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While order has been outwardly restored in the Coeur d'Alenes, and some of the larger mines, such as the Frisco and the Gem, are at work, the situation there is not encouraging. A judicial inquiry is in progress into the Kneebone murder, the attempt to destroy the Bunker Hill & Sullivan mill, and other recent outrages, but its progress is slow and the results are not likely to be satisfactory, owing to the difficulty of securing testimony. The witnesses examined seem to be completely terrorized by the Miners' Union, and it has not been possible so far to secure any who are fully informed as to the matters in hand, or who are willing to tell what they know. Probably no community in America is more completely dominated by such a body of men, and there seems to be no prospect of breaking up the present rule. There can be but one result, and the outlook is for a general closing down of the mines which are still at work, and in the end a complete suspension in this once prosperous mining region.

The reports of the blast furnaces show that the month opened comparatively well. On August 1st there were in blast 136 furnaces, having a capacity of 116,460 tons of pig iron weekly. This shows that the production has recovered from the special wave of depression caused by the coal strike and the railroad strikes and has reached a higher point than it had attained at any time since the business depression began, in June, 1893, with the exception of a short period in April. The number of furnaces in blast has increased by 27, or 25 per cent., and their capacity by 30,260 tons, or 35 per cent., since July 1st. The productive capacity is greater by some 5,000 tons weekly than it was a year ago, in August, 1893, although it is interesting to observe that the number of furnaces is less—136 against 172—than at that time. This is partly due to the fact that a large part of the loss in number is in the charcoal furnaces, generally of smaller capacity than the coke or anthracite stacks. It also shows once more what has been often noted, that it is the larger and better equipped furnaces that are able to keep going in these times of low prices. So far this year comparisons with 1893 have been unfavorable, but we have now reached the point where the depression began to be felt, and future months must show an improvement over those of last year.

The London "Statist" has been making an inquiry into the relative opportunities of accumulating wealth offered by different trades and professions, basing its figures upon the schedules of estates, which in England have to be recorded by the heirs or executors. The class to which the most recently published part of this inquiry relates includes coal operators, iron-makers, engineers and contractors, and taking a list of these extending over several years, it is found that the average amount of wealth in this class has exceeded that of any other with the exception of foreign and merchant bankers. The amount credited to those in the list reached an average of about \$1,200,000 each, while the bankers footed up nearly \$2,600,000 apiece. The lower amount is a very respectable fortune, however, and those who can accumulate that amount to leave behind them ought to satisfy their heirs.

The "Statist's" figures tend to show that there is still in Great Britain, as in this country, an opportunity for success in the coal and iron trades. Of course a large proportion of the wealth computed was inherited; much larger in England than would be the case in this country, where, with perhaps half a dozen notable exceptions, fortunes do not run beyond the third generation. It is unfortunate that the engineers and contractors have been included in this class, since their business is essentially different from that of the coal-miners and iron-masters. Were they included in a separate class in an inquiry of this kind, the result would be very different. Few or no engineers gather large fortunes, or can even be classed as moderately rich men, unless they become contractors also.

After all, the "Statist's" inquiry fails in an essential point. It will show the extent of the accumulations of those who are successful out of a given class, but it does not show the general average of success through the whole class, nor the proportion of total failures. The popular impression, we know, is that "coal barons" and "iron kings" are a successful and wealthy class, but few who are not well acquainted with the trades know how very small is the proportion, not of conspicuous achievement, but merely of moderate success, and how large a chance of failure the coal operator and the iron-maker have before them.

UNDERGROUND PHOTOGRAPHY.

In this week's issue we commence in supplement form a series of photographs of underground workings which will be of both interest and value to our readers. The first series will consist of illustrations of the Cornwall tin mines, and following these will be others of mines in this country and abroad. In order to make this series as complete as possible, we shall be glad if any of our readers who have photographs of underground workings will send them to us so that, if suitable, we may make use of them.

Underground photography is a subject full of interest to both the professional man and the layman, but owing to the unusual difficulties to

be overcome in order to secure successful results it has not received the attention which it deserves. Many of the attempts made have proved dismal failures and discouraged further trials. The absorption of light by the walls, the tendency to flatness in near objects, and absolute lack of detail in the shadows are hard to avoid without specially designed apparatus, but care in choosing the position of the camera relative to that of the light, aided by a display of good judgment in exposing, will accomplish much. Since in the majority of cases the object is stationary, it is possible with one lamp to throw the light from different places, flashing it at one point, then walking to another and flashing there. With the improved double-coated plates there is little danger of halation, the only thing to be avoided in the second or subsequent exposures being the smoke arising from the combustion of the magnesium.

In order to add to the knowledge on this subject, we shall be glad if those who send us photographs will furnish with them a brief description of the method used in securing them, the time of exposure, kind of lens, camera and plates used. This information will give many points which will be helpful to all who may undertake such work.

THE MINERAL PRODUCTION OF THE UNITED KINGDOM.

In the "Engineering and Mining Journal" of April 28th last we published from advance sheets the general statement of the output of the mines of Great Britain for the year 1893. The "Blue Book" has now appeared, giving the full reports, and we find in it some information not contained in the advance statement, which is of much interest. The tables in our former article need not be reproduced here.

The values of the total mineral produce of the United Kingdom are given in the report by divisions as follows:

	1891.	1892.	1893.
Eng'nd.....	£65,334,539	£58,476,040	£49,932,012
Wales.....	15,064,012	13,572,812	11,211,528
Scot'land.....	10,356,154	9,837,740	9,577,085
Ireland.....	394,233	387,128	170,396
Isle of Man.....	69,194	77,010	65,600
Total.....	£91,238,632	£82,350,760	£70,767,611

The total decrease in values shown by this statement was £11,583,109, or 14 per cent. Of this decrease no less than £10,240,643 was in coal, the decrease in the quantity being 17,461,076 tons. We referred at some length, in the article above cited, to the causes of this reduction in output, chief among them being the long strike in the Midland region. It is somewhat surprising, when we recall the high prices of coal during the continuance of the strike, to find that in this report the average price given is considerably less in 1893 than in 1892, being 6s. 9d. (\$1.62) per ton at the colliery last year, against 7s. 3d. (\$1.74) in the preceding year.

It may be noted here, however, that the question of average values is usually the weak point in a report of this kind. The average prices are often, indeed, very difficult to determine, and we may add also that there is very often but little care taken to determine them correctly. Experience has shown us that the table of values in an official report is always to be accepted with caution, more especially if the producers' statements are accepted in compiling, as they very commonly are.

Another addition to our former table, which gave the output of the mines only, is found in the statement of the metals obtained from ores by smelting, which is as follows, the values given being at the "average market price":

	1892.		1893.	
	Quantity.	Value.	Quantity.	Value.
Antimony.....Cwts.	51	£116	nil	
Copper.....Tons.	436	24,740	425	£27,522
Gold.....Oz.	2,835	10,511	2,309	8,691
Iron.....Tons.	4,041,178	10,406,083	3,973,694	9,353,797
Lead.....Tons.	29,580	317,673	29,618	292,442
Silver.....Oz.	271,359	44,393	274,100	40,637
Tin.....Tons.	9,270	894,753	8,838	788,741
Zinc.....Tons.	9,349	203,536	9,284	167,770
Total values.....		£11,902,371		£10,649,610

The tons and hundred weights given are, of course, the British standards of 2,240 and 112 lbs. respectively.

It is to be noted that the pig iron given in the above table is only that made from British ores, and is not the entire output of the British furnaces. As we have already noted, the total production of pig iron in the United Kingdom in 1893 was 6,977,000 tons, so that 2,998,300 tons were made from foreign ores, of which 4,517,300 tons were imported. As the amount of British iron ore raised was 11,312,675 tons, it would appear from this statement that on an average 2.84 tons of native ore were used in making a ton of iron, while 1.51 tons of foreign ore were consumed to the ton of pig produced. The figures, however, are only approximate, as the consumption may have varied considerably from the imports. The quantity of coal used in the production of pig iron in 1893 was 13,806,700 tons.

As to the other metals, it will be seen that copper, lead and zinc show no material changes. In tin there was a decrease of 432 tons, or about 5 per cent. The production of antimony ceased altogether. It will surprise many to see that the output of gold was over 2,300 ounces; but we have heretofore noted the fact that there are gold mines in Great Britain

with a small but steady output. Taking the returns together, we find that the yield of gold averaged 0.514 ounce per ton of ore raised.

The total metallic production, it will be seen, shows a decrease in value of no less than £1,252,761, or 11.8 per cent., a considerable part of this being due to the lower values given, and the general fall in prices.

THE CYANIDE PATENT LITIGATION.

The long expected series of lawsuits relating to the validity of the MacArthur-Forrest cyanide patents have at last begun. As we noted briefly last week the first suit is that of the Cassel Gold Extracting Company, Limited (owning the MacArthur-Forrest English patents) versus the Cyanide Gold Recovery Syndicate, Limited, of London. It was tried in the Court of Chancery, in London, before Mr. Justice Romer, and lasted from July 24th to July 31st, but the decision is not yet given. The defendant company was formed to work a process invented by Mr. C. M. Pielsticker, of London, which consists in using an electric current to assist the cyanide of potassium in dissolving out the gold from the ore. A patent was applied for by Mr. Pielsticker, but it has never been issued, owing to the opposition of the Cassel company; the object of this action is to prevent the issue of the patent and also to prevent the defendant company from working the process. The plaintiff's case is, firstly, that their patents cover the use of cyanides and cyanogen in any form or combination, and, secondly, that in the defendant's process it is really the cyanide which effects the solution, and that the electric current has no practical action. After the case had gone on five days, and had nearly reached its conclusion, the judge informed the defendants that absolutely no evidence had been given to prove that the electric current assisted the solution in their process, and the defendants, therefore, abandoned this part of their defense, and concentrated their forces on the one important question, that the plaintiff's patents were not valid, owing to previous use and publication, and that every body had a right to use cyanide as a solvent for gold in ores. As we have said already, seven whole days were consumed in arguments and examination of witnesses, and the decision of the judge has not yet been given. Indeed, it is possible that the decision may not be given for some months yet, though every endeavor will be made to pronounce judgment at an early date.

To go through the whole of the evidence would be quite impossible here, and also most unprofitable. Suffice it to say that the witnesses for the plaintiffs included Prof. James Dewar, Professor Roberts-Austen, Lord Kelvin, Prof. E. J. Mills, Professor Crookes, Mr. J. S. MacArthur and Sir Henry Roscoe; while the defendants relied on Mr. Claude Vautin, Mr. R. H. Harland, Mr. Edward Riley, Mr. James Mactear and others.

Absolutely nothing new about the history of the cyanide process was brought to light in the evidence. The article in the "Mineral Industry," Volume I., formed the basis of operations; in fact this book was in the hands of the judge, counsel, witnesses and spectators all through the case. The defendants claimed that the use of cyanide had been known for many years as a solvent for gold both in the laboratory and for gold in ores; that Rae (United States patent 61,866, of 1867) spoke of cyanide being well known as a solvent for gold in ores, but that what he desired to patent was the combination of the electric current with cyanide; that Simpson (United States patent 323,222, of 1885) used cyanide for this purpose combined with carbonate of ammonia. On the other hand, the plaintiffs stated that no evidence could be adduced that cyanide had been known and used by itself as a solvent for gold in ores; they granted that it was known as a solvent for gold under certain conditions, but not as a practical solvent for gold in the ore; that whenever cyanide was described as a solvent for gold in ores in any previous publication it was always in conjunction with some other agent, such as electricity in Rae's patent, and carbonate of ammonia in Simpson's; which fact proved that by itself cyanide was not considered a practical solvent until the time of the MacArthur-Forrest patents.

It will thus be seen that the real point can be narrowed down to this: That the MacArthur-Forrest people were the first to make the process act in practice, and that therefore they are entitled, they say, to their patent, and others say, only to the gratitude of the human race. It was pointed out in the evidence, however, that they did not make the process a success any more than previous inventors had done until they discovered that zinc in the form of shavings was a suitable precipitant for the gold in the solution. Zinc plates had been used before and found unsuitable, so that their invention, consisting of using zinc in the form of shavings, was really the actual cause of the success of the MacArthur-Forrest process.

Metallurgists throughout the world are looking forward with great interest to the judgment, which in all probability will be a very exhaustive history and criticism of the cyanide process. It may be here remarked that Mr. Justice Romer is a man of very high scientific attainments. We have every reason to expect, therefore, that his judgment will be a clear and intelligent one.

NEW PUBLICATIONS.

SANTO DOMINGO: BULLETIN No. 52. BUREAU OF THE AMERICAN REPUBLICS. Washington; Government Printing Office. Pages, 202; illustrated. This volume follows the same general plan as the others issued by the Bureau, giving first a condensed historical sketch, then a brief general description of the country, and finally all the information available as to its people, their habits, methods of doing business and other matters affecting trade. There is also an account of the laws, customs, tariffs and other matters of interest to those who look for trade there. A map and some illustrations complete the work.

MINING ROYALTIES: THEIR PRACTICAL OPERATION AND EFFECT. By Charles Ashworth James. London and New York; Longmans, Green & Co. Pages, 276. Price, \$1.75.

This book is based chiefly on the recent report of the British Commission on Mining Royalties, which was, as such reports are apt to be, a very long document. The author compares the tenures of mining property in Great Britain with those in other countries, especially in the United States. He seeks to show the restrictions which injure the British miner, and to suggest some remedies. As a summary of the report it will be serviceable to English readers, and it will be interesting here as showing how our competitors across the water are affected by the antiquated and involved systems under which their mines are worked.

THE ANIMAL AS A MACHINE AND A PRIME MOTOR, AND THE LAWS OF ENERGETICS. By R. H. Thurston, Director of Sibley College, Cornell University. New York; John Wiley & Sons. Pages 100; illustrated. Price, \$1.

In this little treatise the attempt has been made to gather all the available information regarding the animal as a prime motor, into a volume which will interest the non-professional reader, and also serve as a book of reference for engineers. The book opens with an introductory chapter discussing the laws of energetics and of power production and utilization. This is followed by the discussion of the animal as a machine and prime motor. In this the author treats of the animal structure as a piece of machinery, and shows its sources of energy, the methods of the transfer and of the transformation of energy from its original sources, and the wastes which occur in these processes. Tables are given showing the work done by animals, their best rates, the effect of the variation of speed upon their working power, and the influence of various favorable and unfavorable conditions upon their performance. The best dietaries and the relative values and energy contents of various kinds of foods are also discussed. The book closes with a discussion of some of the unsolved problems of the animal machine; this last chapter seems to us rather vague and fanciful in some of its deductions. Exception can be taken to Dr. Thurston's dietary tables also; but he has presented some facts in an interesting way.

THE SPEED SECRET: A SHORT-CUT TO RAPID WORK IN SHORTHAND AND TYPEWRITING. By "Official Reporter." New York; Excelsior Publishing House. Pages, 58; illustrated. Price, 75c.

This is a very interesting, instructive and valuable little book to all stenographers and typewriters. The advice given in its pages has taken the author 20 years to acquire from practical experience, serving as student, amanuensis, reporter and teacher. The book is divided into four parts: Part I. is intended for students who are thoroughly familiar with their shorthand system; Part II. is arranged to aid office stenographers in attaining sufficient speed for reporting; Part III. embodies a variety of useful information intended for stenographers of all classes; and Part IV. is devoted entirely to the typewriter, its manipulation, etc.

The last seven pages of Part II. contain among other things the opinions and suggestions of several leading stenographers with regard to speed in writing; all of them giving excellent advice concerning this most important branch of phonography—speed.

The illustrations in Part III. show the best methods of holding the pen or pencil in order to acquire speed, and also give the best position of the arm when writing. The author explains in brief the material to be used in shorthand work. He also describes the use of the fountain pen, and claims that pen writing is more legible and less fatiguing than pencil, in which many will agree with him; in a word, the pages devoted to stenography show what rapid progress has been made in this exceedingly useful art.

Part IV., as stated above, treats principally of the typewriter and contains many useful hints and suggestions by expert operators on different machines.

We may say in conclusion that the "Speed Secret" is well worth recognition by stenographers and typewriters in general, and should find a conspicuous place in their libraries.

BOOKS RECEIVED.

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

A Text-Book on Roads and Pavements. By Fred P. Spalding. New York; John Wiley & Sons. Pages 213, illustrated. Price \$2.

Records of the Geological Survey of New South Wales. Volume IV., Part I. Sydney, N. S. W.; Government Printer. Pages 40; illustrated.

Santo Domingo: Bulletin No. 52, Bureau of the American Republics. Washington, Government Printing Office. Pages 202; illustrated.

Fame: A Journal for Advertisers. Volumes I. and II. New York; Artemas Ward. Pages 480 and 320. (Monthly numbers), price \$1 per year.

Annales du Commerce Extérieur. France. Exposé Comparatif pour la Période 1878-1893. Ministry of Commerce. Paris, France; National Printing Office. Pages 232.

Annual Report of the City Engineer of the City of Providence for the Year 1893. J. Herbert Shedd, City Engineer. Providence, R. I.; printed for the City. Pages 100; illustrated.

Annual Report of the Bureau of Industries for the Province of Ontario, 1892. Part VII. Municipal Statistics. C. C. James, Secretary. Toronto, Ont.; State Printer. Pages 160.

Statistique de l'Industrie Minérale en France et en Algérie pour l'Année 1892. Ministry of Public Works. Paris, France; National Printing Office. Pages 236; with maps and diagrams.

Queensland: Annual Report of the Under-Secretary for Mines, for the Year 1893. P. F. Sellheim, Under-Secretary. Brisbane, Queensland; Government Printer. Pages 148; with diagrams.

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 Cyanide Assay for Copper.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In the "Mineral Industry" for 1893, at page 264, I notice that Dr. Peters makes forcible mention of the inaccuracy of the cyanide assay for copper. I presume that Dr. Peters has reference to the ordinary method of cyanide assay as described by Kerl, Mitchell and others. The inaccuracy of this method is too well known to require comment. However, Dr. Peters' statements may prove misleading, and can hardly be passed without comment, as what is now generally known as the cyanide method, at least in the Western States, is the Low method (see "Transactions" of the Colorado Scientific Society, Vol. I, and also "Manual of Practical Assaying," by the writer). This is the method now generally adopted in the West for the determination of copper in ores, mattes, etc., and, the writer believes, with good reason, as the method is extremely rapid and the results are sufficiently accurate for commercial purposes. The only elements liable to be present in ores or mattes which will interfere with the results are arsenic, antimony and silver. Silver is readily removed, or if the amount present is known, which is generally the case, its influence on the result may readily be calculated and the proper correction can be made. While arsenic and antimony may affect the results the same is true of the battery assay. The effect of arsenic and antimony, if present in small quantities, may be disregarded, the greater portion being eliminated as arsenuretted and antimonuretted hydrogen during the precipitation of the copper by the zinc and sulphuric acid. Where large quantities are present they may be removed by prolonging the operation, the greater portion being precipitated by the zinc and remaining insoluble upon subsequent solution of the precipitated copper.

Zinc does not interfere with the results, and as Dr. Peters ascribes to zinc the high results in the case which he mentions, it is to be presumed that he did not refer to the so-called Low method.

DENVER, Colo., July 21, 1894.

H. VAN F. FURMAN.

The Tennessee Coal, Iron and Railroad Company.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: To one honestly interested in the continued advancement of the mining and manufacturing industries of the country it must be a matter of regret that the management and development of a property of vast intrinsic value should be dependent upon a gamble in its stock.

That for a number of years past this has been the unhappy fate of the Tennessee Coal, Iron and Railroad Company is too well known to be questioned. Certainly no company in the United States has so vast and varied mineral possessions: hard on to 80,000 acres in the Warrior, and practically the whole of the Cahaba coal-fields, in Alabama; 50,000 acres of the Cumberland coalfield along the Sequatchie Valley, in Tennessee, including the great Tracy City mines; 100,000 acres in eastern Tennessee, carrying apparently limitless quantities of the Chilhowie (Potsdam) brown hematites; fossil ore deposits near Birmingham and South Pittsburg; 17 blast furnaces, 13 of which are of the most modern type and size; miles of railroad tracks with ample equipment; great coke oven plants, ore and coal mines, foundries, sawmills, machine shops, and the thousand and one necessary accessories to such a gigantic enterprise.

If it choose, it can readily turn out 750,000 tons of pig iron annually. The daily capacity of its Alabama coal mines alone is 12,500 tons; Pratt 6,000, Blue Creek 2,500 (Warrior) and Blocton (Cahaba) 4,000. With present knowledge the Birmingham district can make cheaper iron than any other in the country. With its holdings and in its present physical condition, the Tennessee company ought to come to the very front as one of the great industrial companies of the country.

But will it or can it with its management constantly changing, with its control being tossed about like a shuttlecock, and its destinies at any time in the hands of a few shrewd manipulators of its stock? For a number of years past nearly every annual election has seen a new deal, the old officers thrown out and new ones installed. Enormous losses and indeed positive ruin to many followed in the train. Only a few years since, during the "industrial" boom, its stock was run up to 80, and then depressed to 14, at this writing hanging about 18.

The report for the last fiscal year, by the secretary and treasurer, Mr. James Bowron, is one of the most admirable documents possible, and any stockholder must be unintelligent indeed if he cannot now truly estimate the value of his holdings, provided, of course, that there will be proper management.

These exhaustive tables furnish some interesting information. The outstanding bonded indebtedness of the concern is \$9,154,377, on which there is an annual charge of \$587,872.

The net profits of the most disastrous year, 1893, were \$685,030, which more than covered this. The total capitalization is:

Bonded debt.....		\$9,154,377
Preferred stock.....	\$1,000,000	
Common ".....	20,000,000	
		21,000,000
Total.....		\$30,154,377

The floating liabilities are \$1,179,638, but as against these there are free assets showing an apparent surplus of \$ 33,000.

There is one satisfactory feature about the large bonded indebtedness; a trifling amount only matures this year; \$1,300,000 does not fall due until 1901 to 1904, while the large amount of \$7,500,000 runs until 1910 to 1922. It seems to follow that, with any care and a return of fair business

condition, these obligations can be taken care of without trouble. For 1893, the coal operations everywhere showed a profit, as also iron making at Birmingham and Bessemer, while Tennessee iron making at Cowan and South Pittsburg showed a loss of \$100,000.

The Tennessee conditions are peculiar—the company has in its employ a large number of State convicts under a tight contract, which does not expire for a year or so, and it was found that a lower loss would result by keeping them actively at work, and on this account the furnaces were run. It was practically a compulsory loss, which could not be avoided, and had not the iron market gone steadily from bad to worse this loss might have been a trifling one.

The public can only judge of the ability of the present management from the results reached as shown in the report, but assuming as we must that it is correct, an administration of affairs, that could show in such a year as 1893, a reduction of \$1,200,000 in the floating debt, that nearly if not quite doubled the average monthly output of the furnaces running and as has been lately shown in your columns has introduced economies, improved product and has steadily reduced costs, is fairly entitled to a continuance in power, and yet it is an open secret that at the coming annual election an attempt will be made, and its success is predicted, to make a clean sweep of the present officers and elect a new set. It looks very much as if it were a question of personal pique, and of good salaries, rather than the interests of the stockholders.

It is said that a very large amount of the stock is widely distributed, and that any ones holding or controlling a third can control the election without difficulty. A continuous management, if fairly competent, is infinitely better than a constantly shifting one with its necessarily ensuing demoralization. If the stockholders of this great company are open to a suggestion, it is, that enough of them combine and place their stock in the hands of proper trustees, who for five years at least shall have the voting power. These, defining a steady and proper policy to be pursued, could then, by a proper selection of officers, see that it was effectively carried out.

Such action would in all probability result in a splendid prosperity. Anything short of an avoidance of these constant changes leaves the company the toy and football of manipulators, and the honest stockholder "in the soup."

COMMON-SENSE.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

SUPREME COURT OF MISSOURI.

Construction of Deed.

Where the owner of platted land dedicates the streets to the public, reserving the minerals therein with the right to mine the same, and afterward conveys the abutting lots, merely by number, without reservation, the rights reserved by the deed of reservation pass to the grantees of the lots.—*Snoddy vs. Bolen*, 25 S. W. Rep., 932.

SUPREME COURT OF MONTANA.

Validity of Statute as to Mining Roads.

The provision of the statute for obtaining a road to a mine are not repealed by the article of the Montana Constitution providing that private roads may be opened in the manner to be prescribed by law, but the necessity and damages shall be first determined by a jury, such constitutional provision merely modifying the statutes so far as they provided for such determination by commissioners; as the territorial laws not inconsistent with the constitution remain in force until altered or repealed.—*State vs. District Court*, 37 Pac. Rep., 7.

SUPREME COURT OF ARIZONA.

Right to Lien for Supplies Furnished Owner's Agent.

Where the owner of a mine made a contract with one by which he was to operate his mine for a certain time, and make certain improvements with the privilege of buying it, a certain proportion of the proceeds of the ore was to be paid to the owner, which would be credited on the price in case the agent bought the mine. If he did not buy it, all the payments and improvements were to be forfeited. He made improvements on the mine for which he did not pay, failed to buy the mine, and turned it over to the owner with the improvements. The court held that he was the agent of the owner, under the contract to operate the mine, and that it was subject to a lien for supplies and materials furnished at his request.—*Eaman vs. Bashford*, 37 Pac. Rep., 24.

ALUMINUM AND GLASS.

M. Charles Margot, of the physical laboratory of the University of Geneva, says "L'Industrie," has just made a curious discovery. He has found that by rubbing on glass with an aluminum point we obtain clear metallic lines, which cannot be removed by washing, no matter how often repeated. This property which aluminum possesses, of adhering closely to glass, or in general to any substance having silica as its base, is most plainly shown when the surface is dampened or covered with a very light coat of moisture, as, for instance, when a man breathes upon the surface of the glass. An indispensable condition is that the glass and the aluminum point shall be clean.

M. Margot has arranged a special apparatus for his experiments. He uses a lathe of aluminum, which turns very quickly, and with it he traces designs on the glass. These lines have a bright metallic reflection; polishing with a steel tool gives them the appearance of metallic incrustation. The adherence to the glass is absolute. Without doubt we can, by treating the decorated glass with caustic potash or chlorohydric acid, remove the metal, but the design remains. The lines are clearly fixed on the glass, as if the surface had been corroded by the metal.

It is known that magnesium, cadmium and zinc have similar properties, and that they will leave visible traces on glass. None of these metals, however, possesses this property to the same extent as aluminum, except possibly magnesium. On the other hand, besides the fact that magnesium oxidizes very quickly, the traces which it leaves on glass vanish quickly,

and therefore the metal can be used for this purpose only under special circumstances.

Many applications can be suggested for aluminum in this direction. It can be used instead of the engraver's tool in cutting designs on glass. With the aluminum pencil diamonds can be distinguished from imitation, since it will make no mark on a diamond. It is possible that the new discovery may make a great difference in the making of cut or engraved glass.

THE LODES OF PONTGIBAUD, FRANCE.

Written for the Engineering and Mining Journal, by T. A. Rickard.

In the *Annales des Mines* there has recently appeared a contribution* descriptive of the ore deposits of the silver lead mines of Pontgibaud, in south central France. The author is M. Lodin, mining engineer-in-chief to the French government, and the district which he describes is part of the region rendered well known by Poulett Scrope's classic work on the volcanoes of Auvergne.

Having in former years more than once visited these mines the writer found M. Lodin's treatise deeply interesting; and in the paragraphs which follow he has endeavored to pick out for comment the portions which might be most instructive to those engaged in mining elsewhere.

The first mining done in the Pontgibaud district dates back to 100 years ago. The first systematic work was carried out in 1838 by Pallu & Company. Varying success was encountered until 1850, when the increasing depth of the workings necessitated additional equipment and the consequent expenditure of more capital. English assistance was obtained, and in 1853 the present company was organized under the title of the "Société anonyme des Mines et Fonderies de Pontgibaud." Until 1862 the company met with indifferent success, but the discovery at that time of a large body of ore at La Brousse placed it in a dividend paying position. From 1863 to 1879 the sum of 6,500,000 francs was distributed in dividends.

In 1879 a consolidation was effected with the company working the foundries of Coueron, in the Loire Inferieure, the result of which was to increase the relative importance of the smelting establishments.

The fall in the market price of both metals—lead and silver—has been a severe blow to the profitable exploitation of the mines, but the smelting operations still leave a good margin. In addition to the supply derived from its own territory the company treats the product of certain French mines in the Aveyron and foreign ores coming from Bolivia and Peru. Furnaces of a newer type have recently been erected and the importance of Pontgibaud as a smelting center is steadily increasing.

The town has a picturesque position on the right bank of the river Sioule and is overlooked by the group of volcanic peaks of which the Puy-de-dome, the scene of Blaise Pascal's experiments on the weight of the air, is the loftiest and best known. The river forms an important feature in the geological structure of the district, since its course, approximately north and south, forms the eastern boundary of the mining belt. The region is, roughly speaking, an undulating plateau of crystalline schists. To the west of the river they form the prevailing country rock, to the east of it they are covered by the lava flows extruded by the chain of volcanoes. Though the absence of lodes in the country east of the river may indeed be only apparent because due to their being hidden by the sheets of basalt, yet judging from the evidence afforded by various ravines and other natural geological sections it would appear that the course of the river coincided with the limit of the metalliferous belt.

The area covered by the concessions of the company amounts to no less than 6,273 hectares or about 14,500 acres. The length is about 14 and the width $4\frac{1}{2}$ kilometres.

The crystalline schists at the extremities of the concession are harder than those of the central portion, and though there is no line of division the former can be termed gneiss and the latter chloritic schist. It is considered that the gneiss represents the lower horizon, and this is confirmed by the fact that near Roure, in the southern part of the company's territory, it is seen to overlie massive granite.

No sedimentary rocks older than the Tertiary have been found within the limits of the concession. Late fluvial deposits are represented by several unimportant patches of arkose near Roure, and by the more recent sands and gravels forming beds of alluvium along the valley of the Sioule. The latter are often covered by flows of basalt.

Of eruptives there is a great variety. Two kinds are readily distinguishable: (1) Acid eruptives usually occurring as dikes and of an age anterior to the lode formation; (2) basic eruptives occurring for the most part as lava flows, of an age posterior to that of the lodes whose croppings they often cover. The former or acid type is represented for the most part by granulate or pegmatite, sometimes rendered porphyritic by the presence of large crystals of felspar. The dikes of this rock are very numerous. Their strike is usually between NNE. and NNW. and their thickness varies from a few inches to more than 60 ft. Their general course coincides with that of the mineral belt. In addition to these there are other dikes, but of porphyrite, far less considerable in number and of an age later than the lode formation. Unlike granite, the granulate, which is older than the lodes, the porphyrite does not, therefore, appear to have exercised any influence upon the mineral occurrence and ore distribution.

In the Tertiary period this district, in common with the rest of Auvergne, was the theatre of extensive volcanic eruptions. The lavas extruded were both acidic and basic, their outflows spread over the surface, and though now for the most part eroded in that part of the region which lies west of the Sioule, some patches of them yet remain and often cover the lode croppings.

In the Quaternary further extrusions took place, notably at Chaluset, near the present workings of the Pranal mines. The dying forces of volcanic activity are represented to-day by the mineral springs which have made hydropathic resorts out of Clermont, Royat, and other localities in the department of the Puy de-dome.

Though the mines are fairly distributed over the territory owned by the company, it is possible and convenient to distinguish three principal groups—at Pranal, near the northern end of the concession; at La Brousse, in the central part; and at Roure, at the southern extremity.

*"Etude sur les gites métallifères de Pontgibaud" par M. Lodin, Ingénieur en chef des Mines, "Annales des Mines," Livraison d'Avril, 1892.

The treatise of M. Lodin gives a careful and detailed account of the mine workings and the lode structure which they exhibit. In the description which follows, only the more salient features will be mentioned.

PRANAL.

From 1826 to 1844 this group of mines was the most important in the district. An accident to the pumps caused work to be stopped until 1854, but since this date no interruptions are to be recorded, though the center of operations has shifted as the various lodes have been explored and developed. The maximum depth attained is as yet only 110 meters. Of the many veins which have largely contributed to the ore production the following are the most important:

1. Henri.—Encased in hard gneiss and having a filling of feldspathic rock in angular fragments mixed with quartz and baryta. The silver bearing galena is coarsely crystalline. The lode when productive is from 1 to 1½ meters wide.

2. Saint-Arnaud.—This unites with the lode just mentioned. The gangue is quartz, some baryta and a little pyrite. The fragmentary granulite abundant in the upper workings decreases as depth is gained and becomes replaced by angular pieces of gneiss. This change is coincident with a diminution in the productiveness of the lode. The ore is usually from 30 to 80 cm. wide, averaging 50 cm. The average tenor is 8 to 12% lead, containing 1,600 to 2,500 grams of silver per ton.

3. Amantine.—This intersects the Saint-Arnaud. It also carries a large proportion of fragmentary granulite mixed with baryta, a little quartz and less pyrite. The amount of galena present in the ore diminishes gradually going south, and at the same time the granulite becomes less abundant. At its junction with the Saint-Arnaud the vein loses its granulite; and when it disappears the ore disappears also. The vein penetrates into the gneiss, but the filling becomes barren milk-white quartz accompanied by seams of dark clay.

The average size of the lode is from 0.50 to 1 m. In the old workings near surface the ore averaged 30 to 40% in lead, but this has now diminished to 8%. The lead used to carry 3,500 grams of silver per ton, but this has diminished to 2,500 in the lower workings (70 m. deep).

4. Suzanne.—This unites the lode channel of the Henri with that of the St.-Mathieu, to be shortly described.

The filling is granulite, accompanied by baryta, quartz, blende and pyrite. The fissure of the Suzanne vein does not extend beyond the St.-Mathieu, and shortly before reaching it both granulitic filling and metalliferous lode matter cease to occur. The average size of the lode is 60 cm., the average contents are 8% lead, and carrying 2,500 grams of silver per ton.

5. St.-Mathieu.—This vein has the deepest shaft at Pranal, viz., 110 m. The longitudinal extent of the workings is 1,200 m. The enclosing rock is, as in the case of the other veins, gneiss. The filling is granulite. It occurs in angular pieces, and is intermixed with white quartz, pyrite, blende and galena. Bournonite and tetrahedrite also occur, but sparingly. At both ends of the workings the vein penetrates into the hard gneiss, the feldspathic filling disappears, and the metalliferous contents also. The size of the lode is usually from 60 cm. to 1.20 m. The contents carry only 5 to 6% lead, containing from 1,800 to 2,500 grams of silver per ton.

The network of veins developed by the mines of Pranal has certain well marked characteristics. None of the lodes are of great dimensions, their mineralization is dependent upon the presence of inclosures of granulite, and when the levels follow the fissures into the surrounding hard gneiss, they prove to be barren of ore. The filling is generally hard and compact, and in this respect differs from the veins of La Brousse and Rosier, where on the contrary the brecciated feldspathic matrix usually exhibits the softening effects of decomposition.

A BROUSSE.

This mine has proved to be the richest of the Pontgibaud properties. Its first development was begun at the time of the inauguration of English management. The exploratory work done in 1854 had no noteworthy results and it was not until 1862 that the finding of the outcrop of a new lode led to the subsequent uncovering of an ore body of large extent and great richness. Previous to that date the country intervening between Pranal and La Brousse was practically unexplored. The workings of La Brousse have a longitudinal extent exceeding 1,000 m. while the maximum depth attained is 240 m.

Two large ore-shoots have been developed; of these only the northern outcrops at surface. At the level of the drainage adit the ore had a length of about 250 m. and was rich in both lead and silver. At a depth of 20 m. the length of the shoot had diminished to 150 m. and it is so continued down to 60 m.; then it again began to decrease and at 120 m. was only 40 m. long.

The lode channel is a dike of granulite, from 15 to 20 m. in width. The ore is arranged in two veins both completely encased in granulite, neither touching the mica schist which forms the inclosing country. The footwall vein is the largest of the two and in the upper levels varies from 80 cm. to 1.50 m. in size. The hanging wall vein rarely exceeds 50 cm. Interlacing cross-veins often connect the two ore streaks, and the pay ore then attains a thickness of from 2.50 to 3 m. At the edges or ends of the ore shoot both the width of the granulite dike and that of the two mineral veins inclosed by it diminishes. The latter gradually unite to form a single vein which in turn thins out and is replaced by a small quartz seam accompanied by a little granulite. Finally there remains nothing but a line of parting traversing the chloritic and micaceous schists.

