
Reliance Steel Co.
Sargent Co.

Shovels (Steam)
Bucyrus Steam Shovel & Dredge Co.
Souther & Co.

Smelting and Refining Works
Balbach S. & Ref. Co.
Baltimore Cop'r Wks.
Bos. & Colo. Smelt. Co.
Cookson & Co.
Cowles Smelt. & Alu. Co.
Kansas City S. & Ref. Co.
Mathison Smelting Co.
Orford Cooper Co.
Penn Lead Co.
Penna. Salt Mfg. Co.
Penn Smelting and Refining Works.
Phosphor-Bronze
Smelt Co.

Steel Rails, Castings, Drill Steel
Abbott, Jere., & Co.
Allentown Fdy. & Mach. Co.
Bethlehem Iron Co.
Billings & Spencer Co.
Carbon Steel Co.
Chester Steel Cast. Co.
Chrome Steel Works.
Crescent Steel Co.
Moore, S. L., & Sons Co.
Pennsylvania Steel Co.
Pratt & Letchworth.
Reliance Steel Co.
Roberts, A. & P., & Co.
Robinson & Orr.
Sargent Co.
Whitney, A., & Sons.
(See Metal Dealers)

Surgical Instruments
Sargent, A. H. & Co.

Tanks
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Sons.
Star Boiler & Sheet Iron Works.
Williams Mfg. Co.

Telegraph Wires and Cables
Crescent Insulated Wire & Cable Co.
Okonite Co., The, Ltd.

Tents, Wagons, Etc.
Morrison, T. J.

Tools
Billings & Spencer Co.
Pratt & Whitney Co.

Tubes
Oil Well Supply Co.
Pollock, Wm. B., & Co.
Williams Bros.

Tubing-Rubber
New York Belting and Packing Co., Ltd.

Turbines
Allentown Foundry & Machine Co.
James Leffel & Co., The.
Poole, Robt. & Son Co.
Stillwell Bierce & Smith-Vaile Co.

Valves
Acton, John.
Drummond, M. J.
Eddy Valve Co.
Jenken Bros.
Mason Regulator Co.
Sturtevant & Co., B. F.

Ventilators
Pollock, W. C. Mfg. Co.

Vulcanite Emery Wheels
New York Belting and Packing Co., Ltd.

Washers
Milton Mfg. Co.

Waste Oil Filter
Woodhouse, Rawson, United Ltd.

Water Purifiers for Boilers
Stillwell-Bierce & Smith-Vaile Co.

Well Drilling Machinery
American Diamond Rock Boring Co.
Oil Well Supply Co., Limited.
Penn Diamond Drill & Mfg. Co.
Williams Bros.

Wire Cloth
Clinton Wire Cloth Co.
Harrington & King Perforating Co.
Tyler, W. S., Wire Works.

Wire Rope and Wire
Abbott, Jere & Co.
California Wire Works.
Cooper, Hewitt & Co.
Crescent Insulated Wire & Cable Co.
Hunt, C. W., Co.
Phelps, Dodge & Co.
Roebling, J. A., Sons & Co.
Ropeways Syndicate, Ltd.
Trenton Iron Co.
Washburn & Moen Mfg. Co.

Wire Rope Tramway
Brown Hoist. & Convey. Machine Co.
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co
Hunt, C. W., Co.
Lidgerwood Mfg Co.
Roebling, J. A., Sons & Co.
Trenton Iron Co.
Vulcan Iron Works.

Mr. John Richards, the able editor of *Industry*, a San Francisco magazine, says:
"We think Mr. Rothwell's monetary scheme by all odds the most rational one yet presented."
Order a copy of Universal Bimetallism.
See Page 18.

FOR A BONANZA
See the offer that is made on Page XVIII.