

the directors pointed to the disastrous coal strike as the cause of their misfortunes and in 1894 the general depression in trade was the scapegoat. For 1895 it would be supposed to be difficult to find any reason for the fall that was not connected vitally with the industry itself, but the directors still put forward the general depression of trade as the cause. The output of salt fell from 1,284,000 tons in 1894 to 1,217,000 tons in 1895, and the net divisible profit from £130,159 to £121,239. We are inclined to think that the directors are unwilling to acknowledge the real cause of their continued shrinkage of output and profits, viz., the increasing competition of German producers. They may choose to ignore this competition, but it is the true explanation of the phenomena in question.

The readers of the *Engineering and Mining Journal* may remember that this paper opposed the extension of this company to this country which was attempted, and predicted its ultimate collapse.

The Acetylene Bubble.

Judging from the advertisements in some of our exchanges it would seem necessary to again warn the public against the gigantic acetylene bubble, one of the most dangerous schemes ever attempted to be floated in this country and one which must bring losses to everyone who invests in it. The mere fact that such financially strong and interested concerns as the Metropolitan Gaslight Company of New York, the United Gas Improvement Company of Philadelphia, the Standard Oil Company and others, had the whole matter investigated by the most competent experts in this country, when it was first brought out and they could have controlled it, and that each of them dropped it as of no importance, should be sufficient warning to most people. We know that these experts reported that the manufacture of acetylene could be carried on freely, no essential part of the manufacture of calcium carbide or acetylene being covered by good patents, and further that even without royalty the cost of acetylene would prohibit its substitution for petroleum naphtha for enriching illuminating gas.

The Spray Works in North Carolina, which we were told could make calcium carbide at \$5 to \$7 a ton, now have got down to the point of quoting it at 5 cents per pound (\$100 a ton) and claim to be able to supply 400-lb. lots—one would suppose they would not throw it away here at about half its advertised market price in England.

At even \$100 a ton for absolutely pure calcium carbide—which none of it is—acetylene would cost about \$250 a ton, as against \$15 a ton for petroleum naphtha for enriching illuminating gas. The danger of handling and using acetylene is also becoming better known and is a very serious drawback.

We may say that the great amount of information that has come to us since the *Engineering and Mining Journal* first exposed this vast and skilfully concocted scheme for "coining money," but confirms our opinion that the acetylene manufacture is not monopolized by any patents, and that even its free manufacture will leave but very modest competitive profits, for its uses will be quite limited. There is absolutely nothing in it to justify the investments of the vast amounts called for by local acetylene companies, and the whole thing is fitly characterized as a gigantic and dangerous "bubble."

Sulphide Processes in England and Australia.

A year or two ago it used to be the saying that every metallurgist and mining man one met had a special process, either patented or in his brain, for the treatment of gold ores. In England and Australia at present the same may be said, with the substitution of zinc-lead sulphides for gold ores. We have reason to believe this, because in our attempts to find some metallurgist in those countries who was capable of criticising the various sulphide processes put forward, we have not been able to find anybody who did not confess to a theory and process of his own.

There are two processes which are at present attracting much attention in England, viz., the Ashcroft process and that of Fry, Everitt & Co. The former is being exploited by the Sulphide Corporation (Ashcroft's process), Limited, and the second by the Burnham Syndicate, Limited, which is merely a syndicate organized by Fry, Everitt & Co., the Swansea smelters. Neither of these companies have advertised publicly for funds, but the capital has been raised privately.

The Sulphide Corporation (Ashcroft's process), Limited, was formed in October last, with a capital of £1,000,000, and an influential directorate, including the Earl of Kintore, Mr. H. L. Gibbs (of Antony Gibbs & Sons and Gibbs, Bright & Co.), and Mr. J. H. Lukach, who is joint managing director with Mr. Hamilton Smith, of the Exploration Company. The company has experimental works at Grays, Essex, near London, under the special direction of Mr. Ashcroft. We are not able to discuss the present value of the Ashcroft process, for the reason that improvements are continually being made on the results of experiments, and the process has by no means arrived at a final form; but these facts demonstrate that it was overvalued when brought out. There is one criticism we have to make which does not depend on the usefulness of the process, but simply on a ques-

tion of patent law. The first patent was taken out in New South Wales and England some two years ago. After it was taken out it was found that part of it was unsatisfactory and the claim untenable. In England there was no difficulty in obtaining an emendation of the patent, but in New South Wales it is impossible to amend a specification. At the present time the people interested in this process are doing everything in their power to obtain an alteration of the patent law of New South Wales. Until such an alteration is enacted, however, it is obvious that in the very country where the process is likely to be of the greatest use the patent is invalid. This point is, we believe, not generally understood in America and England, and we therefore take this opportunity of drawing attention to it.

The other process, that of Fry, Everitt & Co., which is being exploited by the Burnham syndicate, is of an entirely different nature, but it has this in common with the Ashcroft process that it has before it some rocks in connection with the validity of its patents. The process consists practically in the smelting of the ores with coal, iron oxide and salt cake. Quite apart from the question of its practical value and the necessity of establishing concurrently an alkali works, it is doubtful how far it infringes Captain Angel's previous patent, and whether it was not anticipated by Ellershausen experiments, which formed a natural sequence of the process of the alkaline reduction hydrants of London. We hope in a short time to enter into this question fully. It would be well for proposing investors in any of these processes to ascertain what has been done and what patented in America, it may save them much loss in some cases.

NEW PUBLICATIONS.

MATTE SMELTING; ITS PRINCIPLES AND LATER DEVELOPMENTS DISCUSSED. WITH AN ACCOUNT OF THE PYRITIC PROCESSES. By Herbert Lang. New York and London; The Scientific Publishing Company. Pages, 98. Price \$2.

The author and the publishers of this work are to be congratulated for the intelligent and instructive arrangement of the first systematic effort to expound the theory and practice of matte smelting. The Scientific Publishing Company has performed a real service to the profession by adding another practical book to its list. The introduction to the volume itself, and the whole of its contents, though the book contains less than 100 pages, gives more information than has heretofore been presented in the aggregate, in a more scattered form by different writers. Even to a novice the explanatory definition of matte smelting in the introduction would be attractive, and the system of diagrams, and what might almost be called a "family tree," showing the relations of the various processes to one another, aids very considerably in an intelligent understanding of the work.

There is certainly no exaggeration in the statement that more than one-half the world's supply of copper is obtained by matte smelting, and it is perfectly certain that the proportion not only of silver but of gold also collected by this method is steadily increasing, until it now represents a very large percentage of those two precious metals produced. The statement that the aggregate value of all the metals extracted annually in the United States by means of matte smelting methods has now reached the total of \$30,000,000 is certainly below the mark.

The field that is opened to matting as pointed out by Mr. Lang is a very wide one, and with his knowledge of the subject and experimental work he may be correct in stating that "perhaps in the immediate future we may by such means recover arsenic, antimony, tin, bismuth and the metals of the platinum group, and that by modifications, etc., sulphur itself may be practically recovered."

The opportuneness of a complete essay such as the present upon the subject is evident more or less to every one connected with smelting, either lead or copper ores, and more especially to those who have made a special study of matte smelting, as it is of immense value to reap the benefit of the results of such systematic work as detailed by Mr. Lang.

The shape in which the discussion of the subject is placed before the reader is a very useful one, being in effect divided under five heads, taking the form of a comparison between the advantages and efficiencies of matting and lead smelting, and incidentally of the principles involved therein. These headings as tabulated by the author are: (1) Difference in the carrier, by which expression the collecting agent in the one case lead, and in the other case copper matte, is meant. (2) Difference in the slags. (3) Difference in the fuels. (4) Difference in apparatus. (5) Difference in materials treated.

If inclined to be critical it might be said that an important branch of matte smelting has been entirely omitted, viz., reverberatory smelting, and therefore, that the title of the book should have been more correctly "Blast Furnace Matte Smelting." This, however may, and it is to be hoped will be added in a subsequent edition, as there is no doubt as to the popularity of the present book, and that the second edition will shortly be required.

The designation preferred by Mr. Lang, viz., "sulphide smelting" is a very rational one, but it is wiser to continue at present the generally accepted term "matte smelting." Many matte smelters, however, will take issue with him on the subject of embracing arsenide and antimonide smelting in the same category. They are certainly akin, but their operation upon the collection of precious metals is very different from that of ordinary iron-copper matte. In reading the book carefully the reader must observe that the term speiss is dropped, and that "matte" is used to cover the sulphide, the arsenide or the antimonide or the mixtures of all of them.

The table showing the diversity in the composition of mattes, giving the highest and lowest of the various components, is extremely interesting, and it illustrates most conclusively the wonderful applicability of matting to the most varied classes of ores, differing very widely in their

composition. The views as to chemical compositions are also very interesting, and show an amount of research which many who have practiced matte smelting solely from the practical point of view have not had the time to follow up. The value of such work cannot really be overrated, as it is only when such facts are brought to light that some unexpected difficulty can be successfully coped with.

The author renders a service to the smelting fraternity in general by clearly dissipating some of the old-fashioned ideas and prejudices with regard to arsenic and antimony. Others have come to the same conclusions as himself through practical work in this direction, and there is no doubt as to the correctness of his deduction.

Naturally the question comes up as to the influence and necessity for copper in matting, and the observations upon this subject will be read with great interest, some of the conclusions recorded being opposed to what has generally been hitherto accepted as law in this respect.

This first chapter, after disposing of the general problem, deals with the theoretical part of the question; the effect of arsenic and antimony as matte formers, and the classification of matte constituents.

The utility of matte smelting from a practical point of view is also taken up, with an interesting reference to the experience of Mr. Richard Pearce, of Denver, than whom there is no better authority on the subject. The possibilities of a pure iron matte, without the addition of copper, are fairly dealt with, and the simplicity with which such a matte can be treated for the extraction of the precious metals collected is set forth. Mr. Lang very clearly points out the divergence of ideas between smelters who have devoted their entire attention to lead smelting and have handled successfully the sulphide problem from that standpoint, and those who have devoted their time to direct matte smelting.

The history of the Austin process as originally introduced, and in a modified form as elaborated to a great extent by the author himself, will be of use to anyone who is devoting his time to economic matte smelting under certain conditions, and the advantages claimed for it, such as the concentration of 40 tons into one, will prove most attractive. Naturally, under this head also come practical remarks showing the different rates of concentration when using copper as the collecting agent, also the inferiority of lead from this point of view, copper requiring a much smaller proportion of the charge.

For clean work specific gravity of slag is dealt with as it should be; the importance of this point not having been fully recognized or written upon before.

The section, fuel and its use gives the result of a vast amount of experience, and the author's experience with wood and his reference to *Erdmann's Journal* on this subject will be news to many readers, and probably of considerable value to some.

Mr. Lang, of course, writes on the subject of hot-blast, the benefit of which is a much vexed question in this branch of metallurgy. His remarks refer to what may be called more strictly "pyritic smelting," where the heat from the combustion of the sulphur contents of the charge replaces the added fuel in part.

The losses in smelting are fully and instructively discussed, and the comparison between lead and matte slags with regard to cleanness and the efficiency of the two collecting agents are ably dealt with. Volatilization and losses in flue dust receive their fair share of attention.

The tables of work done, and the analyses of products and slags at the end of the book, are extremely useful for reference, since they give actual data that can be depended upon.

It is impossible to do justice to this work in so short a review, and to obtain the full benefit of Mr. Lang's labors everyone interested directly or indirectly in matte smelting should carefully peruse his work and keep it for reference.

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.

- Annual Report of the Auditor General of Michigan for the Year 1894.* Lansing, Mich.; State Printers. Pages, 353.
- Missouri State Mine Inspector's Report for the Year Ending June 30th, 1895.* Jefferson City, Mo.; State Printers. Pages, 216.
- Republic of Mexico: Estadística Fiscal from October, 1894, to October 1895.* City of Mexico; National Printing Office. Pages, 90.
- United States Consular Reports: Volume XII., 1894; Highways of Railways, Canals and other Trade Routes of Foreign Countries.* Washington, D. C.; Government Printing Office. Pages, 763; with maps.
- Lightning Express Railway Service; 120 to 150 Miles per Hour.* By F. B. Behr, London, Eng.; Published by the Author. Pages, 32; with diagrams.
- Sixteenth Annual Report of the Ohio Society of Surveyors and Civil Engineers, for the Year 1894.* Sandusky, Ohio; Printed for the Society. Pages, 141.
- United States Bureau of Education: Report of the Commissioner; Vol. II., Parts III, and IV., for the Year 1892-1893.* Washington, D. C.; Government Printing Office. Pages, 2153.
- History of Mount Mica of Maine, and its Wonderful Deposits of Matchless Tourmalines.* By Augustus Chate Hamlin. Bangor, Maine, Published by the Author. Pages, 72; with colored plates and illustrations.
- The Aluminum Age. Annual Address of the President, Frederic P. Dewey, before the Chemical Society of Washington, February 8th, 1894.* Washington, D. C.; Published by the Society. Pamphlet; Pages, 43.
- Course in Physics of the Polytechnic School. Supplement No. 1: Heat, Acoustics and Optics.* By MM. J. Jamin and Bouty, Paris, France; Gauthier-Villars & Fils. Pages, 180; illustrated. Price, in New York, \$1.25.
- Nova Scotia Department of Mines: Report of the Commission to Inquire into the Cause, History and Effects of Fires in Pictou Coal Mines; Annual Report of the Inspector of Mines for the Year Ending September 30th, 1895.* By Edwin Gulpin, Jr., Inspector of Mines. Halifax, N. S.; H. M. Printers. Pamphlets.

CORRESPONDENCE.

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

Circular Coal Pockets.

Sir: I note in the *Journal* of February 1st an article on circular coal pockets. Similar coal storage bins built of iron are in use at a number of coal mines in Westphalia, Germany. The writer saw them there in 1890. At one mine they had one circular bin built of iron and another one of red brick.

I trust that this will be of some interest to readers of your valuable paper.
WALTER M. STEIN.
PHILADELPHIA, PA., March 1, 1896.

The Bessemer Process.

Sir: Apropos of President Week's remarks, which have just come to my notice, and reserving further comment for another time, let me now call attention to the very broad difference between the priority of invention which gives legal title to a patent, and the prosecution of an independent invention of the same thing in such a way as to confer immense benefit on mankind. Whatever be the merits of the controversy as to whether Bessemer or Kelly was entitled to a patent for the pneumatic process, and whether Mr. Kelly might or might not have perfected that process and made it useful, it is, I believe, undisputed that Bessemer, inventing the process independently, is the man who has actually benefited the human race, and benefited it in a material way as few ever have. This fact alone is ample justification for calling the pneumatic process by his name, and for giving him the thanks and homage so freely paid him.

The glory of Columbus is not his conception of sailing across the ocean, but his achievement, his giving mankind a new world. For that gift, as for Bessemer's we thank and honor him. Priority of invention or of conception, of one idea or of the other, compared with these colossal gifts, is as a dust-heap to the Alps.
HENRY M. HOWE.
BOSTON, Feb. 28, 1896.

Incandescent Gaslight Mantles.

Sir: Having carefully read the articles which appeared in your last two issues, I take the liberty of sending you the following brief statements with regard to their present condition of litigation concerning the Welsbach patents.

In Germany suits were brought against all parties who were manufacturing Welsbach mantles. These infringers applied to the Imperial Patent Department to have the validity and scope of the patents determined. These proceedings acted as a stay to the infringement suits, and the decision which has recently been rendered was given by the Patent Department. This decision sustains the validity of the patent under the broadest possible interpretation, covering the method of manufacturing the mantles, as well as the fluids themselves, employed to impregnate the fabric, composed of solutions of two or more of the rare earths. The following is the language of the broad claim, as allowed by the decision:

"The treatment or method for making incandescent gas burners by the impregnation of the tubular-shaped woven and eventually combustible textures with the help of nitrates or sulphates, as well as generally, of such destructible compounds as, on ignition, remain as oxides," etc., etc.

That the decision was in favor of the patent is shown by the fact that the court assessed upon the infringers the costs of the court and three-fourths of the lawyers' fees.

So far as known at present, these incandescent mantles cannot be made except by following the processes of the patent, the monopoly for which has thus been given to the Welsbach patent.

When the decision of the patent department tribunal was rendered, the infringers appealed to the Reichsgericht at Leipzig to have the decision reversed. This appeal cannot be settled under one year. In the meantime, the infringers appealed to the Landgericht in Berlin to have the suits, which had been brought against them, stayed until the court at Leipzig should have decided the appeal. This would have permitted the infringers to continue their illicit trade for the period of another year or more, but the Berlin court refused the application and ordered the suits to proceed. They are now being vigorously pushed. The question that remains to be decided is simply that of infringement, the patent department having settled the scope and validity of the patents.

As a consequence of this decision the shares of the German Welsbach Company have advanced materially in value, from 780 to 840, while the shares of the Meteor Company, the leading infringer, which were quoted in November at 170, have dropped to 10.

In Austria the Welsbach patents have received complete protection from the authorities. The Supreme Court recently declared that as long as the Welsbach patents continue in force no competition whatever against them will be tolerated. On every application injunctions have been granted against infringers, prominent among which was the company in which Mr. Frederick Siemens was the controlling spirit.

In France a decision favorable to the Welsbach patents was given, and, so far as the litigation has proceeded, it has been uniformly in favor of the patents. The case is now in the Court of Appeals.

In England infringers have been promptly and vigorously proceeded against. Among the most prominent of these, against whom suits are now pending, are the Meteor Company and the Sunlight Company. The case against the latter has been ready for trial some months, and is simply waiting for the assignment of a judge to hear the case.

In the United States the patents under which the American Company is operating are of a far more comprehensive character than those taken out in foreign countries, for the reason that they not only cover broadly the method of manufacture and all the impregnating solutions which are of any value, but they also cover certain minor details which have been found just as essential to the successful manufacture of mantles, as the original inventions themselves.

C. F. CHANDLER,

NEW YORK, March 5, 1896.

THE OIL BOOM OF TENNESSEE.

Written for Engineering and Mining Journal by E. J. Schmitz.

A professional examination trip to the carboniferous and sub-carboniferous sections of northeastern Tennessee, made during January and the first week of February, has brought me in contact with the recent oil boom of Tennessee.

The existence of petroleum in this section of Tennessee has been known for a long time, and is proven by a number of oil springs in the valleys and on the low grounds of the broken and channeled sub-carboniferous, west of the escarpment of the Cumberland plateau of northern Tennessee and southern Kentucky, and I hear that experimental borings for oil in this section had already been undertaken before the late war between North and South. Want of railroad facilities and the great distance from the coast is probably the reason that this field has not been developed long ago. Attempts at development have never entirely ceased since these early efforts, or at least they have been repeated from time to time, and highly promising, or rather highly successful, results have been claimed in the local press of the country for such efforts in the recent years. If correctly, the near future ought to show, since strenuous efforts for the opening of paying wells are being made. Quite a number of companies have been formed and are in the field for this purpose, and the supposed oil territory is almost all held under lease by these companies. In Tennessee this oil territory covers the counties of Pickett, Scott, Fentress, Overton, Putnam, Morgan, White, Cumberland, etc., following the general belt of the Appalachian System with its southwestern trend. Great confidence and importance being placed in this "belt line" theory, as well as into the "anticlinal theory," by local geologists and oil speculators of this region.

The most active among the different companies has up to this time been the Miss J. W. Stone syndicate, which has sunk three wells, viz.: Stone No. 1, or Lacy Well; Stone No. 2, or Rockhouse Well; Stone No. 3, or Bole's Well, and which is interested and has been instrumental in sinking the so-called Bob's Bar Well, by the Wiser Brothers' under contract for the Southern Oil Company. Next comes the Forest Oil Company (Standard Oil Company), who had in the first days of February three wells in course of sinking, two of which had just been commenced within a mile or two from Rugby, and the third drilled to about 1,000 ft. or more, and was located 1 1/2 miles from Rugby Road on the Cincinnati Southern Railroad.

Besides these in the last 12 months two more had been drilled, the MacDonalds Well, which was a dry well, and the Struve Well, for which enormous results are claimed, and which lies about 1 mile distant from Glen Mary and about two miles from the well near Rugby Road.

Stone No. 1, No. 2, No. 3 and the MacDonald Well lie with a radius of three miles in the corner formed by Overton, Pickett and Fentress County commencing on sub-carboniferous ground, No. 1 on the east fork of Obey, Stone No. 3 in the corner between the east and west fork, Stone No. 2 in the valley of Rockhouse—all on low ground, while the MacDonald Well is located on the ridge between the west fork of Obey and the Rockhouse Creek. Bob's Bar or burned well lies in the valley of east fork of Obey River about four miles distant of Stone No. 2.

The wells of the Forest Oil Company, near Rugby Road and Rugby, and likewise the so-called Struve Well are on the Cumberland plateau. From 400 to 700 ft. of coal measures (the lower and a part of the upper measures of the Cumberland) have to be penetrated before the mountain limestone of the sub-carboniferous is reached.

In the over-enthusiastic boom literature of Tennessee of the month of January wonderful stories are told, especially about the so-called Struve Well and the Bob's Bar Well. The Struve Well is reported by some to be 1,500 ft. in depth and to have struck a large supply of oil at this depth, while others doubt the find of any oil at all in the well. Likewise the press story of Struve's sale to the Standard Oil Company for \$10,000 is not believed by conservative people of Tennessee. It is impossible for me to make a positive statement as to the value of the Struve Well, as I could neither obtain trustworthy information from others, nor could I examine the well myself, it being closed. The Bob's Bar Well is generally conceded to have struck a good pocket of oil at a depth of 270 to 277 ft. The well has flowed for 14 hours and is claimed to have produced between 500 and 700 barrels of a greenish oil. From 6:30 a. m. to 8:30 p. m. a 64-inch stream poured from Bob's Bar Well on January 18th, the well showing no gas pressure and having more the character of an artesian flow. By some accident the oil escaping from the well caught fire and consumed machinery, derrick and tank, before the flow stopped and the oil receded in the casing to about 50 ft. from the surface.

Bob's Bar Well had been bored by the Wiser Brothers, from Chicago, who are experienced contractors in this line, under a "10-barrel a day" clause, and Wiser Brothers claimed at the time of my visit that this clause had been filed on account of the 14 hours, flow from the well, while the other side—represented by Mr. Cusack, of Allardt—claims that the contract is not finished.

The drill record obtained for the Bob's Bar Well is as follows, viz.:

| | | | |
|-----------------------------------|-----|--------------------------------------|-----|
| 1. Drift and black loam..... | 24 | 6. White, quartz sandstone..... | 82 |
| 2. Pebbly gravel..... | 3 | 7. Black Shale (Devonian)..... | 28 |
| 3. Limestone..... | 30 | 8. Below the Black Shale limestone | |
| 4. Coal..... | 2-4 | or siliceous limestone down to..... | 277 |
| 5. Limestone to the depth of..... | 70 | and oil was first struck at depth of | 270 |

The oil is found in a siliceous limestone of about 100 ft. in thickness. This material is from white to brown in color and soft; it drills easy, and the oil appears irregularly on top middle or lower part of the series.

The Stone No. 1, or Lacy Well, has a depth of 1,000 ft., and was finished last year. The drill record of the Lacy Well is about as follows, viz.: The well commences in valley, near river, about 130 ft. or more below the top of ridge or high ground, channeled down by Obey River. The upper portion of the ridge is formed by a bluff limestone (sub-carboniferous) for about 50 ft. down, and the rest, down to water level of Obey River, consists mostly of blue and dark slaty shale (Devonian). The stratification is almost level and dips slightly with stream.

| | |
|---|-----|
| 1. Shales, etc., to depth of..... | 64 |
| 2. Black shale..... | 28 |
| 3. Below black shale, mostly limestone, down to depth of..... | 268 |
| 4. The siliceous limestone (brown here), which produces the oil: First oil is struck at depth of..... | 271 |
| At 300 ft., another oil vein, claimed to have flowed hundreds of barrels..... | 300 |
| At 358 ft., another vein, flowing 20 barrels an hour for some time..... | 358 |
| The oil-producing material continues to 373 ft..... | 373 |
| 5. Limestone for about..... | 150 |
| 6. Blue, soft slate..... | 200 |
| 7. Then to 1,900 ft. alternately siliceous limestone and slate..... | 277 |

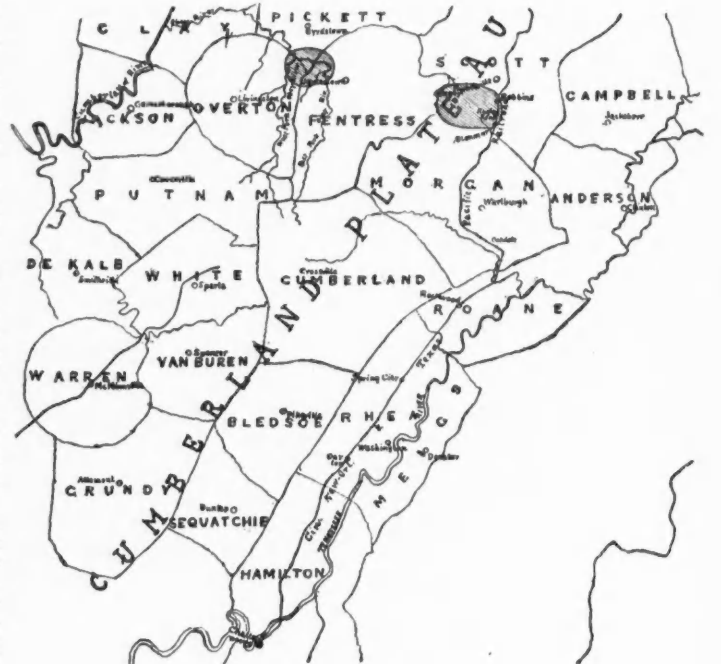
The oil is the same greenish oil as at the Bob's Bar Well; it stood at the time of my visit about 100 ft. from top of casing. Salt water was struck at 370 ft. and 500 ft. and exhausted soon in both cases.

There are claimed at least 500 bbls. of oil for the Lacy Well. S-a-level is accepted by Mr. Cusack at 595 ft. to 600 ft. from top for the Lacy Well, characterized by a change in the formation, either to a pebbly sandstone or slate.

The Stone No. 2 or Rockhouse Well has a depth of 510 ft. The formation above the level of Rockhouse Creek consists mostly of slaty shale (calcareous), and only the top of the Highland or ridge is limestone for about 40 ft. to 50 ft. Total height to creek level is about 120 ft. to 150 ft.

The sample of crude petroleum, Noah Wright Well, Rockhouse Creek, Pickett County, Tenn., received from you January 31st, contains no rhigolene or gasoline. It commences to boil at 90° C., and yielded:

| | | | |
|---------------------------|--------|-----------------------------|-------|
| Naphtha..... | 3.8% | Specific gravity comb. | 0.703 |
| Benzoin..... | 1.8% | | 0.750 |
| Kerosene to 204° C..... | 15.2% | | 0.801 |
| " 260° C..... | 14.8% | | 0.830 |
| " 306° C..... | 12.8% | | 0.859 |
| Heavy paraffine oils..... | 51.6% | | |
| | 100.0% | | |



MAP OF THE DISTRICT.

The latter on standing over night had already partly crystallized. (Paraffine.) The oil yields to treatment with oil of vitriol. Original specific gravity, 0.625.

The first oil was struck at depth of 437 ft. It is the same greenish oil then in the other wells. The oil stood, at the time of my visit, within one inch from upper end of casing and the well shows considerable gas. If pumped the well may produce about 5 bbls. per day for some time.

An analysis of a sample of oil from the Rockhouse well made by Endemann & Laarback, New York, gave the following results, viz.: The Stone No. 3, or Bole's Well, was sunk to a depth of 452 ft. and penetrated similar formations than the Rockhouse and Lacy well.

The black shale was struck at a depth of 88 ft.; the thickness of black shale was 28 ft.; the first oil was struck at a depth of 397 ft.; the second oil at a depth of 428 ft.

It is an oil of a similar character to that in the other wells. I could not measure the column of oil in the well, as the tools stood in the casing.

The MacDonalds' well has a depth of 685 ft. and stands on high ground. The following drill record was furnished me for this well, viz.: 1. Limestone, hard to depth of 283 ft.; 2. Limestone, granulated (295 ft.) 12 ft.; 3. Black shale, 28 ft.; 4. Siliceous limestone and calcareous shale to 590 ft.; 5. At 590 ft. the (brown) oil-producing siliceous limestone was struck and continued to 685 ft. It was the only sign of oil; 95 ft.

From the information collected by me it appears that the oil-bearing siliceous limestone is encountered from 160 to 280 ft. below the Devonian black shale; in the Bob's Bar Well 160 ft. below the black shale; in the Stone No. 1 176 ft. below the shale; in the Stone No. 2 261 ft. below the shale; in the Stone No. 3 281 ft. below the shale, and in the MacDonald Well 267 ft. below the shale. It looks doubtful if this porous siliceous limestone, in which the oil has been opened in the various wells, represents one continuous stratum or the same horizon, in case these drill records are correct. But we may accept with considerable certainty that these

oil-bearing beds belong to the Silurian, since the Devonian of this neighborhood is not over 300 ft. thick. If I am not mistaken, does the valley of the Cumberland River and its tributary, the Obey, near its mouth, expose only Lower Silurian, which would indicate the same age for the oil-bearing series, viz:

THE TRENTON OR CINCINNATI OR NASHVILLE.—To strike this horizon in the Ruby and Rugby Road vicinity, not far from the Cincinnati Southern Railroad and about 30 to 35 miles east from the Obey River locality, where those various wells have been sunk, will require a depth of from 1,380 to 1850 ft., since the following carboniferous formations have to be penetrated: Coal measures above the upper conglomerate of the Cumberland Plateau, 100 to 300 ft.; upper conglomerate, 30 to 50 ft.; lower measures (with or without lower conglomerate), the same being often missing, 300 to 400 ft.; total, 430 to 750 ft. Sub-carboniferous, mostly limestones and siliceous limestone, about 600 to 600 ft.; Devonian, 250 to 300 ft.; to the oil-bearing beds accept 100 to 200 ft.; total, 1,380 to 1,850 ft.

As I am informed, the Forest Oil Company will drill their wells to the depth of 2,000 ft. or more, so that they certainly will strike these beds. The chances for productive wells on the Cumberland plateau, where the Forest Oil Company is boring, about 25 miles east from the escarpment of the plateau, are certainly far superior than in the Obey River vicinity, where the oil-bearing rocks exist under so little cover. The phenomenon of the oil springs, which frequently can be observed in the subcarboniferous low ground west of the Cumberland plateau, acts rather against the accumulation of large oil-basins in that locality.

It is certainly to be desired that these efforts are continued in a practical way under the guidance of responsible engineers, and that to further this end the bulk of the supposed oil territory should pass into the hands of concerns strong enough to give their holdings a final test.

The press of Tennessee cannot assist the development in any better way than by rejecting all over-rated and untrue stories and accounts about the oil resources and the claimed drill results from their columns. New industries are not promoted by doubtful means.

ABSTRACTS OF OFFICIAL REPORTS.

The Montana Mining Company, Limited.

The Revenue Account shows a profit of £17,088 7s. 4d., of which £16,428 4s. was applied in payment of dividends on October 15th, 1895, and January 15th, 1896, leaving a net balance of £660 3s. 4d., which, with the sum of £6,001 14s. 5d., brought from the previous half-year, gives a total of £6,661 17s. 9d. to be carried forward to the next half-year. The expenditure during the half-year charged to Capital Account comprises: Legal expenses, etc., £880 11s. 7d.

During the six months ending December 31 last, the mills reduced 37,790 tons of ore, which yielded in bullion-bars and concentrates (on assay coinage value) \$496,662, equivalent to \$13.14 per ton. The actual realized and realizable value of the ore amounted to \$381,401, the difference on the coinage value being \$115,261 or 2.33% on the gold, and 52.14% on the silver produced. The average net realized and realizable value of the ore treated was, therefore, \$10.09, say £2 1s. 8d. per ton. The proportionate money value of the precious metals contained in the ore was: Gold 73.87, and silver 26.13%.

| | Gross Yield, Ounces. | Realized and Realizable Value. | Percentage of Gold and Silver in Realizable Value. | Average Realizable Value of Ore per Ton. |
|--------|----------------------|--------------------------------|--|--|
| Gold | 13,955 | \$281,751 | 73.87 | \$7.45 |
| Silver | 161,400 | 99,659 | 26.13 | 2.64 |
| Total | 175,355 | \$381,401 | 100.00 | \$10.09 |

Income and Expenditure.—The following table presents the actual result of the company's operations, exclusive of London charges, for the half year:

STATEMENT OF INCOME AND EXPENDITURE AT THE MINE.

| Income. | Working expenses. | Extraneous expenses (insurance, taxes, etc). | Prospecting and Shafting. | Permanent Improvements. | Total Expenditure. |
|-----------|-------------------|--|---------------------------|-------------------------|--------------------|
| \$381,401 | \$202,400 | \$12,670 | \$69,537 | \$4,067 | \$288,694 |

Compared with the same statement for the preceding half-year, the foregoing shows a slight increase in working expenses of \$7,694, due to the fact that both mills have been in operation during the whole of last half-year, whereas in the previous half-year the 60-stamp mill was closed down for four months.

MONTHLY RUNS FOR THE HALF-YEAR ENDING DECEMBER 31ST, 1895.

| Month. | Stamps dropped. | Tons of ore crushed (dry weight). | Average gross yield per ton (coinage value). | Gross yield (assay coinage value). | Net realized and realizable value of bullion, bars and concentrates. |
|-----------|-----------------|-----------------------------------|--|------------------------------------|--|
| 1895. | | | | | |
| July | 110 | 6,410 | \$14.69 | \$94,908 | \$69,354 |
| August | 110 | 6,360 | 13.91 | 88,480 | 64,982 |
| September | 110 | 6,120 | 12.35 | 75,623 | 57,815 |
| October | 110 | 6,400 | 11.96 | 76,514 | 62,180 |
| November | 110 | 6,100 | 13.32 | 81,260 | 65,404 |
| December | 110 | 6,400 | 12.59 | 80,577 | 61,666 |
| Total | 110 | 37,790 | \$13.14 | \$496,662 | \$381,401 |

| | Total expenses. | Average per ton | | | Total expenses. |
|-----------|-----------------|-----------------------------|--|----------------------|-----------------|
| | | Working operating expenses. | Prospecting and operating No. 1 shaft. | Extraneous expenses. | |
| July | \$50,725.58 | \$5.45 | \$1.89 | \$0.57 | \$7.91 |
| August | 47,881.44 | 5.50 | 1.69 | 0.34 | 7.53 |
| September | 43,537.63 | 5.19 | 1.71 | 0.21 | 7.11 |
| October | 45,901.50 | 5.45 | 1.67 | 0.65 | 7.77 |
| November | 48,979.24 | 5.51 | 2.03 | 0.49 | 8.03 |
| December | 47,582.16 | 5.03 | 2.05 | 0.35 | 7.43 |
| Total | \$284,007.55 | \$5.36 | \$1.84 | \$0.33 | \$7.53 |

THE PITTSBURG MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

Many interesting papers and communications were read at this meeting, and the discussions that took place were equally interesting. For special comment, however, I would take as most notable the following four:

1. Mr. Wilkens' paper on the "Magnetic Separation of Non-magnetic Materials." The publication of this paper, with full details as to apparatus, etc., will be awaited with eager interest. Unfortunately, it could not be prepared in time to be printed before the meeting, and will, perhaps, not appear before April. All that Mr. Wilkens could do was to state the scope of the new invention, and exhibit samples showing its effectiveness. The full extent of the field in which it will be commercially applicable has yet to be determined. Mr. Wilkens explained the somewhat paradoxical title of his paper by saying that the "non-magnetic materials" referred to are such as are considered "non-magnetic" in the art and practice of magnetic separation, as, for instance, franklinite, garnets, red hematite, spathic iron ore, and other materials containing iron or manganese in any degree of oxidation. The process and machine are the invention of Mr. J. Price Wetherill, of South Bethlehem, Pa., and have been used on a large scale with complete success at the works of the Lehigh Iron and Zinc Company, in that place. Scientifically speaking, all the minerals which Mr. Wetherill's machine will magnetically attract are, according to Faraday's famous classification, "paramagnetics"—i. e., they are in some degree attracted by the magnet, whereas all other substances (called by him "diamagnetics") are in some degree repelled. But Faraday's paramagnetics are practically divided into two classes, the first of which (comprising iron, magnetite, pyrrhotite and a few other minerals) is characterized by very high magnetic susceptibility, and is therefore generally called "magnetic," while the other class possesses so little susceptibility in comparison as to have been hitherto practically lumped with all the diamagnetics, as "non-magnetic." In other words, the paramagnetics do not constitute a continuous series, from metallic iron down, exhibiting a gradual decrease in this property. On the contrary, there is a startling gap in the series, widely separating the two groups of this class. If the force with which metallic iron is attracted under given conditions be taken as 100,000, then magnetite stands at 40,227; and (ignoring pyrrhotite, which has not been accurately determined, but probably comes close to magnetite) the next in the descending series, thus far accurately tested, is specular iron ore, which rates at only 533. Roughly speaking, there seems to be nothing between about 40 per cent., and about 0.5 per cent. of the susceptibility of iron. I have seen Mr. Wetherill's machine extract powdered ferrous sulphate, the susceptibility of which is rated at 98, or less than 0.1% of that of iron. The above figures as to relative attraction are taken from the classic paper of Plücker, published in 1848, in Poggendorff's *Annalen*, to which I referred in my remarks at Pittsburg, in discussion of Mr. Wilkens' paper. I shall publish a more detailed statement hereafter; but the above is sufficient to show that Mr. Wetherill's invention really enters a field heretofore untrod in the art of magnetic separation. As regards its commercial importance (apart from the special problem which it has so successfully solved at South Bethlehem, by cleanly separating franklinite, garnets and zinc silicate), it may be sufficient to point out that experiments made at South Bethlehem indicate that the Clinton red fossil ores of the South can be concentrated without roasting; whereas, no longer ago than the Atlanta meeting, the paper by Professor Phillips, describing the roasting and subsequent magnetic concentration of these ores, was taken as representing the last word of science in this direction. On the other hand, some desirable applications may prove to be impossible. For instance, the separation of chromic iron-ore from serpentine has proved, in preliminary tests, unexpectedly difficult, on account of the magnetic susceptibility of the serpentine. But it would be unsafe to express any conclusions at present as to the possible scope of Mr. Wetherill's invention. The Institute and the profession are indebted to him, and to Mr. Wilkens as his engineer, for the frank preliminary statement made at Pittsburg; and premature criticism would be discourteous as well as perilous.