The southern of the two ore bodies of La Brousse did not extend above the 60 m. level. Its maximum length was 300 m. at the 160 m. level. Below this horizon it rapidly diminished in size, and at 200 m. it was not considered worthy of exploitation. The ore occurred in granulite, but in this case it was confined to a single vein, following a narrow dike (1.50 to 2 m. wide) along its footwall contact with the inclosing schist. In both directions, north and south, the workings have been pushed far beyond the ore bearing ground, and it has been found that the granulite gradually thinned out and a non-productive vein becomes encased in hard walls of mica schist.

The association of minerals changes with depth. Near surface the galena has been oxidized and is mixed with a good proportion of cerussite,

pyromorphite and occasional mimetite. At the 20 m. level baryta was abundant, but blende and pyrite were absent.

The average yield of the La Brousse ore was for the two ore bodies, 12% and 6% of lead, respectively. The silver contents were very variable. Near surface the yield is as much as 6 kilos per ton of lead. Most of the silver occurred in certain dark carbonate ore; there was less in the galena and very little in the pyromorphite; at the lower levels the northern ore body gave 5 kilos and the southern 3.50 to 4 kilos of silver per ton of lead. At the 240 m. level the occasional pieces of galena found in an otherwise barren lode contain 1½ kilos of silver.

The lode structure of this mine and the ore distribution both present distinct features which will be discussed later on.

ROURE.

This, the most southern group, is also the most systematically developed of the Pontgibaud mines. The longitudinal extent of the workings is about 1,700 meters, the width of ground explored is about 500 m., and the maximum depth attained 250 m. below the adit.

The oldest workings date to the close of the previous century. The French company (la Societe Pallu) did not do much to prove the value of the mine, and it was not until 1853, under the English management,* that active explorations were commenced.

The mine workings are not only extensive but complicated. There are two main lode channels, known respectively as the veins, Agnes and Virginie. At surface and to the north the distance between them is from 150 to 250 m., but southward they approach to within 70 m. of each other. Their dip is opposite, and they ought to meet between 500 and 600 m. in depth. The average strike is N. 40° E.

1. Saint-Georges.—This was one of the veins first developed. It appears to be a branch of the Virginie. Where it separates from the main lode a very rich ore body was found, but as the distance from the junction increased the ore got poor and thinned out rapidly. The lode consisted of several veins of quartz, galena and pyrite, with a good deal of baryta near the surface, the whole traversing a large dike of granulite. The maximum width of the ore was 4 to 5 m. Its richness was also very noteworthy. Down to a depth of 30 m., the lead contained 4 to 5 kilos of silver; from 40 to 50 m., 2 to 3 kilos, improving temporarily just below this level to a grade of 6 kilos and then falling off again. At 100 m. the contents in silver decreased to 2 kilos per ton of lead.

This ore body was a short one. From surface to a depth of 55 m. it averaged 50 to 60 m. in length, being most extensive at a depth of 20 m. Below 55 m. it diminished rapidly, and at 100 m. it could be worked profitably for only 10 m. in length, the ore having become poor in silver and very quartzose.

This vein contains pyrite in notable quantities. It generally occurs in irregular seams, save at the edges of the ore shoot, where it is massive.

2. Virginie.—This, the main lode of which the Saint-Georges was only a branch, was poor at the junction. A short distance to the south, however, pay ore was found and followed for 150 m. The lode filling much resembled that of St.-Georges, with the exception that the pyrite was present in less quantity and occurred in spots instead of veins. Blende was rarely seen. Baryta, abundant at surface, disappeared completely below 60 m. The lode had a width of 70 to 80 cm., and the filling was, as usual, granulite, together with veins of quartz interpersed with galena. The latter, more often in streaks than massive, had a thickness of from 15 to 30 cm. The silver tenor varied, with a tendency to decrease as depth was gained. At 30 m. the lead contained 4 to 5 kilos of silver; from 40 to 50 m. only 2.50 to 3 kilos.; just below 60 m., 4 kilos.; and at 100 m., only 2 kilos, the galena having diminished very decidedly. The workings on this ore body did not extend below 100 m.; indeed, but little stoping was done below the 60 m. level.

At less than 100 m. south of the workings just described another large ore shoot was discovered many years later. In the barren ground which intervenes between the two bodies of ore the Virginie is represented by a thin vein of granulite, barren of ore and often broken by cross fractures. The second ore body was found in the midst of a network of granulite veins traversing the gneiss. The ore was scattered throughout this stockwork which in places had a width of 30 m. It was extremely productive near the surface and also between the 80 and 100 m. levels. Between 100 and 225 m. there was no ground worthy of being stoped. At 225 m. the lode was quartzose and barren. The gneiss, soft near the surface, becomes very hard in the lower levels. Within the productive area the ore contained 6 to 8% lead, carrying from 3 to 6 kilos of silver per ton. The length of ground stoped reached 200 m.

3. Saint-Agnes.—This, the companion lode to the Virginie, has been immensely productive. The main ore shoot has been developed for a length of 500 m. but it scarcely extends further than 60 m. in depth. It consists of quartzose material, 3 to 4 m. wide, traversing a dike of granulite of much greater thickness. The ore yielded an average of 10% lead, containing 2 to 2.25 kilos of silver. The continuity of the ore shoot was not affected by the irregularities in the course of the lode. While the main body did not, as has been stated, extend below 60 m. yet some stoping was done on patches of ore found down to 80 m. and even 100 m. The ground between the 100 and the 175 m. levels is quite barren. Beneath this again some unimportant spots of ore were found down to 225 m., the maximum depth of the workings.

At the other mines of Micoche, La Grange, Barbecot, Brot, La Combe, La Mothe, Bouzarat, etc., work has been done at various times, but it has been of no great importance and will not concern us at the present time.

(To be continued.)

An Australian Burning Mountain.—At Wingen, in New South Wales, 204 miles from Sydney, is a burning mountain, one of the most remarkable sights to be seen in Australia. It is 1,820 ft. in height, and is supposed to be a large coal seam which has in some unaccountable way become ignited, and has been burning for many years, certainly long before the advent of the white man in this portion of the colony. The course of the fire can be traced a considerable distance by the numerous depressions or chasms occasioned by the falling in of the ground from beneath which the coal has been consumed.

* In 1853 Mr. James Rickard was manager of the mines. He was succeeded, in 1860, by his son, Mr. W. H. Rickard, who is still manager.

THE CYANIDE PROCESS IN THE TRANSVAAL MINES.*

By W. R. Feldtmann.

(Concluded from page 103.)

Having obtained the gold in solution precipitation in the zinc boxes is, as a rule, a simple matter. The only points requiring attention are to keep a sufficient stock of zinc shavings in the compartment and to regulate the flow of solutions so as not to incur danger of the fine precipitate being carried away. The zinc shavings are prepared usually by turning down zinc disks on a lathe. Precipitation of the gold varies somewhat with the different classes of ore. Its completeness appears to depend, in a measure, on a slight excess of cyanide of potassium being present in the solutions. Roughly speaking, it may be said that if solutions leaving the boxes assay more than 2 dwt. per ton the precipitation is not as it should be. This may be owing to the paucity of zinc in the boxes, which should be rectified at once, to too great speed in the flow of the solution, or in a few cases to insufficient cyanide in the solution. The zinc shavings in the boxes may require replenishing every day to replace the amount consumed, or may run a week at a time without requiring attention.

The construction of zinc boxes is shown on Fig. 8. The zinc box consists practically of a wooden launder, fitted with baffle-boards which divide the launder in such a way that solutions are forced to flow upward through the zinc shavings with which the large compartments are filled.

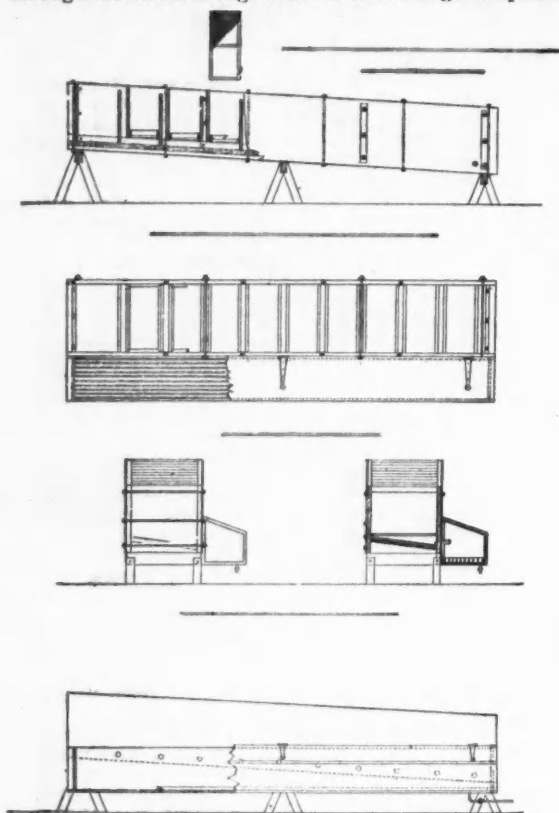


FIG. 8

The top division is advantageously used as a settling tank to collect any sand which may have come through the filter, or a separate settling tank may be used, particularly in plants where solutions are pumped direct from filter vats. The zinc box compartments are fitted with removable trays, consisting of wooden frames supporting wire gauze of about $\frac{1}{4}$ in. mesh. This, while it carries the zinc, allows most of the fine gold precipitate to fall through into the bottom of the box. The filter (launder) shown on the side of the zinc box need not necessarily be attached to same, but may be connected by a small wooden V-launder, with the plug holes in the zinc box compartments. The zinc box sketched is large enough for each 1,000 to 1,500 tons of monthly plant capacity. But although it is generally found best to have at least two zinc boxes to a plant, it is, of course, not necessary to increase the number of them in proportion to the tonnage to be treated. The increase in precipitating capacity can just as well be attained by increasing the width of the boxes.

Having reconverted the gold into metallic form by passage of the solutions through the zinc shavings we have it as a sludgy looking precipitate, commonly known as "slimes," and the next step is to get it into marketable shape. This is done by separating from the zinc, drying, roasting and smelting. The clean-up, which takes place once or twice a month, is conducted as follows: A small amount of clean water is run through the boxes to remove the cyanide solution, which might otherwise be injurious to the workmen. The zinc shavings are taken out, being twisted and scrubbed in the water to remove as far as possible without adhering to them. In some cases there is quite a thick plating on the zinc which cannot well be removed by scrubbing, but this is usually ignored, as the shavings are returned to the boxes any way and this plating will go into the precipitate of the next clean-up. Having removed nearly all the coarse zinc, the precipitate contained in the water is allowed to settle; an addition of a little alum will considerably assist this process. Most of

the clear water is then siphoned or pumped off, and the precipitate together with the remaining small quantity of water is drawn off into a calico or linen filter or a filter press. After drying sufficiently to handle with a scoop the precipitate may be further dried in iron pots and is then ready for roasting and smelting.

The object of the roasting is so to oxidize the greater portion of the zinc, which has, in the form of small chips and shavings, fallen through the zinc-box trays, as to cause it to combine in the subsequent smelting with the fluxes, and leave the bullion fairly fine. Oxidation by the aid of the atmospheric air is sufficient, but a certain amount of the zinc oxide subsequently becomes reduced by the carbon of the plumbago melting pots and re-enters the bullion. A good method of roasting has been found to be the addition of a little niter, say about 3 to 10% to the precipitate. It is best applied as a strong solution before drying the precipitate, so that it gets equally mixed with the whole mass. In the subsequent roasting the niter not only assists by yielding up oxygen to the zinc, but to some extent also appears to flux the zinc oxide, forming zincate of potash, which is not so readily reduced as zinc oxide. In case the precipitate is very sandy—owing to tailings coming through the filters—niter roasting is not so successful, as it tends to cake. By the addition of niter the tendency of the precipitate to dust on stirring up in the roasting furnace is minimized, the amount of flux required in smelting is reduced, and the resulting bullion is better. In roasting the precipitate, care should be taken not to raise the temperature much above a dull red heat (to avoid partially

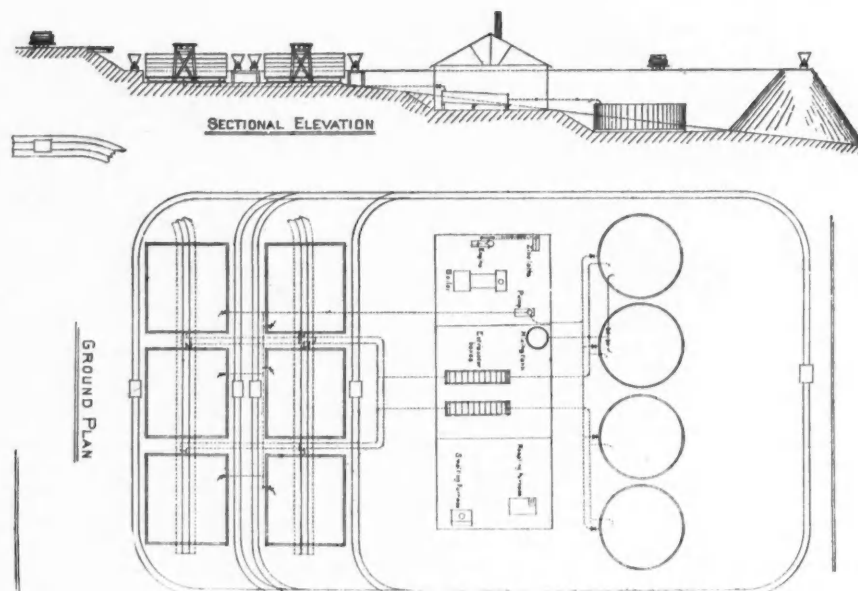


FIG. 9.

THE CYANIDE PROCESS IN THE TRANSVAAL.

fusing it to a pasty mass), and not to stir too violently, especially just at the commencement of the roast, or dusting and consequent loss is the result. The furnace sketched in Fig. 12, will conveniently take 50 lbs. of precipitate at a time.

The precipitate having been sufficiently roasted, the next step is to mix it with suitable quantities of flux, and smelt in plumbago pots. The fluxes commonly used are bicarbonate of soda, borax, and sand. In the case of sandy precipitate, of course, further addition of sand is omitted, and it may be found advisable to add a small quantity of fluorspar. The proportions of fluxes and precipitate vary within very wide limits. For general guidance it may be stated that where much sand is present—which would give a glassy, but thick-flowing slag—the best corrective is more soda, with the addition, if necessary, of a very little powdered fluorspar. For a too basic slag (a dull, lusterless one), which is too stiff, more borax will generally do good.

Precipitate and fluxes are well mixed and charged into the plumbago crucibles. The smelting furnaces which may be constructed to take two or three pots at a time, should be good ones, as the heat required for this first fusion is rather in excess of the ordinary gold melting temperature. After the charges in the pots are run down, more of the mixture may be added from time to time—the whole of a charge, as given above, will go into two No. 35 crucibles—and everything being fused until perfectly liquid, the contents of the pots are poured into molds. Conical-shaped molds are the best suited for this work. The metal settles to the bottom and after cooling may be turned out and freed from the slag by breaking off the latter with a hammer. The several pieces of bullion thus obtained at one clean-up, are subsequently remelted with borax and run together into one ingot. This remelting should be done at as low a temperature as possible, so that the metal may solidify almost as soon as it is in the mold, otherwise liquation results, and it becomes exceedingly difficult to obtain anything like a representative sample of the bullion for assay. The slags, which generally contain a considerable amount of gold in beads, are crushed up and panned, or cradled, to obtain the metal.

* Abstract of paper by W. R. Feldtmann, chemist to the African Gold Recovery Company; published by the Witwatersrand Chamber of Mines.

One of the great bug-bears of the cyanide men on the Witwatersrand has been the treatment of slimes, by which is meant the very fine, or in the case of free-milling ores the clayey, portion of the tailings. Many suggestions have been made for the treatment of these, but the only really practicable scheme so far appears to be to allow them to dry thoroughly and by screening or otherwise to reduce them to a fine powder. This powder is thoroughly mixed with sandy tailings, and the mixture will usually percolate fairly well. The trouble is that if these slimes go into the vats in half-dried lumps they will absorb and yield it up again. There is no chemical difficulty in the way. Another solution suggested is dry crushing and direct treatment of the powdered ore with cyanide.

To economize labor the experiment is being tried of running tailings direct into leaching vats after separating the slimes by means of spitzkasten or similar contrivances. The objection to this is that the tailings run in direct and have a tendency to pack so close in the vats that it is impossible to obtain a thorough contact with the solution.

Many things which have been said about discrepancies between assays and actual returns are probably due to carelessness or incorrect methods in sampling. By the common methods of taking samples we are very liable to obtain an undue proportion of the upper part of the residues and consequently to show a better extraction than has actually taken place.

An important discussion now going on relates to the question of removing the pyrites from tailings by concentration before treating the latter

cient to do all the solution work. In addition to these, at least one Kafir ganger is generally employed.

It is obvious that the expense per ton will be lower in a large plant than a small one. The average total cost of treatment on the Rand is somewhere about \$1 to \$1.13 per ton in large works, treating say upward of 10,000 tons per month, whereas in small plants it may be put down at an average of \$1.50 per ton.

Experiments have been and are being made in the way of obtaining a substitute for zinc precipitation. So far, no great measure of success appears to have attended these efforts, as all other proposed methods seem to be either more expensive or less effective—or both. The objections to the zinc precipitation have been stated to be the troublesome work of cleaning up and smelting the precipitate, and the cost. As a matter of fact, the clean-up is not much more troublesome, if intelligently gone about, than a mill clean-up, and the cost of zinc precipitation, which amounts to 3c. to 6c. per ton of ore treated, will be hard to improve on by any other method.

As illustrating differences in the general design of plants with regard to the relative position of the different parts, three outline sketches are given. In Fig. 9 we have the leaching vats placed highest. The solution gravitates from these through the zinc boxes into storage vats, there to be made up to strength ready for pumping up to leaching vats again. The discharge of tanks is assumed to be done over the side in the sketch.

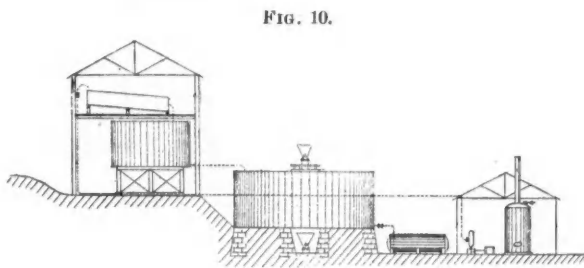


FIG. 10.

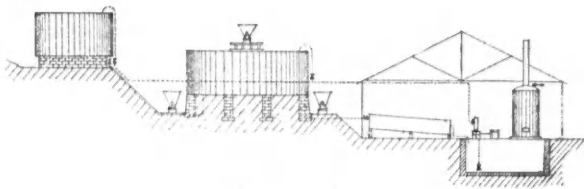


FIG. 11.

THE CYANIDE PROCESS IN THE TRANSVAAL.

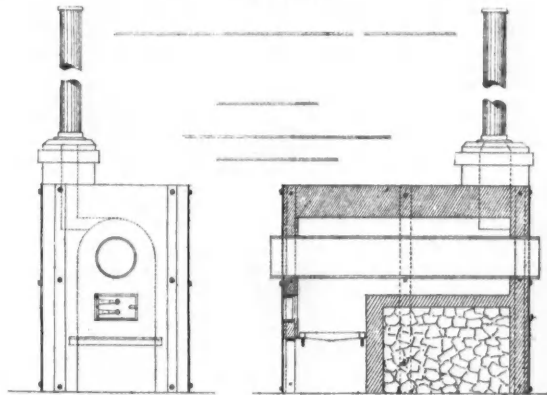
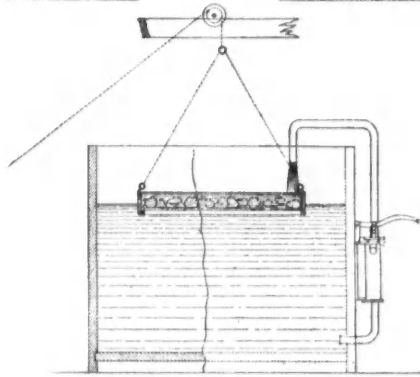


FIG. 12.

FRONT ELEVATION. LONGITUDINAL SECTION.



SECTION OF MIXING TANK AND TRAY.

by cyanide. Some maintain that it must be more economical to treat the tailings as they leave the plates without passing them over any form of concentrator. On the other hand many claim that it is best to collect the pyrites first and subject them to separate treatment, either by cyanide or chlorination. The main question is, of course, whether the gold contained in the pyrites can be extracted by so short a treatment as is ordinarily applied to tailings. It is most probable that the best plan is to be decided in each particular case by experiment. Tests ought to show whether the value of the gold contained in the residues is more than sufficient to cover the cost of concentrating. If it is, it is plain that the preliminary concentration will be of commercial advantage.

The cost of treating tailings by the cyanide process is necessarily determined in large part by local conditions, the nature of the ore treated, and the special facilities for handling the ore. The biggest item of cost is generally for the cyanide of potassium, which probably averages on the Witwatersrand about 48c. per ton of ore treated. A good deal of economy can be effected by a careful chemist in charge of a plant. He must note the nature of the ore, and know when it is necessary to use lime or caustic soda to neutralize any acid present. Further, by keeping solutions of different strengths separate, he must so regulate matters that the last weak wash applied to the ore (in the absence of final water washing) really is a weak wash. Otherwise, of course, a certain amount of cyanide is thrown out of doors with the residues.

Economy in the handling of the ore has to be provided for at the time of the erection of the plant, by a judicious selection of site—especially providing for a good dump for residues—and efficient facilities for filling and discharging tanks. According as those facilities are favorable or otherwise, handling of the ore may vary anywhere from 18c. to 24c. per ton. Wages for white men are comparatively a small item per ton in the various cyanide works on the Rand.

It is important to have at least one man who, whether he has to do the assays or not, possesses at least a rudimentary knowledge of chemistry. For small works, treating say 2,000 tons per month, and given a convenient plant to work, a chemist and one shift man will generally be found suffi-

In the second design the solution is either pumped direct from the leaching vat; or, running into a small sump, or into an air-tight receiver (as shown in Fig. 10), is pumped from there into zinc boxes, and runs thence into overhead storage vats. Having been made up to strength, it is ready to run direct into the leaching vats again. The discharge system indicated is the bottom discharge.

The third design, shown in Fig. 11, is a combination of those shown in Figs. 9 and 10, and is fitted with a pipe service to enable the operator, if desired, to run solution up through the sand in the leaching vats. As shown in the sketch, the plant is designed for side discharge; but all of them could be adapted for different systems of discharge, as may be found advantageous according to local conditions.

The Canadian Sault Ste. Marie Canal.—The new canal on the Canadian side of the Sault Ste. Marie will be opened for traffic in a few weeks. The canal is 13,100 ft. long; depth of water on the miter-sills, 20 ft. 3 in. at low water. The prism of the canal is 152 ft. broad at the water line and 145 ft. at the bottom. Its cost has been about \$3,000,000.

The Australian Iron Industry.—So far nothing tangible has yet resulted from the efforts made during late years to establish the iron making industry in New South Wales, although attention has from time to time been directed to many natural advantages possessed by several districts of the colony, namely, deposits of iron ore, with coal and flux in close proximity. The iron made in the colony at the present time is not from ore but from scrap, and the quantity so manufactured during last year was 2,190 tons, valued at £14,786. The Eskbank Ironworks, where this industry is carried on, are situated at Lithgow, on the western side of the Blue Mountains, and employ about 150 men. In the Broken Hill district there were raised during the year 1,051 tons of iron ore, valued at £1,198. The bulk of this comes from Balaclava, about eight miles from Broken Hill, the rest of it being taken by the Proprietary Company from the outcrop of the lode. It is solely used as flux.

THE PLANE TABLE UNDERGROUND.

Written for the Engineering and Mining Journal, by R. G. Brown.

The use of the plane table for mine surveying seems to have been largely overlooked, though it affords a fairly accurate and very expeditious method of traverse running, and one not requiring a great degree of knowledge or experience to follow successfully. Of course it is not sufficiently close for final determination as to the reaching of an end line, or even for giving directions for a connection between different workings, but in this also it is often valuable. With an apparatus of the kind described below I have frequently seen work that would check very closely with transit lines over the same ground, perhaps exhibiting a maximum error of 2 ft. at the end of a traverse of 1,000 ft., comprising a dozen courses; further, two hours would easily suffice for the survey.

The table used for this had a well oiled pine top, 18 in. long by 14 in. wide. Underneath, at the ends, were rollers $\frac{1}{2}$ in. in diameter and fitted each with a small crank for turning and a ratchet and pawl arrangement for holding in place. The paper, a long strip, was wound on one roller, passed up over the end of the table, which was rounded for that purpose, over the table and down around the other roller, the pawls serving to stretch the paper tight in any position, while allowing longitudinal motion at will. The rest of the apparatus is substantially that of the simple form of plane table, the alidade being of the familiar compass sights form.

The operation scarcely needs describing, except as to a few details. The starting course is taken from the last transit course, or is brought down the shaft by any of the usual methods, according to the conditions: the paper is reeled along by means of the two rollers as fast as the courses approach closely the front end of the table; dimensions of workings are drawn in as the survey progresses. On completion, the work is traced on the mine map, which in this way is kept neat.

MINING AT THE ANTWERP EXPOSITION.

Gold and silver mining are not without representation at the Exposition at Antwerp, which seems to be attracting hardly as much attention as it deserves. South Africa has taken a prominent part there in showing its resources. A stamp mill for crushing gold quartz is in operation, and is attracting a good deal of attention. It has been made at the Erith works of Messrs. Fraser & Chalmers, of Chicago, and it forms part of the exhibit of the Transvaal Republic. The material treated is brought from different mines in the Transvaal; they have altogether 150 tons of quartz, and are working an hour per day. The chief novelty in this mill is in the method of feeding. A new arrangement of the "automatic challenge feeder" has been adopted, in which the whole of the feed apparatus is hung on iron bars, running from the battery posts to the framework of the ore bin, instead of standing on a separate frame. In the "challenge" feeder, the ore falls from the bin on a circular revolving table. An arm from the central stamp of the battery works a lever, which causes this table to turn, so that the delivery of ore is always proportioned to the speed of the battery, which is here set for 92 blows per minute. The ore is crushed wet in the usual manner, and then falls on to an amalgamated copper plate 12 ft. long by 5 ft. wide, and set at an angle of $\frac{1}{4}$ in. to the foot. In the Transvaal the fall is usually rather less; but here it has been increased as an experiment. The mercury on the copper plate takes up the free gold in the mixture, and the remainder passes through troughs to two Frue vanners. The concentrates will be sent to England for treatment, probably also the slimes, if they are found to contain sufficient gold to make it worth while; but the free gold from the amalgamating table will be retorted at the exhibition.

In an adjoining building is the general exhibit of the Transvaal Republic. In the entrance hall are pyramids representing the annual gold export of the country. These are exhibited by the Chamber of Commerce of Johannesburg, and range from 230,189 oz. in 1888 to 1,478,114 oz. in 1893. There are also several other examples of the mineral production of the country, such as coal from different mines, a large block of silver-bearing galena, etc. In the hall on the left are chiefly agricultural products, such as grain and tobacco. There are also good samples of ostrich feathers and ivory, a little timber, and some native curiosities. On the right of the main entrance the exhibits are almost exclusively mineral.

The most interesting is probably a complete section of the Witwatersrand lode near Johannesburg, with samples taken every few yards along the entire length of the lode. Specimens of various descriptions of gold-bearing quartz, of antimony ore and of various descriptions of galena are also shown; but these lose much of their value from the fact that no assay of any of the exhibits has been furnished, and that the explanation on the specimens has only been given in Dutch. A good many specimens of coal are also shown, mostly of poor quality, as is generally the case in the upper seams of a mine. Another very interesting exhibit in the same room is part of the core of a boring put down with a diamond drill at the Witwatersrand, to the depth of 2,442 ft.

The plans of the railway to Johannesburg are also shown. The line commences at Komati Poort, on the Komati River, where it joins the Pretoria & Delagoa Bay Railway, and goes to Leijdsdorp, on the Murchison Range, a distance of 225 miles.

Another interesting exhibit in the grounds is called "The American Gold Mine." It is a model, to the scale of $\frac{1}{4}$ in. to the foot, of the first and bottom levels of the Saratoga Mines, in Colorado. Country rock and ore are in their proper positions, to scale; miners work in the shafts or in stoping, ore trucks run, buckets ascend, and the pump rods rise and fall—in short, the whole work of the mine may be seen at a glance. In the Saratoga mines the tunnels are run under the ore deposit, and the miners work upward, timbering where necessary. The scenery on the surface is a good representation of that part of the Rocky Mountain district, and pumping engines, winding engines and air compressors are all shown to scale. A train of mules conveys stores up a mountain path, and a stamp mill, like the one exhibited by the Transvaal, is working in one corner. A Halliday ropeway conveys the ore to the stamp mill, which is driven by a water-wheel. Between the mines and surface there are figures of 80 men at work, and the model is altogether a complete piece of work.

ABSTRACTS OF OFFICIAL REPORTS.

New Guston Company, Limited; Colorado.

The report of this company for the year ending December 31st, 1893, as presented to the stockholders in London, shows that the total receipts for the year were: Sales of ore, £27,469; miscellaneous, £575; total, £28,044. Against this is charged: Mine expenditure, £25,908; London expenses, £2,168; taxes, exchange, etc., £1,289; ore at mines, January 1st, 1893, £400; total, £29,765. This shows a debit balance of £1,721 for the year; deducting this from the surplus on hand, £3,516, leaves a balance of £1,795 carried forward to the current year.

The directors' report says: "The ore raised and sold to various smelters amounted to 7,280 tons, which realized £27,469, or an average of £3 15s. 6d., against an average of £3 11s. 6d. per ton of 2,000 lbs. realized in the previous year. The average mine cost per ton was £3 11s. 2d., against £2 13s. 8d. incurred in the previous year. On January 1st, 1893, the price of silver was \$0.82½ per ounce. On December 31st it had fallen to \$0.68 per ounce. The tonnage and average sale value of the ore raised, as well as the amount of dividends paid since the formation of the company, are as follows:

Year.	Ore raised, tons.	Av. sale value per ton.	Av. mine cost per ton.	Dividends paid.
1888.....	315	\$360.44	\$53.24	£18,875
1889.....	2,882	130.08	32.20	37,500
1890.....	4,469	108.60	31.84	65,000
1891.....	11,723	69.94	18.69	88,000
1892.....	14,291	17.10	12.88	30,250
1893.....	7,280	18.12	17.08	None
Total....	40,960	Av. \$52.96	Av. \$19.20	£239,625

"The wide variation in the tonnage value of the ores raised and sold is due partly to the decline in the price of silver, but mainly to the change from very high to very low grade ore, the latter especially from the year 1891.

"Instead of contributing to the Silverton Smelting Company the sum of £2,000 in cash and £2,000 in ore, as stated in the circular of November 30th last, it has been found expedient to pay to the company the full sum of £4,000 in cash. The severity of the weather during the late winter occasioned delay in the erection of the smelter. This work is nearing completion, and cable advices of starting smelting operations are daily expected."

Superintendent James K. Harvey says: "Owing to the depreciation in the price of silver, the year under review has been disastrous for silver mining, the New Guston mine in common with other mines having greatly suffered through the unprecedented fall in the market value for silver. In the south drifts, at Nos. 9 and 10 levels, we have frequently found ore carrying free gold. This is a new feature in the mine, as no ore carrying free gold was ever met with in the upper levels. Assays of samples from No. 9 level have given from 2 to 20 oz. of gold per ton; assays of samples from No. 10 level have also given from 3 to 20 oz. gold per ton. Although we do not expect to meet with this class of ore in quantity, it is encouraging for the further energetic prosecution of our developments in depth. A large amount of dead work, necessitating close application and study, has necessarily had to be done in order (1) to discover the cause of the change below the 7th level; (2) to follow up and find the ore break in the lower levels, and (3) to discover the position of the ore within the ore break. This work has been done to the great advantage of the mine. At surface and underground everything is in a high state of efficiency for economical and expeditious working. Respecting the future of the property, the outlook is encouraging, the ore tonnage available for the next shipping season being greater, probably, than it has ever been before in the history of the mine."

VANADIUM IN ARGENTINE COAL.

Written for the Engineering and Mining Journal by William P. Blake.

The discovery of the rare element vanadium in the ash of coal is a surprise to mineralogists and chemists, and deserves more than the very brief mention hitherto accorded it.

In the province of Mendoza, in the Argentine Republic, a lignitic coal is found at San Rafael at an elevation of some 10,000 ft. above the sea. This is the coal which according to Dr. Juan J. J. Kyle, of the National Mint of Argentina, contains vanadic acid. In analyzing this coal, the sample having been sent to him by the Minister of the Interior, Dr. Kyle observed a peculiar appearance of the ash which induced him to make a careful qualitative investigation of it. This showed the presence of vanadium, amounting by a quantitative determination to 38% of vanadic acid.

His discovery was announced in the Argentine Republic, in Scotland and in the "Chemical News." It has also been noted in "Iron," and in Volume II. of the "Mineral Industry," page 574. Samples of the ash and of vanadium compounds made from it were shown in the Argentine section of the Department of Mines and Mining at the Columbian Exposition in 1893, and it is said were promised an award. The word "promised" is used advisedly, for it does not yet appear that any award has been issued. On the return of Commissioner H. D. Hoskold to Buenos Ayres, he published a letter in the "Standard," January 30th, 1894, giving some particulars of the discovery, which led to a consular report upon the subject by our consul, E. L. Baker, recently published by the State Department, Washington (June, 1894). This report includes a copy of a paper published by Dr. Kyle, entitled "Vanadiferous Lignite Found in the Argentine Republic, with Analysis of the Ash." It does not appear when and where this paper was first published, but it is the basis of the following abstract.

The coal is lustrous black, even in powder; very brittle and without fibrous structure; specific gravity, 1.173. It contains 49.51% of volatile substances and 47.81% of fixed carbon, and only 0.63% of ash of a greenish color, which yielded 38.22% of vanadic acid. It was evident by careful tests that only a small fraction of the vanadium was in combination with iron or alumina, and that the greater part of the vanadic acid could be obtained by digestion with warm ammonia solution.

If the vanadium compound is as generally distributed in the coal as in

the small sample analyzed, Dr. Kyle figures that one ton of coal will yield 14 lbs. of pure ash, containing $4\frac{1}{2}$ lbs. of the vanadic pentoxide, of which $3\frac{1}{2}$ lbs. may be extracted by simple treatment of the ash with an alkaline liquor, while the remainder is susceptible of extraction from the insoluble part as in the case of the basic slags of Creusot,* which contain but 1.5%.

It appears that Dr. Kyle has not seen the coal seam, and there is no expert evidence regarding its extent and average quality. There are three mines owned by Dr. Salas and associates. The main seam is reported to be about 3 ft. thick. Samples from other beds yield more ash, but are not proportionately richer in vanadium, which seems to be associated more with the combustible elements than with the earthy part of the coal.

Whether this coal can be utilized as a source of vanadic acid on a large scale is yet to be satisfactorily determined. It is suggested that, owing to the expense of transportation for use as fuel, it could be used for the production of paraffin oil, while the ash would yield the vanadic acid or vanadium compounds; products which would bear the transportation.

The weakest point in the evidence of the existence of commercial quantities of the vanadium is, as already indicated in regard to the sample, whether or not it fairly represents the average of the whole deposit. It is possible that there are local accumulations of the vanadiferous compound deposited in the coal by infiltration in a manner analogous to the

desirable to pulverize the material very fine, 50 revolutions may be added to each cage. From 12 to 15 H. P. is required to drive this mill. The sizes of mills made run from 24 in. to 60 in.

A number of these machines is now in use for disintegrating coal to be used in making coke. The advantages of crushed coal for this purpose are well known, and these machines seem to be very well adapted for this service.

