

THE ENGINEERING AND MINING JOURNAL



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

VOL. LVII. MARCH 10. No. 10.

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

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

SOPHIA BRAEUNLICH, Business Manager.

THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTIONS TO THE ENGINEERING AND MINING JOURNAL ARE PAYABLE IN ADVANCE. Price: For the United States, Mexico and Canada, \$3 per annum; \$2.50 for six months; all other countries in the Postal Union, \$7.

The address slip on the paper will show date of expiration of subscription. Subscribers wishing their address changed will please give the name of the old post-office as well as the new one.

NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration and is sent to subscribers until an explicit order is received by us, and all payment of arrearages is made, as required by law. The courts invariably hold a subscriber responsible to the publisher for the subscription price of all papers received until the paper is paid for in full up to date and ordered discontinued. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

ADVERTISING RATES furnished on application.

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

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS: R. P. ROTHWELL, Pres. & Gen'l Mang. P. O. BOX 1533. SOPHIA BRAEUNLICH, SEC'Y & TREAS. 27 Park Place, New York.

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

LONDON OFFICE:

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

CHICAGO OFFICE: "The Rookery," Room 531.

CONTENTS.

	Page.
The Swedish Iron Trade	217
The Cyanide Process.....	217
Tariff Bill Changes.....	217
Our Exports of Ferro-Manganese.....	217
United States Coal Production in 1893.....	218
The Amy & Silversmith Case.....	218, 226
New Publications	219
Books Received	219
Subsidiary Currency.....	V. M. Braschi 220
The Cyanide Process at the Deep Down Mine.....	C. Andersen 220
Ontario Mines in 1893.....	223
* The Riedler Duplex Air Compressor.....	221
Abstracts of Official Reports.....	221
The Meeting of the American Institute of Mining Engineers.....	222
* Ore Washers at Longdale, Va.....	G. R. Johnson 223
The Calculation of the Fusibility of Clays	H. A. Wheeler 224
* The Blanton Cam for Stamp Mills.....	227
Recent Decisions Affecting the Mining Industry.....	227
Patents Issued	227
Personal, Obituary, Societies, Technical Schools, Industrial.....	228
Notes: Russian Iron Ores, 221—German Patents, 225—Transportation of Injured Men in Mines, 225—Coal Production in Spain, 227—Spanish Iron Production, 227—Metric Measures in England, 227.	

* Illustrated.

MINING NEWS.	South Carolina..... 232	Pittsburg..... 234	San Francisco..... 240
Alabama..... 229	South Dakota..... 232	New York..... 234	Colo. Springs..... 240
Arizona..... 229	Tennessee..... 232	Buffalo..... 234	Baltimore..... 240
California..... 229	Texas..... 232	Chicago..... 234	London..... 240
Colorado..... 229	Utah..... 232	Philadelphia..... 235	New York..... 240
Florida..... 230	Virginia..... 232	Pittsburg..... 235	Duluth..... 240
Georgia..... 230	West Virginia..... 232	METALS..... 235	Denver..... 240
Idaho..... 230	Wisconsin..... 232	CHEMICALS AND MINERALS..... 236	Helena..... 240
Illinois..... 230	Wyoming..... 232	MINING STOCKS:	Philadelphia..... 240
Indiana..... 230	FOREIGN NEWS.	New York..... 237	Pittsburg..... 240
Massachusetts..... 230	Br. Columbia..... 232	Boston..... 237	Paris..... 240
Michigan..... 230	British Guiana..... 232	San Francisco..... 237	Aspen..... 240
Mississippi..... 230	Great Britain..... 232	Meetings..... 237	Coal Stocks..... 240
Missouri..... 230	Mexico..... 233	Dividends..... 237	Ind. and Trust..... 240
Montana..... 231	Ontario..... 233	Assessments..... 240	MINING Co's..... 239
Nevada..... 231	South Africa..... 233	CURRENT PRICES:	Chemicals..... 238
New Jersey..... 231	MARKETS:	Minerals..... 238	Rarer Metals..... 238
New Mexico..... 231	COAL:	ADVT. INDEX..... 15	ADVT. RATES..... 33
New York..... 231	New York..... 233	STOCK QUOTATIONS:	
Ohio..... 232	Boston..... 233	New York..... 238	
Oregon..... 232	Buffalo..... 234	Boston..... 238	
Pennsylvania..... 232	Chicago..... 234		

Like their brethren in other countries the Swedish ironmasters are complaining of low prices, while they have not yet succeeded in making any corresponding reduction in costs. The pig iron production is increasing somewhat, in spite of the low prices, as there were 110 furnaces reported in blast on January 1st, 1894, against 89 in 1893. The steel production, on the other hand, shows a decrease, 21 Bessemer and 21 Martin converters having been in operation at the opening of the year, against 24 of each class a year ago. The number of forges, an important element in the trade, was 370, against 335 last year. The only element of cost in the iron trade in which a reduction is reported is in iron ore, the prices of which have fallen on account of the great development of the Gellivara mines during the past few years. This decrease, however, does not equal the fall in prices of pig and bar iron which the makers have to face.

In another column will be found an account of the experiments made with the cyanide process on the ores of the Deep Down mine in New Mexico. These seem to have followed the course which has so far attended the attempts to introduce the process in this country—an apparent success at the outset, followed by changes and experiments of various kinds and final abandonment. The only exception to the general rule which we are now able to record is at the Mercur mine, in Utah, where the process is still in use and an increasing production of gold is reported. Whether the failure at the Deep Down mine was due to improper management of the process, or want of comprehension of the best methods of applying it to the special ore in question, we cannot say, though the first trials were certainly promising. The fact remains that with the exception of the Mercur and one works in Mexico, the only fully demonstrated success of the process has been in South Africa, where it has been used entirely on the tailings from the mills, which it seems well adapted to treat profitably. Undoubtedly the process is well adapted to certain ores, but these appear to exist in but few localities, and we have yet to learn how to extend the use of the process to more common material.

The Tariff Bill is still in the hands of the Senate Finance Committee, though a report to the Senate, it is said, may be expected next week. The changes made by the Committee in the metal schedules include increases of 2½ to 5 per cent. on nearly all forms of finished iron and steel. The most important change, however, is that iron ore is taken from the free list and made subject to a duty of 40 cents per ton; under the present law the duty is 75 cents. Coal is also taken from the proposed free list and duties provided of 40 cents a ton on screened or lump coal, 15 cents a ton on slack and culm, and 15 per cent. ad valorem on coke. These, it will be remembered, are committee changes only, and the proposed amendments will depend on the action of both Senate and House.

Minor changes, however, are of less importance than a speedy settlement. If the Senate will only act and give us some decision, some imperfections in the bill may be pardoned. It is delay which is doing more harm than anything else, as Senators ought to realize. Moreover, if every interest is to be conciliated by getting its own little tax inserted not only would there be no end to the conferences, but it would be impossible to enact any tariff bill except one increasing duties.

OUR EXPORTS OF FERRO-MANGANESE.

A short time ago the "Engineering and Mining Journal" called attention to the wonderfully low cost at which pig iron is being produced at well located furnaces in Alabama, the figure given, viz., \$6.37 per ton, being, we believe, lower than anywhere else in the world. We can now claim also that ferro-manganese is being produced in this country at a lower cost than anywhere abroad, and the credit for this is due to the Carnegie works, which have always been in the van of industrial improvements, and which have been one of the chief producers of ferro-manganese for many years past. So successful have they been in reducing the cost of production that they are now able to ship ferro-manganese from Baltimore to Glasgow, Antwerp, Hamburg and Rotterdam, sending more than one thousand tons in October, November and December, 1893, and a certain amount also from New York, while more than 1,200 tons have been shipped in the first two months of the present year. We are not advised as to whether any was shipped from Philadelphia also.

A part of this ferro-manganese has been exported under the name "manganese ore," but there is no mystery as to what the material actually was. The invoiced value was a little less than two cents per pound, or about \$44 per gross ton. At present the market quotations of ferro-manganese are \$52 to \$53 per ton in Pittsburg, the present import duty being three-tenths of one cent per pound, or \$6.72 per gross ton.

Ferro-manganese and spiegel-eisen are very important products used in steelmaking, and our consumption of them may be appreciated from

the fact that the production of spiegeleisen and ferro-manganese in 1892 amounted to 179,131 gross tons, though in 1893 it declined to 81,118 tons. The high price of the product has caused earnest search to be made in this country for an ore well suited for its production, and numerous mines have been opened, but for one reason and another they have not succeeded in supplying the demand. The production of manganese ore in 1892 was 19,117 gross tons, and in 1893 it reached only 9,150 tons, a decline almost proportionate with the falling off in the output of speigel and ferro. The remainder of the ore used comes from the imports of iron ore (including manganeseiferous ores) which, in 1892, amounted to 806,585 tons, and in 1893 to 526,951 tons.

The Carnegie Company certainly deserves the highest commendation for the skill shown in the economical management of its plant, which has enabled it not only to produce steel rails in competition with the world, but to make ferro-manganese in part from imported ores, and actually export it to the home of ferro production, Belgium.

THE COAL PRODUCTION OF THE UNITED STATES IN 1893.

The "Engineering and Mining Journal" is enabled, through the hearty co-operation of State inspectors of mines and various State officials and the willing assistance of the operators themselves, to present at this early date complete returns of the coal production of the United States during 1893. These statistics have been collected for the forthcoming volume of "The Mineral Industry," and are in nearly every case official and authoritative. Such small corrections as may be necessary when the last returns are in will be trifling and have no appreciable effect upon the total, and can affect only two States from which our returns are now being received.

The vast amount of labor involved in gathering together, within such a short time after the end of the year, the details of an industry scattered through thirty States and varying from mines producing a few tons a year to those producing two and one-half million tons, cannot be comprehended by the layman. It has only been through continued correspondence, by both mail and wire, and untiring diligence on the part of those engaged in it, that these results have been secured.

Tons of 2,000 lbs.	1892.	1893.	Tons of 2,000 lbs.	1892.	1893.
Alabama.....	5,314,227	5,170,042	Pennsylvania:		
Arkansas.....	739,300	750,000	Anthracite.....	52,472,504	53,810,214
California.....	131,431	167,219	Tennessee.....	2,413,678	1,857,432
Colorado.....	3,771,234	3,947,056	Texas.....	300,000	322,745
North Dakota.....	240,000	325,000	Utah.....	363,020	416,605
Georgia.....	165,000	372,191	Virginia.....	800,000	842,933
Indiana.....	4,494,811	4,584,000	West Virginia.....	8,710,878	8,891,323
Indian Territory...	1,004,765	1,229,562	Washington.....	1,000,000	1,211,550
Illinois.....	17,949,989	18,955,000	Wyoming.....	2,454,449	2,243,404
Iowa.....	3,820,000	3,790,000	North Carolina.....	6,417	17,000
Kansas.....	2,794,000	3,089,300	Nebraska.....	1,500	2,000
Kentucky.....	3,020,650	3,290,632	Rhode Island.....	14,000	14,000
Maryland.....	3,639,283	3,727,079			
Michigan.....	70,000	75,000	Total production.....	180,399,017	183,422,710
Missouri.....	3,017,285	3,285,000	Imports.....	1,281,839	1,241,028
Montana.....	648,701	783,300			
New Mexico.....	434,291	457,045	Total supply.....	181,680,856	184,663,738
Ohio.....	14,569,908	14,521,800	Exports.....	2,997,004	4,497,913
Oregon.....	34,720	50,000			
Pennsylvania:			Consumption.....	178,683,852	180,565,735
Bituminous.....	46,576,576	45,225,881			

These figures are surprising, for notwithstanding the severe business depression which existed throughout the country during the last half of 1893 there has been a very substantial increase in the production of coal; that is to say, an increase of 3,023,693 tons, or 1.67 per cent., making 1893 the banner year of coal production in the United States. This increase is all the more remarkable when contrasted with the course of our other staple, pig iron, the production of which declined 22 per cent. during the same period. It is a noteworthy fact that our export trade in coal has increased over 1,000,000 tons, or about 36 per cent., during the year 1893.

During the year the production of pig iron in Alabama declined 20 per cent., and though iron-making is estimated to consume a little over 2,000,000 tons of coal, or about 37 per cent., of the State's output, the actual coal production declined only 144,185 tons, or 2.7 per cent. This is undoubtedly due in part to increased exportations to Mexico and the West Indies, and also to the trade established in the Mississippi Valley in the spring of 1893. Colorado shows an increase of 175,822 tons, or 4.6 per cent., notwithstanding its financial and commercial panics. In Illinois there was an increase of 1,005,011 tons, or 5.6 per cent.; in Iowa a trifling decline, and in Kentucky a marked increase of 269,982 tons, or 8.9 per cent. In Missouri the increase was 267,714 tons, or 8.8 per cent., almost identically that of Kentucky.

The total production of Pennsylvania remained practically the same as in the previous year, decreasing only 12,995 tons, or 0.01 per cent. There was, however, a decrease of 1,350,695 tons, or 2.9 per cent., in the bituminous production, but this was almost balanced by the increase from the anthracite mines of 1,337,710 tons, or 2.5 per cent.

Tennessee shows the greatest decline of any of the States, amounting to 656,246 tons, or 27 per cent., of its output in 1892. This was undoubtedly due in part to the decrease of 30 per cent. in the State's production of pig iron, but shows as well that its other manufacturing interests must have suffered greatly and that when a struggle for

existence comes the miners on small beds worked in portions of the State cannot hold their own.

Maryland, with its large beds, shows exactly the reverse of this, increasing its output 690,796 tons, or 22 per cent., while West Virginia increased 180,445 tons, or 2 per cent. Wyoming decreased 211,048 tons, or 8.5 per cent., of its product, while on the Pacific coast Washington shows an increase of 211,550 tons, or 21 per cent.

These statistics of our coal production are simply marvelous and show that in a few years more the United States will pass Great Britain in her output of fuel.

THE AMY & SILVERSMITH CASE.

We publish in another column one of the most important mining decisions rendered by the United States Supreme Court for several years past. The case of King vs. the Amy & Silversmith Consolidated Mining Company is a "cause celebre." It was decided in the first instance by the District Court in Montana upon one theory of the law; that decision was overruled by the Supreme Court of Montana upon another theory; and the United States Supreme Court now reverses the latter decision, but without adopting the principles of the former, and declares the law to be different from what it was construed to be by either of the subordinate tribunals.

The diagram contained in the opinion clearly shows the facts upon which the controversy was based. It is admitted that the apex of the Amy lode, upon which the Amy mine was located, does not cross the so-called end-lines of the location, but on the contrary crosses the side-lines. After crossing the northerly side-line, it enters the Non-consolidated claim, and, as the lode dips to the north, it also dips under that claim. That is to say, for some distance along the apex within the Amy claim a line drawn at any point down on the true dip (at right angles with the strike) would pass into the Non-consolidated claim. The question was, whether the owners of the Amy possessed any extra lateral right on the lode beneath the surface of the Non-consolidated; and if so, how that right was bounded. The three answers to this question are as follows:

1. Judge De Wolfe decided that the Amy had such a right, and that it was bounded by a vertical plane drawn at right angles to the course of the lode at the point where it crossed the side-line, but limited also in depth by a plan drawn through the easterly end-line of the Amy. This decision, made several years ago, I have discussed at some length in my paper on "End-Lines and Side-Lines in the United States Mining Law" ("Transactions" American Institute of Mining Engineers, Volume XVII., page 787), and in the "Engineering and Mining Journal" of January 26th and February 2d, 1889, to which the reader is referred.

2. Judge Blake, in the Supreme Court of Montana, subsequently held that the Amy had the extra-lateral right, but that it was to be bounded by a vertical plane drawn through the point of crossing, parallel to the located end-lines of the Amy claim. This view ignored the fact that unless the course of the lode, upon which the Amy claim had been located, crossed the nominal end-lines of the location, those lines would not be true end-lines at all, and could not have a legal effect as such.

3. Justice Field, in the United States Supreme Court, now sets aside both these views, and declares that as the Amy lode apex crosses the two opposite and parallel side-lines of the location, they are in fact the end-lines, no matter what other lines may have been so denominated, and that the rights of the Amy owner are cut off by vertical planes drawn through these true end-lines; in other words, that the Amy possesses, under the surface of the Non-consolidated claim, no right whatever.

This conclusion is stated with the clearness and force which characterize all the opinions of Justice Field. It is in strict harmony with the deliverances of the same high authority in two leading cases, namely, the Flagstaff and the Elgin case. In the first of these, it was plainly laid down that when a located lode-apex crosses two opposite and parallel boundaries of the location, those boundaries are to be deemed the end-lines of the location, whatever they may be called. In the latter case, it was held that a location so made that the course of the lode does not cross any two parallel opposite boundary lines has no true end-lines and no extra-lateral rights; and it was further declared that defects in the location could not be cured, after the issue of patent, by judicial rectification of boundary lines, or by the drawing of new ones. The Court said in that connection:

"If the first locator will not or can not make the explorations necessary to ascertain the true course of the vein, and draws his end-lines ignorantly, he must bear the consequences."

After quoting these words, Justice Field adds the following emphatic comment, which, it may be hoped, will put an end to many ingenious attempts at judicial modification of boundaries:

"The court cannot become a locator for the mining claimant and do for him what he alone should do for himself. The most that the court can do, where the lines are drawn inaccurately and irregularly, is to give to the

miner such rights as his imperfect location warrants, under the statute. It cannot relocate his claim, and make new side-lines or end-lines. . . . He must stand upon his own location, and can take only what it will give him under the law."

This decision is so clearly foreshadowed by the prior ones I have mentioned above that it can scarcely be called novel. Yet both of those prior cases were before the two courts which decided this case below; and they managed somehow to satisfy themselves that their views were not in conflict with those of the United States Supreme Court. This reiteration of principles already laid down comes therefore with a timeliness and conclusiveness equivalent in effect to novelty. It was necessary; it is wholesome; and it ought to be welcome to those who desire to see fixed and simple principles of construction prevail, in a department so full of perplexities as the administration of the United States mining law. Nothing can make us thankful for that law or happy under it; but we can feel gratitude for every such clear note of guidance as Justice Field has given heretofore and now gives again.

R. W. RAYMOND.

NEW PUBLICATIONS.

COAL STATISTICS. Compiled from Official Sources. Philadelphia; Alder & Ruley. Pages 180. Price 50 cents.

This is the first issue of a very handy little reference book which it is proposed to publish annually in future. It gives a concise account of the geology, area and production of the coal-fields in the various States with the average price obtained at the mines. The main feature of the work, however, is the publication by counties of all the coal operators in the United States. The production is also shown by counties, so that the location of the largest mines can be seen at a glance. This is an advantage to firms who advertise their business either by circulars or personal solicitation. There has always been a demand for such a compilation as this, as many of the States do not keep an official record of coal producers, and we think "Coal Statistics" should find a ready sale.

THE CONSTRUCTOR: A HAND BOOK OF MACHINE DESIGN. By Prof. F. Reuleaux. Authorized Translation from the Fourth German Edition, by Henry Harrison Supplee. Philadelphia; H. H. Supplee. Pages 312; illustrated. Price (by subscription) \$7.50.

Reuleaux's "Konstrukteur" has long been known as the best and most thorough work of its kind in existence, presenting in compact form a great mass of information, based both on theory and practice, in relation to machine design and construction. It has been in use by many mechanical engineers in this country, in spite of the difficulties presented by the foreign language in which it was written, and Mr. Supplee has done a service to the engineering world by translating it and presenting it in its present form. The translation is an excellent one and its faithfulness has been approved by the author himself.

In this book are presented the results of experience, and actual practice rather than theoretical demonstration. Its chapters are condensed, yet generally clear, and the statements are profusely illustrated by drawings, largely taken from actual constructions. The use of the higher mathematics is avoided, so that the volume can be used by any one having that knowledge of arithmetic and geometry which is necessary to the mechanical engineer or draughtsman.

The book is divided into four sections, the first treating of the strength of materials and giving tables and rules for proportioning different forms of construction. The second section contains the clearest presentation, we think, that has ever been made of the elements of graphic statics. The third section, forming the larger part of the book, treats of the construction of the parts or elements of machines, giving rules and details based both on theory and on the practical results of experience. Some idea of the extent of this section may be given by saying that it includes chapters on riveting, bolts, journals, shafting, couplings, cranks, levers, combinations, crossheads, connecting rods, friction wheels, gearing, power transmission by bolts and otherwise, valves and many other parts of motors and machines. The fourth section contains a large number of tables which are likely to be of use to the constructor or designer.

The book is a most useful one, and should be in the library of every mechanical engineer, and kept as a book of reference in the drawing room of every large machine shop.

PERSONAL RECOLLECTIONS OF DR. WERNER VON SIEMENS. Translated by W. G. Coupland. New York; D. Appleton & Co. Pages 416; with portrait. Price \$5.

Dr. Werner von Siemens was so prominent an actor in the development of modern electrical science and a man of such pronounced individuality that his autobiography could not be otherwise than an interesting book. Moreover, his life was not by any means passed in his workshop or laboratory; he traveled extensively in many lands, superintending the laying of cables and the construction of electrical plants. Finally he came into contact with many men of eminence and high position, so that few men had a life experience of which more could be written. He was certainly a man of great ability, and his "Recollections" show that he had full confidence in himself, and a full appreciation of his own powers. While he has recorded much that is of scientific interest, the book is mainly personal and is full of the incidents of travel and the daily happenings which affected him most directly.

The "Recollections" go back to early childhood and to his boyish education, and here, it seems to us, he is somewhat disposed to undervalue his home training, which was, if not specially in the direction in which his life work was afterward done, at any rate of a kind which prepared a good foundation. His attention was early turned to electrical studies, which were hardly interrupted by a period of service in the Prussian Army, and he was still a young man when in connection with his brother and his friend Halske he entered upon the work which secured him fame as an engineer and electrician. From that time for-

ward his career was identified with the progress of electrical science, in which he bore so prominent a part.

Dr. Von Siemens was, as we have said, a man of marked individuality, and this naturally appears in his autobiography. His opinions were decided and he does not hesitate to express them, whether they refer to things or persons. Generally he seems to have had good grounds for them; he was an original thinker and a careful investigator. He was not always, we think, a temperate antagonist in discussion and apt to be somewhat intolerant of the shortcomings of those with whom he came in contact; but on the whole a just, if not a kindly man.

The translation is, on the whole, a good one, though the translator has been a little too much inclined to be literal and to follow the German idioms of the original. The book is well worth reading and is a most interesting record of the trials and final success of one of the founders of electrical engineering.

MINING. AN ELEMENTARY TREATISE ON THE GETTING OF MINERALS. By Arnold Lupton. London and New York; Longmans, Green & Co. Pages 520; illustrated. Price, \$3.

This book of 52 pages is divided into 24 chapters and an appendix. Chapter I., on Geology, has nothing original in it and is simply a repetition of the usual letterpress found in all mining textbooks. Chapter II., on Exploration, has a number of original cuts and is a detailed essay on this branch of mining. The examples of fault positions and "wash-outs" are practical, and such as are likely to be met with in everyday exploration. The chapter on Boring describes a number of methods and contains several cuts of American rope drilling which have appeared in other publications printed in this country. The chapter on Sinking is well written, but the illustrations are on too small a scale to enable novices to understand the details. Like all other English mining textbooks, the only kind of shaft alluded to is that of circular section and the rectangular shafts of America and Scotland are entirely ignored. This is unfortunate in any work which aspires to the position of a book of reference in these countries, because, no matter whatever arguments may be put forward in favor of the circular shaft the fact remains that it does not economize space like the rectangular section.

In Chapters VI. and VII. the methods of working are treated in a fairly good manner except that too much space is devoted to historical records. For a book of this size it attempts too much in professing to be a manual of mining generally. Coal mining and metalliferous mining can each claim a good-sized text-book without trying to condense both into two or three chapters of an octavo volume. The theory of Ventilation is a subject which is especially a favorite with mining students, and we have no doubt that Chapter VIII. on this subject will receive especial attention from readers. There is nothing especially novel in this chapter, although the author has certainly been at considerable pains in compiling a mass of figures on the efficiency of fans. In the matter of ventilation formulae the old familiar symbols are abandoned for no adequate reason that we can see. If all students were obliged to study only this textbook it would be right enough to use new symbols, but all sensible workers try to secure as many manuals as possible and when one author attempts to strike out an independent line of symbols he only confuses the earnest student and brings down anathemas upon himself.

Mr. Lupton makes a greater mistake, however, in his adoption of a coefficient of friction. He quotes various authors, such as Atkinson, Devilez, Clark and himself, but ignores such standard writers as Murgue and Fairley. Years ago William Fairley advocated 0.00000001 as a proper coefficient instead of 0.000000217 of Atkinson. Little attention was, however, paid to his argument until the other day Murgue proved after innumerable experiments that Mr. Fairley was nearly correct in his approximation. In spite of this, however, Mr. Lupton adopts a figure of only half the value advocated by Fairley.

There is a very interesting chapter on Coal Dust and another on Safety Lamps. The sections on Blasting and Drilling are elaborate. The subject of coal-cutting machines is compressed into seven pages and but casual notice is paid to American machines—the Ingersoll-Sergeant never receiving mention—although we can on this side give the Europeans pointers on machine mining. The subjects of Haulage, Winding and Pumping are treated in fair detail, while numerous problems on the mechanics of mining are fully worked out in the appendix. The volume as a whole stands on equal terms with many of its predecessors and is probably as suitable a manual of mining as any published in England can be for this country. It has the fault that too much space is devoted to history.

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.

- Mining Map of the La Plata Gold Fields, Colorado.* Compiled by Edward Horner. La Plata, Colo.; E. Horner. Folding map with cover.
- Annual Report of the Board of Regents of the Smithsonian Institution:* 1891. Washington; Government Printing Office. Pages 716; illustrated.
- Telephone Lines and their Properties.* By Prof. William J. Hopkins. New Edition, Revised and Enlarged. New York; Longmans, Green & Co. Pages 272; illustrated. Price \$1.50.
- Official Report of the International Irrigation Congress, Held at Los Angeles, Cal., October, 1893.* Los Angeles, Cal.; published by the Chamber of Commerce. Pages 164; with maps.
- Journal of the Iron and Steel Institute. Volume XLIV: No II. 1893.* Edited by Bennett H. Brough, Secretary. London, England; published for the Institute. Also, London; E. & F. N. Spon, and New York; Spon & Chamberlain. Pages 588; illustrated.
- Bulletins of the Geological Society of America. Paleozoic Interformational Conglomerates.* By C. D. Walcott. Pages 8. *Pleistocene Distortions of the Atlantic Seacoast.* Pages 4. *Mountain Growth.* Pages 4. *Beach and Dune Sands.* Pages 6. By N. S. Shaler. *Gabbros on the Western Shore of Lake Champlain.* By J. F. Kemp. Pages 12. *Crustal Adjustment in the Upper Mississippi Valley.* By C. R. Keyes. Pages 12. Rochester, N. Y.; published by the Society.

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.

Subsidiary Coinage.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Reading Mr. W. L. Austin's letter on "Nickel Coins," in your issue of February 17th, reminds me of a point I have always had present regarding the increased use of silver for subsidiary currency. I send you two Mexican coins, one five cents and one ten cents, both of silver. The five-cent silver piece is our only five-cent coin in this Republic, and everybody likes it, and nobody complains of its smallness. Should American opinion incline to think that the five-cent silver piece is too small, the remedy is easy. Increase its size, since the margin is immensely large; or increase its thickness, leaving the diameter to be the same. I know that one of the reasons that caused the minting of the nickel five-cent piece was the theoretical small size of the coin, and this idea was unfortunately very much strengthened by the old three-cent silver piece. As I have said before, our Mexican five-cent silver piece is found perfectly practicable, and as I have said also if the American mint authorities consider it too small, all they have to do is to add to it what they now reserve in the weight between subsidiary silver and the Standard Dollar.

CITY OF MEXICO, Feb. 23, 1894.

VICTOR M. BRA'CHI.

The Cyanide Process at the Deep Down Mine, New Mexico

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The results obtained from the cyanide process on the ores from the Deep Down mine, situated in the Mogollon Mountains, in New Mexico, may be of interest to your readers. The Deep Down vein matter is partly a mixture of quartz, with a little iron pyrites and calcite, and partly clay. The hard rock in some instances contains as high as 62% of CaCO₃, the value in gold and silver decreasing as the proportion of CaCO₃ increases. The gold is in a finely divided state, partly free and partly combined with the pyrites; the silver occurs as a sulphide of silver. The quartz carries from one-quarter to one-third, and the clay from one-third to one-half of its value in gold. The clay contains some manganese, which combines with the KCy, giving the solution a deep violet color, but without affecting its strength to any considerable extent.

The ore, after being dried, is fed into a Dodge crusher, from which a shaking table conveys it in the first set of rolls; from here a bucket elevator brings it to a revolving screen, the first half of which is 35-mesh and the second half 25-mesh. What passes through the 35-mesh screen goes into the pulp bin, situated above the center of the four percolating vats. What passes through the 25-mesh goes to the finishing rolls, and what is coarser still returns to the first set of rolls.

The following are results obtained from four different charges:

Amount of ore per charge.	Assay value.		Amount of solution per charge.	Extraction.			Strength of cyanide solution.	Loss of KCy per ton of ore.
	Gold.	Silver.		Gold.	Silver.	Per cent.		
20,700 lbs.	0.28 oz.	21.12 oz.	19,000 lbs.	98%	62%	75%	1%	5.8 lbs.
30,600 "	0.34 "	21.10 "	23,500 "	95%	66%	76%	1 1/4%	5.8 "
32,000 "	0.40 "	22.08 "	27,800 "	98%	81%	87.5%	1 1/4%	6.25 "
32,300 "	0.34 "	19.60 "	28,000 "	98%	80%	85.5%	1 1/2 + 1/8% KHO	6.0 "

After a month's run it was thought preferable to change the 35-mesh to 25, thus doubling the screening capacity and increasing the capacity of the mill. An average of results obtained shows for a charge of 28,000 lbs., with an assay value of 0.38 oz. gold and 22.40 oz. silver, with a cyanide solution of 1 1/2%, an extraction of 98% gold and 70% silver, or 80% of total value, with a loss of 5 lbs. cyanide per ton.

The lowest extraction made, with exception of four charges treated during my illness, which gave 70% extraction, was on the first tank, treated with 1% KCy solution, when 75% was extracted. The consumption of cyanide decreased during the two months run from 6.25 lbs. to 5 lbs. per ton, on account of getting away from the decomposed surface ore, which contained a small amount of soluble iron salts.

Experiments in the laboratory by percolation gave the following results: 40 hours' treatment, 35 mesh; assay of ore, gold, 0.28 oz.; silver, 15.94 oz.; with 1/2% KCy solution, an extraction of, gold, 98%; silver, 62%; with 1% KCy solution, an extraction of, gold, 98%; silver, 80%, the loss of KCy being 6.4 lbs.

In a test by agitation lasting 18 hours, 35-mesh, the assay of ore was: Gold, 0.50 oz.; silver, 22.50 oz.; with 1 1/2% KCy solution, the extraction was: Gold, 100%; silver, 96.9%; loss of KCy, 6.2 lbs. With 1% solution the extraction was: Gold, 98%; silver, 92.5%; loss of KCy, 5.2 lbs. With 1% solution + CaO, extraction: Gold, 96%; silver, 85.8%; loss of KCy, 2.6 lbs. With 1% solution + KHO, extraction: Gold, 96%; silver, 90%; loss of KCy, 1.5 lbs.

In a test with different amount of KHO, 18 hours' agitation, 35-mesh, the assay of ore being: Gold, 0.40 oz.; silver, 22.08 oz., the results were: 1 1/2% KCy solution, extraction: Gold, 98%; silver, 96%; loss of KCy, 5.1. 1 1/2% KCy solution + 1/4% KHO, obtained: Gold, 98%; silver, 91%; loss of KCy, 4.2 lbs. 1 1/2% solution + 1/2% KHO obtained: Gold, 98%; silver, 88%; loss of KCy, 3.0 lbs with 1 1/2% solution + 1% KHO obtained: Gold, 98%; silver, 88%; loss of KCy, 1.4 lbs. 1 1/2% solution + 1 1/2% KHO obtained: Gold, 98%; silver, 89%; loss of KCy, 2.0 lbs. 1 1/2% solution + 2% KHO obtained: Gold, 98%; silver, 91%; loss, 2.8.

I found that by adding KHO to the KCy solution, which had been used in the mill for some time, ferric hydrate was precipitated, and the solution gained in strength until 1% KHO had been added; by further addition of KHO the amount of active cyanide decreased, corresponding to the above mentioned results. The experiments were

made by adding different amounts of KHO to the solution, filtering the precipitate, wash the filter thoroughly, and titrating with Ag NO₃ to cloudiness.

10 cc. KCy sol. from mill.	Titrate to cloudiness.
" " " " + 1/4% KHO (slight precipitation)....	Filter 11.0 lbs. KCy and 13.8 " "
" " " " + 1% " (heavy).....	Filter 16.5 " "
" " " " + 2% " ".....	washed. 14.3 " "

The gold was extracted very rapidly. The first ton of solution drawn from a charge of 32,000 lbs. of ore (21 in. deep in tank), ore assaying 0.40 oz. in gold and 22.08 oz. in silver, extracted 2.07 oz. of gold and 52.59 oz. of silver in the course of three hours.

As the mine was developed the amount of clay increased, and as the drying floor was not able to supply the mill with sufficient dry ore, a Huntington mill was put in; cyanide solution was used instead of water.

The result was a failure, partly because a sufficient quantity of solution was not used in the Huntington mill (the ore was ground to a impalpable powder before discharged), and partly because of the neglect of precautions that would have helped the percolation, such as using a layer of coarse tailings on top of the canvas, thus to some extent preventing the clogging of the pores. After running the mill three days the company closed down and determined to change the treatment to pan amalgamation, an unnecessary change in my opinion, as the cyanide process, while I was in charge, treated the Deep Down ore successfully.

Since then I have experimented with other ores of this camp, all giving good results. Among those I only mention sample of low grade ore from Captain Cooney's mine, the Old Strike, that assayed 0.60 oz. of gold and 4 oz. in silver, upon which I made an extraction of 98% of gold and 75% of silver, with a loss of 2.1 lbs. of KCy per ton.

I hope these results may be of interest to parties investigating the cyanide process.

MOGOLLON, N. M.

CARL ANDEISEN.

ONTARIO MINES IN 1893.

Written for the Engineering and Mining Journal.