2. To the discussion of the physics of cast-iron, which occupied nearly two full sessions, Mr. A. E. Outerbridge, Jr., the expert of William Sellers & Co., of Philadelphia, contributed, at the request of Mr. Sellers, a paper of extraordinary interest, on "The Mobility of Molecules of Cast-Iron," showing that castings can be "molecularly annealed" by moderate blows or vibrations, so as to increase their strength. So far as I know, Mr. Outerbridge is the first to announce, and establish by unquestionable proof, this effect of vibration upon cast-iron; and his contribution will be intensely interesting to students of the physics of cast-iron everywhere. I am inclined to suspect, however, that the fact itself has been known to practical founders, and has been kept as one of the "trade secrets," which it is a function of the Institute to bring into the realm of science. If this be true, the merit of Mr. Outerbridge is not thereby lessened.

3. In the course of the same discussion, Mr. Webster, of Philadelphia, whose original paper on the subject "started the ball," gave a striking illustration of the untrustworthy nature of the ordinary founders' test for determining the grade of iron by inspecting the fracture. He exhibited a fractured No. 1 casting, showing dark graphitic iron, and, by simply brushing the fracture with an ordinary clothes-brush, transformed it at once, to all appearance, into a hard, white iron. The experiment was varied by operating upon a fractured surface of soft gray iron, half of which was covered with paper, to protect it from the brush. The exposed surface instantly became "white," the visible graphite having been removed by the brush. Mr. Webster's attention had been called to this pretty little object-lesson by Mr. Outerbridge; but he had subsequently found that it had been known for years to an old founder. It thus constituted another of the "trade secrets," of which scientific men are so likely to be ignorant.

4. The paper of Mr. Thomas D. West, of Sharpsville, Pa., and his additional contribution to the discussion were welcome, for a reason already indicated above, namely, as serving to bring the theorists and the practitioners into a closer union. Mr. West's proposed apparatus and

method for physical tests of cast iron still lacks a good deal, in my judgment, of the perfection which would entitle it to adoption as a standard, especially for international use. But his suggestions are valuable as coming from a practical founder who knows his business; and the simple and cheap apparatus which he recommends will be at least an important educating influence in his trade.

Mr. West's special novelty was the statement, made by him in the dis-

BREWER'S SUSPENDED RAILWAY.

A system of suspended railways which has many advantages is that which has been invented by Mr. W. J. Brewer, an American engineer of London. An example of this system is to be seen at Brighton, England and we give some details taken from the working drawings. This is, so far as we know, the first suspended railway which carries passengers, or,

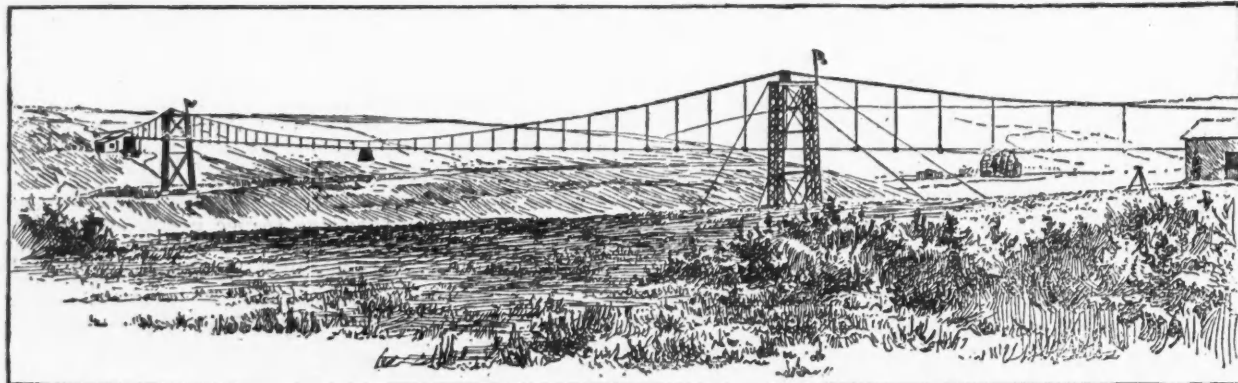


FIG. 1.

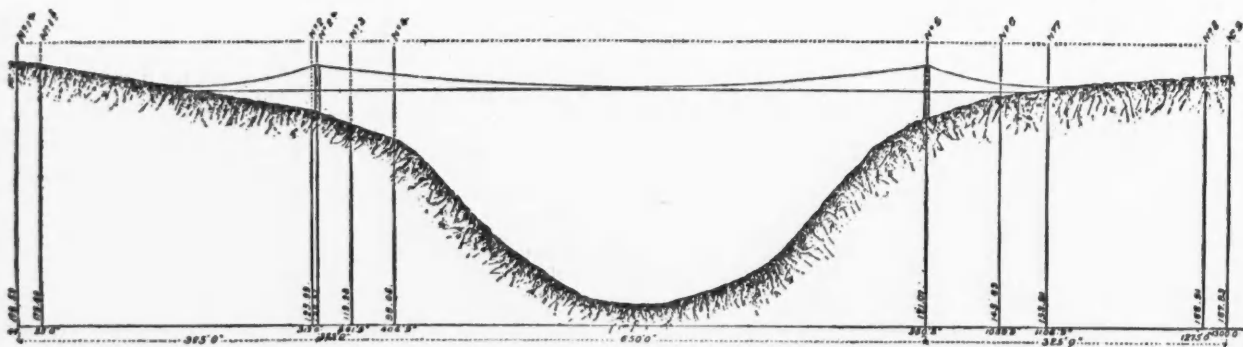


FIG. 2.

cussion, that he had found that "hard" grades of cast iron expanded in solidification more than "soft" ones; the difference in "grade" being due, so far as his experiments indicated, to a larger proportion of sulphur. The principal criticism made upon his data, in the course of the debate, was one which applies equally to the tests of some other investigators, namely, that "expansion" is determined by measuring the increase of length only—the elongation of the test-bar being alone measured, while expansion in other directions is ignored. I think this criticism is

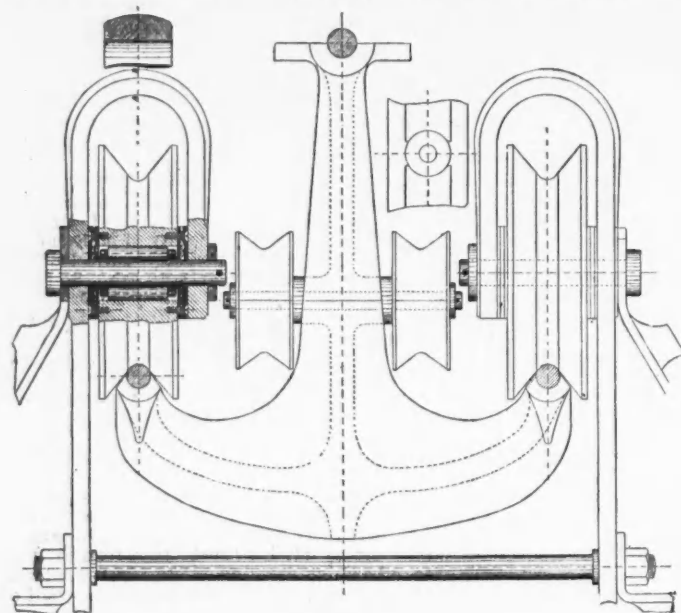


FIG. 3.

sound, as to the quantitative value of the results obtained; but I do not think it follows that such results are not qualitatively valuable, when the conditions are carefully kept uniform, and the test-bars are cast on end, to avoid the effects of the earlier cooling of one side, producing curvature of the bar. At all events, a good beginning has been made, and much has been accomplished, by enlisting the practical founders in the work of scientific investigation.

I might say much more about the Pittsburg meeting; and I stop for lack, rather of time and space, than of material.

R. W. R.

at any rate, it is the first which has been specially built for public passenger traffic.

It will be seen from Figs. 1 and 2 that there is a single suspending cable crossing from support to support. From this cable hang at regular intervals steel rods carrying each an anchor-shaped piece, shown in Fig. 3. The lengths of the hanging rods are arranged so that the anchor pieces shall all be in a horizontal line. The two steel ropes which carry the load are held by clips in sockets, one on each bracket of the anchor piece, and on these ropes run the pulleys which are attached to the frame carrying the car. The hauling ropes run over two pulleys attached to the center stems of the anchor piece.

At Brighton the main span is 650 ft.; the cars hold 12 people each; the suspending rods are 1 in. diameter; the cables on which the cars run are 1 in. diameter and 18 inches apart; the anchor pieces are 15 ft. apart. Each cable is capable of supporting the load separately, and if one cable breaks the car will still be carried with perfect safety. It is impossible for the supporting pulleys to run off both cables simultaneously, and if one ran off the car would still be carried safely. In this system there are no rollers or pulleys on the supports to introduce danger from wear and rust, but the rollers are all on the cars and can thus be continually inspected. Whenever the cables on which the car runs become worn one may be renewed at a time, without interfering with the traffic.

Mr. Brewer is at present engaged in erecting a similar structure at Matlock, in Derbyshire, and has taken the opportunity of introducing several improvements. Most important of these is that instead of using cables for the track he uses steel rails which reach from one anchor piece to the other and are connected by a flexible joint to them. In this way a track without sag is obtained, while at the same time the whole structure is perfectly flexible. Under each line of rail there is also a safety cable in case of breakage.

Transformation of Carbon into Graphite.—Messrs. Girard and Street have devised several special kinds of electric furnaces for the purpose of transforming carbon into graphite. Mr. J. Reyval, in L'Eclairage Electrique, thus describes these furnaces and the process: The carbon rod to be converted into graphite is passed through a block of refractory material, having a small heating chamber in the center.

A second carbon enters this chamber at right angles to the first carbon, and an arc is maintained between the two. The speed at which the first carbon is caused to pass through the chamber is regulated in accordance with the temperature to which it is to be raised. In the case of circular carbons for arc-lighting, the carbon rod to be converted is given a motion of rotation as well as of translation. The effect is then as follows:—The action of the arc leaves a spiral trace on the carbon to be converted. Its size on a 0.55 in. diameter carbon with a 40-ampere arc, was $\frac{1}{10}$ in. broad and about $\frac{1}{8}$ in. in depth, and this represents the carbon converted into graphite. By regulating the speed with the temperature the whole surface of the carbon can easily be converted. In this process the carbon to be treated was connected to the positive pole.

ELECTRIC MINE HAULAGE.

It was long ago decided that the only economical method of bringing the coal from the face in the mine to the tippie was by means of mechanical power. The first systems employed, we believe, for this purpose were the endless wire rope and tail rope. These had their day and accomplished a great deal in their time, reducing the cost of haulage very materially. But we cannot stand still; it is our nature to progress, and the wire-rope systems, like the mule, in their turn have had to go, being supplanted by the superior system of electric traction haulage.

The accompanying illustration of an electric locomotive hauling a loaded trip to the tippie very plainly shows the superiority of this system over either rope or any other. The photograph from which this cut was made was taken at the mines of the Vinton Colliery Company, at Vintondale, Cambria County, Pa., which was recently equipped by the Jeffrey Manufacturing Company, of Columbus, O., with a complete plant of coal cutting, drilling and electric haulage machinery.

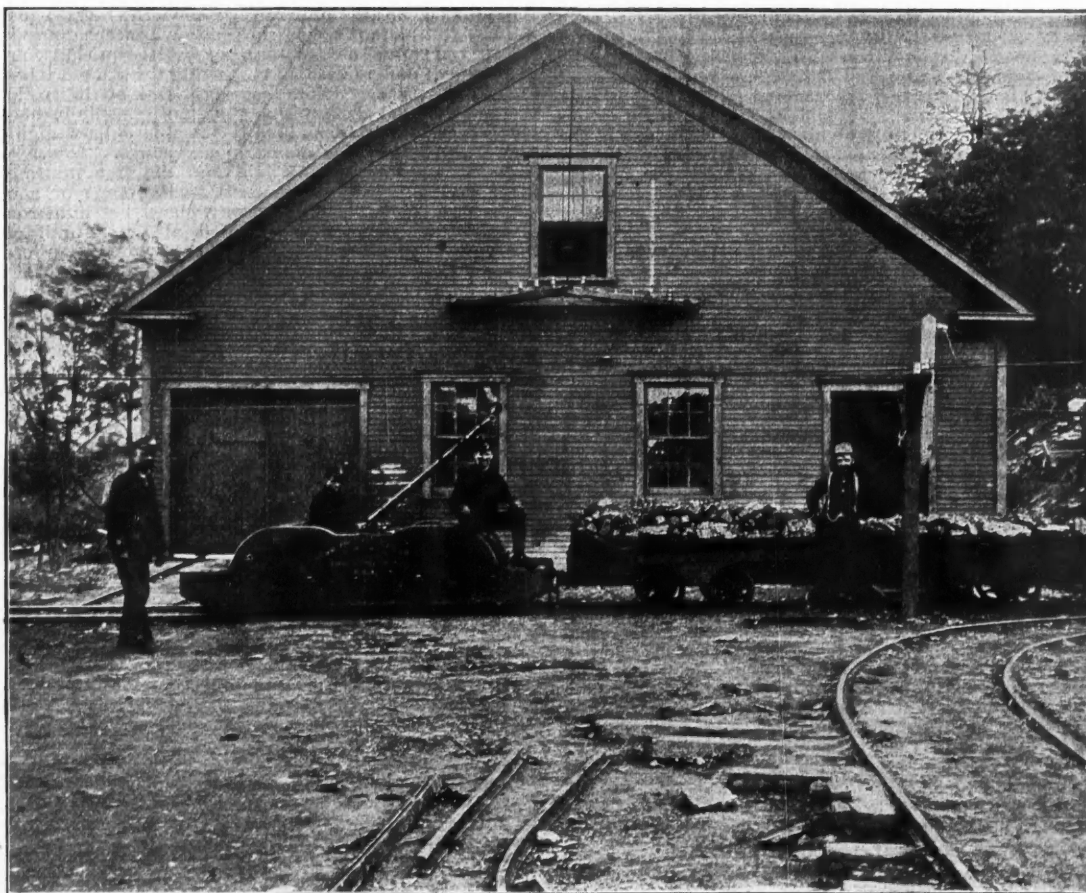
This locomotive does the entire gathering and hauling of the coal from the face to the tippie, not one mule being used in or about the mine. As will be seen from the illustration, three tracks are used—loaded track,

CO-METALLISM!

Written for the Engineering and Mining Journal by I. W. Sylvester, of the U. S. Assay Office.

In May, 1892, I had the privilege of submitting to the Committee on Coinage, Weights and Measures of the House of Representatives a co-metallic certificate of deposit system, based upon an uncoined unit of value, consisting of 12.9 grains of standard gold, plus 206.4 grains of standard silver. Such a system is possible, because it is not absolutely necessary, though it doubtless is desirable, that a unit of value should be coined. The essential feature is that the system be such as to make the weight of bullion in the unit of value familiar. The English silver pound was never coined, yet the quantity of metal contained in it and its proportional value to coins in actual circulation became familiar to everybody. So also the Spanish unit of value (the real), I am informed has never been coined; its multiples in actual circulation making the Spanish people familiar with its weight and value.

In outlining the system then submitted, as well as in suggesting the one herein presented, the inspiring motive has been to produce a metallic currency which, by combining the two metals, gold and silver, in one



JEFFREY ELECTRIC LOCOMOTIVE WITH LOADED TRUCKS.

empty track and third track, so the locomotive can run around the trip and always be in position for pulling the empties or loaded cars in or out of the mine.

We understand that the Jeffrey Manufacturing Company have built quite a large number of these locomotives during the past year, having equipped in all some 14 or 15 different plants. They have also under construction locomotives for a number of coal mines in Pennsylvania, West Virginia and ore mines in Arizona. They build these locomotives in all sizes, from 15 H. P. up to 175 H. P., and for all gauges, from 18 in. up to the standard, 4 ft. 8½-in. gauge.

Electrical Railroad Progress.—The projected electric railway to the top of the Jungfrau seems to have encouraged engineers to try other and still more difficult problems. It appears that a French mining engineer is making plans for an electric elevator to the top of Mt. Blanc; a horizontal tunnel is to be bored, and from there to the top the ascent is to be made by electric elevators in a vertical shaft one and a half miles high. It is questionable whether it is practicable to bore such a vertical shaft, as the work must evidently be carried on from below upward. It is thought that the time for the ascent will be 30 minutes. The plan adopted for the Jungfrau has the great advantage over the other, that the ascent itself will be one of the most attractive features; for the projected Mt. Blanc elevator there will be absolutely nothing of interest until the top is reached. To get to the top by any other means than by a shaft or tunnel seems out of the question, as the top for miles around is all a mass of snow and moving glaciers on which no permanent structure could be built.—*Electrical World.*

unit of value, should make our financial system more truly serviceable to our people, reconcile now antagonistic opinions and compel allegiance to that constitutional interpretation which recognizes both gold and silver as money, subordinating neither.

While it is possible to evolve a system without bringing into actual existence the unit of value, it is yet more desirable to have it coined, provided it be of convenient size and weight; for then it both serves the purposes of trade and becomes an object lesson of greater or less value to every person. Therefore my present proposition is that the dollar or unit of value of the United States consist of a disc of standard gold, weighing 12.9 grains, of the circumference of our present fifty cent piece, mechanically united to a disc of standard silver, weighing 206.4 grains similar in diameter and circumference but necessarily much thicker. This dollar would then be substantially of the size of our silver fifty cent piece: one side of it would present an entire silver front and the reverse side would present an entire gold front. It would be very handsome, and as to size and weight it would be very convenient; any one would be able to carry on his person and without inconvenience to himself double the number of metallic dollars that he can do at present. It could not be counterfeited with any greater ease than our present metallic money, and while I can find in my own mental searchings no valid objection to the coinage of such a legal tender dollar, I do see on the affirmative side many desirable influences which would spring from its existence.

But my proposition is not confined to the creation of this co-metallic dollar; the coin should be supplemented with a \$500 co-metallic coin bar—the existence of which, in conjunction with the dollar coin with or without the creation of multiples, would make the system complete and greatly promote the public convenience. This coin bar can readily be created or manufactured by mechanically pinning a slab or bar of standard gold,

weighing the proper number of grains, to a much thicker and somewhat larger slab or bar of standard silver, weighing the proper number of grains. Bars of pure gold and bars of pure silver, are now made at our assay offices and mints, greatly varying in size, weight and value. The ordinary large sized silver bars now made at the New York Assay Office weigh something over 200 oz. and they are considered a convenient size for handling and transfer in the bullion markets. The sizes vary more or less in thickness, but $7\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2}$ in. is a common size. Now a bar similar in size, say $7 \times 4 \times 1\frac{1}{2}$ in., could be cast from standard metal, the weight of which would just equal the number of standard grains in \$250 (412½ grains to the dollar); 250 whole dollars equal 500 half dollars, and if we insert on one of the faces of this silver bar—or in the language of mechanics countersink it—a bar of standard gold so adjusted in weight as to equal the number of standard grains in 250 gold dollars, we have by the union of these two bars 500 co-metallic dollars. The silver bar might be so cast as to have a recess of the proper dimensions formed on one of its faces; and into this recess the gold bar might be subsequently placed. The gold should be made to occupy a plain surface, level with the silver surface, 2×5 in. In this way the edges of the gold bar would be protected by the silver bar from abrasion and the gold surface would occupy 10 sq. in. in the center of the bar's face. The gold bar would approximate $\frac{1}{16}$ th of an inch in thickness, and the recess in the silver bar would be of the same depth. The gold bar may, by any practical method, be made to present a smooth surface even with the silver and to fit snugly the recess. To hold the bars together a countersunk steel-screw bolt should run through two corresponding holes at the center of each bar. This screw-bolt should screw upon itself and be so adjusted as to hold the bars firmly together, at the same time enabling one suspicious of counterfeiting to take the bars apart for examination and to put them together again without wearing away any of the precious metals. Upon the face of this co-metallic bar any simple and appropriate design may be placed; but the figures and letters expressing its value should be stamped partly on the gold surface and partly on the silver surface, so that they would be divided and meaningless in case of any separation of the two metallic bars. The manner in which this may be done is shown in the cut. The weight and fineness and the American eagle could be stamped on each bar at any appropriate place or places. There would thus be a union of two bars, not so strongly united as to prevent inspection and examination at any time that these might be desirable in guarding against counterfeits, but strong enough to make it practically one bar; or, as I have named it, a co-metallic coin bar.

Such a coin bar would be, in my judgment, a great convenience in effecting large payments. Its size and weight would permit of its being readily handled and its form would favor packing in boxes and storage. Multiples of the dollar and both multiples and subdivisions of the coin bar might be made by carrying out the principles more minutely; but the one dollar co-metallic coin and the 500-dollar coin bar described would, in and of themselves, constitute all that is necessary in the way of coinage to adapt this system to the needs of commerce.

Both the coins and the bars would pass from hand to hand and in this way would become familiar to the people; but in addition the coin bar naturally suggests their use against an issue of bills or paper certificates of deposit. Both the Government and our banks should be authorized to receive and to issue fractional certificates of deposit against them, the coin bars to be held in trust for the redemption of the bills. We would then have a monetary system based on the total volume of gold and silver combined. It would be a system in which neither metal by variations of market value could drive the other out of circulation, for there would be but one kind of metallic dollars, but one unit of value, and the value of this unit would be the merchandise value of its gold, plus the merchandise value of its silver, plus the value of its legal tender attribute. And last, but by no means the least in importance, we would have the best paper money in the world; that is a paper money secured by an actual deposit of gold and silver held in trust for its redemption at any time certificates may be presented.

DISTINCTION BETWEEN CO-METALLISM AND BI-METALLISM.

There is a broad distinction and a vast difference between co-metallism and bi-metallism. Bi-metallism is the free coinage of two entirely independent metallic dollars or units of value, each of which by law is made a legal tender in payment of all debts; both being nominally of the same value and intended to be interchangeable each for the other. This system places the choice of metals in the payment of any debt entirely in the debtors hand; he can tender to his creditor or creditors either kind of dollars and by force of statute law they must accept it in discharge of the debt or debts. Why should a debtor be armed with this exclusive privilege, and the creditor denied it? If for the sum of 100 dollars a man could only purchase gold bullion enough to make when coined just \$100, but could for the same money purchase silver bullion enough to coin \$150, he would be more than human if he did not do it, and thus with \$100 of good money cancel a 150-dollar debt. Is such a policy conducive to good faith—to that confidence which is at least the basis of all new enterprises? Both the moral judgment and the self interest of mankind will place an emphatic negative on the creation or perpetuation of any such system.

Co-metallism, on the contrary, provides for the creation of but one standard of value, the creation of but one dollar, one unit of account. This is made by uniting in the same coin a definite number of grains of each metal, and when a creditor has paid to him a certain number of dollars he receives a certain number of grains or ounces of gold and a certain number of grains or ounces of silver. There is no choice of dollars open to a debtor's selection; there is no particular kind of dollar a creditor can demand, for the debtor must pay and the creditor must receive the dollar prescribed by law—the co-metallic dollar containing the due proportion of each metal. This dollar may be worth much or little; its value will be regulated by the laws of trade and be noted in the decline or the appreciation of prices; but at whatever value it passes its value will be just and correct because valued by the people themselves in their marts of trade.

When Congress enacted that our gold dollar should consist of 25·8 grains of standard gold, it did not set any value upon that coin or the amount of gold it contained. Calling it a dollar is not to value it in the true sense of this word. To value a thing it must be compared with

something else, and to value the dollar, whatever its composition or legal powers may be, we must have in mind its power of purchasing merchandise. Congress by calling that quantity of gold a dollar merely gave a name to our unit of account to which men refer merchandise for its valuation; but in every actual sale of goods for gold dollars the valuation is reciprocal, the gold is valued in merchandise and the merchandise in gold.

The people and not Congress therefore determine the value of the unit of account, and what is true of our own unit or dollar is equally true of the English unit, the pound, the French unit or franc, and the German unit or mark. A unit of account is simply a definite quantity of bullion, so coined as to make it easily handled; and it is made legal tender in order to compel people to exchange their merchandise for it. It never is and never can be valued, except only as the people take it for and with it purchase merchandise. The value of our dollar and the value of every other unit is its average power of purchasing merchandise; this value the people regulate among themselves and change from day to day.

What the free coining of legal tender gold dollars does for gold in our country and in all gold coining countries, is to compel its use and its resultant valuation. If the freedom of coinage, *i. e.*, the privilege of taking bullion to the mint and having it coined into legal tender dollars were restrained or limited in amount, this valuation could not take place or it would be imperfect; but as long as this privilege remains in force the people are compelled to receive the money, to place a value upon it and to estimate the value of their own merchandise in its terms.

Now you cannot confer this same function upon two metals coined into independent dollars without conferring the same privilege of valuation of each by the people. And history is full of illustrations of its effects: people will value cheaply made dollars cheaply by charging high prices for their merchandise, and really valuable dollars highly by exchanging their merchandise for it at lower prices. Hence we cannot have both the free coinage of gold and the free minting of legal tender silver dollars, but we can have free coinage of a co-metallic dollar without any confusing, inconvenient or disastrous consequences, providing we make it our sole legal tender unit of value. Under this system the silver with the gold would be forced into circulation, people would be compelled to value both metals at one and the same time, and to estimate the value of their merchandise in its terms—that is, in co-metallic dollars. Make co-metallic dollars our only metallic legal tender money and it would immediately become our standard of value, and this value would be the sum, so to speak, of three values: first, the value of its gold bullion; second, the value of its silver bullion, and third, that value which attaches to anything, metallic or paper, with which goes the legal tender power to cancel debts.

The strongest influence against the free coinage of silver has been and is the varying ratio; or to put the objection a little more in detail, first, in the impossibility of any one nation preserving any fixed relative value between gold and silver coins; second, the uncertainty and differences of opinion regarding the ability and desirability of any number of nations uniting successfully in such a purpose. These objections would have prevailed with equal force against gold coins, if both metals had proved themselves equally desirable as money metals, but they have not done so. Among a number of other superior qualifications gold has always had an immense advantage in the fact that, weight for weight, it has been and now is many times more valuable; or, in other words, it represents a much larger quantity of merchandise. A pound of gold to-day carries with it as it passes from the ownership of one person to another about 30 times as much merchandise, real estate or any other form of property. To carry the representative value of a \$5,000 house, or \$5,000 worth of stock in silver bullion, would be considered a cruel burden by everybody. People exchanging much merchandise and other forms of property, in other words the larger commercial nations, and commerce and civilization are almost synonymous, must use the gold metal in coinage or be put to a load of cost and inconvenience. Hence the prominent Western nations have for years been gradually discarding silver, substituting gold and floating silver by making it redeemable in gold.

But with the system herein set forth both the ratio difficulty and the weight difficulty disappear. Under it there can be no disappearing of one metal by the substitution of the other under the influence of a changing commercial ratio. There would be no exclusively gold dollars and no all-silver dollars, but each dollar would carry to the person receiving it, the due proportion of gold and the due proportion of silver whatever might be the market value of each. Its value assaid before would be the commercial value of its gold plus that of its silver, plus the value which legal tender power confers on any and all moneys. If the bullion prices of both its gold and its silver depreciated this would gradually lessen its power to purchase merchandise; if the prices increased this would gradually increase its power to purchase merchandise, but if the price of one metal increased and the price of the other decreased this would tend to maintain its purchasing power at a level, which according to most writers would be the most desirable of results.

So also with the manufacture of the co-metallic coin bar the weight difficulty disappears: for if these bars remain, as they would very largely, on deposit against the circulation of their representative paper currency, their possession and ownership would change hands without the element of relative weight being recognized.

It is universally conceded that one of the most desirable features of the currency issued upon our United States Bonds is its elasticity. An elastic currency means a currency, the volume of which can be increased in proportion to the demand for money, and subsequently retired when the demand weakens. It is a desirable feature in any currency, and a currency based wholly on gold is still elastic enough to respond to a higher rate of interest, but what is true of gold alone would be more emphatically true of a currency based on both gold and silver.

It must be obvious to any one interested enough to follow out and comprehend the details of this co-metallic system, that few devices could better respond to the wants of trade and to the interests of money lenders. As already pointed out, the money of the country would be made by mechanically uniting the two metals. If money was in demand its manufacture would be ordered and the demand satisfied; when the demand ceased or slackened some of the bars would be separated, and their fineness and weight being already stamped upon them, they would

find ready sale as bullion. Both the gold bars and the silver bars would be in convenient form for sale as bullion without any further change whatever. They would be sold as bullion whenever their bullion value exceeded their coin value; and again united into co-metallic coin bars, whenever their use as coin would be their most profitable disposition.

Thus when domestic trade called for more money it would be forthcoming at a fair price: when the call ceased the money would be turned into bullion and thus kept in active use. Certainly this is "Elasticity" to perfection; an elasticity to which the total product of the world's bullion is made responsive.

On the other hand there could be no undue influence tending to make shipments of bullion too easy, because in the conversion of the money into bullion the owner of the coin bars would have to find a market for both metals. It would be only when the sum of the market prices of each metal exceeded the profit likely to arise in using or loaning the metals as coin that such transformation and sale would take place.

The principal functions of metallic money are: first, the valuation of property as a basis for the exchange of one kind of property for another kind, and, second, the settlement of balances.

Trade between distant places will become larger and more profitable as the standard of valuation (be it gold or silver, or both) becomes similar in each place. There can be no more important function than this. Correct valuation in each and all instances is the source of that mutuality of profitableness which insures a continuous interchange of products. The enforced settlement of balances in metallic money preserves and constantly adjusts this valuation function, conserves and preserves this power

THE COMPARATIVE EFFICIENCY OF WEST VIRGINIA COALS.

Written for the Engineering and Mining Journal by James W. Paul.

To laud the virtues of Pocahontas Flat Top or New River coals of West Virginia would be but to "paint the lily" and repeat in part the exhaustive reports which have treated of these coals and of their commercial efficiency.

The series of tests made upon different bituminous coals of the United States by the authorities of the United States Navy show at a glance the superiority of the southern coal as a steam generator. In no case has the heat of other coals evaporated so much water per unit of fuel as the celebrated West Virginia Flat Top coal. The marine tests made on the Cruiser *Montgomery* in the latter part of 1894 show that West Virginia coal has no superior and very few, if any, equals.

The present article will endeavor to give the comparative efficiency of all the West Virginia coals that are to any extent on the market, taking the Southern Flat Top coal as a basis of comparison.

Referring to the report of the Navy, it shows that 1 lb. of Flat Top coal evaporates 9.38 lbs. of water from and at 212° F. The heat units given out by the combustion of 1 lb. of this coal, according to calorific tests, amount to 14,969.5 *b. t. u.* This is equivalent to an evaporation of 15,496 lbs. of water. The efficiency of the coal in the marine test is therefore but 61% of the calorific result, the loss being in incomplete combustion, loss in radiation and in the uptake.

The most important factors to be considered in a coal are, first, its

THE COMMERCIAL COALS OF WEST VIRGINIA. TESTS MADE BY J. W. PAUL.

| No. | Physical structure and properties | Kind. | Bed. | County. | Color of Ash. | Thickness of bed. | Analysis. | | | | | Sp. Gravity. | Weight per cubic foot in lbs. | British Thermal units. | Water Evaporated from and at 212° F. | |
|-----|---|--------------|--------------------|-----------|----------------------------|-------------------|------------------|------------------|--------------|------|--------|--------------|-------------------------------|------------------------|--------------------------------------|------------------------|
| | | | | | | | H ₂ O | Volatile Matter. | Fixed Carbon | Ash. | Sulph. | | | | Calori-meter. | Commercial efficiency. |
| 1. | Granular, rings when struck carves easily..... | Bitum. | No. 3. Pocahontas. | McDowell. | Light red-dish br'wn | 6' 6" | .55 | 18.50 | 78.85 | 2.10 | ..... | 1.270 | 79.44 | 14969.5 | Lbs. 15.496 | Lbs. 9.38 |
| 2. | Very hard; splinty; gives yellow flame..... | " | Lower Kittan. | Logan. | Pinkish. Canary yellow. | 5' 2" | 1.40 | 36.95 | 59.80 | 1.85 | ..... | 1.274 | 79.63 | 15138.3 | 15.67 | 9.56 |
| 3. | Columnar, granular and friable..... | " | " | Tucker. | Dirty Br'n to dark red. | 6' 6" | .70 | 21.20 | 75.30 | 2.80 | ..... | 1.297 | 81.06 | 14332.5 | 14.836 | 9.05 |
| 4. | Columnar, lustrous..... | " | Upper Freeport. | Barbour. | Dark Fawn.l | 5' 0" | 1.25 | 32.15 | 58.25 | 8.35 | 1.84 | 1.352 | 84.40 | 13943.9 | 14.43 | 8.80 |
| 5. | Rhomboidal; shiny surface flaky..... | " | Winifrede | Kanawha. | " | 5' 0" | 1.30 | 38.80 | 58.60 | 1.30 | ..... | 1.284 | 79.00 | 13940.7 | 14.43 | 8.80 |
| 6. | Rhomboidal; granular, carves very easily..... | " | No. 3. Pocahontas. | Mercer. | Pinkish. buff. | 14' 0" | .10 | 17.00 | 81.10 | 1.80 | ..... | 1.279 | 79.94 | 13695.5 | 14.18 | 8.65 |
| 7. | Very hard, dull black..... | Cannel. | Lower Freeport. | Logan. | Dark and flaky. | 2' 0" | .70 | 53.30 | 37.40 | 8.60 | ..... | 1.239 | 77.48 | 13536.3 | 14.01 | 8.55 |
| 8. | Concoidal fracture; carbonate of lime in cleavage planes..... | Bitum. | Pittsburg. | M rion. | Lavender-gray. | 7' 0" | 1.30 | 37.15 | 58.45 | 3.10 | .55 | 1.302 | 81.38 | 13461.7 | 13.94 | 8.50 |
| 9. | Very hard, shiny..... | " | " | Ohio. | Very dark. Forms Clinkers. | 6' 0" | 1.75 | 40.60 | 53.10 | 4.55 | 3.47 | 1.304 | 81.50 | 13329.2 | 13.79 | 8.41 |
| 10. | Hard, shiny; laminations show fossil stems..... | " | " | Marshall. | Deep Pink. | 6' 0" | 1.63 | 41.77 | 51.10 | 5.50 | 3.92 | 1.294 | 80.84 | 13212.3 | 13.68 | 8.34 |
| 11. | Columnar; carbonate of lime in planes..... | " | " | Marion. | Flesh tint. | 7' 0" | 1.05 | 33.50 | 62.00 | 3.45 | .72 | 1.290 | 80.63 | 13122.2 | 13.58 | 8.28 |
| 12. | Columnar..... | " | Upper Freeport. | Marshall. | Light pinkish. | 1 0' (t) | 2.00 | 40.50 | 51.10 | 6.40 | 2.06 | 1.295 | 80.94 | 13058.5 | 13.52 | 8.25 |
| 13. | Compact; carves easily..... | " | Lower Kittan. | Fayette. | Lavender gray. | 6' to 12' | .95 | 30.40 | 65.70 | 2.95 | ..... | 1.273 | 79.56 | 12957.2 | 13.41 | 8.18 |
| 14. | Face very pronounced; shiny..... | " | Pittsburg. | Marshall. | Snowy white. | 6' 0" | 1.38 | 42.07 | 49.65 | 6.90 | 4.27 | 1.324 | 82.75 | 12685.9 | 13.13 | 8.01 |
| 15. | Irregular; dull-brownish..... | " | Lower Kittan. | Logan. | Flour white. | 5' 0" | 1.10 | 36.00 | 57.00 | 5.90 | ..... | 1.305 | 81.56 | 12654.9 | 13.10 | 7.99 |
| 16. | Very hard and splinty, gives yellow flame..... | Semi-Cannel. | Upper Kittan. | Wayne. | White buff. | 6' 0" | 2.45 | 36.90 | 54.40 | 6.25 | ..... | 1.348 | 84.25 | 12315. | 12.75 | 7.78 |
| 17. | Irregular; dull luster, CaC O ₃ | Bitum. | Pittsburg. | Mason. | " | 6' 0" | 3.75 | 36.20 | 54.60 | 5.35 | ..... | 1.307 | 81.69 | 12318. | 12.75 | 7.78 |

* 500' below the Ohio River at Moundsville, W. Va.

in the metals themselves, and measures the quantity of products the holder of similar metallic money is entitled to receive by yielding up its possession to other property sellers.