British Iron and Steel Exports.—The total exports of iron and steel from Great Britain for the half-year ending June 30th were 1,202,597 tons, against 1,428,086 tons in the corresponding half of 1893, and 1,277,802 tons in 1892. Imports of iron and steel for the half-year were 135,584 tons, against 128,505 tons in 1893. The iron ore imports amounted to 2,328,488 tons, against 2,196,650 tons in 1893, showing an increase of 6% this year.

The East River Tunnel.—This tunnel, which was recently completed, was built to carry the gas mains of the New York & East River Gas Company under the East River. The location of the tunnel is a straight line a little north of west from the Ravenswood works, between Hunter's Point and Astoria, to the foot of East Seventy-first street, in New York.

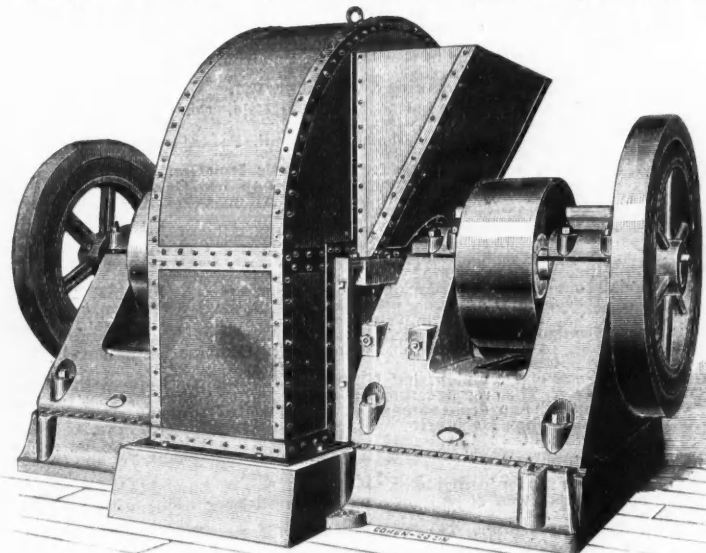


FIG. 1.

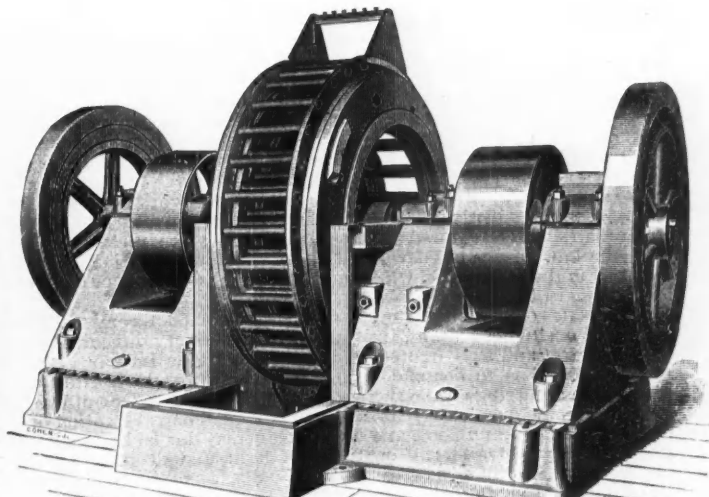


FIG. 2.

THE STEDMAN DISINTEGRATOR.

deposition of silver compounds in the lignites of the Silver Reef sandstone, Utah, or of copper compounds in the lignites of Texas.

A second locality of vanadiferous coal in the Argentine Republic is reported by Mourlot in "Comptes Rendus," CXVII., October, 1893; this is also cited in the "Mineral Industry," Volume II., page 574.

THE STEDMAN DISINTEGRATOR.

The accompanying illustrations show a form of disintegrator which has been used with much success for crushing the softer rocks, clay, coal, coke and similar materials. Fig. 1 shows the machine with the casing over the cages, and Fig. 2 with the casing removed. It consists, as will be seen, of two cages revolving in opposite directions; these are covered by a sheet-iron casing, provided with feed-hopper and discharge. This casing, which fits around the cages, has an extension wing which extends clear down to the base-plate, so that when removed from over the cages they are presented in full view, and it is an easy matter to reach the interior parts. Fastened to the outside revolving cage are two scrapers; the crossbars of these scrapers extend 6 or 8 in. beyond the revolving cages, and revolve close to the iron casing that fits around the cages. This always insures a space of 6 to 8 in. between the cages and casing for a free discharge.

The construction of these cages is such that the grinding can be accomplished with comparatively little power and little wear and tear. They approach in form a conical construction from the center of the shaft to the circumference of the outside cage. The inside row of pins is shorter than the second row, and the third and fourth rows increase in length over the second. This construction leaves no recess between the ring of one cage and the casting of the other, so that any material that works behind the rings being immediately thrown outwardly into the cage beyond, has a free discharge, and the centrifugal force it receives will not permit it to lodge between the ring and casting. This increased clearance allows the material, as it is fed to the cages, to spread and free itself, giving an increased grinding surface as the material works outwardly. The material can be fed irregularly or fast, and it will not choke or clog the mill.

Fig. 2 also shows the construction of the journal bearings. The arrangement for oiling is carefully devised, and the journals are constructed dust-tight, so that there will be no danger of heated bearings.

These disintegrators are manufactured by Stedman's Foundry and Machine Works, Aurora, Ind. In the 36-in. mill shown in the illustration the driving pulleys are 18 in. in diameter for 8-in. belt. The pulley on the hopper side should make from 700 to 750 revolutions per minute, and the opposite one from 600 to 650 revolutions per minute. When it is

It passes under Blackwell's Island, the west and the east channel of the East River. It is 2,541 ft. long, 10 ft. wide and $8\frac{1}{2}$ high in the center of the arch. The tunnel is 135 ft. below the surface and 216,000 cu. ft. of solid matter were taken out of it. Three gas mains, one 48 in. in diameter and the other two 36 in. each, from the generators at Ravenswood will be run through the tunnel to feed the service pipes of the East River Gas Company in New York.

Chinese Rolling Mill.—Consul Jacob T. Child, of Hankow, writes to the State Department as follows: "One of the marvels of this country is the vast rolling mills and arsenals now approaching completion in Hanyan, a city opposite Hankow, on the Han side, erected under the auspices of Chang-Taz Tung, Viceroy of Hupeh and Hunan. The plant covers about 70 acres, with a railroad $1\frac{1}{2}$ miles in length from the Yangtze River to the works, and thence to the Han River, with an incline from the top of the Yangtze bank to the water, where powerful machinery is located to draw the cars up a steep incline of about 300 ft. to the level. The works were designed by an English engineer on a gigantic scale, and in their fitting up nothing but the most modern and improved machinery has been imported, mainly from England. The work was commenced in 1891, and is yet far from completion, as much of the machinery is still in boxes. There are four blast furnaces, two large steam hammers, and rolls, with all their appendages, for manufacturing railroad iron, which is the main object for the erection of the plant. Large quantities of Chinese iron are now in the yard, with some English iron; and coke is being imported from Wales to be used temporarily in the construction of rails, as soon as the machinery can be put in operation, as a test of what it can do. The sheds, covered with corrugated roofing, cover an area of 20 acres. The smelters are of the most improved patterns, and a large furnace is nearly completed for the manufacture of Bessemer steel. The molding and pattern shops are as complete as they can be, and large elevators are placed in various buildings for hoisting material. In fact, if ever finished, it will be one of the most complete rolling mills in the world, as expense seems to have been a secondary consideration in the erection. Once in operation, it is the intention of the Viceroy to manufacture everything in the iron line—ordnance, rails, machinery, small arms, etc. The arsenals are about complete, and machinery will soon be set up for the manufacture of arms and munitions. A number of skilled workmen are now en route here for the purpose of instructing the native artisans and of arranging everything in working order. Should the means of the Viceroy hold out and the plant be successfully operated, it will prove a revelation to the natives of this portion of China, and do much to disabuse their minds of their own infallibility, and convince them of the benefits to be derived from the genius and skill of the foreigner.

* "Comptes Rendus," XCV., pages 42-44.

CORNBISH TIN MINING IN PHOTOGRAPH.

WITH SUPPLEMENT.

The rapid improvement made within recent years in the material and apparatus employed in photography has made this interesting subject an invaluable ally to the engineer in all the various branches of his profession. Thanks to the convenient dry plate, which has succeeded the cumbersome wet-plate method, it is possible to carry for indefinite time the material on which to take a photograph, and the still more recent films and rolls of sensitized celluloid have reduced weight to a minimum. In the cameras there has been as great an improvement, both as to convenience of form and ease of manipulation and weight. The last is one of the most essential features to the engineer, and to it in large measure is due the rapidly spreading use of the camera in professional work in the field as well as in resident duty.

A branch of photography which has received far less attention than it deserves, both because of the unusual difficulties involved, which have caused more failures than successes in the attempts made, and because a comparatively limited number of engineers or photographers has had opportunities to try it, is that of taking photographs underground by means of magnesium light. The early experiments in this direction were made by first focusing on candles suitably placed, and then burning magnesium ribbon by the yard until a sufficiently long exposure have been obtained. These results were seldom good. Even with a strong reflector the light did not penetrate into the background, and the contrasts were either black shadows and high lights without detail, or else, in near objects, absolute flatness, and in addition to this the smoke from the burning magnesium invariably floated in the wrong direction, giving a cloudy obscurity that was most exasperating. The ordinary magnesium flash powder did not offer any material improvement on this, but when the magazine lamps were brought out, with which a steady stream of powder could be blown through a flame of alcohol, producing a light of great intensity, which could be maintained for a considerable period, quite under the control of the operator, and capable of being turned in any direction, so as to illuminate various parts of the subject, the work became easier.

Again, in the sensitive plates used there has been a vast improvement. From plates which required an exposure of one or two minutes in a well lighted room, science has developed plates which require but $\frac{1}{100}$ part of a second in the same light, while in full sunlight $\frac{1}{1000}$ part of a second or less is sufficient.

With plates of this character, rapid lenses, compact cameras and the improved magnesium lamps, it would seem not a very difficult matter to secure perfect and well lighted photographs of mine interiors. But the photographer has to contend with many elements which differ widely from those occurring on the surface, even in interiors. One of the hardest to overcome, particularly in coal mines, is the great absorption of light by the walls, roof and floor, and in consequence the lack of penetration and tendency to give strong contrasts of light and deep shadow in the picture. Other difficulties are those usually found in mines, the awkward position sometimes required and the trouble in carrying safely even the most compactly designed apparatus in wet or steep places.

That all of these may be overcome and remarkably fine results obtained are shown in the series of illustrations which commence in supplement form in this issue of the "Engineering and Mining Journal," entitled "Cornwall Tin Mining in Photograph." These photographs, taken by Mr. J. C. Burrow, one of the best known photographers in England, show how perfect may be the results when the work is properly carried out. In describing the method used, Mr. Burrow says a small sized camera about 4 x 6 in. was found most satisfactory because of its portability. In the matter of lenses, a Zeiss Anastigmat, Series III, was selected, and, for plates, the most rapid which could be secured. In addition to several triple-flash magnesium lamps, an oxy-hydrogen lime light was employed. Exposures varied from two to four seconds, but a second exposure could rarely be made because of the smoke arising from the first one. Many of the trials resulted, no doubt, in failures, but the successes scored are in every way remarkable and full of interest.

Mr. William Thomas, C. E., secretary of the Mining Association and Institute of Cornwall, who accompanied Mr. Burrow while taking these photographs, has supplemented them with an interesting account of the mines and their peculiarities.

Dolcoath mine has been worked so long that even tradition does not give the time of its opening. It is said that prior to 1788 the aggregate product, mostly copper ores, had realized over 2,000,000 sterling, but in that year the mine was abandoned. In 1799 the present company was formed and after expending about £45,000 the mine was again placed in working order. Between that year and 1893 the dividends have amounted to £920,000. In its early years the mine was worked for copper, but later tin was the principal metal extracted, though it has produced also considerable quantities of silver, nickel and cobalt. The mine gives employment to 1,300 hands, and is now being sunk below the 425 fathom level.

Cook's Kitchen mine was so named, so tradition says, from a tinner named Cook, who located the seam and in reply to questions would answer that the lode was as wide as his kitchen. No one knows when the mine was first started, but it has been working without a day's suspension for 150 to 200 years. Few Cornish mines have been more successful as copper producers, but since 1871, when it became a tin producer, operations have been carried on without profit. The mine is about 450 fathoms deep.

East Pool mine was begun in 1834. One of the most notable features about it is that the shareholders, after expending about £3,000, have received over half a million sterling in profits. The mine is operated principally for tin, but copper, arsenic and wolfram are also secured. The mine is about 300 fathoms deep, and furnishes employment for 730 hands.

The illustration, Fig. 1, gives a good general view of the chief mining district of Cornwall. The works in the immediate foreground belong to Dolcoath mine; those in the middle foreground to Cook's Kitchen mine; and in the background to Tincroft mine, Carn Brea mine and East Pool mine. Carn Brea Castle and Monument showing over the hill to the right.

Fig. 2 shows the 180 fathom level in the East Pool mine, where the lode has been worked away for a considerable length and height. Communi-

cation with the levels above and below is had by means of the ladders shown in the illustration or a two-deck cage in the main shaft.

Fig. 3 shows a level in the New East shaft of the Dolcoath mine where some time ago a large amount of rock fell through the old workings, carrying the tram road and everything else with it. In order to maintain communication, heavy pieces of wood were slung with chains from above and lowered to the required point. On these a new tram-road was constructed which is in constant use. The illustration shows the treacherous character of the ground met with in the hanging wall, which frequently gives a good deal of trouble. The lode varies at this point from 20 to 30 ft. in width.

British Coal Exports.—Exports of coal and coke from Great Britain in June were 3,014,455 tons, an increase of 70,536 tons, or 4.4%, over June of last year. For the six months to June 30th the exports were 16,343,060 tons, an increase of 1,833,764 tons, or 12.6%, over the corresponding period in 1893.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

TUESDAY, JULY 31ST, 1894.

- 523,664. Ore Sampler. George L. Hooper, Denver, Colo. Combination of crank and vibrating spout.
- 523,674. Conveyor. Kaletan Michalouckj, Munhall, Pa. Machine of the belt and tray or carrier type.
- 523,680. Process of Winning Metals from Magnetic Iron Ore. Ernest Nienstaedt, New York, N. Y., Assignor of one-half to Leo Goldmark, same place. The process consists in forming pulverized ore into bricks with a suitable flux, and then smelting.
- 523,688. Process of Making Compounds of Iron and Albumin. Oswald Schmiedeberg, Strasburg, Assignor to C. F. Boehringer & Soehne, Waldhof, Germany. Keeping an albuminous substance in solution in presence of an iron salt and an alkali.
- 523,694. Mechanism for Seaming and Colling Sheet Metal. Frank T. Thompson, Cleveland, O., Assignor of one-half to Eustace N. Thompson, same place; E. N. Thompson, administrator of said Frank T. Thompson, deceased. Combination of reels and rollers on frame.
- 523,705. Crane. Alexander Grafton, Bedford, Eng. Combination of barrel, jib and windlass.
- 523,716. Process of Desulphurizing Mineral Oils. Adolph Sommer, Cambridge Mass. The process consists in volatilizing the oil and passing the vapor through anhydrous sulphate of copper, heated to about 130° Cent.
- 523,731. Ore-Sampling Machinery. George D. Potter, Wallace, Idaho, Assignor of five-eighths to Charles M. Whitlaw, same place, and Ernest C. Arnoldi, Spokane, Wash. Combination of double screw conveyor and swinging chute.
- 523,770. Apparatus for Straightening Beams. Johan F. Lundahl, Homestead, Pa. Combination of reciprocating and stationary heads with blocks and anvils.
- 523,774. Ore Concentrator. Thomas C. McCleary, Exeter, Neb. Table of the oscillating type suspended in a frame.
- 523,797. Machine for Pressing Bricks, Tiles, Etc. Jacob Leonhardt, St. Louis, Mo., Assignor to the Columbia Manufacturing Company, same place. Combination of molds with plungers actuated by cams.
- 523,808. Boiler Furnace. William W. Dean, Chicago, Ill. Combination of double grates with a single combustion chamber.
- 523,819. Process of Making Ammonia. Lothar Sternberg, Jersey City, N. J. The ammonia is produced by calcining nitrogenous matter in retorts.
- 523,838. Steam Vacuum Dredger. Levi Hussey, New York, N. Y., Assignor to the Mining and Dredging Power Company, of West Virginia. Combination of pumps, suction pipe and discharge.
- 523,851. Chute for Loading Vessels, Cars, etc. James M. Dodge, Philadelphia, Pa., Assignor to the Dodge Coal Storage Company, Naugatuck, Conn. The chute has movable extensions pivoted together.
- 523,862. Metal Saw. Charles C. Newton, Philadelphia, Pa. Combination of toothed segments forming periphery of the saw.
- 523,868. Steam Generator. Charles H. Preston and William A. Preston, Detroit, Mich. Boiler of the tubular type.
- 523,900. Pump Regulator. William B. Mason, Boston, Mass., Assignor to the Mason Regulator Company, same place. Combination with the main valve of a piston actuated by a diaphragm, which is moved by the fluid passing to the pump.
- 523,901. Boiler Furnace. Zenas E. Moon, Schuyler, Nebr., Assignor to himself, and James S. Standeford, Council Bluffs, Iowa. Arrangement of air-pipes leading to grate and combustion chamber.
- 523,935. Centrifugal Blower. William H. Harrison, Newark, N. J. Fan wheel having a series of diverging vanes.
- 523,938. Crushing and Grinding Machine. William H. Howland, Chicago, Ill. Combination of crushing jaws moved by eccentrics.
- 523,959, 523,960. Dredging Apparatus. Ephraim Chaquette, Bridgeport, Conn. Assignor to the Chaquette Canal and Harbor Dredging Company, same place. Combination of swinging table, cage and frames for carrying buckets.

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 21ST, 1894.

- 15,875 of 1893. Allen and C. Davy, Sheffield. Apparatus for storing molten steel or iron, intended to equalize the products of several furnaces, and so to produce a more constant cast steel or iron.
- 16,151 of 1893. P. J. Worsley, W. Windus and B. Bracey Bristol. Absorbing chlorine gas by first drying it and then passing it through a considerable depth of milk of lime.
- 21,067 of 1893. August Hegener, Kalk, Germany. Round buddies, the improvement consisting chiefly in the manner of introducing and regulating the water.
- 9,535 of 1891. M. Hardscog, Ottumwa, Ia. Miners' Pick. Method of fixing the blade to the ferrule so as to make the blade easily renewable.

WEEK ENDING JULY 28TH.

- 13,227 of 1893. C. J. Bagley and L. Roberts, Stockton. Furnace for reheating steel slabs, placed below the level of the floor; practically an adaptation of the ingot soaking-pit.
- 16,561 of 1893. C. Moldenhauer, Frankfurt-on-Main, Germany. Precipitation of gold from cyanide solution by means of metallic aluminum in presence of an alkali.
- 23,619 of 1893. E. R. Besemfelder, Breslau, Germany. Separation of metals; specially referring to the recovery of strontium from sugar-refining residues.
- 6,983 of 1891. F. Dautzenberg, Crefeld, Germany. Improvements in melting furnaces, the object being to prevent cinders from being run out with the metal.
- 8,028 of 1894. A. Morris, Aberdare. Improvements in miners' safety lamps.
- 10,589 of 1894. P. Gredit, Luxembourg. Recovering ammonia compounds and iodides from blast furnace gases.
- 10,923 of 1894. E. Bertrand and O. Thiel, Klado, Bohemia. Improvements on the mechanical arrangement of the open-hearth furnaces in the "duplex" steel process.

PERSONALS.

Mr Charles Kennedy has been appointed superintendent of the Indiana Iron Company, at Muncie, Ind.

Mr. J. O. Hopkinson, of Llewellyn, Pa., has been appointed manager of the Royal Oak Colliery near Shamokin, Pa.

Mr. William Young, formerly with the Carnegie Steel Company, has charge of the masonry of the new plant now building at Lorain, O., for the Johnson Steel Company.

Mr. John Dowling is now general superintendent of furnaces of the Tennessee Coal, Iron and Railway Company. Mr. H. De Bardeleben, Jr., has immediate charge of the company's furnaces at Bessemer, Ala., and Mr. James Shannon of those at Ensley. Mr. W. L. Johns is superintendent of the Blocton and Blue Creek mines.

Mr. J. R. Hollibaugh, mining engineer, is now engaged in collecting statistics of the production of the lead and zinc mines of southwest Missouri from July 1st, 1893, to June 30th, 1894, for publication in the eighth annual report of the State Mine Inspector. Mr. Hollibaugh has made a specialty during the past few years of statistical work and has accumulated a large amount of valuable information. He is now a recognized authority on lead and zinc statistics by the State and the "Mineral Industry."

OBITUARY.

Franklin Lawton died in New Rochelle, N. Y., on August 4th. In 1849 he went to California, and located in San Francisco, where he became prominent in financial circles. Several years later he helped to found the San Francisco Stock Exchange, of which he became secretary. He held that post until 1869, when he once more returned to New Rochelle.

Gilbert D. Johnson died at Cripple Creek, Colo., on July 28th, aged 74 years. He was well known throughout the Upper Peninsula of Michigan. During the Iron River silver excitement he was in Ontonagon, Mich., and conducted the first actual mining work in that district. He was born in Enfield, N. H. In 1857 he went to the Upper Peninsula, first locating in Marquette, to take charge of the Lake Superior mine. It was he who opened up this property. During the year 1857 Captain Johnson and six men mined 500 tons of ore which was shipped to Marquette in the fall after the completion to that place of the Marquette, Houghton & Ontonagon Railroad. In 1858 Captain Johnson employed a small force to work in that part of it known as the McEncroe pit. During that year they mined and shipped 4,685 tons of ore to Detroit and Cleveland.

SOCIETIES AND TECHNICAL SCHOOLS.

University of Wyoming.—Prof. Knight, State geologist and principal of the Wyoming State School of Mines, and Prof. Nelson, botanist of the State University, with three helpers, are visiting Lander and the Teton basin. They are out collecting specimens for the university museum, and will be out until September.

Technical Society of the Pacific Coast.—The society held its regular meeting in San Francisco, July 6th. Mr. Isaac Tipping, of Victoria, Australia, was elected a member of the society. A technical paper on "High Masonry Dams," prepared by Mr. J. Carroll, was read and filed among the contributions, no discussion following. There was then a discussion directed to the topical question: "Has the time arrived when our patent laws should be abolished or modified to suit the present condition of the mechanic arts?"

At the regular meeting in San Francisco, August 3d, Mr. Robert Stevenson read a paper presenting a "Theory of Centripetal Force," which was generally discussed by members present.

INDUSTRIAL NOTES.

Oliver & Roberts' wire and rod mills, at Pittsburg, Pa., will start up next week, after a close-down of a month.

The Pittsburg Wire Company, Braddock, Pa., is building six annealing pits, which will increase the capacity of the plant.

The Hercules Dynamite Factory, at Lima, O., was demolished by an explosion of dynamite on August 7th. No one was injured.

The Reliance Steel Casting Company, Pittsburg, has put on a number of hands who were laid off recently. The entire plant is now in operation.

Block C of the oxide department of the Lehigh Zinc Works, South Bethlehem, Pa., has closed down, and now the whole oxide department is out of operation.

The American Wire Nail Company, Anderson, Ind., has again resumed operations, putting 400 men to work. The rod department of the works has also resumed operations.

The plant of the Canonsburg Iron and Steel Company has resumed after being idle for some time

making repairs. The new tin mill recently erected by the firm was also put in operation.

The new plant of the United States Glass Company, at Glassport, Pa., on the Monongahela River, where it is the intention to finally centralize all its business, is now completed and ready for operation.

The new plant of the Lincoln Foundry and Machine Company, Pittsburg, is being built as fast as possible. The foundations have all been laid, and work of erecting supporters has been commenced.

The following directors were elected at a recent meeting of the Shenango Valley Steel Company, of New Castle, Pa.: W. E. Reis, W. E. Patterson, George B. Berger, John Stevenson, Jr., and James A. Crawford.

The Clinton blast furnace, Pittsburg, was damaged by an explosion last week, caused by the breaking of the jacket, allowing the molten metal to run out. Repairs will be made at once and operations will be resumed.

The Whittaker Iron Company, Wheeling, W. Va., will soon put in operation at its plant a mill that will manufacture black plates. The company has contracted with the Wheeling Corrugating Company to do the coating.

The Youngstown Iron and Steel Roofing Company, recently organized, has purchased a tract of land at Haselton, O., where it will erect a building 50 x 100 ft. The structure will be frame, covered with corrugated iron.

The Rochester Ammonia Company, Rochester, N. Y., has been organized to manufacture ammonia; capital, \$15,000; directors, W. L. Cole, Theo. Schmidt-born and A. H. Harris, of Rochester, and Harry G. Runkle, of New York City.

On August 20th, application will be made to charter the Brady's Bend Coal and Iron Company, of Kittanning, Pa. A number of Eastern capitalists, together with W. J. Hammond and W. J. Hammond, Jr., of Pittsburg, are interested.

The Siegfried's Manufacturing Company, of Siegfried's Bridge, near Catasauqua, Pa., is at present building a separator, which is to go to Chile, South America, on exhibition in connection with some New York machinery for working gold ores.

The Linden Steel Company, Pittsburg, is in full operation with the exception of the plate mill. The company is just now turning out a large tonnage of open-hearth steel billets and is finding a ready market for the same. It has recently made a shipment of 50 tons of floor plates, ½ in. thick, to New Orleans, La.

S. D. Kimbark, of Michigan avenue and Lake street, Chicago, has just issued a price list of sleigh materials for 1894-95. This book is out in season for early buyers of such goods. It profusely illustrates and describes everything wanted by the sleigh-maker. Copies will be mailed to parties interested upon application.

A Washington dispatch says that the receipts of the Patent Office during the last two months have been lower than at any time for three or four years. The receipts during July of last year were \$88,000, while this year the month's aggregate was \$86,000. In June of this year the receipts aggregated \$90,000, a decrease of about \$1,000 from June, 1893.

The West End Rolling Mill and Chain Works at Lebanon, Pa., have commenced working extra time, owing to the increased number of orders on hand at present. The 16-in. mill of the Pennsylvania Bolt and Nut Works, at the same place, which had been idle since last fall, is now running on double turn. The outlook for future business is encouraging.

The Wellston Iron and Steel Company, a new incorporation of Wellston, O., has recently purchased the Wellston furnace, and will start it up about August 10th on foundry iron. The officers of the company are: J. C. Clutts, president; H. A. Marking, vice-president; L. C. Voglesang, secretary, treasurer and general manager, all of Wellston; and E. A. Hyde, Chicago, general sales agent.

The Youngstown Bridge Company, Youngstown, O., has been awarded the contract for the Pope's Crossing bridge on the Washington & Chesapeake Beach Railroad, and the Black river bridge at Vicksburg, Miss., consisting of 150 ft. draw span, a 50 ft. and 100 ft. fixed span, together with a viaduct approach, also for the steel and iron work for the buildings of the Northwestern Iron and Steel Company rolling mills at Tacoma, Wash.

Out of the eight of the great manufacturing industries of Braddock, Pa., only one is now idle, the Edgar Thomson Steel Works, which includes the converting, bloom and rail departments and the forge. The National Tube Works are now running full. An additional welding furnace was placed in operation this week. The steel mill, which has not been operated for a year, started on August 6th. The company now has more men working, it is reported, than for the past year and a half.

A mortgage on one of the largest machinery plants in the United States was recorded in the Register of Deeds' office at Milwaukee, August 3d. The mortgage was executed by the Edward P. Allis Company to the Northern Mutual Life Company, of Milwaukee. The amount of the mortgage is \$340,000.

It covers all the lots and buildings of the corporation connected with the plant, and is due in five years. The mortgage bears date of July 30th, 1894.

The Western Iron Works at Butte, Mont., have been very busy the past month. This company, at the suggestion of Manager Pinkston, foresaw the coming condition of affairs and laid in a 60-day supply of material, and during the railroad strike there was not a single man laid off. There are orders in at these works for two concentrators from British Columbia: one from the Mountain Chief at New Denver, which will be a largesteam and concentrating plant, and the other of the same size and character for the Leroy Consolidated Company on Trail Creek.

The Lackawanna Iron and Steel Company is dismantling its blast furnace at Franklin Furnace, Sussex County, N. J., and removing the machinery to Cornwall, Pa., where the company, as noted in our columns, recently bought the Coleman iron ore properties. Franklin Furnace, when it was built, some 15 years ago, was one of the largest and most complete blast furnaces in the country. It used anthracite coal for fuel, the ores coming chiefly from McAfee and Pochuck, a few miles distant. It has not been in blast for some time, since the cost of hauling coal to the furnace prevented it from competing with others better situated for a supply of fuel.

The Pittsburg Architectural Iron Works has begun the erection of a new plant at Canonsburg, Pa., which will occupy about seven acres of ground. The foundations for the buildings are being laid by Chas. Trautwein & Company. The plant will consist of a bridge and construction shop 175 x 360 ft., general foundry 75 x 160 ft., blacksmith and boiler house 40 x 100 ft., and pattern and storehouse 40 x 100 ft. All the buildings will be built of iron, and will be fireproof in every detail. The plant will give work to a large number of hands and will be completed and ready for operation in three months. This will make three plants that the company now operates, having one in Uniontown and one in Pittsburg also.

The Southern Exchange Association announces that it has opened an office at No. 23 Park Row, New York, and is ready to begin the work laid out by the recent conference of capitalists and influential Southerners recently held in this city. A proper registration fee, says one of the rules, shall be paid by all corporations, firms and individuals desiring to make use of the association as a means of communication, by indorsement or otherwise, with those whose business and co-operation they seek. The registration fee shall in no case be less than \$1 or more than \$100, and, in addition thereto, the expense attending a proper investigation of the subject, if the latter shall be found necessary. Concerns and individuals offering opportunities for investment or having property to sell or wants to be supplied in the South may register details, for which blank forms will be supplied. Registration will be allowed either with or without investigation by the association. If with investigation the statements will be verified and certified to in the registry books of the association as correct; if without, the statements will be entered in the registry books of the association without certification.

Plans that have been under consideration for some time by the Iron Cliffs Company, owner of the Pioneer charcoal furnaces at Negaunee, Mich., have now been perfected for the erection of a charcoal furnace of large capacity at Gladstone, Mich., says the Cleveland "Iron Trade Review." With considerable stocks of non-Bessemer ores on hand at their mines, which cannot be sold at a profit under present conditions, the company turns to the smelting of the ores in an upper lake furnace of large output, as a proposition offering a possible profit. Gladstone has been selected as the site, owing to advantages offered there, and for the present one stack will be erected. This will be the largest charcoal stack, with one possible exception, in the United States. It is to be built with a view to changing to coke, should that be thought advisable, and it is understood that in the latter event the erection of Otto-Hoffman ovens and the conservation of by-products, as is done in Europe, are part of the plan. Either proposition is an enterprising one in these days, and the development of the project will be watched with interest. It is plain that the only hope for profitable production of charcoal iron in the future is in the operation to its utmost possibilities of a furnace of exceptional capacity, and, in connection with the cutting of timber, the erection of a sawmill to convert into lumber such of the hard wood as is too valuable to send to the charcoal kilns.

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.

The coal miners' strike in Southern Colorado and New Mexico ended on August 6th, the men having returned to work.

The "Derrick's" report gives the following statement of new oil wells completed in the month of July: In the New York, Pennsylvania and West Virginia districts, 319 new wells, with a daily production of 8,747 bbls.; there were 480 new wells drilling July 31st. In the Buckeye district, in Ohio, 233 new wells with 5,637 bbls. production were completed, and 185 new wells are in progress. In the South-eastern Ohio district 23 wells, producing 262 bbls. daily, were completed, and there are 36 wells in progress. The Indiana field reports the completion of 84 wells with 3,530 bbls. production, and 103 new wells under the drill at the close of the month.

The Secretary of the Interior has made an important ruling with reference to mineral lands selected by railroads. When lands have been returned by the surveyor-general as mineral lands a hearing may be had to determine their character. When lands selected by a railroad company are within a mineral belt or proximate to a mineral claim the company will be required to file with the local land office an affidavit setting forth that none of the lands is mineral. The commissioner will cause examination to be made, and if any of the lands are within six miles of a mineral entry a supplemental list will be prepared and the local land office will receive protests or contests within 60 days. The remaining lands will be certified to the department for approval.

ALABAMA.

Cleburne County.

(From our Special Correspondent.)

Active mining operations in the Alabama gold fields at present are being carried on only in this county in the vicinity of Turkey Heaven Mountain. To a great extent the future of Alabama as a gold producer depends on the results obtained by the syndicates performing this prospect work. It is very generally understood that no more work will be done on the thin, lenticularly formed veins, or strata, of highly sulphureted ore in the vicinity of Arbacochee, until a custom chlorinating plant for the treatment of the ore is assured.

Lee Mine.—At this mine, the property of the Cincinnati syndicate known as the Arbacochee Mining and Milling Company, the work of development is progressing very satisfactorily. A drift on the 40-ft. level has been run 121 ft. in ore from 2 ft. to 5 ft. in thickness. Some 80 ft. of this distance shows the ore body to be of the maximum thickness. From the level of this drift an incline has been sunk 20 ft. at the bottom of which the ore body is 5 ft. 6 in. thick, and samples I took from near the hanging and foot walls, also near the middle of the ore body, panned very satisfactorily. The hanging and foot walls of this ore body are more clearly defined than is generally the case in the mines on this belt; while so far as at present determined, the ore body carries gold throughout its entire thickness, which is not usually the case so far as the workings in the different mines have progressed. The extent of the workings at present gives a fair idea of the quantity of ore in sight above the lower level, 60 ft. from the surface on an incline with the dip of the vein. A second drift is being run with the strike of the ore body on that level, and it is the purpose of the management to run a tunnel from the base of the hill, which is about 30 ft. perpendicularly below the bottom of the present incline, which will serve the purposes of draining the mine, as well as for a tram track, to transport ore to the mill which is located near the proposed mouth of this drift tunnel as it will be, because of being run with the strike of the ore body from northwest to southeast. A large quantity of ore has been already mined and stored in ore bins at the mouth of the present tunnel; whence it is at present transported to the mill by wagons, a distance of nearly a quarter of a mile. The plant is furnished with three arrastras; two being 8 ft. in diameter, and one 7 ft. The power to run these is furnished by a 20-H. P. engine and 30-H. P. boiler. The ore is crushed in a Blake crusher before being fed into the arrastras, which, of course, adds to their capacity, because it is crushed fine enough to pass through a 1/2-in. screen, while a large proportion will pass through a 20 or 30-mesh screen. Two of these arrastras are running on ore, and the third will be charged in a few days. The management expects to save \$5 a ton by this process, and run through 6 or 7 tons every 24 hours in each arrastra. If these expectations are realized the present plant will have nearly the capacity of a 10-stamp mill, while the saving of gold should exceed that on plates by amalgamation, because the graphite carried by the ore will interfere with satisfactory results by that method. Should the results as to capacity and amount saved prove satisfactory, then three additional arrastras will be added to the present plant and this made the permanent plant; but should the results by this method prove unsatisfactory in any particular, then tests will be made in search of a satisfactory process.