Considerable progress was made in 1893 in the gold mining industry of Ontario. The activity has not been confined to any one locality, but has shown itself in all parts of the Province where gold has been known to exist, while discoveries of the metal have been made in districts not hitherto reckoned among the gold-bearing regions. Four mills for treating gold ores have been erected and have worked more or less constantly during the year, and some \$35,000 in bullion has been the result. In the extreme west of the Province, on Lake of the Woods, the Sultana Mine has been operated pretty steadily throughout the year. This mine is situated on an island in the lake, near Rat Portage, on the Canadian Pacific Railway, and is owned by Mr. John F. Caldwell, of Winnipeg. Three veins on the property converge into one, the largest vein having a width of 23 ft. The vein matter is quartz, iron pyrites and a little galena, and the surrounding country rock a silicious gneiss. Three shafts have been sunk, the deepest reaching 100 ft. The ore assays from \$4 to \$20 in gold per ton, with a little silver. There are two batteries of five stamps each to treat the ore, and at present the concentrates are being stored. Several thousand dollars' worth of gold have been extracted, and the outlook is hopeful. In the same district, several miles distant, is situated the Northern Gold Company's property, about 2 1/2 miles from Moore Bay. Mr. D. B. Burdette is the manager, and the shares of the company are held principally in Minneapolis. An experimental plant invented by Mr. Leede, of Minneapolis, was installed early in 1893, but failed to meet the expectations of the company, and it was taken out and a Gilpin County mill put in its place about the end of the year. Sinking has been kept up on one of the veins, and rich pockets of ore have, it is said, recently been struck. Adjoining the Northern Gold Company's property is one owned by Duluth parties. Two Crawford mills were put in last summer, but satisfactory results were not obtained. At the El Divir mine, northeast of Rat Portage, a shaft was sunk to a depth of over 100 ft., and a Crawford mill erected to treat the ore. Fire destroyed the buildings and badly damaged the machinery after a run of about a month. It is claimed, however, that the plant did good work. A large number of other gold locations have been taken up in the Lake of the Woods district, on some of which development work has been done, and more properties continue to be bought or leased from the Crown, the whole district being as yet Crown lands. The work which has so far been done in the way of gold mining has not been sufficiently extensive to prove beyond a doubt the richness and continuity of the veins, but it certainly affords ground for encouragement. If as time goes on it is shown that the veins carry paying ore in depth as well as at the surface, this region will unquestionably take a place among the gold-producing districts of America, exploration having shown that gold is found over a wide extent of territory.

On Rainy Lake, which constitutes part of the boundary between the Province of Ontario and the State of Minnesota, discoveries of gold-bearing quartz have been made on both sides of the line during the past summer and fall. Rich specimens showing free gold have been found, and it is believed that the most valuable finds so far have been on the Ontario side. On Black Bay, 14 or 15 miles up from Fort Frances, a town-site has been laid out on American territory, and a boom is looked for when spring opens. Indeed, accounts just at hand show that the rush has already begun, and a number of prospectors are living and sleeping in tents and rude huts with the thermometer at zero. The new-born town has been named Rainy Lake City. It is the opinion of some that the discoveries here are on a continuation of the range of gold-bearing rocks found some distance north and extending from Manitow Lake to the line of the Canadian Pacific Railway.

The Creighton Gold Mining Company has been busily engaged all the past season sinking a shaft on their property in Creigh-

ton township, a few miles west of Sudbury, and are still at work. The vein matter is quartz and slate, with some iron pyrites. It carries no visible gold, but assays show from \$12 to \$20 per ton. The shaft has now a depth of 180 ft. A Crawford mill was put in last October, and it is the intention of the company to erect a stamp mill when the property is a little more developed.

Perhaps the most promising of all Ontario gold mines at the present time is the Ophir, situated in the township of Galbraith, about 18 miles north of the old Bruce copper mines. A large quartz vein occurs in diorite, and carries free gold in considerable quantities, some portions of the vein yielding very handsome specimens. The mine is the property of the Ophir Mining Company, of Chicago, which purchased it from McArthur Brothers, of Toronto, for \$100,000. The capital stock has been placed at \$3,000,000. Shafts have been sunk and adits driven both on the vein proper and on a large vein-like mass or chimney to the left, with good results. A 20-stamp mill has been put in, with all the requisite accessories, and a boiler and engine of sufficient power to admit of a large increase being made in the stamping capacity. An abundant supply of water for all purposes is found in a small lake on the northern side of the location. About 40 tons of ore are being treated per day of an average value of \$8 per ton, the cost of mining and milling being reported at \$2.58 per ton. The putting in of additional hoisting machinery, and of an electric plant for drilling, lighting, etc., is contemplated, as well as a chlorination process for treating the concentrates. The quantity of ore in sight is estimated as large.

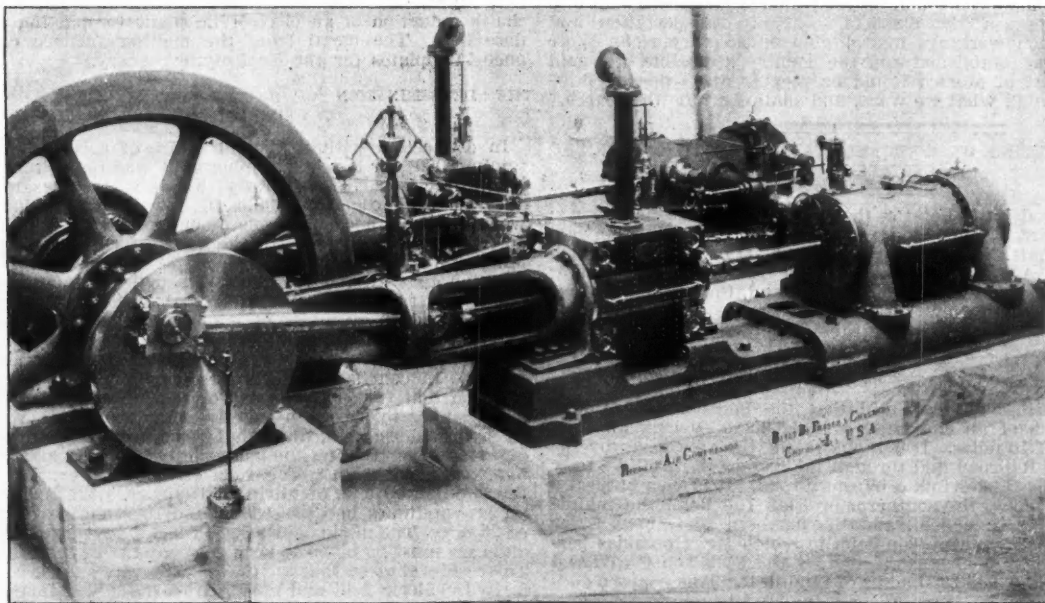
A joint stock company has been organized in Rochester, N. Y., to work a mica mine on lots 12 and 13 in the Ninth concession of the

A RIEDLER DUPLEX AIR COMPRESSOR.

The accompanying illustration is from a photograph showing a duplex air compressor of the Riedler type recently built by Fraser & Chalmers for the Milwaukee Mining Company, in Idaho. The air cylinders are 18 by 30-in. and are operated by a compound condensing engine, with Corliss valve-gear, having cylinders 18 in. and 28 in. in diameter and 30 in. stroke. The general design and arrangement of the engine and compressor are well shown in the engraving.

The Riedler air compressors and pumps have found much acceptance in this country and are being rapidly introduced. Other recent orders include an 18 by 30-in. single compressor, driven by a 16 by 30-in. Corliss engine for the Alaska-Mexican Gold Mining Company, in Alaska. The advantages claimed for this type of compressor are the quick-acting positive motion of the valves, the simplicity and ease of adjustment of the mechanism, and the possibility of running at a very high speed.

In our issue of May 20th last there was described a Riedler pump built by Fraser & Chalmers for the Boston & Montana Mining Company. This pump, the superintendent of the company states, is set in the 600-ft. station of the Leonard shaft, at Butte, and pumps the water easily by running about 33 revolutions. Formerly three pumps were used to do the same work. The speed of the Riedler pump can be increased to about 90 revolutions, and in the event of accident to one side the other side can be operated independently. This is one of the advantages of the pump. The engine is 16 and 25 by 24 in., and the pump plungers are 8 and 5½ by 24 in. The pump has been in operation about six months, and thus far the superintendent finds a saving



RIEDLER DUPLEX AIR COMPRESSOR FOR THE MILWAUKEE MINING COMPANY, IDAHO.

township of Methuen, Peterborough County. Supplies are being sent in, buildings erected, etc. There are three or four veins on the location which appear to converge to a common point. The mica is said to be of the finest quality white, and the size of the crystals is such as to admit of pieces 5 x 6 in. being cut. Mr. J. B. McWilliams, of Peterborough, is interested in the property.

News comes of a discovery of tin ore in the Sudbury district, the variety and richness of whose mineral resources are only beginning to be known. Mr. W. Thomas Newman, of Toronto, received from a Sudbury miner specimens of the ore which were stated to have been taken from a quartz ledge standing out boldly, several feet in width. The samples consisted of several pieces of soft, clear quartz, fairly filled with pellets of mineral from the size of grains up to that of a small bean, the mineral constituting perhaps 20 or 30% of the vein matter. The crystals, or rather fragments, conformed in specific gravity and other physical characteristics to cassiterite, or tin oxide, which further assay proved them beyond doubt to be. Tin has not hitherto found an authenticated place on the list of Ontario minerals, and if the discovery be confirmed and the ore found in quantity, a very important addition will be made to the mineral wealth of the Province.

Some trial shipments of iron ore have recently been made from mines on the Kingston & Pembroke Railway to McDougall's blast furnaces at Radnor Forges, Quebec, to mix with the bog ore now principally used there. Charcoal from the Rathbun Company's works has also been shipped to the same place. That firm, however, markets most of its charcoal product at the charcoal iron furnaces of Detroit, Mich.

The deposits of barytes on McKellar's Island, Lake Superior, are about to be worked by a company organized for that purpose. The mineral occurs there of high quality and without much admixture of impurities. It is the intention to put in machinery which will raise about 75 tons per day, and the output will be shipped to the United States for further treatment.

Russian Iron Ores.—A large deposit of magnetic iron ores has been discovered on the right bank of the Wels River, near Tchardinak, in the government of Pem, in Russia. The ore is said to be valuable.

in the consumption of fuel of about 60% over the pumps previously used.

ABSTRACTS OF OFFICIAL REPORTS.

BATOPILAS MINING COMPANY, MEXICO.

The report of the president, Mr. G. W. Quintard, for the year ending December 31st, 1893, says: "The report cannot fail to greatly encourage all who have any financial interest in the company. . . . The remaining machinery and materials required to equip and complete the water power plant and the new Hacienda, including the ironwork for the new bridge structure, have been purchased and paid for, and are now on the road to the mines. The actual bonded indebtedness of the company, which matures December 1st, 1902, amounts to \$459,700. It will be seen from the report of the general manager that \$133,433 (Mexican silver) is in transit, which is to be applied on the floating debt of the company. Owing to the greatly depressed and fluctuating condition of the silver market it is impossible to state with exactitude the amount that will be realized from this. But it is safe to say that the outstanding floating debt of the company, exclusive of bonds, will then be less than \$150,000. When it is remembered that despite the great shrinkage in the value of silver, the company has been able out of its earnings for the year to nearly complete its plant and at the same time greatly reduce its floating debt, there is good reason to hope for the resumption of dividends at no distant day."

The detailed report of the general manager shows that the workings in the various mines have been as follows in tunnels, fronts, shafts, pozos and contra-pozos: Ronceuales and Todos Santos mines, 3,271 ft.; San Miguel mine, 2,569 ft.; Camuchin mine, 1,694 ft.; Descubridora mine, 1,125 ft.; Porfirio Diaz tunnel, 480 ft.; Porfirio Diaz cross-cut to air shaft, 24 ft.; Cinco de Mayo mine, 154 ft.; various exploration works (estimated), 1,200 ft.; total, 10,517 ft. These workings vary in size from 9 by 9 to 6 by 5 ft.

The total ores received, ores on hand and the average yield per ton are as follows: Ores received in haciendas, 3,980 tons; ores on hand, being 2d and 3d class, 2,045 tons; ores beneficiated, 1,935 tons. The ores beneficiated averaged \$611.20 per ton in Mexican silver, and gave a total yield of \$1,182,508.

The total receipts were as follows: Product from ores reduced, \$1,182,508; profit on discount of hacienda currency, \$15,102; profit on sales at mine stores, \$6,162; total receipts, \$1,203,773. The expenditures were: Mining and exploration account, \$156,822; reduction works account, \$111,192; mine betterments and development, \$179,370; total, \$447,384; balance, net earnings, \$756,388.

This amount was disbursed as follows: Porfirio Diaz tunnel, \$27,525; construction, to wit: Aqueduct, Hacienda San Antonio, turbines, pipe lines, steam hoists, etc., etc., \$79,358; increase in supplies on hand, \$26,512; exchange on silver remitted to U. S., \$126,945; interest on company's bonds, \$27,926; expenses of New York office, \$2,103; interest, \$53,423; reduction of debt, \$279,161; silver in transit to New York, \$133,433; total, \$756,388.

The report of the various mines gives the details of the work shown in the general statement above, which we have not space here to repeat in full. In the Porfirio Diaz tunnel the work has progressed without interruption and 480 ft. have been made in tunnel proper in 11 months, an average of 43.7 ft. per month. The cross-cut to air shaft was finished in January, being 24 ft., making 504 ft. for the year. The workings on tunnel are as follows: Tunnel proper and cross-cut, 3,139 ft.; first air shaft, 784 ft.; second air shaft and tunnel, 1,150 ft.; total, 5,073 ft.

General manager A. R. Shepherd says in conclusion: "I have kept up explorations within the concession in our adjoining neighborhood at Batopilas, and in Sinaloa, prospecting for a suitable gold mineral in which to establish a business, it having become of the utmost importance to utilize our silver product as far as possible in Mexico and use gold for export, exchange having risen to 90%. There are many good properties here and this metal is abundant in small deposits, but nothing has been found as yet which would justify an outlay. The remoteness of the districts, cost of transportation and freights, render such workings unprofitable unless very rich. Were railroad connections established and the country accessible, the gold industry in this part of Mexico would be very great. I do not, however, despair of finding what we want, and shall continue the search."

THE ANNUAL MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The officers elected by ballot for the ensuing year are as follows: President, John Fritz, Bethlehem, Pa.; vice-presidents, J. T. Holloway, New York; J. C. Platt, Waterford, Conn.; E. V. D'Invernizzi, Philadelphia; managers, T. A. Rickard, Denver, Colo.; H. O. Hofman, Boston; John A. Church, New York; treasurer, T. D. Rand, Philadelphia; secretary, Dr. R. W. Raymond, New York.

We give below some condensed abstracts of papers presented at the meeting:

THE POCAHONTAS COALFIELD: BY MAJOR JED. E. HOTCHKISS.

This paper, or rather address, said that the Pocahontas coalfield, which has the form of an elongated oval, is 90 miles long and has an average width of 10 miles. It is tapped along the New River by the Chesapeake & Ohio Railroad and through the waters of the Big Sandy and its tributaries by the Norfolk & Western road. It is thus naturally divided into three parts, the southern, or Flat Top field, the middle or the Chesapeake & Ohio field, and the northern or Gauley River portion. It is the first, or Flat Top field, to which Mr. Hotchkiss particularly referred. The field is controlled by the Flat Top Coal Land Association, which owns 196,950 acres of land in it. This concern does not mine or make coke, but simply leases the land to miners and coke producers. On December 31st, 1893, it had thus under lease 26,016 acres of land, including all the territory within easy access of the Norfolk & Western Railroad. The first branch road to lands at a distance from the main stem is now under construction. The field has three good coal beds, dipping to the westward and gradually thinning out in that direction. The principal bed, and practically the only one now worked, is the famous No. 3 or Pocahontas bed. Mining was begun in 1882, but regular, important shipments did not take place until 1884. The shipments of coal and the production of coke for seven years past have been as follows:

Year.	Coal.	Coke.	Year.	Coal.	Coke.
1887.....	1,026,141	136,561	1891.....	2,259,757	153,384
1888.....	1,376,009	180,462	1892.....	2,517,889	390,736
1889.....	1,592,485	275,042	1893.....	2,711,527	451,656
1890.....	1,792,720	381,345			

During 1893 there were 22 mines which removed the coal from 300 acres, the yield being 2,311,592 tons, or an average actual yield of 7,818 tons per acre. The width of the Pocahontas bed ranged from 6 to 8.4 ft., the theoretical yield being figured at 11,196 tons to the acre. Since the opening of the field the coal from 1,700 acres has been mined out, yielding 15,005,909 tons, or 8,818 tons per acre. Since the theoretical yield was 12,390 tons the acre, the actual yield was 71% of the theoretical.

PRODUCT AND RESULTS OF THE MARSAC REFINERY FOR 1892: BY C. A. STETEFELDT.

In a former paper the author described the plant of the Marsac refinery, and the manipulations of the process, but could not, at the time, give reliable statistical results. To supply the latter is the object of the present paper. Before starting on the work of the year 1892, a most careful clean-up was made, and any remnants were charged to the refinery. During 1892 the Marsac lixiviation works produced 48.8 tons of so-called "regular" sulphides, which contained, on an average, 11,449 oz. of silver per ton; 11.77 oz. of gold per ton, and 569.8 lbs. of copper per ton. To this must be added 266 lbs. of sulphides and by-products left over from the product of 1891, which contained 1,380 oz. of silver, 1.41 oz. of gold, and 63 lbs. of copper.

The total product of the refinery was 560,095 oz. silver, 577 oz. gold and 31,231 lbs. copper. There was also 107,643 lbs. bluestone sold. The expenses of the refinery, including freight on bullion and

all charges were \$16,395. The paper goes very carefully into the details of the work and draws some conclusions, which are given below.

The old process for refining sulphides, which worked very smoothly in a technical sense, should it be restored, can be made more economical in expense and less wasteful in silver. The plant, as now constructed, requires only an addition of crystallizing vats for bluestone to handle more than double the quantity of sulphides. The muffle furnace, which was running intermittently, proved, in consequence, to be very wasteful in fuel. It took more coal to heat up the furnace in starting roasting, and to keep it hot for 16 hours while no roasting was done, than the quantity consumed during roasting itself. Nor would it be necessary to employ twice the number of men in doubling the capacity of the refinery.

The most important point for consideration is, to reduce the loss of silver, which the author thinks is chiefly due to the present method of melting the silver cakes in crucibles. The silver cakes contain more or less impurities, which cause the metal to boil during and after fusion. In fact, the silver globules adhering to the sides of the melting furnace, and accumulating in the flue leading to the chimney, and the large amount of silver found in the ashes, are sufficient evidence in support of this. Reverberatory furnace melting would reduce these losses to a minimum. It would be well to moisten the cement silver before pressing into cakes with a concentrated solution of borax, perhaps with the addition of niter. A thorough drying of the cakes would not be necessary. The reverberatory furnace could be charged with them, and a slow fire started to drive out all moisture first. This method of melting would also reduce the weight of refinery cleanings to a minimum, thus causing less expense in their reduction. A further saving could be made by the introduction of an electrolytic plant for parting and refining the dore bars. The metal from the melting furnace could be cast at once into plates for the electrolytic refinery.

THE DETERMINATION OF PHOSPHORUS IN COAL AND COKE: BY JACOB LYNCHENHEIM, SWEDLAND, PA.

In connection with the manufacture of special Bessemer pig, containing .030% or less of phosphorus, it was found that the phosphorus in anthracite varied so greatly that it was necessary to sample and analyze each carload. This, of course, in addition to our routine work, involved a considerable amount of extra trouble, and some experiments were made, with the view of cutting down the time and labor of the determination to a minimum. As there seemed to be no question that all the phosphorus is to be found in the ash, the old method of fusing 5 grammes of coal with 40 grammes of carbonate of soda and 40 grammes of potassium nitrate was not tried. It involved too much attention in preventing the fused mass from over-running the crucible. Several methods were tried without satisfactory results. In conclusion, the author says: "I had been under the impression that fusion of the ash or residue was necessary in all cases; but wishing to ascertain exactly what proportion was dissolved out by hydrochloric acid, and what remained in the residue, I tried the experiment of treating the ash exactly like an ore, transferring it to a 5-in. casserole; adding 40 c. c. of strong HCl; evaporating to 10 c. c.; then adding 40 c. c. of nitric acid (sp. gr. 1.42) and evaporating until all brown fumes had passed off and the solution contained about 20 or 25 c. c. The nitric acid solution has a strong tendency to "bump;" and care must be taken to keep the contents of the casserole in motion. The results showed that the phosphorus was almost completely soluble in hydrochloric acid and only a trace remained in the residue. This, then, was a solution of the problem by which results could easily be obtained in from an hour to an hour and a half, with little labor and attention on the part of the operator. It is just as satisfactory and gives just as concordant results as the longer methods.

"In all this work we have been using a very simple arrangement, by which the combustion of the carbon was considerably hastened. In fact, it was found much more satisfactory than the large fusion crucibles we had previously employed. Its comparative cheapness enabled us to run six analyses at a time, and also did away with the expensive necessity of laying in a supply of large crucibles. It consists of a boat 2 in. square and ½ in. deep made from 0.002 platinum foil. Care should be taken in making the boats that the corner flaps fit tightly, so that none of the ash will be lost by getting into the interstices. A tripod, Erdman chimney, and two pieces of thin platinum wire complete the arrangement. The wires should be so bent as to be about ¼ in. below the top of the chimney. The heat applied for the first five minutes should be a low red, in order that none of the coal shall be lost in the escape of the volatile matter. After that the gas should be turned on full, and a bright red heat maintained. It is not necessary that the sample should be ground very finely. By constant stirring we have effected the combustion of the carbon in half an hour, and with an occasional stirring it should never take more than an hour."

IRON ORES OF EAST TEXAS: BY W. KENNEDY.

Throughout northeastern Texas we have an extensive series of iron ore deposits, occupying portions of 19 counties and having approximately an actual ore covered area of 1,000 square miles. The existence of these ores has long been known. The great ore belt may be described as a triangular area, bounded on the north by an irregular line drawn from the Sulphur Fork, in Cass County, extending west and south through Daingerfield, in Morris County, to a little south of Quitman, in Wood County. The western limitation of the belt extends irregularly southward through the west side of Smith, east side of Van Zandt and Henderson, and the center of Anderson County, a short distance west of Palestine, and in a south-westerly direction to the Brazos River, near Hearne. The southern side is limited to a line crossing the Trinity River, near Crockett, the Neches at Augusta, and the Sabine River near the northeast corner of Sabine County. The total area is approximately 10,000 square miles, of which about 1,000 square miles are covered with iron ore.

The topography of the ore region will be best understood when it is compared to a great plain sloping gently to the southeast, cut into many flat topped, steep sided ridges and small tablelands by the numerous water courses which have their sources within the region, or find their way through it. These flat-topped areas are usually denominated mountains, although but few of them reach an altitude of over 700 ft. above sea level, and their existence is due solely to the presence of an iron capping found either lying upon the surface or beneath a thin covering of yellowish-brown sand. This condition obtains mostly through the central and western portions. In the northeastern and along the eastern boundary of the area, the hills forming the overlying beds of the central and western portions have been almost entirely eroded and the country lies at a generally lower level. In this region the hills rarely reach an elevation of 350 ft., and water courses and larger streams are bordered with wide margins of marshy lands and extensive areas subjected to repeated and long-continued overflow.

The geology of the ore region is extremely simple in its greater features. Only two of the great geological divisions are represented—the Quaternary or Pleistocene and the Eocene stage of the Tertiary. The former of these consists of irregularly deposited soft ferruginous sands and ferruginous sandstones of a brown and brownish-yellow color, lying in irregularly lenticular shape and intermixed or interstratified with the sand from which they have been derived or of which these sandstones form the source. It is impossible to determine exactly the relations between the two, they look so much alike. Light gray and yellow sands and brown clays occur in many places; and to this division belongs the great series of what have been denominated conglomerate iron ores.

The iron ores of east Texas are all hydrated, and have been

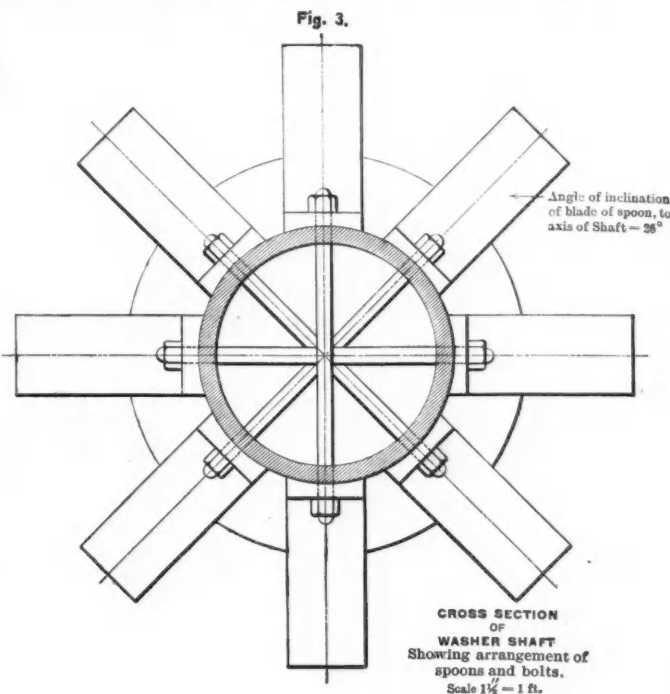
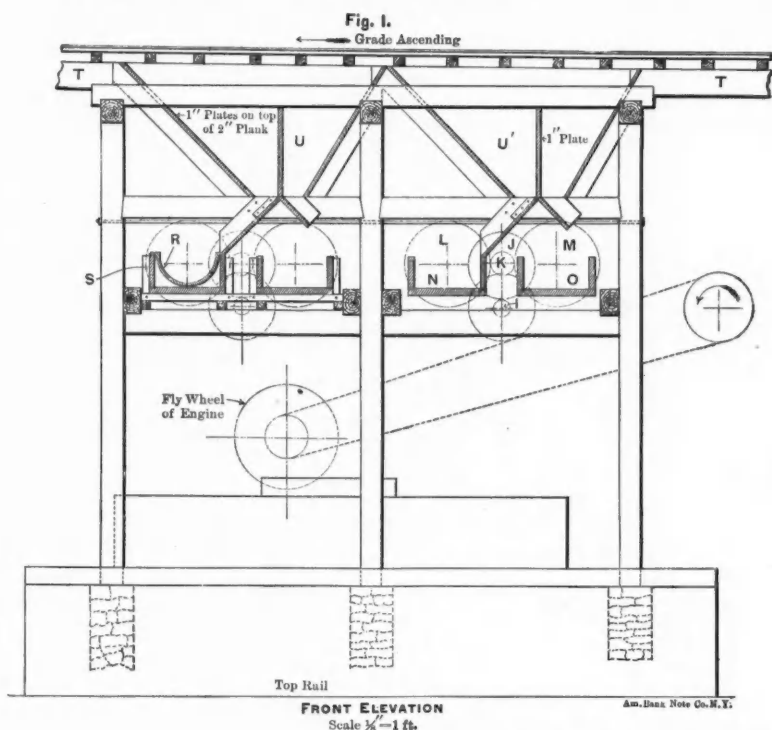
Altogether, the Texas ores may be classed as having fair average metallic contents, a medium admixture of silica and low percentages of both sulphur and phosphorus, as yielding rather above the average, for their grade, in the furnace, and as producing a very high grade of perfectly neutral iron, much of which is well within the limits of the requirements of Bessemer iron. With these qualities we have also the additional and probably most essential one at the present time, that the ores are easily mined and can therefore be obtained at a low cost. There is, however, no fuel near or cheaply accessible but charcoal, and no supplies of limestone for flux can be had without a haulage of 75 to 150 miles. These conditions have limited the use of the ores.

THE ORE WASHING PLANT AT LONGDALE, VIRGINIA *

By Guy R. Johnson.

The plant described was designed by the writer in 1891 to take the place of an older one, which had begun to show signs of giving out. While not involving any new features of prominence, the type being that of the well known log washer, the details are of interest.

Fig. 1 is a front and Fig. 2 a side elevation of the new washer. The new engine (not shown) is an automatic Buckeye, giving 25 H. P. with 60 lbs. pressure, and 285 revolutions per minute. From the 3-ft. belt-pulley of the engine, the main shaft is driven by a 12-in. belt. On this main shaft are the pulleys for driving the washers, which is done with 6-in. rubber belts, running over the pulleys, D and E (Fig. 2). F and G, in the same figure, are the loose pulleys to which the belts are shifted when it is desired to stop the washers without stopping the



THE ORE WASHER AT LONGDALE, VIRGINIA.

classed for convenience as limonites or brown ores, although, strictly speaking, some portions of them may not belong to that species. From their physical structure, rather than their chemical constitution or metallic ratios, these ores have been divided into three classes, viz., nodular, laminated and conglomerate. Of the last class no account has been taken in this paper, since aside from the peculiarity of its structure, position and quantity it is of no great interest, and of no economic use whatever as a metal producer. The conglomerate ores are usually a mixture of ferruginous pebbles, sand and gravel, and in many places siliceous pebbles cemented together in an iron matrix. They are generally associated with streams, either (as in the case of the older deposits) lying high up in the bank, marking a former level of the stream, or near its source, or (as in the case of the newer deposits) lying close to the present water level. Occasionally deposits of siliceous conglomerates are found capping the hills and ridges. The nodular ore is usually found in the form of irregularly-rounded, oval and flattened or ellipsoidal nodules or boulders from a few inches to one or two feet in length. Outside, these present a smooth appearance and dull or earthy brown color. When broken, the shell presents a striated appearance of yellow and brown colors, formed by the alternate concentric rings of iron ore and ocher. The laminated ores vary in appearance as well as texture and thickness. In places, these ores occur in thin laminae of dark brown or chestnut color, interstratified with similar laminae of bright orange or yellow. These laminae rarely exceed a quarter of an inch in thickness. At other places, the ores become more massive, occur in beds from two inches to as many feet thick, and vary in color from a dark chestnut-brown to a lighter shade of the same color, with small irregularly disseminated patches of yellow showing throughout the mass. This ore also occurs in thin wavy laminae of from chestnut-brown to black color.

engine. As the four logs are arranged in pairs, the pairs being alike, a description of one pair only will be given.

To the end of the shaft, H (Fig. 2), to which is fastened the pulley D, is keyed the small pinion, I, which meshes into the spur-wheel, J. This drives another pinion at K, and this in turn gears into the spur-wheels, L and M, thus driving the logs in the two washers, N and O, at the rate of 1 1/2 revolutions per minute. The driving gear is connected to the logs, which are on a slope of 3/4-in. per ft., by cast iron clutches, one of which is shown at P (Fig. 2). The rear bearing is 5 1/2 in. in diameter, and is of cast iron. It is cast solid with a flange, on the face of which is turned a shoulder. This shoulder fits into a corresponding recess turned in the similarly flanged end of the log. The two flanges are bolted together, and make a very stiff joint, as the shoulder prevents any lateral motion. The logs are simply pieces of cast iron pipe, 17 ft. 5 1/2 in. long, 11 1/2 in. diameter, with metal 3/4-in. thick, and flanged at each end. This makes a splendid log, one that is stiff and wears well.

The method of attaching the spoons is shown in Fig. 3. They are put on in two spiral threads, 180° apart, and with a 5-ft. pitch. They are set 45° apart on the circumference, thus making eight spoons to each revolution, as shown in Fig. 3. By this method of laying out, there are, at every 1/2 of a revolution, two spoons opposite each other and 180° apart. If now, holes be bored through the pipe, under the two holes with which the foot of each spoon is provided, two through-bolts will fasten on two spoons. These bolts are 3/4-in. in diameter, and are made with nuts at each end as shown. At the upper end of the log there is a gudgeon, similar to the one at the lower end, except that the bearing is only 4 1/2 in. in diameter and extends 2 ft. beyond the

* Abstract of paper read at Virginia Beach Meeting of the American Institute of Mining Engineers.

box. To this end the revolving screen Q (Fig. 2) is attached. The screens are made of 3-16-in. steel plates, perforated with 3-16-in. holes, $\frac{1}{2}$ in. from center to center.

The troughs are made in the usual way, of a wooden frame in which are fastened the iron plates constituting the trough proper. The bottoms and sides of the frames are of 3-in. pine, thoroughly braced by the yokes shown at S, Fig. 1. Both bottom and sides are bolted to iron end pieces, in which are cast seats for the chilled iron gearing boxes. The iron plates constituting the trough proper rest upon the sides of the frames, to which they are attached by $\frac{1}{2}$ -in. lag-screws. As indicated at R, Fig. 1, they are of the usual semi-circular pattern, the only modification being that they are cast in sections only 15 in. long. This permits them to be made as open-sand castings.

In the operation of the plant, the ore is brought from the mines in side-dump cars, holding about $5\frac{1}{2}$ tons each. The cars are pushed out past the washer on the trestle T, Fig. 1, which is built with a grade ascending in the direction of the arrow shown in the drawing. The cars are then allowed to drop down, two at a time, until they come over the chutes, U and U', which are lined with 1-in. iron plates, as indicated in Fig. 1. The ore, falling through the chutes to the logs, is caught by the spoons, which force it up against a descending current of water from the trough V (Fig. 2), until it reaches the revolving screens Q, into which a stream of water from the same trough V is flowing. There the ore is further washed and at the same time separated. All over 3-16-in. diameter passes along the screen and falls

poses, the iron and silica contents were the same in each case. The percentage yield was increased tremendously by the fine screens, but the furnaces did not seem to work the increased fines very well. It was therefore decided to drop the experiment for the time being. It seems very probable, however, from knowledge since acquired, that the trouble at the furnaces may have been due to a different cause, now overcome. Since the foregoing was written (in 1893), we have put in 20-mesh screens, with an additional saving of 4% of ore as the result. We have also added two Merry picking tables (a modification of the German bumping table).

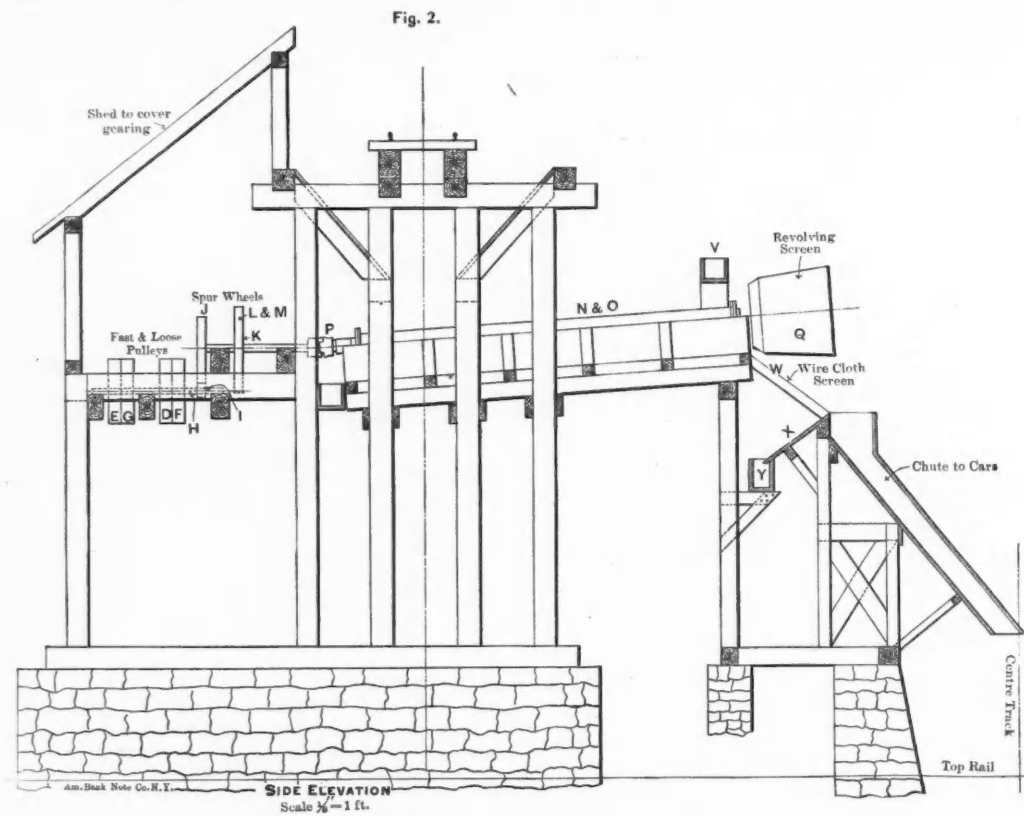
THE CALCULATION OF THE FUSIBILITY OF CLAYS.*

Written for the Engineering and Mining Journal by H. A. Wheeler E. M.