But the quantity of metal actually used in settling balances has in proportion to volume of trade largely decreased, and may continue to decrease with the extension of the facilities for applying the credit system. Nevertheless large quantities of bullion will always be necessary, the demand for actual money will always exist in greater or less degree, and at periodical times of distrust and mercantile failures this demand is at its maximum. Not only at such times but at all times the knowledge that bullion exists in quantities, and that it can be had in the shape of legal tender money at any time by the payment of a fair rate of interest, is, in itself, a safeguard against attempts to corner the money market, or attempts at controlling the supply. Just as "corners" are made in stocks so "corners" are sometimes made in money or bullion, and to put a brake upon this power, to antagonize it in the interest of the community, a very large volume of metallic money is sometimes necessary.

Castner-Kellner Alkali Process.—The building of the works of the Castner-Kellner Alkali Company at Weston, on the estuary of the Mersey have been commenced. This company does not stand alone in beginning this electrolytic process in connection with a large chemical industry. One of the largest shareholders was the Deutsche Solvay Werke Gesellschaft, the directors of it having been so far satisfied with the investigations they had made in the Castner-Kellner electrolytic processes that they had not only subscribed largely to the capital of this company, but had determined to erect works in Germany simultaneously with the works which were being erected in England. They thought it desirable to get such an advantage as time and experience would give them in a few months before proceeding with the remainder. This process is in use by the Mathison Alkali Works, at Saltville, Va.

calorific power; second, percentage of refuse; third, the nature of the ash; fourth, the character of smoke and amount of soot formed.

A coal which gives a satisfactory ash in steam generation will not make a coke with the most desirable ash. In the first place, the composition of the ash should be such as to not flux at the temperature of the boiler furnace fires. In the second place, the ash should satisfy the formula for Percy's slag: $R_2O_3SiO_2 + 2(3RO, SiO_2)$. Provided the ash is a small percentage, it matters little if it is refractory and fails to form a slag, since the flux added in the coke furnace will supply the material necessary to flux the ash.

The proximate analysis of a coal is no criterion of its coking qualities. This is verified in the Staffordshire coal-field, where a distance of two miles in a coal bed renders the coal non-coking, although having practically the same analysis.

Previous to making the laboratory tests upon the coals in question the writer had visited nearly all the coal-fields of the State and it was upon these visits that a great many of the samples were secured. The remaining samples were furnished by mine superintendents and managers. The samples were taken from the working faces and such parts of the stratum were rejected as are thrown in the gob by the miners. All samples were collected and prepared, and all tests made in the mechanical and chemical laboratories of the University of West Virginia under the guidance of the professors in charge of these departments. The calorimeter used in the tests was the Barrus modification of the Thompson calorimeter as described by Mr. Jos. Struthers in the School of Mines Quarterly, April, 1895. It is a matter of much regret that the State of West Virginia has no place for the purpose of making full tests on a commercial scale.

Very complete tests have been made upon natural gas as a fuel at the State University, but the means are not at hand for the handling of solid fuel to the extent of carrying on the tests economically.

The enormous quantity of mineral fuel which the State possesses makes

the subject of economy of secondary consideration on account of the cheapness of the article.

The table gives results from the coals which are representative of four different fields, which are: the Southern, along the line of the Norfolk & Western Railroad; Kanawha and New River field, along the Chesapeake & Ohio Railroad; the Northern or Fairmont field, along the B. & O. Railroad and Monongahela River; the Eastern or Potomac field, along the line of the West Virginia Central Railroad.

The only analogy which asserts itself in the table of results is between the percentage of ash and the specific gravity. The following conclusions are the result of the observations made during the tests.

The color of the ash is a key to the liability of the coal to form clinkers. Iron pyrites, FeS_2 , is the most probable source of iron in the ash. The sulphur is driven off and the iron unites with oxygen to form sesquioxide of iron. The oxide of iron, with the potash, soda, lime and silica of the ash, forms a slag which is known as a clinker. Iron usually gives a reddish color to the ash. The intensity of this color and the amount of ash are indications of the proportion of sulphur existing in the state of pyrites. Silica and alumina predominated in all the ashes.

With the exception of the cannel and semi-cannel coals, all the coals herein examined are fat coals with a short flame, the conditions most favorable for coke making.

The coals of the northern Panhandle agglomerate more easily and furnish the greatest amount of hydro-carbon gases.

The sulphur in the coals of this State exists mostly in the state of iron sulphide. Some sulphide of lime is found in the Pittsburg bed, but in small percentage. Carbonate of lime is found in abundance in some localities of the northern field. This is found in the vertical cleavage planes. Nodules of sulphate of iron are found in the Pittsburg bed in the counties north of Ohio County.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

MINING CLAIMS.—In an action to determine the right to proceed in the United States Land Office for patent on certain mineral land, a party having offered in evidence the Receiver's receipt for entry thereon, which by the laws of Montana is *prima facie* evidence of title to the land, the one sued may give in evidence decisions of the Land Office, made on a protest against the issuance of patent to the first party, cancelling the receipt for fraud in obtaining it.—*Murray vs. Polglase* (43 Pacific Reporter, 505), Supreme Court of Montana.

Comparative Cost of Acetylene and Common Gas.—The fact that calcium carbide is now obtainable commercially has been ingeniously applied by M. G. Trouvé for the purpose of domestic lighting. The principle of his lamp is that of the "Kipp," used in chemical laboratories, in various forms, for the production of hydrogen sulphide and other gases. The mode of arranging the contact of the water and carbide had to be carefully worked out, as an ordinary "Kipp," charged with calcium carbide and water, gives such a vigorous evolution of acetylene as to be unmanageable. An estimate of the working cost of the lamp compared with that of coal gas is favorable. *Nature* says, to the former in Paris, where gas is costly—7s. per 1,000 ft.—but in London, if the carbide could be obtained at the same price—4d. per lb.—the cost would still be double that of ordinary lighting gas.—*The Engineer, London.*

Developments in Coal Mining in Japan.—About 18 years ago the government transferred the management of the Mike mines to Messrs. Mitsui & Co., the well-known Japanese merchants, and the firm, seeing that much more could be done with the mine property than had hitherto been attempted, induced the government to adopt modern methods of working. The sale of the coal was placed absolutely in Messrs. Mitsui & Co.'s hands, and under the name of the Mitsui Bussan Kaisha they established offices for the sale of Mike coal at Shanghai, Hong Kong, Singapore and the principal Japanese ports, and sub-agencies at other Eastern ports. In sinking the Kutchidachi shaft great difficulties were encountered by the large amount of water met with. Pumping plant had been erected capable of raising 3,000 gals. of water per minute, prior to the great earthquake in the vicinity of Kumamoto, which occurred on July 21st, 1889; but after this violent shock the influx of water became so great that the pumps were drowned, and the work had for a time to be abandoned. Two large compound differential pumping engines, capable of raising 6,000 gals. per minute, were ordered from Messrs. Hathorn, Davey & Co., of Leeds, each engine having a high-pressure cylinder 40 in. and a low-pressure cylinder 76 in. in diameter, the stroke being 10 ft. These engines when erected were found able to cope with the inflow of water, and the abandoned sinking operations were placed in a condition to be recommenced.

Hardening Steel by Gas.—The Germans are interested in a new process for hardening steel by means of gas. The invention originated with the famous French steel and iron firm, Schneider & Co., of Creuzot.

It is a well-known fact that gas, under great heat, deposits carbon in solid form. Upon this depends its light effects, and also the formation of the so-called retort graphites, a thick covering of pure carbon on the walls of the gaslight retorts. The gas that strikes the retort walls deposits part of its carbon upon them. This is the fact upon which Schneider bases his very useful invention—a process for cementing together (uniting) steel armor plates. It is said to be very important in the production of armor plates to have them comparatively soft inside and hard outside. This hardening is obtainable by the application of carbon. Formerly, the process of hardening consisted in covering the plates with layers of coal and heating them till they glowed. Schneider's process puts two plates into a furnace, one on top of the other, with a hollow space between. This space is made gas-tight by means of asbestos packing put on around the edges, and the plates are heated red-hot, while a stream of

light gas is poured into the hollow space indicated. The carbon thrown out by the gas is greedily taken up by the glowing plates until they are thickly covered. The depth of this carbon covering can be regulated by the amount of gas admitted. In order to secure regular and uniform action during the process, and to prevent the pipes that carry the gas to the hollow space from absorbing any of the carbon, they are insulated in other pipes through which water is constantly circulating. It is believed that this simple and rapid carbonizing process will soon be applicable to many other branches of the steel industry.

Mining Machinery in Japan.—The following interesting comments are sent by Mr. J. Anjou, of the Ashio copper mines, Shimotsuke, Japan, to the *British Trade Journal*: "The machine-building industry of Japan is as yet in its infancy; and although we construct some machines, there are others which we are obliged to import from foreign countries. Perhaps mining machinery is more largely made in Japan than any other kind, excepting certain parts of steel which cannot be produced here; but having discovered large deposits of iron ore in many parts of Japan, I am sure we shall have steel and iron foundries in a few years, and we shall then be in a position greatly to develop our engineering industries. Japan has been a good customer of England for many years. We have bought every kind of apparatus from Great Britain, which we have always regarded as the most advanced engineering country in the world, but recently American invention has made great progress, especially in connection with that for mining; and comparing English and American machines of this class, we find that those from America are not always inferior, but rather often better than the English apparatus, while the price, having in view the improved character of the machine, is comparatively low. In addition to this, it must be remembered that the distance between Japan and America is much less than that between Japan and England. American engineering firms are always looking for a demand for their productions here, and send us their catalogues, from which we can select at our convenience. They also send experts, who travel through the country and consult our mining engineers as to the machinery required. On the other hand, English manufacturers and engineers have only a few agents throughout Japan, and these do not generally push the sale of the machinery. In short, British engineering knowledge and the trade policy of England in the Orient does not tend to develop, while the Americans are making progress."

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

WEEK ENDING FEBRUARY 25TH, 1896.

- 555,128. **ROCK DRILL.** Adam Scheid, Harrison, N. J. Combination of a steam-chest and its trip-valve, with the cylinder and piston, and with two ports penetrating the piston and extending to opposite ends thereof, the steam-inlet communicating with the steam-chest and cylinder, two channels communicating with the central portion of the steam-chest and the ends of the cylinder, a branch port leading from each of these channels to the steam-chest, an exhaust-port on each end of the steam-chest and communicating with the cylinder, and an exhaust in the cylinder and on each side of the steam-inlet.
- 555,185. **COAL SEPARATOR.** John R. Richardson, Scranton, Pa., Assignor of fourths to Thomas R. Hughes and F. H. Emery, same place. Combination with a receiving chute and a transversely and longitudinally adjustable discharge chute in proximity to the lower end thereof, of a rock shaft and deflecting-plate carried at the lower end of the receiving chute, and mechanism for adjusting the angle of inclination of the deflecting plate.
- 555,231. **ENGINEER'S Y-LEVEL.** Christian L. Berger, Boston, Mass. A support, a narrow cross-bar pivoted for horizontal movement thereon, and having at either side, adjacent to the pivot, a lateral carrying arm extending outwardly and upwardly therefrom, combined with a cradle-bar arranged immediately above and closely adjacent to cross-bar, and provided with lateral arm, extending closely adjacent to and above the carrying arms and pivoted thereto at their outer ends, a telescope, a level thereon, and and Y-supports for the telescope at the ends of the cradle-bar, whereby the level to lie immediately above and close to the cradle-bar, whereby a compact Y-level of light weight and minimum height is provided.
- 555,254. **RECIPROCATING DRILLING-MACHINE.** Adolf E. W. Meissner, Charlottenburg, Germany, Assignor to the Siemens & Halske Electric Company of America, Chicago, Ill. Patented in Belgium March 15th, 1894, No. 108,701; in Italy March 21st, 1894, No. 35,821; in France May 4th, 1894, No. 296,250; in South African Republic June 19, 1894, No. 655; in Switzerland August 15th, 1894, No. 8,317; in Germany August 23d, 1894, No. 77,887; in England November 17th, 1894, No. 646; in Norway November 30th, 1894, No. 3,592, and in Sweden January 24th, 1895, No. 5,789. Combination with a reciprocating plunger having a socket for the drill at the forward end and a bore extending through the plunger and affording communication to the socket from the rear, of a drill adapted to fit the socket and having an elongated shank to permit the insertion of the drill into the socket from the rear through the bore in the plunger, and abutments near the forward end of the socket for taking up the thrust and the pull upon the drill.
- 555,262. **SHAKER SCREEN.** David E. Phillips, Mahanoy City, Pa. Filed July 25th, 1895. In a screening apparatus, a screen longitudinally inclined, a rock-shaft provided at either end with depending hangers rigidly fixed thereon and pivotally supporting the lower end of the screen at their vibrating ends, a shaft provided with a plurality of cams, an arm fixed at one end to the rock-shaft in axial alignment therewith and provided at its opposite end with a forked portion arranged to be moved vertically by positive engagement with one of the cams, and another set of hangers supported at their upper ends on the cams, and arranged in pivotal connection at their lower ends with the higher portion of the screen.
- 555,365. **COAL TIPPLE.** Thompson B. DeArmit, Turtle Creek, Pa. Combination of a screen, a weigh-basket having its bottom formed by a screen, a hopper for receiving the coal passing through the weigh-basket screen, a chute extending along under the first screen and the hopper, the portion of the chute under the first screen being provided with a screen of smaller mesh, spouts arranged at different points along the chute, doors for controlling the passage of coal along the chute and spouts, a supplemental chute arranged under the screen in the first chute and connected to the first spout, and a pivoted plate forming the end wall of the supplemental chute, and adapted to be turned down to form a prolongation thereof, and to close the mouth of the spout.
- 555,483. **PROCESS OF RECOVERING PRECIOUS METALS FROM SOLUTIONS.** Thomas L. Wiswall and Jerome B. Frank, Denver, Colo. The process consists in taking crude zinc (spelter) and subdividing it into a mass of filaments, when the crude zinc contains as an alloy at least three per centum of lead and one or more other metals which impart to the filaments a tensile strength sufficient to enable them to withstand the compression of the solution which flows through them, such as antimony, arsenic, bismuth, or cadmium, and then passing the solutions through the mass of filaments.

PERSONAL.

JOSEPH PRESTWICH, Professor of Geology in the University of Oxford, has been knighted by Queen Victoria.

MR. C. K. LORD, president of the Consolidation Coal Company, has been inspecting the company's property in Allegany County, Md.

PROF. HARRY LANDES has been appointed Professor of mineralogy and geology at the Washington State University, Seattle, Wash.

COL. JOHN C. WYMAN has been appointed commissioner to represent the State of Rhode Island at the approaching exposition in Mexico.

MR. J. B. NAU, recently of Pittsburg, has established an office in the Temple Court Building in New York as consulting metallurgical engineer.

MR. DE COURCY MAY has been appointed general manager of the Dickson Manufacturing Company at Scranton, Pa., to succeed Mr. SYDNEY BROADBENT.

MR. C. M. BOSS, mine inspector for Gogebic County, Mich., has gone to Cuba in the interest of Cleveland and other capitalists. He will be succeeded by Capt. J. H. TAYLOR, of Ironwood, who has been appointed deputy inspector, to the satisfaction of all interests concerned.

The Canadian Pacific Railway Company has established at Montreal a mining department in charge of a capable consulting mining engineer. Mr. J. H. SUSSMAN, who is in charge of this branch of the company's service, is a graduate of the Massachusetts Institute of Technology, and has done much practical work in the metallurgy and mining of the precious metals. Mr. SUSSMAN will examine and report on all mining enterprises in any district through which the Canadian Pacific passes. If his report is favorable the company will do everything within its power to assist by building branch lines, giving low rates of freight, etc.

OBITUARY.

WYATT W. PIERCE, superintendent for the New Jersey Zinc and Iron Company, at Franklin Furnace, Sussex County, N. J., died in Newton, N. J., on February 24th, aged 56 years.

C. H. WHITFORD, superintendent of the Victoria mine, of the Minnesota Mining Company, at Virginia, Minn., died there last week. He was one of the pioneer mining men of the Mesabi range, and opened the fine ore body at the Franklin mine.

SOCIETIES AND TECHNICAL SCHOOLS.

MINING SOCIETY OF NOVA SCOTIA.—The annual meeting of this society will be held in the rooms of the society, 107 Hollis street, Halifax, March 11th. A good programme has been prepared and some interesting papers are promised. The annual dinner will be held in the evening.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.—At the February meeting in Boston five new members were admitted, as follows: H. B. Murless, Rockville, Conn.; A. Carpenter & Sons, Providence, R. I.; C. H. Bausch & Sons, Holyoke, Mass.; the Union Iron Works Company and the General Electric Company, Lynn, Mass. A paper was read by J. A. Penton and there was a general discussion on "Foundry Practice at the Present Time." The next meeting will be held at the United States Hotel in Boston on March 11th.

GENERAL MINING ASSOCIATION OF QUEBEC.—The provincial government has promised to aid the association by a grant of \$2,500 yearly, the object being to enable it to establish in Montreal, in a prominent business center, a Bureau of Mines, where mining men can meet and discuss mining affairs, where exhibits of the ores and minerals of the Province will be available for inspection by capitalists, where mining students can have access to a library of mining literature, and where a series of popular lectures on mineralogy and mining may be given by members of the association and others interested in promoting the extension of mining.

WESTERN FOUNDRYMEN'S ASSOCIATION.—At the regular February meeting in Chicago there was a large attendance, and Mr. A. W. McArthur occupied the chair in the absence of the president. The secretary read a paper by Mr. H. Hansen, of St. Louis, on "Oil as a Fuel for Core Ovens," giving the results of some interesting experiments, and also some notes as to the relative cost of fuel-oil and coal for the purpose. His chief argument in favor of oil was the better utilization of the fuel and the ease with which the fire can be regulated, a very important point in finishing cores. The reading of the paper was followed by an interesting discussion in which nearly all the members took part, giving notes from their own experiments.

BRITISH COLUMBIA ASSOCIATION OF MINING ENGINEERS.—The mining men of British Columbia have succeeded in organizing "The British Columbia Association of Mining Engineers." The officers are: President, R. C. Campbell Johnstone, M. E., Vancouver; Vice-President, S. M. Robins, Nanaimo;

Secretary-Treasurer, G. F. Moncton, M. E., Vancouver; Council, Howard West, A. H. Holditch, H. E. D. Merry, J. Newlands, E. Bellamy, and two others not yet appointed. The association comprises members who are actively engaged in mining in the province, associate members who are not professional mining men but are interested in the development of British Columbia minerals, and students. The honorary members are: Col. Baker, Minister of Mines, Victoria; Dr. G. M. Dawson, Director of the Geological Survey; Mr. B. T. A. Bell, editor of the *Canadian Mining Review*. The first regular meeting will be held at Nelson in April.

INDUSTRIAL NOTES.

James Gordon Bennett has reduced the price of the *Evening Telegram* from two cents to one cent.

It is stated that the Rich Patch Iron Company, of Low Moor, Va., has decided to erect an additional blast furnace.

The plant of the Pittsburg Tool Steel Company, at Greensburg, Pa., has been put in operation, after an idleness of some months.

The Pittsburg (Pa.) Locomotive Works have secured the order for building 10 engines for the Lake Superior & Ishpeming Railway.

The McGlewe Ore Concentrator Company, of San Francisco, Cal., have just shipped concentrators to Australia and to Wadsworth, Nev.

George B. Sennett, owner of the Eagle Iron Works, of Meadville, Pa., announces that he will remove the works to Youngstown, O.

During the last week of January the output of the Ohio Steel Company, of Youngstown, O., on one day reached 1,252 tons, which is the highest since the works started a year ago.

Francis Smith & Co., of San Francisco, report sales of pipe for power plants to the Alaska-Mexican mine, Alaska; Southern mine, Amador County, and the Golden Gate mine, Tuolumne County, Cal.

Miller Bros. & Co. have just received a contract from the Allison Manufacturing Company, of Philadelphia, Pa., for the erection of a lap-weld furnace, bending furnace and five Duff water seal gas producers.

Geo. E. Woodbury, of San Francisco, reports shipments of Woodbury concentrators as follows: Sidney, Australia, 8; Lordsburg, N. Mex., 1; Boise City, Idaho, 1; Salt Lake, Utah, 1, and the Taylor mine, Eldorado County, Cal., 1.

The Maine Steamship Company's special committee has awarded the contract for the new steel steamer to the Delaware Ship Building Company of Chester, Pa. The new steamer is expected to make the trip between Portland and New York in 20 hours.

The Midas Gold Saving Machine Company, of San Francisco, Cal., has recently shipped Gold King amalgamators as follows: Carson Creek, Cal., 2; Westfall, Cal., 1; Burson, Cal., 2; Ensenada, Lower California, 1; Telluride, Colo., 1, and Port Orford, Ore., 1.

James V. Rose, of the Sharon, Pa. Fire Brick Works, has been awarded the contract for the erection of 25 patent Semet Solvay by-product coke ovens for the Sharon Iron Company. The product of the ovens will be used at the company's furnace and its extensive mills.

The Ironton Structural Steel Company, of Duluth, Minn., has let to the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa., contracts for electrical equipment for the driving of its two 25-ton traveling cranes, which are to be put in to handle blooms and ingots. Other contracts will follow.

Judge Dibell, in the Circuit Court, has ordered the Joliet (Ill.) Enterprise Barb Wire mills to be sold April 8th, the Receiver to advertise for bids. The mills belonged to Fish Bros. & Co., also interested in the Fish Bank, better known as the Stone City Bank. The concern went into bankruptcy three years ago with liabilities of nearly \$1,000,000. The mills cost \$300,000 and are ready for use.

The Berlin Iron Bridge Company, of East Berlin, Conn., has just completed for the Citizens' Gas Company, at Bridgeport, Conn., two large buildings, one 63 ft. wide by 171 ft. long, comprising a purifier house, a meter house and a valve house, and the second building, 44 ft. wide by 122 ft. long, comprising a generator house, a scrubber house and engine room. The side walls are of brick and the roof trusses of steel, covered with corrugated iron.

The Dow Steam Pump Works, of San Francisco, Cal., report trade in their line very lively at present. They have under way at present two pumps for mines in Arizona; one of them being of the compound duplex outside packed plunger pot valve pattern and the other of the duplex pot valve pattern with a capacity of forcing water 550 ft. high through 12 miles of 4 in. pipe. Also a triplex power pump for elevator use in Los Angeles. A deep well pump and a triplex power pump for use in one of the new buildings now in course of construction in San Francisco, and report having just shipped to

Central America 4 of their boiler feed pumps and a sinking pump, as well as one of their largest sinking pumps for Mexico.

Among the many new purposes for which Hadfield Manganese steel made by the Taylor Iron and Steel Company, of Highbridge, N. J., is being used is that of cast perforated curved plates for the shell of large trommel or rotary screen which is used for sizing crushed stone for macadamizing or other purposes at the Rockland Lake plant of Cosgriff, Conklin & Foss, one of the largest producers of crushed stone on the Hudson River. There are 40 plates on each screen. The sizes of the holes are $\frac{1}{2}$ in., 2 in. and $\frac{3}{4}$ in. All the plates are $\frac{1}{2}$ in. thick. The holes are cored of course. Such castings are difficult to make of any material, but the advantages to be gained by the use of this material for this purpose fully warranted an attempt to overcome the obstacles presented in casting them of manganese steel. It is impossible now to predict what the life of these plates will be in service, but it must be very great.

The Cramp Shipbuilding Company has issued a statement of the business results for nine months ending January 31st last, showing gross receipts of \$3,817,494, and expenses (including taxes, insurance and sinking fund) of \$3,543,698, leaving a surplus of \$273,795. The statement adds: "The results of the business would justify, therefore, the declaration of the regular dividend, but owing to recent disturbances in the money market it was found necessary to enter into an arrangement—which has just been consummated—to fund the floating indebtedness of the company to the extent of \$1,500,000, to be payable at the rate of \$50,000 a month, beginning with the first of August next, and to provide a fund to meet these monthly payments and to retire other obligations presently maturing it was determined that no dividend should be declared at this time. It is believed by the board that such a substantial reduction will have been made in the current obligations of the company in the course of the next few months that the payment of dividends may be resumed before the end of the current year."

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

ALASKA.

ALASKA MEXICAN GOLD MINING COMPANY.—This company reports its clean-up for the month of January, as follows: Period since last return, 31 days; bullion shipment, \$24,651; ore milled, 7,498 tons; sulphurets treated, 156 tons; bullion from sulphurets, \$8,701; working expenses for period, \$13,279.

CALIFORNIA.

CALAVERAS COUNTY.

CENTRAL HILL.—This property, located at Douglas Flat, the only extensive hydraulic mine in this county, has been closed down by order of Captain Gillette, the Government engineer. It is thought that some technical requirement was not complied with, and that the owners will be able to arrange for the immediate resumption of hydraulicking. Meantime they are sluicing. The mine is 60 miles from navigation, and there is no testimony to show that any injury has been done.

EL DORADO COUNTY.

(From our Special Correspondent.)

BIG SANDY.—The owners of this mine near Kelsey are pushing the work rapidly. The hoist frame is almost completed and the pumping plant is being placed in position. The shaft will be sunk 500 ft.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

WHITLOCK.—This mine, five miles north of Mariposa, employs 80 men and extensive development work is going on. The 20-stamp mill has paid all the expenses of the mine.

NEVADA COUNTY.

MT. GEORGE.—An important strike is reported at this mine, on Rush Creek, near Grass Valley. The strike was made about 75 ft. from the main shaft. The ledge is a solid one and about 10 in. wide.

(From Our Special Correspondent.)

CADMUS.—This mine, near Nevada City, has struck a new ledge about 10 in. wide rich in free gold and sulphurets. The shaft will be sunk 200 ft. deeper and three levels and crosscuts will be run.

ORO GRANDE.—A tunnel 600 ft. long has been run at this mine. It is on the pay chute which is about 4 ft. wide, assaying over \$10 per ton. This tunnel gives about 180 ft. of backs, as soon as these have been crushed a new tunnel will be run. There

are several small veins; one 10 in. wide has been worked for several hundred feet, yielding about \$90 per ton.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

GOLD KING AND GOLD QUEEN.—The Cincinnati Belle, Gold King and the Gold Queen mines, all in the Banner District, are to be reopened by J. M. Grahl, of St. Louis, Mo., who has purchased a controlling interest and invested \$10,000 in machinery.

SHENANDOAH.—This mine is in the Mesa Grande District 10 miles north of Santa Ysabel Ranch. A contract has been made by the company with Johnson & Williams to sink the main shaft to a depth of 400 ft. These contractors have a complete outfit of the latest improved machinery for sinking and pumping so they anticipate no difficulty from the large flow of water which obliged the company to discontinue work at the 300-ft. level.

SAN LUIS OBISPO COUNTY.

(From Our Special Correspondent.)

OLD SPANISH MINE.—The rediscovery of an old Spanish quartz mine is reported in this county. The ledge is about 4 ft. wide, assaying about \$25 gold, \$40 silver and a large percentage of copper. It was formerly worked by a tunnel which ran 200 ft. into the hill.

SHASTA COUNTY.

(From Our Special Correspondent.)

MOUNTAIN MINING COMPANY, LIMITED.—This company has notified the Southern Pacific Railroad that it expects to make several shipments of copper matte monthly. The matte will be carried a distance of 12 miles from the mine on the company's road to a point about three miles above Redding. From there the Southern Pacific will carry it to San Francisco for 45c. per ton, where it will be reshipped to Swansea, Wales, for refining. For months 1,200 men have been employed building the railroad and getting the works at the mine in working order. This force will be reduced to about 100 men to work the mine and smelting works. The four smelters are almost completed. They will run six hours a day each and will be operated by electricity. This mine is dry and no difficulty will be experienced in taking out ore by means of tunnels.

SISKIYOU COUNTY.

RED HILL.—This hydraulic mine on Salmon River is now being worked with good results, two clean-ups made since January 1st, yielding about \$6,000.

(From Our Special Correspondent.)

FRENCH CREEK.—A rich ledge 12 ft. wide is reported to have been found at French Creek, seven miles from Etna. The ledge has been prospected for several hundred feet, showing rich free milling on the whole distance. The mine was bonded for \$14,000 before this strike was made. A small Huntington mill is on the property and 12 men are employed. Arrangements are being made to erect a large mill.

COLORADO.

COLORADO FUEL AND IRON COMPANY.—This company has just listed on the New York Stock Exchange \$2,021,000 general mortgage 5% sinking fund gold bonds, which are a part of an issue of \$6,000,000 authorized by the company. The amount listed was to supply working capital for improvements upon the company's property—chiefly upon its steel works and for operating additional mines. According to the application of the company for the privilege of having the bonds listed, it is stated that the property securing the mortgage includes 68,187 acres of coal lands owned and 3,670 acres leased, other real estate aggregating 75,954 acres, 15 coal mines in operation with a daily capacity of 12,000 tons, 857 coke ovens, two iron mines in operation, and various other mines, steel and iron plants. Of this property 11,957 acres are not covered by any prior mortgage. The company's net earnings in 1895 showed an increase over 1894 of \$113,230. Proposals are invited in writing, to be sent on or before April 5th, to the Atlantic Trust Company, New York, for the sale of 40 of the now outstanding bonds of the Colorado Fuel Company for sinking funds, said sale to take effect and bonds to be delivered and paid for on May 1st, at the office of the Atlantic Trust Company.

EAGLE COUNTY.

BELDEN.—Shipments have resumed after having been stopped on account of driving 30 ft. in the 600-ft. level through to a large ore body. The connections were made on February 23d, and the large lead carbonate ore body was encountered. Actual measurements are said to show ore in this virgin ground 25 ft. thick. Manager A. A. McDonald states that 60 to 90 tons of ore will be shipped daily.

HENRIETT.—Another new strike in Red Cliff, almost in the city limits, was made last week by Latene & Gay in the Henriett, an old-time shipper. The ore, a rich silver, was found next to the black porphyry, and was encountered while driving an upraise from the old workings.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

GOLD KING MINING COMPANY.—The El Paso, owned by this company, is looking well. The mine was for over four years worked by tunnels, but now a 2-compartment shaft, 4 ft. 4 in. by 8 ft., has been

sunk 300 ft. At a low estimate it is stated there are \$30,000 worth of ore in the slopes (broken), and the reserves are daily increasing. The property has recently been examined for an English syndicate. The company, within the past year, has bought several adjoining claims. The mine now employs 60 men.

JEFFERSON MINING COMPANY.—The Mattie L. claim, owned by this company, and worked under lease by a Mr. Grant and associates, is shipping about 300 tons of fairly good grade ore \$80 monthly. The shaft has been sunk 230 ft., but most of the ore is being taken out at the 150-ft. level.

LUCKY GUSS.—This property on Bull Hill is now owned by the original possessor, the Wilson Creek Consolidated Company. An English syndicate paid some \$20,000 on the property and failed to meet subsequent payments.

MOLLIE KATHLEEN.—Although being worked on lease, this property is doing development work only. One lessee, who has 400 ft., has to sink a shaft 250 ft., and the second lessee has to sink 200 ft. before any stoping can be done or ore shipped. At the 85-ft. level the vein was intersected by a crosscut, and at that point it was 11 ft. wide; some portions being very rich in telluride.

MOON-ANCHOR.—This is a new combination, the result of a compromise of a lawsuit between the New Moon, formerly owned by the Gold & Globe Company, and the Anchor, formerly owned by the Anchor-Leland Company, both situated on Gold Hill. It is working 40 men and has two steam hoists. One shaft has been sunk 370 ft., and was formerly known as the Cobb lease; the second shaft has been sunk 250 ft. and was known as the Peachey lease, both sets of lessees having obtained a good round sum for the unexpired term. The output is about \$1,500 per day. J. R. McKinnie, one of the pioneers and one of the most successful men of the camp, is the president and Mr. Cobb is the superintendent of the new company.

REBECCA MINING COMPANY, LIMITED.—The C. O. D., owned by this company and located in Poverty Gulch, recently made a shipment from the lowest workings, which sampled $5\frac{1}{2}$ oz., or \$110 per ton. This ore was taken from a winze sunk from the 4th to the 5th level. At the 6th, or 350-ft. level, the vein from the new shaft has recently been intersected and is nearly vertical, instead of having a dip to the south of 55° . At the point where the vein was cut, large volumes of water, about 200 gals. per minute, rushed out. The vein at this depth does not contain as much fluorite, but the values have increased. It would appear that at this level instead of having two distinct and separate ore shoots, as at the upper levels, there would be but one, varying in length from 300 to 350 ft.

GILPIN COUNTY.

(From an Occasional Correspondent.)

GUNNELL-CONCRETE.—A compromise has been arranged between the respective managements of these mines. If report is to be trusted, the Concrete is no loser by the terms agreed on.

KANSAS-BURROUGHS.—The Kansas vein has been cut by a crosscut from the tenth level on the Burroughs. The veins are here only 12 ft. apart, the Kansas being 11 ft. in width, 2 ft. of which are low-grade smelting ore and the remainder milling ore. A core taken by diamond drill from a point some hundred feet further east on the Burroughs showed the two veins to be here about 67 ft. apart, and the assay value of the Kansas was not encouraging. Further west, in the Ophir Burroughs mine, the Kansas and Burroughs veins are found still further apart, although further west again they are supposed to come together.

LITTLE FRANK.—It is reported that this mine, on Winnebago Hill, has been sold to Pittsburgh parties for \$45,000, to be paid in three installments of \$15,000 each. A contract has been let to sink the shaft, now about 200 ft. deep, a further distance of 200 ft.