Lucky Joe Mine.—This mine, owned by the Lucky Joe Mining Company of Cincinnati, O., and of Hightower in this county, after having laid idle for some months is being actively operated again, and the stamps will be dropping on ore before this correspondence is in print. When this company was first organized in April 1893, the management com-

mitted the fatal mistake of erecting this plant before they had prospected the mine sufficiently, consequently the first clean-up was not satisfactory, and work was abandoned; but later, after more extensive prospecting a run was made yielding about 70c. per ton as compared with 50c. from the first run. Prospecting was still carried on and a third run yielded \$1.47 a ton, which was followed by another showing \$2.07 a ton, or sufficient to determine that mining and milling could be carried on at a profit, if the quantity of ore of this grade was sufficiently extensive. The cost of mining and milling, as I am informed by the superintendent, Mr. Loomis, is from \$1.35 to \$1.45 a ton. The capacity of the mill, with 30 mesh screens, as he is now using, being 30 tons a day. A thorough exploitation of this mine a few days since enabled me to determine the principal cause for the failure last summer. It was because, while the vein matter is apparently quite extensive, yet only a limited portion of that at present exposed is mineralized and carries values; consequently a large number of tons of waste material having the appearance of ore was milled, which of course reduced the yield of the ore itself to an insignificant value. The vein matter is a garnetiferous quartzite interstratified with a decomposed talcose slate or schist; and by panning I ascertained that sometimes the value is carried by the quartzite, but more often the decomposed material pans richer results than the quartzite. The workings, consisting of some 300 ft. of drifting, crosscutting and stopping on a level about 50 ft. below the surface, show that the pay ore occurs in chutes or chimneys about 4 ft. wide and from 3 to 4 ft. thick, dipping toward the southeast on about a 30-deg. angle. The course of these ore chutes as far as developed is invariably from north west to southeast, while the strike of the formation is from north to south, with its dip to the east; therefore we find two distinct dips, i. e., the dip of the ore chute to the southeast and the dip of the formation to the east. The footwall of this entire ore body, or immense deposit of vein-stone, has been exposed at a point on the west side, and is a hornblende slate; the hanging wall has not yet been encountered underground, but judging from surface indications it will be exposed about 150 ft. from the footwall. Between these, and almost paralleling each other, occur the ore chutes I have referred to, with apparently one main channel about twice the width of the narrow chutes. In order to mine this pay ore in these chutes, the greatest care has to be exercised to avoid taking out waste material, which in appearance can hardly be identified, so similar is it to the pay ore. The average grade of the ore is low, as the mill yields demonstrate; consequently a comparatively small quantity of waste material reduces the grade sufficiently to prevent profitable operations. An average assay of the tailing dump showed a loss of 40c. a ton in the tailings; therefore this ore, so far as work has progressed, is of the free milling variety. The work at present being prosecuted consists of a crosscut tunnel on the 50-ft. level, which will be extended until the hanging wall is encountered. This tunnel was run 160 ft. from southeast to northwest, and almost to the footwall, when a turn was made to the north and thence to the east, in order to demonstrate the correctness of the theory that these ore chutes occur in a fan-like shape with the center or narrow portion near the point where the tunnel was first started, and the widest portion some distance farther north; hence the reason for the turn from the point near the footwall to the north and east. This theory is based on surface prospecting. A winze is also being sunk from a station to the east of this crosscut, which is expected to develop the main ore chute, as it now appears to be, at depth, and determine its permanency. All the ore chutes developed to the present time are on the west side of this crosscut tunnel, and between it and the footwall; while those exposed by surface prospecting are above or overlapping those already developed.

ALASKA.

Alaska-Treadwell [Gold Mining Company.—The July clean-up is reported as follows: Shipment of bullion, \$52,500; ore milled, 18,874 tons; sulphurets treated, 344 tons. The amount of bullion from sulphurets is not stated. The estimated gross expenses for July were \$17,000, leaving a balance of \$35,500 for the month.

ARIZONA.

Pinal County.

Collins, Mammoth.—Two distinct veins have been opened up in the Hackney and Aaron mines, each averaging about 12 ft. in width. There is now ready for extraction sufficient ore to supply the 50-stamp mill for a few months, and work at the mill is being pushed. Thirty-five stamps are working; the remaining 15 stamps will be started shortly. The Reber amalgamators are in place. Mr. Reber, the inventor of the process, is at the mill personally superintending the working of his machines.

Mohawk Mining Company.—This company is continuing the development of the Mohawk mine, an extension of the Mammoth. The working shaft, says the Tucson "Citizen," is down 320 ft. and stations and levels are being opened up. Steam hoisting works are on the ground and soon will be in place. The machinery for the mill will also soon arrive. Water to supply the mill will be pumped from the San Pedro River, a distance of three miles.

CALIFORNIA.

Mono County.

Bodie Consolidated Mining Company.—At the Bodie mine 130 tons of first-class ore have accumulated, and enough will soon be in hand to start the mill again. A new prospect 2 1/2 ft. wide has been found on the 400 level.

COLORADO.

Clear Creek County.

Alice.—This mill at Silver City is running about 100 tons of ore per day.

Amy C.—This mine is producing ore steadily which is shipped to Denver in carload lots.

Clear Creek Placer Mining Company.—This company has been organized to work the Arthur placer near Idaho Springs.

Lexington.—At this mine, in Idaho Springs, the tunnel is now in 800 ft. Some good ore is being taken out of the shaft.

Silver Age Mill.—During July 41 carloads of ore were treated at this mill.

Silver Queen.—This mine made a shipment last week, the second class running over 4 oz. in gold to the ton.

Custer County.

Bassick Mining Company.—The Bassick mine shut down on Aug. 3d and the pumps were pulled to the 900 ft. level. The shutdown is on account of Judge Hallett's decision, but it is thought it will only be temporary. All the men were paid off.

Geyser.—The management of this property at Silver Cliff will sink the main shaft to a depth of 2,100 ft. Ore stopping will be going on from the 2,000 ft. level at the same time.

Silver Bar.—This mine at Silver Cliff has resumed work.

Eagle County.

Reports from Red Cliff say that placer mining in Eagle County has lately been receiving more attention than for some years past. A. A. McDonald has sold to an Eastern company 400 acres of placer ground in the McDonald mining district, near McCoy, 20 miles from the Denver & Rio Grande station of Wolcott. The company has an option on 600 more acres owned by McDonald.

El Paso County.

Anna Lee.—This property is shipping two cars of ore daily. The Portland continues her regular shipments. There is more ore in sight, it is said, than ever before at any time since the mine was opened up. The Portland company will equip the Bob Tail with a new plant of machinery. The Queen of the Hills, also the property of the same company, is in shipping ore at 85 ft. deep in the shaft.

Blowout.—The ore in this property holds out well with depth, also the Forest Rose, which has improved in the last 20 ft., both in size and grade. The Carolina is also improving in quality, and the vein is much larger. There is now a talc streak of 2 ft. on the hanging wall which mill runs \$27, with 2 in. on foot wall of \$80 ore.

Gold & Globe.—Sampling and chlorination works will be added to this mill at Cripple Creek, which will cost \$40,000. It was decided by the Board of Directors to make the improvements, as it will enable millowners to handle all grades of ore. It is the intention of the company to purchase the ore and handle it exclusively for itself. Work will be commenced September 1st on the new addition. The mill is under the management of W. H. Goudy.

Nellie Bly.—The shaft is down 60 ft.

Portland No. 2, Cripple Creek.—At a depth of only 10 ft. the Portland vein has been uncovered. At the point where it is cut it is said to be 3 ft. wide, all of it ore; 14 in. of it averages 20 oz. in gold to the ton. The new strike is located about 300 ft. southeast of the main shaft on the Portland. It is the intention of Mr. W. Stratton, the principal owner, to develop the property at once.

(From our Special Correspondent.)

Physicians' Mining and Milling Company.—In answer to various inquiries we would say that this company owns two claims, the Thompson and Sir John Bostwick, situated on Little Bull in the Cripple Creek district. The company was incorporated in March, 1893, for \$500,000 in shares of the par value of \$1. The directors are physicians of Denver; a Mr. Madden, a well-known placer miner, is connected with the company. Mr. Joseph Gibbons, of Denver, long connected with mining in the San Juan District, has obtained a lease and bond on the two claims, and is working the Thompson rather vigorously. Thus far no shipments have been made. The claims are well located, being adjacent to the Elkton and Raven mines. No stock has been placed on the local market.

Gunnison County.

Moss Rose.—A large body of high-grade silver ore has been struck in this mine at Gothic. The ore, it is reported, is of the same class as that of the Sylvanite mine. Work is being pushed, and a car of ore will be shipped in a short time.

Jefferson County.

Golden Claim Mining Company.—This company has been incorporated by Eben Smith, C. T. Carnahan, R. B. Estey, Roland Morrison and Charles T. Simberg, with a capital stock of \$100,000, to operate in Jefferson County.

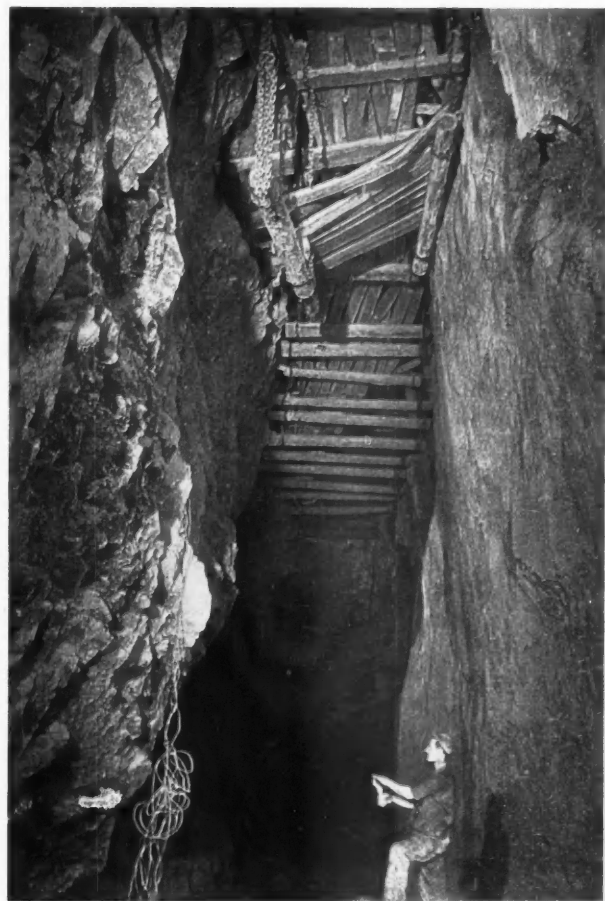
SUPPLEMENT TO
THE ENGINEERING AND MINING JOURNAL, AUGUST 11, 1894.



1. THE CHIEF MINING DISTRICT OF CORNWALL.



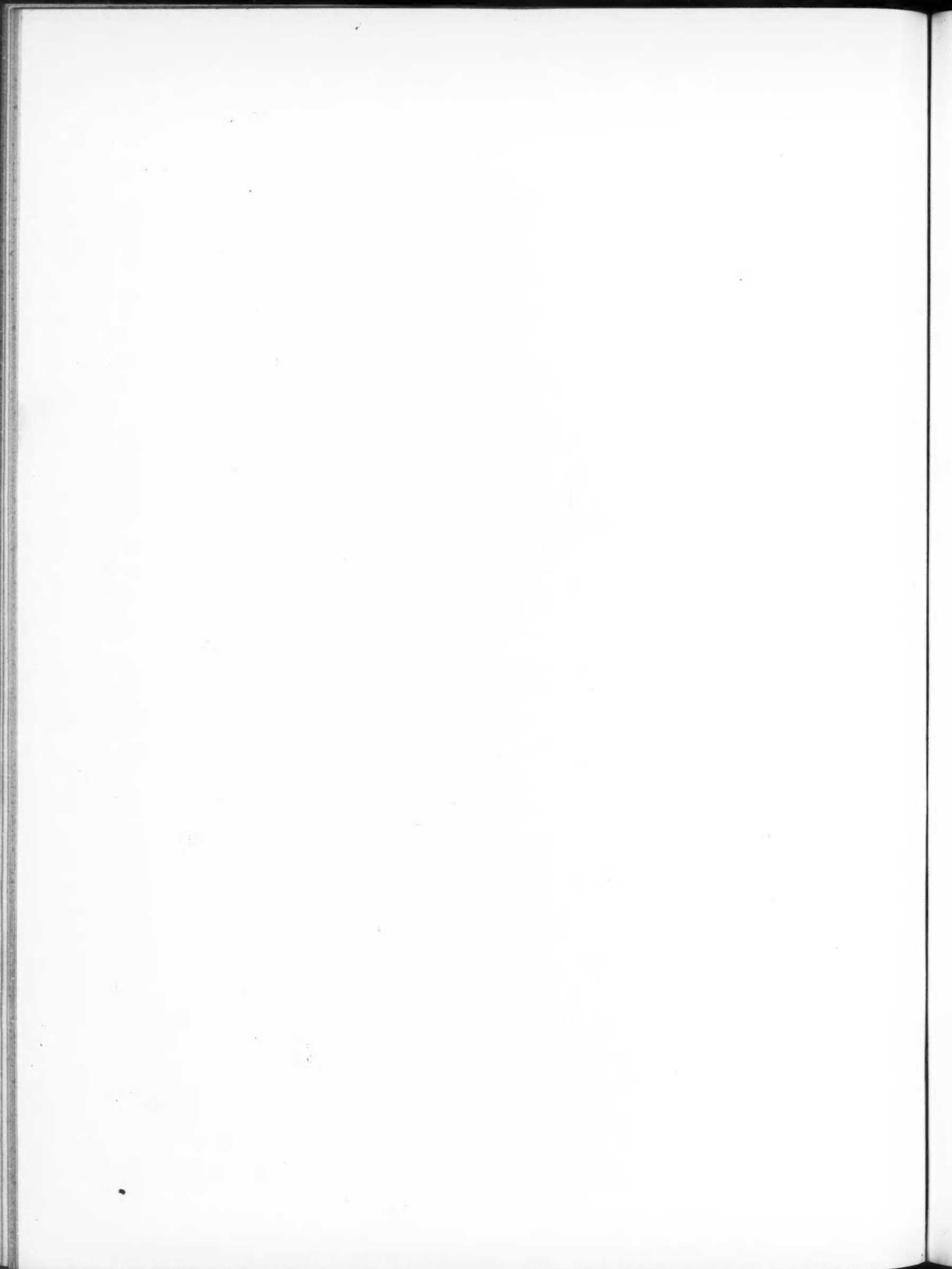
2. THE 180 AT EAST POOL MINE.



3. THE 375 AT DOLCOATH MINE.

CORNISH TIN MINING IN PHOTOGRAPH.

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Lake County.

(From our Special Correspondent.)

Alicante Group.—The vein in the Alicante mine has been drifted on for some 800 ft. The vein shows better returns of gold as depth is reached. It is expected to put up a mill to handle the ore.

Belgian.—As the famous ore chute of the Iron mine extends into this ground, work is being vigorously prosecuted to find this chute, and indications are very favorable.

Elk.—It is said that a combination will take hold of this property, which was at one time extensively operated by Mr. John Campion, considerable valuable mineral being taken out.

Fanny Rawlings.—Amended articles of incorporation filed this week set forth that the capital stock has been increased from \$500,000 to \$1,000,000, consisting of 1,000,000 shares \$1 each, non-assessable stock.

Hibschle.—Development work and the sinking of the S. Small shaft are being pushed. As soon as these are completed shipments will be resumed.

Iron Mine.—Only a few lessees are working and are taking out a small amount of lead ore. Mining men acquainted with the property state that there is a large amount of ore in sight, but it cannot be handled profitably at the present price of silver.

Leadville Gold Output.—The gold output of Leadville shows a steady increase. This is due to the increase of shipments from new lessees along the belt. Considerable new work is being done, and as these properties are all in a well known mineralized area, another six months will see numerous others on the producing list.

Ontario.—Lessees are taking out a good grade of lead ore, carrying about one-half its value in gold.

Reville.—This is a new shaft on the gold belt being sunk by Mayor Nicholson, C. L. Hill and others. It seems probable that a good body of gold ore will be encountered when contact is reached within the next 30 days. The shaft is going down in pyritiferous porphyry.

Triumph.—A company of well-known capitalists has been formed to handle this property in the gold belt, and it is understood that a deep shaft will be sunk with the expectation of catching the rich ore chute of the Ibez.

Welden.—The sinking of shaft No. 2 now in progress is one of the most important enterprises being carried on in the city limits. It is already down 160 ft., and 8 ft. daily is sunk. Machinery has been placed in readiness for water, and it is expected to sink 1,000 ft. if necessary. The surface plant of machinery is good, and cost \$30,000.

La Plata County.

(From our Special Correspondent.)

Ashland.—This old property is being worked under lease and is producing some good tellurium ore. For many years past the property has been idle.

Bulldozer.—A force of men is at work taking out shipping ore, while the old dump is being sorted, and the ore recovered shipped to the Lewis mill for concentration.

Durango Girl.—The last shipment from this property gave a return of 8 oz. gold and 42 oz. silver per ton. Everything being ready for the extraction of ore, the owners expect to continue shipments at the rate of two tons per week.

Indiana.—Work is progressing rapidly and ore sacked that samples high in gold and silver.

Minnie.—The latest discovery in Burnt Timber Gulch is showing a large body of free milling ore, which, after repeated test, gives an average value of \$22.00 per ton. Of this only \$1.50 is refractory, the balance being saved by plain amalgamation. The owners expect to have a mill on their property before winter.

Larimer County.

American Redstone Company.—The redstone quarries at Bellevue, six miles west of Fort Collins, will resume operations upon an extensive scale in the very near future.

Ouray County.

(From an Occasional Correspondent.)

Genesee-Vanderbilt Mine.—The output is 30 tons per day, the ores going to Denver smelters. The force of men employed is 40. The ores carry gold, silver and copper.

National Belle Mine.—The output is 50 tons per day, the ore being sold to matting the furnace at Silverton. The average force employed is 50 men. Copper is the chief product, but the ores carry some gold and silver and occasionally lead.

New Guston Mine.—The present output is 70 tons per day. The high grade ore is sold to the smelter at Durango; the low grade ore is sold to the matting furnace at Silverton. The average force employed is 80 men. Ores carry gold, silver and copper. In the New Guston mine free gold occurs very plentifully in the heavy spar in the lower levels of the mine.

Yankee Girl Mine.—At this mine a force is engaged in sinking the Robinson shaft; little other development work is being done underground.

FLORIDA.

Polk County.

Clear Springs Phosphate Company.—The contract has been let by this company for the construction

of a railroad from the Savannah, Florida & Western railroad to the company's plant, a distance of about two miles.

GEORGIA.

Haralson County.

(From our Traveling Correspondent.)

Camille Mine.—This old property, in which the defaulting State treasurer Burke, of Louisiana, was heavily interested some years since, has, I am reliably informed, been leased. Preparations are being made to pump out the water and thoroughly explore the mine with a view to working it in the near future.

Muscoogee County.

Georgia Quincy Granite Company.—This company will soon open up a new granite quarry near Columbus.

IDAHO.

Alturas County.

Camas No. 2.—Preparations are being made to resume operations at this mine and mill. The pumps will be started as soon as a supply of fuel is secured.

Owyhee County.

The following notes are from the Silver City "Avalanche" of a recent date:

Burro.—Lewis Sorensen found this vein and sold out last summer to Messrs. Callery, Powell & Nette. The new owners started a crosscut tunnel, lower down, and are now nearly in to the vein. This crosscut is some 235 ft. in length and will tap the ledge about 40 ft. deeper than where opened by Sorensen above. The ore taken out by the former owner is rich, but the vein was considerably broken up. It is expected that the new tunnel will find the rock in place.

Christiana.—Messrs. Lewis & Lloyd have bonded this claim of Mikkleson & McElmeel, and are pushing development work. The claim is generally known as the "Young America" and has produced some rich ore. Their bonds extend for 60 days.

Tip Top.—Sixteen men are employed upon this property and ore is being hauled to the Lincoln mill. The mill is being remodeled to work this ore, which is a free-milling gold ore. Battery and table plates and Frue vanners will be used. Wood is being delivered at the mill, which will probably start up about August 15th. All the ore taken out at the mine has been extracted in development work. They are now raising to the surface from the south drift for air. Recently a survey was made in the Mountain Boy, an adjoining claim, to tap an old shaft on the property for air. The connection has now been made. The shaft was full of water and run out of the tunnel like a mill race, but sunk before reaching the mouth. In a very short time water appeared in Tip Top shaft some 300 ft. away, which demonstrates that the ledge is continuous and open. The Tip Top ore is soft, decomposed quartz; requires no blasting.

Trade Dollar.—The July installment due on the Feour ground has been paid. For the month ending July 20th the company shipped about 10 tons of rich concentrates and \$5,000 in bullion. Work in the face of adit tunnel has been discontinued for a few days to allow stopes to be started and chutes erected on the Feour chute of ore.

ILLINOIS.

The miners of Springfield, La Salle, Peru, Oglesby Jones, Seatonville, Ladd and Laceyville, to the number of about 5,000, held a mass meeting near Springfield on August 4th, and with the exception of 200 La Salle miners who signed contracts to return to work on August 5th at the Columbus scale, all voted in favor of prolonging the strike begun last May.

Bureau County.

Spring Valley Coal Mining Company.—A mass meeting at Spring Valley, August 8th, attended by over 1,000 miners, resulted in a unanimous vote to accept the Columbus scale, with several conditions, among which was a demand that all the old employees be taken back, and no discrimination made against any miners for any part they took in the suspension, and that they be not charged rent for the occupancy of houses from April 1st to the time of settlement; that each miner who has a family receive two loads of nut coal in the winter and one in the summer. A committee was appointed to call upon General Manager Dalzell, but he refused to entertain any proposition from them, saying that he had never recognized a miners' committee and never would, but would meet the men in mass meeting whenever he was invited. The miners became angry, and say they will not deal with him further.

La Salle County.

Colville & Pontiac Coal Mining Association.—This company has filed articles of incorporation, with office at Streator. The incorporators are Richard Evans, Richard Evans, Jr., and T. Russell.

Vermilion.

The coal strike at Danville is virtually ended, the operators and miners having reached an agreement by which "shooters" are to be paid \$2.50 a day and shovelers 15c. a ton.

INDIANA.

Clay County.

Brazil Block Coal Company.—This company recently bought a tract of 120 acres in the southern part of the county for \$100 per acre. The land had been tested by numerous borings for coal.

Davies County.

Davies County Coal Company.—This company has been organized at Washington. The directors are W. Kenner, of Washington; F. W. Tracy, of Springfield, Ill.; W. W. Peabody, Jr., J. G. Rawn and W. C. Rogers, of Madisonville, Ind.

KENTUCKY.

Johnson County.

Miller Creek Coal Company.—This company has been organized by J. C. C. Mayo, George C. Perry and others, with office at Paintsville. The company controls an extensive tract in the cannel coalfields of the county.

MASSACHUSETTS.

Norfolk County.

Dedham Granite Company.—Frank Rogers, of Dedham, Rufus Clark and Arthur Rogers, of Hyde Park, Mass., have formed a partnership and leased a large quarry in Dedham to be known under the above name.

MICHIGAN.

Copper.

Allouez Mining Company.—It is reported that the pumps will be stopped, and no more work done for the present.

Calumet & Hecla Mining Company.—This company has declared a dividend of \$5 per share, payable August 30th. The last dividend (of the same amount) was paid May 15th. In its last fiscal year, ending April 30th, three dividends of \$5 each were paid. The present dividend is the first one for the current fiscal year, and comes a month earlier than the corresponding one last year.

Centennial Mining Company.—Mr. A. W. Hoyt, of New York, through his attorney, Mr. Thomas Chadbourn, of Houghton, has commenced a foreclosure proceeding against this company for money due him for the work of exploration he has been carrying on the property for the past year or two, according to local exchanges.

Franklin Mining Company.—Rock from the opening on the conglomerate lode at the 27th level of No. 2 shaft is being taken to the mill, says the Ontonagon "Miner." This is the opening made several years ago which was not then thought rich enough to do much in. This is the lode to open up which the perpendicular shaft is now being sunk.

Tamarack Mining Company.—The new No. 3 shaft has, it is reported, struck the lode at a depth of 4,200 feet. No definite statement has yet been made public, however.

Wolverine Mining Company.—At the annual meeting in New York this week the old directors were re-elected. The statement showed receipts for the year, \$158,507; all expenses, \$145,063; profit, \$13,444. The cost of refined copper at the mine was 76c. per lb.; adding transportation, etc., brought the cost up to 89c. in all.

Iron—Marquette Range.

Cleveland Cliffs Iron Company.—A deal has been closed between W. L. Marble, of Gladstone, and C. J. Merian, of the same place, and P. Mathews, of Escanaba, whereby they dispose of 4,000 acres of land in Alger county and 5,000 acres in Delta county to this company for \$20,000. The company has already commenced the erection of a blast furnace at Gladstone, and coke and charcoal iron will be manufactured. The lands purchased are heavily timbered.

Iron—Menominee Range.

Columbia.—At this mine two new bailers, of capacity of 1,100 gallons each, have been put in, and the work of unwatering the mine is going on rapidly.

Dunn Mine.—This mine is now practically dry and the last bailer has been removed from No. 2 shaft. The work in No. 1 is being directed to the opening of a stope at the end of the 350 ft. drift. This drift extends from the bottom of the shaft southward and recently breasted in clear ore.

MINNESOTA.

St. Louis County.

Bevier Mining and Milling Company.—This company, in the new Rainy Lake district, recently closed its first run on ore from the Little America mine. There were 300 tons worked, and the result gave \$16 per ton in free gold, besides which two tons of concentrates were saved for treatment by smelting.

MISSOURI.

Jasper County.

Western Zinc Company.—Arthur E. Waldron, of New York, and Galen Spencer, of Joplin, have been appointed receivers of this company, of Joplin, suit having been brought by the New York Guarantee and Indemnity Company, because, it is alleged, the defendant company has defaulted in payment of interest on certain bonds.

(From our Special Correspondent.)

Joplin, Aug. 6.

The Joplin correspondent of the "Journal" has remained silent for the past few weeks during which time there has been but little change in the condition of the zinc ore market, the prices having remained at \$16@18.50 per ton, and the smelters have been ready to take all ore offered at that price. The operators are not making any effort to make a large production, and in fact are all running as light as

possible while some mines are giving their whole attention to the production of lead ore, and as soon as zinc ore reaches a price of \$20 to \$22 per ton the large mines are in shape to make an enormous output of zinc ore.

The sale of ore from the mines for the week ending August 4 was as follows:

Joplin mines, 1,443,000 lbs. of zinc ore and 488,000 lbs. of lead, value \$21,990; Webb City mines, 400,670 lbs. of zinc ore and 46,380 lbs. of lead, value \$4,264; Carterville mines, 1,393,030 lbs. of zinc ore and 293,830 lbs. of lead, value \$17,276; Oronogo mines, 43,820 lbs. of zinc ore and 61,250 lbs. of lead, value \$1,506; Carthage, 288,750 lbs. zinc ore, value \$2,116; Zincite, 9,480 lbs. lead ore, value \$175; Spring City, 49,880 lbs. of zinc ore and 15,130 lbs. of lead, value \$680; total value of district, \$44,891.

MONTANA.

Beaver Head County.

Hecla Consolidated Mining Company.—This company on July 25th paid the 127th dividend of 1% (making \$15,000), bringing the total dividends paid up to date to \$1,905,000.

Cascade County.

Castner Coal and Coke Company.—This company has contracted with the United States Coal Washing Company, of Chicago, to put up a coal washing plant of the Lubrig pattern at its mines at Belt. The plant will have a capacity of 250 tons per day. The Castner company will also begin work at once on 100 coke ovens of the beehive pattern. This is the result of tests of coke made from Belt coal, which have been very satisfactory.

Custer County.

Houston Copper Mines.—These mines have been leased by W. A. Clark & Co., of Butte City, and it is understood will be worked this fall and winter.

Granite County.

Royal Gold Mine.—At this mine, says the Phillipsburg "Mail," the mill is not now in operation, as the flow of surface water into the tunnels lately has prevented the extraction of ore. The water is slowly receding, however, and 30 men are now engaged in one way or another in preparations to start the mill at the earliest possible time. The development thus far made consists of 3,000 ft. of tunnels and drifts, and at least one-half of which has been or is now in ore. Everything about the place in the way of permanent improvements shows arrangements for economic operations. A tram road of 1,000 ft. is built from the upper tunnel to the mill, which is operated by gravitation, and the ore is conveyed by it at a cost of less than 3c. per ton. The superintendent is now planning to run the mill, with water power, which can be done about eight months in each year, and that will prove a big saving. Just now Frank Durand is laying in a large contract of wood, and when the mill is again started up there will be nothing to prevent a long run and a greater output than it has yet had.

Jefferson County.

Messrs. Clinton and De Snell are working some rich placer ground a few miles southeast of Woodville. George Oswald of Meaderville has some fine placer ground in the same vicinity.

Lewis & Clarke County.

The following notes are from the Marysville "Mountaineer":

Lode locations were filed recently as follows: Stenderly, Stemple district, Nick Michaels; Fairview, East Fork Skelly gulch, August Oertel et al.

Placer miners are again turning their eyes toward Nevada Creek. Virginia and Trout creeks are also attracting attention and panners are panning the golden sand.

The Tremont Company is now putting in an air compressor at the Hubbard mine. New men are being put at work at the mine and soon stamps will be dropping in the mill.

The Mabel & Lester mining claims, owned by Messrs. Lighthbody and McIntosh, adjoining the Black Diamond on the south, are being developed with promising prospects.

The St. Louis Mining and Milling company is repairing the Big Ox mill and will start it up in a few days on rock from the St. Louis Co.'s mine. Dave Sutton will have charge of the mill.

An additional 100 ft. is being sunk in the Jeanette mine on the Drum Lummon mountain. It is confidently predicted that the rich new Castletown lead will be encountered before the shaft is down 50 ft. more.

Madison County.

Sand Creek Mining and Improvement Company.—Articles of incorporation of this company have been filed to-day with the county clerk and recorder. T. A. Grigg, D. Robertson Barlow and C. H. Sherwood are the incorporators. The objects of the company are to conduct a general mining business, the reduction and smelting of ores and to lease, sell and deal in all kinds of mining property. The capital stock is placed at \$1,000,000, divided into 200,000 shares at a par value of \$5 per share. The capital stock is non-assessable. Operations are to be carried on in Madison County, but the principal office will be in Butte.

Silver Bow County.

In accordance with the law which requires all mining companies to render annual statements to the county assessor of gross and net receipts, ex-

penditures, ore extracted, cost of production, etc., for the purpose of taxation, nearly all companies have made their reports. The Anaconda company, says the Anaconda "Standard," added nearly \$3,000,000 to the taxable values of the county. The statements are for the year ending June 30th, 1894. The following figures show the net proceeds or value in dollars of the mines upon which taxes are paid, the returns of the Anaconda company being about 12 times more than those of all the other mining companies in the district combined:

Anaconda Mining Company	\$2,823,690
Moulton Company	2,605
Colorado Company	217,310
Boston & Montana	15,000
Montana Ore Purchasing Company	15,000
Alice Mining Company	15,000
Original Mining Company	15,000
Parrot Company	1,000
Arling on Company	1,000
W. A. Clark, Travona	840
W. A. Clark, lessee, Spruce	840
W. A. Clark et al., Black Rock	485
W. A. & J. K. Clark, lessees, Acquisition	295
W. A. Clark et al., lessees, Seymour	295
W. A. Clark, lessee, Neptune	640
W. A. & J. K. Clark, lessees, Colusa Parrot, Elm Orlu	605

The companies showing blanks claim a loss after deducting expenses from the gross receipts. The Alice company shows total receipts of \$454,719, and disbursements amounting to \$456,200, making a loss for the year of \$1,481. The Colorado Smelting and Mining Company's return shows total receipts amounting to \$173,463, and expenses \$248,867, making a loss of \$75,403. The Anaconda company's total receipts for the year were \$11,131,731, and the expenses \$8,303,642, leaving a net profit of \$2,828,090. Some of the companies have not yet handed in their reports, and the reports of all are not as complete as the blank forms furnished them call for. The number of tons of ore extracted in mines for which reports are made out on that subject are as follows:

	Tons.	Cost of Mining.
Colusa Parrot	16,640	\$32,840
Elm Orlu	305	665
Neptune	125
Seymour	295
Acquisition Spur	100
Black Rock	2,795	13,255
Spruce	85
Travona	607	9,570
Parrot Silver and Copper Co.	53,155	184,575
Original Mining Company	9,405	40,805
Glengarry	17,000	51,000
Moulton Company	940	7,303

Few companies give a separate statement of the amount of money expended directly for labor. Those that do make a report on it are as follows: Colusa Parrot, \$32,840; Black Rock, \$9,780; Travona, \$9,308; Original, \$31,285; Moulton, \$10,000. The gross value or yield per ton of ore is also given in some reports as follows: Colusa Parrot, \$272.30; Neptune, \$6.40; Seymour, \$2.95; Acquisition Spur, \$4.85; Black Rock, \$72.48; Travona, \$63.70; Original, \$135.75; Glengarry, \$12.00; Moulton, \$15.00. The Butte & Boston, Lexington and several other big companies have not yet sent in their reports.

Washoe.—Ground was broken early this week for a two-compartment shaft on the Washoe, the property which recently passed into the hands of C. F. Booth, who is supposed to be the acting agent for a number of Butte and Canadian capitalists, says the Butte "Inter-Mountain." The shaft now being developed is located a few hundred feet southwest of the Virginus and will be a two-compartment one. At present water is not encountered in that locality above the 500 level, the Parrot draining the ground on one side and the Gagnon on the other. The shaft is situated between two ledges and will be developed to a depth of 200 ft. before the work of cross-cutting begins. The necessary lumber is now on the ground for the erection of a shaft-house and gallows frame, and soon a 9 x 12 engine and 50-H. P. boiler will be housed in. This engine will have a capacity of sinking 500 ft. It is understood that another shaft will be sunk on the east end of the claim shortly. This property was recently sold for \$50,000; it is situated in the middle of one of the richest copper ledges in the district. The Virginus adjoins it on the north-east, and the adjoining claims are the Parrot and Blue Jay, both of which are great copper producers. The company operating the Washoe has secured a number of adjoining properties. William Shovell, formerly foreman of the Alice, has charge of the work and will be the foreman of the new company.

NEVADA.

Storey County—Comstock Lode.

Savage Mining Company.—The directors of this company have ordered the superintendent of the mine to send 800 tons of low grade ore to see if it cannot be concentrated to advantage, as Crown Point ore has been. There is an abundance of such ore in the Savage mine.

The following are extracts from the latest weekly official letters of superintendents of Comstock mining companies:

A.ta.—The south drift from the north winze was advanced to a total length of 32 ft.; face in quartz of low assay value. Will crosscut next week to ascertain the distance to the foot and hanging walls. Have extracted and delivered at the mill 20 carloads of ore, 19 tons of fair milling grade.

Consolidated California & Virginia.—In stopping out between south drifts 2 and 3, in the ore body recently found, on the west side and to the south

and upward, we extracted 347 tons of ore, the average mine car sample of which was \$61.79 per ton. The faces of the ore body in these directions continue to look well. On the 1,700-ft. level the north drift started at the end of the west crosscut just west of where 6 ft. of ore averaging \$32.50 per ton were passed through, has been advanced to a total length of 18 ft. The face is in a quartz formation, which gives assays of from \$3 to \$10 per ton. Opposite the north drift a south drift has been advanced 14 ft. in a formation of clay, porphyry and quartz, which yields assays of \$3 to \$10 per ton. With an accumulation of about 1,000 tons of ore in the orehouse, we have resumed shipments of the same to the Morgan mill. The mill began to crush this ore on August 1st.

Crown Point.—The west crosscut from the face of the south drift on the 500 level has been advanced to a total length of 53 ft. The face is in porphyry mixed with clay of no assay value. We extracted from the slope above the 600 level, and between the 600 and 700 levels, 716 tons 1,680 lbs. of gold ore during the past week, which has been sent to the Mexican mill for reduction, or a total shipment for the month of 1,288 tons 1,390 lbs. We have suspended work in the mine (with the exception of some minor repairs) until exact returns of the ore can be obtained.

Ophir.—Some streaks and bunches of quartz giving low assays are being cut in the 1,465-level workings. In the old Central tunnel workings of the Ophir quartz assaying from \$2 to \$10 is being cut. Some new prospecting work will soon be started from an old winze station well to the north.

Savage.—During the week we hoisted 86 cars of ore. Car samples average \$24.08 per ton. Shipped to the Nevada mill 270 tons and milled 300 tons. Battery samples average \$17.39 per ton. Bullion yield for the week, \$3,231.90.

From the face of the east drift, 1,000 level, we have started north and south lateral drifts following the course of quartz body. These drifts are advanced respectively 12 and 10 ft. in quartz carrying bunches of fair grade ore.

NORTH CAROLINA.

Buncombe County.

American Talc Company, Limited.—This company, capital \$100,000, has been chartered at Asheville, to mine, manufacture and sell talc. R. P. Foster, W. L. Connelly and others are the incorporators.

OHIO.

Allen County.

The plant of the Vermont Granite Company at Lima was recently sold by Assignee W. J. Richie to the Westerly Granite Company, of Westerly, R. I. The management of the company will be looked after by Butler & Wells.