In connection with the investigation of the clays of Missouri, a large amount of experimental work has been done for determining their fusibilities and other properties. The following considerations are the outcome of this work:

Bischof, in his "Feuerfesten Thone" (p. 71), gives a formula for calculating the fusibility of a fireclay from a chemical analysis, which is based on the statements that the pyrometric value depends on:

1. The relation of the alumina to the fluxes (or detrimental).
2. The relation of the alumina to the silica.



ORE WASHER AT LONGDALE, VIRGINIA.

into the chute to cars (Fig. 2). The fines, which drop through the perforations, fall on the 14-mesh wire cloth screen W (Fig. 2), where they are further washed and screened, all over 14-mesh going to the cars, while the sludge falls on the apron X, and is thence carried away in the trough Y, which also conveys away the water from the rear end of the washers. As all who have used log-washers know, the current of water descending in the troughs is apt to carry off more or less ore through the rear end. To prevent this loss, two perforated screen plates (not shown in the drawings) are used. The muddy water from the trough passes through a gate upon these screens, through which it falls and is carried away into Y, while the ore remains upon the screen. Only one screen is used at a time, and as soon as ore enough has accumulated upon it to stop the perforations, the water is shut off and turned into the other. The ore is shoveled back into the washers. This device saves a great deal of ore at a very low cost, as it requires the attention of one man for only part of his time, thus leaving him free to help at other points.

The following figures taken over a week in March, 1893, give a good idea of the capacity of the plant and its performance. They give the daily performance as an average of six days' work: Coal burned per day, 1,479.16 lbs.; ore washed, 196.2 tons; washed ore, 138.9 tons; percentage of washed ore to ore washed, 70.8%; hours run, 5:37 $\frac{1}{2}$; men (including engineer), 6; cost per ton of washed ore for labor, \$0.045; coal burned per ton of ore washed, 10.6 lbs.

An attempt to use finer wire screens has been made, and, though temporarily dropped, has not yet been abandoned. A rough examination had induced us to believe that the silica particles of the sludge were finer than those of the ore. To test this, screens of varying fineness of mesh, all finer than the 14-mesh, were placed under three of the revolving screens, the fourth being allowed to remain as it was, 14-mesh. Samples were taken frequently throughout each day's run, for a week, from all four screens. An analysis showed that, for all practical pur-

From this he derives the following expression for representing what he calls the "Feuerfestigkeitsquotient," or fusibility quotient:

$$F. Q. = \frac{\text{Alumina} \times \text{alumina}}{\text{Silica} \times \text{fluxes}}$$
 The value of F. Q., he finds to be 14 for the most refractory clays (Saarau, with 1.26% of detrimental); about 9 for pure kaolins (Zetlitz, with 2.00% fluxes), 4 for Belgian fireclays (3.0% fluxes), and 1 or less for the Rhine fireclays, which have 4 to 7% of detrimental. From Bischof's statement it follows that the more aluminous a clay is the more refractory it will be, while the more siliceous or the more impure with detrimental the less refractory it will be.

While high alumina is indicative of purity in a clay, yet the work on Missouri clays shows no loss in refractoriness when the alumina is replaced by sand, or the clay is very siliceous, while every increase in the detrimental decidedly affects the fusibility, especially if the increase is in the alkalis. But the work on the Missouri clays shows that density and fineness of grain have also a very important influence on the refractoriness, and these must be considered in weighing the value of the detrimental present in a clay. Hence Bischof's formula will be totally unreliable, even in clays of similar density and fineness, on account of confusing the silica and alumina as such vital factors of fusibility, when it is mainly, if not entirely, a question of fluxing impurities, density and fineness. When clays are similar in density and fineness, the refractoriness will be inversely as the detrimental impurities, when the latter are equated as to their proper fluxing values, and if this is called the "Fusibility factor," it may be expressed by the following formula:

$$F. F. = \frac{N}{D \times D'} \quad (A)$$

in which N represents the sum of the non-detrimentals or total silica.

* Published with the approval of Arthur Winslow, State Geologist of Missouri.

alumina, titanio acid, water, moisture and carbonic acid; D represents the sum of the detrimental impurities, or the iron (as sesquioxide), lime, magnesia, alkalies, sulphuric acid, sulphur, etc.; D' represents the sum of the alkalies which have been found to have about double the fluxing value of the other fluxes; ferrous oxide is probably about as objectionable, but as it usually oxidizes up into much less fusible form of sesquioxide in the operation of burning the clay, it is not thus accented in ordinary coarse clays. This formula will be found to give a fairly good comparative value of the refractoriness of clays that do not differ more than 0.2 from one another (the closer the specific gravity, the more reliable the comparison) in density, and are of similar fineness of grain. When the clays to be compared differ in density and fineness, then it is necessary to modify formula A by a constant, C, that will have different values depending on the density and fineness, so the formula will be:

$$F. F. = \frac{N}{D \times D' \times C} \quad (B)$$

in which N, D and D' will have the same values as in formula A; C = 1 when the clay is coarse grained and specific gravity exceeds 2.25; C = 2 when clay is coarse grained and specific gravity ranges from 2.00 to 2.25; C = 3 when it ranges from 1.75 to 2.00; C = 2 when the clay is fine grained and specific gravity is over 2.25; C = 3 when it ranges from 2.00 to 2.25; and C = 4 when it is from 1.75 to 2.25. These values of C are only crudely approximate, as not enough work has been done on a sufficiently large variety of clays to give satisfactory values, while no simple method has been, as yet, arrived at for giving a ready and correct expression of the fineness. Still, enough work was done to show that formula B is the only

its very poor conductivity of heat; differences of over 100° F. were found within less than half an inch on the same bricklet. In burning a clay, it slowly shrinks and becomes harder as the temperature is raised above a red heat (when it begins to lose its chemically combined water), and at a certain point the granular structure of the raw clay can no longer be distinguished, and it is now found to have a hardness of 6.0 to 6.5; this is called the point of incipient vitrification (in the table), or fusibility, and it is necessary to burn clay wares to this point to develop strength and hardness. If the temperature be raised still higher, it will become slightly harder, or 6.5 to 7.0, and at a certain point will look more or less stony or vitreous, which is called completely vitrified; at this point the clay will not soften or flow or become distorted. If the heat be still further raised, the clay will finally soften, vesicles and bubbles will begin to appear as the result of gases given off by the chemical changes that now slowly take place, and finally a very spongy, scoriaceous, pasty mass will result, unless the heat be raised so high as to thinly liquify the mass, when the gases escape and a pool of glass results. The first appearance of the bubbles is called the point of scoriaceous vitrification, or fusion, and shows that the clay is failing and would slowly flow or yield under pressure or abrasion. As the range in temperature is usually from 300° to 600° F. between this first or incipient point and last or scoriaceous or failing point, with a gradual transition from one to the other, it is difficult to state with any degree of accuracy just when the clay fails, and to decide any closer than a rough approximation as to when a clay gradually passes through the above three important stages in its very slow transition from a rigid solid to a very viscous liquid. Hence the pyrometric determination of these three conditions is only approximate,

TABLE SHOWING THE VALUE OF CALCULATED FUSIBILITIES.

Name.	SiO ₂ .	Al ₂ O ₃ .	H ₂ O.	Total N.	Alkalies D'.	Total D.	Sp. Gr.	Grain.	Fusibility, F.°			Calculated Values.				
									Incip.	Complete	Scor.	Bischof F.°	Wheeler's.			
													A.	B.		
St. Louis Fireclays:																
Christy, washed.....	64.35	21.16	8.94	94.45	0.51	4.81	2.13	Fine	2200	2400	2700	ab'v'e	1.44	17.7	13.0	
" mine run.....	61.73	23.56	9.25	94.54	1.00	7.30	2.47	Coarse	2100	2300	2500		1.23	11.4	10.2	
Jameson's, washed.....	58.61	27.36	11.13	94.10	0.71	5.25	1.92	"	2200	2400	2700		2.47	15.8	11.8	
" mine run.....	53.90	28.85	11.61	94.36	0.85	6.86	2.40	"	2200	2400	2600		2.33	12.2	10.9	
Sattler, washed.....	52.98	28.77	11.42	93.17	1.01	5.12	2.40	Fine	2200	2400	2700		3.44	15.2	11.4	
" mine run.....	51.66	30.78	11.86	94.30	0.99	5.88	2.40	"	2100	2300	2500		3.06	13.7	10.6	
Parker & Russell.....	67.47	19.33	7.73	94.53	1.07	5.14	2.44	Very coarse	2250	2450	2700		1.08	15.2	13.3	
Laclede.....	57.34	24.68	11.55	93.57	0.67	6.30	2.45	Coarse	2250	2450	2650		1.89	12.9	11.1	
Evans & Howard.....	59.36	23.26	10.20	92.82	0.63	5.67	2.41	"	2250	2450	2650		1.64	12.7	11.3	
" Rock " or Non-Plastic Fireclays:																
Pendleton.....	46.18	38.12	14.01	98.31	1.20	1.06	2.42	Fine	2300	2500	2700	over	16.	28.	18.	
High Hill.....	45.12	40.46	13.34	98.92	0.30	1.06	2.33	Very fine	2350	2550	2700		37.	73.	29.	
Drake.....	40.50	43.22	14.15	97.87	0.51	1.93	2.35	"	2300	2500	2700		23.	40.	22.	
Truesdale.....	43.56	41.48	14.05	99.09	0.20	1.60	2.45	"	2300	2500	2700		40.	82.	31.	
Union.....	44.14	39.86	13.84	97.84	0.76	2.45	1.98	Fine	2200	2400	2700		15.	31.	18.	
Owensville.....	44.70	35.92	12.62	93.24	0.29	6.85	.....	Coarse	2050	2200	2350		4.	11.	9.	
Sankey's.....	50.18	33.02	11.88	95.07	2.06	5.29	2.10	"	2100	2300	2500		4.	13.	10.	
Kaolins:																
Glen Allen.....	72.34	18.94	7.04	98.28	0.42	1.89	1.89	Very fine	2200	2400	2600		2.7	42.	15.6	
Sterling.....	57.75	27.60	11.43	96.78	0.60	3.24	.....	"	2200	2400	2600	ab'v'e	4.3	26.	12.3	
Cape Girardeau.....	91.05	5.01	2.74	98.80	0.12	1.27	2.02	"	2200	2400	2600		0.2	70.	22.	
Winona.....	56.74	27.29	7.40	91.43	1.21	8.52	1.86	"	1800	2000	2200		1.5	9.6	7.	
Potters' Clays:																
Guthrie.....	47.13	34.93	13.88	95.99	0.52	3.76	2.13	Very fine	2000	2200	2400		6.5	22.	13.	
Mammoth.....	49.04	34.85	12.33	96.22	0.85	3.93	1.69	"	1800	2100	2400		6.3	20.	11.	
Commerce.....	71.78	17.01	8.13	96.92	0.78	3.56	2.03	"	1950	2150	2350		1.0	22.	13.	
Clapper.....	67.76	21.96	8.23	97.95	0.24	2.13	2.45	Coarse	2500	2600	2600	over	3.7	46.	27.	
Deepwater.....	74.02	15.26	3.69	92.97	2.37	5.38	2.37	Fine	2100	2300	2500		0.6	12.	10.6	
Brick Clays (Loess):																
Kansas City.....	72.00	11.97	6.42	90.19	3.25	10.11	2.17	Fine	2600	2200	2300		0.2	6.8	5.7	
Hartwell.....	60.93	21.51	5.30	87.64	2.03	10.15	1.80	"	1850	2050	2150		0.7	7.2	5.4	
St. Louis.....	73.92	11.65	5.26	90.83	3.13	9.90	1.98	"	1800	2000	2100		0.2	6.8	5.3	
Shales:																
Moberly.....	65.01	19.34	6.54	90.85	2.60	9.31	2.41	Coarse	1850	2050	2250		0.6	7.5	7.0	
Kansas City.....	54.80	23.73	6.00	84.53	3.80	15.34	2.37	Very fine	1500	1700	1900		0.7	4.4	4.0	
Deerfield.....	58.90	21.38	8.69	88.97	1.52	10.84	2.43	Medium	1800	2060	2200		0.7	7.3	6.5	
Louisiana.....	57.01	24.43	7.63	89.07	3.81	11.47	2.39	Coarse	1600	1800	2000		0.9	5.8	5.5	

one that can be used indiscriminately on all kinds of clay, though a very large amount of work has still to be done to arrive at more reliable values for C and the fineness, as the large number of factors involved makes it a very complex question.

In the table of analyses given herewith examples have been selected from the 110 samples of the Missouri clays that have been completely studied, which fairly illustrate the unreliability of Bischof's formula the quite satisfactory comparative values given by formula A on clays that are physically similar, and the much more general scope of formula B, which considers physical as well as chemical influences, though it also shows the need of further work to obtain more reliable values for the constant C. Thus, in the St. Louis fireclays, which are all obtained from the same seam, Bischof's formula gives about equal values (1.23 to 1.44) to clays of very different fusibility, and very different values (1.08 to 3.44) to clays of about equal fusibility; the Cape Girardeau kaolin (91.05% SiO₂ and 1.27% fluxes) is given a very inferior value for its refractoriness (0.2), though (as the analysis would indicate) it could not be affected by the highest heat of the furnace, while the easily fusible Winona kaolin is given a higher value (15). Again, the Clapper (potter's) clay, which is one of the most, if not the most, refractory clay known, is given a value of only 3.7 by Bischof's rule, while the readily fusible Owensville fireclay has a value of 4. A further study of the table will show the utter unreliability of Bischof's F Q as a means of arriving at the relative fusibility of clays.

The table shows that the value of F F should exceed 12 when calculated by formula A, for coarse, very dense clays, or exceed 10 when using B, for a refractory clay; and the higher the value, the more refractory it will be. It should be remembered in consulting the table that no matter how reliable a pyrometer may be—and the best of them need much care and attention—it is difficult to determine just what the temperature of a clay is, when it begins to change, on account of

and an error of 25° to 50° in the figures given in the table is quite possible.

Le Chatelier's thermo-electric pyrometer was used in making the temperature observations, which was calibrated to show changes of 25° F., and the samples, varying from 1/2 in. by 1 in. by 4 in. to 1 in. by 1 in. by 4 in., were burned in muffles and graphite crucibles that were run at different degrees of heat in coke fired assay furnaces.

German Patents.—The total number of patents issued in Germany in 1893 was 17,299, an increase of 1,474 over 1892.

Transportation of Injured Men in Mines.—The difficulty of carrying wounded men in mines through narrow and uneven passages has often been recognized. An apparatus invented by Dr. Paul Troisfontaines is described by the "Semaine Industrielle," of Brussels, and seems to be simple and convenient, as well as cheap. It consists of a sort of hurdle or litter, made of hoops about 8 mm. in diameter, placed parallel and joined by a fabric of cord or mat, somewhat like a hammock, thus giving, when required, rigidity in one direction and flexibility in the other. The injured man is laid in the litter with his legs extended and his arms at the side of his body; the upper part of the litter is then folded over and secured by three or four straps. The man then forms a package and can be carried without the slipping and jolting of an ordinary litter, no matter how narrow or rough the mine galleries may be. In case of fracture there is believed to be less danger in carrying a man in this way, holding him immovable, than in attempting to keep the broken limb in place by rough splints or bandages extemporized on the spot. These litters can be easily stored in a small space, and their cost, in Belgium, is 3 francs, or about 60c., only.

THE AMY & SILVERSMITH CASE.

The decision of the United States Supreme Court in the case of Silas F. King versus the Amy & Silversmith Consolidated Mining Company, appeal from the Supreme Court of Montana, has just been published, and as it is one of much importance we give the opinion of the court, as delivered by Justice Field, substantially in full, as follows:

The plaintiff and the defendant are owners, as tenants in common, of certain mining property in Silver Bow County, State of Montana, known as the Non-consolidated lode mining claim. The plaintiff owns three-fourths of the claim and the defendant one-fourth. The defendant, is, besides, the sole owner of the mining claim situated in the same county and State, known as the Amy lode mining claim. Both claims are located and patented under the mining laws of the United States contained in sections 2320 and 2322 of the Revised Statutes. The Amy claim was first located and has the earlier patent.

The relative positions of these two claims are seen on the diagram in the record, which shows the course of the vein in the Amy claim upon which its location was made and the boundaries of the two claims, with the length and direction of each. The description of the two claims can be understood only by reference to the diagram, as each line is given. A copy of the diagram is here produced, as without it the description will be unintelligible to the reader.

The Amy claim has a surface length of 1,470 ft., and its side-lines are parallel. The end-lines are each 491 ft., and they are also parallel. The surface location forms a parallelogram of 1,470 ft. running easterly and westerly, by 491 ft. running northerly and southerly.

The Non-consolidated claim lies adjoining the northwest corner of the Amy claim. Its surface shape is that of a triangle, the longest side of which joins the northerly side of the Amy claim, and, commencing 17 ft. from the northwest corner of the latter, extends easterly 411 ft. in length. Its northerly side line commencing (on the northerly line of the Amy) at the point where the first line terminates, runs in a northwesterly direction 372 ft. to the point where it meets the westerly line of the lode, and extends southwesterly from this point 181 ft. to the place of beginning.

The vein of the Amy claim, on its course or strike, passes through its northerly side-line, as marked on the diagram, into the Non-consoli-

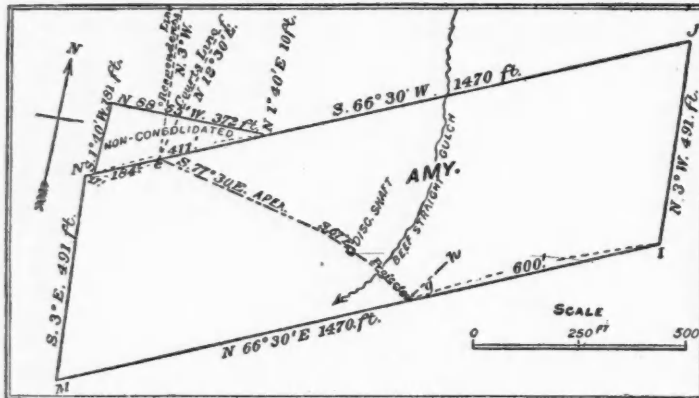


DIAGRAM OF THE AMY AND NON CONSOLIDATED CLAIMS.

dated ground; its apex crosses that line 184 ft. easterly from the west side-line of that claim, and does not again enter the Amy claim. The apex of the vein enters the south side of the Amy claim at a point within 600 ft. westerly from the southeast corner of the Amy, and the dip of the vein is to the north.

The plaintiff has brought this action for a partition of the Non-consolidated claim with the defendant, according to the respective rights of the parties, if that be possible; but if the property cannot be thus partitioned advantageously, then for a sale of the premises and a division of the proceeds among the owners, in conformity with such rights.

As stated above, the vein of the Amy, of which the apex lies within the surface lines of the claim, in its course passes through the northerly side-line, and enters the Non-consolidated claim; and it is alleged that the vein has been there worked by the owners of that claim and valuable ore taken therefrom. The plaintiff, therefore, prays, in addition to a partition or sale of the Non-consolidated claim, for an accounting for his share, as tenant in common of an undivided three-fourths of that claim, of the ores taken from the underground workings of the vein of the Amy after it had passed into that claim, if any there were.

The defendant admits co-tenancy in the Non-consolidated claim with the plaintiff, but denies the taking of any ore from the vein of the Amy after it had passed into its ground.

The first question for determination is whether the Amy retained any right to the vein, the apex of which was within its surface lines, after it had passed through its northerly side-line, or rather through the vertical plane running down that line. If the Amy retained its right to that vein after it had entered the ground of the Non-consolidated claim, it belonged to the defendant as sole owner of the Amy, and he could not be called on to account to the plaintiff for any portion of the ores taken from it. If, on the other hand, the Amy did not retain its right to that portion of the vein after it had passed into the Non-consolidated claim, it became a part of that claim, and the proceeds of the ore there taken from it would, with other proceeds of the Non-consolidated claim, be the subject of an accounting between the plaintiff and the defendant, the owners, as tenants in common of that claim. The answer to the question must be found in the construction given to section 2322 of the Revised Statutes, which took effect December 1st, 1873, and which provides that locators "shall have the exclusive right of posses-

sion and enjoyment of all the surfaces included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges."

The preceding section (2320) prescribes the extent to which mining claims upon veins or lodes of quartz, or other rock in place, bearing gold, silver, or other valuable deposits on lands of the United States, may be taken up after May 10th, 1872. It allows a claim to be located to the extent of 1,500 ft. along the vein or lode, but provides that no location shall be made until the discovery of the vein or lode within the limits of the claim located; which is, in effect, a declaration that locations resting simply upon a conjectural or imaginary existence of a vein or lode within their limits shall not be permitted. A location can only rest upon an actual discovery of the vein or lode. The section also declares that no claim shall extend more than 300 ft. on each side of the middle of the vein at the surface; nor shall any claim be limited by any mining regulation to less than 25 ft. on each side of the middle of the vein at its surface, except as prevented by adverse rights existing on May 10th, 1872, and that the end-lines of each claim shall be parallel to each other. A claim located in conformity with the provisions of this section would take the form of a parallelogram, if the course or strike of the vein or lode should run in a straight line; but such veins and lodes are often found upon explorations to run in a course deviating at different points from such line. And from this circumstance much difficulty often arises in determining the lateral rights of the locators.

Section 2324 of the Revised Statutes recognizes the power of miners in each mining district to make regulations not in conflict with the laws of the United States, or of the laws of the State or territory in which the district is situated, governing the location, manner of locating, and amount of work necessary to hold possession of a mining claim, subject to the requirement that the location must be distinctly marked on the ground so that its boundaries may be readily traced. It is evident from the provision cited that the location as made and defined must control not only the rights of the claimant to the vein or lode within its surface lines, but also any lateral rights.

Section 2322, cited above, declares that the locators of all mining locations shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their location; and also the exclusive right of possession and enjoyment of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side-lines of said surface location. The surface side-lines, extended downward vertically, therefore determine the extent of the claim, except when in its descent the vein passes outside of them, and the outside portions are to lie between vertical planes drawn downward through the end-lines.

The difficulty in the present case arises from the course of the vein or lode upon which the Amy location was made. It is evident that what are called side-lines of the location, as shown in the diagram, are not such in fact but are end-lines. Side-lines, properly drawn, would run on each side of the course of the vein or lode distant not more than 300 ft. from the middle of such vein. In the Amy claim, the lines marked as side-lines, cross the course of the strike of the vein and do not run parallel with it. They, therefore, constitute end-lines. It is true the lines are not drawn with the strict care and accuracy contemplated by the statute, and which could only have been done with more perfect knowledge of the true course or strike of the vein from further developments. But, as was said by this court in *Iron Silver Mining Company vs. Elgin Mining Company* (118 U. S. 196, 207): "If the first locator will not or cannot make the explorations necessary to ascertain the true course of the vein, and draws his end-lines ignorantly, he must bear the consequences." The court cannot become a locator for the mining claimant and do for him what he alone should do for himself. The most that the court can do, where the lines are drawn inaccurately and irregularly, is to give to the miner such rights as his imperfect location warrants, under the statute. It cannot relocate his claim and make new side-lines or end-lines. Where it finds, as in this case, that what are called side-lines are in fact end-lines, the court, in determining his lateral rights, will treat such side-lines as end-lines and such end-lines as side-lines; but the court cannot make a new location for him, and thereby enlarge his rights. He must stand upon his own location, and can take only what it will give him under the law.

Acting upon this principle there is no lateral right to the holder of the Amy claim by which he can follow its vein into the Consolidated claim. Mistakes in drawing the lines of a location can only be avoided as said in the case cited, by postponing the marking of the boundaries until sufficient explorations are made to ascertain, as near as possible, the course and direction of the vein. "Even then," the court added, "with all the care possible, the end-lines marked on the surface will often vary greatly from a right angle to the true course of the vein, but, whatever inconvenience or hardship may thus happen, it is better that the boundary planes should be definitely determined by the lines of the surface location than that they should be subjected to perpetual readjustment according to subterranean developments subsequently made by mine workers. Such readjustments at every discovery of a change in the course of the vein would create great uncertainty in titles to mining claims."

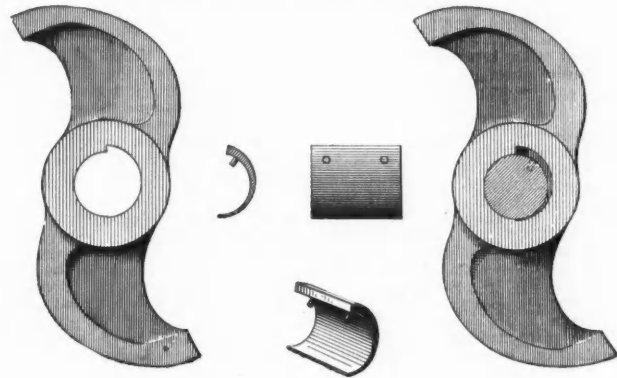
Applying this doctrine to the case before us, it follows that the vein in controversy, the apex of which was within the surface lines of the Amy claim, did not carry the owner's right beyond the vertical plane drawn down through the north side-line of that claim. The Amy claim had no lateral right by virtue of the extension of the vein

through what was called the north side of its claim, as that side-line so-called was, in fact, one of its end-lines.

The judgment of the Supreme Court of Montana should therefore be reversed, and judgment entered in favor of the plaintiff, for a decree of partition of the Non-consolidated claim between the parties to the suit, who are owners as tenants in common, provided such partition can be made with due regard to the respective rights of the owners; and if it cannot be thus advantageously made, that the premises be sold and the proceeds divided according to their respective rights; and further, that the respective parties render an account of the proceeds received by them, respectively, from the Non-consolidated claim, and that such proceeds be divided between them according to their respective rights.

THE BLANTON CAM FOR STAMP MILLS.

This device, like many other useful ones, is very simple, and is shown so clearly in the accompanying engraving that very little description is needed. It is made by Fraser & Chalmers, of Chicago, and is in use in some large mills. Taper bushings, which may be forged upon the cam shaft, but which are preferably separate pieces secured by pins, afford seats for the cams, which are bored to fit and work tight upon these bushings. The method advised for securing the bushings is by means of pins as shown, since there is no shearing stress upon the fastening. When necessary to take off a cam, a slight blow on the back edge with a hammer loosens it instantly. The great advantage of this construction of cam lies in its convenience. For the adjustment of ordinary cams to their proper positions on the shaft they are sent blank, the key seats having to be cut at the mill. A long time must be spent chipping keyways and putting cams on the shaft. Cams of the new style are sent from the shops finished, and can be applied in a small fraction of the time—one-tenth, or less—which is a great economy, preventing



THE BLANTON PATENT SELF-TIGHTENING CAM.

interference with the continuous operation of the mill. In practice at El Callao mine in Venezuela and elsewhere they have been found better than the old styles, never working loose, and superior in wear and duty, owing to the relief of stresses by equalization. The entire cam hub by its self-tightening construction takes hold upon the shaft, and dependence is not placed on the shearing stress of a key, which is liable to be driven so as to split the cam, or impair its strength for severe service.

A recent note from Mr. R. T. Bayliss, manager of the Montana Mining Company, in whose mills at Marysville, Mon., these cams are in use, notes one advantage of the device, as follows: "On the one point of economy in labor its advantage has been proved by recent experience in this company's mills. A cam shaft bearing 10 cams attached by this fastening cam, in case of accident, be stripped, and re-furnished with new cams and placed in running order again in less than half an hour, a period of time which, in many instances, would not be sufficient to remove one cam fastened with the old-fashioned key."

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of California.

Agreement to Purchase Mines.

A contract giving an option to purchase a mine, wherein the vendors covenant to sink a shaft of at least 100 ft., imposes on them the absolute duty of sinking the shaft to the agreed depth, though they find no evidence that the mine contains enough valuable ore to justify them in purchasing it.—Davis vs. Eames, 35 Pac. Rep., 566.

United States Circuit Court, District of Nevada.

Right to Condemn for Location of Tunnel.

In condemning a right of way for a tunnel to a mining claim under the Nevada statute, a large discretion is necessarily vested in the petitioners in selecting the route of the tunnel, and this discretion will not be reviewed by the court unless they have exceeded the authority

of the statute or acted in bad faith. The fact that petitioners actually constructed the tunnel before taking steps to condemn the lands cannot affect their right of condemnation. Statutory authority to condemn "real estate" necessary for carrying on the business of mining includes power to condemn a right of way for a tunnel through other mining claims, when necessary to the development of a given mine.—Douglass vs. Byrnes, 59 Fed., 29.

Coal Production in Spain.—The production of coal in Spain is estimated at 1,531,810 tons in 1893, an increase of 107,625 tons, or 7.5% over 1892. The output in 1893 by provinces was: Oviedo, 810,000; Cordoba, 310,000; Palencia, 149,850; Sevilla, 103,660; Ciudad Real, 88,000; Gerona, 40,300; Leon, 30,000; total, 1,531,810 tons. The production of lignite shows a decrease; the exact figures are not given.

Spanish Iron Production.—The output of pig iron in Spain in 1893 is reported by the "Revista Minera," at 260,450 metric tons; an increase of 13,121 tons, or 5.3% over 1892.

The production of iron ore in 1893 was, in metric tons: Biscaya, 4,000,000; Murcia, 300,000; Santander, 300,000; Almeria, 115,000; other provinces, 182,540; total, 5,497,540 tons, an increase of 92,398 tons, or 1.8% over 1892.

The production of wrought iron was 121,349 tons, a decrease of 1,146 tons. The total steel output was 71,200 tons, an increase of 15,310 tons over the preceding year.

Metric Weights and Measures in England.—The English Decimal Association has recently issued the following memorandum:

"In the last published Foreign Office Report (No. 1,300) on the trade etc., of Bulgaria, it is stated that would-be sellers in England do sometimes go so far as to send out catalogues in French or some other foreign language, but that even then they persist in retaining the intricate English standards of weights and measures. It is added: 'The metric system is the one now employed throughout Bulgaria, and it is useless for English manufacturers—especially of machinery and hardware—to expect that their potential foreign customers will give themselves the trouble of learning our avoirdupois and dimension tables, in order to be able to puzzle out quarters, pounds and ounces, yards and inches, gallons, pints, etc., into their metric equivalents.'

"Regarding Peru a correspondent writes complaining of the inconvenience he suffers when consigning machinery. The shipping specifications have to be sent out in metric weights and measures, and if there are any errors his customers are liable to a fine. This means that he has to make out the specifications twice over, first in English and then in metric weights and measures. He, therefore, urges, and not unreasonably, that the metric system should be adopted officially in England. This would, doubtless, lead to its being adopted by all shipowners and carriers, and one more step in the direction of an international system of weights would be taken. Great Britain is almost the only civilized country of first rank which is blind to the interests at stake in this question, and it is high time that a public inquiry should be instituted."

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING FEBRUARY 24TH, 1894.

- 2,119 of 1893. Treating Nickel and Copper Ores. C. G. Richardson and A. B. English, Toronto, Can.
6,786 of 1893. Rock Drills. W. Charlton, Guisborough.
6,965 of 1893. Electric Smelting Furnaces. R. Urbanitzky and A. Fellner, Linz, Austria.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, FEBRUARY 27TH, 1894.

- 515,331. Blowing Engine or Compressor. William E. Good, Philadelphia, Pa., Assignor to the Southwark Foundry & Machine Co., same place.
515,338. Governor Attachment for Separators. John Overholser, Cottage Grove, Ore.
515,377. Apparatus for Controlling the Admission of Air to Furnaces. George L. Thiell, Baltimore, Md., Assignor to the Thiell Combustion Governor & Mfg. Co., same place.
515,379. Dredging Machine. George H. Titcomb, Boston, Mass.
515,380. Steam Stamp. Charles W. Tremain, Portland, Ore.
515,384. Smoke Consuming Furnace. Robert Walsh, Pittsburg, Pa.
515,422, 515,423, 515,424. Vapor Burner. John A. Chandler, Kansas City, Mo., Assignor to one-half to Nellie D. Waters, same place.
515,475. Blowpipe. John D. Ennes, Norfolk, Va.
515,440. Carburetor. John T. McCarrier, Minneapolis, Minn., Assignor of five-sixths to Edward S. Austin, Amasa C. Paul, and Charles G. Hawley, same place.
515,443. Porous Permanganate Block and Process of Making Same. James H. Parkinson, Manchester, England.
515,452. High Temperature Furnace for Steel Melting or Analogous Purposes. Benjamin H. Thwaits, London, England.
515,453. Apparatus for Pulverizing and Amalgamating. Angelo Tornaghi, Sydney, New South Wales.
515,459. Process of Making Sublimed Lead Pigment. Eayre O. Bartlett and Carl V. Petraeus, Joplin, Mo., Assignors to said Bartlett and Oliver H. Ficher, same place.
515,471. Furnace. Richard Hartfe, Pittsburg, Pa.
515,475. Deep Well Pump. Charles A. Kelley, Oakdale, Cal.
515,516. Hydraulic Air Compressor. Joseph H. Champ, Cleveland, O., Assignor to The Bishop & Babcock Co., same place.
515,528. Smoke Catcher and Separator. Frederick L. McGahan, St. Louis, Mo.
515,530. Gas Engine. Ernest Narjot, San Francisco, Cal., Assignor to Henry Vayre, same place.
515,569. Gas Producer. Leon Bemelmans, Brussels, Belgium.
515,612. Furnace. Francis H. Richards, Hartford, Conn., Assignor to Eckley B. Coxe, Drifton, Pa.
515,652. Apparatus for Electrically Heating or Working Metals. Charles L. Coffin, Detroit, Mich.
515,673. Pulverizing Mill. James K. Griffin, Brooklyn, N. Y., and Edwin C. Griffin, Newton, Mass.
515,680. Apparatus for the Manufacture of Gas. John W. Hayes, New Brunswick, N. J.
515,708. Process of Making Phosphate Fertilizers. John Gregory, Newark, N. J.
515,727. Smelting and Separating Furnace. Louis B. Bonehill, St. Louis, Mo., Assignor by direct and mesne assignments of two-thirds to Gustave Alexander Pierrot and William H. Swift, same place.

PERSONALS.

Messrs. Alfred and L. Merritt have resigned their positions as trustees of the Lake Superior Consolidated Mines.

Mr. A. Latcha Waters took charge on March 1st of the concentrating and smelting plant of the Blue Springs Mining Company, in Bradley County, Tenn.

Mr. Robert Mulford, mining engineer, of Chicago, is at present engaged in opening up the property of the Kanimapoo Gold Mining Company, at Georgetown, British Guiana.