ROBERT EMMETT.—A new shaft is to be sunk on this mine in Chase Gulch, the present one being narrow and unsuitable for work on an extensive scale. A plot is being blasted out of the hillside to make room for a new shafthouse, which will contain steam hoist and pump. The mine has yielded a little high-grade ore for many years and is well spoken of by most of the miners in the district.

LAKE COUNTY.

BANGKOK CORA BELL MINING COMPANY.—We are officially informed that this company which paid \$54,000 of dividends in 1895 but none since December last, expects soon to resume. In fact, the company is in a position to pay a dividend now and the property is looking well.

(From Our Special Correspondent.)

BELCHER.—It is given out that new lessees, the same people working the Brooks shaft, will commence work on the old Belcher tunnel. This tunnel is now in about 1,000 ft., with very good indications.

BOHN.—Pumps and machinery are now in place to sink the Bohn shaft down 100 ft. more in order to catch the ore body, which is dipping, and at the same time explore the lower workings. As a great deal of water will be encountered preparations are being made to handle it.

FAMOUS CONSOLIDATED MINING COMPANY.—This company, which was incorporated a few weeks ago, will conduct important operations on the Famous and Mosquito claims in Big Evans Gulch. The Famous

shaft is down 130 ft. and it is expected to catch the ore channel at about 350 ft.

GLENGARRY-IBEX SUIT.—Judge Owers this week rendered his decision in the important mining suit of Max Boehmer vs. The Glengarry and Ibox Mining companies and others. Plaintiff charged that the directors and officers of the Glengarry Company, of which he was a partner, leased the Glengarry ground to the defendants for an unduly low sum, that defendants were directors and owners, employees, etc., of the Ibox Company as well as being owners of the Glengarry Company, and it was this interest in the Ibox Company that caused them to grant the lease for so small a sum; further, that when the lease was granted a very rich body of ore was exposed in the Glengarry ground, and that the defendants knew this when they leased the ground to the Ibox Company. Mr. Boehmer, therefore, asked that the lease be declared cancelled and a permanent injunction made. This request was granted by the Court. The case will likely be appealed.

TURBOT CONSOLIDATED MINING AND LEASING COMPANY.—The owners of the Turbot have formed this company and are now opening up this "city" property. The officers of the company are: Perly Dodge, president; D. La Salle, vice-president; George F. Campion, secretary and manager; Patrick Crowe, treasurer. The group being operated includes the Turbot, Chip, Pandora, Colorado Chief and Vulture. The shafts of the Pandora, Turbot and Chip are being operated, and drifts in all directions are developing the ground. The daily output is 60 tons of lead ore and iron. The average value of the lead is \$25 per ton. Much new work is under way which promises to result very favorably.

VIVIAN MINING COMPANY.—Articles of incorporation have been filed. Capital stock, \$100,000; shares, \$1 each. The incorporators are: James Vivian, F. O. Stead, George Douglass and W. W. Old.

WHITE CAP.—Two sets of lessees are working. The fire there some months ago did much more damage than was first supposed and much of the ground caved in. The drifts and workings are now cleaned out and shipments of 150 to 200 tons a month of high-grade ore have been commenced.

YAK MINING COMPANY.—This company is still pushing work on the great Silver Cord tunnel. It just secured a lease on the Ravena lode promising to drive the company's tunnel through this property within 18 months.

PITKIN COUNTY.

LITTLE ANNIE MINING COMPANY.—The Board of Directors of this company had a meeting at Aspen last week to consider the question of leasing a portion of the company's property. A resolution was passed unanimously to lease the ground 100 ft. below the Little Annie tunnel and all north of the Little Annie shaft for 23 months to John W. Atkinson $\frac{1}{4}$ and the Famous Mining, Tunnel and Improvement Company $\frac{3}{4}$, on a graded royalty of from 15 to 33%. The lessees are to sink below the tunnel 100 ft. within nine months. The Famous company agrees among other things to secure for the Little Annie company the tax title of the iron mine from Mrs. B. Clark Wheeler on the payment of the amount of money she is out for the title and taxes. The same lessees have the lease on the same ground above the tunnel for 23 months yet. The lessees will have to work fast to get below the tunnel very far before the spring flood sets in which will make sinking almost impossible until September. The work of preparing a station was started on February 22d. This deal will insure ample water for the Famous concentrating mill now building at the mine and will enable both lessees and the company to soon realize something from the property, as there is enough concentrating ore mined and in sight to run a mill a year. There are no large bodies of ore excepting the low grade now in sight above water, says the Aspen Times, but at three different points in the mine the indications are that good ore bodies are being approached. The ground south of the Little Annie tunnel and west of the porphyry is not leased, and the company will be glad to entertain propositions to lease this block, which is about 500 ft. south.

SAN MIGUEL COUNTY.

CONTENTION.—Extensive development work is again in progress on the Contention group, on Bear Creek, says the Telluride Journal. E. A. Hockley has been appointed superintendent of the mine and the work will be pushed. There are extensive bodies of high-grade gold ore already blocked out. The ore runs \$15 and upward per ton in gold. It is conveniently situated in a large body of heavy timber on the mountain side and easily accessible the year round.

GOLD KING.—The new hoister recently installed in this mine is operated by electric power and works well. The mill is now dropping 25 stamps, and it is expected to keep it running steadily throughout the winter. The ore now being encountered in the shaft or winze is of a good character and the average value per ton is about \$12. The vein is several feet wide.

HECTOR MINING COMPANY.—This company, which owns and operates the Cimarron properties in Marshall basin, is doing some important development and improvement work around the mill, says the Telluride Journal. An engine will be installed this spring and used for running an air compressor, which will also be put in, and when both are ready for operation considerable drilling in the mine now

done by hand will be done by air drills. The company is making arrangements preparatory to increasing the force. The 30-stamp mill is concentrating from 70 to 100 tons of ore per day, which runs from \$10 to \$12 in gold per ton. About 20 tons are reduced into one and a car or two of concentrates, worth several thousand dollars, are shipped every week.

IDAHO.

LEMHI COUNTY.

INDEPENDENCE AND GOLD DUST.—Mr. C. E. Rives has returned from Salt Lake City and the East, where he has been perfecting arrangements for the construction of a 20 stamp quartz mill upon the ground of these claims, including pumping and hoisting works for the development of those ledges. Mr. Rives states that the whim now working upon the claims has a capacity to sink a shaft to a depth of 200 ft. The mill is to be thoroughly equipped. A concentrating plant is also projected. The concentrates will be treated by the chlorination process.

SHOSHONE COUNTY.

GEM.—It is reported that a rich ore chute has been struck in the 400-ft. level. It took 125 ft. of drifting to strike the chute, and 75 men have been employed in the mine, but the force will probably be increased.

ILLINOIS.

MACOUPIN COUNTY.

CONSOLIDATED COAL COMPANIES.—The strikes of coal miners at the mines at Staunton and Mount Olive, owned by these companies, have come to a close and most of the 500 men who have been out have returned to work without having the scale of wages raised. The Clyde and the Gillespie men, who had promised to come out, after consultation in a body, decided to remain at work. The men of the Consolidated Companies' mines at all points are now trying to arrive at a conclusion, and unless all strike, no one mine will close.

MICHIGAN.

IRON—MARQUETTE RANGE.

LAKE SUPERIOR & ISHPERING RAILWAY.—This railway, now being built between Marquette and Ishpeming, is owned by the Cleveland Cliff and Lake Angeline mines, but an agreement has been reached recently by which the Chicago, Milwaukee & St. Paul Railway will be extended from Champion to Ishpeming, and trains run over the new line direct to Marquette, making that city the Lake Superior terminus of the St. Paul system.

MINNESOTA.

(From Our Special Correspondent.)

LAKE FREIGHTS.—The lake vessel men are happier than for several years. They expect the opening rate of ore to be \$1 from head of the lake points. This is the basis for other rates and will make wheat 3c. from Duluth and 2½c. from Chicago. There is only about 6,000,000 bushels capacity in grain left unfilled in the Duluth elevators, and there will be at least 25,000,000 bushels there by the opening of navigation.

LAKE SUPERIOR CONSOLIDATED.—After paying \$125,000 earnest money, and spending 90 days in the exploration of the property, the Lake Superior Consolidated Mines has given up its option on the Roncheleau-Ray 80 in 17, 58-17. The price of the property was put at \$1,250,000. The reasons for this close of the deal is not known, but is generally supposed to be because the company thinks it can buy the same quantity of ore at a less price. The dropping of this option will have a decided tendency to scale down the valuation put on mining properties in the new range which their owners want to sell. It is considered likely that the property, which has a vast quantity of ore, will now be included in a traffic arrangement under which the projected Merritt railway to the range will be built. It is known that for some months previous to the bonding of the mine, its owners were in consultation in regard to a deal for a road to be built by outside parties. Since this bond was taken several important discoveries of ore have been made on the range. Several other mine owners, who have bonded their properties to the Consolidated, are now wondering how they will come out.

MINERS' ASSOCIATION.—This association, which started on the upper peninsula after last summer's strike on the Marquette range, has finally been extended to Minnesota, and the first lodges of the new union were started at Virginia and Hibbing this week. It is already very strong on the lower ranges, and its organizers claim they will have 3,000 members in Minnesota before the close of navigation. The association has been discussed so far that mine owners and operators are generally satisfied that it will do no great harm. It will attempt to settle wage difficulties and to help the miners in hospital aid and in other lines, in which it is conceded there is some room for reform at many mines.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

COMMODORE MINING COMPANY.—This company will reopen its mine at Virginia, and will sink two new shafts; the single shaft used two years ago being in bad repair. It will do considerable mining this season.

DAY LANDS.—J. W. Day and others of Minneapolis, have sold mining lands in 31, 53-20, for \$50,000 to parties who will open and explore.

EVELETH TOWNSITE.—Explorations made by the owners of the mining rights in the section on which is the village of Eveleth are showing considerable ore bodies there. Three crews are test-pitting, and one pit is down 30 ft. in ore of good quality. It is covered by about 29 ft. of surface. The explorations are to be continued and pushed.

FRANKLIN MINING COMPANY.—This company has put into operation a sawmill of its own, being the first of the Mesabi companies to do so.

HELMER.—S. G. Helmer and others of Duluth, have found ore in quantity in 20, 58-19, close to the new Iron Chief of the Minnesota Iron Company.

LAKE SUPERIOR IRON COMPANY.—The Consolidated Company operating the properties of this company is now down about 80 ft. in ore in the shaft being sunk at the Rust mine, about a mile west of Hibbing. The double hoisting plant being put in at the Burt mine, north of Hibbing, is in place and the engine house is completed. The plant is one of the most serviceable on the range. At the Hull mine, of the same group, the machinery for a double hoisting plant is on the ground and set up ready for work. It is almost the same as that at the Burt. These three shafts will be prepared to hoist not less than 500,000 tons during the summer, and it is the intention to ship nearly that amount.

NORTH CINCINNATI.—This property will be made a shipper at the opening of navigation and work will begin soon to get it in readiness for business. It will ship no great total during the year.

PENOBSCOT MINING COMPANY.—This new company has now commenced work on a hoisting shaft at the Eddy mine, the sale of which for \$140,000 was first reported in these columns some weeks ago. The company will do some mining this season, and has an excellent quality, as well as a great quantity of ore to all appearances.

ROUCHELEAU IRON COMPANY.—This company has given an option on part of its iron-bearing lands near Biwabik to the Minnesota Iron Company, which is now exploring there. The lands adjoin the Minnesota Company's Canton mine, and are supposed to contain valuable ore bodies.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The metal markets are firm, and the ore market last week was practically unchanged from the week before. The top price for jack was \$23 per ton, with an average of \$21 per ton, and silicates brought \$10 per ton. The sales of zinc ores were the largest in several months, and there is still a large amount unsold in the ore bins. Lead ore sold at \$17.50 per thousand, with 50c. added for hauling. The sales of lead ore were also very large, and but little lead was left in the ore bins at the mines. The turn in from the different camps in the district was as follows: Joplin, zinc, 1,206,170 lbs.; lead, 293,270 lbs.; value, \$18,550. Webb City, zinc, 816,680 lbs.; lead, 63,950 lbs.; value, \$9,725. Carterville, zinc, 1,674,710 lbs.; lead, 952,580 lbs.; value, \$34,738. Galena, Kan., zinc, 2,470,000 lbs.; lead, 600,000 lbs.; value \$36,920. Oronogo, zinc, 36,610 lbs.; lead, 14,480 lbs.; value, \$465. Auriara, zinc, 170,000 lbs.; silicate, 304,000 lbs.; lead, 75,000 lbs.; value, \$5,825. Totals for the district, zinc, 5,557,490 lbs.; silicate, 304,000 lbs.; lead, 1,935,330 lbs.; value, \$106,223.

CENTER CREEK COMPANY.—Ford, Owens & McConey on the Center Creek Company's land have a fine concentrating plant with a capacity of 225 tubs of dirt each 10 hours and produces 6 tons of zinc ore in the same time. They are hoisting dirt from two drifts 150 ft. deep with a 12 x 24-ft. face of ore in each in hard ground and good ore in the bottom of each drift which they are not able to work at present on account of the strong water. The Center Creek Company is putting in an 18-in. force pump near its shaft which will drain the ground to 180 ft.

HOUGH LAND.—Harden & Harden are operating two lots on the Hough land and have a fine steam concentrating plant, equipped, a 120-H. P. boiler, a 60-H. P. automatic Atlas engine, two steam hoists, a 14-in. crusher, two sets rolls, a screen, a 4-cell rougher and cleaner. The plant handles 350 tubs of dirt and produces 7 tons of zinc ore every 10 hours. They are drifting at 205 ft. on a 35-ft. face of zinc ore in soft ground with strong water which they easily kept down with a large duplex steam pump.

SOUTH JOPLIN LEAD AND ZINC COMPANY.—In the city limits is situated this company, which has a fine steam concentrating plant that handles 300 tubs of dirt each 10 hours, and it is equipped with a 60-H. P. boiler, 40-H. P. engine, two 8-in. pumps, crusher, two sets of rolls, a 4-cell rougher and cleaner, and is producing 75,000 lbs. of high-grade zinc ore and 9,000 lbs. of lead every shift. The company is hoisting ore from three shafts, one 160 ft., another 90 ft. and a third 60 ft., each having a good face of ore in soft timbering ground. In sinking an air-shaft a large body of zinc ore was struck at 43 ft. in soft ground.

TROUP LAND.—Davis & Co. on the Troup land, have a fine steam concentrating plant, with a capacity of 250 tubs of dirt each 10 hours, and are producing 20,000 lbs. of lead and 25 tons of jack each week. They are drifting at 210 ft. on a large face of lead and zinc ores in open ground. This is the deepest drift in the district from which ore is being hoisted at present. This mine has been worked for several years, and they have worked at different

levels from 60 ft. down to the present level of 210 ft.

MONTANA.

DEER LODGE COUNTY.

INDEPENDENCE.—Taylor & Campbell, of Deer Lodge, have a lease and bond on this mine in the Oro Fino district. They are stopping, and have taken out a carload of ore which is said to run from \$50 to \$200 in gold. This claim was located 20 years ago, and has been worked more or less ever since.

GRANITE COUNTY.

GOLD COIN MINING COMPANY.—L. W. Loomis, of Anaconda, has gone to Chicago to order a mill and machinery to be used in the development of this company's property in the Red Lion district. This property is reported to be making a good showing.

JEFFERSON COUNTY.

STATE.—There several claims in this group located 14 miles from Boulder, which are to be operated and developed by Messrs. Hodgins, Largey & Johnson of Butte. Shipments of ore are said to have netted 20 oz. in silver and from \$25 to \$50 in gold.

LEWIS & CLARK COUNTY.

PORPHYRY DIKE.—The mines on the Porphyry Dike are all running again. The Merrill property is said to be satisfactory to the owners. The Columbia, and also the Pauper's Dream, are running their mills, the ore being taken wholly from the open cut. The Ontario is employing the greatest number of men and they are handling a good quantity of ore. It is expected that there will be 500 men working in that country this spring.

NEVADA.

WHITE PINE COUNTY.

OLATHA.—This mine in Robinson district is becoming a good copper producer. This mine and the Cox have produced large quantities of pay ore in the past.

COX.—The ore taken from this mine averages over 30% in copper.

MONARCH.—Copper ore is being taken from this mine, West Camp, says the Ely News, averaging high in copper and carrying some gold and silver.

OREGON.

BAKER COUNTY.

BABY MCKEE AND JOSEPHINE.—A large amount of development work has been done this winter on many mine locations in the Cable Cove district, says the Baker City Democrat, principal of which are the Baby McKee and Josephine mines, owned by Dr. T. M. T. McKennon and M. C. Hamilton, of Pittsburgh, Pa., and Charles Hauck, of Bourne. A shaft 75 ft. deep and about 50 ft. of tunnel has been run, the tunnel being 350 ft. long on the former and a tunnel 140 ft. long on the latter.

TIMBER CANYON.—Mr. Jacob Thompson, owner of this group, situated about 45 miles East of Baker City, states that a syndicate, composed of Chicago capitalists, has secured a bond on the property. The group consists of the Hay Digger, Delma, Ethel, Cape Cod, Big Boulder, Spring, Crystal, Denver of the Northwest and Baker City. The several claims are developed sufficiently to show strong bodies of ore, and the yellow metal is to be found in paying quantities. Mr. Thompson has just completed a 400-ft. tunnel which penetrates both the Crystal and Spring. A 200-ft. tunnel is to be driven in the Ethel, one of the most promising ledges in the group. A force of miners will be set to work at once.

PENNSYLVANIA.

ANTHRACITE COAL.

FIRST ANTHRACITE DISTRICT.—Mine Inspector Edward Roderick, of the First Anthracite District (Scranton), has completed his report for 1895. The output of coal in tons from the various companies in the district is as follows: Delaware & Hudson Canal Company, 2,403,385; Hillside Coal & Iron Company, 840,904; Delaware, Lackawanna & Western Railroad Company, 463,015; Jones, Simpson & Co., 289,379; Lackawanna Coal Company, 287,596; Elk Hill Coal & Iron Company, 272,846; Pennsylvania Coal Company, 247,138; Pancoast Coal Company, 224,092; Northwest Coal Company, 190,518; Edgerton Coal Company, 173,839; New York & Scranton Coal Company, 173,395; Sterrick Creek Coal Company, 165,013; Blue Ridge Coal Company, 154,199; Moosie Mountain Coal Company, 120,888; Mount Jessup Coal Company, 116,365; Riverside Coal Company, 74,091; Murray Coal Company, 50,096; Dolph Coal Company, 109,937; Jermyn & Johnson, 134,100; Waddell Coal Company, 21,089; Franklin Coal Company, 6,132; Russell B. Coal Company, 1,800; total, 6,510,817. The number of tons of coal produced in 1894 was 5,907,251, which was 603,666 less than last year. It required 220,462 kegs of powder of 25 lbs. each to mine this amount of coal, and 1,668 mules and horses were worked. There were 554 steam boilers in operation. The total number of men employed was 16,272. The total number of accidents during the year was 160; of these 39 proved fatal, and 121 recovered. In the year 1894 there were 145 accidents, but 47 were fatal. Falls of rock and coal produced 76 accidents, 22 of which were fatal, and the remainder were caused by premature explosions of gas, kicks from mules and by cars. The increase of tons mined per fatal accident in 1895 over that of 1894 was 45,258 tons.

BEAR RUN.—This colliery at Wiggins, near St. Nicholas, Pa., operated by the Philadelphia & Reading Coal and Iron Company, has been abandoned and the mammoth structure will be torn down. The

company has decided to sink a new shaft at Burnside colliery to tap a basin of coal never yet worked. A large number of men will be employed.

G. B. MARKLE & CO.—This firm, operators of the Jeddo and Highland collieries, and who are now putting the Ebervale mines into condition to resume, will erect a large iron breaker at Jeddo, in which all the coal from the Jeddo, Oakdale and Ebervale mines will be prepared.

LEHIGH & WILKES-BARRE COAL COMPANY.—The annual meeting of this company was held recently at its office in Philadelphia, Pa. The election resulted as follows: President, J. Rogers Maxwell; directors, George F. Baker, James A. Garland, Charles Parish, Joseph S. Harris, Samuel Dickson and O. Pardee.

PETTEBONE.—The officers of this colliery say that they have subdued the fire in the mine. The idleness and the vast amount of coal consumed for the five weeks since the fire started have been very costly to the Delaware, Lackawanna & Western Railroad Company.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The Gilberton Colliery, operated by this company, resumed operations on March 3d after an idleness of five months. Extensive repairs were made and the plant now employs 500 men and boys. The company has commenced to sink a new shaft at Wadesville, a few miles northwest of Pottsville, which will be 750 ft. deep. The shaft will be sunk on the mammoth vein and it will require two years to complete the work. This will be an important step toward the development of the comparatively new southern coal field.

RIVERSIDE COAL COMPANY.—The company, the members of which are J. J. Williams, Thomas E. Jones and John T. Richards, has sold its colliery between Peckville and Archbald to the New York, Ontario & Western Railroad Company. The colliery has a capacity of 750 to 800 tons a day. Its highest monthly output has been 14,800 tons a month. The amount paid for the colliery is not given out for publication.

SCHUYLKILL COAL EXCHANGE.—The committee of this exchange has fixed the rate of wages to be paid miners in the Schuylkill region for the last half of February and the first half of March at 5% below the \$2.50 basis. The rate for the preceding month was 9% below, so that the new rate is an increase of 4%. This is the highest rate paid since May, 1894.

ST. CLAIR COAL COMPANY.—The Finch Manufacturing Company, of Scranton, Pa., has nearly completed its contract for improved mine machinery for this coal company, consisting of screens, hoisting engines, rolls, Lehigh Valley jigs, etc. The St. Clair Coal Company is composed of W. W. Pater-son, W. H. Taylor, E. P. Kingsbury and other gentlemen of Scranton, who leased coal lands in Schuylkill County, near Pottsville, from private individuals and purchased the site and an old Philadelphia & Reading breaker, a few months ago. The company tore down the old breaker, but will utilize the tracks. A new breaker is being erected.

BITUMINOUS COAL.

PITTSBURG DISTRICT.—Forty operators last week signed an agreement toward uniformity in the Pittsburg coal district and it is announced that others will soon drop into line, so that on March 10th, the day upon which the agreement becomes operative, fully 95% of the coal operators, the required number, will have signed the papers. President Dearth, of the New York & Cleveland Gas Coal Company, states that his company will sign the agreement and be governed by its provisions. This means an advance of the mining rate to 70c. per ton and settles the wage scale for 1896.

JUNIATA COUNTY.

REED'S GAP PHOSPHATES.—The United States Geological Survey has received samples of the phosphate rock recently found near Reed's Gap. Analyses show from 12 to 56% phosphoric acid. The highest is found in nodules somewhat resembling the coprolite forms found in South Carolina. Professor Ihseng, of the Pennsylvania State College, has visited the locality and made over 150 analyses with varying results. Much more prospecting will be done in the spring.

SOUTH DAKOTA.

LAWRENCE COUNTY.

BUXTON MINING COMPANY.—This company has brought suit to recover \$220,000, the value of ore alleged to have been taken from its mines by the Golden Reward Mining Company.

GREAT THUNDER MINING COMPANY.—This company owns a large group of mines near Deadwood, which have been closed down for the past year. Its local representatives recently received instructions to resume operations.

HOMESTAKE MINING COMPANY.—At the April session of the United States Circuit and District Court, the Homestake timber suit, wherein the government has sued for \$715,000, the value of timber taken from government lands, will be tried.

PENNINGTON COUNTY.

(From an Occasional Correspondent.)

J. R.—Work is about to be resumed upon this well-known mine in the Spring Creek District

This mine paid \$55,000 from workings above the 200-ft. level in 1893. Below that depth, though the vein presents all the characteristics of a true fissure, the ores were too lean for profitable working. During 1895, Milwaukee parties expended some \$12,000 in drifting upon the 300-ft level, but failed to find the pay chute. The "J.R." is the standing mining problem of this region, and many theories are advanced as to the sudden disappearance of the milling ores. Parties from the east, under the advice of an engineer, will now attempt to recover the lost chute. The best opinion seems to be that the chute dipped into the supposed foot wall.

KEYSTONE GOLD MINING COMPANY.—This company's new mill began operation upon Keystone ores on February 15th. Ten stamps recently set in motion are working upon ores from the Bullion Mine, adjoining the Keystone property and connected with the mill by a tramway recently built. The Bullion ores are from a large body of low grade decomposed quartz recently made accessible by a chute from the open cut at the apex of the hill, through which the rock is dropped into cars in the tunnel below.

LUCKY CUSS.—The work of removing 20 stamps from the old Grand Junction mill to the Wealthy or Lucky Cuss mine on Tepee Gulch is nearly done. The mine is under active development in anticipation of early operation.

NEAL.—A new 10-stamp mill erected by Mr. Harris, of Minneapolis, for the reduction of ores from the Neal property on Iron Creek, three miles southeast of Keystone, is nearly ready for operation. The ores from this property are said to carry a large per cent. of bismuth.

PENNINGTON COUNTY.—Several well-known mining men and engineers have recently visited the mines and prospects of this county, among them being H. S. Bradford, of New York; Jas. D. Robinson, of the Kansas City Smelting Company; H. C. Holthoff, of Milwaukee, and one of the late owners of the Mercur mine, Utah.

SUNNYSIDE.—Arrangements are being made by the owners of this property, 2½ miles north of Hill City, to put in a pump and erect hoisting works. At 70 ft. the ledge is 20 in. wide, with well defined walls, incased in gouge matter. Estimates from pan tests place values at \$100 per ton. I visited the property a few days ago and examined the quartz (bluish white in color) and found free gold visible upon most of that taken from below the 50-ft. level. The vein when found was a narrow seam of gossan, very rich in heavy gold. The entire neighborhood along Newton's Fork is seamed and scarred by the early placer workings of 1878-79.

TEA.—The property of the Tea mining partnership, consisting of six claims, including the Tea and Dolcode lodes, two of the richest free gold prospects are under bond to Chicago parties. In the shaft of the Dolcode, now down 65 ft., rock as rich as any found from grass roots is being encountered. The ledge is widening. The average value of the vein stuff as determined by two mill runs is \$25 per ton in free gold.

TENNESSEE.

PHOSPHATE PRODUCTION.—According to the *American Fertilizer* the production of phosphate rock from the Tennessee mines in January was 4,075 tons. The shipments for the north were 3,775 tons, and the estimated stock on hand at the mines on February 1st was 4,000 tons.

RHEA COUNTY.

DAYTON COAL AND IRON COMPANY.—According to a press despatch from Chattanooga, the entire possessions of this company have been purchased by Peter Donaldson and Thomas Neal Mackinnon, of Glasgow, Scotland. In the transfer there are embraced 5,000 acres of coal lands, two mines in operation, coke ovens and two blast furnaces of 150 tons capacity each at Dayton, at an estimated valuation of \$200,000. The company has suffered severe losses of late, 29 miners having lost their lives by explosion in coal banks last December. The sale is understood to be part of a scheme of reorganization.

UTAH.

JUAB COUNTY.

GODIVA.—Ore is being steadily taken from this mine.

MAMMOTH MINING COMPANY.—The annual meeting of this company was held in Salt Lake City on February 25th, 330,024 shares of stock being represented. The election of officers and directors for the ensuing year resulted as follows: William McIntyre, president, J. A. Cunningham, vice-president; H. S. Young, treasurer; Samuel McIntyre, P. T. Farnsworth, W. W. Riter and J. T. Little, directors. J. Fred Corker will continue as secretary. The annual report showed that the net earnings of the mine for 1895 amounted to \$99,000. The company is out of debt, and the mine is looking well, as the gold values increased with depth.

WEST CABLE.—The shaft on the West Cable is now going down from the 400 level, and Manager Ryan reports a favorable showing. The rock now being taken out runs heavily in iron and should indicate the near approach to mineral.

SALT LAKE COUNTY.

WINAMUCK.—This group, consisting of eleven patented claims situated in main Bingham canyon and owned by a Holland syndicate, was purchased

last week by Col. Percy S. Sowers and John G. Logan, and the new owners are now in possession. The property is one of the best known in West Mountain mining district, and some years ago produced some high-grade ore. The greatest depth attained on the group was in a shaft which was put down 216 ft., and which will be, under the new ownership, sunk 500 ft. In addition to this, the collar for a new shaft that will be sunk 1,000 ft. will be located. The purchasers of the Winamuck also hold the Mohawk group of seven claims, adjoining the Winamuck, and in which a rich strike was recently made.

SUMMIT COUNTY.

ANCHOR MINING COMPANY.—This company resumed shipping first-class ore last week. In working its new diamond drill no trouble whatever has been encountered, save that which came from the hard white and seamy quartzite in which the drilling is being done. In the 1,400 level the Anchor encountered what was at first a broken formation, containing high-grade ore. This has finally developed into a strong vein, which looks good.

WASHINGTON.

SNOHOMISH COUNTY.

SNOHOMISH MINING ASSOCIATION.—The mining men of Snohomish met recently and organized an association to protect, develop and foster the mining interests of this county and contiguous districts. Non-resident owners of Snohomish mining property are invited to unite with the organization. Parties were present from Everett, and a similar organization will be formed there, to work in conjunction with the Snohomish association. A. W. Hawks was elected president, F. M. Headlee, vice-president; C. L. Clemens, secretary; A. M. Farrar, treasurer.

STEVENS COUNTY.

COLVILLE RESERVATION.—A press despatch from Marcus says that numerous prospectors are encamped on the borders of the Colville Indian Reservation awaiting the proclamation of the President opening the mineral lands to settlement. There is snow over all the mineral lands in the reservation, and no possibility of prospecting till spring. The Colville reservation is the size of Rhode Island, and is said to be rich in mineral. In the last two weeks over 200 locations have been filed on lands in the ceded portions, and the notices claim gold, silver, cinnabar, copper, iron, mica, galena, coal and other minerals. The reserve is in the upper hills of the Cascade Range and has few streams of importance, the Kettle River, which enters it twice, being the largest.

WHITMAN COUNTY.

BLACKFOOT CONSOLIDATED GOLD MINING COMPANY, LIMITED.—This company was incorporated recently to do a general mining business. The incorporators and trustees for the first six months are J. C. Northrup, A. E. Severance, J. H. Ashley, J. R. Ryerson, J. T. Willis, Paul Bockmier and A. A. Wilson, of Palouse, and R. W. Pinnell and Mack Drake, of Garfield. They own six claims adjacent to each other and have consolidated for economy in working their properties. These claims are on Jerome Creek, about 20 miles east of Palouse, in the Blackfoot mining district, and consist of the following locations: Cora, Yellow Jacket, Gold Nugget, Last Chance, Davenport and Populist, all gold bearing. Development work will be carried on this spring.

WEST VIRGINIA.

FIRST COAL DISTRICT.—D. M. Harr, inspector of mines for the First District of West Virginia, has just issued his report of coal and coke production for 1895, and it shows a small increase in each of these products over the preceding year. There were 2,796,944 tons of coal mined and 248,433 tons of coke manufactured, apportioned among the counties as follows: Brooke, coal, 50,013; coke, 4,418. Harrison, coal, 204,442. Marion, coal, 1,193,326; coke, 128,194. Marshall, coal, 137,763. Mineral, coal, 614,789. Monongalia, coal, 47,653; coke, 21,792. Ohio, coal, 88,691. Preston, coal, 52,385; coke, 18,473. Taylor, coal, 86,536; coke, 5,936. Tucker, coal, 316,345; coke, 71,620. Marion County thus produced almost half the coal and more than half the coke, employing 2,063 of the 4,606 men. The average wages of these men for the year were \$28.50 per month.

WHEELING GAS COMPANY.—A number of prominent stockholders and officers of the Wheeling Gas Company are at Wheeling, and if their plans materialize that city will soon have another industry. The party is composed of State Senator Wm. Flinn, of Pittsburg; Alexander C. Humprey, of New York; W. L. Elkins, Sr., the street railway magnate; D. Shenewind, J. F. Wilcox and W. I. Diehl, of Pittsburg. One of the Pittsburg parties said: It is our intention, if possible, to secure a location for a coke plant, where this very salable fuel may be manufactured by what is known as the German method. This method utilizes all of the tar, ammonia and gas in the coal, instead of allowing the gas to escape, which in the old method is by far the greater waste compared to tar, etc. The new method collects the gas which the Wheeling Company contemplates turning into its mains thus giving an additional supply of gas. The gas from the coke ovens mixed thoroughly with the natural article and a good-sized plant can produce an exceedingly large amount of gas, which if saved and supplied to consumers through the mains means much

ahead always, and, in order to do so, have been obliged to make the "concessions" which proved so disastrous to their net earnings last year. This year, however, or at least since the middle of February, the restriction in the output has prevented heavy accumulations, and sellers have been enabled to maintain prices firm at the circular. The majority of the companies assert that their unsold stocks to-day are much smaller than at the same time last year, and current deliveries seem to take care of almost the entire output. March is a good coal-consuming month, and at the present rate of production there is no reason to expect a decline in prices even though there may not be very heavy buying. The circular is enforced by the companies on their new orders. These quotations are: \$3.60 for stove; \$3.35 for egg and chestnut, and \$3.10 for broken, all net on board. Certain grades of coal may sell for slightly less, but special coals are selling for more, so that the circular is a fair average.

From this time on the market must continue to be governed exclusively by weather conditions, consequently market reports will show but little change from week to week. Not until May and June, when inducements to buy must be offered to dealers, will the true strength of the market be tested.

Bituminous.

The soft coal market continues unchanged from last week. New business is next to nothing and such small shipments as are being made are on old or last year's orders. It is felt, however, that the season will open soon. Some contracts are already coming into the market and sellers generally seem to abide by the agreement reached at Philadelphia last week and are not shading what are supposed to be the new association's figures. Consumers probably find it difficult to realize the new order of things. For years past they have been accustomed to see each season open with slight reductions in prices from the preceding year rather than with an advance.

The disastrous floods in certain parts of New England have wrought damage to many of the mills, with the result that there has been quite a number of shut-downs for repairs, thus lessening the consumption in that territory. The Sound ports report a shortage of certain classes of coal and there is a good demand for prompt shipments. Owing, however, to the difficulty of getting vessels and the delays in the coal in transit from mines to shipping ports no immediate relief is looked for. New York harbor trade continues fairly active and regular.

The recent stormy weather has affected transportation to some extent, but it is reported to be improving daily. The car supply is good. In the vessel market rates are unchanged. Fair arrivals are looked for at the shipping ports, but the present supply is not large. We quote rates as follows from Philadelphia. To Boston, Salem and Portland, 80c.; Providence, New Bedford, New Haven and other Sound ports, 70@75c.; Portsmouth, 80@85c. From Baltimore, Norfolk and Newport News, rates are 5 to 10c. higher.

There is a better feeling regarding the "combination." It is now believed that every producer of consequence has entered the agreement.

There is some speculation among the operators in the Cumberland region as to whether the new management of the Baltimore & Ohio will change the policies regarding the soft coal trade which the company has followed so disastrously for many years, and also whether the West Virginia Central will not at last get the Chesapeake & Ohio Canal for use as roadbed, to tidewater, thus giving to the Baltimore & Ohio a direct competitor. The canal for years past has been a source of continued expense to the B. & O. and the court and the receivers may be obliged to abandon it for practical business reasons.

NOTES OF THE WEEK.

Under the agreement of the joint convention of miners and operators, held in Pittsburgh in December, the price of mining in the Pittsburgh thin vein district is advanced from 64c. to 70c. per ton for screened coal, taking effect on March 2d. The joint scale committee of 10 appointed by the convention met at the headquarters of the Railroad Coal Operators' Association last week and adopted the following:

"Resolved, That pending the securing of the names of operators by a committee appointed for the purpose of entering into an agreement of uniformity, we declare the price of mining in this district on and after March 1st to be 70c. per ton for thin vein coal, to conform to the agreement entered into by the miners and operators in their December meeting; the above price to continue until further notice."

Under the operation of the Interstate scale the price of mining in Ohio will advance from 52c. to 61c. by the establishment of the 70c. rate in the Pittsburgh district. The joint-scale committee is scheduled to meet in Pittsburgh shortly to ascertain if the advanced rate is being paid. Should the uniformity contract be accepted by 95% of the production in the Pittsburgh district the 70c. rate will be paid throughout the year. It is generally believed that the advance will be permanently maintained for the time fixed in the agreement.