Columbiana County.

Fairfield Coal Company.—At this company's new works near New Waterford the main entry recently reached the vein. In the face of the workings the coal shows 3 ft. 8 in. thick.

Stark County.

On the Stamford farm, four miles west of Massillon, it is reported that a coal vein 4 ft. in thickness has been found at a depth of 125 ft. This is much nearer the surface than coal has been heretofore found in this district.

OREGON.

Baker County.

Albert Gilliam and W. W. Robbins have sunk a prospect hole at the head of Quartz gulch near the forks of Clear and Olive creeks. They a few days since unearthed a couple of nuggets, not worth so much themselves, but valuable as indicating that a paying lead has been found. The boys are now busy following up the find, says the Baker City "Democrat."

Black Butte.—The sale of this mine to Marcus Daly and J. B. Haggin is off, the bond having expired.

Columbia Mine.—This gold property, says the Baker City "Democrat," was recently purchased from Messrs. Thomas Gorman and W. O. Reynolds by a Chicago capitalist, and Mr. Topsy Johnson, of California. Mr. Johnson is the superintendent and he has a force of 10 men employed in the mine and in constructing the necessary building for a permanent operation of the mine, such as boarding-house, lodging-house, office, etc. A site and building are also being prepared for a 10-ton Crawford mill purchased in the East and now on the way.

Friday Mine.—Development work is being pushed on this property.

Nelson Mines.—These placer mines, six miles from Baker City, recently made a shipment of 165 oz. of bullion, valued at \$16 per ounce, says the Baker City "Democrat."

Grand County.

Red Boy.—A lot of ore from this mine is being worked at the Taber mill at Granite.

PENNSYLVANIA.

New York & Cleveland Gas Coal Company.—This company, operating mines at Plum Creek, is employing over 100 men.

Anthracite Coal.

Royal Oak.—This colliery, near Shamokin, operated by Lewis Kantner and Paul Roth, of Shamo-

kin has been sold to Messrs. McMillen and Johnson, of Pitston. A new slope will be sunk to reach the veins which underlie the present workings and extensive improvements will be made. J. O. Hopkinson, of Llewellyn, will be the manager of the colliery.

Bituminous Coal.

In the Birch Creek coal region the resumption of active mining operations was general on August 6th, a local question preventing resumption of work at one of the Colorado and one of the Victor mines.

At Osceola all the mines having orders started up, though trouble is anticipated at Laurel Run, where the understanding arrived at as to discriminating against any former employees was not respected.

In the Houtzdale district the same and other causes of a local character prevented all the mines from resuming save three.

The 450 miners of the Cresson & Clearfield Coal and Coke Company, at Frugality, Cambria County, resumed work at 35c. a ton on August 6th. These men went out on April 20th and have not worked since. When they quit work they were getting 40c. a ton.

Westmoreland County.

Johnstown Quarry Company.—This is the name of a new company. John J. Roberts is president; Alex. McDonald, secretary, and Joseph Jones, treasurer. They propose to make an effort to establish a permanent and extensive trade in blue Ligonier granite.

SOUTH DAKOTA.

Lawrence County.

It is said that the Central City Miners' Union has notified Superintendent Grier, of the Deadwood, Terra and Caledonia companies, that the scale of wages had been reduced 50c per day from the former price, and that all union men on that side were ready to go to work at \$3 per day. It is stated that the Lead union and the Terra Peak union have expressed themselves as not intending to interfere with the Central union in making the reduction.

Bald Mountain Alert Mining Company.—At the annual meeting of the above company, held at Central City recently, the following directors were elected for the ensuing year: W. A. Dunn, M. Plunkett, H. Rosenkranz, John O'Connell and M. F. Hennessey. The board then elected the following officers: President, W. A. Dunn; vice-president, M. Plunkett; secretary, M. F. Hennessey, and treasurer, H. Rosenkranz. The company's property says the Deadwood "Pioneer," is situated on the southern slope of Green Mountain, lying between the R. D. Gates ground, and that owned by the English company on Annie Creek. The company has a large body of refractory ore in sight.

TENNESSEE.

Bradley County.

Blue Springs Lead Mining Company.—An order for 360 tons of pig lead has been received by this company. This lead property is being developed, and a shaft has been sunk to a depth of 125 ft. The furnace will, it is expected, blow in as soon as improvements have been completed and a good stock of ore accumulated.

Hardwick Lead Mining Company.—In the bottom of the shaft at Cleveland, this company has struck zinc.

Jefferson County.

B. W. Witt Zinc Company.—This company, at Mosy Creek, recently shipped two carloads of zinc to Pulaski, Va. This mine was only opened a few months ago, but the company finds a ready market for its product and reports a good business.

UTAH.

Salt Lake City.

Shipments of ore and bullion from Salt Lake City during the week ending July 28th were: Bullion, 718,070 lbs.; silver and lead ores, 737,480 lbs. The receipts of ore and bullion at Salt Lake City for the week ending August 2d were to the aggregate value of \$125,987, of which \$58,100 was in ore and \$69,837 in bullion. The receipts of Pennsylvania base bullion amounted to \$18,237; Hanauer base bullion, \$10,800; Germania base bullion, \$28,700; and Mercur gold product, \$12,100.

Salt Lake Copper Company.—The smelting furnace of this copper plant was blown in last week under the direction of Otto Stalman.

Tooele County.

Red Cloud Mining Company.—The Red Cloud mine has developed an 8 ft. body of gold ore, about 700 ft. north of the Sunshine property, which is also showing up well. The property is being worked by this company under a bond.

Sunshine.—The prospects of a mill for the Sunshine group are said to be very favorable.

WASHINGTON.

Pierce County.

The State of Washington has turned prospector, says the Spokane "Statesman-Review." School section 16 immediately adjoins Tacoma, and is valued at \$1,000,000. Claimants representing the land to be mineral are contending for the privilege of entry on this land under the general land laws, and the Secretary of the Interior has ordered a further investigation as to the mineral character of the tract, giving the State from July 20th to August 20th to prospect, and the claimants from August 20th to September 3d, when a hearing will be held

at the Olympia land office. It is contended that the tract is placer ground.

The State prospectors have built a stockade 12 ft. high around a piece of ground 50 ft. square, and sunk a shaft, which was down 20 ft. at last accounts, without detecting gold beyond a minute color here and there. The State's prospectors are now blasting in hardpan.

Stevens County.

W. B. Aris and C. E. Brooka have claimed a large section of the Marcus flats under the mining laws, and are preparing to put in some very extensive works in that line, says the Spokane "Review." The sands that are thrown over the flats by the recent flood accumulated to the depth of from 2 to 10 ft., and are said to be rich in dust. A wheel will be placed in the river near the town of Marcus for the purpose of raising the water to a height of 20 ft. It will then be confined in flumes, and conveyed over a distance of a mile to the sand bars.

WYOMING.

Uinta County.

Rocky Mountain Coal and Iron Company.—This company has posted notices at Red Canon, near Evanston, notifying the miners who have had no work since the strike began, that the mine would not be opened for some time, and when business is resumed the force will be decreased considerably.

FOREIGN MINING NEWS.

MEXICO.

Guanajuato.

Nayal Mining Company.—This company, owning a group of mines at Guanajuato, recently put up a new 10 stamp mill and carried out on their property other improvements, costing \$100,000.

Lower California.

Boleo Company.—This company furnishes us with the following statement of its output for the full year 1893, the result being compared with those for 1892. The figures are in metric tons:

	1892.	1893.
Mineral smelted.....	92,513	117,963
Black copper.....	2,113	3,089
Matte.....	7,009	8,430
Fine copper.....	6,415	8,107
Yield.....	6.93%	6.87%

It will be seen that there was a large increase in the output last year.

San Luis Potosi.

The production of the Guadalcázar quicksilver mines for June was over 10,500 lbs.

SPAIN.

(From Our Special Correspondent.)

Before the Spanish Cortes adjourned this summer two bills were placed before them, which, if passed when the Cortes reassemble, are calculated to practically ruin the lead business in the Cartagena, Mazarón and other smelting districts in the south of Spain besides injuring the various ore trades of these districts. The first of these bills is to increase considerably the import duty on foreign coal and coke. The second is a bill, or proposition rather, to the railway companies of Spain to greatly increase the freight tariffs at present in use. Now taking both these bills together, the result would be, should they be passed, that the Spanish lead industry would be practically ruined, besides seriously affecting the other ore businesses, especially those of which the ores are cut in the interior. For firstly, the smelters would have the extra import duty to pay on the coal and coke they use; and secondly, the extra freight on the lead ores from Linares and other inland districts.

These two heavy extra expenses added upon the smelters would at the present prices prohibit the exportation of Spanish pig lead and also lead ores, the result being that in many districts smelters would have to close up, and thousands of people would then be thrown out of work. Added to the above working against the smelters is the import duty France is going to place on Spanish lead, so that we may expect to see in a short time a great decrease in the export of lead from this country to France, whither at present a considerable amount is weekly shipped. The sole object of the Spanish Cortes in putting forward the first mentioned bill seems to be with the idea of giving protection to and increasing the use of the Asturias and other Spanish coal mines, but the product of these would in no way reach the consumption of Spain nor is the class of coal extracted suitable for smelting purposes, nor could the southern smelting districts afford to pay the extra train freights on these coals.

The Cartagena Chamber of Commerce has, on behalf of the southern smelting and mining districts, forwarded a petition to the President of the Congress of Deputies, pointing out the ruin such a bill, if passed, would produce and the short-sightedness of such policy. The railway companies have not accepted the proposition as laid before them by the Cortes, as, though the government would guarantee them 3% interest on shares, the railway companies would be bound to extend their lines and make various improvements on arbitrary conditions which do not suit them. However, when the Cortes reassembles, should they modify some of the conditions, we may expect to have the railway tariffs considerably increased.

LATE NEWS.

Mr. Richard A. Parker, of Duluth, Minn., has started on an extended trip to the West, where he will examine mines in Montana, British Columbia and Idaho. His headquarters will be at Helena, Mont., for the next 10 days.

The stockholders of the Montana & Massachusetts Gold Mining Company, at a recent meeting in Butte, Mont., re-elected the old trustees and voted to continue the work of development on the company's claims, which are in the lowland district, about 12 miles northeast of Butte.

The Boston & Montana Mining Company is installing a rope drive for the transmission of power in its works at Great Falls, Mont. In all over 2½ miles of rope will be used, and all of this will be the "Stevedore" rope made by the C. W. Hunt Company, of New York.

The annual meeting of the stockholders of the Bangkok-Cora Bell Mining Company, of Leadville, Colo., was held in Denver last week and the following directors were chosen: W. C. Wynkoop, N. Q. Tanquary, Maj. D. N. Bash, William Toovey, James H. Crandell, James B. Andrews, Max Boehmer.

The Lepley group of mines in Owyhee County, Idaho, has been bonded by the owners, Frank Lepley and others, to Col. George V. Bryant, the bond running until January 1st next. The group includes a number of claims lying close to the De Lamar mine, and of value principally for the gold in the ores.

In Custer County, Idaho, while the silver-lead mines are generally quiet, a good deal of work is being done on the gold properties. The placer ground in the neighborhood of Challis is being actively worked. On the Lincoln group of mines Mr. Howe is building a 10 stamp mill, and arrangements are being made to replace the mill lately burned at the Yellow Jacket mine by a new 20-stamp mill.

The serious effects which the freshet of last May had upon the coal region were illustrated when No. 11 Audenreid Colliery at Hazelton, Pa., resumed operations on August 8th. This mine was filled with water almost to the surface. The regular pumping facilities were destroyed. Although new pumps were placed promptly and the work of clearing the mine was prosecuted day and night, it has taken three months to accomplish it.

At the recent annual meeting of the Golden Era Mining Company in Butte, Mont., the stockholders elected officers as follows: President, John J. McHatton; vice-president, Clarence J. Farland; secretary, John G. Noble; treasurer, Clinton C. Clark. The company's property is situated about 12 miles south of Butte, in the direction of the Highlands. Considerable development work has been performed. Active operations will begin at once under charge of Mr. C. C. Clarke as manager.

The Florida Mountain Tunnel in Owyhee County, Idaho, is being pushed as rapidly as possible. Lumber is on the ground for the erection of suitable buildings and work has started upon the same. As soon as completed, the tunnel will be pushed by night as well as day. The tunnel is now in about 40 ft. and has not reached bed-rock. Arrangements are being made to put in a first class Ingersoll-Sergeant air-compressing plant, to be used in driving the tunnel as soon as hard rock is encountered. Col. W. H. Dewey is at the head of this enterprise.

Dispatches from Tampa, Fla., report a sale of 250 acres phosphate land in Alachua County for \$26,000. Another dispatch says that Col. T. M. Wier has organized a company with a capital of \$100,000 to operate a phosphate plant on the Alafia River. The plant they intend erecting will use the hydraulic system and will have a capacity of 100 tons a day. Work is to commence about September 15th and it is expected to commence operating about January 1st next. The location will be about seven miles from the Bone Valley works. The main office will be in Buffalo, N. Y., with a branch office at Tampa.

Our special correspondent writes from Cleveland County, in North Carolina, that monazite mining is becoming a paying industry in several counties in the western part of the State. Recently a Mr. Gettys, representing the Wisenbach Incandescent Light Company, of Gloucester, N. J., purchased 10,500 lbs., paying for the same 6c. per pound. The mineral is recovered from the surface in the beds of streams and washes by farmers or placer miners in much the same manner as gold, and has associated with it in certain localities some gold.

"L'Echo des Mines," of Paris, reports a recent discovery of a large deposit of phosphate of lime in Tunis, the extent of which is not yet fully defined, although the discoverers report it as very large and also of remarkable purity. Application has been made for a concession, but it is not yet known whether they will receive it. One result of this discovery is that the work which had already been commenced for an extension of the Algerian railroad system into Tunis from Sfax to Oued Seldja, a distance of 2-0 km., will be hastened. The prelimin-

any line passes not far from the deposits and it is said the latter could be reached by a short branch or branches.

Early last month the tunnel being driven by the Polaris Mining and Milling Company, of Beaverhead County, Mont., struck the vein 1,812 ft. from the mouth of the tunnel 700 ft. deep. Since then the superintendent has drilled and opened up considerable milling and shipping ore. Assays run from 111 to 460 oz. in silver and from \$2.40 to \$11 in gold to the ton. The superintendent is expected in this city next week to confer with the owners. The vein is well defined and is the same which was struck above in the 300 ft. level, thus showing the Polaris to be a deep mine. It is anticipated that the shipping of high grade ore from now on will pay the expenses of further development work.

The suit of the Cassell Gold Extracting Company in London against the Cyanide Gold Recovery Syndicate to enjoin the issue of a patent to the latter for its so-called electric cyanide process, and also to prevent the syndicate from using the cyanide process under any form on the ground that it was covered by the MacArthur Forrest patents, was continued at considerable length. The testimony taken was almost entirely that of experts, whose number included, besides those mentioned last week, Mr. Claude Vautin, the well known chemist; Mr. R. H. Harland; Mr. Riley, of London; Mr. James McTear, of Edinburgh; Professor Atfield, and Mr. Louis Janin, Jr., of New York, who needs no introduction to our readers. As mentioned above, the testimony was entirely of a technical nature, relating to the early uses of cyanide of potassium in dissolving gold and for extracting the metal from its ores. At the close of the testimony the hearing was adjourned, the court taking the order asked for under consideration.

The following is the full text of the bill lately passed which suspends the requirements for assessment work on mining claims for the present year:

An act to amend section numbered 2324 of the Revised Statutes of the United States relating to mining claims.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of section numbered 2324 of the Revised Statutes of the United States, which require that on each claim located after May 10th, 1872, and until patent has been issued therefor, not less than \$100 worth of labor shall be performed or improvements made during each year, be suspended for the year 1894, so that no mining claim which has been regularly located and recorded as required by the local laws and mining regulations shall be subject to forfeiture for non-performance of the annual assessment for the year 1894. Provided, That the claimant or claimants of any mining location, in order to secure the benefits of this act, shall cause to be recorded in the office where the location or certificate is filed, on or before December 31st, 1894, a notice that he or they in good faith intend to hold and work said claim: Provided, however, That the provisions of this act shall not apply to the State of South Dakota.

Advices from Aspen, Colo., state that at the Argentum-Juniata mine, the extensive alterations and improvements necessary to the recovery of the mine and its subsequent operation on a large scale, are rapidly approaching completion. The new power house, containing seven 80-H. P. boilers, air compressors, feed water tanks, etc., is finished and the boilers are set ready for pipe-line connections to the main leading to the hoisting apparatus and pumps underground. A new flume has been constructed from the mouth of the M. & G. tunnel for conveying the water of the mine through the town of Aspen to the Roaring Fork river. At the river the mine water is delivered with a head upon a Pelton wheel furnishing power for throwing back to the power house pure river water for steam purposes. The M. & G. Tunnel from its mouth to the hoisting station at the head of the incline has been retimbered throughout and improved in many ways to meet the requirements of heavy traffic through it. The old hoisting station has been enlarged and retimbered throughout. A new 6-in. steam line has been laid through the tunnel to the head of the incline and down the incline for a distance of 175 ft. to the level at which the water stands. A new sinking pump of novel construction, recently designed and patented by the vice-president and manager of the company, Mr. C. E. Palmer, is used. Remarkable results, it is said, were attained in a recent trial of this machine on the Mollie Gibson mine.

George H. Earle, president of the Finance Company of Pennsylvania, has drawn up a plan of reorganization for the Reading Railroad Company with which some of the conflicting interests concerned seem favorably impressed. The principal basis of the plan is a funding of the general mortgage for five years from the date of the first default, which practically makes the plan operative in 3½ years. If the bondholders accept this condition and the plan is put into effect the defaulted interest of \$2,000,000 will at once be paid. Stock and junior bondholders will be asked to make a small subscription to an issue of collateral trust bonds, the amount as partially decided upon being at the rate of \$1.75 per share. It is not known whether the subscription

will be compulsory or not, but it is to all practical purposes an assessment. All the money required for the plan has been subscribed, it is understood, by New York and Philadelphia capitalists. The floating debt of the company is \$4,250,000; on standing certificates, \$3,750,000, and overdue interest on the general mortgage bonds \$2,700,000, a total of \$10,700,000 in debts. This \$10,700,000 is all the new money that it will be necessary to provide under the plan unless the Reorganization Committee decides to provide the company with working capital. There are about \$5,000,000 of car trusts, which will be provided for separately. Mr. Earle has invited the following gentlemen in Philadelphia to join the Reorganization Committee, and they will probably accept. They are: Richard Y. Cook, president of the Guarantee Trust Company; John B. Gest, president of the Fidelity Trust Company; Samuel R. Shipley, president of the Provident Trust Company; Sydney F. Tyler, president of the Fourth Street National Bank. One New Yorker, representing the bondholders of that city, has also been asked to join the committee.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 10.
Statement of shipments of anthracite coal (approximate) for week ending August 4th, 1894, compared with the corresponding period last year:

Regions:	Aug. 4, 1894.		Aug. 5, 1893.		Difference.
	Tons.	Value.	Tons.	Value.	
Wyoming region.....	403,651	429,358	429,358	429,358	Dec. 25,707
Lehigh region.....	135,145	134,329	134,329	134,329	Inc. 816
Schuylkill region.....	181,589	206,724	206,724	206,724	Dec. 25,135
Totals.....	720,385	770,411	770,411	770,411	Dec. 50,628
Totals for year to date. 23,298,808		24,934,978		24,934,978	Dec. 1,636,170

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending August 4th and year from January 1st:

Shipped East and North:	1894.		1893.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.....	3,727	41,617	3,727	53,173
Cumberland, Md.....	↑	1,785,337	↑	2,411,504
Barclay, Pa.....	↑	10,061	↑	35,218
Broad Top, Pa.....	16,102	202,076	16,102	394,790
Clearfield, Pa.....	16,691	1,213,214	16,691	2,482,955
Allegheny, Pa.....	21,466	593,406	21,466	763,615
Beech Creek, Pa.....	↑	838,310	↑	950,931
Pocahontas Flat Top.....	69,313	1,832,958	69,313	1,679,236
Kanawha, W. Va.....	↑	1,272,439	↑	1,867,366
Totals.....	127,242	7,791,648	127,242	10,612,758
↑ Returns not received.				

Shipped West:	1894.		1893.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.....	36,453	785,427	36,453	767,366
Westmoreland, Pa.....	53,118	784,402	53,118	1,193,798
Monongahela, Pa.....	24,900	377,297	24,900	437,962
Totals.....	114,471	1,947,126	114,471	2,402,126
Grand totals.....	241,713	9,738,674	241,713	13,022,884

Anthracite.

August is never a good month to the anthracite coal trade. Just now the market is passing through a period of excessive dullness, in no wise different from the situation as it has been described in these columns for the past few weeks. It is yet too early for the beneficial effects of the restriction in the output to be felt. In another month unless something unforeseen happens, we shall begin to see an improvement.

The market itself is not characterized by any features. The demand for anthracite hereabouts is practically nil. Dealers—that is, the retailers—are all well supplied and complain of the small volume of business which they are doing. Naturally they do not buy coal when they don't need it.

Stocks in producers' hands at tidewater, and especially at interior stocking points, is still accumulating, this being particularly the case in the higher priced coals. This state of affairs will continue for some time yet, or until the natural effects of the restriction will show themselves. Coal had begun to accumulate in July, and August has hardly begun. All producers, for the first time in the history of the trade, are keeping within their allotted tonnages, and it is this fact which encourages impartial observers in the belief that the market will begin to show some improvement before long. The collieries are working from two and one-half to three days a week, and all producing interests seem alive to the folly of over-production.

Prices are yet in an unsatisfactory condition. They continue low and unsettled. We do not find that they are any higher than they were in June. Of course, there are numerous rumors of very low figures, but sales are so few that they can hardly be called ruling figures. The lowest prices, to our own positive knowledge, at which sales were actually made during the past week are: Stove, \$3; broken, \$3.10; egg, \$3.15; and chestnut, \$3.15. At these prices we know coal to have been sold. It is true that it was not the best quality. Of course, the best grades will sell for more, when they sell at all which is not often; but if anybody wants to buy coal he will find but little difficulty in getting as good terms as ever. All the companies and individual operators have been guilty of low prices these past three months. Of all the sellers of anthracite coal the Reading has been the firmest in retaining prices. This fact can be seen by looking at its figures of production this year. To-day the Philadelphia & Reading holds out for higher prices than any other company. It

has not always held this position, and that is why we call attention to it. We think it a wise course for more than one reason.

In short, the market, in the absence of any business of consequence, is neither strong nor particularly weak. Certainly, there is not so much cause for alarm as to the future as there was a month ago. Restriction is the order of the day. It is being carried out strictly now, and it must continue throughout the year if there is to be any firmness to the market. Prices cannot help but stiffen if this is done. The chances, to judge from present appearances, are that it will be done, and buyers will do well to bear this fact in view.

NOTES OF THE WEEK.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending August 4th, was 175,000 tons, of which 36,000 tons were sent to Port Richmond and 7,000 tons were sent to New York waters.

According to a press despatch from Hazleton, Pa., the contract for building the new Beaver Meadow, Treskow & New Boston Railroad has been awarded. The projector of this road is Mr. A. S. Van Winkle, of Hazleton. The proposed road will extend from Beaver Meadow to New Boston. At this point it will connect with the Pennsylvania system. It will be 18 miles in length. This will give the Pennsylvania an entrance into a territory which has heretofore been exclusively Lehigh Valley. Heretofore the individual operators have complained of unjust discrimination in the distribution of cars. With plenty of orders for their product on hand they have been obliged to shut down the collieries while others continued to work right along. The introduction of the new service will obviate this, they say.

The outstanding convertible loan of the Lehigh Navigation Company, amounting to \$585,000, due September 1st next, will be paid at maturity. This loan was issued in 1869, and was originally \$2,000,000. The bonds were convertible into the stock of the Lehigh Navigation Company prior to 1879, and are secured by mortgage on coal lands in Luzerne County, Pennsylvania. These coal lands were sold to the Lehigh & Wilkes Barre Coal Company, subject to this mortgage, which was assumed by that company. The amount has been reduced to its present figures through the operations of the sinking fund, and whatever amount is needed to repay the mortgage loan on September 1st will be supplied by the Lehigh & Wilkesbarre Coal Company.

The coal passing through the Sault Ste. Marie Canal in July was: Anthracite, 58,141 tons; bituminous, 227,061 tons; total, 285,202 tons, against 618,021 tons in July, 1893. From the opening of navigation to July 31st the total tonnage of coal through the Sault Canal was 532,677 tons, against 1,501,240 tons for the corresponding period last year.

Bituminous.

During the week the miners in the Clearfield and Beech Creek regions have gone back to work on the terms proposed by the operators. In some points certain exceptions have been made by the operators who agreed to do so at a former meeting with their men. This is the end of the great coal strike of 1894, so far as the East is concerned. It has been a great struggle and the men have gained nothing in any of the mines. They have suffered losses in wages which aggregate many millions of dollars.

Orders for coal are still coming in faster than it can be shipped, although a resumption of work by the two regions mentioned above will relieve the pressure somewhat. There are signs in one or two sections of a slacking up in the great demand of the past few weeks. It is difficult to say, however, whether this comes from the belief that coal will be more plentiful now that Clearfield and Beech Creek have gone to work again, or from a natural lack of demand. However there is still more trade than will go around and most producers are merely taking orders with the idea of getting more later on in case trade should fall off.

There are in the hands of the shippers probably enough orders to extend over the balance of the month, exclusive of those in the hands of the operators themselves not yet forwarded and also the contract orders on which regular shipments have to be made. It is thought that the present demand will last until the middle of the month when the regular fall trade will commence and consumers begin to put in their winter supplies. This applies to users of soft coal situated at shoal water points who must have a large stock on hand when navigation stops in the beginning of winter.

There have been advances in price of from 10 to 25 asked and given, but good consumers who will take cargoes later can purchase at market rates.

The transportation of cars is excellent. We know of one case where some cars were loaded at the mines and unloaded at the shipping port in four days. No side-tracking of coal is reported, nor are any blockades feared. The supply of cars is good on all roads, although the delivery of cars for some points off the main line roads is not good, thus showing that most of the car equipment of the different roads is getting into use again. The main line roads are getting better service out of their tide business, and prefer it to the all-rail trade to the points off their line.

There is a considerable demand for coal all rail along the lines of the various roads. Stocks must

have been greatly reduced to have produced the present big demand.

The short supply of vessels which existed in the beginning of the week has been decreased by the arrival of a fleet, and the demand for vessels is already less than it was. It is a peculiar fact that in the vessel market rates to Sound ports are higher than to points around the Cape. This is due to the fact that the great demand for vessels at the ice ports induces captains to take charters to those ports in order to get return cargoes of ice. We quote the following rates, ocean freights, from Philadelphia: To Boston, Salem, Portland, Bath and Bangor, 65c.; Providence, New Bedford, New Haven, Bridgeport, Portsmouth and Gardiner, 65c. to 70c.; Wareham, 85c. to 90c.; Lynn, 75c. to 85c.; Newburyport, 75c. to 80c.; Dover, 85c. and towages; Sacon, 75c. and towages.

NOTES OF THE WEEK.

The shipments of the Dominion Coal Company from its Cape Breton mines for the month of July were as follows: Caledonia, 22,000; Glace Bay, 23,000; Gowrie, 20,000; International, 34,000; Reserve, 27,000; Victoria, 14,000; total, 140,000 tons.

Buffalo. August 9.

(From our Special Correspondent.)

The anthracite coal trade continues very dull at unchanged quotations. Shipments by lake are light at the advance.

Bituminous coal dull and lower. Dealers say that there will be no change until the tariff uncertainty is ended.

A well known vessel man says that though the advance in coal freight rates to Milwaukee and Chicago—10c. and 5c. respectively—does not cut much of a figure, it is, nevertheless, a change in the monotony which has prevailed. But the situation in general will not be improved until the demand for coal at upper lake ports increases, and there are no indications just now that that will be the case for several weeks hence. There is, of course, some coal here for shipment, but vessels at present are rather scarce.

West Superior and Duluth are still suffering from the strikes of the coal handlers. It is with difficulty that vessels are unloaded after long waits.

The shipments of coal westward by lake from Buffalo from July 28th to August 4th, both days inclusive, aggregated only 51,042 net tons, distributed as follows: 25,420 tons to Chicago, 9,100 tons to Milwaukee, 2,400 tons to Duluth, 2,500 tons to Superior, 5,100 tons to Toledo, 300 tons to Saginaw, 400 tons to Gladstone, 500 tons to Hamilton, 2,200 tons to Manitowoc, 707 tons to Windsor, 640 tons to Hancock, 775 tons to Bay City, 600 tons to Traverse City, and 400 tons to Port Huron. The rates of freight show an advance of 5@10c., as follows: 45@50c. to Chicago, 40@50c. to Milwaukee, 25@30c. to Duluth, 40c. to Hancock and Manitowoc, 35c. to Portage and Saginaw, 25c. to Windsor and Toledo, 35c. to Bay City, 55c. to Traverse City, and 30c. to West Superior, closing with improved demand for vessels and rates tending upward.

The following statistics of the coal movement at Buffalo are furnished by Secretary Thurstone, of the Merchants' Exchange: Railroad receipts and shipments of coal are not reported by request. Receipts by lake thus far this season, none. Shipments of coal westward by lake for month of July, 318,672 net tons as compared with 254,070 tons in 1893 and 425,785 tons in 1892; for the season to August 1st, 1,045,079 net tons as compared with 1,187,129 tons in 1893 and 1,194,215 tons in 1892. The receipts of coal by canal for month of July 3,199 net tons, as compared with 12,227 tons in 1893 and 402 tons in 1892; for the season to August 1st 4,664 net tons as compared with 25,672 tons in 1893 and 4,491 tons in 1892. The shipments of coal by canal for month of July 1,942 net tons as compared with 909 tons in 1893 and in 1,893 tons in 1892; for the season to August 1st 2,402 net tons, as compared with 9,739 tons in 1893 and 15,219 tons in 1892. The aggregate shipments of coal westward by lake thus far this year show a decrease of 142,050 tons under 1893, and a decrease of 149,136 tons under 1892. Freight on coal by lake during July were 45c. to Chicago, 40c. to Milwaukee and Green Bay, 45c. to Racine, 35c. to Saginaw and Bay City, 25c. to Duluth and Lake Superior ports, Detroit and Toledo. A year since the rates were 50c. to Chicago, 45c. to Milwaukee, 40c. to Green Bay and Saginaw, 30c. to Duluth and Lake Superior ports, 30c. to Toledo and Detroit; 35@50c. to Racine, and 35c. to Bay City.

The distribution of coal shipped this season to August 1st was to the following places: 445,026 net tons to Chicago; 257,144 tons to Milwaukee; 91,740 tons to Duluth; 94,904 tons to West Superior; 11,500 tons to Gladstone; 40,120 tons to Toledo; 14,870 tons to Racine; 4,900 tons to Hancock; 1,300 tons to Houghton; 1,900 tons to Kenosha; 14,835 tons to Green Bay; 5,880 tons to Detroit; 7,825 tons to Bay City; 11,305 tons to Saginaw; 8,590 tons to Port Huron; 600 tons to Alpena; 5,150 tons to Marquette; 1,450 tons to Washburn; 900 tons to Manistique; 2,290 tons to Sheboygan; 650 tons to Grand Haven; 5,066 tons to Fort William; 16,280 tons to Manitowoc; 600 tons to Benton Harbor; 600 tons to Sand Beach; 1,150 tons to Ludington; 2,190 tons to Cheboygan; 650 tons to Owen Sound; 1,150 tons to St. Clair; 380 tons to Hamilton, Canada; 650 tons to Michigan City; 2,700 to Sault Ste. Marie; 2,810 tons to Lake Linden; 3,950 tons to Ashland; 400 tons to St. Ignace; 650 tons to Muskegon; and 700 tons to Sarnia.

Chicago. Aug. 8.

(From our Special Correspondent.)

Anthracite.—The hard coal market has gained nothing in strength during the past week, and with some shippers the evidence is not wanting that there has been a loss both in price and tonnage. It is very generally understood that buyers of large amounts can shade \$5 per net ton f.o.b. Chicago for any deliveries up to November 1st, and your correspondent knows that some of the shippers are placing all-rail coal in the yards of small dealers, leaving track facilities at this price and absorbing half of the switching charges, the Eastern carrying roads taking care of the balance, which in some cases run as high as \$8 per car. This would indicate a slight direct cut on regular current quotations and shows to what extent the demoralization of circular has extended. Some of the Chicago daily papers have published articles emanating from New York, stating that the Philadelphia & Reading Coal and Iron Company has given notice of its proposed withdrawal from all agreements with other anthracite companies governing production and price; a number of dealers here is disposed to think from this that the bottom prices have not yet been reached. Country trade is very dull—the rather more than partial failure of the late grain crops in very many sections will, it is generally believed, interfere most seriously with the amount of tonnage usually shipped thence. That market has already been well supplied during the break in freight rates in May to Missouri River points, hence it will be at least three or four months before there will be any demand from that source. Retailers are complaining bitterly of the great quietude in trade and it would seem that the ordinary domestic consumer scented the prospective further decline and was holding off to receive the benefit, if any, which might be obtained. Bids have been asked for a large tonnage by the Board of Education to be supplied to the various public schools to be opened August 14th, and already rumor has it that extremely low prices are being named.

Bituminous Coal.—All classes and grades are in superabundant supply—the rush of coal to this market has been greater than its absorbent capacity, consequently circular price, for the present, is cut to suit. The fact of the matter is the coal blockade on most of the coal carrying roads continues nearly as bad as ever, and, although the strike by the A. R. U. is declared off, matters in connection with switching, transferring coal, etc., are still much behind the normal conditions which should obtain. This adds to the perplexity of the situation, and the 2,000 cars of soft coal on track in this vicinity which under ordinary conditions would readily be absorbed are standing; fully one-third of that number could be easily taken care of by consumers and the remainder by dealers, if they could be switched into position. This inaction of the railroads has produced a scarcity of empty coal cars, and although there is a fair demand for coal, miners in Indiana are unable to make more than three or four days a week. The miners in central and southern Illinois are running steadily, with few exceptions, but many in the northern fields are working under protection of sheriffs' deputies, and more are idle on account of the intimidation. Pittsburg, Pa., \$3.25; Hocking Valley, \$3; smelting coal, \$3.70; Illinois coal, Southern, \$1.75@1.80; canal, \$4.25.

Coke.—This market is now almost exclusively supplied from the ovens of West Virginia, only an occasional car of Connellsville being received. Demand is light as few foundries are running to full capacity. Prices vary from \$3.50 to \$5.25, according to grade, etc.

Pittsburg. Aug. 9.

(From our Special Correspondent.)

Coal.—The Pittsburg market is well stocked, the shipments from the pools being heavy; prices are down to a low figure. Most of the second and third pool mines are closed, and none runs full. Hundreds of miners are out of employment and many are reported destitute. The plan of assessing each one at work a certain per cent. of his wages for the benefit of those idle is not meeting with much success. The operators do not feel the strike quite so severely as the miners, for the reason that they already have a large quantity of coal mined and loaded into boats and barges. President Cairns, of the miners' union, is very willing that a settlement should be made upon the lines of a compromise. He is now up the river, where he will endeavor to bring about an adjustment of the difficulties. In the railroad lines, plenty of coal is being transported, as the lake season is now at its height. The Ohio River is dead low, from Pittsburg to its mouth.

Connellsville Coke.—A dispatch from Dunbar says: The strike, so far as this section is concerned, is practically broken. Everywhere there is a rush for work by the English-speaking miners. At several of the plants the old men have been unable to get back their places. The Cambria Iron Company has 500 out of 700 ovens in full operation, and by the close of this week every plant in this section will be running full.

All the old employees who can secure work will have taken it at the Frick scale, 78c. a hundred for mining and 42c. for drawing an oven charged with 100 bushels of coal. It is stated on authority that the start will be made by the Mahoning plant's workmen at once. The coke trade continues to make handsome gains. There are now over 41,000 ovens, with production for the week the largest for

the year. Coke prices are so uncertain that correct figures are out of the question. One of the largest producers informed us that there were no fixed prices, sales being governed by circumstances.

Shanghai, China. July 6.