Capt. E. Ball has resigned the charge of the Platt mine, on the Marquette Iron Range, in Michigan, and has accepted a responsible position with the Minnesota Iron Company to date from May 1st.

Mr. Granville Stuart, who has just been appointed United States Minister to Paraguay and Uruguay, was one of the pioneers of Montana, and was with the party which did the first prospecting for gold in Deer Lodge Valley, about 1858. He has resided in Montana since that time, and was for some time State Land Commissioner.

The friends of Sir Lowthian Bell are intending to present him with his portrait, to mark their appreciation of the great services rendered by him to the iron, coal and chemical trades of England. The movement started in Middlesbrough, where Bell Brothers' furnaces and works are situated, but it soon spread to other iron and steel centers. A replica of the portrait is to be placed in some public building in Middlesbrough.

OBITUARY.

George G. Lobdell, president of the Lobdell Car Wheel Company, of Wilmington, Del., died in that city on March 1st, aged 77 years. He was the first to manufacture the double plate convex wheel. He made various other inventions used in this line.

Oscar Barnett, proprietor of the Barnett Iron Foundry, at Newark, N. J., died suddenly in that city on March 5th. His father, the late Stephen D. Barnett, was the oldest iron founder in Newark. Oscar Barnett was born in Rahway, N. J., in 1835.

Robert Foster, Ph. D., superintendent of the Polytechnic Institute, in Brooklyn, N. Y., died in that city on March 6th, aged 67 years. He was born at Bath, Me., and graduated from Princeton University in 1847. In 1853 he opened the Dudley English and Classical School in Brooklyn. In 1856 his connection with the Polytechnic Institute began and it continued until the time of his death.

SOCIETIES AND TECHNICAL SCHOOLS.

International Geological Congress.—The sixth meeting of this body will be held at Zurich, in Switzerland, August 29th-September 2d next. In connection with the Congress a number of excursions to districts of geological interest have been arranged, in which members can, if they wish, take part. The Committee on Arrangements consists of Prof. E. Renevier, Lausanne; Prof. Albrecht Heim, Zurich; Prof. H. Gollier, Lausanne, secretary.

National Electric Light Association.—The annual meeting was held in Washington, February 27-March 2. A number of valuable papers were read and discussed. The following officers were elected for the ensuing year: President, M. J. Francisco, Rutland, Vt.; first vice-president, C. H. Wilmerding, Chicago; second vice-president, Frederic Nicholls, Toronto, Can. Executive committee, Chas. R. Huntley, Buffalo, N. Y.; A. J. Markel, Hazleton, Pa.; W. W. Carnes, Memphis, Tenn.

Western Foundrymen's Association.—At the regular meeting in Chicago February 28th, a paper by E. A. Wheeler, on "Furnace vs. Foundry Practice," in reply to Mr. Keep's criticism before the Foundrymen's Association of Philadelphia of Mr. Wheeler's paper before the December meeting of this Association, was read by the secretary and was followed by a long discussion. The secretary then read a paper entitled "A Foundryman on Foundry Chemistry," by Simpson Bolland, which also called out a very full discussion.

Engineers' Society of Western Pennsylvania.—At the regular monthly meeting in Pittsburgh, February 20th, several persons were elected to membership, and changes proposed in the by-laws. After the business meeting Mr. Chas. F. Scott presented an interesting paper entitled, "Electrical Systems of Distribution." It was illustrated by large diagrams, and by interesting experiments, and evoked considerable discussion in which many of the members engaged.

In the Chemical Section, February 26th, Mr. R. N. Clark read a paper on the "Chemistry of Gold Milling," giving especial attention to roasting sulphurets, and the extraction of gold by chlorine, bromine and cyanide solutions. He also referred to the interference of acid and alkaline waters in all usual methods. His remarks were concluded by reference to the chlorinating system used at the

Treadwell mill, in Alaska; and the cyanide process now being tried in Colorado.

Engineers' Club of Philadelphia.—At the regular meeting, February 17th, Mr. W. B. Riegner described the new falls of Schuylkill Bridge of the Philadelphia & Reading Railroad, which consists of an 80-ft. stone arch over the East Park Drive, and eight deck plate girder spans, one of 60 ft., one of 92 ft., and six of 87 ft., over the river and adjacent low ground and the West Park Drive. It carries two tracks. The alignment is a 6° curve, and the gradient is 0.25%, rising to the eastward. For founding the river piers upon the rock bed, a floating cofferdam was used. This paper was discussed at some length, after which Mr. John C. Trautwine, Jr., called the attention of the meeting to an interesting problem which occurred in supplying the village of Frackville from the Mud Run Reservoir, in Schuylkill County. The water was fed through a 10-in. pipe, for a distance of 8,000 ft., to locomotives and fire plugs in the village. The fall in the pipe was 40 ft., and the head in the reservoir 20 ft. At the village this pipe separated into two branches 6 in. in diameter, one 3,200 ft. long, running to the village of Mahanoy Plane, with a fall of 340 ft., and the other about 1,500 ft. long, running to the head house of the plane, and in this distance first rising 2 ft., then falling about 10 ft. to the upper story of the head house, and 15 ft. farther to the cellar. The difficulty experienced was, that owing to the much greater head in the long pipe, the valley at its end got all the water, leaving practically none for the head house at the top of the plane. Mr. H. K. Nichols, chief engineer of the Philadelphia & Reading Railroad, remedied the trouble by the simple expedient of introducing in the long pipe, just below the branch, a siphon about 18½ ft. high, provided at the top with a blow-off cock, by which the air is allowed to escape when it accumulates in too great quantities. Mr. Trautwine's remarks were followed by a considerable discussion on this and other interesting instances met with in hydraulic practice. A memorial of Joseph D. Potts was presented and adopted.

American Society of Civil Engineers.—A meeting of the Society was held February 21st. The paper presented was on the subject of "Driven Wells of the Plainfield Waterworks," by Louis L. Tribus. It was read by the writer and discussed by Messrs. Yates, Brush, Croes, Ware, Kenneth Allen, A. S. Tuttle and Tribus.

At the meeting held on Wednesday evening, March 7th, a paper was presented by Robert Cartwright, M. Am. Soc. C. E., on "The Electric Station of the Citizens' Light and Power Company, of Rochester, N. Y." The consolidation of three gas companies and of three electric companies at Rochester, N. Y., into one organization, known as the Rochester Gas and Electric Company, was effected in 1892. After this consolidation, some of the stockholders in the different companies organized an independent company, whose plant was designed and constructed by the writer, and is in operation, supplying electricity for light and power. The equipment is of the latest and most improved machinery under the Westinghouse system. The Genesee River runs nearly centrally through the city of Rochester, and has a fall within the city limits of about 257 ft., in a succession of three falls and rapids. The water is used four times over before it reaches the level of Lake Ontario. The flow since the country has been cleared of timber is much more irregular than formerly and measures are now being taken to store the water in times of excess of flow by damming it back in the ravine to the south of Mount Morris. The State of New York has the first right in the water of the Genesee for feeding the Erie Canal, and in times of drought the quantity reaching the city is only 4,000 cu. ft. per minute and becomes practically useless for the many industries dependent upon it. By impounding the water it is contemplated that a constant power of 30,000 H. P. per day may be realized. The fact of water storage in the near future being a possibility was considered by the writer in designing the power station, so that advantage may be taken of it without unnecessary charge or expense.

A paper by Arthur S. C. Wuertele, on "Spirals and their Use on Railroads," was presented. This paper, after a brief historical sketch, takes up the spiral generally, under two forms. It gives the formulas for the spiral of Archimedes, the parabolic and hyperbolic spirals and other forms, and notes their characteristics. He gives also the method of computing the elements of spirals, and treats of their practical application in railroad work.

INDUSTRIAL NOTES.

The Safety Emery Wheel Company, Springfield, O., issues a neat illustrated catalogue and price-list, showing the various forms of wheel which the company makes.

William Tod & Co., Youngstown, O., have just closed a contract for a 36 x 40-in. cylinder Porter-Hamilton engine for the Canton Rolling Mill Company, at Canton, O.

Mr. Earle C. Bacon, dealer in hoisting machinery, engines, etc., has removed his New York office to the Havemeyer Building, at Cortlandt and Church streets.

Work was resumed in the West Superior, Wis., shops of the American Steel Barge Company March 5th, 200 men being employed preparing the whaleback barges and steamers for navigation.

The Mason Regulator Company, of Boston, is preparing a very useful "Log Book" for engineers, in which all the particulars of the daily run of an engine can be entered and a full account of cost, repairs and all other particulars can be kept.

An illustrated catalogue shows the improved form of disintegrator and pulverizer made by Stedman's Foundry and Machine Works, Aurora, Ind., which is particularly adapted to working clay, shale, slate, graphite and similar materials, as well as bone and brick.

The Mason Regulator Company, Boston, has found a new and ingenious method of advertising in the form of a box of dominoes, each bearing on the back a neat and unobtrusive reference to the company's manufactures. The Mason company wishes to say that a box will be sent to any applicant on receipt of 12 cents for postage.

The Babcock & Wilcox Company has removed its main offices to No. 29 Cortlandt street (corner of Church street), New York. As old and tried friends, we wish the company in its new quarters a continuation of the extraordinary success which it has achieved; and we have no doubt that it will follow, since the company has earned and well maintained its high reputation.

The Morgan Pump and Conveyor Company, of Kansas City, Kan., has been organized to manufacture pumps and other appliances under patents granted to Waitman M. Morgan. The capital stock is \$100,000. The following are the directors: W. M. Morgan, John N. Trout, George McCutcheon, Kansas City, Mo.; M. H. McHale, L. W. Gilpin and William H. McHale, Kansas City, Kan.

In the court at Pittsburg March 3d, the discharge of Receiver John Eaton, of the Oil Well Supply Company, of that city, was ordered. The concern has secured an extension from the creditors. John Eaton, president of the company, was appointed receiver on June 19th of last year. The company has arranged to pay creditors 6% of the amount of their claim at once, 2% monthly for 20 months, and after that period 2½% monthly.

The Pittsburg Reduction Company issues a neat and useful pamphlet giving much information as to aluminum, its properties and uses and the best methods of working it, and also as to the various alloys into which this metal enters. There are also tables of relative weights, electrical resistances and other useful matters concerning the metal. The company now furnishes No. 1 aluminum 99.25% pure and No. 2, which is 96% pure.

The Schiffler Bridge Company, of Pittsburg, has secured the contract for the erection of a building for the Whitaker Iron Works, at Wheeling, Va., to replace those destroyed by fire some months ago. The new buildings will be entirely of iron and are to be completed in about 90 days. The same firm has also received a contract for the erection of a steel roof for the machine shop of the Brooks Locomotive Works, Dunkirk, N. Y.

The Truax Manufacturing Company, Denver, Colo., has met with much success in introducing its automatic ore cars, which are made of steel, provided with chilled wheels, and have a very convenient and ingenious dumping arrangement, which holds the ore until the car is tipped to an angle of 12°. In this way the truck can be set nearer the dump end, affording an easier dump than the ordinary car and giving a more equal wear on the wheels and axles.

The Cleveland Iron Ore Paint Company has had in use for a year a No. 2 rock-breaker and a No. 2 ball pulverizer made by the American Mining and Milling Machinery Company, Cleveland, O., the machines having been used in grinding hard iron ore for paint purposes. The report is that the two machines crush and pulverize over one ton an hour, using about 12 H. P. The pulverizer shows but little wear, the 5-in. steel balls having been reduced to 4½ in., while repairs have been very small.

"Graphite as a Lubricant" is the title of a useful pamphlet issued by the Joseph Dixon Crucible Company, Jersey City, N. J. It gives an account of the various applications of graphite in this direction which have been successfully made, and which include cylinders, shaft bearings, engine valves, axles, gearing, etc.; also for packing manholes, pipe joints and in similar work. The pamphlet also contains some scientific opinions and tests made of graphite as a lubricator, showing its superiority in many points.

The City Council of Port Arthur, Ont., is considering an offer from D. F. Burk and others to establish a blast furnace and rolling mill, provided the town will issue \$100,000 bonds in aid of the project, with exemption from taxes for 20 years. The proposition is that the Ontario & Rainy River Railroad, over which the iron ores for the furnace are to come, is to be built, the terminus being in Port Arthur. The furnace is to be at Fort William, the rolling mill in Port Arthur and each town is to give \$100,000. The project seems to be one requiring careful investigation.

MACHINERY AND SUPPLIES WANTED

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

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

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

GENERAL MINING NEWS.

ALASKA.

(From an Occasional Correspondent.)

Berner's Bay Mining and Milling Company.—Development work on the Count mine has progressed well, and they have developed a ledge of what appears to be rich ore; it is certainly very rich in spots. The ledge maintains a width of 3 to 4 ft. and has been developed to a depth of 150 ft. from the original tunnel. It is a contact vein with slate and granite walls, and is the most permanent ledge of its kind that I have seen in Alaska. The 20-stamp mill in connection with this mine is nearly complete, but the water power has not yet been connected. They will possibly be in running shape by June 1st.

Of the other finds made late in the fall, not much is to be said. Dix struck a rich pocket of free gold on Jacoby Island, and is there this winter doing development work. Nothing is known of his success at this time. James Smith claims a rich ledge on the head of Montana Creek, between Berner's Bay and Juneau, but it cannot be definitely pronounced upon until more development work is done.

The Sum-Dum properties are still largely talked of and the Nowells have had a force at work all winter on the claim which they have bonded. It has not, so far as learned, developed any extensive bonanza, though they are talking about building a mill there. Nothing has been done on the Reed property this winter.

ARIZONA.

Yuma County.

Harqua Hala Gold Mining Company, Limited, Harqua Hala.—On February 23d the superintendent of this company reported that the new shaft had reached a depth of 270 ft. and that the mill was expected to start on March 1st.

CALIFORNIA.

Butte County.

Catskill, Bangor.—This mine, which has been run on a lease since the middle of last October by Frank Johnson, of Marysville, has closed down, and the men have received about half their wages since that time. Johnson turned the lease over to the foreman, J. D. Campbell, and the miners have decided to run it on the co-operative plan.

Calaveras County.

Among the mines at or near Angels which, it is rumored, will reopen this spring are the Demarest, owned by Demarest, of Altaville; Smith, by Lindsay, Prince & Co.; Stickle and Bennett, by Lindsay & Prince; Gold Cliff, by Hayward, Lane & Co.; Tullock, by Hayward & Co.; Eastland, by Eastland & Co., of San Francisco; Coleman, by James V. Coleman; Fritz, by Fritz & Co.; Gold Hill, by Eastern capitalists. There are also the Fitch, Altaville, Keystone, Curtiss, Eclipse and other mines that have had prominence.

El Dorado County.

Gregory, El Dorado.—Nine stamps of the mill at this mine, after a six-days' run, produced a bar of gold valued at \$3,000.

Unity Mining Company.—This company has developed a mining property at Oak Ranch, about three miles northeast of Placerville. In a run of 8½ days, averaging 22 hours per day, with a nine-stamp mill, it cleaned up \$5,300.

Mono County.

Bulwer Consolidated Mining Company, Bodie.—The Standard mill, at Bodie, crushed 35 tons of Bulwer ore last week. The average assay of battery samples was \$29.53 per ton. Average of tailings, \$11.48. The ore stopes in the Bulwer mine show no change.

Nevada County.

Hecla Mining and Milling Company, Grass Valley.—This company has filed articles of incorporation of the 100,000 shares, of which 40,000 have been subscribed for. The directors are J. C. Roberts, D. N. Coffin, W. A. Hawley, Wm. M. Blair and John Roberts. The Hecla mine was formerly known as the Kate Hayes mine.

Maryland Mine, Grass Valley.—The new hoisting works of this mine are being put in as rapidly as possible.

Placer County.

Big Oak.—According to the Colfax "Sentinel," this mine, situated about a mile from Colfax, is soon to resume operations after being shut down for several years. It is proposed to run the mine by water from the South Yuba ditch. Some rich rock has been taken out of the mine in past years.

About 45 white men and 100 Chinamen are employed at the Hidden Treasure mine, at Sunny South. The Golden River mine, at Red Point, is said to have reduced the white miners' wages to \$2.60 per day and the Chinese miners' in proportion.

Mayflower Gravel Mining Company, Forrest Hill.—This company has made another shipment of bullion valued at \$4,000.

Riverside County.

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

Eagle Mountain Placer.—The gulch discovered several years ago by John McGrath has passed into the hands of Mr. Lindsey, who will soon begin operations.

Good Hope.—The main shaft which is 400 ft. deep has been cleaned out and a contract let to sink it 200 ft. deeper. An excavation has been made for a 20-stamp mill and within 90 days it is proposed to have 100 men at work.

Menifee Mine.—There is some talk of resuming work on this property which has been idle for some years. The development of the Good Hope with depth is giving an impetus to the entire district.

Pinon Mountain.—Tingman & Holland have drifted 80 ft. from the bottom of a 60-ft. shaft and are getting some good ore which they are working in a two-stamp mill. A new discovery was recently made by Lang & Co., which promises well.

Pinto Mountain.—John McGrath, of San Bernardino, has a number of ledges in this district and has recently bonded two more. Some active work has been prosecuted this winter.

Santa Rosa.—Governor Blaisdel has a five-stamp mill on this mine, which is improving with depth.

Twenty-Nine Palms.—Some ore is being worked in arrastras by Parks, Wilson and others.

Virginia Dale.—The old mine which gave this district its name is not at present running and the five-stamp mill is idle, but a number of properties are being worked. The ore is partly rebellious, in one instance yielding \$30 on the plates and the tailings assaying as much more.

San Bernardino County.

Morongo Gold Mining and Milling Company.—This company has purchased a 10-stamp mill which is being moved to the mines.

San Diego County.

According to the local papers, Julian, in this county, affords a more promising field than for years past, owing to the rich strike in the Ella, Helvetia, Fraction and other properties. The owners of the Helvetia are constantly adding more men to the payroll. The camp is said to present a lively appearance generally.

Escondido.—The work at the Escondido gold mines is being pushed as rapidly as possible, says the "Advocate." The development work in the tunnels goes right along, while a good force of men are at work preparing the grounds for the mill and machinery, which was shipped from Boston on January 10th. The company now has about 500 tons of ore on the dump and as soon as the mill arrives and is put in running order it will be set to work to its fullest capacity.

Tulare County.

(From our Special Correspondent.)

E. E. Bush discovered a valuable coal deposit in the coast range of foothills, about 12 miles from Alameda, about eight months ago, but owing to the financial stringency was unable to enlist capital to develop the find. **D. R. McNeil** and **M. J. Donovan**, both of San Francisco, have now, in conjunction with Bush, completed arrangements for opening the mine and a large force of men have been set to work. A road will be made to Alameda, the terminus of a Southern Pacific branch line, and the coal placed on the San Francisco market at an early date. While the deposit is, so far as prospected, of large extent, it is similar to most of the Californian coal, being simply a high-grade lignite. It is, however, superior to the average product and can be placed on the market at such a cheap rate that operations are being carried on on an extensive scale.

COLORADO.

Colorado Gold Reduction Company.—This company has been incorporated with a capital stock of \$300,000 in \$100 shares. The incorporators are Willard Teller, Eben Smith, Geo. E. Ross-Lewen, who with S. W. Dorsey, R. H. Reed, J. C. Montgomery and F. L. Rondebush, constitute the first directors. Business will be done in Fremont and El Paso counties. The principal office is in Denver.

Mineral surveys approved by the United States Surveyor-General for Colorado during the week ending February 24th, 1894: Survey No. 8764, Durango land district, Emma; 8702, Pueblo, Little Percy; 8767, Durango, Durango and La Plata placers; 8670, Pueblo, Mule and Combination No. 25 lodes; 8744, Pueblo, M. J. T.; 8785, Pueblo, Calhoun and Calhoun No. 4 lodes; 8788, Pueblo, Fido; 8677, Pueblo, North Star; 8775, Pueblo, Southern Boy; 8776, Pueblo, Grover Cleveland.

People's Coal Company.—The sheriff's sale of this company's property which took place in Denver a fortnight ago has been set aside by Judge Graham on the ground that it was not for the best interests

of all the creditors and stockholders of the company.

Boulder County.

Left Hand District.—The Gold Nugget mine is producing about \$100 a day in gold retort from a small mill. The Giant Camera, situated on Left Hand, just above those of the Western Milling Company, has a tunnel run 175 ft. on the trend of the vein, and a shaft sunk 35 ft. The excavations will be connected during the next two months, as the company will soon start up work. Thirty tons of ore will be run through the Western mill to test the ore. The Adele Gold Mining Company is a new organization, whose property is near the Gray Eagle mine, on Left Hand. A group of several strong and promising lodes is owned by this company, which will begin work at once. H. M. Williamson, of Denver, will sink the new shaft in the Great Britain, on Pumpkin Hill, Sugar Loaf. Levels will then be run east and west on the trend of the vein. The ore is telluride of high grade.

Clear Creek County.

There seems to be considerable activity in mining transactions in the lower part of the county, says the Silver Plume "Standard," many properties changing hands, and numerous locations being made. There is considerable prospecting for gold.

Shipments of ore from Silver Plume during February were as follows: Burleigh tunnel, 9 cars; Mendota, 4 cars; Dunderburg, 4 cars; Stevens, 6 cars; Mammoth, 1 car; total, 24 cars. Five cars of slag from the old Brownville smelter dump were shipped to the Globe smelter, at Denver.

Eagle County.

Buena Vista, Red Cliff.—Martin & Collins have been compelled to suspend work on their lease on the Buena Vista mine by reason of an injunction obtained by J. J. Hill, one of the owners. Mr. Hill claims that property was leased by one of the owners without the consent or knowledge of the company. The Buena Vista is said to be one of the best silver properties on Battle Mountain.

Gaboury Mine, Aspen Junction.—J. Shears and A. L. Bowman, of Aspen, have bonded and leased the mining property of O. S. Baboury for one year, paying 12½% royalty. Assays made on mineral 4 ft. from the surface went, it is said, \$94 to the ton. The claim is located on the bank within 10 ft. from the main line railroad track of the Midland and a 2-ft. vein of rich ore is now uncovered. The leasers have already begun work. There is no snow on the claim. The vein crosses the Roaring Fork River 50 ft. away and the same formation has been found on Sopris Creek, which is now being covered with prospectors. It is believed the gold district will cover 20 miles square.

El Paso County.

A great number of mining lawsuits are being tried at Colorado Springs. On March 2d the Ben Hur Mining Company filed a suit for an injunction against William O'Brien and others to restrain them from working the Tejon lode. The following adverse suits were filed on the same date in the district court: The Chicago & Cripple Creek Company vs. H. A. Watson; the Big C. & Austerlitz vs. the Lulu M. lode; Nellie Henslee et al. vs. Mary C. Gardner; Midnight adverting the Rosetta; Mary E. Grover vs. the Jeff Davis Company; Tommie Crews lode adverting the Bull Domingo, Accident and Grotto lodes; Mary E. Grover et al. vs. the Jeff Davis Company; the Dandy adverting the Grotto and Accident.

Alamo Mining Company, Cripple Creek.—At a meeting of the directors of this company the following officers were elected: J. W. Proudfit, president; C. E. Wandell, vice-president; C. H. Morse, secretary; and A. C. Proudfit, treasurer. The president was authorized to procure propositions for leasing the various claims of the company upon the best possible terms.

Princess Mining Company, Cripple Creek.—At the annual meeting of the stockholders of this company at Colorado Springs on March 1st, the following directors were elected: R. P. Davis, president; G. Wunderlich, vice-president; Ira P. Trickey, secretary and treasurer; and Paul Gerhardt, W. H. Sutherland, D. Z. Reed and C. J. Reynolds. Several propositions are now pending in reference to leasing the claims of this company. The reports of the officers show the company to be free from debt and with a slight balance in the treasury.

Gunnison County.

Shipments from Crested Butte for the week ending March 1st were 1,546 tons of bituminous coal; 1,905 tons of anthracite; and 962 tons of coke.

Lake County.

Belle of Colorado, Leadville.—The Belle of Colorado, on Breece Hill, the ores of which are supposed to run a good gold percentage, has been leased and a new shaft started. The Belle lies between the Mikado and Iron mines, above the fault. The territory is virtually unexplored, but it is figured that the contact will be caught at a depth of 220 ft.

Bison Mining Company, Leadville.—This company is shipping some good ore from its Wild Cat shaft. At a depth of 460 ft. the shaft encountered a large and rich iron ore body and 150 tons a day are now being shipped. As yet but very little drifting has been done and the work has been carried on from the main ore body.

Bison.—In this property the second bench of ore from the Niles Augusta has been caught and the Bison is now on the producing list.

Bohn Shaft.—In a few days the old Star of Hope property, better known as the Bohn shaft, will be sold by the sheriff, and it is likely that it will be bought in by the Bonair Mining Company, composed of Messrs. Moffat, Dorsey, Jones et al.

Fitzhugh.—The shaft on the Fitzhugh mine is being put in shape, a pumping plant put in position and preparations to work it are being made.

Garbutt, Leadville.—The new Garbutt shaft is being sunk as rapidly as possible, and is now at a depth of 150 ft. and in hard rock. The expectation is to catch the ore chute between 335 and 350 ft. The May Day is another property located on the gold belt which has not been worked for many a day. Negotiations are now pending for a purchase of a portion of the mine, with the view of conducting vigorous work on it.

Grey Eagle, Leadville.—The Penrose property, one of the claims of the Moffat-Smith combination, and belonging to the Grey Eagle consolidated group, is now one of the big producers of the camp. There are large bodies of lead and iron ore being worked, and shipments average 100 tons daily through the Penrose shaft. There has been a large amount of underground work done during the past year, all tending to prove the value of this great ore chute, as it dips under the city. The flow of water is very great, and the Penrose will be among the last properties to close down, as a cessation of work means the flooding of the property.

Holden Smelter.—It is expected that the old Holden smelter, which has been repaired and in a measure rebuilt, will be blown in shortly by the new owners, the Union Smelting Company. It is probable that only two stacks will be used in the start up. The ore production has been somewhat curtailed and the smelters find it hard at times to get at once the character of ore desired. However, the Arkansas, Bi-Metallic and Elgin are running full blast and to these will soon be added the Union.

Marian Leasing Company, Leadville.—The R. A. M. shaft, belonging to this company, is one of the deepest in the camp, being over 1,030 ft. deep and having been completed just as the decline in the price of silver came. Work, however, still continues and drifting through the contact is being pushed. Several small bodies of oxidized ore have been encountered, and there are indications that the main ore body is near.

Wolcott.—Shipments are being made from the Esther shaft, Wolcott ground, at an average of 90 tons daily.

(From our Special Correspondent.)

Garbutt.—The new shaft is now in hard rock at a depth of 150 ft. It is expected to encounter the ore chute at a depth of from 335 to 350 ft. The enterprise, as has already been described in this "Journal," is an important one.

Marian Lease.—These people have put their new shaft down to a depth of 1,030 ft. and are now drifting through the contact. Several small bodies of oxidized ore have been encountered, but the main body has not yet been caught. An upraise is now being run to explore the upper portion of the contact. There is every indication that the main ore body is not far away.

Union Smelter.—On Tuesday the new Union Smelting Company blew in one stack and followed this up with another Thursday, while still a third furnace will likely be blown in very soon. The smelter has been almost entirely rebuilt and is now in every respect a lead smelter. The Union Smelting Company has filed a certificate of its stock, setting forth that it is capitalized for \$50,000, and that five shares have been paid in cash and 2,495 shares have been fully paid for in land and property.

Pitkin County.

Advices from Aspen state that the closing down of low-grade silver mines at that camp has begun. At the Durant about 60 men were thrown out of employment on March 1st. No leases have ever been given on the property and only men enough will be retained to keep the workings in good order and finish the contract on the shift. Thirty men will be laid off the Aspen mine in a few days, reducing the force one-half. Some men were employed on the Argentum Juniata preparatory to a general start up, but these have been laid off. Company work has entirely ceased on the Della S. and the entire property will now be leased in blocks under certain conditions. The Smuggler will continue operations for a while without change of force. There are now only the latter mine, the Park Regent, Mollie Gibson and the Aspen which are being worked by their owners, all other work being done under lease.

Routt County.

Messrs. Miller, Blackburn, C. E. Dow and Byron E. Shearer will cut a bedrock flume for about two miles in the Willow Creek Canyon, and expect to take out gold enough to pay the expense incurred.

Prospectors are preparing for a rush to the new goldfield on Sarvis Creek, between Steamboat Springs and Egeria Park; assays run \$12 to \$18 gold. Routt County has never been prospected and

it is said there is not a shaft in the county 50 ft. deep.

Hahn's Peak Mining Company.—This company has its ditches, pipes and giant ready for a run next spring and summer.

Republican and Democrat.—Messrs. C. E. Dow and Byron E. Shearer have consummated a deal with W. C. Shaw for the Republican and Democrat group, four miles north of Steamboat Springs. The claims consist of a 20-in. lode of quartz, carrying carbonate of copper, gold and silver. Some specimens running as high as 1-5 oz. gold, 15 oz. silver and 43 oz. copper have been taken out.

Saguache County.

Advices from Creede disprove the report that only 200 men were at work in the mines of that once lively camp. The New York, Last Chance and Amethyst mines are employing 325 men alone, and added to these are the men at work on the Park Regent, Ridge, Bachelor, Ethel, Nancy Hanks, Mammoth, Mother and Ramy tunnels, Monon, Red Top, Sundown, Ballarac tunnel, Eureka extension, Yellow Jacket, Alpha, Judson tunnel, Corsair tunnel, Kreutzer Sonata, Schuyllkill tunnel, Lufe Pence, Jumbo, Yankee Girl and Yankee Girl extension, Sunnyside and Sunnyside extension, Manhattan, Nelson tunnel, Emma and the properties of the United Mines Company, making a total of over 500 men who are kept steadily at work developing the respective properties.

FLORIDA.

Alachua County.

High Springs Phosphate Company.—At the annual meeting at High Springs recently the following directors were chosen: A. W. Barrs, H. W. Clark, D. B. Upson, R. D. Knight, Lockhart Little, L. Furchgott and W. A. Bours. At a subsequent meeting of the new directors the following officers were elected: A. W. Barrs, president; H. W. Clark, vice-president; and W. A. Bours, secretary and treasurer.

Levy County.

Camp Phosphate Company.—This company has let contracts for a washing plant on its mines, at Albion. The machinery will be built by McLanahan & Stone, of Hollidaysburg, Pa.

Marion County.

Dunellon Phosphate Company.—At the annual meeting at Ocala recently, the old officers and directors were re-elected.

Sumter County.

Netherlands Phosphate Company.—This company has let contracts for a new plant on its property near Pemberton.

GEORGIA.

Cherokee County.

Georgiana.—Work has been resumed at this mine, near Acworth, under charge of Captain Crowell.

Lumpkin County.

Worley Mine.—At this mine, near Dahlonega, a tunnel has been started which is expected to tap the vein within 250 ft.

Oglethorpe County.

Diamond Blue Granite Company.—This company, which has its office in Augusta, has completed a railroad from its quarry to the Georgia Railroad and is actively at work.

Polk County.

A tract of land near Rockmart, having an excellent outcrop of slate, has been sold to J. J. Craig and others, of Knoxville, Tenn., who intend to work the slate.

IDAHO.

Alturas County.

War Dance.—In this mine they are now working on a vein 2½ ft. thick, of which from 15 to 18 in. is rich ore.

Idaho County.

Gill Placers.—In these placers, on the South Fork of Clearwater Creek, 12 miles from Grangeville, work has been successfully carried on. A ditch, two miles long, has been completed, and work will be extended this season.

Lemhi County.

Arnett Creek Gold Mining and Milling Company.—This company has filed articles of incorporation. It is capitalized at \$100,000, the stock being of the par value of \$1 per share. The incorporators are A. B. Gibson, W. M. Mansfield, C. W. Thompson, C. I. Moore and L. E. Clark, A. Hensgen, R. Zwicky, J. L. Hamilton, C. J. Pence, J. R. Bowdle, H. F. Dale, F. A. Virtue and J. T. Snelson, all of Salt Lake. The officers are: H. F. Dale, president; C. I. Moore, vice-president; W. M. Mansfield, treasurer; and J. R. Bowdle, secretary. The company owns the Gold Star and the California mining claim, in Lemhi County, but its main office will be in Salt Lake City, Utah.

Shoshone County.

Bunker Hill & Sullivan Mining Company.—By a fall of rock in this mine on February 23d three men were killed and two badly hurt.

ILLINOIS.

La Salle County.

Union Coal Company, Peru.—This company has closed options on coal underlying about 4,000 acres

of land between Tonica and the Oglesby Coal Company's territory at \$12.50 per acre. It is said that the company will continue to buy more coal adjoining and not included in the option deal. At present the southern boundary of the Union's territory is a mile and a half north of the center of Tonica. Three borings were made last summer.

Sangamon County.

The coal miners in the Springfield district have voted to accept the proposed reduction from 40 to 35 cents per ton, provided a corresponding reduction is made in prices of supplies.

INDIANA.

The convention of bituminous coal miners of the State of Indiana, after a heated and long debate in Terre Haute, March 2d, adopted a resolution not to accept the cut of 20 cents per ton offered by the operators. In their ultimatum the operators gave this as the alternative to closing the mines until May 1st. The vote was a close one, and an effort will be made to-day to reconsider the vote and make a compromise.

MASSACHUSETTS.

Franklin County.

Davis Sulphur Ore Company.—This company is preparing for work at its mines, which are about four miles from Charlemont station.

MICHIGAN.

Copper.

Atlantic Mining Company.—In February 221 tons of copper were produced, against 215 tons in February of last year.

Calumet & Hecla Mining Company.—The new No. 10 steam stamp has been started up. It is said that the company has made contracts for lake transportation at 21 cents per ton for copper down, and 10 cents per ton for coal up, below last season's rates.

Franklin Mining Company.—The output for February was 174 tons of copper, against 187 tons in February, 1893.

Quincy Mining Company.—The February output was 700 tons of copper, about the same as last year.

Dickinson County.

Northern Michigan Marble Company.—This company's quarry, says the Norway "Current," is located on Section 26, 42-28 in Dickinson County. It is reached by a spur track 1¼ miles long from the Metropolitan Branch of the Chicago & Northwestern. During the summer a large amount has been shipped to different marble works for the purpose of testing the various grades and colors for practical use, with very satisfactory results. The marble is susceptible of a very high polish; some of the colors are very beautiful and tests as to its resistance of sudden and extreme changes of temperature have given good results. The quarry has been equipped with the most modern machinery for economical work and a force of 17 men are busy getting ready for next season's shipments. It is the intention to erect machinery and do the sawing and polishing for architectural designs, at or near the quarry. Edwin Porter, of Chicago, is president; Robt. C. Harper, vice-president; F. W. Woodruff, treasurer; L. Soule, secretary; and A. L. Foster, superintendent. The general office is in Chicago, and the local office at Foster City, Dickinson County.

Iron—Gogebic Range.

Penokee & Gogebic Consolidated Mining Company.—It is stated that this company's mine, near Ironwood, will soon be started up. The receivers have been authorized to issue \$300,000 in certificates for the purpose of settling all labor and supply claims.

Iron—Marquette Range.