Buffalo, N. Y. March 5.

(From Our Special Correspondent.)

The demand for anthracite the past week was good. The weather had a beneficial effect on the market. No change to note in quotations; nor is any expected now for a month at least.

Bituminous coal a shade firmer but price list does not show it. Supply fully adequate to the requirements of the trade as the railroad blockade caused by heavy snow has been raised.

For the past 40 hours the weather has been very cold—but with bright and unclouded sky.

It is reported that the new lock of the Sault Ste. Marie canal will be ready to be opened before the close of navigation of 1896. Little ice at Duluth and Superior, but the Straits of Mackinaw are traversed by teams on the rough ice, which is covered with snow over large tracts. The new trestle and pockets of the Erie Railroad at Buffalo will be completed by May 1st. It is expected that very little coal will be found stored at Western ports on the opening of navigation this year.

Chicago. March 4.

(From Our Special Correspondent.)

Weather conditions have been again favorable to coal dealers and consequently the coal business was decidedly better than the preceding week. The aggregate tonnage of coal placed has not been of any large figures from the fact that consumers merely buy for immediate wants and but few contracts of any size were booked. Anthracite coal stocks are large and are causing embarrassment in certain cases. Prices in hard coal are held fairly well, in fact more so than for some time past.

Bituminous coal has only had moderate sales and from the looks of things will continue so until the industrial situation improves materially.

Coke sales are slightly improved and prices quite firm.

Pittsburg. March 5.

(From Our Special Correspondent.)

Coal.—The Ohio River is again in a fair boating stage; the cold spell, however, will check the shipments which will not exceed 2,000,000 bu. The rise which enable tow boats laid up along the way to reach port with empties. This will insure work for the miners for some time to come. There is about 5,000,000 bu. coal loaded. Representatives of both miners and operators make the gratifying statement that the latest plan for the establishment of uniformity in the Pittsburg mining district is a success beyond a doubt. About 70% of the tonnage of the district is already committed to the plans and the 95% of the assenting operators, whose signatures are required to put it into effect, are now assured. The new agreement will be unique in that it will be a legally formulated contract made binding by payment of considerations, etc., and operative for one year. This is a novel sort of trade combination, one of its inevitable first consequences being an increase of the average of wages, but the operators will be large gainers in the end. In the railroad coal trade conditions have a more satisfactory aspect.

Connellsville Coke Trade.—There was a slight falling off in production and demand; the latter went down 1,000 tons and production was not far off, with a decrease of 7,775 tons. There was but little change in the list of active ovens; it is expected that no more ovens will be blown out at present. The large number of ovens idle and many lay-off days in the region are making times very hard for the workmen; many have to walk several miles, and then do not get a day's run. An effort is made to divide up the work that all may live, and so far as known none are in want. A summary of the region shows 12,256 ovens in blast, with 5,691 idle; weekly capacity, 116,485 tons; decrease, 7,775 tons. Fifteen ovens were fired up at W. J. Rainey's Grace plant. In the running order of the 12,256 ovens in blast 4,593 made six days, 670 five days, an average of 5-29 days. The week's shipments for the region amounted to 6,255 cars as against 6,297 the week previous; decrease, 42 cars. The shipments were as follows: To Pittsburg, 1,817 cars; to points East, 1,019 cars; to points West, 3,419 cars; total, 6,255 cars, or 114,156 tons.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 6, 1896.

Pig Iron Production and Furnaces in Blast.

| Fuel used. | Week ending | | From | | | |
|-------------|----------------|----------------|-----------|-----------------|-----------|-----------|
| | March 7, 1895. | March 6, 1896. | Jan. '95. | From Jan., '96. | | |
| Anthracite. | 35 | 21,004 | 55 | 35,435 | 213,180 | 339,703 |
| Coke. | 127 | 137,879 | 140 | 166,830 | 1,415,010 | 1,632,179 |
| Charcoal. | 19 | 4,268 | 20 | 5,425 | 47,040 | 48,825 |
| Totals. | 181 | 163,151 | 215 | 207,690 | 1,875,230 | 2,020,707 |

The iron market has been quiet, almost dull, for the past week, so far as actual transactions of large amount are concerned. For the moment demand seems to be suspended, but there is an undercurrent of strength, and the elements in favor of future activity are that there has been very little giving way in prices. There is an evident attempt to "bear" the two speculative elements in the market, Bessemer pig and steel billets, but the success of the movement is doubtful. Outside of those two factors there has been little change. While business generally is not as good as many had expected, the demand for foundry iron and for merchant iron and steel keeps up very well.

The unfavorable feature in this market, as in all others, is the currency question, and we cannot repeat too often that there can be no steady and healthy revival until that is settled. So long as

uncertainty continues the growth of trade will be spasmodic and irregular.

There is a notable increase in the demand for iron for railroad purposes, though rail orders are still light. The *Railroad Gazette* notes contracts for 12,500 new freight cars let since January 1st, with orders pending for 5,000 or 6,000 more. These contracts will require a large amount of iron to complete them.

NOTES OF THE WEEK.

The Globe Iron Works at Cleveland, O., have just launched what is claimed to be the largest vessel on the lakes. The boat, which is for the Mutual Transportation Company of Cleveland, has a length over all of 432 ft., 48 ft. beam, 28 ft. depth and net tonnage on an 18-ft. draft of 6,700 tons of ore or 200,000 bushels of wheat. With a 14-ft. draft she will carry 4,500 tons of ore. The engines are of the inverted cylinder triple-expansion type, with cylinders 23, 39 and 63 in. x 42 in. She will have four Scotch type boilers 11½ ft. in diameter by 10 ft. in length. The new boat will be ready for service at the opening of navigation on the lakes.

Some time ago several of the large iron companies in and near Harrisburg—including the Harrisburg Rolling Mill Company, the Central Iron Works, Bailey & Co. and others—brought suits against the Pennsylvania Railroad Company to recover damages for alleged discriminations in freight rates on coal. The total amount sued for was nearly \$200,000, and the suits were watched with much interest by manufacturers, as they were the first brought under the Pennsylvania law. The company has, it is announced, now settled them by refunding about \$120,000 in all.

The William Cramp & Sons' Ship and Engine Building Company, of Philadelphia—the largest iron shipbuilding concern in this country—has made a statement to the stockholders for the nine months ending January 31st last, showing gross receipts of \$3,817,494, and expenses (including taxes, insurance and sinking fund) of \$3,543,698, leaving a surplus of \$273,795. The statement adds: "The results of the business would justify, therefore, the declaration of the regular dividend, but, owing to recent disturbances in the money market, it was found necessary to enter into an arrangement—which has been just consummated—to fund the floating indebtedness of the company to the extent of \$1,500,000, to be payable at the rate of \$50,000 a month, beginning with August 1st next, and to provide a fund to meet these monthly payments and to retire other obligations presently maturing it was determined that no dividend should be declared at this time. It is believed by the board that such a substantial reduction will have been made in the current obligations of the company in the course of the next few months that the payment of dividends may be resumed before the end of the current year."

New York. Mar. 6.

The local market may be called quiet, though there has been a good amount of business done in some departments, especially in pig iron and structural material, and there is a fairly steady run of small orders everywhere.

A good deal of business is expected this season from the street railroads. It is understood that the Metropolitan Traction Company will put in the underground electric system on its Sixth and Eighth avenue lines, while the Third Avenue company will rebuild its Forty-second street & Boulevard line, as a cable road probably. All this will call for a good deal of iron work, and there is already some inquiry as to the contracts.

The latest statement as to the order for 10,000 tons of steel rails for Chile, which was talked of some weeks ago, is that it has gone to Germany. There have been rumors of another foreign order to be placed here, but no one seems to know anything definite about it, or to be willing to tell if they do know.

Apparently nothing will be done this season about the two new bridges proposed over the Harlem River, at Willis avenue and at 149th street. Both are much needed.

Pig Iron.—A considerable amount of business has been done this week and there seems to be no decrease in the disposition to lay in stocks among the foundries. The general opinion is that there is going to be a fair demand this summer, and that most, if not all, of the local concerns will be busy. At any rate they are preparing for it. It is still evident that Southern iron is to be pushed in this market. Well-known grades are selling well, and some concessions are noted on No. 2 foundry and No. 1 soft, other sorts are firm, though there is talk of further shading.

We quote for Northern brands as follows: No. 1 foundry, \$13@13.50; No. 2, \$12.25@12.75; gray forge, \$11.50@12. For Southern irons prices are: No. 1 foundry, \$12.50@13; No. 2 foundry, \$11.75@12.25; No. 1 soft, \$11.75@12.25; No. 2 soft, \$11.50@12; forge, \$11@11.50.

Cast Iron Pipe.—Plenty of inquiries is the statement everywhere, and it looks as if a great deal of pipe would be laid next summer. The pipe foundries all have work, some of them for several months ahead.

Spiegeleisen and Ferro-Manganese.—The mar-

ket is still quiet. Some sales are reported at \$19@ \$20 per ton for spiegeleisen and \$47@ \$50 for ferro.

Steel Billets and Rods.—There is not much demand for billets, but several small sales are noted at \$19.25@ \$19.75, tidewater; a concession on last week's prices. Sellers are not willing to shade prices on future deliveries, however, and are quoting \$19.50@ \$20 for anything later than March. Rods can be had at \$25.50@ \$26, tidewater.

Merchant Iron and Steel.—Business continues fairly active, though still rather on the retail order. There has been talk of an advance in bars, but none has been announced yet. Bars are 1.25@ 1.35c. for common and 1.35@ 1.50c. for refined. We quote for soft steel bars 1.30@ 1.40c.; open-hearth machinery steel, 1.50@ 1.60c.; steel hoops, 1.50@ 1.60c.; steel axles, 1.65@ 1.80c.; links and pins, 1.65@ 1.80c.; tire steel, 1.85@ 2c.; spring steel, 2.10@ 2.25c. Rivets are 2.20@ 2.30c. for steel, and 3@ 3.30c. for iron.

Plates.—Conditions are not materially changed, except that there is some increase in demand for boiler plates and flange. Prices show no change. Universal mill plates are 1.45@ 1.55c. For steel plates we quote: Tank, 1.45@ 1.55c.; boiler shell, 1.55@ 1.65c.; good flange, 1.80@ 1.95c.; firebox, 2.10@ 2.40c. Charcoal iron plates are 2.20@ 2.30c. for shell, 2.70@ 2.80c. for flange, and 3.20@ 3.30c. for firebox.

Structural Iron and Steel.—Contracts for several buildings, one a large one, have been let this week, involving a total of about 1,600 tons of material. It is announced that the mills making beams have agreed on a price of 1.60c. for large lots, New York delivery, and 1.65c. for delivery east of New York. No other changes are noted. We quote, for angles, 1.45@ 1.55c.; channels, 1.60@ 1.75c.; tees, 1.65@ 1.75c.; beams (up to 15-in.), 1.55@ 1.60c. for large lots and 1.85@ 2c. for small orders.

Steel Rails and Rail Fastenings.—Rails are unchanged at \$28 per ton at mill, or \$28.75 at tidewater for standard sections. Girder and street rails are \$28@ \$32 per ton at mill, according to section. Negotiations are understood to be pending, for at least two good sized lots of street rails for delivery in New York next summer. The West End Company of Boston has contracted for 8,000 tons with a Pennsylvania mill.

Rail fastenings are steady and prices unchanged. Quotations are: For fish and angle-plates, 1.30@ 1.40c.; spikes, 1.65@ 1.80c.; bolts, 1.95@ 2.05c., for square nuts, and 2.05@ 2.15c. for hexagon nuts.

Scrap Iron.—The demand for foundry scrap is quite up to the supply, and it is not easy to get good lots. We quote \$9@ \$11 per ton, according to size and quality of lots.

Buffalo. Mar. 4.

(Special Report of Rogers, Brown & Co.)

There is an air of quietness about the local market which is hardly reflected to a like degree in tonnage. This is due to the inactivity of buyers in general and the large size of the few transactions which have taken place. Jobbing foundries appear to be increasing their melt, and owing to a scarcity of good scrap, considerable of the closer grained pig-iron has been sold as a substitute. Prices remain unchanged, and range about as follows, cash basis: No. 1 foundry strong coke iron Lake Superior ore, \$13.50; No. 2 foundry strong coke iron Lake Superior ore, \$13; Ohio strong softener, No. 1, \$13.70; Ohio strong softener No. 2, \$13.20; Jackson County silvery No. 1, \$15.25@ \$15.75; Southern soft, No. 1, \$12.90; Southern soft No. 2, \$12.50; Hanging Rock charcoal, \$18; Lake Superior charcoal, \$15.50.

Chicago. March 4.

(From Our Special Correspondent.)

The Chicago iron market has improved somewhat during the past week. Through the influence of car-builders the pig iron market has gained much. It is said that the combined sales of pig iron to car-builders during the month of February was greater in that month than the entire twelve months of 1895. Billets are quiet, the companies here preferring to keep out of the market than to quote at prevailing prices. Rods are in excellent demand and steel rail sales have increased. Prices in many lines remain firm. The general situation is much better than for some time, and inquiry shows that buying may begin in earnest at an early day. The Illinois Steel Company are operating their South Chicago works to full capacity.

Pig Iron.—The sales of pig iron during the past week have footed up a good total, in the neighborhood of 13,000 tons, a good part of it being Lake Superior charcoal iron. During February, furnaces both North and South disposed of 40,000 tons of pig iron in this market. The outlook is good and prices are holding firm. Prices are: Lake Superior charcoal, \$13.50@ \$14; local coke foundry No. 1, \$12.75@ \$13.25; local coke foundry No. 2, \$12.25@ \$12.75; local coke foundry No. 3, \$11.25@ \$11.75; local Scotch foundry No. 1, \$12.75@ \$13.25; local Scotch foundry No. 2, \$12.25@ \$12.75; local Scotch foundry No. 3, \$11.25@ \$11.75; Southern coke No. 1, \$12.85@ \$13.10; Southern coke No. 2, \$12.35@ \$12.60; Southern coke No. 3, \$11.75@ \$12.35; Southern No. 1, soft, \$12.10@ \$12.60; Southern No. 2, soft, \$11.75@ \$12.10; Southern silveries No. 1, \$13.35; Southern silveries No. 2, \$12.85; Jackson County silveries, \$14.50@ \$16; Ohio silveries No. 1, \$15@ \$15.50; Ohio silveries No. 2, \$14.50@ \$15; Ohio strong softeners, \$15@ \$15.50; Alabama car-wheel, \$17.50@ \$18; Bessemer iron, \$13.50@ \$14.

Structural Material.—Nothing very extensive

has appeared during the past week. General business remains good and prices are fairly firm. A bridge over the Kansas River at Topeka, Kan., is in the market for a few thousand tons, and a couple of office buildings will require several hundred tons. Prices are: Beams and channels, 1.60@ 1.65c.; plates, 1.55@ 1.60c.; tees, 1.60@ 1.70c.; angles, 1.50@ 1.55c.

Bar Iron.—Very good sales of bars have been made and business looks decidedly well. Car builders are taking most of the output at the present time. Prices are firm, being for common iron 1.35c., and for refined 1.40@ 1.45c.

Steel Rails.—Business in rails has been more active and fully 15,000 tons have been sold during the week. Prospects of larger buying are good, and the companies here expect a great deal of business to soon materialize. Prices are \$29 and upward, according to specification.

Billets.—There has been but little sale of billets, the Illinois Steel Company preferring not to quote at present. Prices are \$19 or \$20.

Rods.—About 6,000 tons of rods were sold in this market for the week at prices ranging from \$26.50@ \$28, according to delivery.

Old Rails and Wheels.—Old wheels are in great demand by car builders, but they are scarce. In February 2.5.0 tons of old wheels were sold at about \$14. Old iron rails have had a few sales at about \$12.50@ \$13.

Cleveland, O. March 5.

(From Our Special Correspondent.)

Iron Ore.—Shippers are in daily session now arranging the schedule of prices for Bessemer during the coming season. Exhaustive analyses have been made of all the ores, and it is upon the results thus obtained that relative values will be obtained. This detail work involves all the principal Mesabi ores, besides the old range products. An announcement of prices is expected within two weeks.

No vessel charters for the season have yet been made. There has been a little talk on both sides about negotiations. Conservative vesselmen expect about \$1.15 from the head of the lakes. Ore men's figures are lower, or from \$1 to \$1.10. The ice has broken away from Duluth and there are now indications of an early opening of navigation.

A little trading is going on daily in Lake Erie dock ores, in lots ranging from 1,500 to 8,000 tons. Very low phosphorus ores are in especial demand, but are scarce, and are selling at from \$4.25 un. Standard Bessemer are quoted at from \$4 to \$4.25. There have been also a few transactions in foundry ores at from \$2.75 to \$3.

Pig Iron.—The local market is weaker. There seems to be an almost total suspension of orders and prices are lower than they were a week ago. This depression is attributed solely to the absence of buyers and one or two good sized orders in the market would quickly revive prices. Stocks are accumulating to some extent in this district but not so rapidly as elsewhere. Consumers of steel are preserving a masterly inactivity and so the price of Bessemer pig has gone down to about \$12.25 on quick sales. Orders extending over several months have been refused at that figure and a number of strong furnacemen have preferred accumulation to a disposal of products under about \$13 Cleveland. Foundry irons are reported in stronger position than Bessemer and in the local market show no depreciations. Southern products are quoted a point or two off but Northern strong is selling at \$13@ \$13.25 for No. 1 and \$12.50 for No. 2. Ohio Scotch is quoted at \$12.50 for No. 1 and \$12 for No. 2. Lake Superior charcoal is weaker at about \$13.75. Steel billets are quoted at \$17.25.

Pittsburg. March 5.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business during the week has not developed the increased activity that had been generally anticipated. There has been a moderately improved jobbing trade in some departments. The temper of operations generally is very conservative, and, although financial conditions are no longer a disturbing factor, there is little disposition in any branch of trade to extend operations much in advance of assured requirements.

In the iron and steel trade slight concessions were made in prices of outside lots of Bessemer and steel billets; city furnaces refuse to meet any decline in values. There was increased inquiry for gray forge and scrap material; activity is noted, however, in the nail trade and in barbed wire, and there has been a continued liberal business in wrought and cast-iron pipe, but some of the orders for the latter are said to be booked at low prices. While the demand in leading products is not what it ought to be, at this season of the year, the undertone of the market is certainly gaining strength, which is certain to be followed by increased demand and larger operations, as stocks in consumers' hands are known to be limited. Railroad orders for liberal quantities of material are known to be under consideration at various points, and as other business is known to aggregate a considerable amount, a feeling of greater confidence prevails among the mill men. The feature of the week has been the placing of large orders for wrought-iron pipe in this city and in the East, and this has made some business for plate and skelp mills. The pipe orders are said to aggregate 30,000 tons. One company is said to have ordered two miles of pipe. It is also known that a good deal of business is in contemplation

which is practically certain to be given out as the financial situation improves and the season advances. An active market is certainly not far off.

The Latest.—The market is certainly a waiting one; sales were numerous, but of small proportions. For most descriptions prices are weaker. Bessemer pig ranged from \$12.50 to \$12.75. Gray forge prices were fairly maintained. Steel billet sales range from \$17.40 to \$17.75. Makers say that present prices don't cover first cost. Foundry irons are a shade weaker. Scrap material is improving slowly, and so are old rails. Muck bar was more inquired for. The demand for skelp iron and steel is increasing. The outlook at present is not very rosy.

| COKE SMELTED, LAKE AND NATIVE ORE. | | BLOOMS, BILLETS AND SLABS AT MILL. | |
|--|---------|--|-------------|
| Tons. | Cash. | Tons. | Cash. |
| 3,000 Bessemer, Mar., April, Valley... | \$11.75 | 2,000 Billets, Mar., Apr., May, at mill... | \$17.85 |
| 3,000 Bessemer, Mar., Apr., Pitts... | 12.50 | 1,500 Billets, Mar., Apr., May, at mill... | 17.65 |
| 2,600 Bessemer, Mar., Pitts... | 12.40 | 1,000 Billets, Mar., Apr., May, at mill... | 17.75 |
| 2,000 Bessemer, Mar., Pitts... | 12.65 | 1,000 Billets, Mar., Apr., May, at mill... | 17.65 |
| 2,000 Gray Forge, Pitts... | 11.60 | 500 Billets, Mar., at mill... | 17.50 |
| 1,000 Bessemer, Mar., Apr., Pitts... | 12.50 | SKEIP IRON. | |
| 1,000 Bessemer, Mar., Valley... | 11.75 | 5,000 Narrow grooved, Pitts... | \$1.25 4 m. |
| 1,000 Gray Forge, Mar., Apr., Pitts... | 11.00 | 2,000 Sheard, Pitts... | 1.45 4 m. |
| 1,000 Bessemer, prompt, Pitts... | 12.50 | 2,000 Narrow grooved, Pitts... | 1.25 4 m. |
| 300 Gray Forge, Mar., Pitts... | 11.00 | SKEIP STEEL. | |
| 300 No. 2 Foundry, Prompt, Pitts... | 12.50 | 2,000 Sheard, Pitts... | \$1.35 4 m. |
| 300 No. 1 Foundry, prompt, Pitts... | 13.75 | 1,000 Narrow grooved, Pitts... | 1.20 4 m. |
| 200 No. 2 Foundry, Mar., Pitts... | 12.75 | 500 Wide grooved, Pitts... | 1.20 4 m. |
| 200 No. 3 Foundry, prompt, Pitts... | 12.00 | MUCK BAR. | |
| 100 No. 2 Foundry, Mar., Pitts... | 12.50 | 1,500 Neutral, Mar., Pitts... | \$21.00 |
| 50 No. 1 Foundry, spot, Pitts... | 11.00 | SHEET BARS. | |
| CHARCOAL. | | 1,000 at mill, Pitts... | \$19.50 |
| 200 Cold Blast, Pitts... | \$23.50 | STEEL WIRE RODS. | |
| 75 No. 2 Foundry, Pitts... | 16.80 | 1,100 5-gage, at mill, Pitts... | \$ 3.00 |
| 50 No. 1 Foundry, Pitts... | 17.25 | BLOOMS, BILLETS AND BAR ENDS. | |
| 50 Cold Blast, Pitts... | 23.50 | 500 Bar ends, (delivered) Pitts... | \$14.00 |
| 50 No. 2 Foundry, Pitts... | 17.00 | SPELTER. | |
| | | 100 Prime, Pitts... | \$1.05 |

Philadelphia. March 6.

(From Our Special Correspondent.)

Pig Iron.—The furnacemen feel that they have escaped the danger that was threatened some time ago from enormous production. From our standpoint the accumulation of iron appears to have ceased. If not true all around, it is true as to the bulk of the furnaces that sell in this market. Foundry iron was not sold in as large lots this week, though buyers last week appeared to be ready for business. Certain makes of forge have been well sold up, and this is the only grounds for the strained conclusion in one or two papers that mill irons have advanced. There is an abundance of good iron available at old figures and in large lots, even at concessions. Foundry irons of desirable makes are not a shade weaker, as has been asserted. Bessemer is \$13; No. 1, \$13; No. 2, \$12.50; Forge, \$11.50.

Steel Billets.—Buyers are beginning to feel that their long-predicted \$19 billets are now almost at hand. Some parties would have placed large orders last week at this or a trifle more. Buyers say the market is unsettled. Sellers insist on \$19.50 for quick deliveries.

Merchant Iron.—The better trade condition mentioned continues, but the anxiety to protect ourselves from western Huns and Vandals keeps prices very low. Orders for steel bars were picked up at 1.25, which is about the best we can get on a good iron order.

Skelp.—The little boom we had last week and the sprinkling of smaller orders ever since has made people feel that skelp at \$1.25 was too cheap. Buyers are incredulous and hang back at \$1.30. Mill men say if half the promised business comes they will soon be getting that and more.

Sheets.—A few pieces of work are under way calling for heavy sheet. The general market is dull.

Merchant Steel.—Shop and factory steel is now in fair request, and storekeepers' retail stocks are being replenished.

Pipes and Tubes.—The foreign order it was said to-day would be placed within a very few days. Now that a few mills have enough work for a while there is less pressure for new business, but the intimation that prices are firmer, though a plausible supposition, is not a fact where a big order is concerned.

Plate and Tank.—From what every one says there ought to be an unusual amount of business in two or three weeks. Manufacturers have had inquiries for much material, and they of course take the ultra-hopeful view of the market. Several mills could remain out of the market and give the others a better show if they only would. Tank plate and universals are 1.45; shell, 1.50; flange, 1.65.

Structural Material.—If the builders who have

virtually got the contracts for big building work would buy now, it would fatten up the mills for a little while. These giants roll out shapes with such speed that nothing but continuous bridge and office building work keeps their voracious maws in order that angles can be ordered to-day at 1:40; tees, beams and channels, 1 60.

Steel Rails.—The only business heard of is in girder rails.

Old Rails.—Quoted at \$15.50.

Scrap.—Choice railroad is offered at \$14 for some; old car wheels, \$12.

METAL MARKET.

New York, Friday Evening, March 6, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

| Feb. Mar. | St. Ex. | London | N. Y. Cls. | Value of sil. to \$1. | Mar. | St. Ex. | London | N. Y. Cls. | Value of sil. to \$1. |
|-----------|----------|--------|------------|-----------------------|------|----------|--------|------------|-----------------------|
| 29 | 4 87 1/4 | 31 3/8 | 68 1/4 | .527 | 4 | 4 87 3/4 | 31 3/8 | 68 1/4 | .530 |
| 2 | 4 87 3/4 | 31 3/8 | 68 1/4 | .527 | 5 | 4 87 3/4 | 31 3/8 | 68 1/4 | .529 |
| 3 | 4 87 3/4 | 31 3/8 | 68 1/4 | .528 | 6 | 4 87 3/4 | 31 3/8 | 68 1/4 | .529 |

With strong inquiry by the Eastern banks as well as continental orders the market has been a steady one with an advancing tendency; Mexican dollars have been in good demand at 31@31 1/4.

The United States Assay Office in New York reports the total receipts of silver at 101,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, January, 1896, and years 1896 and 1895:

| | Specie and bullion. | | In ores. | | Total excess, Exp. or Imp. |
|--------------|---------------------|--------------|----------|-----------|----------------------------|
| | Exports. | Imports. | Exports. | Imports. | |
| GOLD | | | | | |
| Jan. | \$10,565,516 | \$10,294,290 | \$5,002 | \$178,050 | E. \$99,178 |
| 1895 | 10,585,516 | 10,294,290 | 5,002 | 178,050 | E. 99,178 |
| 1895 | 25,929,828 | 1,231,339 | 275,432 | 68,326 | E. 24,905,595 |
| SILV. | | | | | |
| Jan | \$1,912,629 | 1,069,298 | 81,670 | 1,438,082 | E. 2,539,919 |
| 1896 | 4,902,639 | 1,069,298 | 84,670 | 1,438,082 | E. 2,539,919 |
| 1895 | 3,755,501 | 662,374 | | 975,344 | E. 2,117,783 |

These figures are furnished by the Bureau of Statistics of the Treasury Department, and include the exports and imports at all United States ports.

Gold and Silver Exports and Imports, New York

For the week ending March 6th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

| Week | Gold. | | Silver. | | Total Excess, Exp. or Imp. |
|------|------------|------------|-----------|----------|----------------------------|
| | Exports. | Imports. | Exports. | Imports. | |
| 1896 | 9,748,885 | 858,967 | \$721,109 | \$28,596 | E. \$633,147 |
| 1895 | 27,590,978 | 15,915,833 | 7,135,245 | 306,001 | E. 682,296 |
| 1894 | 3,827,848 | 8,575,726 | 5,676,502 | 274,014 | E. 24,887,740 |
| 1893 | 3,174,540 | 2,411,831 | 9,115,343 | 264,499 | E. 10,266,871 |
| 1892 | 3,174,540 | 2,623,740 | 5,902,955 | 824,356 | E. 33,199,364 |
| 1892 | 9,972,961 | 3,320,309 | 4,854,715 | 290,185 | E. 11,217,184 |

No gold was exported during the week and all the silver went to London. Of the gold imported, \$16,019 came from Europe; \$21,951 from the West Indies; \$17,950 from Panama, and the remaining \$3,047 from Mexico; the silver came chiefly from Panama.

FINANCIAL NOTES OF THE WEEK.

The principal financial event of the week has been the renewed bankruptcy of that important railroad system the Baltimore & Ohio. The result so far as can be discerned, of constructing unprofitable branches and taking up or fathering those constructed by others, was a heavy fall in all Baltimore & Ohio securities which at one time were looked upon as a first-class investment.

Other conditions in the market being comparatively favorable, if we exclude the language used both in the Senate and the House on the subject of belligerency would have had a favorable effect, especially when the financial position of the Treasury is considered, the gold reserve on Thursday being higher than at any time for the last few years. The reserve was then reported as \$125,406,138, of which \$26,907,748 was in gold bullion, and \$142,213,429 in gold coin, including what was held against gold certificates outstanding, amounting to \$43,715,039. Up to Friday night the amount paid on bonds was more than \$100,000,000 in principal, premium and interest. It now remains to be seen whether this gold will be held in the Treasury or whether it will not be exported in consequence of what has been recently our ordinary conditions of trade balance. To which should be added the further contingency of withdrawals, or at least an increase of this adverse balance of trade owing to the action of Congress.

There was one exceptional movement in the withdrawal of \$1,000,000 from the Sub-Treasury by a railroad company, which amount probably will be re-deposited through the various banks with which the corporation does business, and, therefore, may not figure in the official returns of the week.

The statement of the United States Treasury on Thursday, March 5th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

| | Feb. 27. | March 5. | Changes. |
|---------------------|---------------|---------------|--------------|
| Gold | \$124,631,141 | \$125,406,138 | I. \$774,997 |
| Silver | 23,781,581 | 22,789,429 | D. 992,151 |
| Legal tenders | 74,814,645 | 74,391,935 | D. 422,710 |
| Treasury notes, etc | 29,820,513 | 30,629,901 | I. 809,388 |

Totals.....\$153,048,879 \$253,167,403 I. \$100,102,524

Government deposits with national banks on the same date amounted to \$23,677,560, an increase of \$2,376,897 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$136,780,280. Against these are held in the Treasury 14,124,928 coined standard silver dollars, and silver bullion purchased at a cost of \$122,655,352, making a total of \$136,780,280.

The receipts and expenditures of the United States Treasury for February and the eight months of the current fiscal year, from July 1st to February 29th, were as follows:

| | February, Eight Months. | February, Eight Months. |
|------------------|-------------------------|-------------------------|
| Receipts | \$26,059,228 | \$24,568,699 |
| Payments | 26,749,976 | 242,085,548 |
| Excess, payments | \$690,728 | \$17,516,858 |

These statements include only the current revenue from customs and other sources, and not the receipts from bonds sold in any form, and show that the ordinary revenue is now almost equal to our current needs.

The statement of the New York banks—including the 69 banks represented in the Clearing House—for the week ending February 29th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

| | 1891. | 1895. | 1896. |
|---------------------|---------------|---------------|---------------|
| Loans and discounts | \$139,303,400 | \$181,201,240 | \$162,521,700 |
| Deposits | 531,741,200 | 528,410,800 | 489,612,200 |
| Circulation | 11,610,000 | 12,083,300 | 13,619,600 |
| Specie | 97,525,300 | 69,592,500 | 60,304,000 |
| Legal tenders | 111,187,900 | 99,572,200 | 85,921,200 |
| Total reserve | \$308,714,200 | \$163,164,700 | \$146,825,200 |
| Legal requirement | 132,945,300 | 132,110,200 | 122,463,650 |
| Surplus reserve | \$75,778,900 | \$28,054,500 | \$24,422,150 |

Changes for the week this year were increases of \$4,726,100 in loans, and \$233,200 in circulation; decreases of \$120,400 in deposits, \$3,616,900 in specie, \$618,100 in legal tenders, and \$4,204,900 in surplus reserve.

The following statement from the Bureau of the Mint shows the coinage executed at the mints of the United States during the month of February and the two months ending February 28th, 1896:

| Denominations | February. | | Two months. | |
|------------------|-----------|-------------|-------------|--------------|
| | Pieces. | Value. | Pieces. | Value. |
| Double eagles | 62,000 | \$1,240,000 | 69,775 | \$1,395,500 |
| Half eagles | | | 44,900 | 224,500 |
| Quarter eagles | | | 5,840 | 14,600 |
| Total gold | 62,000 | \$1,240,000 | 746,515 | \$14,134,600 |
| Standard dollars | 1,500,000 | 1,500,000 | 1,500,000 | 1,500,000 |
| Quarter dollars | | | 260,000 | 65,000 |
| Total silver | 1,500,000 | \$1,500,000 | 1,760,000 | \$1,565,000 |
| Five cents | 182,000 | 9,100 | 1,921,300 | 46,060 |
| One cent | 2,908,000 | 29,080 | 4,608,000 | 46,080 |
| Total minor | 3,090,000 | \$38,180 | 5,259,200 | \$92,140 |
| Total coinage | 4,652,000 | \$2,778,180 | 8,035,715 | \$15,811,740 |

The February coinage was light, and was confined chiefly to silver dollars and minor coins.

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

| | Gold. | Silver. | Total. |
|-------------------------|---------------|---------------|--------------|
| Asso. Banks of New York | | | \$60,301,000 |
| 1895 | | | 69,592,500 |
| Bank of England | \$246,374,385 | | 246,374,385 |
| 1895 | 185,934,150 | | 185,934,150 |
| Bank of France | 390,356,106 | \$249,058,070 | 639,414,100 |
| 1895 | 429,679,119 | 247,337,011 | 677,016,130 |
| Imp. Bank of Germany | | | 256,610,000 |
| 1895 | | | 269,110,000 |
| Austro-Hungarian Bank | 127,110,500 | 63,957,500 | 191,068,000 |
| 1895 | 85,465,000 | 68,560,000 | 154,025,000 |
| Netherlands Bank | 14,034,000 | 34,509,000 | 48,543,000 |
| 1895 | 22,130,000 | 34,968,000 | 57,098,000 |
| Belgian National Bank | | | 18,936,000 |
| 1895 | | | 25,551,000 |
| Bank of Spain | 40,022,000 | 52,354,000 | 92,376,000 |
| 1895 | 40,021,000 | 59,481,000 | 99,502,000 |
| Bank of Italy | 61,250,000 | 10,230,000 | 71,480,000 |
| 1895 | | | |
| Imp. Bank of Russia | 351,560,000 | 44,075,000 | 395,635,000 |
| 1891 | 214,032,000 | 112,761,600 | 326,793,600 |

The return for the Associated Banks of New York is of date February 29th; all the others are of date March 4th, except the Bank of Italy, which is dated January 31st, and the Bank of Russia, whose return is dated December 16th-28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports its gold only, not considering silver at all.

The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to February 20th are reported by Messrs. Pixley & Abell's circular as below:

| | 1895. | 1896. | Changes. |
|-------------|------------|-----------|--------------|
| India | \$763,130 | \$485,998 | D. \$277,132 |
| China | 392,900 | 84,500 | D. 508,400 |
| The Straits | 101,300 | 76,482 | D. 27,818 |
| Totals | £1,460,330 | £546,980 | D. £913,350 |

Arrivals for the week this year were £184,000 bar silver from New York; £22,000 from the West Indies; and £27,000 in Mexican dollars from New York, a total of £233,000. Shipments for the same period were £165,000 bar silver to India; £21,322 to the Straits; and £36,600 in Mexican dollars to Hong-kong; a total of £222,922.

Indian exchange continues to rise, and on the 60 lakhs of Council bills offered in London this week an average of 14 1/2 per rupee was realized, the applications being very large. Part of this is due to the increasing tightness of money in India, the banks of Calcutta and Bombay having advanced their official discount rates to 7 and 8% respectively, a rise in each case of from 2 to 3% during the past month. There is also a considerable demand for money in view of the very large rice crop in Burma, and part of the buying of Council bills is due to Chinese orders for arms and to take up rice bills. At 14 1/2 d. the price of the rupee is considerably higher than its value in silver at current rates.

Domestic and Foreign Coins.