(Special Report of Wheelock & Co.)

Coal.—A large business has been done owing to the trouble brewing in Corea, and coal of all kinds has been in demand. There is no stock of Cardiff or American anthracite on hand. Australian is quoted at Tls. 9.25@9.50 per ton for cargo lots. Japanese is quoted as follows: Takasima, Tls. 6 for lump, 4 for small; Milke, Tls. 5.50 for lump, 4.25 for small. Other sorts, Tls. 5@5.25 per ton.

Kerosene Oil.—The only business is resales among the native dealers at prices varying from Tls. 1.29@Tls. 1.27 per case, the market closing weak at the latter figure. Arrivals have been "Ben Lee" and "Silberhorn," with 97,763 and 73,700 cases respectively. "Lauriston" with 92,000 cases, "Androsa" with 89,000 cases, and "Muskoka" with 90,000 cases, all Devoe's. Stocks in godown are now: American 1,428,275 cases and Russian 406,559 cases, including Russian in bulk. Quotations: Devoe's, Tls. 1.27 per case, one month's prompt; Batoum, Tls. 1.25 per case; Batoum, bulk, Tls. 1.20 per 2 tins.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 10, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending				From	From
	Aug. 10, 1893.	Aug. 10, 1894.	Aug. 10, 1893.	Aug. 10, 1894.	Jan., '93.	Jan., '94.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	52	23,716	35	16,800	1,613,612	494,347
Coke.....	85	81,450	79	95,900	4,087,793	2,645,139
Charcoal...	35	6,316	22	3,780	232,560	125,937
Totals....	172	111,482	136	116,480	5,933,965	3,265,443

Pig Iron.—A careful canvass of the trade in New York and vicinity brings to light the fact that the past month was the dullest in its history. It is impossible to get exact figures showing the consumption during July, but all furnace agents report an exceedingly light demand and fewer sales than during any other month for many years past. And as consumers had no stocks in their yards to draw upon, it is safe to say that the consumption during the past month was very limited.

The figures of pig iron production on August 1st show an increase over July 1st, owing principally to the return of the bituminous coal miners, which temporarily caused a decline from the June figures. Further details will be found in the editorial page.

In this market no improvement whatever can be reported. The demand continues exceedingly small, consumers evidently still suffering from dullness in their respective lines. Prices show no change one way or the other. Consumers would not buy any more iron even if it were offered them at lower prices. Quotations at tidewater are as follows: Northern brands, No. 1. \$12.25@13; No. 2 11.25@12.50; gray forge, \$10.25@11. Southern irons, No. 1, \$11.75@13; No. 2, \$11.75@11.50; No. 1 soft F., \$10.75@11.50; No. 2 soft F., \$10.25@11.25. Scotch irons are quoted Coltness, \$21.50@22; Eglington, \$19.50@20; Summerlee, \$20.50@21.50.

Billets and Rods.—There is no change to report of this market. A few small sales are reported, but consumers still regard sellers' prices as too high. Quotations are nominally: Domestic billets, \$19@20; wire rods, domestic, \$27@27.50; foreign rods, \$30@31.

Manufactured Iron and Steel.—There is very little new business to report in this market. Prices show little or no change from last week. We quote: Angles, 1.30@1.40c.; axles, scrap, 1.40@1.60c.; delivered; steel, 1.40@1.55c.; bars, common, 1.15@1.30c.; refined, 1.25@1.40c. on dock; beams, up to 15 in., 1.40@1.50c.; channels, 1.40@1.50c. on dock; steel hoops, 1.45@1.75c.; delivered; links and pins, 1.40@1.65c.; plates, flange, 1.60c.@1.80c.; fire-box, 1.80@2.10c.; marine, 2.45@2.70c.; sheared, 1.80c.; shell, 1.40@1.60c.; tank, 1.3@1.40c.; universal mill, 1.25@1.40c.; tees, 1.50@1.60c., all on dock.

Merchant Steel.—This market continues unchanged as to prices and volume of business. Quotations this week are: Tool steel, 5.75@6.25c.; tire steel, 1.60@1.75c.; toe calk, 1.70@1.90c.; Bessemer machinery, 1.25@1.50c.; open-hearth machinery, 1.90@2c.; open-hearth carriage spring, 1.90@2c.; crucible spring, 3.50@3.75c.

Old Material.—We do not hear of any business doing in old material. Quotations are nominally as follows: Old steel rails, \$9.50@9.75; old iron tees, \$10.50@11.50 per ton; New York railroad scrap, \$11.50@12 per ton delivered at mill, and yard scrap at \$10; wrought turnings, delivered at mill, \$8.50@9; No. 1 wrought scrap at \$9.50@10.50 from yard, and machinery cast scrap \$9@10; old wrought tubes and pipe, \$6.50@7; old car wheel, \$9.50@10.50 New York; cast borings, \$8@8.50 delivered at mill.

Rail Fastenings.—This market continues exceedingly dull. Quotations are as follows: Fish and angle plates, 1.20@1.40c. at mill; spikes, 1.50@1.75c.; bolts and square nuts, 2@2.25c.; hexagonal nuts 2.10@2.30c., delivered.

Spiegeleisen and Ferromanganese.—There is nothing doing in this market. Quotations remain nominally: Spiegeleisen, 10@12c., \$21@22c., 20% \$25@26c., Ferromanganese, \$51.50@53.

Steel Rails.—The steel rail market is quiet and featureless. Prices continue \$24 at mill and \$24.80 at tidewater.

Tubes and Pipe.—Business in this market continues quiet. There is no change in prices. Ruling discounts are: On 1½ in. and smaller, 60, 10 and 5 for plain black pipe, and 50, 10 and 5 for galvanized; for 1½ in. and larger, 70, 40 and 5 for black, and 60, 10 and 5 for galvanized.

Buffalo. August 9.
(Special Report of Rogers, Brown & Co.)

Except for indications that the scarcity of iron is being felt acutely in some quarters, there is nothing in the situation different from the conditions of the past month. Strong Ohio softeners have been marked up slightly because of this condition, but otherwise prices remain as they were, and the consumptive demand continues light. The iron which is relatively the lowest is now Lake Superior charcoal. This is difficult to explain, as while the stock on hand is relatively larger than coke iron, there are practically no furnaces running at present and few which contemplate starting soon. We quote on the cash basis, f. o. b. cars Buffalo: No. 1 foundry, strong coke iron, Lake Superior ore, \$11.25; No. 2 foundry, strong coke iron, Lake Superior ore, \$10.75; Ohio strong softener No. 1, \$11.25; Ohio strong softener No. 2, \$10.75; Jackson County silvery No. 1, \$15.75@16.75; Lake Superior charcoal, \$14; Tennessee charcoal, \$15.50; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.50; Hanging Rock charcoal, \$18.50.

Chicago. Aug. 8.
(From our Special Correspondent.)

In the iron, steel and associated trades, furnace and mill agents as well as jobbing houses are inclined to take a more cheerful view of the situation, and many of them claim there is some improvement as compared with more recent weeks, and a considerable betterment as compared with the same period last year, as there should be, for conditions then were not normal. Railroads are getting into better shape and moving freight more regularly, but there is still much to be desired in that respect. The strike having been declared off, improvement will be much more rapid. The furnaces recently started up at South Chicago are running smoothly and making good records. Many of the larger foundries are commencing to take iron, recently placed under contract, more freely. There is on the whole a little better inquiry for crude and manufactured iron, with a large proportion of the latter for quick shipment, yet the market does not respond very freely to the better feeling so generally noticeable.

Pig Iron.—Foundries on the outside are commencing to start up, and some of them are running full, but the majority from half to three-quarter time; they are also receiving increased shipments of iron and fuel. Makers of coke foundry iron in this vicinity note a moderate amount of small business in car lots up to 300 tons, and have also closed several 1,000-ton orders. Railroads are still slow to make requisitions for material of any kind, but a gratifying increase is noted from several shops of the larger systems, some fair sized orders being placed. Southern coke iron continues dull, as the lower prices of the Northern product is a bar to them here at present. Orders are small, ranging from carloads to 50 or 100 tons, and chiefly for specialties. Lake Superior charcoal iron, probably on account of the lower price, is in better demand, but almost exclusively for small lots. Quotations are, per gross ton f. o. b. Chicago: Lake Superior charcoal, \$14.25@14.75; Lake Superior coke No. 1, \$10.25@10.50; No. 2, \$10.00@10.25; No. 3, \$9.50@9.75; Jackson County silveries, \$14.50@15; Southern coke, foundry No. 1, \$10.75@11; No. 2, \$10.25@10.50; No. 3, \$9.75@10; Southern coke, soft, No. 1, \$10.50@10.75; No. 2, \$10.25@10.50; Southern car-wheel iron, \$17.50@18; Southern silveries No. 1, \$11.75@12; No. 2, \$11.25@11.50; Tennessee charcoal No. 1, \$14@14.50; Bessemer, \$11.50@11.75; Ohio strong softeners, \$12.75@13.25.

Structural Material.—Chicago contractors have secured contracts for large buildings in Cleveland, Buffalo, New Orleans and Memphis, Tenn., ranging in value from \$275,000 to \$500,000. The amount of iron and steel required is large and is now on the market. Demand for bridge material is quite fair and some good sized orders were closed this week. Quotations are f. o. b. Chicago: Angles, 1.50@1.55c.; tees, 1.70@1.80c.; universal plates, 1.50@1.55c.; beams and channels, 1.50@1.60c.

Plates.—Within the week, warehouse demand has shown more activity, mill business is also picking up with a few good inquiries from Western consumers, but prices are without improvement. Flange steel is quoted at 1.70@1.80c.; fire-box steel, 3.50@4.50c.; tank steel, 1.40@1.50c.; boiler tubes, 75% discount.

Merchant Steel.—Small orders only are reported, and some mill agents state that many consumers have decided to wait until fuller and more reliable reports are made of the crops. Up to the present a very fair tonnage has been booked. Quotations are, carload lots: Smooth finished machinery, 1.80@1.90c.; tire steel, 1.70@1.80c.; Bessemer bars, 1.45@1.55c.; tool calks, 2.05@2.15c.; crucible spring, 3.40@3.65c.; tool steel 65c. and upward; specials, 12@20c.

Galvanized Sheet Iron.—Millowners carrying large warehouse stocks report trade very quiet and

mill orders scarce at 77½@80% off. Jobbers quote 75 and 10 and 5% off.

Black Sheet Iron.—Mill business is very quiet for either light or heavy sheets and quotations are easier at 2.35@2.40c. for No. 27 common. Jobbing price from warehouse is 2.50c. for same gage.

Bar Iron.—Orders in carloads to 50 or 100 tons from manufacturing concerns are rather more frequent, and largely for quick delivery. One of 200 tons for a car marked at 1.10 Chicago is also reported. Regular quotations are 1.05@1.07½c. here, and Eastern mills quote the same at mill with a 13c. freight to the West.

Billets.—Some new inquiry is reported by the steel mills, but the actual business closed during the week was light at \$17.75@18. Steel rods are very quiet, no inquiry at all, and price nominal at \$25 mill.

Steel Rails.—Orders generally for renewals or extensions continue light, but they are a little more frequent for delivery during the next 60 days. The tonnage placed for the first six months of the year is little more than half for the corresponding period in 1893. Further comment is unnecessary. Quotations are steady at \$25@27, according to size of order.

Old Rails and Wheels.—Iron rails are held firm at \$10.50@11, but there is little inquiry here. A light demand is noted for steel rails at \$9.75@9.75 for ordinary and \$10.50 for selected. Car wheels are inert at \$10@10.25.

Scrap.—Dealers report a very limited demand from consumers and quotations largely nominal. Prices are: Forge, \$8.50@9; Cast borings, \$3.50@4; wrought turnings, \$4@4.50; axle turnings, \$6@6.50; mixed steel, \$5@5.50; tires, \$12.50@13; iron axles, \$13@13.50.

Pittsburg. Aug. 9.

(From our Special Correspondent.)

Raw Iron and Steel.—Trade is slowly and steadily improving, with an increased inquiry for most of the leading products. The coke strike is certainly drawing to a close. Before the close of the present month a large number of the most objectionable coke workers will have departed, and those who remain will have learned a lesson that will be profitable to them as long as they live. Furnaces are firing up in many directions and a big fall trade is among the certainties of the future. There is a distinct growth in the volume of business, an increasing conviction that prices will go no lower and a greater disposition on the part of manufacturers to be cautious about making engagements at current quotations. As yet the change is merely sentimental, for there has been no particular rush on the part of consumers to lay in supplies, nor has there been any movement toward higher prices, but it is an important change all the same. The feeling is perhaps more pronounced in the pig iron department than in any other. Consumers admit that they cannot hope to buy cheaper than now, and are disposed to make a little venture from their previous practice of buying from band to mouth; there are, therefore, more inquiries in the market. The firmness in Bessemer pig and steel billets is, of course, due to the scarcity of these grades of material. With very little crude material at the foundries and mills, with producers holding less stock than at any time for many years, and with production so restricted there appears good ground for the position taken by sellers in holding prices firm. While ordinary quotations remain unchanged there are instances where the outside figures have been insisted upon for first-class iron, and the producer refused to consider any orders below this price.

The following statement shows the July sales of Bessemer pig and steel billets. The last column contains the total sales of raw material for the month. Notwithstanding dull times billet and blooms sale amount to 137,300 tons, and total sales 190,395 tons:

	Bessemer pig, Billets and slabs,		Total sales.
	Tons.	Tons.	Tons.
July 5	15,600	12,500	39,885
" 12	20,600	11,300	42,105
" 19	14,400	14,500	42,150
" 26	10,100	14,100	34,100
Aug. 2	11,500	12,700	31,875
Total	73,200	65,100	190,395

The following table shows the July prices of Bessemer pig iron for three years past. The prices given are the cash rates at Pittsburg as published in this paper, giving the highest and lowest prices for each week, the highest being in all cases for spot or prompt delivery:

	1892.	1893.	1894.
July 5	\$14.00@14.10	\$13.35@13.50	\$11.90@12.75
" 12	14.00 " 14.10	13.25 " 13.50	11.75 " 12.65
" 19	13.85 " 14.00	13.10 " 13.40	12.15 " 12.50
" 26	13.90 " 14.00	13.15 " 13.30	11.75 " 12.50
Aug. 2	14.00	13.00 " 12.20	11.85 " 12.00

The following table shows the July prices of steel billets and slabs at Pittsburg for the past three years. Billet sales are made f. o. b. on cars at makers' mill. Transactions show a wide range of prices, the highest in 1892, \$25, and the lowest in

1894, \$17.25. Spot commands the highest prices, future deliveries the lowest:

	1892.	1893.	1894.
July 5	23.00@23.25	\$21.40@21.75	\$18.00@19.00
" 12	23.25 " 24.10	21.00 " 21.75	17.50 " 18.75
" 19	23.25 " 24.10	21.15 " 21.50	17.25 " 18.00
" 26	23.50 " 25.00	21.00 " 21.25	17.50 " 18.00
Aug. 1	24.00 " 25.00	20.75 " 21.25	17.50 " 18.00

Your representative has obtained by careful personal inquiry the following list of furnaces at work in the Pittsburg and adjoining districts at the present time, showing the condition of affairs now. The list is an encouraging one:

PITTSBURG DISTRICT.

Carrie Furnace Company, 2; Isabella furnaces, 2; Shoenberger furnaces, 2; Carnegie furnaces, 9; Monongahela furnace, 1; Edith furnace, 1; Laughlin furnaces, 3; total, 20.

WESTERN PENNSYLVANIA AND OHIO.

New Castle, Pa.—Rosena furnace, 1; Atlantic Iron and Steel Company, 1; Etna, 1; Raner & Berger, 1; total, 4.

Sharon, Pa.—Stewart furnace on Bessemer, 1; Sharpville, Pa.—Douglass furnace on foundry, 1; Dunbar, at Dunbar, 1; total, 7.

WHEELING AND CLEVELAND DISTRICTS.

Wheeling, etc.—Laughlin Junction furnace, 1; Jefferson, 1; Bellaire, 1; Wheeling Steel Company, 1; total, 4.

Cleveland, O.—Emma furnace, 1; Cleveland R. M. Company, 1; total, 2.

Furnaces to start as soon as they can obtain sufficient coke are: Leetonia, 2 furnaces; Youngstown, 10 furnaces; Shenango Valley, 9 furnaces; total, 21. Latest.—The market is firmer; holders decline to make concessions. Coke supply is daily increasing and the outlook for fall trade good.

BLOOMS, BILLETS AND SLABS.		500 Bessemer, prompt, 12.00	
Tons.	Cash.	500 Grey Forge, Aug- ust,	
5,000 Billets, Aug., Sept., Oct., at mill,	\$17.65	500 Bessemer, Valley Furnace,	
2,500 Billets, Aug., at mill,	17.85	500 Bessemer, Valley Furnace,	
2,000 Billets, Aug. and Oct., at mill,	18.00	250 Grey Forge,	
1,500 Billets, Aug., at mill,	17.75	200 Grey Forge,	
500 Billets, prompt, at mill,	18.00	200 Bessemer, spot,	
500 Billets, prompt, at mill,	18.00	100 Grey Forge, prompt,	
200 Billets, Aug., at mill,	17.50	100 No. 1 Foundry,	
CHARCOAL.		100 No. 2 Foundry,	
125 Cold Blast,	24.00	51 No. 2 Silvery,	
100 Cold Blast,	23.50	50 No. 1 Silvery,	
100 No. 2 Foundry,	16.50	50 No. 1 Foundry,	
75 No. 1 Foundry,	17.75	50 No. 2 Foundry,	
SKELP IRON.		50 Bessemer,	
525 Wide gr'vd., 1.90 4 m, 38" Sheared,	1.40 4 m,	MUCK BAR.	
325 Nar. gr'vd., 1.30 4 m,	1.30 4 m,	300 Neutral, prompt, 19.50	
SKELP STEEL.		275 Neutral, Aug.,	
700 Sheared,	1.20 4 m,	BLOOMS, BILLETS AND RAIL ENDS.	
800 Wide gr'vd., 1.10 4 m,	1.10 4 m,	650 Rail ends,	
500 Nar'w gr'vd., 1.10 4 m,	1.10 4 m,	STEEL WIRE RODS.	
COKE SMELTED LAKE AND NATIVE ORE.		500 Five gauge Am- erican, at Mill,	
3,000 Bessemer, Aug- ust, September,	\$11.90	500 Five gauge Am- erican, at Mill,	
2,500 Bessemer, Aug- ust,	12.00	SHEET BARS.	
1,500 Bessemer, Aug- ust, September,	11.85	360 Delivered,	
1,000 Bessemer, prompt 12 00	10.00	SPEITER.	
1,000 Grey Forge,	12.00	125 Tons, per 103 lbs., 3.32	
1,000 Bessemer, Aug- ust,	12.00	FERRO-MANGANESE.	
PHILADELPHIA.		50 87% at mill,	
Aug. 10.		SCRAP AND RAILS.	
(From our Special Correspondent.)		400 Cast scrap, gross, 9.00	
Pig Iron. —Mill brands have been taken more freely from both northern and southern furnaces, but there is no improvement in prices. Southern force can be delivered at \$10, Lehigh irons at \$10.50 @10.75. Large buyers are on the point of placing orders for three months' stocks. Foundry irons sell in small lots at \$12.50 for No. 1, and \$11.50 for No. 2. There are no features worth speaking of.		400 Iron rails,	
Muck Bars. —Good sales are reported at \$19.50@ \$20. Demand is improving.		400 Steel rails,	
Billets. —Once in a while a sale of billets is made, usually at \$19. Buyers offer \$18 for large lots, con- venient deliveries, but makers are not inclined to accept such offers. Every one is waiting for the return of normal conditions. While coke is scarce negotiations hang fire.		300 No. 1 wrought scrap, net,	
Merchant Steel. —A little cold rolled shafting has been shipped east in stock. Several orders for tool steel have been booked. Bessemer machinery or- ders are in sight.		100 Iron rails,	
Plate and Tank. —A little more boiler plate has been ordered, and an inquiry from New York parties has just been received which will take about 1,000 tons. Very close figures are quoted.		100 Iron rails,	
Structural Material. —The demand for small lots is improving, but competition is very close. Angles are offered here from the West at 1.20, plus freight. All the structural mills have picked up good orders. Beams and channels, 1.50.		100 Iron rails,	
Steel Rails. —No change. Standard, \$24. Girder rail orders are helping us out of trouble.		100 Iron rails,	

Old Rails.—Plenty stock is offered at \$11.50; one sale was made at \$11.25.

Scrap.—Car wheels, \$9.50; cast borings, \$6; machinery cast, \$9.75.

Merchant Iron.—Bar mills are gaining each week, and manufacturers have once more the Eastern markets pretty much to themselves. All are very anxious for business, and this keeps iron down in the neighborhood of 1'20@1'25 for refined. One order for common was taken to day at 1'10.

Nails.—A week of more encouraging activity can be reported. Both local trade and shipments are better. Very few large lots were sold in cut. Wire nails are not shaded as much as they were.

Skelp.—About one good sized order a week comes in. The wholesale rate is 1'25, but actual prices are a secret.

Sheet.—One mill finally closed a good order or two for heavy sheets, and the manager says September business in both light and heavy will be better. There is no contradiction to this statement in other quarters.

Pipe and Tubes.—Sharp competition from the West has lowered quotations.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 10, 1894.

Gold and Silver.

Prices of Silver per Ounce Troy.

August.	August.			August.			Value of sil. in \$.
	St. Ex.	London Pence.	N. Y. Cts.	St. Ex.	London Pence.	N. Y. Cts.	
4	4.88 1/4	28 1/2	62 3/4	4.87 3/4	28 3/4	62 3/4	.486
6	4.88 1/4	28 1/2	62 3/4	4.87 3/4	28 3/4	62 3/4	.486
7	4.88	28 1/2	62 3/4	4.87 3/4	28 3/4	62 3/4	.486

The silver market continues steady, with small fluctuations in prices. Shipments from here have increased this week, owing to some bullion coming forward that had been detained by the strikes in the West. The China-Japan war does not yet affect prices.

The United States Assay Office at New York reports the total receipts of silver at 92,000 oz. for the week.

Gold and Silver Exports and Imports at New York, Week Ending August 4th, 1894, and for Years from January 1st, 1894, 1893, 1892.

Week	Gold.		Silver.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1894...	\$3,102,397	\$61,057	\$592,043	\$95,681	\$3,537,707
1893...	80,316, 01	10,989,711	21,243,111	99,632	89,576,769
1892...	69,219,427	12,977,579	19,611,415	1,475,281	74,428,049
1891...	49,858,099	6,348,600	12,933,158	1,203,090	55,398,867

The gold exported for the week went chiefly to France and Germany, the silver to London. The gold imported came from the West Indies; the silver from South America.

During the five days ending August 9th the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$547,302; silver, \$9,156. Exports, gold, \$965,000; silver, \$475,360. Of the gold exported, \$77,000 was in French coin and went to France; all the rest was in American coin, \$50,000 of which went to Germany, and \$388,000 to France. Of the silver exported, \$107,500 was in Mexican coin, \$86,900 of which went to London, and \$21,600 to the West Indies; \$6,665 was in Peruvian coin, all of which went to South America. The remaining \$361,195 was in American coin and bullion, and went to London.

Gold and Silver Exports and Imports of the United States, at all Ports, for June, 1894, and for Six Months to June 30th, 1894, 1893.

June	Gold.		Silver.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1894...	\$23,340,888	\$907,295	\$3,381,822	\$771,656	\$25,043,759
1893...	70,980,843	11,459,720	24,714,093	4,586,918	78,648,295
1892...	73,717,938	11,759,043	19,551,771	8,672,571	72,838,095

The statement includes all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

NOTES OF THE WEEK.

The improvement in the general situation continues, and is, if anything, more marked than at our last writing. The signs of returning confidence are multiplied, and the steady growth of business now seems to be assured. We give below some remarks from a careful observer, which seem to express well the condition of affairs.

The following excellent remarks on the present situation are from a high and usually very conservative authority, the "Financial Chronicle," of New York: The indications of an improvement in business are noticeable in a great many different ways. The railroads report in most cases a larger traffic movement than for a long time past, and returns of earnings for the closing weeks of July fully bear out these statements. At the same time advices received from the West and South, and also the observations of persons who have just returned

from extensive trips through those sections, agree in saying that business has latterly begun to increase, and that with the tariff question out of the way there would be a pretty general revival of industrial activity. As concerns the iron and steel trades, statistics to-day reveal results that are well worth pondering. Evidence of the revival of business is also clearly seen in the money market. What we refer to is the much better feeling in the market for time money and for commercial paper. More business has been done by brokers within the past few days than in many weeks before. This is in face of the fact which we reported last week that many of the banks are out of the market. As the tariff bill is expected soon to be disposed of, banks carrying large deposits are induced to prepare for the withdrawal of money by such of their customers as have heavy amounts of goods in bond, and this naturally makes them very conservative lenders. Indeed, there are already increased withdrawals of bonded goods, and the customs duties are becoming materially larger. This, too, accords with the statements of better business doing in trade circles, which find further confirmation in the reports from the principal trade centers, southern as well as western, as already noted. They all speak of a growing demand for money, and the inquiry no doubt will be greatly stimulated by the ending of the suspense regarding the tariff. Trust companies and institutions other than banks are showing a desire to place their funds on time, but very naturally all are anxious to take advantage of the lighter offerings of money and get the best rates obtainable. The demand for money on time is also increasing from commission houses, though just now they are not in pressing need of funds, owing to the light speculation in stocks, and also to the fact that the borrowing demand from the "bears" is urgent enough to enable these houses to have their lines of stocks carried at least free of cost; still there is a disposition to take advantage of the comparatively low rates offering on time and to make engagements.

The conference committees of the two Houses of Congress have continued at work, but up to the present writing without result. All sorts of rumors have been current as to the final settlement of the differences on the tariff bill, but they are not much more reliable than such reports generally are. The House committee has shown a disposition to stand up for the original bill, while on the Senate side there has not been much disposition to compromise apparent. The latest rumor—given for what it is worth—is that a duty on coal will be retained, but iron ore will go on the free list. The chief contest in the committee, however, has not been over coal or metals, but on the sugar schedule.

Gold exports have been light this week on a lower exchange market. The only shipment made so far has been \$500,000 taken by a Boston house on Monday, but not shipped until Thursday's steamer. So far no taking of gold for Saturday's steamers is reported. One shipment of \$500,000 is noted, but it is gold in transit from Cuba, and is not taken from our stocks.

Washington advices are to the effect that the Secretary of the Treasury has no intention of making any new issue of bonds at present. No legislation on this point is expected from Congress at its present session, and while the authority of the Secretary to issue bonds to maintain the gold reserve, under the present law, is unquestioned, it is understood that he does not consider it expedient under present circumstances.

The statement of the New York banks for the week ending August 4th shows decreases of \$96,000 in specie, \$3,369,800 in legal tenders, \$2,463,100 in deposits and \$58,900 in circulation, an increase of \$670,800 in loans. The decrease in deposits continues the movement begun in the preceding week, and is likely to continue, as the usual fall demand for money begins to be felt.

The statement of the United States Treasury on Thursday, August 9th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	Aug. 2, 1894.	Aug. 9, 1894.	Changes.
Gold.....	\$55,037,084	\$52,257,598	D. \$2,839,486
Silver.....	18,723,415	18,799,258	I. 75,843
Legal tenders...	19,777,735	23,058,093	I. 3,280,358
Treasury notes, etc.	22,697,873	22,225,703	D. 472,170

Total..... \$116,296,110 \$116,341,652 I. \$44,542
Government deposits with national banks on August 9th amounted to \$12,052,730; a decrease of \$669,715 during the week.

The Treasury monthly statement of the stock of money in the United States August 1st, 1894, shows large and important changes as compared with the same statement of a year ago. The detailed statement of money in circulation is as follows:

	Aug. 1, 1893.	Aug. 1, 1894.	Changes.
Gold coin.....	\$116,909,911	\$499,133,577	I. \$382,193,636
Standard sil. dol.	56,223,989	50,959,540	D. 5,264,449
Subsidiary silver.....	61,007,129	58,250,802	D. 2,756,327
Gold certificates..	87,611,429	63,917,229	D. 23,694,200
Silver certificates...	330,188,570	321,491,738	D. 8,696,832
Treasury notes.....	143,774,138	129,978,527	D. 13,795,611
U. S. notes.....	321,394,404	261,564,225	D. 59,830,179
Cur. certificates..	7,835,000	61,895,000	I. 54,060,000
Nat. bank notes..	180,134,997	202,644,601	I. 22,509,604
Totals.....	\$1,611,099,017	\$1,657,574,239	I. \$46,475,222

The most notable features in this statement are the increases in gold coin and in national bank notes and the decrease in legal tenders. The statement of money and bullion in the Treasury is as follows:

	1893.	1894.	Changes.
Gold coin.....	\$103,363,626	\$73,872,012	D. \$29,491,614
Standard sil. dollars.	363,108,461	368,796,668	I. 5,688,207
Subsidiary silver.....	12,556,719	17,970,611	I. 5,413,892
Treasury notes.....	4,512,210	22,528,599	I. 18,016,389
United States notes..	22,286,612	82,116,791	I. 59,830,179
National bank notes..	3,620,150	4,895,465	I. 1,275,315
Total.....	\$509,447,808	\$570,179,796	I. \$60,731,988
Gold bullion.....	83,450,336	47,500,824	D. 35,949,512
Silver bullion.....	119,277,735	127,113,753	I. 7,836,018
Total.....	\$712,175,879	\$744,344,373	I. \$32,168,494

For reasons which we have several times stated, we are inclined to believe that the Treasury estimate of the amount of gold in circulation is too high. Space will not permit a discussion of this question here, but we hope to refer to it again shortly.

There was no gold coined at the San Francisco Mint in July and only \$280,000 in silver, of which \$160,000 was in standard dollars and \$120,000 in half-dollars. These are the first standard dollars coined here in nearly two years. The mint was closed in July, 1893, pending the annual clean-up and transfer. The coinage for the first seven months of the calendar year has been as follows: Double eagles, \$10,875,000; eagles, \$250,000; standard dollars, \$160,000; half dollars, \$1,379,948; quarter-dollars, \$554,205; dimes, \$3; total, \$13,219,156.

The Bank of England on Thursday, August 9th, reported its gold holdings at £38,301,313, an increase of £13,158,859 as compared with the corresponding date last year. The bank continues to hold an enormous amount of cash, its reserve being 66 2/3% this week, although there has been a slight increase in the outflow of cash, and the receipts of gold from abroad have been temporarily checked.

The Bank of France on Thursday, August 9th, reported its specie holdings at 1,882,732,000 fr. gold and 1,266,730,000 fr. silver; an increase of 154,661,800 fr. gold and 19,080,250 fr. silver as compared with the corresponding date in 1893. Changes for the week were an increase of 18,425,000 fr. gold and a decrease of 1,250,000 fr. silver.

A dispatch from the City of Mexico says that London advices received by bankers in that city indicate an increasing demand for Mexican dollars in the Chinese and Japanese trade, with prospects of a rush for the white metal. If necessary the mints throughout Mexico will double their forces to supply the demand.

A Washington dispatch says that information has been received from the American Consul at Calao, Peru, that the acting President of Peru had issued a decree in which he recites that the present tariff was predicated upon a value of 34d. per silver sole, but now that it has fallen so far below that value equity to the Government and to commerce requires that the value of the silver sole be fixed at 30d. This decree, the consul says, was received with disfavor by the business community, as it practically increases the customs duties about 15%.

Shipments of silver from London to the East for the year up to July 26th are reported by Messrs. Pixley & Abell's circular as below:

	1893.	1894.	Changes.
India.....	£4,429,452	£3,044,815	D. £1,384,637
China.....	640,836	1,938,553	I. 1,297,697
The Straits.....	923,240	748,552	D. 174,688
Total.....	£6,003,528	£5,729,920	D. £273,608

For the week ending July 26th the shipments were £51,700 to India; £34,499 to China, and £17,000 to Japan.

The India Council on Wednesday sold 42 lakhs in bills at a better rate than was expected, and indeed better than has prevailed for several weeks past. The prices ranged from 12 1/2d. up to 13d. per rupee, a large part of the bills being taken at the last named rate. This rise will tend to check the export of gold from India. It is in large part due to that export and the demand for funds to pay for gold purchases.

An esteemed correspondent writes from Osaka, Japan, as follows: As a probable consequence of the "silver question," the importation here of the white metal for coinage is rapidly increasing nowadays. During the last three months, April-June, more than 10,000,000 oz. of silver of American, European and Australian origin were imported into the Imperial Mint. The mint is now producing 110,000 pieces of silver yen (dollars) every day, besides the usual amount of gold coins. This extraordinary production is not yet sufficient to meet the demand, and we are now considering how to turn out some more. The annual trial of the Pyx coins for the financial year ending March 31st, 1894, was held June 23d, with very satisfactory results with regard to both weight and fineness.

As much has been said of the trade aspects of the war in Korea, the following from the London "Economist" will be found of interest: The probability is that the war will cause an increase of trade. Immense quantities of military supplies of all kinds will certainly be needed by both combatants, and in the supply of these England will no doubt take her

share. It may also be noted in passing that India, which has recently been complaining bitterly of the competition of Japan in the supply of cotton goods to China, will gain by the exclusion of her rival. And, looking further ahead, there is the possibility that the war will do much to break down the extreme conservatism of the Chinese government, and to induce it to open up the country to foreign enterprise. In her first encounters with Japan it is almost certain that China will be worsted. The superior armament and training of the Japanese forces is bound to tell. But however heavily she may be defeated in the beginning, there will be with China no thought of giving up the struggle. The loss of tens of thousands of men is to her a matter of comparative indifference. To her teeming millions that is as nothing. Her dependence is upon the masses of troops she can keep pouring into and, if necessary, spending in the peninsula, and her policy will be to bear down her opponent by sheer weight of numbers. This policy is not unlikely to prevail in the end, but in carrying it out she will find herself terribly hampered by the want of proper means of communication. She has, practically speaking, no railways, and will be compelled to march her troops hundreds and thousands of miles before she can put them in the field, and then they will arrive weakened and exhausted by the preliminary hardships they have been forced to endure. She will thus be made to feel in a way she has never yet experienced the want of those modern facilities she has so rigorously excluded, for in her previous conflicts with foreign powers she has always had to deal with numerically small forces, and has never found it necessary to put out her strength to anything like the extent she will in all probability now be compelled to do. Whatever else it may do, therefore, the war is pretty certain to teach her a lesson as to the folly of the policy she has hitherto pursued, and to lead to the opening up of the country by means of railways, telegraphs, etc., and to a consequent development of trade. Thus, out of the present evil some ultimate good promises to arise.

At present neither China nor Japan has a foreign debt of any magnitude. China has raised external loans to the extent of £3,753,000, but these have been reduced through the operation of the sinking funds, until now the amount outstanding is a little under £1,000,000. Japan has a heavy internal debt, but her foreign borrowing has been limited to one loan of £2,400,000, of which all but £600,000 has already been redeemed. Tested by market prices, the credit of China stands higher than that of her enemy, and at any time she could have had millions of fresh money for the asking. She has, however, preferred to rely upon her own resources, but these cannot be expected to suffice for the present emergency, and it is not improbable that we may soon see her in the market again. For a fresh loan the Maritime Customs revenue would afford adequate security, and to provide for internal requirements a silver loan, which would be eagerly subscribed to, would suffice. Japan has in her paper currency a resource of which she will doubtless avail herself in the first place; but if the struggle is prolonged, she also will have to seek for financial help abroad.

The Argentine gold premium, since its recent fall from about 300, has not varied much; it has continued to range between 260 and 270. Those interested, however, expect a rise before long.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$1.50 3/4	\$1.51 1/4
Peruvian soles and Chilean pesos....	.51 1/2	.52 1/2
Victoria sovereigns.....	4.87	4.90
Twenty francs.....	3.88	3.92
Twenty marks.....	4.75	4.83
Spanish 25 pesetas.....	4.80	4.85

Other Metals.