Escanaba River Land and Iron Company.—This company has 18 men at work in its new shaft, which is to be carried down 100 ft. farther.

Salisbury Mine.—An extra shift will soon be put on at this mine, giving employment to about 75 additional men.

MISSISSIPPI.

Jefferson County.

Stonington Brick and Pottery Company.—Messrs. J. W. Burch, L. M. Dalgarn, J. C. Mandeville, H. C. Griffin, P. W. Mulvihill, S. J. Perant, W. C. Martin, L. P. Conner, Jr., and S. D. McNair have incorporated this company with a capital stock of \$90,000, of which \$65,000 is paid in. The company owns 600 acres of clay near Stonington, where a complete plant will at once be erected for the manufacture of brick, tiles, pottery, piping, etc.; about all the necessary machinery has been secured. A. Wheeler, of Natchez, Miss., is president; Mrs. N. B. Whitney, of Stonington, secretary; and A. Chappelle, general manager. The main office of the company is at Natchez.

MISSOURI.

Jackson County.

Kansas City Clay and Coal Company, Leeds.—An explosion of gas occurred at this company's property on March 2d, by which four miners were killed and several seriously injured.

Jasper County.

(From our Special Correspondent.)

Joplin, March 5.

The lead and zinc industry of this district was very active during the past week and the operators are better satisfied with prices paid for their product; zinc ore maintained the prices of the previous week of \$20 to \$21 per ton, and the ore buyers were all in the field for everything offered. Lead ore remained firm during the week at \$17 per thousand.

Following are the sales of ore from the different camps: Joplin, 1,364,450 lbs. of zinc ore and 389,870 lead, value \$20,272; Webb City, 1,095,380 lbs. of zinc ore and 31,970 lead, value \$11,496; Carterville, 1,614,990 lbs. of zinc ore and 238,870 lead, value \$20,210; Zincite, 29,410 lbs. of zinc ore and 10,470 lead, value \$464; Oronogo, 7,660 lbs. of zinc ore and 125,370 lead, value \$1,958; Carthage, 103,000 lbs. of zinc ore, value \$1,030; Alba, 42,500 lbs. of zinc ore, value \$425; Galena, Kan., 966,000 lbs. of zinc ore and 144,000 lead, value \$9,935; district's total value \$65,790; Newton County, 560,940 lbs. of zinc ore and 81,960 lead, value \$6,161; Aurora, 856,000 lbs. of zinc ore and 175,000 lead, value \$8,819; Springfield, 220,000 lbs. of zinc ore, value \$2,200; lead and zinc belt's total value \$82,970.

Messrs. Geo. A. Case and John B. Searge, of the International Bank of Joplin, have recently assumed control of the lead smelter built by O. R. Moffet, at Grand Falls, on Shoal Creek, five miles south of Joplin. This is a new plant built by plans of Mr. Moffet, and, according to a trial run made, is said to give returns of about all the metal that is contained in the ore; the smelter will start at once with a capacity of 18,000 lbs. of ore per day, and worked up to its full capacity of 24,000 lbs. Mr. Searge was in the market last week and purchased considerable lead ore at \$17 per thousand, and from now on the new firm will be in the market steady. The Argentine Smelting Company, of Kansas City, were in the market last week and purchased a few carloads of lead, but were not inclined to advance the price.

MONTANA.

Deer Lodge County.

Anaconda Mining Company.—The new converter plant at Carroll is rapidly nearing completion, says the Anaconda "Review." The foundations for the five large engines are completed and two of them are in position. Four of these engines will be about 200 H. P. each and one about 500 H. P. The boilers are nearly all in place. The greater part of the power developed by these engines will be used on the air compressors for the converters in the building above. There are six stands ready for converters in the building, on four of which the converters are already in place, and the others can be put in at any time. It was expected that all the machinery would be in place and they would be able to start up on April 1st, but the machinery has been arriving so slowly that it will be a difficult matter to do so. The company is receiving 120 cars of ore every day, which is all used at the lower works. These cars are of 30 tons capacity each.

Bloomington.—In this mine, in the Royal district, the vein was struck last week in a cross-cut run at a depth of 400 ft. The vein carries free gold.

Esperanza.—In this mine, adjoining the Bloomington, the tunnel has struck a vein carrying free gold at a depth of 150 ft.

Nevada Valley Mining Company.—A certificate of incorporation has been filed by H. J. Akers, William Ryan, Thomas McTague, Pat Cahalin, Nicholas J. Bielenberg, Charles F. Mussigbrod and A. H. Mitchell, of this company. The objects of the corporation are to be the buying, selling, exploring and locating placer claims. The capital stock is \$100,000, divided into 50,000 shares of \$2 a share. Operations are to be carried on in the Nevada Valley, near Deer Lodge.

Jefferson County.

Hope.—This mine is at the present time the foremost in point of production in this district, says the Basin "Times." The owners of this property are O. N. Spratt, E. D. Edgerton, Thomas H. Carter, J. B. Clayberg, E. W. Bath, B. R. Young and F. M. Fletcher. The present depth of the Hope from the collar of the shaft is 280 ft., to what is called the 200-ft. level. There are three levels, the 50, the 100 and the 200. There is a tunnel which intercepts the lead 50 ft. above the 50-ft. level. The lead at the 50 was 30 ft. in width, at the 100 15 ft., and at the 200 3 to 15 ft. The walls are a porphyritic granite and the ore is base, containing pyrites of iron, zinc, lead, copper, silver and gold. The leads are more valuable for the gold than any of the other minerals. The Hope is being systematically worked. The drifts on both the 100 and 200-ft. levels are being extended west on the lead, opening up new ground and keeping the work of development far ahead of the necessary supply of 120 tons per day. There are two machine drills used in the drifts, while in the stopes on both the 100 and the 200 there are three machines used, which produce sufficient ore to keep the concentrator fully supplied. The mine is well timbered, using stulls and a few square sets. The old stores are filled with waste as fast as the ore is taken out. It is the intention of the company in the next few months, or as soon as the west drift is sufficiently extended, to raise a shaft

in the center of the ground. Owing to the incline in the present shaft buckets only can be used, but when the new shaft is raised through all the modern appliances for hoisting will be put in. The concentrator has a capacity of 120 tons every 24 hours. The superintendent of the works is B. R. Young, of Helena.

NEVADA.

Storey County—Comstock Lode.

Alta Silver Mining Company.—A sensational suit with this company as plaintiff has been filed in the Superior Court of the State, and in many of its features presents a strong similarity to the celebrated Hale & Norcross case. Attorney Baggett, who won reputation by his conduct of Mr. W. Fox's suit against the Hale & Norcross "gang," has been retained by the Alta company. He is ready for trial, as the proofs of the allegations made are almost entirely documentary. It will be noted in the following outline of this suit that some old Hale & Norcross men again make their appearance. The suit is entitled "the Alta Mining Company vs. Monroe Thompson, R. N. Graves, L. Osborn, I. E. Jacobus, G. H. Pippy, W. S. Wood, Chancellor Derby, E. Miller, E. D. Boyle, Charles Derby, T. Fitzsimmons, S. G. Whitney, J. P. Martin, J. W. F. Peat, the American Milling and Mining Company and Louise Arner Boyd." The complaint gives a history of various transactions in which the Alta company was concerned, as also others of the defendants, and asks that the latter may be ordered to account for money claimed to have been received by them; that plaintiff be adjudged costs, etc., counsel fees, and that it be decreed that the release of a certain claim for \$49,049 was fraudulent and that the estate of Little Cook, now in the ownership of Louise Arner Boyd, be chargeable with the payment of said claim. The complaint involves certain allegations of fraud and the trial will cause some sensation.

Comstock Tunnel Company.—A telegram from Carson City, says: The long-pending litigation against this company has ended in a victory for the company. Judge Hawley, of the United States Circuit Court, of Nevada, has rendered an opinion reviewing the whole case on its merits. It approved of the acts of Theodore Sutro and his associates in the reorganization of the Sutro Tunnel Company.

Consolidated California & Virginia Mining Company.—It is reported that the Morgan mill will soon be started up on this company's Virginia ore, of which there is quite an accumulation. This ore is being taken from the 1,650 level of the mine. The Virginia "Chronicle" says: Six or seven hundred tons of ore will be shipped from the Consolidated California & Virginia mine early in March. The ore is of good quality, and a valuable clean-up is expected. The east cross-cut from the Rule drift is progressing as usual. When the Central tunnel shall have been repaired to the old Mexican shaft and work on the Ophir west ledge begun, it is expected that a good thing will be shown up at that point.

Consolidated California & Virginia Company.—A. W. Havens, secretary of this company, has compiled the following statistics of the entire yield of the mines composing the present corporation in full to October 1st, 1893, per assay value: California—Gold, \$23,395,270.01; silver, \$23,473,804.07; total, \$46,869,074.98. Consolidated Virginia—Gold, \$29,377,441.91; silver, \$36,234,233.14; total, \$65,611,675.05. Consolidated California & Virginia—Gold, \$8,209,145; silver, \$9,355,643.06; total, \$17,564,788.06. Total to October 1st, 1893, from all sources—Gold, \$61,270,520.19; silver, \$69,299,214.64; total, \$130,569,734.83. Dividends.—The total amount disbursed in dividends to date is \$77,932,800. Of this the California company paid \$41,320,000; the Consolidated Virginia company, \$42,930,000; and after the consolidation of the two mines under the title of the Consolidated California & Virginia the total amount paid in dividends was \$3,682,800.

Following are extracts from the latest weekly official letters of superintendents of Comstock mines:

Chollar Mining Company.—The raise for ventilation from the 100 level to the surface is up 42 ft. We are still extracting from the 100 level stopes about 15 tons of ore per day of fair-grade, which is accumulating in the chute.

Crown Point Mining Company.—The southwest drift, on the 600 level, has been advanced to a total distance of 52 ft. The face is in a mixture of porphyry and low-grade quartz. The northeast drift, started from the raise from No. 2 cross-cut, on the 700 level, has been advanced 17 ft., and the face is in a mixture of quartz and porphyry.

Justice Mining Company.—The winze started from the Blaine tunnel is now down a total depth of 92 ft. The bottom shows a width of about 4 ft. of ore, 2 ft. of which is being saved for pay.

Savage Mining Company.—On the 1,050 level the south drift, started in the east drift from the shaft station was advanced to a total length of 121 ft.; face in quartz with some pay ore. The east cross-cut, started from the southeast drift at a point 170 ft. from the station, is now advanced 30 ft.; face in porphyry and quartz giving some assays. On the 1,100 level the west cross-cut from the north drift, started at a point 132 ft. north from the sta-

tion, was advanced to a total length of 142 ft.; face continues in low-grade quartz and porphyry. The south prospecting drift from the 12th floor of this level was advanced to a total length of 40 ft.; the face is in quartz, giving fair assays. In the east prospecting drift from the 15th floor we have started a south drift following a stratum of quartz giving some fair assays. The south prospecting drift from the 18th floor is advanced a total length of 29 ft.; face in quartz, some of which is being saved for pay.

Segregated Belcher & Midas Mining Company.—The raise from the south drift, on the 1,150 level, is now up 58 ft. The top is in porphyry, with a small streak of fair grade ore through it. The east cross-cut from the foot of this raise is now out a total distance of 20 ft. The face is in hard porphyry.

Yellow Jacket Mining Company.—Preparations are making to explore the south part of the Yellow Jacket mine, on the 1,200 level, and the Kentuck Consolidation Mining Company will co-operate. Just above, on the 1,190 level of Yellow Jacket, some rich ore was found.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the average car and battery assay, values, bullion product, etc.:

Mines.	Ore Hoist'd	Car Sample Assay.	Ore Mill'd.	Av. Bat'y Assay.	Bullion for Week.	Total.
Belcher, Con. Cal. & Va.	14 ¹	.....	.....	.....	.....	.....
Chollar, Crown P't	19 ¹ 65 ²	30'25 20'65	76	20'30	.....	.....
Hale & Norcross	4 ³ 26	29'75 19'48	.....	.....	.....	.....
Occidental Savage	.....	.....	.....	.....	.....	.....

¹ Cars of ore. ² Fair grade ore.

Consolidated California & Virginia Mining Company.—On March 1st considerable excitement was manifested in the San Francisco stock exchange when it became known that a telegram had been received from "Jim" Rule, informing the directors that a 6-ft. ledge had been struck in the east cross-cut from the south drift on the 1,100-ft. level. The stock market became quite active. On February 28th the second east cross-cut was started from the south drift. This cross-cut is 450 ft. south of the shaft and 100 ft. south of the first east cross-cut, started the week before. It is in 55 ft. and is expected to reach an east clay when carried a short distance farther. Midway between the two cross-cuts, at a point in the south drift, 400 ft. from the shaft, an upraise is being run, the material in the top of the raise being of favorable character. It is here that the strike has been made and if present indications are to be believed, Mr. Rule will keep his word and give a new lease of life to the Comstock lode.

Hale & Norcross Silver Mining Company.—James Cross and Charles T. Bridge, executors of the late W. S. Hobart's will, one of the defendants in the suit of M. W. Fox vs. the company et al., through their attorneys, have filed a brief consisting of over 300 pages, in the Supreme Court. The case on appeal, including the various side issues, will be heard by the Supreme Court, March 19th.

West Consolidated Virginia & California Mining Company.—The west cross-cut, 320 ft. north of the 1,100 level station, has been extended 29 ft. in hard porphyry, the total distance being now 506 ft. A telegram on March 2d from Superintendent Tangerman reports a very favorable change in the face of the cross-cut, and it is expected that good ore will be encountered at an early date.

NEW JERSEY.

Morris County.

Mt. Pleasant Iron Mine.—The men employed at this mine, near Dover, struck March 6th, the company having refused an increase of wages to \$1.25 per day. About 250 men were employed. It is thought that a compromise will be arranged.

NEW MEXICO.

Grant County.

Alhambra, Silver City.—This mine was sold at sheriff's sale on February 26th. It only brought a nominal price, but was sold subject to mortgages and liens existing against it, says the "Enterprise." It was bought in the interest of one of the mortgagees.

Ivanhoe Smelter, Silver City.—The machinery for the new Ivanhoe copper smelter has arrived at the mine and will be erected immediately.

Manhattan, Silver City.—The Manhattan tunnel was shut down several days last week to make necessary repairs upon the boiler. The tunnel has now reached a length of 889 ft., with indications that the main Aztec vein will be cut within a very short distance.

Teel & Poe Mining Company.—This company is working a few men; the prospects are favorable.

NEW YORK.

The Hudson River brick manufacturers have

effected a combine and have appointed the following appraisers: John V. Cockroft, John C. Rose, William H. Aldridge, Frank Timoney, N. Mehrhof and Homer Ramsdell. The appraisers began their work this week at Roseton and Dutchess Junction. The combination includes the yards on the Hackensack, in New Jersey, also. A meeting for fuller organization was held in New York on Friday, March 9th.

OHIO.

At a conference of miners and operators of the sixth sub-district of Ohio, held at Bellaire, March 7th, and presided over by President John Nugent, of the State Mine Workers' organization, an agreement on the wage question was reached which will be in effect up to May 1st. As the result 7,000 miners and mine workers will go to work in that district at once.

Columbiana County.

The miners of the Cherry Valley, Milville, Salem and other miners to the number of about 500 held a meeting last week at Washingtonville to consider the demand of the operators for a reduction in price of mining from 75 cents to 55 cents per ton over screen. A committee was appointed to prepare and present to the operators a set of resolutions declaring the willingness of the miners to accept a reduction of 20 cents per ton from scale of prices presented by Columbiana County delegates to the miners' convention in Columbus in April last, which would give them 70 cents per ton over screen and 46½ cents run of mine. It is not known what action will be taken by the operators, but it is expected that the miners will go out in case the operators demand the reduction asked.

Jackson County.

The coal miners and operators have not been able to agree, and the mines are closed down for the third time this year.

Richland County.

Lucas Stone Company.—At a meeting of the stockholders at Lucas, T. A. Parry, Gilbert Swaney, Walter T. Fletcher, Hiram and Henry Baker were elected directors, and at a meeting of the board T. A. Parry was elected president; Walter Fletcher, treasurer; and D. B. Leiter, secretary.

OREGON.

Baker County.

Bay Horse.—At this mine, in the Greenhorn district, a 10-ton Crawford mill is being put in.

Malheur County.

A porphyry formation has attracted more or less attention from miners at Malheur City for several years past, but little development work has been done on account of the low-grade character of the ore. Lately, says the Baker City "Democrat," Mr. C. C. Bars, of Ogden, secured a bond on the property and he in turn has rebanded. The ledge or formation is fully 16 ft. wide and assays of the ore give a value of from \$6 to \$7 per ton arrangements are now under headway to commence sinking operations as soon as the weather will permit.

PENNSYLVANIA.

Anthracite Coal.

Mine Inspector Williams, of the Fourth Anthracite District, has just completed his annual report for 1893. It shows a total production of 8,065,768 tons mined. This is an increase of 516,169 tons in production over 1892. The total number of men employed in 1893 was 22,790, an increase of 1,009. During the year there were killed in the mines 77, and injured 221, leaving 49 widows and 131 orphans.

A fall of rock occurred at the Richmond shaft, in Scranton, on March 6th. Four miners were killed.

A cave-in occurred on the Lehigh Valley Railroad between Freeland and Highland on March 2d, and all trains had to run over the branch by way of Drifton. The cave-in was caused by the robbing of pillars. This portion was known to be dangerous for many months.

Cross Creek Coal Company.—Orders were issued by this company on March 3d, shutting down the Tomhicken colliery for an indefinite period. About 400 men are affected. Dullness in the coal trade is said to be the cause of the suspension.

Iron.

The iron ore mine of Lichtenwalner & Schmoyer, near Mertztown, stopped work on March 5th, owing to dull times. This leaves but four mines in operation in that vicinity. Five years ago 19 mines were in operation in that district.

Slate.

Blue Ridge Slate Company.—This company has been incorporated, with office at East Stroudsburg. The directors are Isaac S. Case, Tobyhanna; Henry L. Gaige, Wilbur T. Clements, Moscow; John Gardiner, Portland; Joseph G. Kinney, Wind Gap. The company's property is located at Wind Gap.

Consolidated Lehigh Slate Company, Slatedale.—Three men were injured in a fall of rock on March 4th, due to the thaw in this company's slate quarry, operated by M. P. Hersh & Co., of Philadelphia. The quarry is three miles west of that of the Williams quarry, in Williamstown, in which seven men were buried last week by a cave-in of a tunnel.

Gem Slate Company.—This company has been reorganized with the following directors: John Lobb, J. E. Long, Solomon Flory, Ernest Lobb and James H. Gist. The directors organized by electing John Lobb, president, and Ernest Lobb, secretary and treasurer.

SOUTH CAROLINA.

According to the "Manufacturers' Record," the river phosphate companies are hard at work repairing plants. The Coosaw Company has just finished one dredge and is now at work mining with this. The Beaufort Phosphate Company will in a couple of weeks have its washboat ready; its dredges are in order and doing some government work. The wrecking company has succeeded in raising the dredge "Kennedy," of the Carolina Mining Company, which is now in Charleston undergoing repairs. The Phosphate Commission has issued the rules and regulations to govern miners in the State waters hereafter; they are acceptable to the miners.

SOUTH DAKOTA.

Lawrence County.

Red Cloud.—According to the Deadwood "Times" the tunnel driven 70 ft. from the north side of the claim, has uncovered the vein. The latter shows a width of 4 ft. in the face of the tunnel. This new opening on the ledge proves it continuous for over 400 ft.

TENNESSEE.

Bradley County.

Blue Springs Mining Company.—The Walburn Swenson Company has just finished a complete concentrating plant for this company at Blue Springs. The company has started its lead smelter and wants bids on a 10-ton zinc smelter, also an assayer's outfit. Mr. A. L. Waters, late of Spring Lake, Mich., is now connected with the company as mining engineer and chemist.

Knox County.

Concord Quarry Company.—This company, at Knoxville, has received the order for the marble for a large memorial building in Connecticut.

TEXAS.

Presidio County.

San Carlos Coal Company.—This company, which owns 1,280 acres of coal lands, has made a contract to furnish the Southern Pacific Company with coal, the latter to build a branch line to the mines. The San Carlos company has also leased coal rights on several large tracts of land.

Uvalde County.

Ground has been broken for a factory on the asphalt tract lately bought by a New York syndicate. The work is under charge of W. W. Trask, of San Antonio.

UTAH.

The following list of mineral patents have been granted by the Land Office: M. E. No. 1759, to John McChrystal and John H. McChrystal, for the south extension Eagle lode mining claim, covering lot No. 214, in Tintic mining district, Juab County. The claim embraces 584 acres of land.

M. E. No. 1761, to John McChrystal and John H. McChrystal, for the south extension Blue Belle lode claim, covering lot No. 215, Tintic district. The claim embraces 5½ acres.

M. E. No. 1956, to George E. Chandler and Charles Mayberry, for the Maggie lode claim, covering lot No. 470, in West Mountain mining district, Salt Lake County. The claim embraces 20½ acres.

M. E. No. 1474, to James W. Campbell, John T. Gilmer and Monroe Salisbury, for the Highland Boy lode mining claim, covering lot No. 639, in West Mountain mining district. This claim embraces six acres.

M. E. No. 902, to the Tintic Iron Company, for the Cross Dragon lode claim, covering lot No. 80, in Tintic mining district. The claim embraces 1½ acres.

M. E. No. 1937, to David Keith, Thomas Kearns and Frank J. Vierra, for the Gold Standard, Silver Standard and Spotted Fawn lode claims, covering lot No. 205, in the Blue Ledge mining district, Wasatch County. The claim embraces about 62 acres.

M. E. No. 1600, to Newton A. Dunyon and Lewis Martin, for the Bonnemort lode claim, covering lot No. 49, in the Clifton mining district, Tooele County. The claim embraces about 19 acres.

M. E. No. 873, to the Apex Mining Company, for the Antelope lode claim, covering lot No. 268, in the Uintah mining district, Summit County. The claim embraces about two acres.

M. E. No. 974, to Calvin T. Sampson, for the Silver Treasure lode claim, covering lot No. 66, in Uintah mining district. The claim embraces about four acres.

Salt Lake County.

The shipments of ore and bullion from Salt Lake City for the week ending February 24th were: Bullion, 609,278 lbs.; silver and lead ores, 1,642,010 lbs.

The receipts of ore and bullion at Salt Lake City for the week ending February 28th were to the aggregate value of \$101,406, of which \$63,136 was in bullion and \$38,270 was in ore. The receipts of Pennsylvania bullion amounted to \$24,292; Hanauer bullion, \$2,700; base bullion, \$27,600; Daly bullion, \$8,544. Ore receipts were \$7,370 by Wells, Fargo

& Co., \$20,900 by McCornick & Co. and \$10,000 by T. B. Jones & Co. For the months of January and February the receipts aggregated \$736,052 in bullion and \$383,905 in ore, a total of \$1,119,957. Shipments for the same period were: 5,341,117 lbs. of bullion; 14,500,214 lbs. of silver and lead ores and 175,410 lbs. of copper matte.

Salt Lake Copper Company.—The Salt Lake "Tribune" says that the company's plant will be started early in April and this, it is expected, will give an impetus to copper mining in the territory. Several copper properties are being opened up and getting ready to ship copper ore. The company has a large force of men at work on its mine at Copopolis preparing it for ore shipments.

VIRGINIA.

Montgomery County.

Walters & Gardner Gold Mine.—An option on this mine, at Christiansburg, has been taken by E. A. Reige, of Washington.

WEST VIRGINIA.

Kanawha County.

The striking miners finally withdrew from their attack on the Wyant coal mines on March 5th, after burning a bridge and several cars and doing other damage. The approach of the State militia forced a withdrawal, and at present matters are quiet.

WISCONSIN.

Pierce County.

Eagle Iron Company.—The new charcoal furnace of this company, at Spring Valley, was successfully blown in for the first time on February 19th. The furnace was built in 1893, and is equipped with machinery from the two abandoned Fannie furnaces, of Shawnee, O. The ore used is brown hematite, and is mined about 1½ miles from the furnace. The annual capacity of the furnace is 22,000 gross tons. S. Frank Eagle is president and manager of the company.

WYOMING.

Fremont County.

Burr.—Some very good ore has been taken out from this mine at Lewiston recently.

Mikado.—A rich strike is reported in this mine at Lewiston, owned by Riley Edmunds.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

Josie Mine.—The district court at Spokane, Wash., has issued an injunction restraining the Exchange National Bank, of that city, from delivering a deed in escrow of the Josie mine to George A. Sonneman. The suit was brought by Frank C. Loring, who, with Sonneman, bought the Josie claim from Mr. Lemon, of Nelson, for \$12,000, and the deed was placed in escrow pending the final payments. The partners have of late had misunderstandings and the suit is the result.

(From our Special Correspondent.)

Botanic Creek Gold Mining Company.—This company has commenced work in its property. Mr. R. C. Campbell-Johnston, M. E., of Vancouver, is consulting engineer in charge of the property, which lies on the northwest bank of Thompson River, two miles from Lytton, a station on the Canadian Pacific. Development has demonstrated the fact that the property covers an old channel bed of Thompson River. Drifts to tap the channel have been run and pay dirt has been found at bed-rock.

Mile Point.—From this claim, in the Ainsworth district, a small shipment of picked rich ore was sent to the Tacoma smelter last week. Surface water gives trouble in the incline on the property, and work will be stopped on that part of the claim until pumping machinery is procured. Exploration, however, will be continued in the south drift, which is drained by a tunnel.

Slocan District.—It is reported that the B. N. White Company will erect a concentrator at the mouth of Sandon Creek to work the lower grade, concentrating ore on their property—the Slocan Star. Owing to the low price of silver, some of the American smelters have refused to buy any more Slocan ores unless the mineowners will give 90 days for payment. This the owners will not agree to, consequently several mines will suspend shipments.

BRITISH GUIANA.

Kanimapoo Gold Mining Company.—At the recent annual meeting in Georgetown, the directors reported that \$105,000 had been paid in on the stock and about \$75,000 expended. The work was progressing well and the company expected to start its mill about the end of June. This is the first company in the colony to engage in quartz mining.

GREAT BRITAIN.

Petroleum.

The discovery of petroleum in wells in Somersetshire referred to in the "Journal" recently, has led to

the formation of a syndicate entitled The Somerset Petroleum Wells Syndicate, with offices at 25 Bucklersbury, London. The object of the syndicate is to bore for, and search for petroleum under the Ashwick estate, near Shepton Mallet, Somersetshire. The general belief here is that the discovery is of only scientific interest, and experts like Mr. Boverton Redwood will not promise a supply of oil on a commercial scale.

MEXICO.

Butopilas Mining Company.—At the annual meeting in New York, February 27th, the following directors were chosen: George W. Quintard, A. R. Shepherd, E. V. Loew, J. N. Hayward, H. B. Parsons, B. D. Hasell, L. H. Stevens, Samuel Elliott, James W. Quintard, W. F. Mattingly, Walter L. Frost, George Christall, L. H. Scott. At a meeting of the directors, held March 1st, officers were elected as follows: Geo. W. Quintard, president; Edw. V. Loew, vice-president; H. B. Parsons, treasurer; L. H. Stevens, secretary and assistant treasurer; Alex. R. Shepherd, general manager; executive committee, Geo. W. Quintard, Edward V. Loew, Samuel Elliott, L. H. Scott and L. H. Stevens.

San Luis Potosi.

Dios me Ampare.—This mine, also situated at Catorce, gives good promise. Recent assays run high in silver. The tunnel running along the vein has certain imperfections in its construction which the company is engaged in rectifying.

La Union Potosina.—This company, operating the Padre Flores mine, at Catorce, has been rewarded for six years of development work by the discovery of paying ore. It has just sold ore to the value of \$3,000 to the agent of one of the smelting companies. It is now expected that this property will take a prominent place among the paying mines of the Catorce district.

Sonora.

El Cibuta Placers.—Much excitement has been caused at Nogales by the reported discovery of gold placers at El Cibuta, 24 miles distant from that place.

La Grande.—A rich lode of silver ore, 4 ft. wide, has been struck in La Grande mine, at Baviacora, belonging to Messrs. Quiroz Brothers.

ONTARIO.

Rat Portage District.

Black Jack.—At this mine a force of men are cross-cutting south from the 100 ft. level, to intersect the proposed westerly extension of the pebble lode of the adjacent property referred to, the Gold Hill. In addition to this, a small force are sinking upon another vein in good mill rock.

International Gold Mining and Milling Company.—This company, which has its headquarters in Cleveland, O., will begin active work on its property, at Rossland, in April.

Northern Gold Mining Company.—At this company's Gold Hill mine, according to the Port Arthur "Sentinel," a depth of over 60 ft. has been attained in two shafts since the advent of Captain Williams, with some drifting on the pebble lode, in all of which openings mill rock is found, much of which in the lower workings shows native gold, finely disseminated. A new 10-stamp mill has lately been erected on this property, but owing to limited capital the supply of mill rock is not sufficient for more than a run of a few hours per day.

Sultana.—The force of miners in the lower level (122 ft.) were driven out by a sudden inflow of water. Work is again progressing at the first level (about 60 ft.); the ore at this point as well as at bottom of shaft still keeps up an excellent average with a vein of 3 ft. to 5 ft.

SOUTH AFRICA.

Transvaal.

Simmer & Jack Gold Mining Company.—The report of this company for the half-year ending November 30th shows that the net profits, including £8,674 for tailings sold, were £30,799. The company paid £17,000 in dividends. During the year 3,451 ft. of driving and sinking were done, and it is estimated that there is 158,000 tons of ore in sight. During the half-year the 100-stamp mill crushed 53,594 tons, yielding 20,140 oz. of gold, an average of 7.51 dwt. per ton, and 144 tons of concentrates were produced, yielding 731 oz. of gold. The total expenses, including development, were \$5.37 per ton; the cost of milling was \$1.37 per ton.

Witwatersrand.—The following is a list of dividends paid by companies in this district during 1893: City & Suburban, 100%, £85,000; Crown Reef, 50%, £60,000; Durban-Roodepoort, 45%, £56,250; Ferreira, 100%, £45,000; Geldenhuis Estate, 25%, £43,750; Johannesburg Pioneer, 50%, £10,500; Jumpers, 25%, £25,000; Jubilee, 120%, £36,000; Langlaagte Estate, 30%, £141,000; Langlaagte Royal, 5% £7,000; Meyer & Charlton, 60%, £43,020; Meyer & Leeb, 10%, £1,500; New Heriot, 10%, £8,500; New Aurora West, 5%, £4,000; New Primrose, 40%, £78,374; New Rietfontein, 25%, £40,000; Nigel, 50%, £80,000; Robinson, 8%, £217,500; Salisbury, 10%, £9,300; Simmer & Jack, 40%, £34,000; Stanhope, 50%, £17,000; Treasury, 25%, £9,000; Worcester, 15%, £13,600; Vogelstruisfontein, 5%, £2,000. The total amount paid was thus £1,067,393 for the year.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 9.

Statement of shipments of anthracite coal (approximated) for week ending March 3d, 1894, compared with the corresponding period last year:

	1894.	1893.	Difference
	Tons.	Tons.	Dec. 1893.
Wyoming region.....	363,268	514,524	Dec. 151,256
Lehigh region.....	106,553	133,110	Dec. 26,557
Schuylkill region.....	173,010	236,429	Dec. 63,419
Totals.....	642,831	884,063	Dec. 241,232
Total for year to date..	5,145,969	6,675,733	Dec. 1,529,764

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs. for week ending March 3d and year from January 1st:

	1894.		1893.
	Week.	Year.	Year.
Shipped East and North:			
Phila. & Erie R. R.....	1,625	10,672	26,230
Cumberland, Md.....	65,398	488,663	579,521
Barclay, Pa.....	481	4,171	14,451
Broad Top, Pa.....	8,975	63,790	140,410
Clearfield, Pa.....	81,509	576,225	716,426
Allegheny, Pa.....	31,582	235,595	189,026
Beech Creek, Pa.....	45,721	437,521	387,795
Pocahontas Flat Top.....	47,355	439,704	432,410
Kanawha, W. Va.....	39,855	429,078	562,717
Totals.....	322,507	2,676,019	3,048,985
Shipped West:			
Pittsburg, Pa.....	27,994	228,787	234,906
Westmoreland, Pa.....	27,161	254,537	347,896
Monongahela, Pa.....	11,411	80,310	131,907
Totals.....	66,566	563,634	713,699
Grand totals.....	389,073	3,239,653	3,762,684

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending March 3d, 1894, and year from January 1st, in tons of 2,000 lbs.: Week, 67,903 tons; year 546,746 tons; to corresponding date in 1893, 985,312 tons.

Anthracite.

The anthracite coal market during the past week has been exceedingly dull, and utterly devoid of new features. In the absence of a good demand no recourse is left anthracite producers except to continue their policy of restriction more strictly than ever; this they are doing.

The mild weather of the week naturally has tended to make the trade very quiet. The collieries are running on half capacity only and coal is not being stocked up to any great extent. Consumers are holding off in the hope of lower prices at the beginning of spring, a course which they are justified in following, as there is no likelihood of any advance and there certainly is a good chance of concessions being made next month, despite the strenuous assertions to the contrary on the part of the salesagents.

Considering the dull condition of the trade prices are being fairly well maintained. Salesagents quote as follows: Stove and chestnut, \$4; egg, \$3.75; broken, \$3.60; pea, \$3@3.25; and buckwheat, \$2@2.50.

For the larger sizes it would not be a difficult matter to obtain "concessions" in prices which would make them a little below the quotations given.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending March 3d, was 185,000 tons, of which 10,000 tons were sent to Port Richmond and 20,000 tons were sent to New York waters.

NOTES OF THE WEEK.

Mr. Samuel Heilner, trading as Percy Heilner & Son, wholesale dealers in anthracite, whose assignment was announced in this column some time ago, has resumed business.

Judge Dallas, in the United States Circuit Court, at Philadelphia, has confirmed the report of Special Master Crawford, authorizing the arrangement for the issue of \$5,000,000 Reading coal bonds, to be consummated. The order read as follows: And now, March 5th, 1894, it is ordered that the Philadelphia & Reading Coal and Iron Company be authorized to issue its certificates of indebtedness to the amount of \$5,000,000 in the form annexed to the foregoing report, and to execute with the Finance Company of Pennsylvania and with the Pennsylvania Company for Insurance on Lives and Granting Annuities, a contract in the form annexed thereto, and that the receivers be authorized to negotiate the said certificates of indebtedness so as to net them 97½% of the par value thereof, and that the receiver, Mr. John Lowber Welsh, be authorized to take an interest in said certificates of indebtedness to the amount of \$250,000.

The annual report of the Pennsylvania Railroad Company for 1893 to the stockholders says: The total amount of anthracite coal mined by the four coal companies, in which you are interested, was 2,612,788 tons, an increase of 40,372 tons. There was a decrease in their net earnings of \$276,085.72, but this was fully offset by the increased amount of stock coal on hand at the close of the year.

The report of the Central Railroad of New Jersey for the year 1893 gives the total tonnage of anthracite coal carried at 6,084,502 tons, an increase of 514,880 tons, or 9.2%, over 1892. Of the coal carried last year 2,800,884 tons was for the Lehigh

& Wilkes-Barre Coal Company, against 2,712,642 tons in 1892.