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

| | Bid | Asked |
|----------------------------------|------------|------------|
| Mexican dollars | \$0.54 1/2 | \$0.55 1/2 |
| Peruvian soles and Chilean pesos | .48 | .50 |
| Victoria sovereigns | 4.87 | 4.90 |
| Twenty francs | 3.88 | 3.92 |
| Twenty marks | 4.75 | 4.80 |
| Spanish 25 pesetas | 4.80 | 4.85 |

Other Metals.

Copper.—The market remains very firm, but somewhat quieter, and we hear that various efforts have been made to "talk the market down." There is, however, exceedingly little offered for sale, and the prices asked are high. Besides, while exports are going on at such a satisfactory rate and a continuous good demand exists from abroad, there is little likelihood of prices giving way to any extent, even if consumption by home trade does not become better than it already is. All manufacturers appear to be rather busy, and with the approaching spring orders will become more numerous. There can be no doubt that production will be somewhat curtailed by the diminished output of both the Butte & Boston and the Tamarack, which will hardly be offset by an increase in other brands. For lake copper 11c is being bid, with no sellers below 11 1/2 @ 11 1/4 c. Electrolytic copper is obtainable from 10 3/4 @ 10 1/2 c. in cakes; ingots or wire bars, with an allowance of 1/4 c. for cathodes. Casting copper remains dull at 10 1/2 @ 10 1/4 c.

The London market opened rather easier on Monday on heavy realizations of speculative holdings, but recovered part of the loss on Tuesday, declined again on Thursday, and this morning there was renewed energetic selling, which drove prices down sharply to £45; but the market closes somewhat irregular, but better at £45 7s. 6d. @ £45 10s. for spot, and £45 15s. 6d. @ £45 7s. 6d. for three months prompt. Best selected copper is exceedingly scarce, and high prices are obtainable. The feature abroad just now is the rapid consumption of Chile bar copper, which, if it continues, will seriously reduce the spot reserve in England, which would not fail to influence prices. For refined and manufactured we quote: English tough, £48 15s. @ £49; best selected, £50 5s. @ £50 10s.; strong sheets, £55 10s. @ £55 15s.; India sheets, £53 5s. @ £53 10s.; yellow metal, 4 1/4 @ 4 3/4 d.

According to our cable statistics for the second fortnight in February again decreased 400 tons. The European statistics of copper on March 1st show total stocks, including 4,000 tons afloat, of 43,460 tons, a decrease of 480 tons from February 15th. The total supplies in Europe for February are estimated at 14,500 tons, of which 10,400 tons were from North America. The deliveries for the month were 17,200 tons.

Tin continues dull and the demand is not very brisk. Prices here remain somewhat below the parity of the European and Eastern markets. We quote 13 30 for March, and 13 35 April, May and June.

The tendency of the London market was toward lower prices, but in the main there has not been much change, and we quote £60 5s. @ £60 7s. 6d. for spot and £60 17s. 6d. @ £61 for three months prompt. The statistics for the month of February show a decrease of 500 tons.

Tin statistics for February, as prepared by the New York Metal Exchange, show a total consump-

tion for the month of 4,064 tons. The visible supply on March 1st was as follows, in long tons:

| | In store. | Afloat. | Total. |
|------------------------------|-----------|---------|--------|
| London..... | 15,647 | 2,513 | 18,160 |
| Holland, Banca and Billiton | 4,200 | 1,410 | 5,610 |
| Straits..... | 525 | 943 | 1,468 |
| U. S., ex Pacific Ports..... | 3,693 | 2,580 | 6,273 |
| Total..... | 24,065 | 7,506 | 31,571 |

This shows an increase of 1,326 tons in the supply during February.

Lead has become rather dull. Prices have eased off somewhat, and we can to day quote for spot and nearby delivery 3.20c.

The market abroad is rather dull, Spanish lead being quoted £11 3s. 9d. @ £11 6s. 3d., and English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and lower. The latest sale basis is 2.90, East St. Louis. The market looks as though the late boom had completely collapsed again.

Spelter remains firm, and again higher prices have been realized. Very little is offered from the West, and we quote 4.15 @ 4.20c.

The London market has been firm and steady, good ordinary brands being quoted £13, and specials £15 5s.

Antimony is without any quotable change. Prices are 7½c. for Cookson's, 6½c. for Hallett's, 7c. for U. S. Star, and 6.75c. for Japanese.

Nickel.—The market is quiet, but firm, and prices are unchanged. Small lots are 35½ @ 38c. per lb., New York; ton lots are quoted at 34 @ 35c. per lb. The London quotations are 13½ @ 15d. per lb. In Paris pure metal is quoted 3.50 @ 4 fr. per kilogram.

Platinum.—There is a continued upward tendency, and we quote \$1½ @ \$1.50 per oz. New York. London quotations are 49 @ 51s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotation, the prices given being respectively for orders of over 250 grams; for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 48c. 49c. and 50c. per gram. Wire and foil are 45c., 46c. and 47c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—Current quotations continue unchanged at \$37.50 per flask, New York. The London price is £7 2s. 6d. per flask, with £7 1s. 6d. @ £7 2s. quoted from second hands.

| New York.* | Week, Feb. 27. | | Year, 1896. | |
|------------------------------------|----------------|--------|-------------|---------|
| | Expts. | Imps. | Expts. | Imps. |
| Aluminum..... lbs. | | | | 423 |
| Antimony ore..... short tons | | 93 | | 480 |
| regulus..... casks | | 50 | | 198 |
| Brass, old..... short tons | 3 | | 32 | 2 |
| Copper, fine..... long tons | 11,470 | 120 | 12,007 | 478 |
| matte..... " | 1405 | | 2,847 | 11 |
| ore..... " | | | | |
| sulphate..... " | | | 1,215 | |
| Iron ore..... " | | | | |
| pigs, bars, " | | | | 1,297 |
| rods..... " | | | | 2,275 |
| Iron pyrites..... " | | | | 1,700 |
| sulphate..... " | | | | |
| Ferro-manganese..... " | | 100 | | 314 |
| Manganese ore..... " | | 288 | | 572 |
| Spiegeleisen..... " | | 705 | | 7,315 |
| Lead ore..... " | | | | |
| pigs and bars..... " | 11,120 | 1387 | 7,847 | 6,387 |
| Nickel..... " | 10 | | 122 | |
| Steel, billets, rods..... " | | 518 | | 5,037 |
| Tin..... " | | 1515 | | 2,730 |
| Tin and black plates, boxes..... " | | 20,385 | | 193,674 |
| Zinc (spelter)..... long tons | 18 | | 118 | 85 |

* Metal Exchange Reports. † Week ending Mar. 6.

| Baltimore.** | Week, Mar. 5. | | Year, 1896. | |
|------------------------------------|---------------|--------|-------------|--------|
| | Exp. | Imp. | Exp. | Imp. |
| Chrome ore..... long tons | | | | 500 |
| Copper, fine..... " | 762 | | 3,626 | |
| matte..... " | | | 500 | |
| sulphate..... " | 144 | | 912 | |
| Iron ore..... " | | 11,206 | | 95,470 |
| pigs, bars, " | | | | |
| blooms..... " | | 129 | | 1,172 |
| Iron oxide..... bags | | | | 304 |
| pyrites..... long tons | | | | 2,475 |
| Ferro-manganese..... " | | | | 1,019 |
| nase..... " | | | | 30 |
| Ferro-silicon..... short " | | | | 2,743 |
| Limestone..... " | | | | 1,073 |
| Manganese ore..... long " | | | | 60 |
| Spiegeleisen..... " | | | | 10 |
| Steel..... " | | | | 1,647 |
| Steel wire, bundles..... " | | | | 32 |
| Tin, long tons..... " | | 115 | | 51,336 |
| Tin and black plates, boxes..... " | | 13,821 | | |

**From our special correspondent. † Feb. 27.

| Philadelphia.†† Imports only. | |
|----------------------------------|--------|
| Antimony, casks..... | 17 |
| Copper, long tons..... | 2,200 |
| Iron ore..... | 17,630 |
| Manganese ore, long tons..... | 2,100 |
| Tin..... | 115 |
| Tin and black plates, boxes..... | 2,058 |
| | 5,104 |

††From our special correspondent. Week ending Feb. 27.

The Minor Metals.—Quotations for these metals

are given in the table below, the prices being for New York delivery:

| | |
|--|-----------------|
| Aluminum: | |
| No. 1, 98% pure rolling ingots, per lb..... | 50 @ 55c. |
| No. 1, ingots for re-melting, per lb..... | 48 @ 53c. |
| No. 2, 9½% pure..... | 38 @ 42c. |
| Ingots from scrap, per lb..... | 35 @ 40c. |
| Aluminum-nickel casting metal, per lb..... | 40 @ 45c. |
| Bismuth, per lb..... | \$1.30 @ \$1.75 |
| Phosphorus, per lb..... | 50 @ 55c. |
| Platinum, per oz..... | \$13 @ \$14 |
| Tungsten, pure, powder per lb..... | 70c. |
| Tungstic acid, per lb..... | 45c. |
| Ferro-tungsten, 60% in ton lots, per lb..... | 60c. |

The variations in price are chiefly on size of order.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 6.
Heavy Chemicals.—There is little of interest doing in the heavy chemical market. Caustic Soda is quiet the greater part of the business doing being confined to deliveries on old contracts. Alkali is practically without change, only a few sales being reported at unchanged prices. The other chemicals are dull and without change in prices. We quote: Caustic soda, 2 1/2 @ 2 3/4 c. for spot, according to test; Carbonated soda ash, 48% is 90 @ 1c., according to quantities and deliveries. Alkali is 85 @ 95c., according to test and package. Bleaching powder, prime brands, \$1.80 @ \$1.90. Sal soda, 65 @ 70c.

Acids.—There is nothing new to report of the acid market. Manufacturers report a fair jobbing trade and no more. We quote per 100 lbs. in New York and vicinity, in lots of 50 carboys or over, as follows: Acetic acids (in barrels), \$1.40 @ \$1.70. Muriatic acid, 18°, 75 @ 80c.; 20°, 80 @ 90c. Nitric acid, 36°, \$3.50 @ \$4; 40°, \$4 @ \$4.50; 42°, \$4.75 @ \$4.25. Oxalic acid, \$7.10 @ \$7.60. Mixed acids, according to mixture. Sulphuric acid, 60°, 75 @ 85c.; chamber acid, \$6.50 @ \$7.25 per ton at factory. Blue vitriol, \$3.65 @ \$4.10 according to size of order.

Brimstone.—We quote for shipments, best un-mixed seconds, \$15. Thirds are 50c. less. Spot or nearby is \$16 for seconds.

Fertilizing Chemicals.—There was a lull in the fertilizer market during the past week, a few sales of ammoniates and potash salts are reported. Beyond that the market has ruled quiet. Quotations are as follows: Sulphate of ammonia, gas liquor, \$2.40 @ \$2.50 bone, \$2.30 @ \$2.35. Dried blood, high grade, \$1.75 @ \$1.80; low grade, \$1.60 @ \$1.70 per unit. Azotine, \$1.80. Concentrated phosphate (30% available phosphoric acid), 70 @ 71½ c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅, 57c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 90 @ 92c. per unit. Acidulated fish scrap, \$12, and dried scrap with few or no sales, nominally \$21 f. o. b. fish factory. Tankage, high grade, \$19 @ \$20; low grade, \$18 @ \$19. Bone tankage, \$21; ground bone, \$19 @ \$20. Bone meal, \$21 @ \$22.50.

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

Double Manure Salts: 48-53%. New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03½.

Muriate of Potash.—New prices for muriate are: New York and Boston, 1.75c.; Philadelphia, Baltimore and Norfolk, 1.76½c.; New Orleans, 1.78½c., for 80 @ 85% (basis of 80%), in lots 25 tons and upward.

Kainit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.55 per ton; Norfolk, \$8.90, and New Orleans, \$9.05 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36½c., 37½c. and 38c., respectively.

Nitrate of Soda.—Messrs. Mortimer & Wisner, the well known brokers of this city, send us the following statement of nitrate of soda issued under date of March 2d:

| | 1896. | | | 1895. | | | 1894. | | |
|---|---------|---------|---------|---------|-------|-------|---------|-------|--|
| | Bags. | Bags. | Bags. | Bags. | Bags. | Bags. | Bags. | Bags. | |
| Imported into Atlantic ports from West Coast S. A., from Jan. 1, 1896, to date..... | 163,164 | | | 113,725 | | | 107,073 | | |
| Imported into Atlantic ports from Europe, from Jan. 1, 1896, to date..... | | | | | | | | | |
| Stock in store and afloat March 1, 1896, in New York..... | 89,781 | 68,460 | 44,946 | 1,782 | 2,590 | | | | |
| Boston..... | | 140 | 888 | | | | | | |
| Philadelphia..... | 4,000 | 250 | 2,506 | | | | | | |
| Baltimore, Va..... | 584 | 1,690 | | | | | | | |
| Charleston..... | | 2,500 | | | | | | | |
| To arrive, actually sailed..... | 300,000 | 232,000 | 111,000 | | | | | | |
| Vis. supply to June 15, 1896..... | 394,505 | 307,480 | 160,946 | | | | | | |
| Stock on hand, Jan. 1, 1896..... | 53,839 | 58,267 | 44,938 | | | | | | |
| Deliveries past month..... | 88,249 | 25,781 | 63,175 | | | | | | |
| Deliveries Jan. 1 to date..... | 149,498 | 103,632 | 102,065 | | | | | | |
| Total yearly deliveries..... | | 828,042 | 701,202 | | | | | | |
| Prices cur. March 1, 1896..... | 170 | 172½ | 2'05 | | | | | | |

Liverpool.

Feb. 26.

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

Taking the chemical market all round, trade is still rather disappointing and lifeless. For the 12 months ending December 31st last, the United Alkali Company has declared a dividend of 2s. per share on the ordinary stock (equal to 1%), besides placing £55,000 to the reserve fund. This is an improvement on the previous year, but it is to be hoped that the trading for 1896 will show a much better result.

Soda ash is in limited request, while quotations are nominally unchanged. We quote spot range for tierces as follows: Leblanc ash, 48%, £4 @ £4 5s.; 58%, £4 5s. @ £4 10s.; ammonia ash, 48%, £3 7s. 6d. @ £3 10s.; 58%, £3 12s. 6d. @ £3 15s. per ton net cash; bags, 5s. per ton less; soda crystals are in fair request and steady at £2 7s. 6d. @ £2 10s. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is in fair demand and firm at the following range, according to the export market: 60%, £6 5s. @ £6 10s.; 70%, £7 5s. @ £7 10s.; 74%, £8 5s. @ £8 10s.; 76%, £9 5s. @ £9 10s., per ton net cash.

Bleaching powder is flat at nominally £7 5s. @ £7 10s. per ton net cash, for hardwood packages according to the export market. Orders are scarce. Chlorate of potash is inactive, but makers are firm at 4½d. Bicarb. soda is in steady demand at £6 15s. per ton, less 2½%, for the finest quality in 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is fairly steady at £8 15s. @ £8 17s. 6d. per ton, less 2½% for good gray, 24s., 25% in double bags f. o. b. here, according to quality. Nitra of soda is held for £8 5s. per ton, less 2½% for double bags f. o. b. here. Carb. ammonia, lump, 3½d. per lb.; powdered, 3¼d. per lb., less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 246 and 247 of mining stocks listed and dealt in at:

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

NEW YORK, Friday Evening, March 6.

The mining stock market has continued quiet. At the Consolidated Stock and Petroleum Exchange very little business was done. The Comstocks were neglected as usual and it would seem as though the New York public were tired of the old stocks. The California shares were equally dull.

The greatest activity continues to be in the Colorado shares. Some of the old stocks, as, for instance, the Leadville group, have been in better demand. Small Hopes was in request and ruled steady at \$1 @ \$1.05, with sales of 1,000 shares at these figures. We are informed that the company has enough money in the treasury to declare a dividend and that it will do so as soon as a quorum of the board of directors can get together.

The Cripple Creek shares continue to show the largest numerical transactions. Creede and Cripple Creek show sales of 5,950 shares at 7 @ 8c. Croesus at 4c. sold 2,400 shares. Other sales were 1,800 shares of Mount Rosa at 15c.; 3,100 shares of Pharmacist at 14 @ 16c.; 400 shares of Portland at \$1.50 @ \$1.55; 650 shares of Victor at \$6.50 @ \$6.62½, and 500 shares of Work at 17c.

The New York Mining Exchange has been perfecting its organization during the week and expects to start in full blast before many days. The Clearing House charges have been reduced and are now 1c. per hundred shares each way. Things have been running more smoothly and the volume of business shows an appreciable increase.

The public for some reason or other has not responded as quickly as the organizers of the exchange had hoped. Probably this is not the fault of the officers of the exchange, but is due to the fact that it takes some time to convince New Yorkers that special benefits may be derived from trading in mining stocks. The Exchange must not lose courage, but should persevere in its efforts. The start is always difficult.

Boston.

March 5.

(From Our Special Correspondent.)

The movement in mining stocks has been variable, but a fairly good market on the whole, and in some special case quite an upward turn. Ingot copper is not quite so strong as previously, but this, as yet, has not had any material influence on the price of stocks. Arnold, a purely speculative stock, is slightly lower at \$1½ @ \$1¾. Atlantic has not sustained the previous advance to \$20, selling off to \$19, and closing at \$19½. The dividend for 1896 has been offered on the Stock Exchange here for \$1 per share. Calumet & Hecla is strong, advancing from 305 to \$310.

Boston & Montana, which was up to \$79½ last week, gradually settled to \$74½ from which it rallied reaching \$79½ again, but closing at \$77½. There is nothing new regarding this stock. Butte & Boston has had its poorest week, farther declining from \$3½ to \$2½. The interest on \$1,000,000 of bonds due, March 2d was not paid, and interest on the Consolidated bonds due April 1st will undoubtedly be passed in fact the latter bonds sold by auction this week at 25%. As the company has a large floating debt, and the stock is not assessable, a reorganization is probable.

Franklin hangs around \$15 steadily, but the news comes to-day that the bottom of the Pewabic shaft (so-called) on the Franklin Junior, is showing up some very handsome copper.

Kearsarge went off from \$13 to \$11, closing \$12. Oseola which reached \$29 on Friday last, has been unusually active dropping to \$27, and rallying later to \$28, but still closing \$27, Quincy which was up to \$134 last week, took a sudden drop to \$125, but has since rallied to \$130. Tamarack, which broke to \$92 (as noted last week) and then rallied to \$103, has since reached \$112 but closing \$109. There is nothing new regarding the mine farther than as stated last week. Tecumseh has rallied slightly from \$3 1/4 to \$4, but does not seem to "pick up" much since the reported new find on the vein. Wolverine hangs around \$7 1/2 @ \$8, but has no vigorous movement.

Boston & Cripple Creek went off from 37 1/2 c. to 30c., but has since fully recovered the loss. Gold Coin is slightly lower at 82 1/2 c. Merced has shown strength again, and, after going off from \$28 1/2 to \$27, rallied sharply to \$33. Santa Ysabel still has an upward tendency, gaining from \$13 1/4 to \$15 1/2.

Chicago. March 4.

(From Our Special Correspondent.)

Brokers on the Chicago Mineral and Mining Board are very much pleased at the interest that has been shown in the list during the past week. Most of the stocks have been fairly active within a comparatively narrow range.

Finance has been one of the most active stocks, and the sales during the week have been quite large. It was strong at the close, and there are plenty of rumors of an attempted corner. Orders to buy in large blocks have been coming in from Denver, where during the previous week the orders were to sell.

Rhyolite is keeping up its record as an active stock and has advanced during the week, closing at the highest point to-day.

Three mines were listed and called to day for the first time; they were the Iron Mountain, Imperial and Hawkeye. The Iron Mountain is located in Helena and has just declared its 30th dividend of 1c. a share payable March 13th. This property has paid \$440,000 in dividends. The Imperial is located near Winston, Mont., and is a shipper. The Hawkeye is an extension of the Homestake mine in the Black Hills. It is a shipper and is equipped with a 40-stamp mill and claims to have 200,000 tons of ore in sight.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending March 4th:

| Stocks. | Feb. 27 | Feb. 28 | Feb. 29 | Mar. 2 | Mar. 3 | Mar. 4 | Sales. |
|-------------------------|---------|---------|---------|---------|---------|---------|---------|
| Anaconda | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Annapolis | ..... | .01 | ..... | ..... | ..... | ..... | 1,000 |
| Boston & C. C. | ..... | .05 1/4 | .06 1/4 | .04 1/4 | .06 1/4 | .06 1/4 | 27,000 |
| C. C. & C. C. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| C. C. G. M. B. & L. Co. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Chi. & G. Mt. | ..... | ..... | .03 1/4 | .03 1/4 | .04 1/4 | .03 1/4 | 11,610 |
| Christmas | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Defender | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Delaware Cf. | .29 1/4 | .30 | .29 1/4 | .29 1/4 | .29 1/4 | .30 | 9,000 |
| Dictator | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Finance | .73 1/4 | .63 1/4 | .62 1/4 | .63 | .63 1/4 | .63 1/4 | 173,110 |
| Golden Stairs | .06 1/4 | .06 1/4 | .06 | .06 1/4 | .06 | .06 1/4 | 10,100 |
| Jefferson | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Justice | ..... | .05 1/4 | ..... | ..... | ..... | ..... | 3,000 |
| Rhyolite | .17 1/4 | .17 1/4 | .17 1/4 | .17 1/4 | .17 1/4 | .18 | 101,300 |
| Rough & Rdy | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Royal Ace | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Squaw Mt. | .09 1/4 | ..... | ..... | ..... | ..... | ..... | 700 |
| Thompson | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

Total shares sold, 336,800.

Cleveland, O. Mar. 5.

(From our Special Correspondent.)

Iron ore stocks continue in fair activity, but the market is overshadowed by other investment and speculative properties, which are absorbing local funds. The general tendency of the stocks is upward. Lake Superior Consolidated is called for by outside parties at \$22 and some transactions have been made at that figure.

Cleveland Cliffs during the week has sold as high as \$44. There is a better inquiry for Lake Superior iron, but Republic has dropped a point. Sales have been made at from \$18 to \$19. Following are current quotations:

| Name of Company. | Par val. | March 5. | |
|----------------------------|----------|----------|-------|
| | | Bid. | Ask. |
| Aurora | \$25 | ..... | \$8 |
| Chandler | 25 | \$12 | 14 |
| Cleveland Cliffs Iron Co. | 100 | 40 | 42 |
| Jackson Iron Co. | 25 | 70 | 75 |
| Lake Superior Iron Co. | 25 | 32 | 35 |
| Lake Superior Consolidated | 100 | 21 | 22 |
| Minnesota Iron Co. | 100 | 70 | ..... |
| Pittsburg & Lake Anzeline | 25 | 75 | 85 |
| Republic Iron Co. | 25 | 18 | 20 |

Colorado Springs, Colo. Feb. 29.

(From Our Special Correspondent.)

The mining stock market during the past week has been rather weak, and prices with but few exceptions show declines to a greater or less extent.

There seem to be more sellers than buyers, but this is by no means a novel condition, as there have been various periods during which values would go down only to react upward later. Local investors apparently hold as much stock in the various companies as they wish to, and it will be some time before they will desire to increase their holdings.

It is a matter of regret to everybody who has the best interests of the mining industry at heart that so many "wild cats" are springing all over the country. There has been a lull in the demand from the East for the reputable stocks traded in at the local exchanges, and this can only be attributed to these "varmints." This is all the more to be regretted since there are so many reputable brokers in this city who are anxious that the mining industry, as well as the mining stock market should not suffer any injury through misrepresentation. I can only advise the readers of the *Journal* to peruse the advertising pages, where they will find the cards of reputable members both of the Colorado Springs Mining Stock Association and of the Board of Trade and Mining Exchange. A great deal of ignorance prevails both about the mines and about mining stocks. A prominent broker here states that he received this week a letter from a woman in Philadelphia enclosing \$10 for which she wanted mining stocks. She did not say what kind she desired nor how much; she simply wanted "mining stocks," presumably as many shares as she could get for the price. Having heard that certain stocks have been sold as low as \$5 per thousand shares she presumably wished to get as many thousands as the money would buy, going on the same principle on which affectionate wives will buy a box of Pittsburgh "stogies," because she can buy a hundred of them for the price that her unfortunate husband usually pays for a half dozen Havanas. These feminine investors are somewhat ungallantly referred to as "mud-hens." They may consider themselves lucky when the money is sent to reputable brokers who will not take advantage of their ignorance; but as often as not they will confidingly hand their money over to the "wild cat" promoters, whose motto is: "The richest mine is found in the purse of a fool."

The success of the Colorado Springs exchanges has induced many people to join in movements to open similar exchanges in other places. It has been shown that the majority of these exchanges have made no money for themselves, nor for their members and have succeeded only in taking away some business from the exchanges in this city owing to their capital offering every facility and safeguard to investors.

(Special Telegram to the *Engineering and Mining Journal*.)

COLORADO SPRINGS, February 6th.—The Portland Gold Mining Company announces that it will not declare a dividend for March as it will put in a plant of machinery on its property. However, the company expects to pay 12 dividends during 1896.

BY TELEGRAPH.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending March 5th, as follows:

| Name of Company. | Feb. 25 | Feb. 29 | Mar. 2 | Mar. 3 | Mar. 4 | Mar. 5 |
|--------------------|---------|---------|---------|---------|---------|---------|
| Alamo | .06 1/4 | .06 1/4 | .06 1/4 | .06 1/4 | .06 | .06 |
| Anaconda | .60 | .58 | .57 | .56 | .56 | .53 |
| Argentum-Juniata | .63 | .63 1/4 | .62 | .59 1/4 | .61 | ..... |
| Blue Bell | .08 1/4 | .08 1/4 | .08 1/4 | .08 1/4 | .08 1/4 | .08 1/4 |
| Cripple Creek Con. | .17 1/4 | .17 1/4 | .17 1/4 | .17 | .17 1/4 | .17 1/4 |
| Golden Fleece | 1.50 | 1.50 | 1.51 | 1.48 | 1.50 | ..... |
| Isabella | .50 | .51 1/4 | .50 | .49 1/4 | .51 1/4 | .52 1/4 |
| Mollie Gibson | .49 | .49 | .49 | .49 | .51 | ..... |
| Mount Rosa | .15 | .15 | .15 | .13 | .15 1/4 | .15 |
| Pharmacist | .13 1/4 | .14 1/4 | .14 | .13 1/4 | .14 | 1.40 |
| Portland | 1.41 | 1.52 | 1.42 | 1.38 | 1.42 | ..... |
| Silver State | .01 1/4 | .01 1/4 | .01 1/4 | .01 | .01 1/4 | ..... |
| Union | .52 | .42 1/4 | .42 1/4 | .42 1/4 | .44 1/4 | .44 1/4 |
| Work | .17 1/4 | .17 1/4 | .17 1/4 | .17 | .17 1/4 | .17 |

In addition to the above quotations Messrs. A. Pick & Co., of New York, furnish the following:

| Name. | Feb. 28 | Feb. 29 | Mar. 2 | Mar. 3 | Mar. 4 | Mar. 5 |
|---------------|---------|---------|---------|---------|---------|---------|
| Bankers | .17 1/4 | .17 1/4 | .17 1/4 | .17 1/4 | .17 1/4 | .19 |
| Des Moines | .07 | .07 | .07 1/4 | .07 | .07 | .07 1/4 |
| Gold & Globe | .24 | .24 | .21 | .21 | .21 | .21 |
| Gold Standard | .09 | .09 | .09 | .09 | .09 | .09 |
| Isabella | .50 | .50 | .50 1/4 | .50 | .51 | .52 1/4 |
| Jefferson | .19 | .19 | .19 1/4 | .18 | .18 | .18 |
| Keystone | .06 1/4 | .06 1/4 | .07 1/4 | .06 1/4 | .07 1/4 | .08 1/4 |

Salt Lake City, Utah. Feb. 29.

(Special Report of James A. Pollock.)

The stock market was healthy and active upon advanced quotations. The offerings were freely taken, with confident expectations that prices were going higher.

Ajax at the close of the week was not offered under \$1.25, with over \$1 bid. This advance is the result of a pooling of the heavy blocks of stock taken in conjunction with the good showing at the mine. Alliance was weak, and little business was done in it. Gas did little. Anchor was strong, with little of the stock offered, and bidding quite active. The work with the diamond drill in the properties of the company is reported to be making a gratifying showing.

Bogan stockholders have settled their differences and practically agreed upon an assessment. Work

will probably be resumed at the properties without delay. Bullion-Beck continues the shipment of good grade ore and concentrates in about the usual quantities. The stock did some business with quotations slightly shaded, due to certain holders being compelled to liquidate.

The usual special double dividend of \$1 per share is anticipated by Centennial-Eureka stockholders on the first of March. The properties are looking better daily and the stock cannot be purchased under 70, bids of \$66 being refused. Comstock is reported to be looking considerably improved.

Experts have been sent down to the Dalton for the purpose of making an examination for the company. The last report received was in effect that the mines are looking very well, with some ore ready to ship. The stock just about held its own. Daly was in demand, with little of the stock to be had under \$8.

Geysers continues its mill work, and the report came in during the week that some new ore bodies had just been opened up in the territory free from litigation. Very little Horn Silver was offered. At the properties work of a development nature is being prosecuted vigorously and the showing is said to be good. Ore and concentrate shipments continue without interruption. Lucky Bill is advertising about the usual number of delinquents. The assessment of 1/2 c. per share did not have a depressing effect upon Little Pittsburgh, but on the other hand the stock made an advance of about a cent. The directors have announced that they intend to prosecute work as soon as the snow leaves.

Mammoth has held its usual meeting, and the result is a settlement of all difficulties among the heavy stockholders. The reports showed that the company is out of debt, and that the properties are in splendid shape. The company's net earnings for 1895 reached the sum of \$99,000. There was very brisk inquiry for the stock, which made a great advance, selling around \$2. Morgan (Mearns) has nearly completed its new hoist. Mercor continued its upward march, selling above \$7.50 with very little of the stock offered. Reports from the properties are even more encouraging than ever.

Ontario will pay another 10c. dividend, or \$15,000, on the 29th. The stock was very strong, selling above the \$12 mark. The mines are making a great showing, new ore bodies having been uncovered in several places. Rover continues development work. Silver King was in good demand. Sunshine is working away with good success. The stock was slightly weaker through lack of official information. Utah is looking well and making heavy shipments.

San Francisco. Feb. 28.

(From Our Special Correspondent.)

The market at the opening on Monday showed more life than for two or three weeks past. There was a demand for stocks and some improvement in prices. Later in the week, however, it relapsed into dullness, and closes to-day weak, with a loss on all the prominent stocks of several points. There was nothing in the news from the mines of a bearish nature and the condition is simply the result of manipulation on one side and lack of interest on the other.

Consolidated California & Virginia is quoted \$1.80@1.85; Ophir, \$1.20@1.25; Hale & Norcross, \$1.20@1.25; Confidence, 90@95c; Potosi, 40c.; Savage, 37@38c.; Yellow Jacket, 32@34c. There were some sales of Bodie Consolidated at 30c.

The annual meeting of the Potosi Mining Company will be held March 11th.

At the weekly executive session of the San Francisco Stock and Exchange Board to-day it was resolved to give mining companies whose annual dues are delinquent two weeks additional time in which to pay the \$100. There are only three of these companies which have not yet paid.

The following resolutions have been unanimously adopted at a special session of the San Francisco Board of Trade:

"WHEREAS, Various measures of vast importance to the mining industry of the Pacific coast are now pending before Congress; and whereas, the suspension of hydraulic mining for the past 15 years in the State of California has curtailed the gold production of the nation to the extent of \$10,000,000 per year; therefore be it

Resolved, By the directors of the Board of Trade of San Francisco that our Senators and Representatives in Congress be earnestly requested to give their constant and energetic support to the immediate passage of such laws as will permit the resumption of hydraulic mining in this State, sufficient safeguards being provided to prevent injury or damage to any public or private property; be it further

Resolved, That we heartily concur in the provisions of the act commonly known as the Mineral Lands Bill, which has already passed the House of Representatives, and is now awaiting the approval of the Senate, and we respectfully urge our Senators to secure favorable action thereon at an early date."

THE NEW EXCHANGE.

The rooms of the new Gold Mining Exchange are nearly ready for use, and it is said that the opening will take place about March 10th, though the date has not been finally fixed. The exchange has already several experts in the field examining mining properties offered for listing.

In dealing in stocks a new method is to be adopted, which differs materially from that of the old exchanges. It is proposed to list and arrange

stocks in two separate classes. The first class, which will be known as "Investment Securities," will consist of properties that have been examined, favorably reported upon and recommended by the Mines and Mining Committee as safe investments. The second class, which will be called "Speculative Securities," will comprise stocks of mining companies whose prospects or claims are in the initial stages of development and will be offered to the public without any recommendation of the Exchange. All stocks will be called under the respective class to which they may belong. The Exchange intends there shall be no misrepresentation and that the public will know just what it is buying.

BY TELEGRAPH.

SAN FRANCISCO, Cal., March 6.—The opening quotations to-day were as follows: Best & Belcher, 68c.; Bodie, 19c.; Bulwer, 17c.; Chollar, 69c.; Consolidated California & Virginia, \$1.65; Eureka, 25c.; Gould & Curry, 30c.; Hale & Norcross, \$1.35; Mexican, 54c.; Mono, 9c.; Occidental, 9c.; Ophir, \$1.20; Potosi, 42c.; Savage, 34c.; Sierra Nevada, 63c.; Union Consolidated, 53c.; Yellow Jacket, 23c.

London. Feb. 22.

(From Our Special Correspondent.)

The market in South Africa has been dull all the week, and the only stock which has received any attention has been British South Africa. In this stock there has been a good deal of buying, presumably by those who had calls for the end of February, and in consequence the quotation has advanced. Many rumors have been circulated with the object of sending up the quotation, but none of them was substantiated by facts. The appointment of Earl Grey as co-administrator of Charterland with Mr. Rhodes had no effect on the market, and it was generally supposed to be a step taken at the special request of the Imperial authorities, and to act as a curb on Mr. Rhodes. The dynamite explosion served to call attention once more to the thoroughly corrupt government of the Boers, and has helped to strengthen the opinion now gaining ground here that Kruger & Co. will have to be coerced into a reasonable frame of mind. The labor difficulty in the Rand continues to cause much anxiety, and several mines, including the Robinson, have had to suspend operations temporarily for the scarcity of natives. The shares of gold mines have not received any marked attention, but diamond shares have been rather more lively.

West Australians have also been dull, very little business has been done, and no one seemed inclined to try to initiate any. The most prominent and healthy section of the money market has been Indian Gold Shares, which have been readily bought at good prices. The Mysore Company has paid a dividend of 45% for the last half of the year 1895, making 47½% for the whole year. Much speculation took place in anticipation of this dividend, and it was generally expected that it would be higher. In any case, however, the return is a satisfactory one, and the quotation has considerably advanced. Other Indians have advanced in sympathy. Of other stocks the most conspicuous has been Broken Hill Proprietary, which has suffered by the publication of news that some of the old creeps have continued to move considerably, and that very great care will be required in mining to prevent a total collapse. The output will consequently be restricted for some time. The prospects of the sulphide question are not particularly hopeful, for the directors have not yet obtained a process which is thoroughly suited to the conditions. During the past week some of the London board have examined the Burnham Syndicate's process, invented by Fry Everett & Co., of Swansea, of which some particulars are given elsewhere in the Journal.

American stocks have been dull and not much has been heard of new American properties. Two companies, the Cripple Creek Mines, Limited, and Cripple Creek Explorers, Limited, have been formed, but in neither case is it expected that the public will be appealed to. For some reason or other Palmarejos had a little revival, and on inquiry it appears that additional capital has been subscribed by the shareholders who carried through the amalgamation with the Mexican Minerals Railway. Presumably the mine and railway are to recommence work.

Copper shares have been strong all week and most quotations have advanced. During the past month copper has advanced £4 per ton and as the demand is still strong, a continued rise may be expected. This will greatly improve the position of all copper companies.

The report of the new Dolcoath Company for its first half year's working from June 17th to December 31st, shows that the mine is being worked at a profit under the new regime. The profit was £3,230 but the directors do not consider it sufficiently large to provide a dividend so the amount will be carried forward. The weekly output of tin has increased from 20 tons to 42 tons during the half year and as some further new machinery will be at work shortly the rate of output will materially advance.