Copper.—The market continues very dull, and, if anything, prices have given way a little, as Lake has been freely offered at 9c., without finding takers. This is probably due to the fact that the sale made by the Calumet Company some time ago involved a much larger quantity than was then supposed, which, in the absence of the anticipated better business has gone further than was expected, and even resulted in some people wishing they had not purchased so largely. Under the circumstances, it would be unreasonable to expect even a fair demand to arise until next month, although if the tariff bill should finally be passed, and soon, that might bring about a better state of affairs. Arizona copper must still be quoted at 8 1/2 @ 8 3/4; Casting at 8 1/2, delivered at buyer's works, and Electrolytic at 8 3/4 @ 8 1/2.

Abroad the market did not open until Tuesday, Monday having been a holiday, when prices were unchanged from the close of last week. At the second exchange, however, there was a decline of 2s. 6d., which was made up the next morning, and at the close we have to quote £38 15s. for spot and £39 2s. 6d. for futures, the tendency being firmer. This, however, applies only to the speculative descriptions, orders for fine copper, and especially American refined, being few and far between, and obtainable only at such prices as but few will entertain. The nominal quotations for refined are as follows: English tough, £40 15s. @ £41; best selected, £41 10s. @ £41 15s.; strong sheets, £42 @ £43

10s.; India sheets, £46 @ £46 10s.; yellow metal, 4 1/2 d.

Copper Exports.—The exports of copper from the port of New York, as reported by the New York Metal Exchange, during the week ending August 10th were as follows:

Liverpool—Tauric.....	Ingots	25 tons
	Pigs	100 "
Bremen—Trave.....	Ingots	5 "
Antwerp—Waeland.....	Plates	22 "
Rotterdam—Veendam.....	Ingots	210 "
	Plates	130 "
Hayre—La Normandie.....	Ingots	100 "
	Plates	50 "
Bremen—Saale.....	Bars	20 "

Exports of copper from Baltimore for the week ending August 9th are reported by our special correspondent as follows:

Hamburg—Italia.....	1,865 bars	201,916 lbs.
	67 cakes	33,000 "
Rotterdam—Chicago.....	1,277 bars	224,080 "

Other metals exported during the week were: 525 bundles tin scrap, 119,716 lbs., and 166 bars steel, 27,333 lbs., to Rotterdam; 1,848 plates spelter, 92,074 lbs., 156,800 lbs. tin scrap and 640 bars iron, 86,737 lbs., to London; 27 casks chrome iron ore, 28,635 lbs., to Liverpool.

Tin.—On better buying and the report from Washington that an agreement had been reached by the tariff conferees, prices here in part followed the advance abroad, but when it became known that the announcement of a settlement of the tariff dispute was premature, consumers became skeptical of the advance being maintained, and more or less withdrew from the market, which closes at 19 1/4 for any near-by delivery.

In London prices have been advancing throughout the week, having opened on Tuesday morning at £65 17s. 6d. for spot, and £66 7s. 6d. for futures, closing to-day at £67 17s. 6d. and £68 7s. 6d. respectively.

Messrs. De Monchy & Havelaar's circular gives the following statement of the position of tin in Holland on July 31st: Supply for seven months, 9,182 tons; deliveries, seven months, 7,000 tons; stock in warehouse, 3,648 tons; stock afloat, 1,845 tons; total stocks, 5,513 tons.

The exports of tin from Holland for the six months ending June 30th were 5,514 tons, against 5,915 tons last year and 5,431 tons in 1892.

The British Board of Trade returns give the following statement for the six months to June 30th: Foreign tin imported, 19,132 tons; tin exported, 12,048 tons, of which 2,961 tons were British and 9,387 tons foreign tin.

Lead is in fair demand, and the price steady at 3 1/4 @ 3 5/8 for spot, while, as there is nothing doing in futures, the price therefor must be called nominally 3 3/8 @ 3 5/8.

Quotations in London are £9 12s. 6d. for Spanish, and £9 15s. for English lead.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Since our last report there has been a very fair demand for pig lead. About 600 tons sold for August and September, and with few exceptions nearly all of these sales have been made on a basis of 3 25 @ 3 27 1/2, St. Louis.

Spelter is in but poor demand and the market is weaker, as the figures quoted last week (3 15 East St. Louis, and 3 40 New York) are being shaded right along.

Good ordinaries are quoted at £15 10s. and specials at £15 12s. 6d. in London.

Antimony.—Cookson's is to be quoted at 10c.; L. X. at 9c.; Hallett's at 8 3/4c.; U. S. French Star at 10c.

Aluminum.—Current quotations are as follows, No. 1 being over 98% pure metal, and No. 2 over 94% pure: No. 1, in rolling ingots, 75c. per lb. for small lots at factory; 73c. in 100 lb. lots; 70c. in ton lots. No. 1 in ingots for remelting, 65c. for small lots, 60c. for 100 lb. lots, and 55c. in ton lots. No. 2 in ingots for remelting, 60c., 55c. and 50c. per lb., according to size of order. Sheets, 80c. @ \$4.40 per lb., according to size and thickness. Wire, \$1 @ \$2.40 per lb., according to gauge. Castings, 90c. per lb. up, according to number, weight, patterns, etc.

Abroad quotations for 99% pure metal in Paris are 6 25 @ 7 75 fr. per kilo. for ingots; 7 50 @ 11 50 fr. for sheets, 11 @ 17 50 fr. for wire, and 19 @ 22 fr. for tubes. The Neuhausen Company quotes No. 1 (guaranteed 98% pure, and in fact 99 7/8%) at 5 francs per kilo. for ingots in small lots; for large lots a considerable discount is allowed.

Bismuth.—Recent quotations on the New York Metal Exchange are \$2 per lb. for lots of 500 lbs. or over; \$2.25 @ \$2.50 per lb. for smaller lots.

Magnesium.—No quotations are to be found for this metal in New York. Prices in Germany are, for lots of over 10 kilos.: Ingots, \$6.75 per kilo.; bars, \$6.50; powder, \$9; ribbon and wire, \$9.50. For orders of less than 10 kilos., 25 cents per kilo. must be added for ingots or bars, and 50 cents for ribbon, wire or powder. These prices are delivered at works: the Aluminum and Magnesium Fabrik, Hemelingen, Germany, is the only maker of the metal in commercial quantities.

Nickel.—Quotations are nominally 44 @ 50c. per lb., according to grade. Business is dull, and some sales have been made below these figures, say 40 @ 45c.; in fact at 40c. it is said an order can be filled. Abroad the demand has also been light, and prices have a downward tendency.

Platinum.—Abroad the prices are slightly higher, owing to light supply.

For chemical ware, hammered metal. Messrs. Eimer & Amend, New York, quote crucibles and dishes 41c. per gram for orders of over 250 grams; 43c. for orders of 100 grams or over, and 45c. for small lots. Wire and foil are 40c., 41c. and 4 1/2c. per gram, respectively, for orders of the quantities named. Current retail prices for crucibles are 50c. per gram.

Phosphorus.—Quotations continue steady at 50 @ 52 1/2c. per lb., f. o. b., New York or Philadelphia.

Sodium.—Abroad the price continues steady at 90c. @ \$1 per lb. Sales in this market are too small to furnish quotations.

CHEMICALS AND MINERALS.

New York, Friday Evening, Aug. 10.

Heavy Chemicals.—The dullness which has prevailed in the heavy chemical market for many weeks past continues unabated. For caustic soda there has been but a light demand during the past week. Alkali and carbonated soda ash are both exceedingly quiet. The same may be said of the other articles on the list. Prices generally are without change from last week. We quote: Caustic soda, 60%, 2 82 1/2 @ 2 97 1/2c.; 70%, 2 60 @ 2 70c.; 74%, 2 62 1/2 @ 2 72 1/2c.; 76%, 2 70 @ 2 80c. Carbonated soda ash, 48%, 1 @ 1 25c.; 58%, 1 @ 1 15c. Alkali, 48%, 1 @ 1 15c.; 58%, 1 @ 1 10c.; according package. Sal soda, 82 1/2 @ 95c. Bleaching powder, 1 75 @ 2c.

Acids.—There is nothing new to report of the acid market. There is only a fair jobbing demand for the various acids at unchanged prices. Our quotations this week are: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.40 @ \$1.60; muriatic, 18", 80c. @ \$1; 20", 90c. @ \$1.10; 22", \$1 @ \$1.25; nitric, 40", \$4 @ 4 1/2; \$4.50 @ \$4.75; sulphuric, 75c. @ \$1; chamber acid, \$6 per ton. Mixed acids according to mixture, oxalic, \$6.40 @ \$7.50 per 100 lbs. Blue vitriol is quoted at \$3.50 @ \$3.62 1/2; glycerine for nitroglycerine, 11 1/2 @ 12 1/2c., according to quality and quantity.

Brimstone.—The market for Sicilian brimstone continues very quiet. Quotations are: Best un-mixed seconds on the spot, \$18.00; best thirds, \$1 less. Future shipments, \$16.25 for seconds and \$1 less for thirds.

Fertilizing Chemicals.—Prices are unchanged and the volume of business doing is very small. Consumers, in anticipation of the fall trade, are commencing to feel their way. There are a few inquiries, especially from the South. We quote this week: Sulphate of ammonia gas liquor \$3.75, and \$3.25 for bone. Dried blood, \$2.10 per unit for high grade and \$2 @ \$2.05 for low grade. Azotine, \$2.10. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15% av. P₂O₅, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P₂O₅, 90c. per unit. Acidulated fish scrap, \$15 @ \$16, and dried scrap nominally \$25 f. o. b. fish factory. Tankage, high grade, \$22.50 @ \$23; low grade, \$21 @ \$21.50. Bone tankage, \$23 @ \$24; bone meal, \$24 @ \$25.50.

In lots of 50 tons on contracts we quote: Double manure salts, 48 5/8% (basis of 48%); New York and Boston, \$1.12; Philadelphia, \$1.14 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.17. High grade manure salts, 90-95% and 96-99% (basis 90%), respectively; New York and Boston, \$2.07 @ \$2.11; Philadelphia, \$2.09 1/2 @ \$2.13 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$2.12 @ \$2.16.

Phosphate Rock.—Charleston, S. C., quotations are as follows: Acid phosphate, \$6.25 @ \$6.50 cash, f. o. b. in bulk; phosphate rock, standard land, kiln dried, \$4.25 @ \$4.50 f. o. b. mines.

Muriate of Potash.—In lots of 50 tons, quotations are as follows: 80 85% and minimum 93% (basis 80%), respectively: New York and Boston, \$1.78 @ \$1.91; Philadelphia, \$1.80 1/2 @ \$1.83 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.83 1/2 @ \$1.86.

Kainit.—Prices for kainit (minimum 23%) in cargo lots for 1894 delivery are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, \$9 @ \$9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$9.75 @ \$10. For sylvinite, 27-35%, prices are as follows per cent. per gross ton, invoice weight: New York, Boston and Philadelphia, 37 1/2c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weight, 1c. more per cent.

Nitrate of Soda.—This market continues quiet. Quotations are: Spot, \$2.12 1/2c.; shipments, \$1.95 @ \$2

Liverpool. July 31.

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

Business in heavy chemicals shows no improvement, and it is reported that on account of accumulation of stocks a number of the Lancashire works are to be closed for a fortnight.

At the close of last week it was officially announced that the United Alkali Company would pay the interim dividend on its preference stock, but would pay no interim dividend on the ordinary stock. The announcement did not come as a surprise to the trade, having been anticipated for some time past in consequence of the bad state of trade.

Soda Ash is dull, and, for Leblanc makes, the nominal spot range is about as follows: Caustic ash, 48%, £3 15s. @ £4 per ton; 57 and 58%, £4 10s. @ £4 15s. per ton.

Carb. Ash, 48%, £3 5s. @ £3 15s.; 58%, £3 15s. @ £4, net cash.

Ammonia Ash, 58%, quiet, at £3 10s. @ £3 15s. per ton net cash for tierces and 5s. per ton less for bags. Soda crystals are steady at £2 12s. 6d. @ £2 15s. per ton, less 5%.

Caustic Soda in limited request, while quotations are nominally unchanged, varying according to export market about as follows: 60%, £7 10s. @ £8 per ton; 70%, £8 10s. @ £9 per ton; 74%, £9 10s. @ £10 per ton; 76%, £10 10s. @ £11 per ton, net cash. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching Powder is only wanted to a moderate extent, while quotations are nominally unchanged, ranging according to market from £7 10 to £8 per ton net cash for hard wood packages.

Chlorate of Potash is nominally quoted at 6½ @ 6¾ d. per lb. for prompt delivery, but no buyers. Bicarb. Soda is firm at £6 15s. per ton, less 2½% per 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of Ammonia is quoted at about £14 2s. 6d. @ £14 7s. 6d. per ton less 2½% per good gray 24 to 25% in double bags f. o. b. here, as to quality. Nitrate of Soda rather idle at £9 2s. 6d. @ £9 5s. per ton, less 2½% per double bags f. o. b. here.

Carb. Ammonia: Lump, 3¾ d. per lb.; powdered, 4d. per lb., less 2½%.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 142 and 144.]

NEW YORK, Friday Evening, Aug. 10.

There is nothing of interest to report in the mining stock market this week; it is far quieter than the grave, a thousand times duller than ditch water, and far more uninteresting than a report of the Department of Agriculture. We make this statement deliberately, and without fear of contradiction. To write weekly reviews of this market affords an excellent opportunity for the study of synonyms, for it is always the same, and a report of it entails a repetition of the one fact that it is very dull expressed in different terms every week.

During the past week the sales are officially stated to aggregate 5,820 shares. It is more than probable that of this number at least 1,000 shares were "washed" sales—a method of illegitimate trading, popularly believed by certain brokers at the Consolidated stock and Petroleum Exchange to be conducive to more business, by leading the public to imagine that those shares actually changed hands at the prices quoted. This is a mistake, however, in addition to being wrong. The public just now will not buy mining stocks at any price. To arouse interest in what was once a popular form of investment and speculation, other and better methods must be resorted to. In the mean time, why does not the Committee on Mining Securities of the Consolidated Exchange put a stop to practices which if not out and out dishonest are certainly not creditable to the Exchange? The committee has only to enforce the by-laws of the Exchange.

There has been but little trading in the Comstocks during the past week at slightly higher prices. Chollar shows sales of 1,300 shares at 34c. @ 40c., the former price being the closing price. Of Comstock Tunnel 1,500 shares were sold at 3c. @ 4c.

Consolidated California & Virginia advanced from \$3 80 to \$4 20, but the total sales were only 120 shares. Crown Point shows sales of 400 shares at 85c. to \$1. Savage advanced from 39c. to 44c., with sales of 70 shares. Yellow Jacket opened at 47c., advanced to 60c. and declined to 54c.; total sales, 600 shares. Other sales were: 200 shares of Gould & Curry at 54c.; 100 shares of Sierra Nevada at 78c., and 200 shares of Mexican at \$1.15 @ \$1.20.

No California stock shows any sales this week. The net profit of last month's mill run of the Standard Consolidated amounted to \$4,200. Of this sum, \$1,500 will be devoted to building some tailing vats.

According to the official lists of sales, 700 shares of Victor were sold at \$3. Notice of the dividend declared by this Cripple Creek company will be found elsewhere in this issue. No other Colorado stock was traded in during the week.

Messrs. Doubleday, Ropes & Co., the well-known mining stock brokers of Colorado Springs, Colo., write to us calling our attention to an advertisement in the "Rocky Mountain Illustrated Weekly," and which, Messrs. Doubleday, Ropes & Co. say, is calculated to entrap innocent investors. We quote from their letter:

It is the advertisement of a concern styling itself the "Pike's Peak Investment Company," Mining Exchange Building, Denver, Colo. Here are some of the "Bargains in Gold Stocks" which they offer for sale: Golden Eagle at \$10 per hundred, while the proper quotation is only \$1.50 per hundred; Orphan bell at \$15 a hundred, which should be \$4.25; Columbine, \$6 a hundred, should be \$1; Granite Hill \$7 per hundred, should be 75c.; Goldstone, \$4 per hundred should be 50c. per hundred. Besides these there is a long list of other stocks, whose quotations are just about as far out of the way as those we have instanced. Then there are one or two of the stocks advertised for sale which we doubt have any existence to-day.

Boston. Aug. 9.

(From our Special Correspondent.)

The market for copper stocks, which has been for the past few weeks extremely inactive with a

tendency to lower prices, took on quite a boom early in the week on a dispatch from the Tamarack mine, saying: "Have struck the lode in No. 3 shaft; find it rich." This started a buying movement in the stock, sending the price up from \$158 to \$170. A later dispatch was not so positive, but still considered the prospect very promising. However, the holders of the stock who bought at low prices were disposed to realize, and in consequence on the pressure to sell on a market with limited buying orders, it lost all the advance and \$3 more touching \$155 in sales yesterday and to-day. The advance in Tamarack stimulated the market, and almost every stock on the list gained more or less. Calumet & Hecla advanced to \$290 on very small sales. The directors have declared a dividend of \$5 per share; this makes \$10 per share paid this year, and it is probable that another dividend of \$5 may be paid later on. The total dividends paid by this company aggregate \$41,850,000. Osceola advanced from \$18½ to \$20½ on good buying and held the advance remarkably well. The improved prospects of the Tamarack are construed as favorable to this mine and encourage holders to retain their stock. Quincy advanced from \$80 to \$85, at this price 100 shares being taken. The scrip advanced in sympathy from \$28½ to \$30. Kearsarge came to the front again and was quite active at improved prices; sales at 45½ @ 55½, against \$5 previous sales. Centennial sold at 75c. @ \$1 and 90c. respectively. Franklin sold at \$8 to \$8½, not much doing in it. Wolverine sold at \$11½ for 50 shares. Atlantic advanced on small sales from \$8½ to \$8¾ @ \$8¾.

The Montana stocks sympathized in the general improvement and Boston & Montana advanced from \$22½ to \$24½, with a subsequent decline to \$23½. Butte & Boston sold up to \$9½ and declined to \$8½ on later sales. The combined sales of the two were about 2,500 shares.

3 p. m.—The market to-day was dull and inactive. The only transaction at the morning call was a sale of 45 shares of Tamarack at \$155, and at the afternoon call a demand for Tamaracks advanced the price to \$160, at which about 80 shares were taken. Closing prices were: Calumet & Hecla, \$285 bid, ex-dividend, \$290 asked. Tamarack, \$128 bid, \$160 asked. Quincy, \$85 @ \$87. Boston & Montana, \$23½ bid, \$23¾ asked. Butte & Boston, \$9¼ bid, \$9 asked.

San Francisco. Aug. 3.

(From our Special Correspondent.)

The demand for mining stocks during the current week has continued light, but a better tone has prevailed in the market, and the North-End Comstocks have advanced somewhat in value. The mining dividends paid during the month of July aggregated \$107,350, as compared with \$67,700 paid during the same month last year; this speaks well for the improvement in the mining industry, but the stock market in this city, as has often been illustrated, depends in no way upon the general prosperity in the mines, but only upon the action of the "milking" operating on the Comstock lode. During the period of financial depression, now showing signs of passing away, the manipulations of this small clique have been necessarily circumscribed, but a large amount of necessary work was done in the mines, and now they are in good condition to turn out ore, if it so please the powers that be.

This market gives almost continuously succor to the bearish element, but this week the tendency displayed by the North-End Comstocks to stiffen on several occasions brought about a bear attack that brought prices back to the old level. Consolidated California & Virginia sold to-day for \$4.10 in the Pacific Board, and \$3 75, the highest rate in the San Francisco Board, the latter being an advance of 50c. on the ruling rate of a week ago. Ophir opened this morning at \$2.00 and closed at \$2 35, an advance during the week of 55c. Mexican sold at \$1 05; Sierra Nevada at 71c., and Union Cons. at 65c. show slight advances also.

In the middle group of Comstock shares Best & Belcher was in demand to-day at prices ranging from \$1 to \$1.20, the latter a 15c. advance during the week. Chollar sold for 33c.; Gould & Curry for 50c.; Hale & Norcross for 75c.; Potosi, for 43c., and Savage for 31c. All these figures are in advance of last week's ruling rates, albeit the total sales were not large.

The Gold Hill stocks have been the quietest of any on the list, and, with the exception of Belcher, prices are much the same as last week. Belcher opened in the Pacific Board to day at 80c. and sold 6c. in advance in the morning sessions of the San Francisco Board. It closed at 88c., a 15c. advance during the week. Bullion sold for 21c.; Crown Point for 75c.; Justice for 20c.; Kentuck for 12c.; Overman for 13c., and Yellow Jacket for 46c.

The Bodie have continued to sell quietly at the old rates—Bodie Consolidated for \$1.05; Bulwer Consolidated for 16c., and Mono for 15c. In the Bodie mine good ore has been found in the upraise, 300 level, and good ore is also being taken from the stope above the north drift, 300 level. There are 150 tons stored in the orehouse and the outlook is good—at present.

Of the other outside stocks no sales have been made, even Mayflower, a good dividend payer, not receiving a quotation. From this mine another bullion shipment, valued at \$1,500, was received this week.

BY TELEGRAPH.

SAN FRANCISCO, Aug. 10.—The opening quotations to-day are as follows: Best & Belcher, \$1.25; Bodie,

\$1.20; Bulwer, 17c.; Chollar, 34c.; Consolidated California & Virginia, \$4.10; Eureka Consolidated, 25c.; Gould & Curry, 57c.; Hale & Norcross, 75c.; Mexican, \$1.20; Mono, 18c.; Ophir, \$2 25; Savage, 44c.; Sierra Nevada, 69c.; Union Consolidated, 65c.; Yellow Jacket, 51c.

London. August 2.

(From our Special Correspondent.)

During the past week business in American mining stocks has been practically non-existent. The only movements to note are the fall in New Gustons, owing to the less hopeful character of the monthly report, and the unsuccessful endeavors to sell several blocks of American Belle. It is generally conceded that, in spite of the attempts to galvanize the latter stock, there is practically no hope for it. No buyers come forward at any price at all, and the present quotation is purely nominal, and is, of course, far greater than its real value. The position of Mesquital del Oros is gradually becoming less favorable, as anticipated in these columns a month ago, and the quotations have been again marked down, though in this case also there are no buyers at any price. Poormans are still in a state of suspended animation, and no holders dare come forward to sell. Nothing will be done in the way of making good the loss of the mill until the English and American directors have worked the mine and thoroughly investigated the condition of the property. De Lamars, Harqua Halas, Montanas, Elkhorns and Jay Hawks remain in pretty much the same condition as last week, and there has been a marked absence of business all round.

Paris. July 30.

(From our Special Correspondent.)

The absence of speculation continues; this fact is shown by the prices which are reported for the investment securities. French 3% rents are selling at 101, and 3½% at 108; English 2½% consols are above par; Russian 4% bonds are 101; and it is so all through the list.

In our proper list the metallurgical stocks are heavy and generally weaker, with very light sales all through the list. The coal companies, however, show practically no change, remaining steady, though there is little demand except for two or three stocks.—Dombrowa and Carmaux especially.

The Transvaal gold stocks are notably weaker and have been less dealt in than usual. On the other hand Huanchaca is strong, holding well the advances recently made.

The copper stocks have been generally weaker, and Rio Tinto, Tharsis, Cape Copper and Jerez-Lanteira have all fallen. On the other hand, the lead stocks have been doing better, with Laurium, Aguilas and Mokta-el-Hadid in some demand. Nickel continues to fall, chiefly on reports of increasing sharp competition from the Canadian mines.

In zinc, Malfidano shows a heavy fall; the report is that the proposed zinc syndicate will not be formed, and the Austrian and Silesian works have reduced their prices. This has depressed Vielle Montagne also, though not quite to the same extent.

You are aware that there exist in Paris several foreign chambers of commerce. The oldest of them is the British, which was formed in 1872. Since that time Belgium, Italy and Austria-Hungary have organized similar bodies, and now your countrymen here are forming the American Chamber of Commerce, which will soon be in working order. It is said also that the Dutch, Spanish and Russian merchants will organize their respective chambers.

The 17 000 kilos of silver for which the Paris mint invited tenders recently, will be furnished by the two firms of Allard and Lyon-Alemand. The price at which the contract was awarded was 47.25% of the coinage value. The last large purchase (12,000 kilos) was at 48.1% of coinage value.

The monthly bulletin of our Labor Bureau contains a table of the strikes in France during the month of June. At the end of May, 10 strikes comprised in the preceding return continued. The first dated from March 16th, and is not yet terminated. The glassworkers at Rive-de-Gier had turned out to the number of 1,061 to obtain the discharge of an offending workman. The most important was that at the Graissessac colliery, against the discharge of three members of the trade union and for an increase of pay. It commenced on May 6th, and the 1,500 men engaged in it still hold out. The others were of less importance, and four have since been brought to a close, one by a compromise, one by the success of the men, and two by their defeat. Thirty-three fresh strikes occurred in June, and 11 continued at the end of the month. The assassination of President Carnot was followed by a number of demands for the dismissal of Italian or all foreign workmen, and four of the strikes in the last week of June were with that object. Eight of the total number were terminated by a compromise, 11 by the surrender of the men, and in three cases only were they successful. In one instance the strikers were the proprietors of the quarries at Nantes, against an increase in the octroi on stone brought into the town, voted by the Municipal Council, and which caused 600 men to be thrown out of employment. The strike terminated by a compromise.

Generally speaking I can not but little sign of improvement in affairs. On your side you seem to be doing better, but here matters are not improving; really they are growing worse. AZOTE.

NEW YORK MINING STOCK QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, dates from Aug. 4 to Aug. 10, and Sales. Includes companies like Belcher, Nevada; Anaconda, Colorado; and others.

*Ex-dividend. †Dealt in at New York stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 2,930. Non-dividend shares sold, 3,000. Total shares sold, 5,930.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, dates from Aug. 3 to Aug. 9, and Sales. Includes companies like Atlantic, Michigan; Breece, Colorado; and others.

Dividend shares sold, 2,854. Non-dividend shares sold, 1,683. Total shares sold, 4,537.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Name of Stock, dates from Aug. 4 to Aug. 10, and Sales. Includes companies like Am. Coal; Balt. & Ohio; and others.

Total shares sold, 44,749.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Stock, dates from Aug. 4 to Aug. 10, and Sales. Includes companies like Adams Express; Am. Cotton Oil; and others.

Total shares sold, 286,081.

COLORADO.

Table with columns for Name of Company, dates from Aug. 3 to Aug. 9, and Sales. Includes companies like Alamo; Anaconda; and others.

Total shares sold, 102,200.

MARYLAND.

Table with columns for Name of Company, Bid, and Asked. Includes companies like Atlantic Coal; Balt. & N. C.; and others.

PENNSYLVANIA.

Table with columns for Name of Company, Bid, and Asked. Includes companies like Cambria; Central Coal & C. pref.; and others.

UTAH.

Table with columns for Name of Company, Bid, and Asked. Includes companies like Alliance; Anchor; and others.

CALIFORNIA.

Table with columns for Name of Stock, dates from Aug. 3 to Aug. 9, and Sales. Includes companies like Alpha; Belcher; and others.

FOREIGN.

Table with columns for Name of Company, Buyer, and Seller. Includes companies like Alaska Treadwell; Alameda & Tinto, Mex.; and others.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total Levied, Date and amount of last), Dividends (Total paid, Date & amount of last), Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total levied, Date and amount of last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$51,320,000 in dividends, and the Cons. Virginia \$12,350,000. § Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

Table with columns: COLORADO, Aspen, Aug. 4, Price. Lists various mining and industrial products like Argonite-Junata, Aspen Contact, etc.

Table with columns: Colorado Springs, Aug. 3, High, Low, Sales. Lists products like Cripple Crk (gold), Anaconda Gold, Aola, etc.

Table with columns: PENNSYLVANIA, Pittsburg, Aug. 9, Bid, Asked. Lists products like Allegheny County Light, Bridgewater Gas, etc.

Table with columns: MINNESOTA, Duluth, Aug. 7, LISTED STOCKS. Lists various iron and steel companies like Biwabik M. Iron Co., etc.

Table with columns: MISSOURI, St. Louis, Aug. 7, Closing quotations: Bid, Asked. Lists products like Adams, American & Nettle, etc.

Table with columns: MONTANA, Helena, Aug. 2, (Specially Reported by S. K. Davis.) Lists products like Bald Butte (Mont.), Benton Group, etc.

Table with columns: FOREIGN, Shanghai, China, July 6, (Special Report by J. H. Bissett & Co.) Lists products like Hong Kong Electric Co., etc.

Table with columns: FOREIGN, Paris, France, July 30, Francs. Lists products like Acieries de Creusot, etc.

Table with columns: Acieries de France, de la Marine, Agnes Tonidas, Anzin (coal), Callao, etc. Lists various international products and prices.

Table with columns: ASSESSMENTS, COMPANY, No, Dinqt. in office, Day of sale, Amt. per sh're. Lists various companies and their assessment details.

Table with columns: CURRENT PRICES. Lists various chemical and industrial products like Acid-Acetic, Ammoniated, Alum, etc.

Table with columns: Cadmium Iodide, Chalk, China Clay, Chlorine Water, Chrome Yellow, etc. Lists various mineral and chemical products.

Table with columns: Mineral Wool, Phosphorus, Potassium, Pyrites, Quartz, etc. Lists various mineral and chemical products.

Table with columns: Tin-Crystals, Muriate, Vermilion, Zinc White, etc. Lists various mineral and chemical products.

THE RARER METALS.

Table listing prices for rarer metals like Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium-Yttrium, Gallium, Germanium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Manganese, Molybdenum, Niobium, Palladium, Potassium, Rhodium, Ruthenium, Rubidium, Selenium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Tungsten, Uranium, Vanadium.

RAILROAD MATTERS.

The Delaware & Hudson Canal Company's new passenger station at Scranton, Pa., was formally opened to travel on July 30th.

The Pennsylvania Railroad will not build more than 100 locomotives at its shops at Altoona and Juniata, Pa., during the present year. Usually over 225 locomotives are built by the Pennsylvania Railroad at its shops every year.

The Lehigh Valley Railroad Company has given an order for 2,000 hopper-bottom gondola cars to carry 60,000 lbs. each. The order is divided, 1,000 cars to be built by the Buffalo Car Manufacturing Company, Buffalo, N. Y., and 1,000 by the Lebanon Manufacturing Company, Lebanon, Pa. The cars will be equipped with M. C. B. couplers, iron brake-beams, and the truck frames will be Fox pressed steel.

Mr. B. W. Wrenn, who has been general passenger agent of the East Tennessee, Virginia & Georgia for the last ten years, is now in charge of the traffic on the Memphis & Charleston Railroad. When the new Southern Railway Company assumed the operation of the East Tennessee Railroad, Mr. Wrenn was offered the position of assistant-general passenger agent of the Western Division, which comprises the East Tennessee lines, but he declined to accept it.

The engineers appointed by the Swiss Government to consider the feasibility of tunneling the Simplon Mountain have reported in favor of the plan. In October last the Jura-Simplon Railway Company made a contract with Brand, Brandan & Co., of Hamburg, and with Locheer & Co., of Zurich, bankers, to form a company to build the tunnel. By the plans adopted some months previously the tunnel will have a length of 12.6 miles, or 3.1 miles more than the St. Gothard tunnel. The northern portal will be situated about 2,300 yards south of Brieg, at the little village of Im Raffi, and the southern 600 yards beyond Ivelle.

The Baltimore & Ohio Railroad Company has secured a permit to build a power-house in South Baltimore to furnish power for the Baltimore Belt tunnel. The building will be 69 x 300 ft. The power-house will be at the south end of the Belt tunnel on South Howard street, between Montgomery and Henrietta streets. The first story will be stone and the remainder of red brick, while the roof will be of corrugated iron, with iron pillars supporting the several floors. The electrical equipment for the power-house will be furnished by the Thomson-Houston company. There will be dynamos and engines with a capacity of 12,000 H. P.

Mr. R. A. Harlow, of Helena, Mont., the vice-president of the Montana Midland Railroad, and who has been its most active projector, has recently returned to Montana from a visit to the East. He states that he was able to make such arrangements while East that the construction work beyond the Missouri River will be resumed within a few weeks, and he hopes to complete most of the line to the mineral lands in southeastern Montana, to which the railroad is projected, before the end of the year. The railroad is now graded for about 200 miles from Helena east to Canon Ferry at the Missouri River and also from Whitehall. The coalfields to which the railroad is to be built are on the Upper Ruby River, southeast of Helena, about 80 miles from that town.

Fifteen yardmasters on the Western Division of the Chesapeake & Ohio were the recipients recently of handsome badges bearing an inscription testifying to their bravery and fidelity to their duties during the strike, says the "Railroad Gazette." These badges were presented by Superintendent J. M. Gill as tokens of the esteem in which the men are held by their superior officers. Mr. William McLain, a bridge watchman on the Kansas City, Memphis and Birmingham, has received special recognition from the officers of the road and from the local newspapers for his courageous defense of a trestle near Adamsville, Ala., when a mob of strikers tried to set it afire. The attack took place at 3 o'clock in the morning, and the watchman had to go some distance to his house for assistance and ammunition. He was helped by his two daughters, one of whom was injured by a pistol shot from the strikers. The United States Express Company has made a gift of \$10 a piece to many of its men in the station and wagon service at Chicago and Cincinnati in appreciation of their faithful and courageous service during the strike.

Judgment has been entered in favor of the South Pennsylvania company against the Southern Pennsylvania Railway and Mining Company for the amount of the damages assessed by the viewers appointed by the Court of Common Pleas of Fulton County, Pa., to assess the damages sustained by the South Pennsylvania Railway Company for lands taken by the Southern Pennsylvania Railway and Mining Company. The lands condemned extend from Mount Dallas, in Bedford County, to the Franklin and Cumberland county line, a distance of 51 miles, and embraced the roadbed of a portion of the old South Penn. Railroad. The Southern Pennsylvania Railway and Mining Company will extend its line north from Richmond Furnace, Franklin County, to the Tuscarora tunnel; thence west, along the lands condemned, to Mount Dallas, where it will connect with the Bedford division of the Pennsylvania Railroad. From the Tuscarora tunnel east a branch will be built to intersect the Cumberland Valley Railroad at or near Newville.

The new union passenger station at St. Louis is approaching completion and is expected to be ready for use by September 1st. The general offices of the Terminal Railroad Association, the company which owns the station as well as the tunnel, bridge, etc., were removed to the new building on July 28th. This station is spoken of as the largest in the world and doubtless is so in many features, if not in all. The headhouse is 450 ft. long and 80 ft. wide. The trainshed is 600 ft. by 604 ft., and contains 30 tracks. The shed consists of a single roof in the shape of a very flat arch, 75 ft. high in the center, supported by four rows of intermediate columns, besides those at the sides. The 150 ft. frontage not occupied by the headhouse is to be filled by a hotel, which is now in course of construction. This will be uniform in design with the railroad station and will add to its completeness, making the whole establishment one of the handsomest and most convenient railroad stations ever built.

REDUCED RATES TO WASHINGTON, D. C.

Grand Encampment of the Knights of Pythias of the World.

The biennial encampment of the Supreme Lodge and grand encampment of the Knights of Pythias of the world will be held at the National Capital, August 27th to September 5th.

For this occasion the Baltimore & Ohio Railroad Co. will sell round trip tickets at reduced rates from all points on its lines east of the Ohio River, August 23d to 28th inclusive, valid for return trip until September 6th; a further extension of time to September 15th can be secured, provided the ticket is deposited with the joint agent at Washington, D. C., on or before September 6th.

The rate from Philadelphia will be \$4.00, Pittsburgh, \$8.00; Cumberland, \$4.55, and correspondingly low rates from all other stations.

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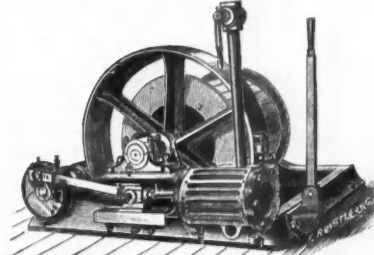
It has in its employ mining engineers whose reports it will guarantee, and desires to act as the Western agent of individuals or syndicates in the selection and purchase of mining property, doing the work on a commission. It will also advise on the operation of such or other property of this class.