In order to prepare for a busy season, for the shipment of coal by water from the Pennsylvania coal districts to New York, Philadelphia and other points, the Reading Railroad Company caused the Manayunk Canal to be drained of its water for the purpose of having it cleaned. A large number of boats are expected to be put on this traffic shortly.

Bituminous.

The slight improvement reported in our last issue continues and all producers seem to be mining a small regular output. The stocks now held by consumers are reduced to a considerable extent, but consumers are buying from hand to mouth and say that they propose to continue to do so. A few orders are coming in from the far East and it is anticipated that the demand from that source must increase from now on. The trade from points this side of Cape Cod continues as it has been during the past two or three weeks; that is, slightly better than in January. The trade in New York harbor is small but regular, enabling producers to make their calculations accordingly.

There is a small, fair supply of orders from local points about the shipping ports. There is considerable coal in transit from the mines to the ports. No blockades are reported on any of the main lines, though the transportation to some ports is slow, shipments being made quickly at all shipping ports as soon as the coal arrives.

Two or three contracts have been placed during the week at low prices; it is believed that they went to Clearfield operators. Contracts generally, however, are not being made yet; consumers declare that with present trade conditions they are not able to judge the amount of coal which they will need for their season's supply and it looks as if the contract season will drag along this year for a longer period than usual.

A harmonious meeting of the Seaboard Steam Coal Association was held on Wednesday last, at which the trade generally was discussed. The matter of prices for the coming season also was discussed, but nothing was decided.

Ocean freight rates are stiff and vessels, especially the small and middle sized ones, are rather scarce. There is a better supply of vessels of 1,800 or 2,000 tons capacity. A great number of vessels are still in winter quarters and their owners say they will not be put in commission until the market has a firmer tone and better rates prevail. The loss of several vessels during the last storm has aided in maintaining and advancing rates. Current freight rates are quoted as follows from Philadelphia: To Boston, Salem, Portland and Portsmouth, 70c; Providence, New Bedford, New London, Fall River, New Haven and Bridgeport, 65c; Allyn's Point, Norwich, 70c; Wareham, 90c.; Lynn, 80@90c. From Baltimore, Norfolk and Newport News are 5 to 10c. higher. New York harbor rates are lower and are quoted at 16@18c. The prospects for vesselowners this year are not encouraging.

All-rail trade continues fair. There is some discussion as to whether producers will not be obliged to take some action in the matter of a reduction in wages to meet the depressed condition of the trade.

NOTES OF THE WEEK.

The Tennessee Coal, Iron and Railroad Company makes the following statement for the year 1893, in tons of 2,000 lbs.:

	Coal.	Coke.
Bessemer, Ala.....	473,853	286,325
Pratt Mines, Ala.....	1,282,382	229,715
Blocton, Ala.....	876,214	43,227
Tracy City, Tenn.....	294,015	94,667
Whitwell Mines, Tenn.....	207,084	38,725
Total.....	3,063,548	692,105

The coal mined includes that converted into coke.

In the amended form of the Wilson Tariff Bill reported to the Senate Finance Committee on March 8th, bituminous and shale coal is taken from the free list and made dutiable at 40c. per ton. Coal, slack or culm, 15c. per ton; coke, 15% ad valorem.

Boston.

March 8

(From our Special Correspondent.)

The meeting of the companies' agents last week does not seem to have had the desired effect on trade. It gives very little confidence to buyers who are disposed to wait for what is known as spring "opening prices." It was generally thought at that meeting these prices would be fixed and it was a disappointment to many. Trade as a result is very quiet. New York f. o. b. prices are quoted here as follows: Stove and chestnut, \$4.00; free broken, \$3.75; and egg, \$3.65.

There is practically nothing new going on in this branch of the coal business. Contracts are being talked of in some quarters, however. Owing to freight rates prices are quite easy. We quote on cars here: George's Creek Cumberland, \$3.60; New River and Pocahontas, \$3.40@3.45; and Clearfield, \$3.15@3.20.

Freight rates are somewhat easier, viz.: From New York, 55@60c.; from Philadelphia, 70c.; from Baltimore, 80c.; from Newport News and Norfolk, 70c.

Business in a retail way is very quiet. Prices are steady.

Buffalo. March 8.

(From our Special Correspondent.)

The past week has been very quiet in the anthracite coal trade, and prices without change. Four days of about 70 degrees temperature was not conducive to the interests of the coal merchant, and such was experienced here from Saturday to Tuesday, both days inclusive.

A propeller arrived at Chicago last Monday from St. Joseph and Benton, Mich. A letter from Cheboygan says: "The prospects are that the ice will soon be out of the Straits of Mackinaw, a week more of the present warm weather being all that is necessary to open the passage." The St. Clair River is clear of ice from Marine City to Lake Huron.

On March 15th lights will be exhibited in the lighthouses on Lake Erie and Detroit River, and on April 1st on the St. Lawrence River and Lake Ontario.

Vesselmen here and elsewhere do not feel very cheerful on the prospects of freights and tonnage for next season. It is probably too early, however, to begin the usual discussion and the accompanying prophecies. There are apparently large stocks of coal on hand at all Western ports of storage, so that there will be nothing this year to urge immediate shipments.

Bituminous coal is moderately active and the market easy, as supply is more than adequate for the demand. Manufacturers are cautious in their movements; as a rule they are keeping only small stocks on hand and await orders before increasing their purchases.

Mr. Millard S. Burns, of the firm of Palen & Burns, coal and lumber dealers of this city, was elected president of the Buffalo Lumber Exchange last Saturday.

Chicago. March 7.

(From our Special Correspondent.)

The movement of hard coal in Chicago and vicinity for the week has been unusually limited, the whole business being practically confined to a few carload lots. Some idea of the present state of the Chicago market may be had from the fact that February, 1893, was not an especially good month for the coal trade, yet the general volume of business for February, 1894, was at least 40% lower. The circular price of anthracite coal still remains at \$5.75, but from appearances this is not being strictly maintained. The anthracite coal market is in a decidedly bad state, and it will undoubtedly take a long time to renovate this very unusual state of affairs.

Anthracite prices are: Egg, range and chestnut, \$5.75. Retail prices are: Egg, range and chestnut, \$6.50@7.

Bituminous Coal has not improved during the week. The amount of sales appears to be somewhat less and the prices are very uncertain. Like hard coal, circular prices have been abandoned, and quotations are very general indeed. The trouble with the miners in Illinois, Indiana and Ohio over wages still continues, and it is very likely that rather than submit to a further reduction many miners will strike. Quotations are per ton of 2,000 lbs. f. o. b. Chicago: Youghiogheny, \$3.15; Pittsburg, \$3.25; Hocking Valley, \$3; Brazil block, \$2.70; Raymond, \$3.65; Shawnee, \$3; Cumberland smiting, \$3; Mt. Olivet, \$2. Cannel coal productions are: Pinkney, \$4.25; Birdseye, \$5.60; Kentucky, \$5.60.

Coke sales are few and far between, the market being exceedingly flat. The news that all the coke ovens in the Connellsville, Pa., region would be fired up within a few weeks was received here today, but dealers rather regard it as doubtful. Prices are: Connellsville crushed, \$4.15; furnace, \$3.90; Ellsworth, \$3.75.

Pittsburg. March 8.

(From our Special Correspondent.)

Coal.—The river and railroad mines have held several meetings during the week; they expect to consolidate forces and demand a 3 cent rate as the uniform rate at river and railroad pits. This is equivalent to 79 c. per ton. The miners in the fourth pool are still out. Seven mines are working and twenty are idle; the miners who are working receive \$1.75 per ton and those out are striking because the operators want them to work for \$1.50. They have been out three weeks with no prospect of settlement.

At Fayette City a relief association was formed to help the numerous families that are in a starving condition. All the coal mines on the line of the McKeesport & Bellevue Railroad are being employed principally at the 2½ cent rate. Some 5,000 miners have returned to work in the Sixth Ohio sub-district, agreeing to continue at work pending a settlement of the wage question by arbitration. A rise in the river caused the shipment the past four days of 4,500,000 bushels of coal to the lower markets; to convey that amount required 20 tow boats; 108 coal boats, 140 barges and 20 floats. The largest portion is for the Mississippi markets.

Connellsville Coke.—The reports from this region are very encouraging so far as work is concerned. A dispatch just received says information from a prominent official of the H. C. Frick Coke Company is to the effect that within two weeks nearly every coke oven in the Connellsville region will be fired up. The men will cover at least 90% of all the ovens; more than have been in operation any time for three years past. At the lowest estimate 6,000 idle men will be given employment. The company will

favor American labor and are receiving hundreds of applications daily from Americans for work. The McClure Coke Company will also increase the percentage of working ovens fully 50%, giving employment to 1,500 men. The strike at Rainey's works has been settled, and the works are in full blast. There is no change in market quotations; \$1 remains the quoted price for furnace grade; freight to Pittsburg, 70c. per ton. The report that coke is selling at 90c. is without foundation. There is no change in the wage question. The Frick Coke Company is now paying the highest wages going in the region.

There is no let up in the improvement in the coke trade, shipments increased and over 1,000 ovens were fired. The active ovens now in this region number 11,168 and the number of idle ovens have been reduced to 6,432, a little over one-third of the whole capacity. The demand increased 9,895 tons over the previous week. Shipments by cars show an increase of 127, with a total of 5,620 cars.

The shipments to points east of Pittsburgh decreased, while shipments to Pittsburgh and west show large increase.

During the week labor troubles cropped out and there is a general feeling of uneasiness among the workmen at places where they have not been receiving cash pay and are working at a rate below the Frick scale.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 9, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Mar 10, 1893.	Mar. 9, 1894.	Jan., '93	Jan., '94.	Jan., '93	Jan., '94.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	74	32,668	27	13,904	323,185	140,480
Coke.....	139	130,593	83	85,467	1,320,915	842,170
Charcoal....	37	9,050	18	3,852	90,025	38,638
Totals....	250	172,311	128	103,223	1,734,125	1,021,288

Pig Iron.—There is nothing new or interesting to report of the pig iron market. During the past week it has been quiet and devoid of any feature worthy of mention. The volume of business done has been rather small and prices have not fluctuated. That the consumption is increasing there can be no doubt; by means of the statistics of production this is seen although the increase is not as great as many expected. Reports are encouraging as showing that normal conditions are returning to the iron industry, and it is only a question of time when the mills and factories of the country will once again be running full time. Reports from the blast furnaces for March, so far as received, indicate an increase of about 12% over the February reports.

There has been no change in prices one way or another; values are neither weaker nor stronger than they have been for several weeks. Sellers profess that the outlook is much brighter, however, and that a fair increase in business will be experienced by the end of the current month. Consumers, while still buying from hand to mouth, apparently are being led to believe that the present prices will undergo no further decline. The increase in production and the low prevailing prices for iron ore doubtless tend to weaken values, but on the other hand it is expected that the growing consumption will offset this. Quotations are nominally as follows: Northern brands: No. 1, \$13@14; No. 2, \$12.50; gray forge, \$12. For Southern iron we quote: No. 1, \$13@13.75; No. 2 F., \$12@12.50; No. 1 soft F., \$12@13; gray forge, \$11@12—all at tide-water. Scotch irons are quoted: Coltness, \$21.50@22; Eglinton, \$19.50@20; Summerlee, \$21.50@22.1.

Billets and Rods.—We do not hear of any sales of billets or rods. The market continues very quiet, and prices are still low and weak. In this market quotations are nominally: Domestic billets, \$18@18.50; wire rods, domestic, \$26@27.50; foreign rods, \$39@40.

Manufactured Iron and Steel.—Several sales are reported this week, some of them being of fair size. The market shows no radical change, however, and prices are practically as last reported. We quote: Angles, 1'40@1'60c.; axles, scrap, 1'50@1'70c. delivered; steel, 1'0@1'70c.; bars, common, 1'25@1'30c.; refined, 1'45@2c. on dock; beams, up to 15 in., 1'45@1'60c.; 20 in., 1'70@1'90c.; car truck channels, 1'95@2c.; channels, 1'50@1'65c. on dock; steel hoops, 1'55@1'75c., delivered; links and pins, 1'55@1'75c.; plates, flange, 1'80@2c.; firebox, 2@2'50c.; flange, 1'75@2c.; marine, 2'50@2'75c.; sheared, 1'80c.; shell, 1'50@1'70c.; tank, 1'35@1'50c.; universal mill, 1'40@1'60c.; tees, 1'70@2c., all on dock.

Merchant Steel.—There is a better feeling in this market, owing to the increased volume of business. Prices, however, are as if anything a little weaker. We quote: Tool steel, 5'75@6'25c.; tire steel, 1'75@1'80c.; toe calk, 1'80@2c.; Bessemer machinery, 1'40@1'60c.; open hearth machinery, 1'90@2c.; open hearth carriage spring, 1'90@2c.; crucible spring, 3'50@3'75c.

Old Material.—The old material market continues quiet. Quotations are nominally as follows: Old steel rails, street, at \$9.75 f. o. b. cars Jersey City; old iron tees, \$12.50 per ton New York; railroad scrap, \$12 per ton delivered at mill, and yard scrap at \$10 vessel New York; old iron T rails, standard sections, at \$11.75@12.00, New York delivery; wrought turnings, delivered at mill, \$9; railroad scrap, also delivered at mill, \$12; No. 1

wrought scrap at \$9.50@10, and No. 1 machinery cast scrap, \$9.50@10.50, delivered to vessels at this port; old steel rails, \$9@10; old wrought tubes and pipe, \$7.50@8.50; wrought turnings at \$8.50@9 delivered at mill; old car wheel, \$10.50@11 New York; cast borings, \$5.50@6 delivered at mill.

Rail Fastenings.—This market continues very dull. Quotations are nominally: Fish and angle plates, 1'30@1'50c. at mill; spikes, 1'70@1'90c.; bolts and square nuts, 2'10@2'30c.; hexagonal nuts, 2'30@2'50c., delivered.

Spiegeleisen and Ferromanganese.—We do not hear of any sales of importance this week in either spiegel or ferro. Prices are nominally: Spiegeleisen, 10@12%, \$21@22; 20%, \$25@26. Ferromanganese, \$52@53. Attention is called to an article in the editorial page.

Steel Rails.—There is nothing of interest to report of the rail market this week so far as standard sections are concerned. Light sections are still low in price, and girder rails are also lower. The official, or combination price for standard sections is still \$24.80 tidewater, or \$24 at mill.

NOTES OF THE WEEK.

A dispatch from Philadelphia states that the bondholders of the Crane Iron Company held another meeting in that city on March 2d for the purpose of effecting a plan of reorganization. It was decided to appoint a committee to secure the requisite number of bondholders to agree to a foreclosure under which the plant would be bought in by the company. The committee is composed of Gordon Monges, W. Spilling, Robert F. Kennedy, J. A. Harris, Jr., and Robert E. Hastings.

The Finance Sub Committee of the Senate has reported an amended form of the Wilson Tariff Bill, in which the following changes of interest to the iron trade appear:

Iron ore, including manganiferous iron ore, also the dress ore residuum from burnt pyrites, 40c. per ton. Wilson bill, free. Iron in pigs, iron kettledge, spiegeleisen, ferro silicon, 22½% ad valorem. Wilson bill, 20%. All iron in slabs, blooms, loop, or other forms more advanced than pig iron and less finished than iron in bars, 25% ad valorem. Wilson bill, 22½%. Bar iron, rolled or hammered, round iron, in coils or rods and bars or shapes of rolled iron, 25% ad valorem. Wilson bill, 25%. Forgings of iron or steel, or forged iron or steel combined, 30% ad valorem. Wilson bill, 25%. Hoop, band or scroll iron or steel, 30% ad valorem. Wilson bill, 25%. Railway bars made of iron or steel, and railway bars made in part of steel, T rails and punched iron or steel flat rails, 22½% ad valorem. Wilson bill, 20%. Beams, girders, joists and all other structural shapes of iron or steel, whether plain or punched, or fitted for use, 35% ad valorem. Wilson bill, 30%. Boiler or other plate iron or steel, except saw plates, not thinner than No. 10 wire gauge, sheared or unshaped, and skelp iron or steel, sheared or rolled, in grooves, 30% ad valorem. Wilson bill, 20%. In paragraph 118 the proviso that the reduction provided for as to sheets of iron or steel thinner than No. 25 wire gauge shall take effect on October 1st, 1894, is stricken out, as is also a like proviso in paragraph 121, relating to tin plates, terne plates and taggers tin. Boiler or other tubes, pipes, flues or stays of wrought iron or steel, 20% ad valorem. Wilson bill, 25%. Cast-iron pipe of every description, 20%. Wilson bill, 25%.

Buffalo. March 8.

(Special Report of Rogers, Brown & Co.)

There has, perhaps, been a little better buying movement during the past week than the average of late transactions, but the improvement is only just perceptible. The month of February marked undoubtedly the lowest ebb which the iron business has reached during the existing depression. It is still a halting market. Buyers are watching closely and standing ready to place large business the moment they feel assured that the downward tendency is checked. The figures below give the range of the market. Some of the larger transactions of the week have been a shade below. We quote on the cash basis, f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$12.50; No. 2 X foundry strong coke iron, Lake Superior ore, \$12; Ohio strong softener No. 1, \$12.50; Ohio strong softener No. 2, \$12; Jackson County silvery No. 1, \$15.80@17.30; Lake Superior charcoal, \$14.75; Tennessee charcoal, \$15.50; Southern soft No. 1, \$12.40; Southern soft No. 2, \$11.90; Alabama car wheel, \$16.50@17.50; Hanging Rock charcoal, \$18.50.

Chicago. March 7.

(From our Special Correspondent.)

A somewhat improved condition prevails, as with but few exceptions dealers regard the situation as being quite an advance over last week. Orders appear to be coming in with more frequency, and for larger quantities, although the majority of sales are still in small lots for immediate use. The question of the tariff continues to create much talk, and dealers generally are under the impression that when Congress decides one way or the other, a marked change for the better will soon appear. Prices on all material continue to remain low, with no apparent probability of early change for the better.

Pig Iron.—Sales continue to run in small lots for immediate or early shipment, customers still remaining unwilling to place orders for raw material

except to cover actual work in sight. Prices are being shaded somewhat, as there is not enough buying to give any strength to the market. Some houses report a larger business during February than any month since February a year ago. Prices are per gross ton f. o. b. Chicago: Southern coke, foundry, No. 1, \$12.50; No. 2, \$11.65; No. 3, \$11.15. Southern coke, foundry, soft, No. 1, \$11.65; No. 2, \$11.15. Local coke, No. 1, \$12.25@12.50; No. 2, \$11.75@12.00; No. 3, \$11.50@11.75. Local Scotch, No. 1, \$12.50@12.75; No. 2, \$12.25@12.50. Southern silveries, No. 1, \$12.50@12.75; No. 2, \$12@12.25. Bessemer \$13.25. Southern car wheel, \$18@18.25. Ohio strong softeners, \$14.50@15. Tennessee charcoal No. 1, \$15@15.50.

Structural Iron and Steel.—The last week has developed a marked increase in structural iron business. Numerous new buildings here in Chicago and throughout the Northwest and West have created the increased demand. The low prices now prevailing seem to have taken hold, as the numerous sales reported the past week show. Quotations are as follows, Chicago delivery: Angles, 1.55@1.60c.; tees, 1.80@1.90c.; universal plates, 1.55@1.65c.; sheared plates, 1.80@1.90c.; beams and channels, 1.45@1.55c.

Plates remain in rather poor demand, although a slightly increased trade is observed. Prices are for plates, mill shipments, Chicago delivery: Flange steel, 2.00@2.10c.; best firebox steel, 3.00@3.50c.; tank steel, 1.60@1.70c. Store prices are: Iron or steel sheets, 10 to 14, 2.00@2.15c.; tank steel, 1.90@2.00c.; flange steel, 2.25@2.50c.; sheet steel, 2.25@2.50c.

Merchant Steel.—Inquiries have increased and a better business may soon result therefrom. Quotations are, carload lots: Smooth-finished machinery steel, 1.80@1.90c.; tire steel, 1.90@2.00c.; ordinary Bessemer bars, 1.40@1.50c.; toe calks, 2.15@2.25c.; ordinary tool steel, 6.40@6.90c.; special brand tool steel, 12@20c.; crucible spring, 3.40@3.65c.

Galvanized Sheet Iron.—There has been no change in conditions for the week. Inquiries are a trifle more numerous and prices the same which are 75 and 5% off for mill shipments on Juniata. Jobbing quantities are selling at 75% discount.

Black Sheet Iron.—There is a tendency towards material improvement in black sheet iron, and should the conditions now observed prevail a considerable business may be the result in a few weeks. Prices are still low, which are: Carload lots f. o. b. Chicago, No. 24, 2.40c.; No. 26, 2.40c.; No. 27, 2.50c. Same gauges and steel sheets are 3.10c.@3.20c., less 10c per 100 lbs. for large lots.

Bar Iron.—Numerous small orders are coming in and business is gaining slowly through the new lines coming into the market. Mill prices f. o. b. Chicago are 1.15c.@1.25c. for iron, and 1.25c. for soft steel bars.

Billets.—Conditions reported for previous week are still in vogue, those on billets being \$18.50. Rods are \$25.

Nails.—Wire nails are not quite so active, buyers appearing to have laid in all the stock they require for spring trade. Steel cut nails are in better demand; prices per keg, \$1.25@1.30.

Scrap.—A slightly increased business in reported with prices as follows: Railroad, \$10.75; No. 1 forge, \$8.50@9; cast borings, \$4.50; wrought turnings, \$6.50; axle turnings, \$6.50; mixed steel, \$6@6.50; tires, \$13.00; iron axles, \$13.00@13.50.

Old Rails and Wheels.—A good sized order for old iron rails is noted during the week, but otherwise little business is moving. Quotations are: Old iron rails, \$10@11 and for old car wheels, \$9.50@10.

Philadelphia. March 9.
(From our Special Correspondent.)

Pig Iron.—About the only noticeable difference between the condition of things to-day and a week ago is, that brokers and agents have a good deal to say about big transactions in the near future. They have heard from their customers and expect to book orders for forward delivery before the month is out. This fact has rather reduced sales this week. Agents are willing to accept orders for foundry iron to run over three months' delivery at current selling prices. The expansion of production has already set in, and that means to us that there will be no improvement in prices. No. 1 goes at \$13@13.50; No. 2, \$12@12.75; Forge, \$10.75@11.25. Forge is dull because of the bad condition of trade in merchant iron.

Muck Bars.—No sales have been heard of.
Steel Billets.—Unless there is a general clearing, billets will go to \$17.25 next week. In fact it is said to-day that a sale has been made at that figure, but it cannot be positively asserted. Quoted rates are \$18.

Sheet Iron.—Within 48 hours orders for round lots of galvanized have been placed for convenient delivery during the second quarter of the year, at 20% under card rates.

Merchant Iron.—Mill owners complain that times would be better if they did not lose so much business that slips westward. They are asking 1.30 at mill for good iron. Stores get 1.50.

Nails.—Dock tidewater sales have been made by factories at \$1.00, the lowest price ever recorded, but the local retail trade pays much better.

Pipes and Tubes.—Small orders are beginning to drop in.

Skelp.—Orders footing up 300 tons have been placed and these will probably be followed before many days with much larger orders.

Plate and Tank.—Small orders pay well, but there is nothing in large orders at this time. The opening of building operations is helping this branch of business indirectly. Orders for tank steel are taken at 1.25. Shell is quoted at 1.50 and flange 1.70. Quite a number of small buyers are in market. Machine shop work is getting better.

Structural Material.—There is a prospect of big orders for two railroad companies in New England, whose directors have voted some important terminal improvements, but the parties on the scene have no facts to throw away. There is an increase of small orders that is helping out. Angles are 1.31@1.40. Beams, tees and channels, 1.50.

Steel Rails.—There is talk here of large orders soon to be placed, mostly on Western account, but the two mills represented here have no statements to make. All rail mill managements are watching their chances for business. Nothing can be gathered concerning the talk of another readjustment of prices.

The general tone of the market is better than two weeks ago.

Pittsburg. March 8.

(From our Special Correspondent.)

Raw Iron and Steel.—The volume of business shows up fairly well; prices, however, are very irregular, in many articles showing a wide range of values. As the volume of business increases new capacity comes into operation and the keen competition is, therefore, unabated. Moreover large contracts for lake ore have been closed at the lowest prices ever known; that, coupled with cheap coke and the lowest scale of wages known for years, assures a production for the year at prices that cannot be much above the present level. Southern competition continues very strong and is felt to be a positive factor at many points in determining values; under these circumstances the demand for pig iron is light and unsatisfactory in the sense that buyers will make but few arrangements for the future. There is considerable diversity of opinion among dealers; while the general features of the market have shown but little change of importance the underlying conditions are not as satisfactory as they were a few weeks back.

During the early part of February the market gave evidence of improvement both in the number of inquiries and the extent of the demand, although prices in most instances were still weak and irregular, while there was a decline in the price of billets, which had risen with the expansion of the demand. There is now exhibited even greater cautiousness on the part of buyers, who are slow to contract in advance of immediate requirements. Notwithstanding the slight setback which the market has experienced, there are many evidences in the improved condition of the general business of the country that the worst is past, and that with the opening of spring the volume of business will be much heavier. The eagerness of the competition, however, makes the outlook for higher prices extremely unfavorable.

The sales of Bessemer pig are the largest for a long time; one sale of 35,500 tons was made to a Pittsburg mill. The delivery is monthly, extending to July 1st.

Iron Ore.—Sales up to date of standard ores are fully 2,500,000 tons, and at prices from \$2.25@3.40 f. o. b. cars at Lake Erie ports. One Pittsburg firm purchased over 1,000,000 tons.

Coke Smelted Lake and Native Ore.		800 Billets, March.	
Tons.	Cash.	April, at mill.	April, at mill.
18,000 Bessemer, March.		15.35	
April, May, June.	\$10.55		15.75
12,000 Bessemer, April.	10.90	Skelp Iron.	
May, June.	10.90	500 Sheared.	\$1.40 4 m.
7,500 Bessemer, March.	10.80	4 0 Wide gr'vd.	1.20 4 m.
April, May.	10.80	380 Nar. gr'vd.	1.20 4 m.
6,000 Bessemer, April.	10.85	Muck Bar.	
May, June.	10.85	500 Neutral, March.	
5,000 Bessemer, March.	10.75	April delivery.	20.00
April.	10.75	300 Neutral, April.	19.50
5,000 Bessemer, March.	10.60	Ferro-Manganese.	
April.	10.60	150 80% delivered.	52.00
1,000 Bessemer, March.	10.60	Blooms, Lillets, Bar Ends.	
April.	10.60	500 Billets and bar	
1,000 Gray Forge, March.	9.65	ends.	10.80
April.	9.65	Steel Wire Rods.	
500 Gray Forge, March.	9.75	500 5-gauge at mill.	24.60
April.	9.75	Skelp Steel.	
200 No. 1 Foundry.	11.50	450 Wide grooved.	\$1.02 1/4 4 m.
200 No. 2 Foundry.	10.75	Sheet Bars.	
100 No. 1 Foundry.	11.65	350 At maker's mill.	\$21.00
100 White & Mottled.	9.25	Spelter.	
75 No. 2 Silvery.	13.00	100 Spelter.	3.80
Charcoal.		Iron and Steel Rails.	
100 Cold Blast.	24.50	1,000 Iron rails.	13.50
50 Cold Blast.	25.00	500 Steel rails, mixed	
50 Cold Blast.	25.50	lengths.	9.75
50 No. 3 Cold Blast.	24.00	200 Steel mixed.	9.25
50 No. 2 Foundry.	17.00	Scrap Iron.	
50 Warm Blast.	17.00	300 No. 1 R.R.W. scrap,	
25 No. 2 Warm Blast.	19.75	net.	10.00
Blooms, Billets and Slabs.		150 No. 1 R.R.W. scrap,	
2,500 Billets and slabs,		net.	10.50
March to June, at		150 Cast scrap, gross.	9.00
mill.	16.00		
1,000 Billets, March.			
April, at mill.	15.80		
1,000 Billets, April, at			
mill.	15.70		

METAL MARKET.

NEW YORK, Friday Evening, March 9, 1894.
Prices of Silver per Ounce Troy.

March.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	March.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
3	4.87 3/4	27	58 3/4	.455	7	4.88 3/4	27 1/2	60 1/2	.468
5	4.87 3/4	27	58 3/4	.455	8	4.88 3/4	27 1/2	59 3/4	.463
6	4.88 3/4	27 1/4	59 1/2	.461	9	4.88 3/4	27 1/2	59 3/4	.461

The silver market has been very steady, and around 27d. the demand has been considerable. The East is willing to take cheap silver in large quantities. The smelting companies claim that under 60c. per oz. there will be a material decrease in production. If this statement is verified by the facts, silver is not dear at current rates, and there is liable to be a sudden spurt if exchanges should rise without notice, as sometimes happens.

The United States Assay Office at New York reports the total receipts of silver for the week to be 141,000 ounces.

Gold and Silver Exports and Imports at New York, Week Ending March 3d, 1894, and for Years from January 1st, 1894, 1893, 1892.

Week	Gold.		Silver.		Excess of Ex or Imp.
	Exports.	Imports.	Exports.	Imports.	
1894...	\$1,786,412	\$459,051	\$807,074	\$2,122	E \$2,132,313
1893...	3,528,470	2,205,781	8,381,158	247,280	E 3,438,567
1892...	26,526,348	964,017	5,195,224	707,867	E 30,049,858
1892...	9,117,613	2,963,382	4,712,932	281,783	E 10,585,380

Of the gold exported for the week \$1,250,000 went to France, the rest to the West Indies, the silver went to London. The gold imported came from Germany and France; the silver from Central America.

During the five days ending March 8th, the exports and imports of gold and silver have been as follows: Exports, gold, \$166,578; silver, \$363,994; imports, gold, \$174,759; silver, \$17,219. Of the gold exported \$131,300 was in Spanish coin and went to the West Indies, all the rest was in American coin and bullion, \$900 of which went to Germany, and \$54,378 to the West Indies. Of the silver exported \$3,695 was in Spanish coin and went to South America, the remainder was in American coin and bullion and went to London.

NOTES OF THE WEEK.

The general situation continues to improve, and continued resumption of work in factories of nearly all classes are recorded. While low prices continue to rule, there is increased inquiry for goods, and a response in increasing production. The pig iron output shows at the opening of March an increase of 10 or 12% over February, as noted elsewhere.

Congress still continues to hold public attention, not so much by what it is doing as by what it has failed, or hesitates, to do. Action on the tariff would do more to help business revival than anything else.

The Bland bill for coining the seigniorage on the silver in the Treasury was passed to a third reading in the Senate on Wednesday of this week, with unexpected celerity. It is said that, owing to carelessness in wording, the section authorizing the issue of certificates against the coined silver would permit an issue of double the amount proposed. The coinage of silver dollars provided for by the bill is \$55,156,681.

The statement of the New York banks for the week ending March 3d shows an increase of \$1,150,400 in legal tenders; decreases of \$1,914,300 in loans, \$389,300 in legal tenders, \$1,001,200 in deposits, and \$23,600 in circulation. The reserve increased \$1,001,400 and was \$75,778,900 in excess of legal requirements.

A decrease in deposits is shown for the first time in a number of weeks. The decrease in loans is a change from the course of the last four weeks. The changes, taken altogether, are not unfavorable, though the falling off in loans was anticipated, being chiefly the result of the discontinuance of outlays for the purchase of the new bonds. The demand for money, however, is still not urgent.

With the present rates of exchange and the large gold balances held by the banks it is quite probable that last week's shipments of gold may be followed by others. While the ordinary balance of trade is in favor of this country, the selling of American securities held in Europe has been large and continuous for some time, and in payment for these and perhaps also in settlement of loans made last year it may be cheaper at any time to ship gold than to buy exchange. Such shipments at the present time would hardly be an unfavorable symptom, except so far as they indicate a withdrawal of European capital invested here.

The statement of the United States Treasury on Thursday, March 8th, showed balances in excess of outstanding certificates amounting to \$131,708,008 made up as follows: Gold, \$107,405,618; silver

September 1st, 1893, to January 31st, 1894, shipments were 101,864 tons, against 108,679 for the corresponding period of the year before, a decrease of 6,815 tons. Acid phosphate (13% available) may be quoted at \$7@7.50 cash, in bulk. High grade phosphate rock is \$4.75@5 f. o. b. vessel and cars at mines.

Muriate of Potash.—Arrivals of muriate during the week aggregated 1,800 tons, all of which went into consumption. Spot prices, which had been advanced owing to short supply, resumed their normal level. In lots of 50 tons, quotations are as follows: 80-85% and minimum 95% (basis 80%), respectively; New York and Boston, \$1.78@1.91; Philadelphia, \$1.80@1.83; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.83@1.95. In a small way, on the spot, quotations are \$1.95.

Kainit.—Prices for kainit (minimum, 23%) in cargo lots for 1894 delivery contracted prior to January 31st 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 sylvinit, 27-35%, prices are as follows per cent. per gross ton, invoice weights: New York, Boston and Philadelphia, 37; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weights, 1c. more per cent.

Nitrate of Soda.—This market, owing to short supply available, has advanced. Quotations this week are as follows; Spot, \$2.07@2.10, nearby, \$2.05@2.07; future shipments, \$1.85.

Messrs. Mortimer & Wisner, the well-known nitrate brokers of this city, send us the following interesting statistics, issued under date of March 1st:

	1894.	1893.	1892.
	Bags.	Bags.	Bags.
Imported into A. ports from West Coast S. A., Jan. 1, 1894, to date.....	107,073	58,465	66,404
Imported into Atlantic ports from Europe.....	.....	5,225	.....
Stock in store and afloat Mar. 1, 1894, New York.....	107,073	63,680	66,404
Boston.....	44,946	1,406	40,938
Philadelphia.....	2,500	.....	500
Baltimore.....	2,500	2,000	.....
To arrive, actually sailed	111,000	279,500	270,000
Vis. supply to J'ne 15, 1894	160,936	282,906	311,168
Stock on hand, Jan. 1, 1894.	44,938	15,454	53,585
Deliveries past month. . .	62,175	41,644	22,654
Deliveries since Jan. 1st to date.....	102,065	75,738	78,521
Total yearly deliveries..	.....	754,560	685,158
Prices current, Mar. 1, '94	2'05	2¼@2'30	1'82

Included in the deliveries of 1893 are 9,500 bags shipped to European ports.

NOTES OF THE WEEK.

The Democratic majority reported to the Senate Finance Committee on March 8th a revised and amended edition of the Wilson Tariff Bill. The changes made in the chemical schedules are as follows: Tartaric acid, reduced from 20 to 10%; alumina, increased from 20 to 30%; glycerine changed to 20% ad valorem; magnesia, changed from 7c. per lb. to 30% ad valorem; baryta, changed from \$3 per ton to 25% ad valorem; blues, changed from 6c. per lb. to 20% ad valorem; ochres, etc., changed from 1½c. per lb. to 25% ad valorem; whitening, changed from 25 to 35%; zinc, changed from 20 to 25%; bichromate and chromate of potash, changed from 20 to 25%; bicarbonate of soda, from ½c. per lb. to 30% ad valorem; hydrate of soda, ½c. a pound to 25% ad valorem; bichromate and chromate of soda, from 20 to 25%; sal soda or soda crystals, ½c. per lb. to 20%; soda ash, ½c. per lb. to 20% ad valorem; silicate of soda or other alkaline silicate, ¼c. per lb. to 20%; cream of tartar and patent tartar, 25 to 20%; tartar and lees crystal, partly refined, from 25 to 20%.