In the West Australian section the activity has been rather greater than has been the case during the past three weeks. Fairly dependable returns are now coming from many of the mines, so that people who believe in actual returns more than in prospects are coming forward as buyers. White Feather Reward mine has crushed 734 tons during the past month and recovered 1,523oz. of gold, and at the

meeting of the company the managing director was able to give some encouraging information relative to the stock of ore in hand. In connection with West Australia it may be mentioned that a syndicate is now being formed in London to send an expedition to Northern Australia to explore for gold. Some definite information has already been obtained with regard to prospects there and the present expedition will examine some six properties located a short time ago. The expedition is going out under the auspices of a group of West Australian promotion companies, so if success attends its efforts, another flood of new companies may be expected.

The Indian section has been fluttered by a most extraordinary announcement by the Mysore Gold Mining Company. The superintendent at the mine writes to say that as the recent clean-ups have been of such a satisfactory character amounts of gold have been regularly held back to form a reserve and so to enable the company to keep its production at an even level. The amounts held back every month have now totalled up to no less than 7,000 oz., and as the forward outlook for contents shows no sign of falling off, the superintendent considers it a duty to his conscience to confess his little scheme. It is, of course, very pleasant to find that the confession reveals a large addition to the production. The public, however, have been drawn in on this report and the quotation of the shares has gone up, as might be expected, for it is not many mines that can boast of such a genuine surplus, of gold as this. All the other Indian mines have been in demand as well, for their monthly output are all as regular as those of the Mysore and consequently it is argued that they may have a reserve fund of gold also.

Paris. Feb. 23.

(From Our Special Correspondent.)

Perhaps the greatest speculative interest this week has been in the copper stocks, which have been strong, in spite of a slight reaction in the price of the metal. All of them have been in demand and Rio Tinto has been bought on a large scale. After all, however, the dealing seems to have been chiefly by the old clique, whose members have so often manipulated these shares.

There has been a downward reaction in the zinc shares, and we hear nothing more about an agreement of the producers. The lead stocks are generally holding their late advances, though not especially in demand.

There has lately been quite an advance in the metallurgical stocks. It looks as if the prospects of the great steel companies for work this year were very good, and as if they would be able to secure contracts on better terms than in 1895.

The advance in the South African gold shares has called out a good deal of stock, and sales have been heavy enough to check the rise. It looks a little as if our people were making up their minds to drop these investments when a favorable chance offers itself. This is a sort of movement which may easily degenerate into a panic, and the situation causes some anxiety to those who are watching it closely.

The foreign trade of France for the month of January is reported by the Ministry of Commerce as follows:

| | 1895. | 1896. |
|-----------------------------|--------------------|--------------------|
| | Francs. | Francs. |
| Imports: | | |
| Food..... | 77,598,000 | 90,789,000 |
| Raw materials..... | 154,404,000 | 190,658,000 |
| Manufactures..... | 34,687,000 | 44,389,000 |
| Total..... | 266,689,000 | 325,836,000 |
| Exports: | | |
| Food..... | 39,409,000 | 44,057,000 |
| Raw materials..... | 59,156,000 | 64,592,000 |
| Manufactures..... | 143,371,000 | 142,674,000 |
| Postal parcels..... | 9,633,000 | 10,706,000 |
| Total..... | 248,569,000 | 262,025,000 |
| Excess, imports..... | 18,120,000 | 63,811,000 |

Our Austrian friends are following up their currency reorganization with their proverbial slowness, and no time is yet settled for the final change, though nearly everything is in readiness. It is now stated that the Austrian and Hungarian mints during the three years since the publication of the Currency Act have coined 1,074,000,000 pieces of the new currency, worth 403,000,000 florins. Hungary has coined sufficient gold to redeem its share of the state notes. Austria has still a certain quantity to coin. In all, 287,116,260 fl. worth of 20-crown pieces and 10,361,589 fl. worth of 10-crown pieces have been coined. Of silver, 72,775,104 fl. worth of crowns were coined, besides 17,976,644 fl. worth of 20-heller pieces, and 11,956,443 fl. of 10-heller pieces in nickel. The bronze coins are 2,522,644 fl. worth of 2-heller pieces, and 632,521 fl. in 1-heller pieces, the latter being worth a little less than one centime.

Our government is very busy elaborating its scheme for a progressive income tax, which is to take the place of a number of smaller imposts. The plan is very strongly denounced by most of the financial journals, but it appears to be popular with a large part of the people. Any way of transferring taxes to someone else will always command support from the exempt; it does not follow that it will be just or work well in practice.

The political skies seem to be clearing a little, and if Messieurs the Politicians will only let us alone for a while, we may see our way clear to better times. Perhaps you can say much the same. AZOTE.

MISCELLANEOUS DIVIDENDS.

Commercial Cable Company, dividend No. 27 of 1½% on the capital stock, payable April 1st. Transfer books will be closed March 20th at 2:30 p. m. and reopen April 2d.

Delaware & Hudson Canal Company, quarterly dividend of 1½% on the capital stock, payable March 16th at the office in New York.

Welsbach Commercial Company, quarterly dividend of 2% on the preferred stock, payable March 10th at the office, 40 Wall street, New York.

MEETINGS.

| Name of Co. | Location of office. | Date. | Time. |
|-------------------------|--|----------|------------|
| Amy & Silver-smith..... | Butte, Mont..... | Mar. 13 | 2 p. m. |
| Bozeman..... | Bozeman, Mont..... | April 6 | 7:30 |
| Comanche..... | J. F. Forbis, Butte City, Mont. | " 18 | |
| Elkton..... | Colorado Spgs., Colo. | Mar. 14 | 2 p. m. |
| Gold Mountain..... | John W. Judd, Salt Lake City, Utah..... | " 20 | 19 a. m. |
| Iron Mountain..... | Mg. Exchange Bldg., Denver, Colo..... | " 13 | 3 p. m. |
| Kearsarge..... | 199 Washington St., Boston, Mass..... | " 17 | 11 a. m. |
| Phoenix Con..... | E. S. Hatch, 100 Broadway, New York..... | " | 6:30 p. m. |
| Ybarra (Gold)... | 132 Market St., San Francisco, Cal. | April 21 | 8 " |

ASSESSMENTS.

| Name of Co. | Loc'n. | No. | Divq. | Sale. | Amt. |
|--------------------|-----------|-----|---------|---------|------|
| Alta..... | Nev..... | 51 | Feb. 17 | Mar. 9 | .10 |
| Andes..... | " | 42 | Mar. 6 | " 28 | .15 |
| Bay State, M. & D. | " | 30 | " 9 | " 28 | .02 |
| *Brunswick Con. | Cal..... | 10 | " 23 | Apr. 22 | .03 |
| Bulwer Con..... | Nev..... | 12 | " 11 | " 3 | .05 |
| California..... | Cal..... | " | " 12 | " | .02 |
| Channel Bend..... | " | 1 | Feb. 21 | Mar. 13 | .35 |
| Crown Point..... | Nev..... | 66 | " 20 | " 12 | .20 |
| Dalton..... | Utah..... | 9 | Mar. 18 | Apr. 4 | .01 |
| Gibraltar Con..... | Cal..... | " | Feb. 21 | Mar. 24 | .001 |
| Gold Bar, Con..... | " | 3 | Mar. 19 | Apr. 10 | .05 |
| *Golden Sand..... | " | " | " 16 | " | .01 |
| Granite Hill..... | " | 13 | Feb. 19 | Mar. 11 | .10 |
| Hite..... | " | 2 | Jan. 20 | " 10 | .10 |
| Jenny Lind..... | " | " | Feb. 1 | " 18 | .01½ |
| Julia Con..... | Nev..... | 27 | " 20 | " 11 | .05 |
| Justice..... | " | 61 | " 17 | " 9 | .10 |
| *Lady Emma..... | Cal..... | " | April 6 | Apr. 27 | .15 |
| Lady Wash. Con. | Nev..... | 11 | Feb. 17 | Mar. 10 | .05 |
| *Leo..... | Mont..... | " | Mar. 18 | Apr. 9 | .00½ |
| *Live Oak Con..... | Cal..... | " | " 9 | " | .10 |
| Mabelle..... | Ore..... | 1 | " 2 | Mar. 30 | .10 |
| *Marguerite..... | Cal..... | 2 | April 1 | Apr. 30 | .10 |
| Minnie Quartz..... | " | 4 | Mar. 2 | Mar. 19 | .00½ |
| *Morning Star..... | Nev..... | 11 | " 13 | Apr. 14 | .00½ |
| *Osceola Con..... | Cal..... | 5 | " 14 | " 8 | .01 |
| Orleans..... | " | 1 | Jan. 29 | Mar. 24 | .10 |
| Shasta..... | " | 3 | Feb. 29 | " 10 | .001 |
| Sierra Nevada..... | Nev..... | 110 | Mar. 7 | " 27 | .25 |
| Silver King..... | " | 13 | " 9 | Apr. 6 | .25 |
| Union Con..... | Cal..... | 52 | " 17 | Mar. 17 | .20 |
| Wm. Tell Con..... | " | 14 | " 2 | " 23 | .001 |

*New assessment.

DIVIDENDS.

| NAME OF COMPANY | Current Dividends. | | Paid since Jan. 1, 1896. | Total to date. |
|-------------------------|--------------------|----------|--------------------------|--------------------|
| | Date. | Amount. | | |
| Etna Con..... | Mar. 1 | \$10,000 | \$10,000 | \$50,000 |
| Alaska-Mexican..... | " | " | 18,000 | " |
| Alaska-Treadwell..... | " | " | 75,000 | 2,750,000 |
| Belden, F. E..... | " | " | 4,000 | 221,000 |
| *Boston & Mont..... | " | " | 300,000 | 3,725,000 |
| *Bullion-Heck & Ch. | " | " | 50,000 | 2,000,000 |
| Calumet & Hecla..... | Mar. 3 | 500,000 | 500,000 | 43,850,000 |
| *Centennial-Eureka..... | " 1 | 30,000 | 90,000 | 1,620,000 |
| C. O. D..... | " 2 | 5,000 | 5,000 | " |
| Dalton & Lark..... | " 15 | 12,000 | 12,000 | " |
| Dominion Coal..... | " | " | 600,000 | " |
| Gold Coin..... | Mar. 16 | 15,000 | 30,000 | 45,000 |
| Golden Fleece..... | " | " | 18,000 | 419,979 |
| Gold & Globe Hill..... | " | " | 15,000 | 24,375 |
| Highland..... | " | " | 25,000 | 3,169,918 |
| *Homestake..... | " | " | 62,500 | 3,743,250 |
| Horn Silver..... | " | " | 50,000 | 5,137,500 |
| Isabella..... | " | " | 22,500 | 45,000 |
| *Mercur..... | " | " | 50,000 | 40,000 |
| *Mont. Ore Pur. Co..... | " | " | 80,000 | " |
| Moose..... | " | " | 6,000 | 186,000 |
| Napa Con..... | " | " | 20,000 | 760,000 |
| *Ontario..... | " | " | 30,000 | 13,203,000 |
| Osceola Con..... | " | " | 75,000 | 2,022,500 |
| Ottawaquachy..... | Mar. | 1,000 | 1,000 | 1,000 |
| Portland..... | " | " | 60,000 | 683,000 |
| *Quincy..... | " | " | 20,000 | 7,870,000 |
| *Silver King..... | " | " | 75,000 | 525,000 |
| Smuggler-Union..... | " | " | 500,000 | 1,640,000 |
| *Utah..... | " | " | 3,000 | 135,100 |
| *Victor..... | " | " | 40,000 | 595,000 |
| Victor M. & L..... | " | " | 3,000 | 27,000 |
| Totals..... | | | \$573,000 | \$3,030,000 |

* February dividend paid.

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

STOCK QUOTATIONS.

BOSTON, MASS. Table with columns for Name of Company, Location, Par value, and dates from Feb. 28 to Mar. 5. Includes companies like Alhous, Atlantic, Bost. & C.C., etc.

NEW YORK Table with columns for Name of Company, Location, Par value, and dates from Feb. 29 to Mar. 6. Includes companies like Adams, Ajax, Alhous, etc.

INDUSTRIAL COAL AND COAL RAILROAD Table with columns for Name of Company, Par value, and dates from Feb. 29 to Mar. 6. Includes companies like East. & Ohio, Col. & I. Dev., etc.

PITTSBURG, PA. Table with columns for Name of Company, Location, Par value, Bid, Ask, and Selling price. Includes companies like Nat. Gas, Peoples Nat. Gas, etc.

COLORADO SPRINGS, COLO. Table with columns for Name of Company, Par value, and dates from Feb. 24 to Feb. 29. Includes companies like Ajax, Alamo, American, etc.

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

BALTIMORE, MD. Table with columns for Name of Company, Location, Par value, Bid, and Asked. Includes Baltimore & S. N. C., Con. Coal, etc.

MISCELLANEOUS SECURITIES Table with columns for Name of Company, Location, Par value, Bid, and Asked. Includes American Coal, Conateaugy Ore, etc.

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

* Official quotations N. Y. Stock Exchange. Total shares sold, 135,629. * Official quotations Pittsburg Stock Exchange.

LONDON. Feb. 22.

Table of mining companies in London, listing Name of Company, Country, Product, Capital stock, Par value, Last dividend, and Quotations (Buyers, Sellers).

DENVER, COLO.*

Table of mining companies in Denver, Colorado, listing Name of Company, Par value, and prices for Feb. 24, Feb. 25, Feb. 26, Feb. 27, Feb. 28, Feb. 29.

PARIS. Week ending Feb. 21.

Table of mining companies in Paris, listing Name of Company, Country, Product, Capital Stock, Par value, Divs. last year, and Prices (Op'nings, Closings).

PHILADELPHIA, PA.*

Table of mining companies in Philadelphia, listing Name of Company, Location, Par value, and prices for Feb. 27, Feb. 28, Feb. 29, March 2, March 3, March 4.

MEXICO. Week ending Feb. 27.

Table of mining companies in Mexico, listing Name of Company, State, No. of shares, Last dividend, Last assessment, and Prices (Opening, Closing).

SALT LAKE CITY, UTAH.* Week ending Feb. 29.

Table of mining companies in Salt Lake City, Utah, listing Name of Company, Par value, Bid, Asked, Actual selling price, and Name of Company, Par value, Bid, Asked, Actual selling price.

ASPEN, COLO.*

Table of mining companies in Aspen, Colorado, listing Name of Company, Location, Par value, Bid, Asked, Sales, Price.

HELENA, MONT.*

Table of mining companies in Helena, Montana, listing Name of Company, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, Date.

VALPARAISO, CHILE.* Week ending Jan. 18.

Table of mining companies in Valparaiso, Chile, listing Name of Company, Capital, Share value, Last dividend, and Prices (Bid, Asked, Last sale).

SHANGHAI, CHINA. Jan. 21.

Table of mining companies in Shanghai, China, listing Name of Company, Country, No. of shares, Par value, Paid up, Last dividend, and Price.

DULUTH, MINN.*

Table of mining companies in Duluth, Minnesota, listing Name of Company, Location, Company's office, Par value, Bid, Ask, Price.

NOTE.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

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

* Official quotations Colorado Mining & Lumber Exchange. All the companies are located in Colorado. Total shares sold, 1,270,425; unlisted, 1,981,000.

* Official quotations Philadelphia Stock Exchange. Total sales, 7,449.

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

* Special Report of J. F. MacMillan. Total sales, 97,600.

* Special Report of Samuel K. Davis. Total shares sold, 10,000.

* Special Report of S. E. Smiths.

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, Capital Stock, Shares, Assessments. Rows 1-120.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,300,000.

CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills
Bostelmann, Louis F.
Bullock, M. C. Mfg. Co.
Burlingame Drill Co.
Clayton Air Compressor Works.
Fraser & Chalmers.
Ingersoll-Sergeant Drill Co.
(See Diamond Drills.)
Aluminum Bronze
Fairbanks Co.
Amalgamators
Bucyrus Steam Shovel & Dredge Co.
Fraser & Chalmers.
Amalgam Plates
Western Plating and Mfg. Co.
Anti-Friction Metals
Besley, Chas. H., & Co.
Chester Steel Cast. Co.
Architects and Builders
Berlin Iron Bridge Co.
Pittsburg Bridge Co.
Pollock, Wm. B. & Co.
Assayers' and Chemists' Supplies
Alpsworth, Wm.
Baker & Adamson.
Baker & Co.
Hacker, Christian.
Bullock & Crenshaw.
Denver Fire Clay Co.
Elmer & Amend.
Henry Hill Chem. Co.
Attorneys, Corporation
Emig, C. E.
Melndoe, H.
Automatic Boiler Feeds
D'Este & Seelye
Bentley's Injector Co.
Babbit's Metal
Besley, Chas. H., & Co.
Bankers and Brokers
Arkell, E., & Co.
Bartlett & Co.
Bozy, R. C., & Co.
Bondright, W. F., & Co.
Carpent, A. A.
Grandell & Huff.
Crip, Cr. Syn. Inv. Co.
Decker, L. R.
Duer, G. A. C.
Dorsey, H. H.
Doubleday Kope & Co.
Edsall, Clarence & Co.
Fall, Brooks & Cramer
Farnsworth, C., & Co.
FITS, G. W., & Sons.
Fletcher, C. S., & Co.
Freyschlag, Kirby & Co.
Gardner & Co.
Grant, E. R.
Handy & Harman.
Harrist, W. M.
Hendrickson, W. J.
Heron Bros.
Hodgins, L. W.
Hicks & Benzie.
Johnson, L. L.
Keeth, F. M.
Ken Irick, W. F.
Key, J. J.
Kinney, M.
Kleinschneider, C. F. & Co.
Laiting
Carpenter, Geo. B., & Co.
Hendrie & Bolthoff Mfg. Co.
Lepheimer, N.
Miller, Chas. N. & Co.
Belt Lacing
Bristol Co.
Blasting Caps
Metallic Cap Mfg. Co.
Blasting Batteries
Climax Fuse Co.
Lau, J. H., & Co.
Pressure Blowers
Connorsville Blower Co.
Boilers
Denver Eng. Wks. Co.
Enterprise Boiler Co.
Fraser & Chalmers.
Philadelphia Eng. Wks., Ltd.
Brattice Cloth
Besley, Chas. H., & Co.
Brewers
Fahst Brewing Co.
Brick Machinery
Frasco, E. M., & Co.
Bridges
Berlin Bridge Co.
Pittsburg Bridge Co.
Buckets
Scaife, Wm. B. & Sons.
Carbens
Bishop, Victor, & Co.
Bostelmann, Louis F.
Lexow, Theodore.
Chain and Link Bolting (See Bolting.)
Chemicals
Baker & Adamson.
Bullock & Crenshaw.
Elmer & Amend.
Henry Hill Chem. Co.
Coal
Herwind White Coal Mfg. Co.
Custner & Curran
Consolidation Coal Co.
Coal Cutters
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co.
Leyner, J. Geo.
Link Belt Machinery Co.
Compressors
Clayton Air Compressor Works.
Norwalk Iron Works Co.
Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. F. & Co.
Beckett Foundry & Machine Co.
Blake, T. A.
Boston Ore Machinery Co.
Bradley Pulverizer Co.
Colorado Iron Works.
Denver Eng. Works Co.
Egebach Mach. Mfg. Co.
Fraser & Chalmers.
Fue Vanner Concentrator.
Hendrie & Bolthoff Mfg. Co.
John Mach. Co.
Krupp, F.
Link Belt Machinery Co.
McCully, R.
Scoville, H. H., & Co.
Stedman Foundry & Mach. Co.
Walburn-Swenson Mfg. Co.
Contractors. (See Machinery.)

Copper Dealers and Producers.
American Metal Co.
Arizona Copper Co.
Atlantic Mining Co.
Salbach S. & Ref. Co.
Baltimore Cop. Wks.
Bath, H., & Son
Boston & Mont. M. Co.
Bridgeport Copper Co.
Butte & Boston M. Co.
Canadian Copper Co.
Copper Queen Mfg. Co.
Detroit Copper Co.
Elliott's Metal Co., Ltd.
Centrifugal Iron
Berlin Iron Bridge Co.
Scaife, W. B. & Sons
Crucibles, Graphite, Etc.
Denver Fire Clay Co.
Dixon, Jos. Crucible Co.
Dampier Recruiters
D'Este & Seelye.
Cyanide
Roessler & Hasselcher Chemical Co.
Diamonds
Bishop, Victor, & Co.
Bostelmann, L. F.
Lexow, Theodore.
Diamond Drills
Bishop, Victor, & Co.
Bostelmann, L. F.
Bullock Mfg. Co., M.C.
Lexow, Theodore.
Sullivan Machinery Co.
(See Air Compressors and Rock Drills.)
Draughtmen
Young, Wm. B.
Drawing Materials
Besley, Chas. H., & Co.
Dietzgen, E. & Co.
(See Engineering Instruments.)
Dredges
Bucyrus Steam Shovel & Dredge Co.
Marion Steam Shovel Co.
Southern & Co.
Dyers
Brown, Horace T.
Cummer, F. D. & Son Co.
Denver Eng. Wks. Co.
Dump Cars
Denver Eng. Works Co.
Hendrie & Bolthoff Mfg. Co.
Educational Institutions
Arizona School of Mines.
Columbian University.
Chicago School of Assaying.
Correspondence School of Mines.
Lehigh University.
Mass. Inst. of Technology
Michigan Mining School.
Royal Mining Academy.
Electrical Batteries
Macbeth, James, & Co.
Electrical Machinery and Supplies
Besley, Chas. H., & Co.
Card Electric Co.
Denver Eng. Wks. Co.
General Electric Co.
Jeffrey Mfg. Co.
Elevators, Conveyors and Hoisting Machines
Brown Holst. & Conv. Mach. Co.
Curtis, H. W., & Co.
California Wire Wks.
Cooper, Hewitt & Co.
Crooks, W. A., & Bros. Co.
Denver Eng. Wks. Co.
Field & Goetzman.
(See Wire Rope Tramway and Machinery.)
Emery Wheels
Besley, Chas. H., & Co.
New York Belting & Packing Co., Ltd.
Engineers, Chemists, Metallurgists
See Directory Pages 4, 5 and 6.
Engineers' Instruments and Supplies
Buff & Berger.
Bullock & Crenshaw
Dietzgen, E., & Co.
Fauth & Co.
Gurley, W., & L. E.
Engines
Buckeye Engine Co.
Bullock, M. C. Mfg. Co.
Dayton Gas Engine & Mfg. Co.
Enterprise Boiler Co.
Ellison, Wm., & So.
Fraser & Chalmers.
Lidgerwood Mfg. Co.
Philadelphia Eng. Works, Ltd.
Excavators
Bucyrus Steam Shovel & Dredge Co.
Marion Steam Shovel Co.
Southern & Co.
Vulcan Iron Works.
Fire-Brick and Clay
Chur, A. T.
Denver Fire Clay Co.
Furnaces
Brown, Horace.
Hodgins, Wm.
(See Machinery.)
Fuses, Powder
Ingersoll-Sergeant Drill Co.
Fuse, Safety
Climax Fuse Co.
Gas Engines
Denver Eng. Works Co.
Norman, J. J., & Co.
Gas Works
Pollock Wm. B. & Co.
Wood, R. D. & Co.
Gauges, Recording, Etc.
Hartol Mfg. Co.
Gearing
Besley, Chas. H., & Co.
Denver Eng. Wks. Co.
Chester Steel Cast. Co.
Fraser & Chalmers.
D'Este & Seelye.
Grease, Graphite, Etc.
Besley, Chas. H., & Co.
Dixon, Jos. Crucible Co.
Harvey's Steel
Pierce & Miller Engineering Co.
Heavy Machinery
Denver Eng. Works Co.
Fraser & Chalmers.
Rose, Rubber, Etc.
New York Belting & Packing Co., Ltd.
Injectors
Fuebery Injector Co.
Insulated Wires and Cables
Okonite Co., Ltd.
The Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.
Joint Fittings
Tight Joint Co.
Lead Linings for Chlorination Tubs.
Raymond Lead Co.

Locomotives
General Electric Co.
Hunt, C. W. Co.
Porter, H. K., & Co.
Machinery.
Dealers in Mining, Milling and Other Machinery
Allis, Edw. P., & Co.
Bacon, E. C.
Bissett Fdy. & Mch. Co.
Besley, Chas. H., & Co.
Blake, T. A.
Bostelmann, L. F.
Boston Ore Mach'y Co.
Bradley Pulverizer Co.
Buckeye Engine Co.
Bullock, M. C. Mfg. Co.
Caldwell, H. W., & Co.
Card Electric Co.
Carpenter, Geo. B., & Co.
Channon, H. Co.
Colorado Iron Works.
Connorsville Blower Co.
Crandall & Huff.
Crook, W. A., & Bros. Co.
Davis-Colby Ore R. Co.
Denver Eng. Wks. Co.
Ellison, Wm., & Son.
Egebach Ma. Mfg. Co.
Field & Goetzman.
Fraser & Chalmers.
Hammond, Mfg. Co.
Hendrie & Bolthoff Mfg. Co.
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co.
Manganese Steel
Taylor Iron & Steel Co.
Metal Dealers
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Bald, Henry & Son.
Besley, Chas. H., & Co.
Bridgeport Copper Co.
Elliott's Metal Co., Ltd.
Eureka Co.
Foster, Blackett & Wilson.
James & Shakspeare.
Johnson, Matthey & Co.
Lambert's Wharf Co.
Lewisohn Bros.
Locke, Blackett & Co.
Mathison Smelting Co.
Matthiessen & Hegeler Co.
Montana Ore Purchasing Co.
Orford Copper Cr.
Pass, C., & Son, Ltd.
Phipps, Dodge & Co.
Picher Lead Co.
Raymond Lead Co.
State Ore Sampling Co.
Tod, William, & Co.
Vivian, Younger & Bond.
Jessop, Wm. & Sons, Ltd.
Leyner, J. Geo.
Lidgerwood Mfg. Co.
Link Belt Mach. Co.
Krupp, F.
McCully, R.
McKiernan Drill Co.
Mecklenburg Ir. Wks.
Merralls' Mill Co.
Moore, Sam. L., & Son.
Nock & Garside
Norwalk Iron Wks. Co.
Philadelphia Eng. Wks., Ltd.
Pollock Wm. B. & Co.
Ridson Iron Works.
Scaife, W. B. & Sons.
Stedman Fdy. & M. Co.
Scoville, H. H., & Co.
Stearns-Roger Mfg. Co.
Sullivan Mach'y Co.
Tod, Wm., & Co.
Union Iron Works.
Vulcan Iron Works.
Walburn-Swenson Mfg. Co.
Walker Mfg. Co.
Webster, Camp & Lane Mach. Co.
Westinghouse Elect. Mfg. Co.
Mather Lead Co.
Baker & Co.
Bald, Henry & Son.
Besley, Chas. H., & Co.
Bridgeport Copper Co.
Elliott's Metal Co., Ltd.
Eureka Co.
Foster, Blackett & Wilson.
James & Shakspeare.
Johnson, Matthey & Co.
Lambert's Wharf Co.
Lewisohn Bros.
Joplin Machine Wks.
Kan. City S. & Ref. Co.
Lectoux & Co.
Montana Ore Purchasing Co.
Newark Pulv'ng Wks.
Orford Copper Co.
Pennell, Salt & Co.
Ricketts & Banks.
Russell Process Co.
State Ore Sampling Co.
Walburn-Swenson Mfg. Co.
Metallurgical Works and Ore Processors
Amer. Zinc Lead Co.
Baker & Co.
Bald, Henry & Son.
Besley, Chas. H., & Co.
Bridgeport Copper Co.
Canadian Copper Co.
Denver Eng. Wks. Co.
Elliott's Metal Co., Ltd.
Foster, Blackett & Wilson.
Fraser & Chalmers.
General Gold Extracting Co.
Matthiessen & Hegeler Co.
Mine Cars
Crandall & Huff.
Denver Eng. Wks. Co.
Hendrie & Bolthoff Mfg. Co.
Hunt, C. W. Co.
Shufeldt Car Co.
(See Machinery.)
Mills and Smelters Supplies.
Carpenter, Geo. B., & Co.
Crandall & Huff.
Denver Eng. Wks. Co.
Gates Iron Works.
Park's & Wilkinson.
Roessler & Hasselcher Chemical Co.
Stieren, Williams E.
(See Machinery.)
Mining and Land Companies
Atlantic Mfg. Co.
Arizona Copper Co.
Boston & Mont. Mfg. Co.
Butte & Boston Mfg. Co.
Clark Land & Mines Co.
Copper Queen Mfg. Co.
Canadian Copper Co.
Ore Roasters
Brown, Horace F.
Cummer, F. D. & Sons Co.
Davis-Colby Ore Roaster Co.
Ore Testing Works
Hunt, F. F.
Ledoux & Co.
Montana Ore Purchasing Co.
Packaging and Pipe Coverings
Brandt, Randolph.
Jenkins Bros.
Perforated Metals
Aitcheson, R., Perf. Metal Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
Phosphor-Bronze
Phosphor Bronze Smelting Co.
Pneumatics
Bucyrus Steam Shovel and Dredge Co.
Ingersoll-Sergeant Drill Co.
Pipes
Pollock, Wm. B., & Co.
Platinum
Baker & Co.
Johnson, Matthey & Co.
Powder
Atlantic Dynamite Co.
Aqua Powder Co.
Ingersoll-Sergeant Drill Co.
Pressure Blowers
Connorsville Blower Co.
Fraser & Chalmers.
D'Este & Seelye.
Pulverizers
American Fertilizer.
Ams & Explosives.
Australian Mfg. Stand.
Bullionist.
Colliery Guardian.
Denver Republican.
Economic Mining.
El Minedo Mexicano.
Electrical Plant.
Stetefeldt, C. A.
Zeitschrift fur Practische Geologie.
Indian Engineer
Pumps
Blake, Geo. F. Mfg. Co.
Cameron, A. S., Ocean Pump Works.
Denver Eng. Wks. Co.
Fraser & Chalmers.
Goulds Mfg. Co.
Wyckoff, A., & Sons.
Lafin & Rand Powder Co.
Lau, J. H., & Co.
Repauno Chem. Co.
Refrigerators
McNeill's Code
Mining Journal.
Poor's Manual of R.R.'s
Scientific Pub. Co.
So. African Mfg. Jour.
Spun & Chamberlain.
Stetefeldt, C. A.
Zeitschrift fur Practische Geologie.
Hooker Steam Pump Works.
Janesville Iron Wks.
Stillwell-Bierce & Smith-Valle Co.
Tod, Wm., & Co.
Worthington, Henry

Quarrying Machines
Bostelmann, L. F.
Ingersoll Sergeant Drill Co.
Rand Drill Co.
Sullivan Machinery Co.
Quicksilver
Eureka Co.
Railroads
C. B. & Quincy R. R.
Denver & Rio Grande R. R.
Denver, Leadville & Gunnison Ry.
Florence & Cripple Creek R. R.
Midland R. R. of Kentucky.
Rio Grande Southern R. R.
U. P., D. & G. R. R.
Railroad Supplies and Equipment
Carp'ter, Geo. R., & Co.
Hunt, C. W. Co.
Channon, H. Co.
Crandall & Huff.
Fairbanks Co.
(See Machinery.)
Regulators, Damper, Heat, Etc.
D'Este & Seelye Co.
Eddy Valve Co.
Jenkins Bros.
Return Steam Traps
D'Este & Seelye.
Rock Drills. (See Air Compressor.)
Roofing
Berlin Iron Bridge Co.
Scaife, Wm. B., & Sons
Phipps, Dodge & Co.
Shiffler Bridge Co.
Rubber Goods
New York Belting & Packing Co., Ltd.
Scales
Fairbanks Co.
Screens
Aitcheson, R., Perf. Metal Co.
Denver Eng. Wks. Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
Link Belt Machinery Co.
Ludlow-Saylor Wire Co.
(See Machinery.)
Second Hand Machinery
Robinson & Orr.
Separators
D'Este & Seelye Co.
Shoes and Dies
Chester Steel Cast. Co.
Fraser & Chalmers.
Cromie Steel Works.
Pierce & Miller Eng'g & Neering Co.
Denver Eng. Wks. Co.
Shovels (Steam)
Bucyrus Steam Shovel & Dredge Co.
Marion Steam Shovel Co.
Southern & Co.
Smelting and Refining Works
Falbach S. & Ref. Co.
Orford Copper Co.
Baltimore Cop'r Wks. Co.
Penna. Salt Mfg. Co.
Bridgeport Copper Co.
Penn. Smelting and Refining Works.
Elliott's Metal Co., Ltd.
Phos. & Sulph. Ref. Co.
Mathison Smelting Co.
Smelt. Co.
State Ore Sampling Co.
Walburn-Swenson Mfg. Co.
Steel Rails, Castings, Rolls, Drill Steel
Bethlehem Iron Co.
Pierce & Miller Eng'g & Neering Co.
Carpenter Steel Co.
Robinson & Orr.
Chester Steel Cast. Co.
(See Metal Dealers.)
Crock, Wm. L., & Co.
Crescent Steel Co.
Scaife, Wm. B. & Sons.
Garrison, A., Fdry. Co.
Taylor Iron & Steel Co.
Moore, S. L., & Sons Co.
Jesseop Wm. & Sons Ltd.
Walker Mfg. Co.
Williams Mfg. Co.
Telegraph Wires and Cables
Okonite Co., Ltd.
Temperature Regulators
D'Este & Seelye.
Testing Laboratories
Fairbanks Co.
Tools
Besley, Chas. H., & Co.
Pratt & Whitney Co.
Tubes
Besley, Chas. H., & Co.
Pollock, Wm. L. & Co.
Williams Bros.
Tubing-Rubber
New York Belting and Packing Co., Ltd.
Turbine Water-Wheels
Stillwell-Bierce & Smith-Valle Co.
Typewriters
Wyckoff, Scamans & Benedict.
Valves
D'Este & Seelye Co.
Fairbanks Co.
Eddy Valve Co.
Jenkins Bros.
Ventilators
Bullock, M. C. Mfg. Co.
Tod, Wm., & Co.
Fraser & Chalmers.
Vulcanite Emery Wheels
New York Belting and Packing Co., Ltd.
Water-Wheels
Girard Water Wheel Co.
Lefell, James, & Co.
Stillwell-Bierce & Smith-Valle Co.
Well Drilling Machinery
Bostelmann, L. F.
Sullivan Machinery Co.
Williams Bros.
Wharfage
Lambert's Wharfage Co.
Wheels, Car
Chester Steel Cast. Co.
Shufeldt Car Co.
Taylor Iron & Steel Co.
White Lead
Foster, Blackett & Co.
Wire Cloth
Aitcheson, R., Perf. Metal Co.
Bateman, E. T.
Harrington & King Perforating Co.
Wire Rope & Wire
Besley, Chas. H., & Co.
Hunt, C. W., Co.
Broderick & Bascom
Lescaud, A., & Sons
Rope Co.
California Wire Wks.
Phipps, Dodge & Co.
Carpenter, G. B., & Co.
Ropeways Syndicate.
Channon, H. Co.
Cooper Hewitt & Co.
Wire Rope Tramway
Brown Holst. & Conv. Mach. Co.
Hunt, C. W., Co.
Roebbing, J. A., Son & Co.
California Wire Wks. & Co.
Ropeways Synd.
Colorado Iron Works.
Trenton Iron Co.
Fraser & Chalmers.
Vulcan Iron Works.

POSITIONS VACANT.

FREE ADVERTISING

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

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

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

1431 WANTED—STEEL CASTING AND Engineering firm, in good financial condition, and with works having about 200 tons weekly capacity, requires a general manager. Must have knowledge of this special business, have general mechanical and metallurgical ability, and be well acquainted with general commercial routine, reliable costing system and able to control workmen. Preference given to one who could extend and introduce business. A very liberal salary and share of profits would be offered to one of special ability. Applications will be treated in strict confidence. Address SPECIAL STEEL CASTINGS, ENGINEERING AND MINING JOURNAL.

1439 WANTED—A PRACTICAL ME-chanic, to have charge of large twisting and compressing machinery, and also supervise machine shop, at an iron ore mine in Michigan. Must be a draftsman. Address A., ENGINEERING AND MINING JOURNAL.