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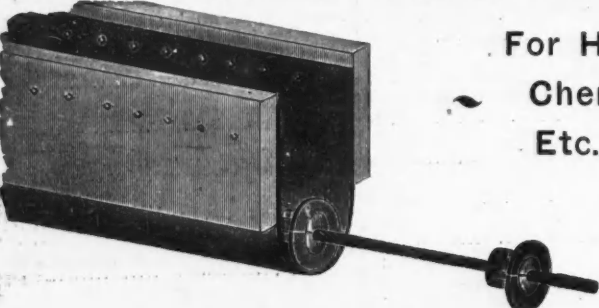
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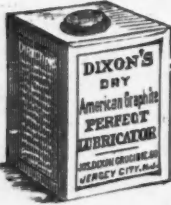
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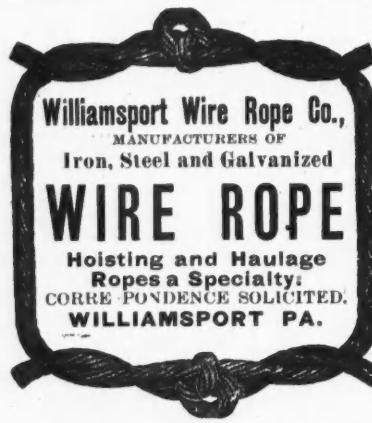
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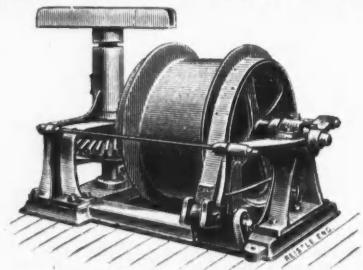
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American Mining & Milling Machinery Co.
Hesselt Foundry & Machine Co.
Blake, Theo. A.
Boston Ore Machinery Co.
Colorado Iron Works.
Fraser & Chalmers.
Frue Vanner Concentrator
Gales Iron Works.
Hendrie & Boltwell Mfg. Co.
Krom, S. H.
Krupp, F.
Mechanical Gold Extractor Co.
Raymond Bros. Imp. Pulv. Co.
Stedman Foundry & Mach. Co.
Totten & Hogg.
Waburn-Svenson Mfg. Co.
(See Machinery.)
Conduit, Fibre
Fibre Conduit Co.
Contractors and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Fraser & Chalmers.
Pollock, Wm. B., & Co.
Pratt & Whitney Co.
(See Machinery.)
Copper Dealers and Producers
Abbott, Wheelock & Co.
American Metal Co.
Atlantic Mining Co.
Baldach S. & Ref. Co.
Baltimore Cop'r Wks.
Bath, H., & Son.
Boston & Mont. Mfg. Co.
Butte & Boston Mfg. Co.
Canadian Copper Co.
Central Mining Co.
Copper Queen Mfg. Co.
Copper Rolling Machinery
Poole, R., & Son Co.
Corrugated Iron
Bryn Iron Bridge Co.
Crucibles, Graphite, Etc.
Denver Fire Clay Co.
Garden City Sand Co.
Obermayer Co.
Crushed Quartz
Garden City Sand Co.
Cupola
Garden City Sand Co.
Obermayer Co.

Dermaglutine
Grootzinger & Sons.
Diamonds
Bishop, Victor, & Co.
Diamond Drills
Bishop, Victor, & Co.
Bostelmann, L. F.
Bullock Mfg. Co., M.C.
Hasenah, W.
Lexow, Theodore.
(See Air Compressors and Rock Drills.)
Drawing Materials
Brandis' Sons.
Queen & Co.
Dredges
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.
Dredging Machines
Poole, R., & Son Co.
Dump Cars
Fraser & Chalmers.
Donaldson, A. M., & Co.
Truax Mfg. Co.
Hunt, C. W., Co.
Wright & Adams Co.
Educational Institutions
Columbian University.
Correspondence School of Mines.
Harvard University.
Mass. Inst. of Technology.
Michigan Mining School.
Ohio State University.
Pennsylvania Military College.
School of Mining (Kingston).
State School of Mines.
Electrical Batteries
Nassau Electrical Co.
Electrical Machinery and Supplies
General Electric Co.
Okonite Co., Limited.
Jeffrey Mfg. Co.
Repauno Chem. Co.
King & Andrews Co.
Nassau Electrical Co.
International Co.
Elevators, Conveyors and Hoisting Machines
Brown Hoisting and Convey. Mach. Co.
California Wire Works.
Cooper, Hewitt & Co.
Fraser & Chalmers.
Hunt, C. W., Co.
Jeffrey Manufacturing Co.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Works.
(See Wire Rope Tramway and Machinery.)
Elevator, Grain, Machinery
Poole, R., & Son Co.
Emery Wheels
New York Belting & Packing Co., Ltd.
Employment Bureaus
Engineering Employment Bureau.
Engineers, Chemists, Metallurgists
Adams, W. H.
Jones & Jones.
Kennedy, Julian
Kerr, Mark B.
Kyles, W. E.
Kirby, E. B.
Lammers, J. L.
Lavagnino, G.
Ledoux, C.
Leggett, Thomas H.
Loring, Frank C.
Lowell, S. J.
Mariner & Hoskins.
Martinez, Dion.
Maynard, George W.
McDermott & Duffield.
Merwin & Richardson.
Minger, W. C.
Mixer & DuBois.
Moore, Gideon E.
Newberry, W. E.
Nichols, Wm.
O'Brien, Frank
O'Leary, Eben E.
Page, Wm. Byrd.
Pearse, A. L.
Peeters, Edward W.
Phillips, W. B.
Poole, Robt., & Son Co.
Porter, J. A.
Potter, William B.
Pushie, J. A.
Randolph, John C. F.
Raymond, Rositer W.
Raymond, R. M.
Richard, T. A.
Ricketts & Banks.
Robinson, G. H.
Rohler, Chas. M.
Rothwell, John S.
Rothwell, Richard P.
Schwartz, Theodore S.
Shapleigh, W.
Shields & Middleton.
Skewes, Edward.
Squire, Jos.
Stein, Wm. M.
Stoiber, J. A.
Taylor & Branton.
Terhune, Richard H.
Tines, A.
Trent, L. C.
Unzicker, H.
Van Stooten, Wm.
Wilson, J. Howard.
Wyatt & Saarbach.
Young & Parr.
Engineers' Instruments
Brandis' Sons.
Stieren, Wm. E.
Queen & Co.
Excavators
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.
Fans, Steam
Cole, Wm. E.
Fertilizer Machinery
Poole, R., & Son Co.
Fibre Conduit
Fibre Conduit Co.
Fire-Brick and Clay
Denver Fire Clay Co.
Garden City Sand Co.
Flour Mill Machinery
Poole, R., & Son Co.
Fluorspar
Obermayer Co.
Fly Wheels
Poole, R., & Son Co.
Founders
Fraser & Chalmers.
Poole, R., & Son Co.
Foundry Cranes
Obermayer Co.
Foundry Supplies
Obermayer Co.
Friction Clutches
Star Burner Co.
Fuel Oil
Star Burner Co.
Furnaces
Pollock, Wm. B., & Co.
Sheffield Car Co.
Hoskins, Wm.
Moore, S. L., & Son Co.
(See Machinery.)
Gas Engines
Weber Gas & Gasoline Engine Co.
Lock, Wm., B. & Co.
Wood, R. D. & C.

Gauges, Recording, Etc.
Allen, Chas. A.
Bristol Mfg. Co.
Gearing
Fraser & Chalmers.
Poole, R., & Son Co.
Grain Elevators
Poole, R., & Son Co.
Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.
Hangers
Poole, R., & Son Co.
Heavy Machinery
Fraser & Chalmers.
Poole, R., & Son Co.
Hopper Cocks
Mueller Mfg. Co.
Hose, Rubber, Etc.
Allen, Chas. A.
Miners' Rubber Co.
New York Belting & Packing Co., Ltd.
Injectors
Young Lock Nut Co.
Inspection and Tests
Hunt, C. W., Co.
Robert W. Co.
Insulated Wires and Cables
Okonite Co., Ltd.
The Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.
Iron Castings
Poole, R., & Son Co.
Laddies
Obermayer Co.
Lamps, Miners'
Stieren, Wm. E.
Lead, White, Machinery
Poole, R., & Son Co.
Locomotives
General Electric Co.
Hunt, C. W., Co.
International Co.
Machine Molded Gearing
Poole, R., & Son Co.
Machinery
Fraser & Chalmers.
Poole, R., & Son Co.
Marine Engines
Poole, R., & Son Co.
Machinery
Machinery.
Milling.
and Other Machinery
Zena Fly & Mach. Co.
Allis, Ed. P., & Co.
Overland Mach. Co.
Percy Diamond Drill & Mfg. Co.
Armstrong Brothers.
Beckett, Andy & Co.
Raymond Bros. Imp. Pulv. Co.
Scaife, W. B., & Sons.
Scoville Iron Works.
Stedman Fdy. & Mfg. Co.
Sullivan Mach'y Co.
Thomson-Houston International Co.
Totten & Hogg.
Trenton Iron Co.
Union Iron Works.
Vulcan Iron Works.
Walbrun-Svenson Mfg. Co.
Webster, Camp & Lane Mach. Co.
Wright & Adam Co.
Youngston's Bridge Co.
Metal Dealers
James & Shakspeare.
Johnson, Matthew & Co.
Lawson Bros.
Mathison Sm'ling Co.
Orford Copper Co.
Picher Lead Co.
State Ore Sampling Co.
Victor Chemical Co.
Metallurgical Works and Ore Processors
American Zinc Lead Co.
Baker & Co.
Balbach Smelting & Refining Co.
Bath, H., & Son.
Canadian Copper Co.
Donaldson, A. M., & Co.
Fraser & Chalmers.
Goldsmith Bros.
Kansas City S. & Ref. Co.
Leduc & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works.
State Ore Sampling Co.
Waburn-Svenson Mfg. Co.
Mine Cars
Hunt, C. W., Co.
Truax Mfg. Co.
Mining and Land Companies
Amer. Devel. & Mfg. Co.
Atlantic Mining Co.
Boston & Mont. Mfg. Co.
Butte & Boston Mfg. Co.
C. C. Co.
Copper Queen Mfg. Co.
Detroit Copper Mfg. Co.
Lehigh & Co.
Moulding Sand
Garden City Sand Co.
Nickel
Canadian Copper Co.
Niles, Lock
Young Lock Nut Co.
Oil, Fuel
Star Burner Co.
Ore Cars
Donaldson, A. M., & Co.
Hunt, C. W., Co.
Fraser & Chalmers.
Truax Mfg. Co.
Ore Testing Works
Donaldson, A. M., & Co.
Hunt & Robertson.
Leduc & Co.
Packing and Pipe Coverings
New York Belting & Packing Co., Ltd.
Wyckoff & Son, A.
Perforated Metals
Alcherson, R., Perf. Metal Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Arms and Explosives
Iron & Coal Trades Review.
Indian Engineering.
Jour. of Assoc. of Engineering Societies.
Mining Journal.
Phosphates
Trenholm, Paul C.
Phosphor-Bronze
Phosphor-Bronze Smelting Co.
Pipes
Bucyrus Steam Shovel and Dredge Co.
Pollock, Wm. B., & Co.
Wyckoff & Son, A.
Plane Gearing
Poole, R., & Son Co.
Platinum
Baker & Co.
Plumbago-East India
Obermayer Co.
Portland Cement
Atlas Cement Co.

Powder
Etna Powder Co.
Lafin & Rand Powder Co.
Publications
Allison Coupon Co.
Arms & Explosives.
Australian Mining Standard.
El Minero Mexicano.
Lau, J. H., & Co.
Repauno Chem. Co.
Electrical Plant & Electrical Industry.
Financial Times.
I. T. & Coal Trades Rev.
Jour. of Assoc. of Engineering Societies.
Mining Journal.
Pulleys
Poole, R., & Son Co.
Pumps
Etna Fdy. & Mach. Co.
Allen, Chas. A.
Blake, Geo. F., Mfg. Co.
Cameron, A. S., Steam Pump Works.
Epping, Carpenter & Co.
Fraser & Chalmers.
Goulds Mfg. Co.
Grootzinger, A., & Sons.
Jeansville Iron Wks.
Quarrying Machines
Bostelmann, L. F.
Ingersoll-Sergeant Rock Drill Co.
Rand Drill Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.
Quickly Ever
Eureka Co.
Railroads
Baltimore & Ohio R.R.
Midland R. R. of Ky.
Railroad Supplies and Equipment
Carpenter, Geo. B., & Co.
Garden City Sand Co.
Hunt, C. W., Co.
Young Lock Nut Co.
Regulators, Damper, Heat, Etc.
Eddy Valve Co.
Lunkenheimer Co.
Rock Drills
(See Air Compressor.)
Rolling Mill Machinery
Poole, R., & Son Co.
Roading
Berlin Iron Bridge Co.
Phelps, Dodge & Co.
Hoburg Iron & Steel Roofing Co.
Pittsburg Bridge Co.
Scaife Wm B & Sons.
Percy Bridge and Const. Co.
Youngston's Bridge Co.
Rope Wheels
Poole, R., & Son Co.
Rubber
New York Belting & Packing Co., Ltd.
Safety Lamps
Wm. E. Stieren.
Screens
Alcherson, R., Perf. Metal Co.
Exeter Machine Works Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
(See Machinery.)
Screen Plates
Harrington & King Perforating Co.
Separators
Harrison Safety Boiler Works.
Shafting
Poole, R., & Son Co.
Scaife, Wm. B., & Sons.
Unrome Steel Works.
Crescent Steel Co.
Shevels (Steam)
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.
Smelting and Refining Works
Balbach & Ref. Co.
Penna. Salt Mfg. Co.
Penn. Smelting and Refining Works.
(See Metal Dealers.)
Scaife, Wm. B. & Sons.
Williams Mfg. Co.
Gas Main, Etc.
Tapping Machine,
Mueller Mfg. Co.
Telegraph Wires and Cables
Okonite Co., Ltd.
The Testing Batteries
Tin Plate Rolling Machinery
Poole, R., & Son Co.
Pratt & Whitney Co.
Tools
Tabes
Hendrick, Wm. B., & Co.
Williams Bros.
Tabing-Rubber
New York Belting and Packing Co., Ltd.
Turbines
James Leffel & Co., The.
Poole, R., & Son Co.
Stillwell-Bierce & Smith-Valle Co.
Turbine Water-Wheels
Poole, R., & Son Co.
Valves
Eddy Valve Co.
Lunkenheimer Co.
Jenkins Bros.
Mason Regulator.
Ventilators
Bullock, M. C., Mfg. Co.
Fraser & Chalmers.
Waburn-Svenson Mfg. Co.
Milton Mfg. Co.
Water Pressure Reducers
Mueller Mfg. Co.
Water Pressure Regulators
Mueller, H., Mfg. Co.
Poole, R., & Son Co.
Well Drilling Machinery
Bostelmann, L. F.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Williams Bros.
Sheffield Car Co.
White Lead Machinery
Poole, R., & Son Co.
Wire Cloth
Alcherson, R., Perf. Metal Co.
Harrington & King Perforating Co.
Wire Rope and Wire
Abbott, Wheelock & Co.
Lushen, A., & Sons.
Rupe Co.
Broderick & Bascom
Phelps, Dodge & Co.
Rope Co.
Riding, J. A., Sons & Co.
Ropeways Synd., Ltd.
California Wire Wks
Trenton Iron Co.
Carpenter, Geo. B., & Co.
Cooper, Hewitt & Co.
Willamport Wire Rope Co.
Hunt, C. W., Co.
Wire Rope Tramway
Brown Hoist. & Convey. Machine Co.
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co.
Fraser & Chalmers.
Hunt, C. W., Co.
Roehling, J. A. Sons & Co.
Ropeways Syndicate, Ltd.
Trenton Iron Co.
Vulcan Iron Works.

FREE ADVERTISING.

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

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

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

Positions Vacant.

1341 WANTED—CHEMIST TO GO TO Florida. Address, stating references, salary expected, etc., **GLOBE, ENGINEERING AND MINING JOURNAL.**

1342 WANTED—A YOUNG MAN TO assist in large general analytical laboratory, South; must be graduate of approved university and thoroughly grounded in analytical chemistry, especially agricultural chemistry; wide experience not necessary, and in fact prefer that experience be gained in this laboratory; salary moderate at start. Address, with references, age, etc., "**SOUTHERN,**" ENGINEERING AND MINING JOURNAL.

1343 WANTED—COMPETENT CHEMIST to make quantitative tests of ores and tailings. Address, stating experience, references and salary expected, **REACTION, ENGINEERING AND MINING JOURNAL.**

1345 WANTED—CONCENTRATION MILL Foreman. A thoroughly competent man to take charge of a concentration mill in the State of Chiapas, Mexico, using rolls, jigs, stamps and Even's tables. Address giving full particulars as to experience, references and salary. "**CHIAPAS,**" ENGINEERING AND MINING JOURNAL.

1346 WANTED—A FIRST CLASS METAL- lurgist, capable of treating refractory gold and silver ores; also a good assayer and chemist. **RIVERSIDE, ENGINEERING AND MINING JOURNAL.**

Situations Wanted.

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

METALLURGIST AND CHEMIST OF eight years' experience as assistant superintendent, superintendent and consulting metallurgist of lead refining, lead concentrating, pyritic smelting, copper smelting and copper refining works, will be at liberty shortly to take new position. Familiar with the latest metallurgical processes and improvements in the winning of metals from their ores, and the treatment of furnace and mill products. Terms reasonable. Address **SMELTING AND REFINING, ENGINEERING AND MINING JOURNAL.** No. 16,650.

MINING ENGINEER, 20 YEARS' EXPERI- ence in gold, silver, copper, lead and coal, is open to engagement. Address **INTEGRITY, ENGINEERING AND MINING JOURNAL.** No. 16,727

A GRADUATE AND THREE-YEAR POST- graduate of Johns Hopkins University desires a position as chemist. Experienced in analysis of ores, iron, steel, paints, oil, cement, limestone, phosphates, etc. Formerly chemist to a large steel works. Address **EXPERIENCED, ENGINEERING AND MINING JOURNAL.** No. 16,728, Aug. 18.

METALLURGIST OF WIDE EXPERIENCE in the building and operation of concentrating works, lead and copper smelting works, copper converting works, silver refineries, etc., will be at liberty in a few months to make new engagement. Should like to correspond with any company requiring a superintendent either for the construction of new works or the operation of existing works. Terms very moderate. Address **CONSTRUCTION, ENGINEERING AND MINING JOURNAL.** No. 16,649.

MECHANICAL DRAUGHTSMAN, SEVEN years' experience, open for engagement. Address **NEW YORK, ENGINEERING AND MINING JOURNAL.** No. 16,817, Sept. 1.

CHEMIST OF EXPERIENCE DESIRES POSI- tion. References. Address **M. A. C., ENGINEERING AND MINING JOURNAL.** No. 16,804, Aug. 18.

CIVIL ENGINEER WANTS POSITION with engineer or contractor; can make all calculations, supervise work, etc.; would accept small salary to commence, if there is chance for permanency; railroad, street, sewer, or building construction. Address **H. H., P. O. Box 1117, New York City.** No. 16,808, Sept. 1.

FOUNDRY FOREMAN WHO HAS HAD 25 years' experience in the making of mining and general machinery castings is open for engagement; good recommendations. Address **J. M., ENGINEERING AND MINING JOURNAL.** No. 16,810, Aug. 18.

EXPERIENCED CHEMIST, GRADUATE OF the Berlin University (Germany), at present employed in large works, reliable analyst, practiced in original and independent work, is open for engagement as assistant to superintendent, analyst, etc. Best of references. Address **A. N. A., ENGINEERING AND MINING JOURNAL.** No. 16,828, Sept. 1.

MINING ENGINEER, NOW EMPLOYED IN Mexico, will go to Central America, preferably Honduras, with New York company as mining engineer or first assistant. Knows thoroughly language, customs and people of Spanish America. Address **HONDURAS, ENGINEERING AND MINING JOURNAL.** No. 16,748, Nov. 11.

FIRST-CLASS MECHANICAL ENGINEER and draughtsman, expert in steam, hydraulic and general machinery and iron construction, familiar with steel works machinery, mining machinery and plants, wishes responsible situation. Address **T. J. V., 1024 Park Avenue, New York.** No. 16,820, Aug. 18.

MINING ENGINEER REQUIRES A POSI- tion. Twenty years' experience in several countries in mining, milling, assaying and the treatment of refractory gold ores; no objection to go to Australia or Africa; good connection with the principal mining men and capitalists in London, England; will go there to represent any first-class firm in the States. Highest references and testimonials. Terms moderate. Address **PRACTICAL, ENGINEERING AND MINING JOURNAL.** No. 16,819, Sept. 8.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPER- vising Architect, Washington, D. C., August 2, 1894.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 29th day of August, 1894, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low-pressure, return-circulation, steam-heating and ventilating apparatus required for the U. S. Post Office building at Galesburg, Ill., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Galesburg, Ill. Each bid must be accompanied by a certified check for a sum not less than two per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Heating and Ventilating Apparatus for the U. S. Post Office Building at Galesburg, Ill.," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

TREASURY DEPARTMENT, OFFICE SUPER- vising Architect, Washington, D. C., August 6th, 1894.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 14th day of September, 1894, and opened immediately thereafter, for all the labor and materials required for the stone and brick work of the superstructure, etc., of the U. S. Post Office and Court House at Kansas City, Mo., in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Superintendent at Kansas City, Mo. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked. "Proposal for the Stone and Brick Work of the Superstructure, etc., of the U. S. Post Office and Court House at Kansas City, Mo.," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Washington, D. C.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until August 21st, 1894, to furnish at the navy yard, Washington, D. C., a quantity of steel forgings, tools, files, lumber, hardware, iron, piles, iron columns, and beams, brick, sand, life preservers and cement. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to navy yard, Washington, D. C. The attention of manufacturers and dealers is invited. The bids, all other things being equal, decided by lot. The Department reserves the right to waive defects or to reject any or all bids not deemed advantageous to the Government. **EDWIN STEWART, Paymaster-General U. S. Navy.**

DISTRIBUTING RESERVOIR.—Sealed proposals will be received at the office of the Cambridge Water Board, City Hall, Cambridge, Mass., until Aug. 31, 1894, for constructing a distributing reservoir at Payson Park, in the town of Belmont, Mass., and at that time and place will be publicly opened and read. The reservoir will be about seven hundred and fifty (750) ft. long, about five hundred (500) ft. wide, about twenty-five (25) ft. deep, with a capacity of about forty million (40,000,000) gallons. It will be constructed largely of earth, with puddle or concrete lining, parting wall, gate chamber and fixtures for controlling the flow of water, etc. The bids will be compared on the basis of the Engineer's approximate estimate of quantities, which will be furnished with copies of the specifications. Plans and specifications can be obtained only by application in person at the office of the City Engineer. Proposals to be addressed to the Cambridge Water Board and indorsed, "Proposal for Distributing Reservoir at Payson Park." **L. M. HASTINGS, City Engineer.**

The Most Successful Process for the Extraction of Gold.

IMPROVED BARREL CHLORINATION.

The undersigned has completed drawings and plans of the latest improvements in Barrel Chlorination, and is open to engagement for the testing of ores, the erection and operation of plants of any capacity. The most successful works in this country were managed by the undersigned.

Correspondence solicited.

JOHN E. ROTHWELL,
ENGINEERING AND MINING JOURNAL, New York.

WATER-WORKS.—Sealed proposals for the construction of a system of water-works will be received at the office of the secretary of the water-works committee at Morganfield, Ky., until Aug. 20, 1894, according to plans and specifications. The work will be approximately as follows: 1. Furnishing f. o. b. cars at Morganfield approximately five miles 8 in. to 4 in. cast iron water pipe with special castings for same. 2. Furnishing f. o. b. cars at Morganfield 36 fire hydrants, with valves and valve boxes. 3. Laying of the above pipe and setting of valves and hydrants. 4. A brick pumping station and chimney. 5. A steam pumping plant, consisting of one simple duplex pump of 250,000 gallons daily capacity and two 60-H. P. boilers, including setting, with all necessary appurtenances, etc. 6. A steel tank of 60,000 gallons capacity on brick tower 60 ft. high. 7. A 60-ft. brick tower with foundation. Bids will be received for the entire work complete, or separate bids for any one or more of the seven parts as above divided. A certified check made payable to the treasurer of the town of Morganfield must accompany each bid, the check to be an amount equal to three per cent. of amount of bid. Plans and specifications will be on file on and after August 8th, 1894, and can be seen at the office of the Secretary at Morganfield, Ky., and the office of the engineers, Sanders & Porter, 908 Columbia Building, Louisville, Ky. **H. X. MORTON Secretary Water-Works Committee. SANDERS & PORTER, Engineers.**

ELECTRIC LIGHT.—Sealed bids will be received by the City Council of Estherville, Ia., at the office of the City Clerk, until August 23d, 1894 for the construction of an electric light plant, about 30 arc lights, 1,000 sixteen-candle incandescent lights, 100 H. P. engine, boilers, and all other masonry material and work to complete plant, also for all cast-iron pipe, hydrants, valves, pumping machinery and boilers, and all other necessary material and labor, including tower house for putting in a direct pressure system of water-works, of about two miles of mains. Plans and specifications for both plants furnished upon application. All bids must be addressed to City Clerk, Estherville, Ia. **N. B. EGBERT, City Clerk.**

WATER PIPE AND PUMPING PLANT.—Honolulu, Hawaiian Islands.—Sealed tenders will be received at the office of the Minister of the Interior until September 1st for water pipe and pumping plant. Specifications may be seen at the office of the superintendent of public water-works in Honolulu and at the offices of the Hawaiian Consuls General in San Francisco and in New York. The Minister of the Interior does not bind himself to accept the lowest or any bid. **JAS. A. KING, Minister of the Interior.**

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Boston, Mass.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until August 21, 1894, to furnish at the Navy Yard, Boston, Mass., a quantity of cotton canvas, flax canvas, cotton raven, twine, sheeting and 159,000 pounds iron for chain cable. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, Boston, Mass. The attention of manufacturers and dealers is invited. The bids, all other things being equal, decided by lot. The Department reserves the right to waive defects or to reject any or all bids not deemed advantageous to the Government. **EDWIN STEWART, Paymaster-General U. S. Navy.**

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the New York Navy Yard," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until August 21st, 1894, to furnish at the New York Navy Yard a quantity of brushes, brooms, brass pipe, pipe fittings, valves, lamps and lamp fixtures, squirt cans, plumbago, polishing paste, shellac, tools, cotton waste and 10,000 pounds green coffee. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, New York. The attention of manufacturers and dealers is invited. The bids, all other things being equal, decided by lot. The Department reserves the right to waive defects or to reject any or all bids not deemed advantageous to the Government. **EDWIN STEWART, Paymaster-General U. S. Navy.**

CANAL WORK.—U. S. Engineer Office, 2258 Wabash Avenue, Chicago, Ill.—Sealed proposals, in triplicate, for constructing four miles or less of the eastern section of the Illinois and Mississippi Canal, between Mile 0 and Mile 4, near Bureau Junction, Ill., and for excavating the lock pits and constructing the foundations for four locks, will be received here until August 27th, 1894, and then publicly opened. All information furnished on application here or to Assistant Engineer James C. Long, Tikisliwa, Ill. **W. L. MARSHALL, Captain Corps of Engineers.**

Continued on page 19.

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NOTICE OF ASSESSMENT.

(Civil Code of California.)

Silver King Mining Company. Location of principal place of business, San Francisco, California. Location of works, Pioneer Mining District, Final County, Arizona Ter.

Notice is hereby given that at a meeting of the Board of Directors held on the 31st day of July, 1894, an assessment, No. 11, of Thirty (30) Cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, No. 310 Pine St., Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of September, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 2d day of October, 1894, to pay the subsequent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors, J. W. PERRY, Secretary. Office No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

DIVIDENDS.

HOMESTEAK MINING COMPANY,
MILLS BUILDING, 15 Broad Street,
New York, Aug. 16, 1894.

DIVIDEND NO. 193.

The regular monthly dividend, TWENTY (20) CENTS PER SHARE has been declared for July, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 25th inst.

Transfer books close on the 20th inst.

LOUNSBERY & CO.,
Transfer Agents.

Received Too Late for Classification.

1346 WANTED—A COMPETENT SURVEYOR and draftsman. Must be a competent assayer and have a knowledge of washing coals. None but well recommended, sober and industrious men need apply. Address STANDARI, ENGINEERING AND MINING JOURNAL.

1347 WANTED — SUPERINTENDENT for smelting and refining company. Must have a thoroughly practical knowledge of extracting and winning metals out of waste (skimmings and drosses) and of refining waste metals of all kinds and denominations. Should also have a knowledge of chemistry. Address DROSS, ENGINEERING AND MINING JOURNAL.

1348 WANTED—A MAN TO TRAVEL and sell iron and steel buildings and general work. Must have pleasing address and thoroughly understand his business. Position permanent and to right man will pay a fair salary. State experience. TRAVELER, ENGINEERING AND MINING JOURNAL.

1349 WANTED — Competent concentrator constructor and foreman; mechanical engineer preferred, with experience. State experience, age, and wages expected. Address ENERGY, ENGINEERING AND MINING JOURNAL.

A GERMAN MINING ENGINEER AND chemist wants position. Has 15 years' experience in mining, milling, assaying and surveying. Familiar with treating gold ores. Speaks Spanish. References. Address MINERAL, ENGINEERING AND MINING JOURNAL, No. 16, 229, Aug. 25.

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60 H. P.; one 1-in. by 42-in Corliss engine, 1/5 H. P.; double automatic engine, 350 H. P.; two 100-H. P. Phoenix automatic compound engines, 45 and 5 H. P.; westinghouse engine, one 80 H. P. Beck engine, one 7 x 7 Southwark automatic engine, one 4-H. P. Otto gas engine, 100, 200, 300 and 500-H. P. feed-water heaters, 30 to 100 H. P. return tubular, 70-H. P. Locomotives, 60-H. P. vertical boilers, good for 100 pounds. FRANK TOOMEY, Office 131 N. 3d St., Philadelphia, Pa. Warehouses, 974 to 980 Beach Street, 159 to 161 Canal Street.

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The above machinery is new (locomotive and cars built by Ryan, McDonald & Co., of Baltimore, Md.), and is now in Florida, where it will be sold cheap for cash or approved paper.

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Contracts Open

Continued from page 18.

ELECTRIC LIGHT PLANT.—Tenders will be received by registered post only, addressed to Ald. W. T. Stewart, Chairman Committee on Fire and Light, Toronto, until the 1st of September, 1894, for the installation of a complete electric light plant for the city of Toronto, Ont. Separate tenders will be received for the various portions of the work, viz: 1. Engine equipment. 2. Counter shaft and pulleys. 3. Belting. 4. Boilers. 5. Pumps and steam piping. 6. Economizers. 7. Dynamos and station, electrical apparatus. 8. Arc lamps. 9. Poles and overhead circuits. 10. Mast arms and lamp attachments. Plans and specifications may be seen and forms of tender obtained at the office of the City Engineer. Specifications for items Nos. 2, 3, 5 and 6 may be withheld until balance of apparatus is decided upon. A deposit in the form of a marked check, payable to the order of the City Treasurer, for the sum of 2 1/2 per cent on the value of the work tendered for, must accompany each and every tender. W. T. STEWART, Chairman Committee on Fire and Light, Committee Room, Toronto.

WATER WORKS—Cedar Rapids, Mich.—Proposals are wanted until August 28th for the construction of water-works. Address E. L. SARGENT, Village Clerk.

ELECTRIC AND GAS LIGHTING.—Tenders

addressed to the undersigned will be received by registered post until September 1st, 1894, for the lighting of the streets, avenues, squares and lanes of the city of Toronto with electric light and gas for a period of five years from the 1st of January, 1896. Specifications and forms of tender can be obtained upon application at the office of the Secretary of the Fire Department, Bay street Fire Hall. W. T. STEWART, Chairman Committee on Fire and Light, City Clerk's Office, Toronto.

PUMPING ENGINES AND BOILERS.—Office of

the Commissioner of Public Works, City Hall, Providence, R. I.—Plan and proposals are invited at this office until September 1st, for furnishing to the city of Providence three pumping engines, with boilers, for raising sewage from the outfall sewer in Allen's Avenue to a discharging sewer in Ernest street, under the following conditions: Each engine to deliver from 12 to 36 million gallons in 24 hours on an average lift of about 27 ft., but varying from 26 to 34 ft., without greatly decreasing its duty under extreme conditions. The elevation of the floors of engine house and boiler house to be not lower than 22 ft. above low water in the pump well nor higher than 26 ft. above said level, but the pumps may be set lower. The plant is to have complete connections and equipments ready to run permanently. Further information will be given by the City Engineer. Each bid must be accompanied by a properly certified check for the sum of \$1,000, payable to the undersigned, which check will be returned to the bidder unless forfeited by the abandonment of the proposal. A satisfactory bond for a sum equal to one third of the amount of the contract will be required for the faithful performance of the contract. ROBERT E. SMITH, Commissioner of Public Works.

WATER WORKS.—Sealed bids will be received

at the office of the City Clerk of DeKalb, Ill., until September 4th, 1894, for the improvement of the water-works system of said city. The following items will be required: Two high grade boilers; pumping plant for domestic service, including engine, deep well power pump and power service pump; one duplex pump for fire service of one million gallons daily capacity; one half million gallon reservoir; 90 tons of 10 and 12-in. cast iron pipe with special castings; pipelaying, including removal of old pipe. Bids on boilers and machinery will be accepted from manufacturers only. Plans and specifications can be seen, and specifications for boilers, machinery and cast iron pipe, and also general form of contract and proposal, can be obtained at the office of the undersigned. DANIEL W. MEAD, Consulting Engineer, Rockford, Ill.; E. A. PORTER, City Clerk, DeKalb, Ill.

FUEL.—U. S. SENATE, WASHINGTON,

D. C.—Sealed proposals for the following fuel for the U. S. Senate for the fiscal year ending June 30, 1895, will be received at the office of the sergeant-at-arms of the U. S. Senate until the 28th day of August, 1894, viz., 2,000 tons best extra hard white ash anthracite coal, small fracture size, screened and free from all impurities; also 15 tons of said coal, chestnut size; also 30 tons of Lee white ash coal free from all impurities, stove size; also 75 cords of best hickory wood, cut in three pieces, straight, free from knots and split to medium size; also 150 cords of best split pine wood, straight, clean and free from knots; 1,000 bushels best coke; all to be inspected, weighed or measured, sawed, split, and stored in the vaults of the Senate wing of the U. S. Capitol, which are opened to the inspection of bidders, at the expense of the contractor; all to be delivered and stored at such times and in such quantities as may be ordered by the undersigned. The right to reweigh the coal or remeasure the wood at the contractor's expense, also to require and take a greater or less quantity than that stated, not exceeding 50 per cent, in any case, of any of the above items, at the prices proposed and accepted, also to reject any or all proposals, or to accept or reject proposals for any of the above items, is reserved by the undersigned. Bids should be endorsed "Proposals for Fuel," and addressed to the sergeant-at-arms U. S. Senate, R. J. BRIGHT, Sergeant-at-Arms U. S. Senate.

CONDUITS.—Treasury Department, Office of

the Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 6th day of September, 1894, and opened immediately thereafter, for all the labor and materials required to put in place complete all the plumbing, gas piping and electric wire conduits for the U. S. post office, court house, etc., building at Charleston, South Carolina, in accordance with the drawings and specifications, copies of which may be had at this office or the office of the superintendent at Charleston, S. C. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All bids received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Plumbing, Gas Piping, Electric Wire Conduits, Etc., for the U. S. Post Office, Court House, Etc., Building at Charleston, S. C.," and addressed to JAMES MIAH O'ROURKE, Supervising Architect.

DREDGING.—Bureau of Yards and Docks,

Navy Department, Washington, D. C.—Sealed proposals, in duplicate, endorsed "Proposals for Dredging at Naval Station, Fort Royal, S. C.," will be received at this Bureau until Aug. 29, 1893, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be forwarded upon application to the commanding officer of said naval station, or to the Bureau. Bidders are expected to fully inform themselves of the character of the work required by visiting the station, where plans may be examined and all desired information obtained. Responsible security will be required for the faithful performance of the contract, and the right is reserved to reject any or all proposals not deemed advantageous to the Government and to waive defects. A bond for the sum of \$3,600 must accompany bids for the work. K. O. MATTHEWS, Chief of Bureau of Yards and Docks.

BRIDGE.—Franklin, Pa.—T. B. Larne invites

bids up to August 10th for building an iron superstructure of bridge.

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