Liverpool.

Feb. 27.

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

Chemicals.—The market for chemicals shows no improvement and the dull feeling still continues. At the same time, quotations are about unchanged.

Soda Ash receives little attention from buyers and it is difficult to test values, but for Leblanc makes, the nominal range according to market, make, etc., is about as follows: Caustic ash 48%, \$3 15s.@41 5s. per ton; caustic ash 57.58%, \$4 10s.@45 per ton; carbonated ash 48%, \$3 15s.@44 5s. per ton; carbonated ash 58%, \$4 10s.@45 per ton, net cash.

Ammonia ash, 58%, is not active, but business is reported at from \$3 17s. 6d. per ton less 2½% to \$4 net cash for casks, according to brand. Bags, 5s. per ton less.

Soda crystals are slow of sale at \$2 17s. 6d. per ton less 5%.

Caustic soda is inactive and difficult to move. Quotations are nominally unchanged, but makers are open to bids for quantity. We quote nominal spot, range according to export market, about as follows: 60%, \$7 15s.@8 10s. per ton; 70%, \$8 15s.@9 10s. per ton; 74%, \$9 15s.@10 10s. per ton;

76%, \$10 15s.@11 10s. per ton; all net cash. For parcels under 10 tons, 5s. per ton extra is charged. For contracts over all 1894 concessions of from 5s. to 10s. per ton are offered.

Bleaching powder is in small compass and for hardwood packages prices range from £7 10s. to £8 5s. per ton net cash, according to market. Chlorate of potash depressed; and with resellers trying to force sales on a dull market values are quite nominal at about 7½d.@7¾d. per pound for prompt, and 7¼d.@7½d. for March-December; less 5%. If a demand sets in the reaction will probably be rapid, as it would take very little to turn the scale in the direction of higher prices. Bicarb. soda is firm at \$6 15s. per ton, less 2½%, for one cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia keeps steady at about £14 2s. 6d. to £14 7s. 6d. per ton, less 2½% for good grey 24 and 25% in double bags f. o. b. here. Nitrate of soda is held for £9 12s. 6d.@£9 15s. per ton, less 2½% for double bags f. o. b. here, according to quality; with a moderate demand. Carb. ammonia: Lump, 3¾d. 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 238 and 240.]

NEW YORK, Friday Evening, March 9.

There has been but little activity in the mining stock market during the past week. As we foretold in our last report, the attempt at creating a Comstock "boomlet" was doomed to an early death from natural causes. Consolidated California & Virginia, which was the foremost stock in the upward movement, has declined to \$3.65—that is, it lost this week what it gained last.

Those brokers who have been watching with interest all developments in the Rule drift are now assailed by misgivings and are beginning to believe that in case the new development work discloses any ore body of importance the news will not be made public until the "insiders" have had a chance to depress the stock and gather in at low figures as many shares as they can. In other words, the well-known and favorite method of the "ring" of freezing out poor stockholders by the levying of two or three assessments will be resorted to once more, and when the stock has been manipulated to their heart's content, and not until then, will the "insiders" announce that the Rule explorations have been successful. Of course, this presupposes that success will eventually crown Mr. Rule's efforts. In the event of his failure, everything will remain "in statu quo," but assessments may be levied just the same. So long as the present "ring" controls affairs on the Comstock lode, just so long will there be justifiable doubts as to any alleged favorable developments in any of the mines on it.

During the week 400 shares of Consolidated California & Virginia changed hands; the price declined from \$3.90 to \$3.25. Of Hale & Norcross 1,100 shares were sold on Saturday at 70c. Ophir shows sales of 460 shares at \$2 20@2.60. Comstock Tunnel was in better demand this week, 1,100 shares being sold at \$6.9c. The famous suit of Joseph Aron against the Comstock Tunnel Company, the Union Trust Company, J. & W. Seligman & Co. and others has been decided in favor of the defendants. Consolidated Imperial shows sales of 1,200 shares at 19c. Other sales were as follows: 100 shares of Gould & Curry at 95c.; 300 shares of Alta at 25c.; 250 shares of Best & Belcher at \$1.90@2.15; 200 shares of Mexican at \$1.55@1.60, and 100 shares of Potosi at \$1.30.

Of the California shares Quicksilver appeared in some demand; of the preferred stock 500 shares were sold at \$17.25@17.75, and of the common stock 100 shares at \$2.88. Of Standard Consolidated 400 changed hands at \$1.10.

The only Black Hills stock traded in during the week was Homestake, which shows a sale of 100 shares at \$14.50.

The only Colorado stock to show any transactions this week was Lacrosse, of which 300 shares were sold at 6c.

In another column will be found the annual report of the Batopilas Mining Company, printed from advanced sheets kindly furnished us by the company.

NOTES OF THE WEEK.

At the annual meeting of the Osceola Consolidated Mining Company (of Michigan) in Boston, March 8th, the old board of directors was re-elected, without opposition. The board afterward re-elected all the old officers. Nothing but routine business was transacted.

At the annual meeting of the St. Mary's Canal Mineral Land Company in Albany, N. Y., March 8th, John M. Forbes, A. S. Bigelow, W. H. Forbes, Nathaniel Thayer, Charles J. Paine, J. Henry Brooks, S. N. Brown, H. H. Hunnewell and Erastus Corning were re-elected directors by 17,987 votes. No other business was transacted.

Boston.

March 8.

(From our Special Correspondent.)

The market continued dull in the early part of the week with slight variations in prices. The past three days developed a disposition to buy the copper stocks, certain parties quietly picking up the leading specialties especially the Montana stocks,

and to day the whole market took a start, and prices advanced quite generally throughout the list.

Boston and Montana touched \$27, an advance of \$2½ from the lowest price for the week, losing only ½ in the later dealings.

Butte & Boston advanced from \$9@10½ on moderate sales, and closed firm at \$10½. Sales of the above for the week were over 3,000 shares. Calumet & Hecla sold only in a small way at \$292@292½. Tamarack was steady at \$157½@158. Osceola, on the report of operations for the past year, advanced from \$26 to \$27½, and was quite strong at the latter price.

Quincy sold at \$124@125, the same as last week. It is understood that the capital stock is to be increased from 50,000 to 100,000 shares, and offered to the stockholders at par (\$25). Atlantic sold at \$9½@9¾ for small lots.

Franklin advanced from \$9½ to \$10, and is in fair demand. Centennial was active to-day, and advanced sharply from \$3½ to \$4½, with sales of about 1,400 shares. Kearsarge sold in a small way at \$6½@7, and Wolverine at \$1½@1½. One share of Tamarack, Jr., sold at \$15.

3 p. m.—At the afternoon board Boston & Montana sold at \$26½; Butte & Boston at \$10, with later sales at \$10½. Calumet & Hecla advanced to \$294 for two shares, and Tamarack to \$159. Centennial declined ½ to \$4½. The market closed quite firm, and with a fair demand.

San Francisco.

March 2.

(From our Special Correspondent.)

Mining stocks during the early part of the current week gave indications of again sagging, but the report circulated yesterday of an important improvement in the upraise on the 1,000 level of the Consolidated California & Virginia mine tended to stimulate the market. The response was immediate, and prices advanced all along the line of North End Comstocks, the balance of the list also selling stronger. The one showing in the top of the upraise in the bonanza mine was \$50 per ton, and indications are said to be encouraging.

On Thursday the price for Consolidated California & Virginia was \$3.25, while to-day it sold as high as \$4.75. Inasmuch as the advantages of an ore find, under "Jim" Rule's guidance, were to a large extent exploited before a pick was ever put in the ground, and the stock was made to climb to an absurd figure, the news that the first fruits of the exploration work had been won did not create the sensation it otherwise would have done. As a consequence the advance in price, while considerable, was not so marked as might have been expected. Ophir to-day reached \$2.70; Mexican, \$1.70; Sierra Nevada, \$1.35; Bullion Consolidated, \$1.

In the middle group of Comstocks Best & Belcher has been the most active, selling to-day for \$2.30; Chollar sold for 60c.; Gould & Curry for 85c.; Hale & Norcross for 70c.; Potosi for \$1.05, and Savage for 75c.

The Gold Hill portion of the list has been very quiet, during the week the following ruling rates obtaining: Alpha, 15c.; Belcher, 85c.; Caledonia, 15c.; Challenge, 45c.; Crown Point, 70c.; Occidental, 15c.; Overman, 20c., and Yellow Jacket, 90c.

At the afternoon session Consolidated California & Virginia dropped sharply to \$4.40, operators waiting apparently for information regarding the assays of the new find. Later the stock took a further drop, steadily declining until the close, when it was quoted at \$3.65. Ophir was quoted at \$2.35; Best & Belcher at \$1.90; Potosi, 95c., and Belcher, 80c.

SAN FRANCISCO, March 9 (By telegraph).—The opening quotations to-day are as follows: Best & Belcher, \$1.65; Bodie, 20c.; Bulwer, 5c.; Chollar, 50c.; Consolidated California & Virginia, \$3.05; Eureka Consolidated, 15c.; Gould & Curry, 80c.; Hale & Norcross, 60c.; Mexican, \$1.45; Mono, 10c.; Navajo, 10c.; Ophir, \$2.35; Savage, 50c.; Sierra Nevada, \$1.20; Union Consolidated, 85c.; Yellow Jacket, 65c.

DIVIDENDS.

Bald Butte Mining Company paid dividend No. 23 of 5% (\$12,500) March 1st, 1894, at the office of the company, in Helena, Mont.

F. E. Belden Mica Mining Company, regular monthly dividend (\$5,000 in all), payable at the office in Boston, March 19th, to stockholders of record on March 16th.

Rico-Aspen Consolidated Mining Company, dividend of 2½ cents per share (\$25,000) payable March 15th at the office of the company in Denver, Col.

MEETINGS.

Delbi Mining Company, at the office of the company, No. 14 Sansome street, San Francisco, Cal., March 14th, at 12 o'clock noon.

Hale & Norcross Silver Mining Company, at the office of the company, Nevada Block, San Francisco, Cal., March 14th, at 12 o'clock noon.

Potosi Mining Company, at the office of the company, Nevada Block, San Francisco, Cal., March 14th at 1 p. m.

Sloss Iron and Steel Company, annual meeting, at the office of the company in Birmingham, Ala., March 21st, at 12 o'clock noon.

NEW YORK MINING STOCK QUOTATIONS. DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, Mar. 3, Mar. 5, Mar. 6, Mar. 7, Mar. 8, Mar. 9, SALES. Lists various mining companies like B.icher, Belle Isle, Bofie Cons., etc.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, Mar. 3, Mar. 5, Mar. 6, Mar. 7, Mar. 8, Mar. 9, SALES. Lists various mining companies like Alpha, Alta, Andes, etc.

*Ex-dividend. †Dealt in at New York stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. D dividend shares sold 3,160. NON-DIVIDEND shares sold, 3,450. Total shares sold, 6,610.

BOSTON MINING STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, March 2, March 3, March 5, March 6, March 7, March 8, SALES. Lists companies like Atlantic, Breece, B at Mont., etc.

Table with columns: NAME OF COMPANY, March 2, March 3, March 5, March 6, March 7, March 8, SALES. Lists companies like Allouez, Arnold, Ateco, etc.

Dividend shares sold, 2,532. Non-dividend shares sold, 4,119. Total shares sold, 6,651.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid—Acetic, chem. pure. .17@.19. Commercial, in bbls. and cys. .013/4@.02. Carbonic, liquefied, # lb. .18@.02. Chromic, chem pure, # lb. 1.00 for batteries. .40. Hydrobromic, dilute, U. S. P. .25@.30. Hydrocyanic, U. S. P. .40@.50. Hydrochloric, U. S. P. .21@.30. Alcohol—95%, # gal. \$2.30@2.40. Absolute, # gal. \$3.80. Ammoniated, # gal. \$2.80. Alum—Lump, # cwt. \$1.75@1.85. Ground, # cwt. \$1.85@1.90. Powdered, # lb. .04 1/2@.05. Lump # ton, Liverpool. # 25. Aluminum Chloride—Pure, # lb. \$1.25. Amalgamating solution, # lb. .60. Sulphate, # cwt. \$1.90@2.50. Ammonia—Sal., in bbl. lots. # 20. Carbamate, # lb., English and German. 07 1/4@.08. Muriate, white, in bbls., # lb. .08 1/2. Aqua Ammonia—in cys. # lb. 03@.04. Antimony—Oxymur., # lb. .10@.11 1/4. Argois—Red, powdered, # lb. .09. Arsenic—White, powdered # lb. 08@.08 1/2. Red # lb. 06@.07. Yellow # lb. 08@.09. White at Plymouth, # ton. \$12.25. Asbestos—Canadian, # ton. \$50@300. Italian, # ton, c. i. f. L'pool. \$18@250. Ashes—Pot. 1st sort, # lb. .47@.55. Pearl. .05 1/4@.06 1/4. Asphaltum—Prime Cuban, # lb. .04@.05. Hard Cuban, # lb. \$28.00@30.00. Trinidad, refined, # ton. \$30.00@35.00. Egyptian and Syrian, # lb. .05@.07 1/2. Californian, at mine, # ton \$12.00@25.00. at San Francisco \$15.00@25.00. Barium—Carbonate, pure, # lb. .45. Carbonate, commercial, # lb. .05@.10. Chlorate, crystal, # lb. .75. Chloride, commercial, # lb. .05@.10. pure, # lb. .16. Iodide, # oz. .40. Nitrate, # lb. .06 1/4@.07. Sulph., Am. prime white, # ton \$17.50@19. Sulph., foreign, floated, # ton. \$21@24. Sulph., off color, # ton. \$11.50@15.00. Carb., lump, f. o. b. L'pool, # ton. \$6. No. 1 Casks, Runcorn, " " \$3 15 0. No. 2 bags, Runcorn, " " \$10.00. Bauxite—# ton. \$10.00. Bichromate of Potash—Scotch, # lb. .11@.12. American, # lb. .11@.12. Bichromate of Soda—# lb. .09 1/4@.10. Borax—Refined, # lb., in car lots. 08@.09. San Francisco. 08@.09 1/2. Coc concentrated, in car lots. 07 1/4@.08. Refined, Liverpool # ton. \$23. Bromine—# lb. .55@.35. Cadmium Nitron—# lb. \$3.00.

Cadmium Iodide—# lb. \$5.50. Chalk—# ton. \$1.50@2.25. Precipitated, # lb. .04@.06. China Clay—English, # ton. \$13@18.00. Domestic, # ton. \$9@11. Chlorine Water—# lb. .10. Chrome Yellow—# lb. .10@.25. Chrome Iron Ore—# ton, San Francisco. \$10.00. Chromalum—Pure, # lb. .35@.40. Commercial, # lb. .02 1/2. Cobalt—Oxide, # lb. \$1.00@1.70. Copper—Sulph., English Wks., # ton \$20@25. Vitriol (blue), ordinary, # lb. 03 1/4@.03 3/4. extra. .04 1/2. Nitrate, # lb. .40. Copperas—Comm'n, # 100 lbs. \$5@.95. Best, # 100 lbs. \$1.35@1.50. Liverpool, # ton, in casks. \$2@22 1/2. Corundum—Powdered, # lb. .04 1/2@.09. Flour, # lb. .03. Cryolite—Pow., # lb., bbl. lots. .07@.08. Emery—Grain, # lb. (# kg.). .04 1/2@.05. Flour # lb. .02 1/2@.04. Epsom Salt—# lb. .01@.01 1/2. Feldspar—Ground, # ton. \$6.00@10.00. Crude. \$2.00@3.00. Fluorspar—Powderd., No. 1, # ton. \$20@25. Lump, at mine. \$6@8. French Chalk—Fuller's Earth—Lump, # ton. \$16@20. Glauber's Salt—in bbls., # lb. .01@.01 1/4. Glass—Ground, # lb. .09@.10. Gold—Chloride, pure, crystals, # oz. \$12.00. pure, 15 gr., c. v., # doz. \$5.40. a. v., # doz. \$5.50. Chloride and sodium # oz. \$6.00. 15 gr., c. v., # doz. \$2.75. Oxide, # oz. \$27.25. Gypsum—Calcined, # bbl. \$1.25@1.50. Land Plaster. Iodine—Resublimed, # oz. .30@.33. Iridium—Oxide # lb. \$90. Iron—Nitrate, 40%, # lb. .01@.01 1/4. 47%, # lb. .02@.02 1/2. Kaolin—See China Clay. Kieserite—# ton. \$9@10. Lead—Red, American, # lb. 06 1/4@.07 1/4. White, American, in oil, # lb. 06 1/4@.07 1/4. White, English, # lb., in oil. 08 1/4@.08 3/4. Acetate, or sugar of, white. 06@.06 1/2. Granulated. Nitrate. .09@.12. Lime Acetate—Am. Brown. .90@.95. Gray \$1.75@1.87 1/2. Litharge—Powdered, # lb. .05 1/4@.07 1/2. English flake, # lb. .06@.09 1/2. Magnesite—Crude, # ton of 1,015. \$14.75. Calcined, # ton of 2,240 lbs. \$22.00. Brick, # ton of 2,240 lbs. \$47.50. Manganese—Ore, per unit. 23@.28. Oxide, ground, # lb. .02 1/4@.02 3/4. Mercuric Chloride—(Corrosive Sublimed) # lb. \$23@.04. Powdered # lb. \$6. Marble Dust—# bbl. \$1.25@1.50. Metallic Paint—Brown # ton. \$20@25. Red. \$20@25. Mica—in sheets according to size. 1st quality, # lb. 25@36.00.

Mineral Wool—Ordinary slag. .01 1/4. Ordinary rock. .02 1/4. Ground, # ton. .04@.06. Naphtha—Black. \$10.00. Nitre Cake—# ton. \$10.00. Ochre—Rochelle, # lb. .01 1/4@.01 3/4. Washed Nat Ox'rd, Lump, # lb. 06 1/2@.06 3/4. Washed Nat Ox'rd, Powder, # lb. 07@.07 1/2. Golden, # lb. .03@.05. Domestic, # ton. \$12@20. Otis, Mineral—Cylinder, light filtered, # gal. .14@.16. Dark filtered, # gal. .10@.13. Extra cold test, # gal. .20@.24. Dark steam refined, # gal. .07 1/2@.12. Phosphorus—# lb. .54@.55. Precip., red, # lb. .80@.85. white, # lb. .85@.90. Platonic Chloride—Dry, # oz. \$7. Plumbago—Ceylon, # lb. .04@.05. American, # lb. .06@.07. Potassium—Cyanide, # lb., C. P. .52. 67%, # lb. .40. mining. .28@.31. Bromide, domestic, # lb. .28@.32. Chlorate, English, # lb. .18@.18 1/4. Chlorate, powdered, English, # lb. .18 1/4@.19. Carbonate, # lb., by casks, 82% .04 1/2@.05. Caustic, # lb., pure slick. .05 1/2@.06. Iodide, # lb. \$2.50@2.80. Nitrate, refined, # lb. .06@.06. Bichromate, # lb. .10@.11 1/4. Yellow Prussiate, # lb. .21 1/2@.22 1/2. Red Prussiate, # lb. .39@.40. Pumice Stone—Select lumps, # lb. 15. Original cks., # lb. .01 1/4@.02. Powdered, pure, # lb. .01 1/4@.02. Pyrites—Non-cupreous, p. units. 10@.11. Quartz—Ground, # ton. \$6.00@10.00. Rotten Stone, Powdered, # lb. 03 1/4@.03 1/2. Lump, # lb. .06@.07. Original cks., # lb. .03 1/4@.03 1/2. Rubbing stone, # lb. .03 1/4@.04. Sal Ammoniac—lump, in bbls., # lb. \$0.94. Salt—Liverpool, ground, # sack. 700. Domestic, fine, # ton. \$7@7.5. Common, fine, # ton. \$4.50@5. Turk's Island, # bush. 26@.28. Salt Cake—# ton. \$10.00@15.00. Saltpeter—Crude, # lb. .03 1/4@.04. Soapstone—Ground, # ton. \$6@8. Block and slab according to size. Sodium—Prussiate, # lb. .22@.24. Phosphate, # lb. .04@.05. Stannate, # lb. .06@.12. Tungstate, # lb. .30@.35. Hypsulphite, # cwt., in casks \$1.70@1.80. Strontian Nitrate, # lb. .08 1/4@.09. Sulphur—Roll, # lb. .01 1/4@.02 1/4. Flour, # lb. .01 3/4@.02. Sylvinit, 72% S.O.P., per unit. 3.75. Talc—Ground French, # lb. .01 1/4@.01 3/4. American No. 1, # lb. .01 1/4@.01 3/4. American No. 2, # lb. .008. Terra Alba—French, # lb. .55@.80. English, # lb. .55@.80. American, No. 1, # lb. .60@.80. American, No. 2, # lb. .40@.50.

Tin—Crystals, in kegs or bbls. .14@.15 feathered or flossed. .20. Muriate, single. .07@.10. Double or strong, 54° B. .10@.15. Oxymur, or nitro. .19. Vermillion—Imp. English, # lb. .80. Am. quicksilver, bulk. .57@.59. Am. quicksilver, bags. .58@.60. Chinese. .85@1.00. Trieste. .90@.95. American. .11 1/2@.13. Zinc White—Am. Dry, # lb. 04 1/4@.05. Antwerp, Red Seal, # lb. 06 1/4@.07. Paris, Red Seal, # lb. .07 1/2@.08. Muriate solution. .06. Sulphate crystals, in bbls., # lb. 03@.03 1/4.

THE RARER METALS.

The prices given below are the prices in Germany, and are per gramme except where otherwise stated: Arsenic (metallic), per kilo. \$0.25. Barium (ex amakam), per kilo. 2.12 (per electrical). 7.75. Bismuth (metallic), per kilo. 6.25. Cadmium (metallic), " 2.75. Calcium (per electrical), " 5.25. Cerium (pulv.), " 2.25 (fusum in globulis). 5.50. Chromium (fus.), " 40. Cobalt (metallic), per kilo. 10.00. (pure), per kilo. 40.00. Didymium (pulv.), " 5.50. Erbium-Yttrium (oxydat.), " 10.00. Gallium (cryst.), " 100.00. Germanium (fus.), " 37.50. (pulv.), " 35.00. Glucium (pulv.), " 7.00. (cryst). 10.75. Iridium. 5.00. Iridium (fusum). 1.25. Lanthanum (pulv.). 6.00. Lithium (in glob.) (per electrol.). 11.00. (wire). 6.25. Manganese (fusum). 6.25. Niobium (pulv.). 12 1/2. Osmium. 4.25. Palladium (wire). 1.00. (pulv.). 1.00. Potassium (metal), per kilo. 27.50. Rhodium. 1.63. Rubidium. 2.50. Rutherfordium. 6.25. Selenium (cryst.). 54. (precipitated). 62 1/2. Strontium (per electrol.). 7.25. (ex amalgam). 3.25. Tantalum. 4.75. Tellurium (fusum). .50. (precipitates). 22 1/2. Thallium. 0.83. Titanium. 1.13. Tungsten (pure). .05. Uranium. 1.00. Vanadium. 4.00.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company. It lists various mining companies and their financial details.

G., Gold, S., Silver, L., Lead, C., Copper, B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$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.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Stock Names, March 3, 5, 6, 7, 8, 9, and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

Total shares sold, 79,421.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Stock Names, March 3, 5, 6, 7, 8, 9, and Sales. Lists industrial and trust stocks with their respective prices and sales figures.

Total shares sold, 825,259.

CALIFORNIA.

Table for California stock prices, including San Francisco and Colorado Springs. Columns include Stock Name, Mar. 2, 3, 5, 6, 7, 8, and Mar. 9.

COLORADO.

Table for Colorado stock prices, including Aspen. Columns include Stock Name, March 3, Price, and Sales.

Colorado Springs, Mar. 3.

Table for Colorado Springs stock prices, including Cripple Creek (gold). Columns include Stock Name, High, Low, and Sales.

Denver.

Table for Denver stock prices, including Alamo, Anaconda, and Amity. Columns include Stock Name, High, Low, and Sales.

Table for Maryland stock prices, including Cr. the Ensign, C. C., Golden D., and Golden E. Columns include Stock Name, Bid, and Asked.

MARYLAND.

Table for Maryland stock prices, including Baltimore, COMPANY, and Conrad Hill. Columns include Stock Name, Bid, and Asked.

MINNESOTA.

Table for Minnesota stock prices, including Duluth, LISTED STOCKS, and Biwabik M. Iron Co. Columns include Stock Name, Par, Bid, and Asked.

UNLISTED STOCKS.

Table for unlisted stock prices, including Adams Iron Co., Ashland Iron Co., and Buckeye Iron Co. Columns include Stock Name, Bid, and Asked.

MONTANA.

Table for Montana stock prices, including Bald Butte (Mont.), Benton group, and Combination. Columns include Stock Name, Bid, and Asked.

PENNSYLVANIA.

Table for Pennsylvania stock prices, including Philadelphia, Cambria, and Edison E. Light Co. Columns include Stock Name, Bid, and Asked.

London Quotations.

Table for London Quotations, including Alaska Treadwell, Alaska Ter., and Almada & Tiritio, Mex. Columns include Buyer, Seller, and prices.

Paris.

Table for Paris stock prices, including Belmez, Spain, Golden River, Cal., and Laurium, Greece.

New York Mining Stocks.

Table for New York Mining Stocks, including Alice, Alta, and Best & Belcher. Columns include Bid, Asked, and prices.

ASSESSMENTS.

Table for Assessments, including Alpha, Nev., Alta, Nev., and Bullion, Nev. Columns include Company, No., Day in office, Day of sale, and Amt. per share.

CLASSIFIED LIST OF ADVERTISERS.

Adders and Calculators
Smith, R. C.

Air Compressors and Rock Drills
American Diamond Rock Boring Co.
Bullock, M. C., Mfg. Co.
Barrish Rock Drill Co.
Clayton Air Compressor Works.
Hassenthal, W.
Ingersoll Serracant Rock Drill Co.
McKernan, S. G. & Co.
Norwalk Iron Works Co.
Penn Diamond Drill & Mfg. Co.
Rand Drill Co. (See Diamond Drills.)

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

Amalgamators
Bucyrus Steam Shovel & Dredge Co.

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

Arms and Ammunition
Hartley & Graham.

Assayers' and Chemists' Supplies
Baker & Adamson.
Baker & Adams.
Berge, J. & H.
Bullock & Crenshaw.
Henry Hill Chem. Co.
Hoskins, Wm.
Overbrook Chem. Co.
Penn Sm. & Ref. Wks.
Penna Salt Mfg. Co.
Queen & Co.

Attorney, Corporation
McIndoe, H.

Babbit's Metal
Epping, Carpenter & Co.

Band Wheels
Poole, R., & Son Co.

Bankers and Brokers
Babel, E.
Bleber & Sohne.
Billings, Robt. & Co.
Grant, E. R.
Handy & Harman.
Hyde, Geo.
Matten, E. C., & Co.
New Mexico M. Ex'g.

Belting
Grotzinger & Sons.
Hendrie & Bolthoff Mfg. Co.
Jeffery Mfg. Co.
New York Belting & Packing Co., Ltd.

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

Blowers
Foss Mfg. Co. | Sturtevant, B. F. Co.

Boiler Compound
American Fluoride Co.

Boilers
Babcock & Wilcox Co. | Stillwell-Bierce & Orr & Sombower, Inc. | Smith-Valle Co. | Follcock, Wm. B. & Co. | Serracant, W. B. & Co. | Scaife, Wm. B. & Sons. | Tudor Boiler Mfg. Co. (See Machinery.)

Brass Castings
Epping, Carpenter & Co.

Brass Rolling Machinery
Poole, R., & Son Co.

Brick Machinery
Fletcher, S. K. | Freese, E. M., & Co.

Bridges
Berlin Bridge Co. | Pittsburg Bridge Co.
Pencoyd Br. & Con. Co. | Scaife, W. B. & Sons.

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

Cable Railways
Poole, R., & Son Co.

Calculators
Smith, R. C.

Carbons
Bishop, Victor, & Co.

Car Wheels
Whitney, A., & Co.

Chain and Link Belting (See Belting.)
Chemicals
Baker & Adamson.
Bullock & Crenshaw.
Henry Hill Chem. Co.
Overbrook Chem. Co.
Clutches, Friction
Poole, R., & Son Co.

Coal
Berwind-White Coal Mfg. Co.
Canner & Curran Consolidation Coal Co.
Coxe Bros. & Co.
Ward & Olyphant.

Coal Cutters
Ingersoll-Serracant Drill Co.
Jeffery Mfg. Co. (See Machinery.)

Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. P., & Co.
American Mining & Milling Machinery Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Hesse, Theo. A. Works.
Fraser & Chalmers.
Frae Vanner Concentrator Gates Iron Works.
Hendrie & Bolthoff Mfg. Co.
Krom, S. H.
Mechanical Gold Extractor Co.
Pierce & Miller Engineering Co.
Seymour Concentrator Co.
Stedman Foundry & Mach. Co.
Waburn-Swenson Mfg. Co. (See Machinery.)

Copper Dealers and Producers
Abbott, Wheelock & Co.
American Metal Co.
Atlantic Mining Co.
Balsch S. & Ref. Co.
Baltimore Cop. Wks.
Boston & Mont. M. Co.
Canadian Copper Co.
Central Mining Co.
Copper Queen Mfg. Co.
Detroit Copper Mfg. Co.

Copper Rolling Machinery
Poole, R., & Son Co.

Contractors and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Pollock W. B. & Co. (See Machinery.)

Crushed Iron
Berlin Iron Bridge Co. | Scaife, W. B. & Sons.

Crucibles Graphite
Obermayer Co.
Stedman's Foundry & Machine Works.

Capula
Obermayer Co.

Dermauliline
Grotzinger & Sons.

Diamonds
Bishop, Victor, & Co.

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

Dredges
Bucyrus Steam Shovel & Dredge Co.

Dredging Machines
Poole, R., & Son Co.

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

Educational Institutions
Columbian University.
Harvard University.
Mass. Inst. of Technology.
Michigan Mining School.
Pennsylvania Military College.
Woodside Seminary.

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

Elevators, Conveyors and Hoisting Machines
Brown Hoisting and Convey. Mach. Co.
Calvert Wire Works.
Cooper, Hewitt & Co.
Davis, F. M., Iron Works.
Hunt, C. W. Co.
Jeffery Manufacturing Co.
Orr & Sombower, Inc.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Works.

Elevator, Grain, Machinery
Poole, R., & Son Co.

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

Employment Bureau
Engineering Employment Bureau.

Engineers, Chemists, Metallurgists
Adams, W. H.
Aase & Russell.
Baker & Co.
Blauvelt, Harrington.
Boggs, W. R., Jr.
Boss, Clarence M.
Boss, M. P.
Brodie, Walter M.
Burlingame, E. E.
Butters, Charles.
Campbell-Tunstall R.C.
Carnahan, F. W.
Carpenter, Franklin R.
Cary, & Moore.
Case, Wm. H.
Cazin, Franz.
Chandler, W. H.
Channing, J. Parke.
Clark, Ellis.
Clement, Victor M.
Collins, J. H. & Sons.
Courtis, Wm. M.
Cramer, Stuart W.
Crawford, J. S.
Darling, L. B.
Davis, Floyd.
De la Bouglise, Geo.
Dewey, Frederic F.
Dickerman, Alton L.
Dickinson, E. P.
Donald, J. T.
Drysdale, Dr. W. A.
Fide & Burwell.
Finnema, Stephen H.
Fischer, E. C.
Everette, Dr. W. G.
Farish, Wm. A.
Fearn, Percy L.
Fisk, W. W.
Forbes, George.
Freeland, Francis T.
Froehling, Dr. Henry.
Furlong, W. H.
Genth, F. A., Jr.
Gooding, F. W.
Gould, James H.
Hahn, O. H.
Halse, E.
Hammond, John Hays
Hampton, W. Hundley
Hardman, John E.
Hastings, John B.
Hofman, Ottokar.
Hollibaugh, J. R.
Hooker & Lawrence.
Hunt & Robertson.
Inne, F. W.
Jennings, E. P.

Engineers' Instruments
Alexander, T. & Son.
Brands' Sons.
Bullock & Crenshaw
Everhardt, J. M.

Engines
Armstrong Brothers.
Buckeye Engine Co.
Bullock, M. C., Mfg. Co.
Orr & Sombower, Inc. (See Machinery.)

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

Fertilizer Machinery
Poole, R., & Son Co.

Fire-Brick and Clay
Chur, A. T.

Flour Mill Machinery
Poole, R., & Son Co.

Flue Stacks
Obermayer Co.

Fly Wheels
Poole, R., & Son Co.

Forges
Foss Mfg. Co.

Founders
Poole, R., & Son Co.
Foundry Cranes
Obermayer Co.

Foundry Supplies
Obermayer Co.

Friction Clutches
Poole, R., & Son Co.

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

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

Gauges, Recording, Etc.
All-n, Chas. A. | Everhardt, J. M.
Bristol Mfg. Co.
Gearing
Poole, R., & Son Co.

Grain Elevators
Poole, R., & Son Co.

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

Hangers
Poole, R., & Son Co.

Heavy Machinery
Poole, R., & Son Co.

Hose, Rubber, Etc.
Allen, Chas. A.
New York Belting & Packing Co., Ltd.

Inspection and Tests
Poole, R., & Son Co.

Insulated Wires and Cables
Okonite Co., Ltd.

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'
Everhardt, J. M.

Lathes
Seneca Falls Mfg. Co.
W. C. Machinery
Poole, R., & Son Co.

Locomotives
General Electric Co.
Hunt, C. W. Co.
Polaris & Co.
Thomson-Houston International Co.

Lubricants
Dixon, Jos., Crucible Co.

Machine Moulded Gearing
Poole, R., & Son Co.

Machinists
Poole, R., & Son Co.

Manganese Steel
Fowler & Co.

Marine Railways
Poole, R., & Son Co.

Machinery
Dealers in Mining, Milling, and Other Machinery
Allis, Ed. P., & Co.
American Mining & Milling Machinery Co.
Armstrong Brothers.
Beckett Foundry & Machine Co.
Buckeye Engine Co.
Bullock, M. C., Mfg. Co.
Colorado Iron Works.
Davis, F. M., Iron Works Co.
Exeter Machine Works Co.
Fraser & Chalmers.
Griffith & Wedge Co.
Hendrie & Bolthoff Mfg. Co.
Jeffery Mfg. Co.
McKernan, S. G. & Co.
Mechanical Gold Extractor Co.
Mecklenburg Iron Works.
Moore, Samuel L., & Son.
Orr & Sombower, Incorp.
Penna. Diamond Drill & Mfg. Co.
Pierce & Miller Engineering Co.
Pollock, Wm. B., & Co.
Poole, Robt., Son & Co.
Scaife, W. B., & Sons.
Seymour Concentrator Co.
Stedman Foundry & Mach. Co.
Sullivan Machinery Co.
Thomson-Houston International Co.
Union Iron Works.
Vulcan Iron Works.
Waburn-Swenson Mfg. Co.