1440 WANTED—CHEMIST FOR LABO-ratory of iron mine in Michigan. State qualifications and references and also salary required. Address C., ENGINEERING AND MINING JOURNAL.

1441 WANTED—GRADUATE OF TECH-nical school as assayer and assistant to the manager of gold mine in Oregon. No practical knowledge required. Salary to start with, \$75 a month; will increase soon if services are satisfactory. Address R. R., ENGINEERING AND MINING JOURNAL.

1442 WANTED—ASSAYER AND METAL-lurgical chemist wanted as assistant in private assay laboratory in Chicago; must be able to give instruction to students in such branches and make himself generally useful. Really competent men only need answer. Give full details as to age, experience, ability and salary expected, which must be moderate. Address ASSISTANT, ENGINEERING AND MINING JOURNAL.

1444 WANTED—A MAN THOROUGHLY familiar with brass and copper sheet rolling, and capable of making a detailed report upon the same. Address SHEET BRASS, ENGINEERING AND MINING JOURNAL.

1447 WANTED—A CHEMIST, PRACTI-cally familiar with the manufacture of fine medicinal chemicals. One who has been, or is employed in one of the large plants of this sort, preferred. A good opportunity for a young man to show his ability. Address Z., ENGINEERING AND MINING JOURNAL.

1448 WANTED—YOUNG MAN, GRAD-uate in chemistry, possessing high-grade technical ability and originality, for position in new elec-ro-chemical industry. One residing in or near New York City preferred. Give references and particulars. Address ELECTRO-CHEMISTRY, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

GRADUATE MINING ENGINEER (AGE 29) well grounded also in mechanical and civil engineering branches and experienced in connection with extensive mining operations, desires employment as manager, assistant manager or superintendent, with mining company or other suitable employment. Has had commercial experience and is familiar with reliable systems of mine accounting and with general business routine. Best references. Address, S. B., ENGINEERING AND MINING JOURNAL. No. 17,372, March 28.

A YOUNG CHEMIST AND ASSAYER, with thorough and practical business education, desires position where hard work and efficiency will insure promotion. Experienced in surveying, keeping of mine accounts, etc. North or West preferred. Address ASSAYER, ENGINEERING AND MINING JOURNAL. No. 17,351, March 14.

A COMPETENT COPPER REFINER WANTS position as foreman. Thoroughly understands reverberatory furnace work. Good references. Address COPPER REFINER, ENGINEERING AND MINING JOURNAL. No. 17,373, March 28.

SITUATION WANTED WITH A GOOD mining company as superintendent or master mechanic. Thoroughly posted on engines, pumps, compressors, drills, stamps and underground work. Twenty years with one company. Age, 47. Address E. M. ALDRICH, Pacific Hotel, Spokane, Wash. No. 17,374, March 21.

MINING ENGINEER—FOR A COAL MINE—20 years' experience in Bituminous mines, room and pillar, and long wall work; Practical and mechanical experience to construct and manage first-class coal mining plant. Highest references as to ability and character. West preferred. Address, OSCAR F. LAMM, Lansing, Kan. No. 17,368, March 14.

POSITION BY MAN OF GOOD ADDRESS and habits, age 33. Has been with leading firms 15 years as machinist, draftsman and foreman. Competent to fill position of trust. Address H., ENGINEERING AND MINING JOURNAL. No. 17,364, March 21.

SITUATION WANTED—BY AN EXPE-rienced graduate mining engineer. Metal and bituminous coal mining. Best references. Address THEO., ENGINEERING AND MINING JOURNAL. No. 17,359, March 21.

A COMPETENT CHEMIST AND ASSAYER desires position, either in the United States, Mexico or South America. Has a knowledge of Spanish. Can furnish best of references. Address T. M., ENGINEERING AND MINING JOURNAL. No. 17,367, March 14.

METALLURGIST AND ENGINEER DE-sires change. Thorough experience in amalgamation, chlorination, with some knowledge of cyanidation, experienced in construction of plants for same. In charge of stamp mill and large chlorination plant in very successful operation. Willing to go to South Africa or anywhere. Terms moderate. Address CHLORINATOR, ENGINEERING AND MINING JOURNAL. No. 17,359, March 1.

Contracts Open.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., February 29th, 1896. Sealed proposals will be received at this office until 2 o'clock p. m. on the 26th day of March, 1896 and opened immediately thereafter, for all the labor and materials required for the interior finish of the U. S. Post Office and Court House at Fargo, North Dakota, in accordance with drawings and specification, copies of which may be had at this office or the office of the Superintendent at Fargo, North Dakota. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All proposals received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Interior Finish of the U. S. Post Office and Court House, at Fargo, North Dakota," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT, Office of the Super-vising Architect, Washington, D. C., March 2d, 1896. Sealed proposals will be received at this office until 2 o'clock p. m. on the 31st day of March, 1896, and opened immediately thereafter, for all the labor and materials required for the stone and brickwork and interior finish above second story (except plumbing, gas piping, heating apparatus, elevators and electric wiring) of the U. S. Appraiser's Warehouse, at New York, 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 New York, N. Y. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for Stone and Brickwork and Interior Finish, etc., of the U. S. Appraiser's Warehouse, at New York, N. Y.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

WATER-WORKS AND ELECTRIC LIGHT Plant.—Sealed bids will be received by the undersigned up to April 2d, 1896, for the erection or construction of a combined system of water-works and electric lights for the city of Dublin, Ga., in accordance with the survey and plans now in the hands of the City Clerk of Dublin. Specifications and drawings will be furnished bidders at a cost of (\$1) one dollar each. Work to commence on said plants by May 1st, and must be completed by September 1st, 1896. For further particulars apply to the chairman or to Jno. D. Prince, N. B. BAUM, Chairman.

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the Village of Philmont, N. Y., until March 11th, 1896, for the construction of the water-works of the village of Philmont, consisting of about eight miles of cast-iron piping, with hydrants, valves and other accessories, together with the construction of a low dam and intake on Forest Lake; also a distributing reservoir, including all material, tools and labor necessary to complete the same. Plans can be seen at the office of the Board, or at the office of the Stanwix Engineering Company, Rome, N. Y., and specifications obtained from the Secretary of the Board. Bids must be sealed and addressed to F. B. Harder, Secretary of the Board of Water Commissioners, Philmont, N. Y., and marked on outside of envelope enclosing them, "Proposals for Water-Works."

WATER MAIN.—Sealed proposals will be received by the City Clerk of the city of Boone, Iowa, until March 11th, 1896, for all material and labor for the construction of an extension to the water mains on Cedar and Fourth streets, in the city of Boone, Iowa, together with all appurtenances, as shown by the plans and specifications therefor on file in the office of R. M. Mitchell, City Engineer. Approximate quantities: 3,850 ft. 8-in. cast-iron water pipe, 43 lbs. to foot; 3 double-nozzle Eddy hydrants connected with main; five 8-in. Eddy valves and boxes; one 6-in. Eddy valve and box; about three tons of specials consisting of crosses and T's. Each proposal must be made on a printed blank furnished by the city and accompanied by a certified check for two hundred (\$200) dollars, payable to the order of the City Treasurer, as a guarantee that contract, if awarded, will be entered into, and satisfactory bond for one thousand (\$1,000) dollars furnished within five days after contract is awarded. Payments to be made as follows: One-half upon completion and acceptance of the work, and balance August 15th, 1896, without interest. Proposals to be acted upon March 11th, 1896. Contract to be completed between April 1st and July 1st, 1896.

CEMENT.—U. S. Engineer Office, Charleston, S. C.—Sealed proposals for furnishing and delivering 10,000 to 15,000 barrels American Natural Cement will be received here until March 9th, 1896, and then publicly opened. Information furnished on application.—FRED ERIC V. ABBOT, Capt. Engrs.

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the Village of Akron, N. Y., until March 10th, 1896, for furnishing the materials and constructing a system of water-works for said village. There will be required approximately the following: 422 3/4 tons (5 3/4 miles) of cast-iron pipe, 51 fire hydrants, 54 gate valves and boxes, brick pumping station and chimney, two pumps of 750,000 gals. capacity each, two boilers, feed pump, heater, etc., a steel stand-pipe and foundation. Also an alternative bid is invited for a 50 H. P. automatic cut-off engine and a power pump having a capacity of 700 gals. per minute at 30 revolutions per minute. Bids will be received for furnishing any of the materials mentioned above or for constructing the works complete. A certified check equal to 2% of the amount of the bid must accompany each bid. Plans may be seen and specifications and blank forms of proposal procured at the office of the Secretary of the Board, Akron, N. Y., or at the office of the Engineer, J. F. Witmer, Chapin Block, Buffalo, N. Y. H. H. NEWTON, Secretary.

SEWAGE PUMPING PLANT.—Sealed proposals will be received by the Board of Sewer Commissioners of the City of Ithaca, N. Y., at their office in said city, until the 14th day of March, 1896, for furnishing all the materials, and doing all the work necessary for the complete construction and placing of the pumping outfit of the sewerage system of said city, with all its appurtenances, including the following items: Two boilers with foundations and fittings complete; two engines set in place; two pumps, capacity 1,500 gals. per minute each; two air compressors, each furnishing 200 cu. ft. of free air per minute, with pressure chamber and fittings complete. Bids may be made on the air compressors separately, or with the other machinery. Each proposal must be accompanied by a certified check for five hundred (\$500) dollars, payable to the Board of Sewer Commissioners of the city of Ithaca as a guarantee of intention. All such deposits, except that of the bidder whose bid will have been accepted, will be returned to the person or persons making the same within three days after the contract is awarded. If the successful bidder shall fail to execute the contract within ten days after notice that it has been awarded to him, the amount of the deposit shall be forfeited to the city of Ithaca. But if he shall execute the contract within the time aforesaid the deposit shall then be returned. Copies of the specifications, forms of proposal, etc., may be obtained by addressing Henry N. Ogden, Chief Engineer, and all proposals shall be made upon the blanks furnished for that purpose. Proposals shall be enclosed in envelopes sealed and marked "Proposals for Furnishing Pumping Machinery for the Sewerage System of the City of Ithaca," with the name and address of the bidder on the outside of the envelope for identification, and addressed to the "Board of Sewer Commissioners, Ithaca, New York." The amount of the bond of security required in the contract will be one-half the amount of the contract, which bond must be signed by two or more sureties. The names and residences of the sureties offered must be stated in the bid. In making the award the Commission will be guided by the workmanship and guaranteed duty, as well as by the first cost of the plant.

COAL.—Estimates for furnishing and delivering about 700 tons of anthracite coal under Contract 527, will be received by the Department of Docks until March 10th, 1896. For full particulars see City Record. Copies for sale at No. 2 City Hall, New York.

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES.
(NON-PAREIL MEASUREMENT.)

| | Lines. | Inches. | Regular 1 time. | One Month 4 times. | Three Months 13 times. | Six Months 26 times. | Nine Months 39 times. | Twelve Months 52 times. | Yearly 52 times. |
|--|--------|---------|-----------------|--------------------|------------------------|----------------------|-----------------------|-------------------------|------------------|
| | 6 | 9 1/2 | \$2 | \$5 | \$12 | \$20 | \$28 | \$34 | \$47 |
| | 9 | 12 1/2 | 3 | 6 | 16 | 28 | 38 | 47 | 60 |
| | 12 | 15 1/2 | 4 | 8 | 20 | 35 | 47 | 57 | 70 |
| | 15 | 18 1/2 | 5 | 10 | 24 | 42 | 57 | 67 | 80 |
| | 18 | 21 1/2 | 6 | 11 | 29 | 50 | 68 | 80 | 100 |
| | 21 | 24 1/2 | 7 | 12 | 33 | 58 | 78 | 100 | 113 |
| | 24 | 27 1/2 | 8 | 14 | 38 | 66 | 89 | 125 | 137 |
| | 27 | 30 1/2 | 9 | 16 | 42 | 72 | 98 | 137 | 149 |
| | 30 | 33 1/2 | 10 | 17 | 46 | 79 | 108 | 149 | 161 |
| | 33 | 36 1/2 | 11 | 19 | 50 | 86 | 117 | 161 | 173 |
| | 36 | 39 1/2 | 12 | 20 | 54 | 93 | 126 | 173 | 185 |
| | 39 | 42 1/2 | 13 | 21 | 58 | 99 | 135 | 185 | 197 |
| | 42 | 45 1/2 | 14 | 23 | 61 | 106 | 143 | 197 | 209 |
| | 45 | 48 1/2 | 15 | 24 | 65 | 112 | 151 | 209 | 221 |
| | 48 | 51 1/2 | 16 | 25 | 69 | 118 | 160 | 221 | 233 |
| | 51 | 54 1/2 | 17 | 26 | 73 | 124 | 169 | 233 | 245 |
| | 54 | 57 1/2 | 18 | 28 | 77 | 130 | 177 | 245 | 257 |
| | 57 | 60 1/2 | 19 | 30 | 81 | 141 | 190 | 257 | 269 |
| | 60 | 63 1/2 | 20 | 32 | 87 | 151 | 205 | 269 | 281 |
| | 63 | 66 1/2 | 21 | 33 | 87 | 151 | 205 | 281 | 293 |
| | 66 | 69 1/2 | 22 | 35 | 93 | 161 | 219 | 293 | 305 |
| | 69 | 72 1/2 | 23 | 36 | 99 | 171 | 232 | 305 | 317 |
| | 72 | 75 1/2 | 24 | 37 | 105 | 181 | 242 | 317 | 329 |
| | 75 | 78 1/2 | 25 | 38 | 105 | 181 | 242 | 329 | 341 |
| | 78 | 81 1/2 | 26 | 40 | 109 | 190 | 258 | 341 | 353 |
| | 81 | 84 1/2 | 27 | 41 | 115 | 200 | 271 | 353 | 365 |
| | 84 | 87 1/2 | 28 | 43 | 121 | 210 | 284 | 365 | 377 |
| | 87 | 90 1/2 | 29 | 44 | 126 | 219 | 296 | 377 | 389 |
| | 90 | 93 1/2 | 30 | 45 | 132 | 228 | 309 | 389 | 401 |
| | 93 | 96 1/2 | 31 | 46 | 137 | 238 | 322 | 401 | 413 |
| | 96 | 99 1/2 | 32 | 47 | 143 | 248 | 336 | 413 | 425 |
| | 99 | 102 1/2 | 33 | 48 | 149 | 258 | 349 | 425 | 437 |
| | 102 | 105 1/2 | 34 | 49 | 154 | 268 | 362 | 437 | 449 |
| | 105 | 108 1/2 | 35 | 50 | 160 | 278 | 376 | 449 | 461 |
| | 108 | 111 1/2 | 36 | 51 | 166 | 288 | 390 | 461 | 473 |
| | 111 | 114 1/2 | 37 | 52 | 171 | 298 | 404 | 473 | 485 |
| | 114 | 117 1/2 | 38 | 53 | 177 | 308 | 418 | 485 | 497 |
| | 117 | 120 1/2 | 39 | 54 | 183 | 318 | 432 | 497 | 509 |
| | 120 | 123 1/2 | 40 | 55 | 189 | 328 | 446 | 509 | 521 |
| | 123 | 126 1/2 | 41 | 56 | 194 | 338 | 460 | 521 | 533 |
| | 126 | 129 1/2 | 42 | 57 | 200 | 348 | 474 | 533 | 545 |
| | 129 | 132 1/2 | 43 | 58 | 206 | 358 | 488 | 545 | 557 |
| | 132 | 135 1/2 | 44 | 59 | 211 | 368 | 502 | 557 | 569 |
| | 135 | 138 1/2 | 45 | 60 | 217 | 378 | 516 | 569 | 581 |
| | 138 | 141 1/2 | 46 | 61 | 222 | 388 | 530 | 581 | 593 |
| | 141 | 144 1/2 | 47 | 62 | 228 | 398 | 544 | 593 | 605 |
| | 144 | 147 1/2 | 48 | 63 | 233 | 408 | 558 | 605 | 617 |
| | 147 | 150 1/2 | 49 | 64 | 239 | 418 | 572 | 617 | 629 |
| | 150 | 153 1/2 | 50 | 65 | 244 | 428 | 586 | 629 | 641 |
| | 153 | 156 1/2 | 51 | 66 | 250 | 438 | 600 | 641 | 653 |
| | 156 | 159 1/2 | 52 | 67 | 255 | 448 | 614 | 653 | 665 |
| | 159 | 162 1/2 | 53 | 68 | 261 | 458 | 628 | 665 | 677 |
| | 162 | 165 1/2 | 54 | 69 | 266 | 468 | 642 | 677 | 689 |
| | 165 | 168 1/2 | 55 | 70 | 272 | 478 | 656 | 689 | 701 |
| | 168 | 171 1/2 | 56 | 71 | 277 | 488 | 670 | 701 | 713 |
| | 171 | 174 1/2 | 57 | 72 | 283 | 498 | 684 | 713 | 725 |
| | 174 | 177 1/2 | 58 | 73 | 288 | 508 | 698 | 725 | 737 |
| | 177 | 180 1/2 | 59 | 74 | 294 | 518 | 712 | 737 | 749 |
| | 180 | 183 1/2 | 60 | 75 | 300 | 528 | 726 | 749 | 761 |
| | 183 | 186 1/2 | 61 | 76 | 305 | 538 | 740 | 761 | 773 |
| | 186 | 189 1/2 | 62 | 77 | 311 | 548 | 754 | 773 | 785 |
| | 189 | 192 1/2 | 63 | 78 | 316 | 558 | 768 | 785 | 797 |
| | 192 | 195 1/2 | 64 | 79 | 322 | 568 | 782 | 797 | 809 |
| | 195 | 198 1/2 | 65 | 80 | 327 | 578 | 796 | 809 | 821 |
| | 198 | 201 1/2 | 66 | 81 | 333 | 588 | 810 | 821 | 833 |
| | 201 | 204 1/2 | 67 | 82 | 338 | 598 | 824 | 833 | 845 |
| | 204 | 207 1/2 | 68 | 83 | 344 | 608 | 838 | 845 | 857 |
| | 207 | 210 1/2 | 69 | 84 | 349 | 618 | 852 | 857 | 869 |
| | 210 | 213 1/2 | 70 | 85 | 355 | 628 | 866 | 869 | 881 |
| | 213 | 216 1/2 | 71 | 86 | 360 | 638 | 880 | 881 | 893 |
| | 216 | 219 1/2 | 72 | 87 | 366 | 648 | 894 | 893 | 905 |
| | 219 | 222 1/2 | 73 | 88 | 371 | 658 | 908 | 905 | 917 |
| | 222 | 225 1/2 | 74 | 89 | 377 | 668 | 922 | 917 | 929 |
| | 225 | 228 1/2 | 75 | 90 | 382 | 678 | 936 | 929 | 941 |
| | 228 | 231 1/2 | 76 | 91 | 388 | 688 | 950 | 941 | 953 |
| | 231 | 234 1/2 | 77 | 92 | 393 | 698 | 964 | 953 | 965 |
| | 234 | 237 1/2 | 78 | | | | | | |

LANDS AND MINES FOR SALE.

GOLD MINES FOR SALE.

WE have some splendid propositions for you on dividend paying gold mines in Cripple Creek and Gilpin County districts. Investigate.

THE CLARK LAND & MINES CO.,
Room 10, Opera House Block, Denver, Colo.

GOLD MINES FOR SALE

For full particulars address

CHARLES D. POSTON, Phoenix, Arizona.

GOLD MINES FOR SALE

On Pacific Coast. Correspondence solicited.

J. F. CROSETT,

No. 628 Sacramento St., San Francisco, Cal.

MACHINERY AND SUPPLIES FOR SALE.

FOR SALE—TWO 250 H. P. COMPOUND engines and water tube boilers, 100 H. P. Ideal engine, 30 H. P. automatic engine, 3, 8 and 50 H. P. vertical engines, 400 H. P. duplex pump, 100 and 500 H. P. heaters; all are bargains. N. Y. Safety Steam Power Co., 60 South Canal street, Chicago, Ill.

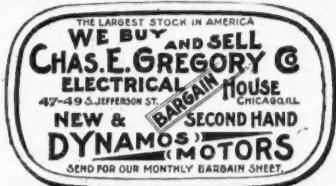
FOR SALE.

The following selected second-hand Rails: About 50 tons 30-lb. Iron T-Rails and complete joints for same, in Pittsburg, in first-class condition to re-lay.

Also a small lot of 60-lb. Steel T-Rails.

ROBINSON & ORR,

No. 419 Wood Street, PITTSBURG, PA.



MISCELLANEOUS WANTS.

WANTED.—AN EXPERIENCED METAL-lurgist and mining engineer to act as superintendent of a well-established copper mining and smelting company. The company is a large and regular producer, and no one need apply unless thoroughly competent for the position.

Reply in own name, giving age, references, salary expected, and full particulars as to experience, addressed to

SUPERIN TENDENT,
P. O. Box 2396,
New York City.

EXCEPTIONAL CHANCE TO GET IN THE chemical business; new plant; all complete; manufacturing special line; very profitable; staple; ready sale for entire product; sold only on account of death; do debts; \$25,000 required, half cash, balance from profits. Address C. D. V., ENGINEERING AND MINING JOURNAL.

24 Per Cent. Guaranteed—40 Per Cent. Probable.

There are no doubt many good dividend-paying securities offered investors, but none of them are SAFER, SURER and MORE PROFITABLE than the Treasury Stock of a paying GOLD MINE. The IOWA GOLD MINING & MILLING CO., of Colorado, offers investors an opportunity to purchase 120,000 shares of its Treasury Stock at 50 cents per share. This is the only portion of the entire 1,000,000 shares for sale at any price. The proceeds will be used in building a tramway for transporting the ore from the mines to the reduction mills, 8,800 feet distant, thus saving on transportation alone exceeding \$72,000 per year on the present output. The ore is at present packed down on jacks at a cost of \$1 per ton.

The Iowa properties consist of three mines, two mill sites and a thoroughly modern mill of 60 tons capacity, near Silverton, San Juan County, Colorado. Only 1,576 fathoms of ground have been worked out, producing in addition from SMELTING ore alone over \$300,000. There are thousands of tons of milling ore now on the dump waiting cheap transportation to the mill. 5,351 fathoms of ore are blocked but not taken out that will yield \$1,002,000. The deepest working from the surface is only about 300 feet, and adjoining mines on the same vein are working 500 feet below on rich ore, which shows that with depth the ore becomes more valuable.

The veins are true fissure in character and go to a depth greater than can be safely worked. So it can be readily seen that this property, like the other big San Juan mines, will be operated for scores of years.

A HANDSOME PROSPECTUS and REPORTS OF EXPERTS, duly sworn to and filed with the SECRETARY OF STATE OF COLORADO, will be mailed free to any address on application. This booklet gives an absolutely correct description of the property. It illustrates by color maps all the workings and development, and shows every shipment of ore and the purchasers thereof.

Commencing with May 1st, 1896, the company guarantees to pay at least \$10,000 monthly dividends, and when the tramway is complete in next August, the dividends are guaranteed to be at least \$15,000 per month. The necessary money can be taken from the mines, but not in the contracted time, and as the prospectus will plainly show, it is better for the company to sell this 120,000 shares of treasury stock than to delay these promised payments and improvements. If taken soon these shares will be sold at 50 CENTS PER SHARE, PAR \$1.00.

The facts stated above are sworn to in this booklet by men of undoubted integrity. Don't throw this proposition lightly aside or class it with the ordinary mining scheme. We ask a thorough investigation, and will gladly supply an abundance of first-class references.

Address **FRANK W. INGERSOLL, Attorney, 719 Cooper Building, Denver, Colo.**

ASSESSMENT NOTICE.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.

Location of Principal Place of Business, San Francisco, California.

Location of Works: Grass Valley Mining District Nevada County, California.

Notice is Hereby Given that at a meeting of the Board of Directors held the Twentieth day of February, 1896, an assessment (No. 10) of Three cents (3) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, J. J. Halpin, No. 57 Broadway (Room 8), New York City, State of New York, on or before the twenty-third day of March, 1896.

Any stock upon which this assessment shall remain unpaid in San Francisco, on the twenty-third day of March, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the twenty-second day of April, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors,

J. STADTFELD, JR., Secretary.

P. S.—All certificates of stock must be sent to the Treasurer to be stamped Assessment Paid.

NOTICE OF ASSESSMENT.

(Civil Code of California.)

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.

Location of principal place of business, San Francisco, Cal.; location of works, Virginia Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 4th day of March, 1896, an assessment (No. 6) of Thirty Cents (30c.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 47, Nevada Block, 309 Montgomery Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 8th day of April, 1896, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on TUESDAY, the 28th day of April, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors,

A. W. HAVENS, Secretary.

Office—Room 47, Nevada Block, 309 Montgomery Street, San Francisco, Cal.

BY MAIL \$5.00.

New revised edition Lock's Miners' Pocketbook.

SPON & CHAMBERLAIN, PUBLISHERS, 10 CORTLANDT ST., N. Y.

ORGANIZED APRIL 12, 1842.

THE MUTUAL LIFE INSURANCE CO. OF NEW YORK.

RICHARD A. McCURDY, President.

Insures every approved description of Life and Endowment Policies on terms as favorable as those of any other company.

Cash Assets, \$204,638,783.96.

DIVIDENDS.

HOMESTAKE MINING COMPANY,
MILLS BUILDING, 15 Broad Street,
New York, March 14, 1896.

DIVIDEND No. 212.

The regular monthly dividend, TWENTY-FIVE (25) 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 25th inst. Transfer books close on the 20th inst.

LOUNSBERY & CO., Transfer Agents.

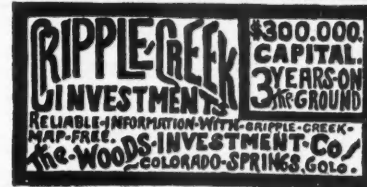
HANDY & HARMAN,
Dealers in Bullion, Specie and Bonds,

No. 32 Nassau Street, New York.

Sovereigns, Francs and Marks, Doubletons, Mexican Dollars, Fine Silver Bars, Fine Gold Bars.

Special attention given to Investments and to Consignments of Silver and Gold Bullion of all grades.

REFERENCE: American Exchange National Bank, New York City.



GOLD AT CRIPPLE CREEK.

THE BEST WAY TO GET THERE IS OVER THE SANTA FE ROUTE.

The fabulously rich gold mining district of Cripple Creek, Colorado, is attracting hundreds of people. By spring the rush bids fair to be enormous. That there is an abundance of gold there is demonstrated beyond doubt. Fortunes are being rapidly made.

To reach Cripple Creek, take the Santa Fe Route, the only standard gauge line direct to the camp. Through Pullman sleepers and chair cars. The Santa Fe lands you right in the heart of Cripple Creek.

Inquire of nearest ticket agent, or address G. T. Nicholson, G. P. A., A. T. & S. F. Ry., Monadnock Block, Chicago, Ill.

New Fast California Train.

The California limited via Santa Fe route leaves Chicago 6 p. m. daily, reaching Los Angeles and San Diego in three days and San Francisco in three and a half days. Equipment consists of superb new vestibuled Pullman palace and compartment sleepers, chair car and dining car, through from Chicago to Los Angeles without change. The California limited is the fastest and most luxurious train via any line to California.

Another train leaves Chicago at 10 p. m. daily, carrying palace and tourist sleepers to Los Angeles and San Francisco.

Full particulars obtained and reservations secured from

J. M. CONNELL,
City Passenger Agent,
No. 212 South Clark Street,
Chicago.

\$1,000 IN PRIZES.

This amount is offered by the Plain Citizens for essays on certain economic and industrial subjects. For particulars apply to

Dr. STEPHEN H. EMMENS,
1 Broadway, New York.

CRIPPLE CREEK Complete history of the great gold camp, with our big 56 col paper 3 mos. for 25c. in stamps.
ILLUSTRATED WEEKLY, Denver, Colo.

Received Too Late for Classification.

1347 U. S. CIVIL SERVICE COMMISSION will hold an examination commencing at 9 a. m., on March 20th, at the post-office in New York City, to fill a vacancy in the position of mechanical engineer in the quartermaster general's office of New York City. The examination will consist of orthography, letter-writing, arithmetic and practical questions in machinery and steam engineering. The practical questions comprise seven-tenths of the whole examination. The salary of the position to be filled is \$1,200 per annum. Persons desiring to compete should write at once to the Civil Service Commission at Washington, D. C., for an application blank and file their applications immediately. Any citizen of the United States above 20 years of age will be eligible to the examination upon filing an application.

1348 U. S. CIVIL SERVICE COMMISSION will hold an examination in this city, commencing at 9 a. m., on March 25th, to secure a list of eligibles for the position of fireman. A vacancy now exists in the War Department. Preference in certification to fill the existing vacancy will be given to competitors who have a knowledge of the boilermaker's trade. The salary of the position in which the vacancy exists is \$720 per annum. Residents of the District of Columbia or of any of the States will be admitted to this examination. Persons desiring to compete should secure application blanks from the Civil Service Commission and file their applications at once.

FRED. F. HUNT,
77 Pine St., New York,
ANALYST AND ASSAYER.
Weighing, Sampling and Assaying of Ores, Mattes,
Lead Bullion and all Mineral Products.

STUDENTS

Instruction in Assaying, Chemistry and
Mineralogy for Business Men.
SIMONDS & WAINWRIGHT,
CHEMICAL & MINING ENGINEERS & ANALYSTS.
Laboratories, 20 Platt St. (cor. of Gold), New York.
Assays, Analyses, Experimental Research and Consultation.

NICKEL

GRAIN—for Anodes, German-
Silver and Steel.

THE CANADIAN COPPER CO.,
201 Perry-Payne Bldg., Cleveland, O.

THE BRIDGEPORT COPPER CO.

BRIDGEPORT, CONN.

Refiners of Copper. . . .

Argentiferous Material treated
on favorable terms.
Advances Made on Consignments . . .

W. F. ROBERTSON,

27 THAMES ST., Cor. Greenwich St., NEW YORK,

**Mining Engineer,
Metallurgist and Assayer**

Ores, Mattes, Lead Bullion, and all Furnace
Products Sampled and Assayed.

Matte Smelting

JUST OUT. ONLY \$2.00.

See Page 36.

**THE AMERICAN METAL CO.
LIMITED.**

80 Wall Street (P. O. Box 957), NEW YORK.
Security 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, Birmingham
Manchester and Glasgow; Metallgesellschaft, Frankfurt-on
Main; Williams, Foster & Co., Ltd., Swansea, Eng.; Societe
le Nickel, Paris, France; Balbach Smelting & Refining Co.,
Newark, N. J.

**THE 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 refin-
ing and sale. **Specialty made of Silver-
Bearing Ores and Mattes.**

SELL

INGOT AND CAKE COPPER.

President, **ROBERT M. THOMPSON,**

Office, 27 to 29 Wall Street, New York.

LAMBERT'S WHARFAGE CO.,

Prince of Wales Dock, SWANSEA.

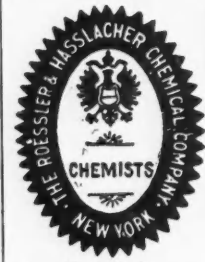
Ores, Mattes, Regulus and Bars Received and
Prepared for Market.

Copper, Lead, Tin, Spelter and Pig Iron Received
Weighed and Sampled and Warrants
issued against same.

N. B.—Warrants are on the Accepted List of the London
Metal Exchange.

Regular lines of Steamers from America, Europe, etc.
Consign Goods to Lambert's Cranes,
Prince of Wales Dock, Swansea.

Advertising not only brings trade; it
directs trade, it creates trade.



CYANIDE

**PEROXIDE OF
SODIUM**
And all other Mining Chem-
icals.

The Roessler & Hasslacher
Chemical Co.,

73 PINE ST., NEW YORK.

Trade Mark.

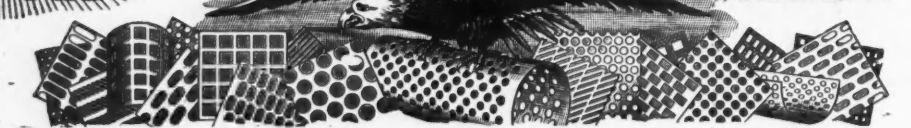
LEWISOHN BROTHERS,

P. O. Box 1247. 81 and 83 FULTON STREET, NEW YORK.

Advances made on Copper, Matte and Ores.

Agents for the following Mining Companies: Boston & Montana C. C. & S. Mining Co.
Tamarack Mining Co.; Butte & Boston Mining Co.; Osceola Consolidated Mining Co.
Arizona Copper Co., Ltd.; Kearsarge Mining Co.

**THE HARRINGTON & KING PERFORATING CO.
CHICAGO.**



**METALS PERFORATED AS REQUIRED.
FOR MINING SCREENS OF ALL KINDS.**

FOR USE IN
MILLING AND MINING MACHINERY, STONE, COAL AND ORE SCREENS,
REDUCTION AND CONCENTRATING WORKS, STAMP BATTERY SCREENS,
WOOLEN, COTTON, PAPER AND PULP MILLS, BRICK AND TILE WORKS, FILTERS,
RICE, FLOUR AND COTTONSEED OIL MILLS, SPARK ARRESTERS, GAS AND WATER WORKS,
SUGAR AND MALT HOUSES, OIL, GAS AND VAPOR STOVES,
DISTILLERIES, FILTER PRESSES, COFFEE MACHINERY, ETC., ETC.

STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.
Main Office and Works, 222 to 240 N. Union St., Chicago, Ill., U. S. A.
Eastern Office, No. 284 Pearl St., New York.

LEDOUX & CO.,

9 Cliff Street, New York.

Assayers and Engineers.

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,

104 JOHN ST., NEW YORK.

ORES TESTED.

Complete Ore Milling and Testing Works
for making practical working tests of ores to determine
the Best Method of Treatment. Milling, Metal-
lurgical and Chemical Processes investigated.

ASSAYS AND ANALYSES.

Assays by appointment to New York Metal Exchange.

JAMES & SHAKSPEARE,

ENGLAND.

1 Metal Exchange Buildings, London, E. C.,

AND

17 Irwell Chambers West, Liverpool, Eng.

METALS, MATTES AND MINERALS.

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

HENRY BATH & SON,

London, Liverpool and Swansea,

BROKERS.

All Description of

Metals, Mattes, Etc.

Warehouses, Liverpool and Swansea.
Warrants Issued under their Special Act of
Parliament.

NITRATE OF SODA.

Cable Address: - **BATHOTA, LONDON.**

VIVIAN, YOUNGER & BOND,

117 Leadenhall St., London, E. C.

Copper, Tin, Lead, Spelter, Antimony, Silver
Bullion and all kinds of metals.

Best terms for Copper Mattes, Lead and Silver
Ores, Silver-Lead Bullion, Etc., Etc.
Tinplates, Galvanized Iron, Railway Material,
Etc., Etc.

Cable Address: "BOND," London.

Telegraph Codes Used: Bedford McNeill's
A B C 4th Edition, Moreing & Neal's.

**BALTIMORE
COPPER SMELTING AND ROLLING COMPANY**

(The Baltimore Copper Works),

Office: **KEYSER BUILDING,
BALTIMORE, MD.**

Ingot Copper. Sheet Copper.

Diamond Pointed Core Drills

Take out **SOLID** core to any required depth. Unequaled for Accuracy, Durability, Efficiency and Economy.
For twenty-six years these drills have led all competitors, and embody many new and **VALUABLE**
improvements not possessed by other drills.

They are the **ONLY MACHINES** that will indicate **INSTANTLY** and **ACCURATELY** the **EXACT THICKNESS** of **EACH** and **EVERY STRATUM** OF
ROCK while the drill is running, thus enabling the operator to save a much **GREATER PERCENTAGE OF CORE** than can be saved by any
other drill. They are the only machines capable of giving a **RELIABLE** record of the **THICKNESS** of **EVERY STRATUM PASSED** through in boring.
We carry **IN STOCK** drills of **VARIOUS SIZES** capable of boring holes from **200 to 5,000 FEET** in depth. Before contracting or purchasing
send for catalogue and terms for drilling holes by contract. We also build a large line of Mining, Hoisting and Underground Haulage Machinery.

Write for what you want to

THE M. C. BULLOCK MAN'F'G CO., 1170 Lake St., CHICAGO, U. S. A.