Metal Dealers
Abbott, Wheelock & Co.
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Cowan, Elec. S. & C. Co.
Eureka Co.
James & Shakspeare.

Johnson, Matthey & Co.
Lewisona Bros.
Mathison Smelting Co.
Orford Copper Co.
Pheips, Dodge & Co.
Picher Lead Co.
Pullman, J. W.
State Ore Sampling Co.
Victor Chemical Co.

Metallurgical Processes
American Zinc Lead Co.
Baker & Co.
Balsch Smelting & Refining Co.
Baltimore Copper Works.
Canadian Copper Co.
Cowan, Elec. Smelt. & Alumina Co.
Kansas City S. & Ref. Co.
Leidoux & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Penna. Diamond Drill Mfg. Co.
Ricketts & Banks.
St. Louis Sampling & Testing Works.
State Ore Sampling Co.
Waburn-Swenson Mfg. Co.

Mining and Land Companies
Atlantic Mfg. Co.
Boston & Mont. Mfg. Co.
Central Mfg. Co.
Copper Queen Mfg. Co.
Detroit Copper Mfg. Co.
Eureka Co.
Nickel
Canadian Copper Co.
Nuts, Lock
Young Lock Nut Co.

Ore Cars
Truax Mfg. Co.

Ore Testing Works
Hunt & Robertson.
Leidoux & Co.
Packing and Pipe Coverings
Brandt, Randolph.
Jenkins Bros.
Sawby, Robt.
Wyckoff & Son, A.

Patents
Atkins, J. L.

Perforated Metals
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Mundt & Sons.

Periodicals
Financial Times.
Iron & Coal Trades
El Minerero Mexicano.
Review.
Indian Engineering.
Mining Journal.

Phosphates
Frenholm, Paul C.

Phosphor-Bronze
Penna. Diamond Drill Mfg. Co.

Picks, Miners'
Collins & Co.

Pile Drivers
Bucyrus Steam Shovel and Dredge Co.

Pipes
Pollock, Wm. B. & Co. | Wyckoff & Sons, A.
Poole, R., & Son Co.

Platinum
Baker & Co.
Johnson Matthey & Co.
Plumbago-East India
Obermayer Co.

Powder
Etna Powder Co. | Lafin & Rand Powder Co.

Pulleys
Poole, R., & Son Co.

Pumps
Allen, Chas. A. | Knowles Steam Pump Works.
Cameron, A. S., Mfg. Co. | McGowan, John H., & Co. | Pump Works.
Epping, Carpenter & Co. | Fulcometer Steam Pump Co.
Grotzinger, A., & Sons | Stillwell-Bierce & Smith-Valle Co.
Jeanesville Iron Wks. | Wortington, Henry.

Publications
Allison Coupon Co. | Iron & Coal Trades Rev.
Arms & Explosives. | Mining Journal.
Electrical Plant & Money of the U.S.
Electrical Industry. | Open Court Pub. Co.
Financial Times. | Stechert Gustave.

Pyrites
Coates W. B.

Quarrying Machines
American Diamond Rock Boring Co.
Ingersoll-Serracant Rock Drill Co.
Stand Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co.

Railroad Supplies and Equipment
Hunt, C. W., Co. | Robinson & Orr.
Porter, H. K., & Co. | Young Lock Nut Co. (See Machinery.)

Regulators, Damper, Heat, Etc.
Eddy Valve Co. | Mason Regulator Co.
Lunkenheimer Co.

Rock Drills (See Air Compressor.)

Rolling Mill Machinery
Poole, R., & Son Co.

Roofing
Berlin Iron Bridge Co. | Phelps, Dodge & Co.
Holton Iron & Steel | Pittsburgh Bridge Co.
Roofing Co. | Scaife, Wm B., & Sons
Pencoyd Bridge and Co. Co.

Rope Wheels
Poole, R., & Son Co.

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

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

Screen Plates
Harrington & King Perforating Co.

Separators
Harrison Safety Boiler Works.

Shafting
Poole, R., & Son Co.

Shoes and Dies
Cromer Steel Works. | Crescent Steel Co.
Shevels (Steam) | Bucyrus Steam Shovel & Dredge Co.
Southern & Co.

Smelting and Refining Works
Balsch S. & Ref. Co. | Penn Lead Mfg. Co.
Baltimore Cop'g Wks. | Penna. Salt Mfg. Co.
Bos. & Colo. Smelt. Co. | Penn Smelting and Refining Works.
Cowan, Elec. Smelt. Co. | Refining Works.
Kansas City S. & Ref. Co. | P h o s p h o r - B r o n s e
Mathison Smelting Co. | Smelt. Co.
Orford Copper Co.

Steel Rails, Castings, Rolls, Drill
Steel
Abbott, Wheelock & Co. | Moore, S. L., & Sons Co.
Bethlehem Iron Co. | Roberts, A. & P., & Co.
Cromer Steel Cast. Co. | Robinson & Orr.
Cromer Steel Works. | Whitney, A., & Sons.
Crescent Steel Co. (See Meta. Dealers)
Exeter Machine W. Co.

Tanks
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Sons.
Williams Mfg. Co.

Telegraph Wires and Cables
Okonite Co. The, Ltd.
Tin Plate Rolling Machinery
Poole, R., & Son Co.

Tools
Frat & Whitney Co.

Tubes
Pollock, Wm. B. & Co.
Williams Bros.

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

Tarblines
James Leffel & Co., The.
Poole, Robt. & Son Co.
Stillwell-Bierce & Smith-Valle Co.

Turbine Water-Wheels
Poole, R., & Son Co.

Valves
Eddy Valve Co. | Mason Regulator Co. | Sturtevant & Co., B'g
Jenkins Bros.
Lunkenheimer Co.

Washers
Bullock, M. C., Mfg. Co.

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

Water-Wheels
Poole, R., & Son Co.

Well Drilling Machinery
American Diamond Rock Boring Co.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Williams Bros.

White Lead Machinery
Poole, R., & Son Co.

Wire Clutch
Harrington & King Perforating Co.
Mundt & Sons.
Tyler, W. S., Wire Works.

Wire Rope and Wire
Abbott, Wheelock & Co.
California Wire Works.
Cooper, Hewitt & Co.
Hunt, C. W. Co.
Pheips, Dodge & Co.
Roebbing, J. A., Sons & Co.
Ropeways Syndicate, Ltd.
Trenton Iron Co.
Waburn & Moon Mfg. Co.

Wire Rope Tramway
Brown Hoist. & Convey. Machine Co.
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co.
Hunt, C. W., Co.
Roebbing, J. A., Sons & Co.
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.

1316 WANTED—A RECENT GRADUATE of Boston School of Technology or other technical school, course mining or mechanical engineering, good surveyor, assayer and machinist, with a knowledge of bookkeeping, as assistant to manager at a Southern gold property. Salary moderate, but chance of increase good. Address, with references, salary expected and experience, ARANOS, ENGINEERING AND MINING JOURNAL.

1317 WANTED—A GENERAL MANAGER for a railroad in South America; must speak Spanish and be well recommended. A thorough knowledge of the operation and organization of a railroad absolutely necessary. Apply by letter to RAILROAD, ENGINEERING AND MINING JOURNAL.

1318 WANTED—A THOROUGHLY COMPETENT Master Mechanic, to take charge of railway shops in South America. A knowledge of Spanish absolutely necessary. Apply to COLOMBIA, ENGINEERING AND MINING JOURNAL.

1319 WANTED—PLACER MINER COMPETENT to install and operate hydraulic plant in South America. New York references required. Address AMERICAN, ENGINEERING AND MINING JOURNAL.

1320 WANTED—AN EXPERT PLACER MINER to superintend the installation and operation of hydraulic plant in South America. Address COMPETENT, ENGINEERING AND MINING JOURNAL.

1321 WANTED—AN EXPERIENCED ASSAYER and chemist for silver-lead smelter in Mexico. Salary fair. Address MEX., ENGINEERING AND MINING JOURNAL.

Situations Wanted.

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

RECENT GRADUATE OF TECHNICAL school with experience in railroad building, at present county surveyor, desires position as assayer or assistant to mining engineer or superintendent. Address GEO. B. GILL, Searcy, Ark. No. 16,053, March 17.

A FIRST-CLASS MACHINIST WISHES engagement to erect or take charge of machinery, or as engineer. Address C. F. ALVERSON, Salem, Ohio. No. 16,149, March 17.

POSITION WANTED OF ANY KIND connected with mining or railroading. Am a practical, experienced civil and mining engineer, and for the last sixteen years have had responsible positions as mining engineer, manager in and outside of mines, construction of railroads, etc. Have first-class references. Married, 35 years of age; speak three languages fluently. Moderate salary expected. Address PRACTICAL, ENGINEERING AND MINING JOURNAL. No. 16,147, March 17.

WANTED—A SITUATION BY A COMPETENT Engineer and Electrician to take charge of an electric railway power-house, an electric light station or other plant. Experience with compound Corliss and high-speed engines, arc and incandescent dynamos, and railway generators. Good references. Will go anywhere. ELECTRICIAN, 64 Ohio St., Allegheny, Pa. No. 16,163, March 17.

POSITION WANTED—AS CHEMIST OR ASSAYER. Experienced. Is also a bookkeeper. Address B. A. C., ENGINEERING AND MINING JOURNAL. No. 16,162, March 17.

EXPERIENCED GRADUATE CIVIL ENGINEER wants position as draughtsman; salary can be moderate; references. Address F. L., ENGINEERING AND MINING JOURNAL. No. 16,146, March 24.

POSITION WANTED. AS STATIONARY ENGINEER Have had 15 years' practical experience with boilers, high speed and Corliss engines. Have indicator and planimeter. Am a member of the N. A. S. E. Can give good reference. Address STATIONARY ENGINEER, ENGINEERING AND MINING JOURNAL. No. 16,139, March 31.

A PRACTICAL MILLMAN, WITH 12 years' experience in managing and working both wet and dry gold and silver chloridizing and amalgamating mills, wishes a position as foreman. Good assayer; has some experience with cyanide process; would be willing to go to Mexico. Unquestionable reference as to character and ability. Address MILLMAN, ENGINEERING AND MINING JOURNAL. No. 16,159, March 31.

WANTED—SITUATION AS CHEMIST AND metallurgist; have had several years' experience with all classes of furnace supplies and products; technical education. Good reasons given for leaving present situation. Address A. M. H., ENGINEERING AND MINING JOURNAL. No. 16,164, May 19.

A YOUNG, TECHNICALLY EDUCATED Mining Engineer and Geologist desires an engagement in South America. Address "DIABASE," ENGINEERING AND MINING JOURNAL. No. 16,151, March 31.

WANTED—SITUATION IN SMELTING OR concentrating works; technical education; several years' experience in treating low grade ores. References given. Address SMELTING AND CONCENTRATING, ENGINEERING AND MINING JOURNAL. No. 16,155, June 9.

A MINING SUPERINTENDENT, GRADUATE Civil Engineer, with successful experience in difficult and dangerous mines, will engage to manage mines, or to examine and report upon mining properties, and furnish mining plans for safe and successful extraction of ores; satisfactory references. Address C. E., ENGINEERING AND MINING JOURNAL. No. 16,150-11.

**Contracts**

WATER-WORKS.—Office of the City Clerk, City of Buffalo, Wyo.—The city of Buffalo, Wyo., invites proposals for the construction of its proposed Gravity System of Water-Works in accordance with the plans and specifications on file in the office of the undersigned. Sealed proposals will be received by the undersigned up to March 31st, 1894. For instructions as to manner and form of submitting bids, terms and conditions of payment, and all other necessary information, call on or address WM. H. FENN, City Clerk, Buffalo, Wyo.

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the Navy Yard, Norfolk, Va.," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until March 22d, 1894, and publicly opened immediately thereafter, to furnish at the Navy Yard, Norfolk, Va., a quantity of pipe fittings and valves; also the necessary labor and material to drive 24 two-inch pipe well. The articles must conform to the Navy standard and pass usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, Norfolk, Va. The attention of manufacturers and dealers is invited. EDWIN STEWART, Paymaster-General U. S. Navy.

FUEL, ETC.—Office of Light House Inspector, Eighth District, at New Orleans, La.—Proposals will be received at this office until April 4th, 1894, for furnishing and delivering fuel and provisions for vessels and stations in this district for the fiscal year ending June 30th, 1895. Forms of proposal and printed specifications, giving full particulars as to the kinds of fuel required, the quantity and quality, and the terms of delivery and payment, can be obtained at this office. J. B. COGHLAN, Commander U. S. N., Light House Inspector.

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the village of Frankfort until March 31st, 1894, for the construction of water-works. The work will be divided into two sections, as follows: First—The supply system, comprising the furnishing and laying about 215 net tons of cast-iron pipe, from 4 to 16 inches in diameter, furnishing and setting about 2 net tons of special castings, about 12 valves and about 1 air valve and about 5 valve boxes. Second—The distributing system, comprising the furnishing and laying of about 520 net tons of cast-iron pipe, from 2 to 12 inches in diameter. The furnishing and setting of about 34 net tons of special castings, about 40 double nozzle hydrants, about 45 valves and about 45 valve boxes. Bids will be received for either or both of the above sections. Plans can be seen and specifications secured at the office of the Board of Water Commissioners at Frankfort, N. Y., on and after March 12th, 1894.

DRILLING ARTESIAN WELLS.—DEPARTMENT of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals indorsed "Proposals for Drilling Artesian Wells," and addressed to the Commissioner of Indian Affairs, Washington, D. C., will be received until April 10, 1894, for furnishing the necessary materials and labor required in drilling one artesian well each on the Pine Ridge, Rosebud and Standing Rock Indian Reservations in South Dakota. Bidders to furnish their own specifications for doing the work, and if possible state the length of time proposed to be consumed in drilling each of the wells. A separate bid for each well is required. Location of the proposed wells, means of transportation, with cost per cwt., and such knowledge of the local conditions of each reservation as is had by the U. S. Indian Agents in charge of the reservations named, will be furnished upon application to said agents, whose postoffice addresses are respectively: Pine Ridge Agency, S. D.; Rosebud Agency, S. D., and Standing Rock Agency, N. D. Proposals will be made to do the work at stated rates per foot, and not for a lump sum. The right is reserved to reject any or all bids or any part of any bid deemed for the best interests of the service. D. H. BROWNING, Commissioner.

WATER-WORKS.—SEALED PROPOSALS will be received by the city of Greenfield, Ind., until March 21st, 1894, for furnishing the materials and constructing a system of water-works for said city. There will be required about 452 tons of cast iron pipe, 13 tons of special castings, 60 fire hydrants, brick pumping station and chimney, two pumps of combined capacity of 2,000,000 gallons per day, pump well, the necessary valves, valve boxes, etc. Bids will be received for furnishing materials above or for constructing the works complete. Plans may be seen and specifications and blank form of proposal procured at the office of the City Clerk, Greenfield, Ind., or at the office of the Engineers, Voorhees & Wimer, rooms 65 and 96 Chablin Block, Buffalo N. Y. AMBROSE J. HERRON, Mayor. HARRY G. STRICKLAND, Clerk.

IRON VAULT DOORS.—TREASURY DEPARTMENT, Office of the Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 20th day of March, 1894, and opened immediately thereafter, for all the labor and materials required to supply and put in place the iron vault doors for the U. S. Court House and Post Office at Troy, N. Y., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Troy, N. Y. 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 and all bids and to waive any defect or informality in any bid if 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 Iron Vault Doors for the U. S. Court House and Post Office, Troy, N. Y.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

FUEL AND PROVISIONS.—Office of Light House Inspector, Sixth District, Charleston, S. C.—Proposals will be received at this office until the 31st day of March, 1894, for furnishing, 1, fuel for tender and light vessels for the fiscal year ending June 30th, 1895, and, 2, provisions for tender and light vessels for the fiscal year ending June 30th, 1895. Forms of proposal and specifications showing what is required can be had or seen by applying to this office. Applicants for forms and specifications should state whether it is for fuel or provisions that they wish to bid. H. R. S. MACKENZIE, Lieutenant Commander U. S. Navy, Light House Inspector.

FURRING, IRON AND COPPER WORK.—Treasury Department, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 28th day of March, 1894, and opened immediately thereafter, for all the labor and materials required for the iron furring, lathing and plastering, iron and copper work of ceiling light, etc., for the United States post office, court house, etc., at Charleston, S. C., in accordance with the drawings and specification, 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 two per cent. of the amount of the proposal. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Iron Furring, Lathing and Plastering, etc., for the United States Post Office Court House, etc., Building at Charleston, S. C.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

COLUMNS, BEAMS, ETC.—TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 29th day of March, 1894, and opened immediately thereafter for furnishing and putting in place complete the first story columns and the second floor beams and girders in the U. S. post office, court house and custom house building at St. Paul, Minn., in strict accordance with the drawings and specifications, copies of which may be obtained at this office or the office of the superintendent at St. Paul, Minn. Proposals must be inclosed in envelopes, sealed and marked, "Proposal for the First Story Columns and Second Floor Beams and Girders, &c. for the U. S. Post Office, Court House and Custom House Building at St. Paul, Minn.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

PUMP-HOUSE.—Office Constructing Quartermaster, Burlington, Vermont.—Sealed proposals in triplicate will be received at this office until April 9th, 1894, and opened immediately thereafter, for the construction at Fort Ethan Allen, Vermont, of a pump-house, complete, and pumping plant, complete, in accordance with the plans and specifications to be seen at this office, where general instructions and circular to bidders and blank forms of proposals will be furnished. The United States reserves the right to reject any or all bids. Address Captain GUY HOWARD, Assistant Quartermaster U. S. Army.

STEEL HORSESHOES.—Jeffersonville, Ind.—Sealed proposals in triplicate will be received here until the 7th day of April and then opened, for furnishing at the Q. M. Depot here 32,000 pounds of steel horseshoes. Government reserves the right to reject any or all proposals, and to accept the whole or any part of the supplies bid for. All information furnished upon application to this office. Envelopes containing proposals should be marked "Proposal for Steel Horseshoes" and addressed to Colonel HENRY C. HODGES, Assistant Quartermaster-General U. S. Army, Depot Quartermaster.

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.

LANDS AND MINES FOR SALE.

Grand Opportunity for Investment

FROM 4,000 TO 4,500 ACRES

Coal, timber and farming lands, near railroad in Somerset County, Pennsylvania, accessible to Eastern markets, for sale on most reasonable terms, or might consider income property clear in part payment if location satisfactory. Owners have not time to give attention. Title perfect. Inquire of

W. P. HUME,
Bellefonte, Pa.

GOLD MINING STOCK

35 Cents per share.
Surely to be worth one dollar.

Send orders for stock or free prospectus, giving full details, to

The West End Gold Mining Company,
W. H. A. STEARNS
(ex-Lieut.-Gov. of R. I.), President,
241 Washington St., Boston, Mass.

GOLD MINE FOR SALE.

A fully developed GOLD MINE in Virginia is for sale, in part or whole, at one-fourth the sum for which a property of the same value could be purchased in a Western State, present controllers not having sufficient capital to put down a chlorination plant and operate it. There are eight to ten true fissure veins assaying \$10 to \$275 per ton. Mill of 10 stamps, engine, boiler, etc.; miners' wages, \$1 per diem; 274 acres of land, over half under cultivation; plenty of wood and water; good residence and all necessary outhouses. A rich magnetic iron ore vein, free from sulphur, crosses the property for three-quarters of a mile; five miles from railroad station. Mining can be done 12 months in the year. No snow blockades; no blizzards. Address

FRANK SMYTH, 904 12th St. N. W., Washington, D. C.

MISCELLANEOUS WANTS.

TO CENTRAL AMERICA.

We are making a professional trip on March 20, and would represent other engineers; also report on any mine or other interests, represent manufacturers, etc.

PASCHKE & KELLEY,
Civil Engineers,

Room 90, World Building, New York City.

DIVIDENDS

HIGHLAND MINING COMPANY.

March 16th, 1894.

The monthly dividend, twenty (20) cents per share, has been declared, payable April 2d, at the office of the company in San Francisco, or at the office of the transfer agents, 15 Broad street, New York. Transfer books close on the 26th inst.

LOUNSBERY & Co.,
Transfer Agents.

HOMESTAKE MINING COMPANY.

MILLS BUILDING, 15 Broad St.,
NEW YORK, March 15, 1894.

DIVIDEND 188

The regular monthly dividend, FIFTEEN (15) CENTS PER SHARE, has been declared for February, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 26 inst. Transfer books close on the 20th inst.

LOUNSBERY & CO., Transfer Agents.

MOLLIE GIBSON CONSOLIDATED MINING AND MILLING COMPANY.

COLORADO SPRINGS, Colo., December 1st, 1893.

DIVIDEND NO. 41

A dividend of five cents per share (\$50,000) has been declared, payable December 15th, 1893, to stockholders of record on December 8th. Transfer books close December 8th, and reopen December 16th, 1893.

PERCY HAGERMAN, Sec'y-Treas.

THE RICO-ASPEN CONSOLIDATED MINING COMPANY.

DENVER, Colo., Feb. 23, 1894.

A dividend of two and one-half cents per share, twenty-five thousand dollars, has been declared, payable March 15 to stockholders of record on March 10. Transfer books close March 10 and reopen March 16. Transfers of stock to be made at the general office of the company, Denver, Colo., or at the offices of W. M. Tuttle, 22 William Street, New York, or Elliot, Johnson & Co., Philadelphia.

A. B. ROEDER, Secretary.

MINING and CORPORATION ATTORNEYS

SALT LAKE CITY, Utah Territory, U. S. A.

General attorneys for these leading corporations, viz.: The Ontario Silver Mining Co.; Daly Mining Co.; Eureka Hill Mining Co.; Centennial Eureka Mining Co.; Mammoth Mining Co.; Gemini (Keystone) Mining Co.; Old Jordan & Galena Mining Co.; Pleasant Valley Coal Co.; Corinne Mill, Canal & Stock Co.; Utah Title Ins. & Trust Co. and others, and attorneys (in and for Utah Territory) for the Rio Grande Western Ry. Co. Rio Grande Construction Co., the Emma Co. (Ltd.) of London and others.

C. W. JOHN A. W. M.
BENNETT, MARSHALL & BRADLEY
Successors to BENNETT, HARKNESS & KIRKPATRICK.

FOR SALE.
SOUTHERN GOLD MINE.
AT REASONABLE PRICE.

Favorably located. Sufficiently developed to prove value. Promise quick and large returns. Reasons for sale, lack of capital.

—ADDRESS—

PROF. J. C. HORTON,
Kings Mountain, N. C., or Box 60, Waterbury, Conn.

A MINING INVESTMENT OF MERIT

THE BLACK WONDER GOLD AND SILVER MINING CO.,
Of Sherman, Minn.-dale County, Col.

Mine thoroughly developed, four levels, a total depth of 240 feet, over 1,400 feet of shafts and tunnels, from which regular shipments of high-grade ore are made, worth from \$50 to \$100 per ton. Stock selling at 70 cents per share (par value \$1.00); soon to be advanced. Monthly dividends paid since July, netting investors at rate of 17 per cent. per annum on present selling price. For stock and full particulars address

The Black Wonder Gold and Silver Mining Co.,
Hon. ANDREW J. WATERMAN (ex-Attorney General of Massachusetts), President,
244 Washington St., Boston, Mass.

FINANCIAL.

QUINCY MINING COMPANY.

New York, March 16th, 1894.
At a special meeting of the stockholders of the Quincy Mining Company held in New York, March 15th, 1894, the purchase from the St. Mary's Canal Mineral Land Company of 640 acres of mineral land, as reported in our last annual report issued to the stockholders, was ratified and confirmed; and in order to provide means to pay for and equip the territory acquired without interfering with the present rate of dividends on the now outstanding 50,000 shares of stock of the company, the following resolutions were unanimously adopted, viz.:

"Resolved, That notice is hereby given that the capital stock of the Quincy Mining Company will be increased, on and after Apr 1 18, 1897, from 50,000 shares of \$25 each, to 100,000 shares of \$25 each, or from par value of \$1,250,000 to par value of \$2,500,000."

"Resolved, That each stockholder of record March 24, 1894, is entitled to receive one additional share for each share then held on payment of \$25 per share of said additional stock in four annual installments, viz.:

Twenty-five per cent. or \$6.25 per share on April 16, 1894.

Twenty-five per cent. or \$6.25 per share on April 16, 1895.

Twenty-five per cent. or \$6.25 per share on April 16, 1896.

Twenty-five per cent. or \$6.25 per share on April 16, 1897.

"And authority is hereby given to the President and Secretary to issue such increased stock, on payment of such installments, the installments to be represented by an issue of scrip certificates, showing on their face the amount paid in, which shall bear no interest, nor be entitled to any dividends nor voting power, until the full amount of \$25 per share has been paid in, and they have been surrendered and converted into full paid stock certificates, on and after April 16, 1897."

"Resolved, That the scrip certificates, representing the installments as paid in, shall be transferable on the books of the company by the holder in person or by attorney, on surrender thereof, but no transfer shall be made until all installments due thereon shall have been paid."

In accordance with the foregoing resolutions, scrip certificates, showing the rights to shares of the capital stock of the par value of \$25 each, issued for the purpose of increasing the capital stock of the Quincy Mining Company, will be ready for delivery on and after April 16, 1894, and can be obtained on payment of first installment then due, by application to the Treasurer of the company, 52 Broadway, room 70, New York.

Interest at rate of 6% per annum will be charged on all installments not paid when due.

Application will be made to have the rights listed at the Boston Stock Exchange.

Any stockholder desiring to dispose of his rights before payment of the first installment, can make them negotiable by use of a power of attorney, properly executed. Blanks for this purpose have been prepared, and can be procured from the treasurer, or Mr. N. H. Daniels, Transfer Agent, 35 Congress Street, Boston, and at the mine office, Hancock, Mich.

WM. R. TODD,
Treasurer.

WANTED AT ONCE.

Copies of the Engineering and Mining Journal of January 11th, February 8th, April 19th, May 3d, August 23d, October 4th and 11th, November 22d and December 27th, 1890; January 3d and 17th, May 2d, 9th and 30th, October 10th and December 23d, 1891; January 9th and 16th, 1892; January 14th, February 4th, July 29th and December 9th, 1893.

—ADDRESS—

Scientific Publishing Co.,
P. O. Box 1833, N. Y. City.

WANTED.

Volumes XI, XII. (1871), XIII. and XIV. (1872) of the Engineering and Mining Journal, bound or unbound.

For full particulars address the Scientific Publishing Co., 27 Park Place, New York.

MACHINERY AND SUPPLIES FOR SALE.

FOR SALE CHEAP

A Good Instrument for a German Engineer.

- 1 German Mining Theodolite, with extra level for short level work.
- 1 Eccentric Telescope.
- 1 Metric Sliding Leveling Rod.
- 1 Lantern for same (in case).
- 1 box with metre reel and 6 screws for spreizen-aufleitung of theodolite, and set plate for theodolite on tripod.

Manufactured by LINGKE, of Freiberg, Germany

Address Theodolite,
ENGINEERING AND MINING JOURNAL.

Any time you are in the market to buy STEEL RAILS,

either New or Second-Hand, write to us. We can furnish any weight of New Rails. We own and have for immediate delivery 400 tons of Second-Hand 60 lb. Steel Rails, guaranteed in good condition to relay, which we will sell cheap.

ROBINSON & ORR,
No. 419 Wood Street, Pittsburg, Pa.

FOR SALE.

One new, improved Nard Pulverizer, with cast iron jacket, cheap for cash. Address
ROBERT W. BONYNGE,
438 Equitable Building, Denver, Colorado.

Notice of Assessment.

Con. Cal. & Virginia Mining Company.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia City, Storey County, Nev.

Notice is hereby given that at a meeting of the Board of Directors held on the 6th day of March, 1894, an assessment (No. 4) of Fifty (50) 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 corporation, Room 58, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Tuesday, the 10th day of April, 1894, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the 28th day of April, 1894, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.
A. W. HAVENS, Secretary.
Office, Room No. 58 Nevada block, No. 309 Montgomery street, San Francisco, Cal.

THE HASENZAHL
DIAMOND BIT ROCK DRILL
 FOR HAND AND OTHER POWER.
 Brings out a Core. Write for Particulars.
W.M. HASENZAHL, Mfr.
 135 West Second Street, Cincinnati, Ohio.

HUNT & ROBERTSON,
 77 PINE ST., NEW YORK,
ANALYSTS & ASSAYERS,
 MINING ENGINEERS.
 Specialty Made of Copper Metallurgy.

THE CANADIAN COPPER CO.
 HEAD OFFICE:
 Room 201 Perry-Payne Bldg., Cleveland, O.
 Miners and Smelters of Copper-Nickel
 Ores at Sudbury, Ontario, Can.
COPPER-NICKEL.

BALTIMORE
 Copper Smelting and Rolling Company
 (THE BALTIMORE COPPER WORKS,
 Office: KEYSER BUILDING,
 BALTIMORE, MD.)
 INGOT COPPER. SHEET COPPER.

J. STOCKLY CARY, JOHN E. MOORE,
 Chemist and Assayer Dep't of formerly with Rattle Nye
 Mines and Mining; Chemist of & Hollis, Rookery Building.
 National Bureau of Awards. World's Columbian Exposition.

CARY & MOORE,
 Analytical and Consulting Chemists, Samplers and Assayers,
 1760 Monadnock Building, - CHICAGO.
 Specialty: Coal and Coke Analyses.

Ofrecimiento de Servicios.

A las personas que necesiten maquinaria ó accesorios mecánicos y á bien tengan dar de ello aviso á la administración de **THE ENGINEERING AND MINING JOURNAL**, se les comunicará la dirección de los fabricantes más acreditados en los respectivos ramos.

Y á cuantos deseen comprar mercancías ó productos Americanos para el extranjero, les ofrecemos de igual manera nuestros servicios para el pronto envío de catálogos, con informes completos sobre los diversos artículos, indicación de precios y descuentos de los fabricantes, etc.

Estos servicios se prestan gratuitamente y sólo en obsequio y beneficio de nuestros suscriptores y avisadores, pues los editores-propietarios de **THE ENGINEERING AND MINING JOURNAL** ni somos corredores ni exportadores, ni nos ocupamos en la compra ó venta de mercancías de clase alguna.

LEWISOHN BROTHERS,
 P. O. BOX 1247. 81 AND 83 FULTON STREET, NEW YORK.
LAKE COPPER, ARIZONA CASTING COPPER.
 SOLE AGENTS A. C. C. AND M. A. BRANDS.
 ADVANCES MADE ON COPPER, MATTE, AND ORES

AGENTS FOR THE FOLLOWING MINING COMPANIES:
 Boston and Montana Consolidated Copper and Silver Mining Company, Montana.
 Butte & Boston Mining Company, Montana.
 Arizona Copper Company, Arizona.
 Huron Copper Mining Company, Lake Superior, Mich.
 Tamarack Mining Company, Lake Superior, Mich.
 Osceola Mining Company, Lake Superior, Mich.
 Kearsarge Mining Company, Lake Superior, Mich.
 Santa Fe Copper Company, New Mexico.
 Peninsula Copper Mining Co., Lake Superior, Mich.

HIGH GRADE HOISTING ENGINES AND DRUMS.

We have some of the heaviest plants in the world in Iron, Copper and Silver Districts of United States.
OUR CORLISS ENGINES ARE DESIGNED EXPRESSLY FOR HOISTS

SEND FOR CATALOGUE.

OTHER SPECIALTIES.

Diamond Core Drills.
 Rock Drills and Air Compressors.

Cable Address:
 "BULLOCK."

M. C. BULLOCK MFG. CO.,
 37 Canal Street, Chicago, Ill.

THE AMERICAN METAL CO., LIMITED.

80 Wall Street (P. O. Box 957), NEW YORK.
 114 Laclède Building, ST. LOUIS, MO.
COPPER, COPPER ORES AND MATTES, TIN, LEAD, SPELTER, ANTIMONY, NICKEL, ALUMINUM.
 ADVANCES MADE ON CONSIGNMENTS.
 Agents for Henry R. Merton & Co., London; Metallgesellschaft, Frankfurt-on-Main; Williams, Foster & Co., Limited, Swansea, Eng.; Pascoe, Penfell & Sons, Limited, Swansea, Eng.; Balbach Smelting & Refining Co., Newark, N. J.

ORFORD COPPER CO., COPPER SMELTERS

Works at Constable's Hook, N. J., opposite New Brighton, Staten Island. Copper Ore, Mattes, or Bullion purchased. Advances made on consignments for refining and sale. Specialty made of Silver-Bearing Ores and Mattes.

INGOT AND CAKE COPPER.
 President, **ROBERT M. THOMPSON,**
 Office, 37 to 39 Wall Street, New York.

JAMES & SHAKSPEARE, ENGLAND.

1 Metal Exchange Buildings, London, E. C., AND
 47 Irwell Chambers West, Liverpool.

METALS, MATTES AND MINERALS.

Cable Address, **METALLURGY, LONDON.**
 Use A B C Code, 4th Edition.

Established 1845.

W. & L. E. GURLEY, TROY, N. Y.
 Largest Manufacturers of Civil Engineers' and Surveyors' Instruments. Send for Illustrated Circular Price List showing latest improvements.

LEDOUX & CO., Assayers and Engineers.

9 Cliff Street, New York.
 ORES, BARS, BULLION AND ALL FURNACE PRODUCTS SAMPLED AND ASSAYED.
 Public Ore Yards and Sampling Works.
 ADVANCES OBTAINED ON CONSIGNMENTS. PRINCIPAL BANKS AND METAL BUYERS ACCEPT OUR CERTIFICATES AS FINAL.

ASSAYERS BY APPOINTMENT TO NEW YORK METAL EXCHANGE.

RICKETTS & BANKS, ORES TESTED!

104 John St., New York.
 Complete Ore Milling and Testing Works or making practical working tests of ores to determine the Best Method of Treatment. Milling, Metallurgical and Chemical Processes investigated.

Assays and Analyses!

CIRCULARS AND TERMS ON APPLICATION.

The best place to order books of any kind.
The Scientific Publishing Co.,
 27 Park Place, New York.

STUART W. CRAMER, Engineer,
 OF THE
D. A. TOMPKINS COMPANY, Charlotte, N. C.
 (EX.-U. S. ASSAYER)

General Consulting and Contracting Engineers Assay and Experimental Laboratory, Westinghouse System of Electric Lighting and Power. Examination of Mineral Properties.

DR. HENRY FROEHLING,
 Chemical and Metallurgical Laboratory.
 7 South 12th Street, Richmond, Va.

Assays and analyses of ores, furnace products, clays, limestones, phosphates, waters, coals, oils, gases, etc. Price lists of analyses on application. Mines and mineral properties in the South examined.

HASTINGS, JOHN B.,
 Consulting Mining Engineer.
 Office: Broad St. House, Old Broad St., London, E. C., England.
 Present Address: Boise City, Idaho, U. S. A.

THE COWLES ELECTRIC SMELTING & ALUMINUM COMPANY,
 LOCKPORT, N. Y.
 Offer Commercially Pure Aluminum in Ingots, Slabs, Sheet, Wire, and Castings at lowest market rates.
 Aluminum Bronze, Aluminum Brass, Silver Bronze, Silicon Bronze, and Manganese Bronze.